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HMT 503

FOOD AND BEVERAGE MANAGEMENT

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Introduction

Food and beverage management is a core course, which carries three (3) credit units. It is prepared and made available to all degree course students offering Hospitality and Tourism related Programme in the Faculty of Agricultural Sciences, Department Economics and Extension at the Nation Open University of Nigeria. This course material is useful in your academic pursuit as well as in your workplace as managers and administrators.

What You will Learn in this Course

This course consists of six modules which are sub-divided into 26 units. This course guide tells you what the course is all about. What course materials you will be using and also suggests some general guidelines for the amount of time you are likely to spend on each unit of the course in order to complete it on schedule. It also gives you guidance in respect of your Self- Assessment Exercises (SAEs) which will be made available in the assignment file. Please attend those tutorial sessions. The course will introduce you to the rudiments of food and beverage management.

Course Aim

The main aim of this course is to arm you with adequate information on the concept of food and beverage management in hospitality and tourism management. This will prepare the student for a future career in hospitality and related disciplines.

Learners' Outcomes

To achieve the aim set out, the course has a set of objectives which are set out as intended learners' outcome under each unit. You should read these objectives before you study the unit.

Working through the Course

This course involves that you devote a lot of time to read and study the contents. Each unit contains self-assessment exercises for this course and at certain points in the course you would be required to submit assignments for assessment purposes. At the end of this course, there is a final examination. I would therefore advice that you attend the tutorial sessions where you would have the opportunity of comparing knowledge with your colleagues.

Course Materials

You will be provided with the following materials

- Course guide
- Study units
- References
- Assignments
- Presentation schedule

STUDY UNITS

There are six modules of 26 units in this course, which should be studied carefully.

Assessment

There are two components of assessment for this course:

- The Tutor Marked Assignment (TMA)
- The end of course examination.

Tutor-Marked Assignment

The TMA is the continuous assessment component of your course. It accounts for 30% of the total score.

You will be given four TMA's by your facilitator to answer before you can sit for the final examination.

Final Examination and Grading

This examination concludes the assessment for the course. The examination will account for 70% of total score. You will be informed of the time for the examination.

Summary

This course intends to provide you with underlying knowledge of food and beverage management for the study of Hospitality Management and Tourism.

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MODULE 1

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Unit 2 Product Development Process 1

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UNIT 1 FOOD PRODUCT DEVELOPMENT CONCEPTS

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1.1 Introduction

Product development is the processes required to bring a product from being a concept through to reaching the market. A product developer manages the process of developing a product or enhancing existing products in order to meet customer expectations effectively. The objective of product development is to cultivate, maintain and increase a company's market share by satisfying a consumer demand.

In this unit we will examine food product development concepts under the following; concept generation, the main sources of new product ideas, survey technique, gained knowledge, users/marketers/managers interface for ideas, other relevant environment and internally generated ideas



1.2 Learning Outcomes

At the end of this unit, you should be able to:

- discuss concept generation
- discuss users/marketers/managers interface for ideas
- discuss other relevant environment under the following:
 - a) the competition
 - b) food conferences, exhibitions, trade fairs, research, symposiums
 - c) libraries
 - d) government publication
 - e) state the criteria for ideas
- analyse the main sources of new product ideas

1.3 Concept Generation

Concept generation involves the conceiving, imagining and forming of ideas. It is a distinct stage in the product development process that serves to generate as many concepts as possible, screen these concepts and determine the most valid concept for further development. A variety of concept generation techniques can be employed to spur ideation, some of which are discussed below:

1.3.1 Criteria for Ideas

Thinking up ideas is not the problem. The problems are as follows:

- The ideas must satisfy the needs and desires of a company's targeted consumers and therefore attract customers.
- The ideas must also satisfy the financial and expansionist goals of the company and be within the skill level, technical capabilities, and managerial and financial resources of the company.
- Ideas must be implementable.

The company must strive to balance perceptions of customer and consumer needs.

Self-Assessment Exercises 1

1. What do you understand by new product development?
2. Discuss concept generation
3. Evaluate the criteria for ideas generation

1.4 Main Sources of New Product Ideas

Food companies have three primary sources for ideas for new products and these sources together with competent market research will uncover the perceived needs of the targeted

customers and consumers, define the marketplaces where these customers and consumers are, and suggest product concepts that satisfy these needs. The sources together with some specific motivations providing inspiration for new product are:

- **The marketplace**

Market research to identify customer and consumer needs; results of customer profiling, retail data of buying, habits of customers; distributors expressing their requirements for products and problems they encounter with handling and in-store customer interfaces; customer and consumer communication through complaint letters, etc.

- **Within the company**

Sales force's interaction with retail buyers, with individual customers in stores and from observations of competitive products and their placement within stores. Government pressure or incentives to innovate spontaneously generated ideas from employees.

- **Environment outside the marketplace**

These are: National and international trade exhibitions where new machinery, food products, and ingredients are displayed; Competitive intelligence gathering; Competitors' new products requiring marketplace retaliation; Food and cooking literature providing ideas on ethnic cuisine and new recipes; Technical, trade, and scientific literature opening new horizons for development.

Other sources and techniques for generating new product ideas include:

1.4.1 The Social Media

The Internet has brought many changes and has forced companies to rethink their marketing strategies. The rules for doing business have changed online. In effect, there are no rules.

Through online resources, a company can sell worldwide, and this may contravene local distribution agreements when contracts are made.

- **Twitter**

A service to communicate via tweets It is obviously a network with a higher percentage of a younger demographic. Twitter companies, is also a mechanism for keeping noticed and as such is a powerful tool for brand awareness. If a product or brand has not been mentioned by others, people wonder why. It is also an equally powerful tool for brand sabotage, and companies must keep aware of what people are saying about them.

- **Social Networking as a Communication Tool for Large Masses**

As an idea-gathering tool, social networking is invaluable as it presents opportunities to collate information about people's opinions on products, companies, interests, etc., without the intervention of a questionnaire or questioner or interpreter of the results of a survey. In short, it is unbiased although companies must always be aware of deliberate maliciousness.

- **Blogs and Blogging** A blog (web log) is a micro Web site on which a person, company, or interest group can post comments, items of interest to other like-minded individuals, For companies, blogs can be a means of obtaining comments, opinions, and ideas from potential customers as they add to the blog.

1.4.2 Survey Techniques

Useful data and information are received first hand from customers and consumers through surveys, polls, observation (customer interfaces), and social networking.

- **Interviews, Surveys and Polls**

A survey is a collation of many interviews. Interviews are simply one-on-one encounters between an interviewer and an interviewee conducted person to person or through a written questionnaire in which attitudes of the interviewee are sought. There are two types of interviews:

1. Structured interviews, in which the interviewer has a very specific list of questions to follow faithfully and poses these to the interviewee.

2. Unstructured interviews, in which the interviewer uses a prompt sheet rather than a list of questions with which to conduct the interview and record answers and opinions

They can be conducted person to person, by telephone, by e-mail, by mail, or gleaned by social networking by consumers directly to the company.

- **Telephone Surveys**

Telephone surveys reach a very dispersed population in a large geographic area. They are not selective for respondents, since they are randomly generated. Questionnaires used in telephone surveys must be brief and simple.

- **Postal and Email Survey**

Electronic mail and postal mail surveys have no geographic bounds. Selectivity of respondents can vary widely. Questions on mail surveys (electronic or postal) must be clear and self-explanatory.

- **Predicting the Future**

A novel method of surveying, especially to spot trends that might lead to new product development ideas, is the Delphi method of forecasting. It is based on questionnaires mailed to addressees whose opinions are valued (e.g., senior company executives, eminent authorities in specific fields, etc.). These selected respondents are assumed to be acknowledged experts in the topics under consideration or are leaders in the various industries for which forecasts are sought.

1.4.3 Gained Knowledge

- **Customer Trends: Less Processed, Natural, Organic, and Local Foods**

Environmental and health concerns have led many consumers, indirectly and directly, to **desire** less processed, more natural foods. There is a growing reluctance to accept highly processed foods—for which the consumer understands “ersatz” and “somehow not good” or with lists of ingredients reading like a list of chemicals.

As the demand for organically grown products increases so are increase in added value products processed from the organically grown crops. Obviously, there is a perception that natural or organic produce has advantages, and many in the public believe that in some way they are better. These sum up to “naturalness,” a trend that can be noticed to this day.

- **Food Habits and Lifestyle:** Families eat fewer meals together because of their individual schedules, and more meals are eaten away from home. In addition, snacking is an established and preferred eating pattern for many people who accept several small meals a day as normal practice. Such a change in eating habits opens up opportunities for finger foods that are tasty and nutritious and as such are incentives for new products development.
- **Health Issues:** Vegetarianism is a dietary regimen, and those practicing it represent a highly segmented market that may practice it for health, ethical, or religious reasons. They range from those rigorous in their practice to those who practice it at convenience. Developers however, are not concerned with the reasons for adopting a vegetarian diet but only for its market opportunities.
- **Obesity and Other Health Conditions as Spurs to New Products Ideas**

The concern for obesity and other such health conditions has created a strong hedonistic market, which can be catered to side by side with healthful foods. This has demonstrated four product opportunities for new product development:

1. Foods for either control or loss of weight and foods for health, that is, disease prevention
2. Foods that are low carbohydrate and high protein
3. Foods that are minimal caloric density since the desire to lose weight is a high priority
4. Repositioning existing “healthy” foods back to what they were e.g. low fat, low carbohydrate foods.

- **Ethics/Social Responsibility/Religion as Sources of Ideas**

These issues are more obscure than the above obesity issues. They are highly polarizing issues between people that may carry over into food products. Nonetheless they are bases generating ideas for new product development.

- **Pollution and Associated Anxiety**

Pollution and other environmental concerns caused by agriculture (especially large-scale factory farming operations that produce tremendous amounts of animal waste), fish farming, food manufacturing, and especially the food packaging industry are highly visible and constitute a great driving force for idea generation towards product development.

1.4.4 User /Marketers/Managers Interfaces for Ideas

- **Analysis of Purchases**

Much information about customer shopping habits is available through the universal product code printed on foodstuffs and recorded at the time of purchase. This includes the following:

- i. What items are purchased? and, through analysis, which items are not moving well.?
- ii. Which items are purchased as a percentage of the total amount of money? and hence those most worthy of keeping well stocked.
- iii. Which stores have the highest average purchase per receipt?
- iv. What combinations of products are purchased together?

Information obtained and analyzed will contribute to idea generation for product developers.

- **Marketplace Analysis:** After studying all categories of products available in all marketplaces, developers record the gaps they find—that is, the products or categories of products not available. GAP analysis is another technique for generating ideas for product development.

1.4.5 Other Relevant Environment

Ideas generated exclusively from within companies or from internal resources hired by companies may bring an introspective range of ideas for development. Exploration of opportunities derived from sources outside the company will balance this.

- **The Competition:** Any competitive activity by a company in the marketplace requires some retaliatory action by a rival company. This action can be the impetus for an

accelerated product development program activity requiring the generation of new ideas for products to counter the competition's new introductions.

- **Food Conferences, Exhibitions, Trade fairs, Research Symposiums.**

Attendance at domestic and international food and equipment trade fairs is an essential activity for members of the development team; these are places where ingredient and equipment companies showcase their new developments and advanced technologies.

- **Libraries**

Public libraries have sections on food and cooking with an extensive collection of cookbooks filled with recipes. Recipes based on local, national, and international cuisines provide ideas for new food products or serve as starting points for bench top test products.

- **Government Publications**

There is a wealth of new product ideas in the literature available from various governmental departments and agencies. Governments regularly promote the use of agricultural commodities or underutilized crops. They provide recipes using the foodstuffs with manufacturing directions and occasionally market test data. Where these fit the manufacturing capabilities and resources of a food company and the demand of a company's targeted consumers, this readily available source for increasing a company's ability to generate new food product ideas should not be overlooked.

1.4.6 Internal Generated Ideas

- **Ideas from within the Company:** Ideas for products that satisfy the needs and desires of targeted customers and consumers in specific market niches can arise internally within any food company. The qualification is that these internally sourced ideas cannot be based on the personal whims of dominant individuals within the company but on consumers' needs.

- **Ideas from Customer and End-Users Contacts:** When consumers or customers take time to e-mail, write letters to, or telephone food manufacturers, those people are

expressing a need to be heard. Customers and consumers need to be respectfully listened to or their letters responded to in some constructive manner. Their letters provide valuable product information.

- **Internal Product and Process Research & Development:** All food companies conduct experimental trials in their research facilities or on their processing lines to test the use of new equipment, new ingredients, and new suppliers of raw material. These studies and experimental trials require documentation, cataloguing, and cross-referencing and then storage in a central repository where they can be accessed. These records have more than historical value; they may contain clues to ideas for products that will be found by future technologists.

Self-Assessment Exercises 2

1. Discuss interface marketing
2. What is product development process?
3. What is Knowledge-driven product development?

1.5 Summary

In this unit we have examined food product development concepts; concept generation, main sources of new product ideas, survey techniques, ways of gaining knowledge, users/marketers/managers interface for ideas, the effect of the environment and internally generated ideas within an organization.

1.6 References/ Further Reading.

Fuller, G.W. (2011), *New Food Product Development: From Concept to Marketplace*, Third Edition. Boca Raton, FL: CRC Press. Retrieved from <https://grbau6u1g3.pdedn1.top/dl2.php?id=157054094&h=f9bdd6c7c6a3f7dbc9aaecdc44dfe263&u=cache&ext=pdf&n=New%20food%20product%20development%20from%20concept%20to%20marketplace%20third%20edition>

1.7 Possible Answers to Self-Assessment Exercises

Self-Assessment Exercises 1

1. New product development is the process of bringing a new product to the marketplace, business may need to engage in this process due to changes in consumer preferences, increasing competition and advances in technology or to capitalise on a new opportunity
2. Concept generation involves the conceiving, imagining and forming of ideas. It is a distinct stage in the product development process that serves to generate as many concepts as possible, screen these concepts and determine the most valid concept for further development.
3. The criteria for ideas are:
 - a. The ideas must satisfy the needs and desires of a company's targeted consumers and therefore attract customers.
 - b. The ideas must also satisfy the financial and expansionist goals of the company and be within the skill level, technical capabilities, and managerial and financial resources of the company.
 - c. Ideas must be implementable

Self-Assessment Exercises 2

1. Interface Marketing is that area where innovation is brought to market; it is specialized in customer value management. The focus is on accountability, efficiency, optimizing performance, and these both at strategic, tactical and operational level. It acts as a guide in the design of a strategy to its practical implementation.
2. Product development process describes the steps needed to take a product from initial concept to final market launch. This includes identifying a market need, researching the competition, ideating a solution, developing a product roadmap, and building a minimum viable product.
3. Knowledge-driven product development is best described as a development culture where knowledge is treated as the team's most valuable resource and where they pro-actively

source and manage knowledge so that it will be available when needed. Furthermore, the entire team and even the organisation, work together to grow their knowledge inventory so that knowledge can be accessed more easily for use during development. With knowledge being a resource that is required in every development stage, developers have the opportunity to use it as a measure or criteria to gauge whether the process is ready to proceed from one stage to the next.

UNIT 2 PRODUCT DEVELOPMENT PROCESS 1

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2.1 Introduction

In product development, generated ideas have to go through a screening process to filter out the viable ones. At the end of the screening process, the firm remains with only a few feasible ideas from the large pool generated. Summing up the stages of new product development; idea generation, idea screening, feasibility consideration, concept development, and testing, market strategy/business analysis, product development, market testing, and market entry/commercialization.

In the previous unit we, examined food product development concepts; idea generation and concept development. In this unit we shall examine the product development processes of idea screening, feasibility consideration and prototyping of the product development.



2.2 Learning Outcomes

At the end of this unit, you should be able to:

- discuss testing of product concepts
- discuss on assessing consumer need
- analyse the feasibility consideration necessary in product development
- analyse the activities carried out during prototyping
- evaluate the purpose of prototyping
- evaluate the information acquired in prototyping

2.3 Screening

2.3.1 Testing of Product Concepts

Food product development involves more than just creating the perfect recipe. Companies must plan extensively, work hard, and research for an extended period of time in order to produce new food products. Prior to starting a new product development venture, it is imperative to develop specific objectives and timetables that integrate the future direction of the business. Companies engage in new product development for the purpose of: i. gaining new customers, ii. expanding into new geographic markets, iii. increasing profits, iv. elevating brand excitement, or iv. increasing market shares. Companies, large and small, introduce thousands and thousands of new food products each year. The time spent developing new food products ranges from 6 months to 5 years, depending on the degree of new technology and innovation. Larger companies rely on a product development team that includes food scientists, food engineers, regulatory specialists, marketing experts, and purchasing gurus, while smaller companies may not even

have a research and development department. Smaller companies may rely heavily on outside resources, such as universities and independent laboratories in order to create successful products.

2.3.2 Assessing Consumer Need

- **The 5 Stages of the Product Development Process:** Product development starts with a simple product idea through to production of the product that reaches the consumer to satisfy the desired need. The product development process is the how to get this accomplished. This process is the first stage in the complete product life cycle. There are two main pieces to the development phase: First – conduct of market research and analysis.

Second - create proof of concept, test, and launch product. These are guides to navigate the five main stages of the new product development (NPD) process. There are also tips on fundraising for product research and creation.

- **Choosing a product development model**

Using a well-defined development strategy helps to avoid common product pitfalls. There are a number of well-known models that have provided guidance to start ups and large firms for decades. Here are a few tried-and-true methods:

- **The Stage-Gate model:** Purportedly the most popular development process, the Stage-Gate model is an eight-step roadmap for successfully evaluating, building, and launching a product.

- **The IDEO process:** IDEO is a concept or opinion one wants to realize. This is a user-centric strategy that lets real-world consumer observation lead product development. This process takes its name from the design firm of the same name.
- **The Booz, Allen, and Hamilton (BAH) model:** This framework comprises seven stages. It guides development teams through strategy formation and focuses on minimizing risk.

Regardless of the method chosen, the team needs ample development time. The innovation process could require months or years of trial and error. The complexity of the product should dictate the time to allocate to this phase.

The product development process in 5 stages

Below, going through each important step of the development process you will learn techniques for ideating, testing concepts, and planning a successful launch.

- **Stage 1: Brainstorming and ideation**

The first stage of the product development process is focused on idea generation. Assemble your team and get product ideas out on the floor. Your deliverables may be a loose roadmap to your final product or a simple list of concepts to research, evaluate, and rule out in the second stage.

Profitable product ideas stem from many different sources as discussed in unit one. Take advantage of resources like:

- Online consumer trend trackers
- B2B industry publications, B2B (business to business), is a situation where one business makes a commercial transaction with another.
- Software marketplaces
- Crowd sourcing platforms

- SEO trends, SEO means Search Engine Optimization
- Web forums

In Idea generation you need to start by identifying a bona fide customer need. Even in this early stage, make sure you can answer questions like: Who is my customer? What specific need(s) will my product satisfy? How will I communicate the value of this product?

A SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis is another go-to tool in the ideation stage. It's a simple but effective way to avoid sinking time into the wrong product for your target market.

Use your product SWOT analysis to single out the strongest product concepts before you start requesting customer feedback in the next stage.

- **Stage 2: Research and idea screening**

The ideas you've generated need to be filtered through an objective screening process. Ideally, you'll use a combination of internal and external processes to get the most actionable data from this phase. You'll gauge your target customers' response and secure product validation.

Before assembling focus groups or sending out surveys, seek feedback from your current hires. Or, work with a business consultant if you don't already have a sounding board with industry knowledge. This helps you avoid the pursuit of expensive or unnecessarily complex ideas. After you've conducted preliminary research and identified your target market, open up response channels. Modern tools have dramatically simplified how you can assess customers' needs—pain points, price range, features, and benefits.

These are common methods:

- Sending online surveys and polls
- Hosting social media Q&As
- Running product giveaways
- Creating a "coming soon" landing page
- Running targeted paid advertisements
- Using Google Trends to research demand

This stage seeds your marketing strategy. Pull potential taglines, ad campaigns, and customer personas from the consumer feedback. Competitor analysis is also essential. Get a clear picture of the number and size of your current competitors and their product offerings. If there are similarities, you may discover your niche.

- **Stage 3: Concept development:** At the end of screening, only a few well-received and realistic new product ideas should remain. You'll need a comprehensive plan and blueprint before launching into a prototype. Assess the costs of designing, manufacturing, packaging, and distributing your leading product concept. You may plan to use third-party vendors or create internal systems where possible. Identify the human and capital resources you'll need, and the core features that must exist for a working product. In addition, begin to break out a potential marketing plan and larger business strategy, including revenues and market share for this product. Take note of legal considerations, too. All this information is critical to building a strong business case and securing investors later on.
- **Stage 4: Prototyping and evaluation:** In this stage, you'll create an actual prototype or an approximate mock-up. Some businesses run a small-scale release at this point.

It is also an option to assemble a select group of your target customers to evaluate the nearly completed product. This is one of your last opportunities to work out major technical issues or

add highly demanded features. As was mentioned earlier, your planned product will determine the cost and length of time needed for this stage. Required industry licenses, internal policies, and other requirements will play a role, too.

- **Stage 5: Product rollout and iteration**

Also known as commercialization, this is when your product finally enters the marketplace. This is essentially the launch of your minimum viable product (MVP). It's common for your first release to include only the core features so that your product can simply move forward and start generating sales figures.

By the time of your product launch, your supporting operations should be prepared. Your customer and technical support should be ready. Plus, you should have determined your pricing and distributed necessary details to the rest of your team—sales, marketing, distribution, and so on. Utilize your previous research and testing rounds to determine when and how to promote your products. Test marketing ideas with your target audience and iterate as needed. **Self-**

Assessment Exercises 1

1. What is product testing?
2. Why is product testing important when developing a new product?
3. Enumerate the 5 stages of the product development process

2.4 Feasibility Considerations - Feasibility considerations for a business include regulations, technology, and finances, etc. By setting up an interdepartmental team, the tools will be available to answer initial questions of attainability that may be introduced at any stage during the development process.

- **Regulations**

At the start of a project, firms must be cognizant of the state and/ or federal agencies that regulate a product. In general, products sold locally (which do not cross state lines) are regulated by state agencies.

Due to the potential hazard of botulism, special regulations apply for heat processed; low-acid canned foods, and acidified foods in hermetically sealed containers. These regulations are based upon the microbiological activity of *Clostridium botulinum* and *Staphylococcus aureus*.

Other regulated areas that require attention fall under two general categories: health safeguards and economic safeguards.

- Health safeguards protect against the issues of adulteration, natural toxicants, food additives, residues, and unsanitary processing or holding practices.
- Economic safeguards include the issues of labeling, especially with respect to misleading or false statements, net contents and batch identification number for product recall if necessary.

- **Technology**

In order to launch a new food product, the necessary equipment, facilities, and processes needed to manufacture a product must be established. When products are found to not be technologically feasible, the project should be terminated.

- **Finances**

Before a food product is created for sale, an understanding of all production and marketing costs is required. A detailed cost analysis should be made prior to manufacture. The two types of costs to consider include fixed costs and variable costs.

- Annual fixed costs are those that will not change in any one year, regardless of the level of production. These costs include equipment, building, property taxes, and other items that do not fluctuate due to changes in production.
- Variable costs are expenditures that vary with the volume of production, such as hired labour, raw ingredients, packaging materials, fuel, electricity, utilities, and other items used during production. Variable costs should be carefully examined prior to test marketing and commercialization to implement a unit price in order for the new product to make a profit.

- **Identify Equipment**

Effective equipment identification system is a critical element. Equipment needs to be identified to:

- Aid the operators and mechanics in identifying the correct equipment to reduce the possibility of operating or working on the wrong equipment
- Aid in proper line sequencing of equipment for efficient flow of materials
- Provide warning of specific hazards
- Identify equipment critical to emergency response
- Enhance training effectiveness
- Minimize risks and workplace hazards

Equipment Identification System should include general requirements for equipment labelling information and maintenance.

- **Label Information**

- Equipment labelling shall use standard nomenclature for names and numbers on equipment
- Equipment labelling shall use standard prefixes to designate type of equipment
- Equipment labelling shall use standard suffixes to designate the service
- The label should provide a concise and meaningful description of the function and a unique alphanumeric code identifying the system and component
- Names and alphanumeric codes should be consistent with those used in piping and instrument diagrams, engineering drawings, procedures, shift logs, operator round check-sheets and control panels attached to equipment being controlled
- Label size needs to be large enough for viewers to see and understand at a safe distance
- When text is used in the labels the words should be spelled out. Use abbreviations when they are clear and easy to recognize, and when it is impractical to include the entire word or phrase

- **Facilities and Processes Needed**

The facility that is available for processing should be considered. If the company has acquired a new plant, the water supply and sewage systems will need to be inspected. The conditions inside the plant, such as temperature and relative humidity control, should be taken into account

.Facilities in areas with high humidity and heat in the summer without controls for these conditions may have to modify operating conditions to produce quality foods.

- **Ingredients**

Considerations when choosing ingredients include whether the commodity will be available for purchase year-round or seasonally. Product developers will generally consider more than one supplier of the same product to test quality and cost effectiveness. Larger companies may need to find more than one supplier of the same product to fulfill needs. If more than one supplier is used, tight product specifications must be followed by all suppliers.

- **Formulation**

Varying ingredients, processing parameters, and packaging options will be utilized in order to find the best combination to create the desired product. Sound statistical analysis and good record keeping are critical at this step. After some initial trials, an experimental design will cut down on the number of prototypes to be developed which will save time and money. All formulas and experiments should be detailed in a laboratory notebook. This is beneficial when projects are temporarily delayed, last for long periods of time, or may be passed to other developers at the organization.

- **Processing**

If there is an existing facility, what equipment do you already have? Companies usually try to produce newly developed products on equipment that is already acquired if possible. New equipment is a big capital expense, so new product development projects are often based on expanding product lines using existing facilities and equipment.

- **Packaging**

Packaging is the use of containers plus labels to envelope a product. It is an important part of a consumer's appeal for a product, especially with first time purchases. It is important to consider how consumers will view the packaging and if it will convey the product's quality goals, such as being a high quality premium product or a generic grade. Marketing, product developers, and

packaging engineers should consider the types of packaging materials that are being used on competitors' products and how to set themselves apart.

- **Distribution**

Products that require special distribution needs include frozen and refrigerated foods. Organizations should consider the cost of special distribution. Other distribution considerations include the radius in which the product will be available. Will the product have nationwide or regional distribution? The distribution radius can also influence the packaging needs.

- **Shelf life**

Shelf life of a product is how long it will hold its quality as perceived by customers. The shelf life of a product is important when considering distribution channels. Shelf life can be determined through the use of accelerated or real time testing.

Self-Assessment Exercises 2

- | |
|--|
| <ol style="list-style-type: none">1. Enumerate the benefits of feasibility study for a business2. State the Feasibility considerations for a business |
|--|

2.5 Prototype

- **Definition and Purpose**

The **Pre-Production Prototype** step will result in knowledge about the manufacturability of the product, the manufacturing processes, maintainability and reliability, material and component lists, plans for field support, installation and production costs, safety and environmental factors, time schedules, and regulatory requirements.

Definition: The process of preparing the product for introduction into the marketplace.

Objective: The objective of the pre-production prototype is to develop the manufacturing processes and techniques required to produce the product.

Product: The product of this activity is a pre-production prototype or process.

- **Activities during Prototyping**

During the pre-production prototype step the following activities must be completed:

- Develop a pre-production prototype
- Determine pre-production processes
- Select final product materials and components
- Select manufacturing procedures, equipment, and tools
- Assess specification conformance
- Test product performance, reliability, and quality
- Design a field support system
- Calculate full production costs
- Milestones: A limited production
- Funding Sources: Angel investors, Debt (seed round)

- **Information Acquired**

The pre-production prototype step will usually result in knowledge about the manufacture-ability of the product, the manufacturing processes, maintainability and reliability, material and component lists, plans for field support, installation and production costs, safety and environmental factors, time schedules, and regulatory requirements.

Self-Assessment Exercises 3

1. State the objective of the pre-production prototype
2. Enumerate the relevance of the information acquired during pre-production prototype steps

2.6 Summary

Prototyping is an experimental process where design teams implement ideas into tangible forms from paper to digital. Teams build prototypes of varying degrees of fidelity to capture design concepts and test on users. With prototypes, you can refine and validate your designs so your brand can release the right products.

In this unit we examined the idea screening, feasibility consideration and prototyping of product development. Before companies make a significant investment in a product's development, they need to ensure that it will bring a sufficient returns, the product is right for the consumer while effectively utilizing the available resources.



2.6 References/ Further Reading

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2.7 Possible Answers to Self-Assessment Exercises

Self-Assessment Exercises 1

1. Product testing is any process by means of which a researcher measures a product's performance, safety, quality, and compliance with established standards. The research methodology allows businesses to collect qualitative and quantitative information about consumer's potential consumption/usage behaviour, preferences and reactions on a product.
2. Product testing is important when developing a new product to ensure quality and reliability of the product. Through product testing, manufacturers are able to set technical standards for their products in order to produce high quality materials that are safe for customer use.
3. The 5 stages of the product development process are; brainstorming and ideation, research and idea screening, concept development, prototyping and evaluation, product rollout and iteration

Self-Assessment Exercises 2

1. There are several benefits of feasibility studies, they include:
 - a) Helping the project manager discern the pros and cons of undertaking a project before investing a significant amount of time and capital into it.
 - b) Providing a company's management team with crucial information that could prevent them from entering into a risky business venture.
 - c) Helping a company determine; how it will operate, potential obstacles, competition, market analysis and the amount and source of financing needed
 - d) Providing the marketing strategies that could help convince investors and banks that investing in a particular project or business is a wise choice.
2. The feasibility considerations for a business include regulations, technology, finances, identify equipment, label information, facilities and processes needed, ingredients, formulation, processing, packaging, distribution and shelf life.

Self-Assessment Exercises 3

1. The objective of the pre-production prototype is to develop the manufacturing processes and techniques required to produce the product.
2. The pre-production prototype step will usually result in knowledge about the manufacture-ability of the product, the manufacturing processes, maintainability and reliability, material and component lists, plans for field support, installation and
3. production costs, safety and environmental factors, time schedules, and regulatory requirements

UNIT 3 PRODUCT DEVELOPMENT PROCESS II

CONTENTS

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3.3 Product Testing

3.3.1 Product Specification and Marketing Strategy

3.3.2 Product Commercialization

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3.9 Possible Answers to Self-Assessment Exercises



3.1 Introduction

The logic behind this rather rigid process is that it requires a great deal of discipline to create new products. It's expensive to launch a successful new product-but it's far more expensive to launch an unsuccessful product. For these reasons, organizations invest a lot in the creation and refinement of their new-product development processes. It helps them raise the odds that they will be successful.

In this unit we will examine product development process; the product testing, specifications and marketing strategy and product commercialization.



3.2 Learning Outcomes

At the end of this unit, you should be able to:

- discuss technical testing

- discuss sensory evaluation
- discuss the shelf life of a product
- analyse advantages of commercialization
- evaluate the steps in product commercialization
- demonstrate the important activities involved in product launch

3.3 Product Testing

Product Testing is an integral part of the product design and process development. In order to achieve a final product prototype, it is very important that the product is tested at all stages during its design for technical compliance, acceptability to the consumer, and compliance with cost constraints. The following are various types of tests and evaluations needed to be conducted for a final product prototype:

i. Technical testing : Technical testing varies a great deal depending on the type of product, the testing facilities available, safety needs, processing needs and legal regulations. The tests can be chemical, physical or/and microbiological. The technical testing for consumer acceptance is built up from the consumers' product profile, and suitable technical test methods are sought which relate to the product characteristics identified as important to the consumer. Technical testing is also required to confirm that any food regulations are being met, that consumer safety is ensured and that any labelling requirements for example nutritional value are confirmed. Technical testing is developed at the later stages to monitor the product specifications for quality assurance, and account needs to be taken of the accuracy and reliability of the results. Consideration also needs to be given to the costs of testing.

ii. Sensory Evaluation: Sensory evaluation can be carried out by expert sensory panels or by consumers. Traditionally in product design, the expert panel determined the differences between prototypes and the direction of the differences, while consumer panels evaluated the acceptance

of products or preferences between products. Such panels are used in screening the ingredients, determining the product characteristics and their strength in the ideal product, developing and optimizing the product profile of the product prototypes, and optimizing products for acceptance and cost.

iii. Shelf life Evaluation: In food design, shelf life testing is important because there is usually a target shelf life to be achieved for transport and storage in the distribution chain as well as for storage of the product by the consumer after buying. Shelf life testing needs to be started as soon as possible in the prototype development, usually at the start of optimization experiments. Shelf life testing takes time and can be the critical activity controlling the completion of the project. The variables need to be identified -usually temperature, humidity and surrounding atmosphere in storage; vibration, handling and contamination in transport. Factorial designs are again used so

that the quantitative effects of changes in the storage and transport conditions on product quality can be measured.

iv. Costs Analysis: Costs provide a basic criterion for controlling the design; they need to be monitored throughout development to ensure they are within the target range. At the beginning of the design, the company's cost structure and the target range of costs for the new product need to be agreed by all involved. The basic costs for producing and distributing the product can be subdivided into manufacturing costs, distribution and marketing costs and general company costs.

Some of the manufacturing costs comprise raw materials, packaging, labour, depreciation of equipment, electricity, steam, gas, water, waste disposal and plant overheads. In many

companies, during the product design and process development, the raw materials and direct processing costs are continuously determined and are part of the design.

3.3.1 Product Specifications and Marketing Strategy

Outline process plans include raw material specifications and quantities, process flow charts and processing conditions, product quality specifications, process control points and product testing methods. From this information, product and process specifications can be written and an approximate product cost determined. If necessary, legal or governmental approval is sought for the product or/and the process. An approximate idea of the customer and consumer acceptance of the products is already known; from this and historical sales data, sales forecasts can be determined. From the consumer and market studies, the marketing strategy can developed.

- **Process and Product Specifications:** Final specifications include the raw material specifications, the product formulation, the process flow chart, the processing conditions in the individual unit operations, a preliminary HACCP analysis of the process, the testing of the intermediate and the final products, and the final product qualities. These are based on only preliminary production runs and can change during the commercialization.
- **Prices and Costs Predictions:** Costs and prices are predicted from the trial production runs and from the consumer test. These will be ranges at the present time, as the production yields are only based on the small-scale tests, and the prices are only based on consumer comments, not actual buying. Usually pessimistic, most likely, optimistic, predictions are made for the costs and the prices
- **Sales Forecasting:** Sales forecasts are based on the consumer test results: the target market segments, the total number of potential customers and the potential consumption rate. There will also be a proportion of potential consumers who will not buy the product

and this is also known from product test results. From this type of data and allowing for direct competition, it is possible to make an estimate of the probable sales. However, this estimate must only be used in conjunction with estimates from other sources, since the details of buying intentions given by consumers to market researchers are notoriously inaccurate. Sales forecasts for most products can be made by considering sales levels of similar products in conjunction with past and current socio-economic trends. A broader approach to sales forecasting includes the factors which have an overall effect on the economic behaviour of the nation. Most new products are in the non-staple food class; they are convenience products, impulse products, or alternative food choices and sales levels of these can be affected by changes in total consumer expenditure.

- **Marketing Strategy:** The marketing strategy is built up, to outline and integrate the product, the packaging, the price, the distribution methods and the promotional message. At this stage, these are still general descriptions, and the two most important decisions to be made concern the objectives of the market strategy, and the product concept developed from the final product prototype and earlier research. At this stage the product concept is being developed into a product proposition, which is the basis for the product communications in selling and promoting the product during the commercialization.
- **Financial Analysis:** This is based on the costs predicted by the processing and marketing research, and the prices and sales forecasts from the market research. From these, the future cash flows and profits are predicted. Capital investment for the production plant and maybe the distribution system are estimated, and the working capital for the commercialization and product launch predicted. From this information, rates of return on investment and also break-even times for development costs to be recovered can be predicted. At this stage, these predictions have quite a high range of inaccuracy, and risk of being wrong; therefore probabilities of accuracy are placed on the predictions

The product and process specifications, the sales forecasts, the marketing strategy and the

financial analysis, although at this time not exact, give excellent information for a feasibility study and for the evaluation of the product before the very expensive step of commercialization is attempted.

3.3.2 Product Commercialization

Commercialization is the process of introducing a new product to the market. It includes stages such as production, distribution, marketing, sales, and customer support. Commercialization is the process that allows businesses to raise and solve problems of new products and bring them to the market. It helps companies decide when to launch a certain product by reviewing various factors influencing or delaying a launch. There might be multiple factors affecting a product, like unfavourable market conditions or inquiries requiring some changes. Firms make some critical choices and strategic decisions. One of the essential parts of the process is deciding where to launch. Companies choose whether to bring their product to a local, national, or international market. They also take into account the resources available, such as operational capacities and capital. Business leaders also conduct marketing research to define their primary consumer group.

- **Product Launch and Product Commercialization:** Product launch is the process that occurs when a product is created and is ready for release. Businesses implement promotional strategies and use diverse channels to reach maximum exposure. When a company launches a product, it has already gone through the idea conceptualization stage.

Companies at this stage are ready to bring their product to the audience, and they usually need a marketing partner to present it. The main aim here is to boost interest in the product and increase customer awareness.

Product commercialization is the process that starts before the product is ready. It involves turning certain ideas and concepts into products that will be accepted by the audience and ultimately bring high profitability. The process involves production, distribution, marketing, and sales.

- **Commercialization** enables customers to obtain a wider choice of products and allows companies to generate more revenue, increase efficiency, and reduce costs. It's a critical process since it entails making strategic and tactical decisions.

Steps in Product Commercialization

- i. Define your offer
- ii. Align the product with your business core
- iii. Identify your target audience
- iv. Promote your product
- v. Use a sales plan
- vi. Forecast the results your product commercialization can bring

The commercialization process can be boiled down to six steps. They allow companies to determine production volumes and methods, choose distribution channels, and implement specific marketing techniques.

Define your offer. Create an overview statement that contains clear and detailed information about your product, describe the benefits customers can obtain after buying it, and mention the problems it can solve.

Align the product with your business core. If your product is similar to those your company has produced before, it means that there is no need for new strategies for product promotion.

However, if the product is more diverse than your core, then there will be need to do more work to set up the new infrastructure.

Identify your target audience. Start with your current customers, and find out whether your new product will satisfy their needs. If you want to define your new audience, you can create a buyer persona to make everything clearer.

Promote your product. Define social media platforms your customers prefer the most. Consider using Instagram, Stories, paid ads, power of opinion leaders, pay-per-clicks on Facebook, pre-roll ads on YouTube, and many others.

Use a sales plan. You should tailor a sales plan for your new product. It helps choose strategies that will enable you to reach your ideal buyer. The plan covers the aspects of business growth: target audience, revenue goals, strategies and tactics, metrics, business goals, market conditions, team capabilities, and resources.

Forecast the results your product commercialization can bring. One of the critical parts of commercialization is predicting the sales volume your company will reach in the nearest three years. The forecast includes your gross margin, sales quantities, operating income, capital expenditure, and return on net assets.

Product Launch : ‘Effective product launch is a key driver of top performance, and launch is often the single costliest step in new product development. The demand outcomes sought from the launch of the new product set the basis for strategy and the activities, and of course in the actual launch the strategy and the activities determine the sales outcome! This interrelationship between strategy, activities and demand outcomes is the major basis for planning the launch. It is important to have alternative plans in the event of failure of a predicted launch plan.

Self-Assessment Exercises

1. What is prototype testing?
2. State the types of tests and evaluations needed to be conducted for a final product prototype
3. What do you understand by final product specification?
4. What is commercialization?



3.4 Summary

In this unit we examined product development process; the product testing, specifications and marketing strategy and product commercialization.

A product marketing strategy prepares your business to allocate funds and resources, evaluate risk, and provide time management for your product before it reaches new market segments. Your business strategy should clearly define your product, set goals for product launch, set pricing, and above all account for the customer experience across each stage of the process.



3.5 References/ Further Readings

<https://nzifst.org.nz/resources/creatingnewfoods/index.htm>

<https://sendpulse.ng/support/glossary/commercialization>



3.6 Possible Answers to Self-Assessment Exercises

1. Prototype testing is the process of testing your prototype with real users to validate the design decision before development starts. The goal is to identify problems and areas of

improvement early so you can make the necessary changes prior to development and build a product that meets user's needs and expectations.

2. The types of tests and evaluations needed to be conducted for a final product prototype are technical testing, sensory evaluation, shelf life testing, and cost.

3. Final specifications are set to make sure a safe and quality product is consistently made. It include the raw material specifications, the product formulation, the process flow chart, the processing conditions in the individual unit operations, a preliminary HACCP analysis of the process, the testing of the intermediate and the final products, and the final product qualities.

4. Commercialization is the process of introducing a new product to the market. It includes stages such as production, distribution, marketing, sales, and customer support. Commercialization is the process that allows businesses to raise and solve problems of new products and bring them to the market. It helps companies decide when to launch a certain product by reviewing various factors influencing or delaying a launch.

UNIT 4 FOOD PRODUCT SAFETY AND QUALITY

CONTENTS

4.1 Introduction

4.2 Learning Outcomes

4.3 Define Safety and Quality of Food Product

4.3.1 Major Types of Food Contaminants

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4.6 Possible Answers to Self-Assessment Exercises



4.1 Introduction

Food is a major determinant of health, nutritional status and productivity of the population. It is, therefore, essential that the food we consume is wholesome and safe. Unsafe food can lead to a large number of foodborne diseases. Food safety and quality are important at the home level, but are critical in large scale food production and processing, and also where food is freshly prepared and served.

Food product safety, quality, and nutrition are foundationally linked and address a need in society. Consumer attitudes toward the consumption of food products (fresh or processed) are critical to marketing success and may be formed based on product safety, quality, and nutritional value. All food manufacturers are required to meet the given standards of quality and safety, and need to have their products regularly tested.

In this unit we shall examine food product safety and quality; define food safety and quality of food product, major types of food contaminants and the quality evaluation of food.



4.2 Learning Outcomes

At the end of this unit, you should be able to:

- discuss food safety and quality of food product
- describe the major types of food contaminants
 - a) biological contaminant
 - b) physical contaminant
 - c) chemical contaminant



4.3 Food Safety, Quality and Consumer Protection

The terms food safety and food quality can sometimes be confusing. Food safety refers to all those hazards, whether chronic or acute, that may make food injurious to the health of the consumer. It is not negotiable. Quality includes all other attributes that influence a product's value to the consumer. This includes negative attributes such as spoilage, contamination with filth, discoloration, off-odours and positive attributes such as the origin, colour, flavour, texture and processing method of the food. This distinction between safety and quality has implications for public policy and influences the nature and content of the food control system most suited to meet predetermined national objectives.

Consumer Protection is the practice of safeguarding buyers of goods and services, and the public, against unfair practices in the market place. Consumer protection measures are often established by laws and regulations.

Food control is the mandatory regulatory activity of enforcement by national or local authorities to provide consumer protection and ensure that all foods during production, handling, storage,

processing, and distribution are safe, wholesome and fit for human consumption; conform to safety and quality requirements; and are honestly and accurately labelled as prescribed by law.

The foremost responsibility of food control is to enforce the food law(s) protecting the consumer against unsafe, impure and fraudulently presented food by prohibiting the sale of food not of the nature, substance or quality demanded by the purchaser.

Confidence in the safety and integrity of the food supply is an important requirement for consumers. Foodborne disease outbreaks involving agents such as *Escherichia coli*, *Salmonella* and chemical contaminants highlight problems with food safety and increase public anxiety that modern farming systems, food processing and marketing do not provide adequate safeguards for public health. Factors which contribute to potential hazards in foods include improper agricultural practices; poor hygiene at all stages of the food chain; lack of preventive controls in food processing and preparation operations; misuse of chemicals; contaminated raw materials, ingredients and water; inadequate or improper storage, etc.

Specific concerns about food hazards have usually focused on:

- Microbiological hazards;
- Pesticide residues;
- Misuse of food additives;
- Chemical contaminants, including biological toxins; and
- Adulteration.
- Metallic contaminants (especially heavy metals)
- The list has been further extended to cover genetically modified organisms, allergens, veterinary drugs residues and growth promoting hormones used in the production of animal products.

4.3.1 Major types of food contaminants

Food contamination is generally defined as foods that are spoiled or tainted because they either contain microorganisms, such as bacteria or parasites, or toxic substances that make them unfit for consumption. A food contaminant can be biological, chemical, or physical in nature, with the former being more common.

Biological Contamination: Biological contamination occurs when food becomes contaminated by living organisms or the substances they produce. This includes biological matter produced by humans, rodents, insects, and microorganisms. Biological contamination is the leading cause of food-borne illness and food poisoning, and a common cause of food spoilage and food waste. There are six types of microorganisms that can cause food-borne illness: bacteria, viruses, parasites, protozoa, fungi, and prions. Most food-borne illnesses are caused by bacteria or viruses, with the most common being: *Norovirus*, *Listeria*, *Salmonella*, *E. coli*, *Campylobacter*

Food-borne illness occurs when disease-causing microorganisms, also called pathogens, get into food and multiply to unsafe levels before being eaten. Bacteria and other pathogens thrive in foods that are:

- moist
- high in protein or starch
- neutral in acidity

Foods that meet these criteria are called potentially hazardous or high-risk foods. To slow down the growth of bacteria and prevent food safety risks, you need to follow food safety best practices designed to control bacterial growth through proper food handling techniques, rigorous cleaning and sanitizing procedures, and time and temperature control of food.

Food poisoning occurs when specific toxins are consumed, such as those produced by *Salmonella*, *Staphylococcus*, or *Listeria*; microbial toxins are extremely potent toxins that can

disable the immune system and damage tissues if they are consumed. Many microbial toxins are heat-resistant, so even if bacteria are destroyed in the cooking process, the toxins remain in the food and can cause violent, almost-instantaneous symptoms.

Physical Contamination: Physical contamination occurs when a physical object enters food at some stage of the production or preparation process. Physical objects in food can be a choking hazard and often introduce biological contaminants as well.

Common examples of physical contaminants in food businesses include: Hair, fingernails, bandages, jewelry, broken glass, staples, plastic wrap/packaging, dirt from unwashed fruit and vegetables, pests/pest droppings/rodent hair etc. To minimize the risk of physical food contamination occurring in your food business, always: wear hair neatly tied back or wear a hair/beard net; keep jewelry to a minimum when necessary, wear brightly colored bandages that

can be easily seen if they fall off; throw out and replace cracked, chipped, or broken dishware, glassware, and equipment; use a plastic or metal scoop for ice (never use the glass!); wash fruits and vegetables thoroughly; establish pest prevention and control procedures as part of your Food Safety Plan.

Chemical Contamination: Chemical contamination of food has emerged as a serious concern with potential health hazards in their wake. Majority of the food contamination occurs through naturally occurring toxins and environmental pollutants or during the processing, packaging, preparing, storage, and transportation of food.

Self-Assessment Exercises

1. Differentiate between food safety and quality of food product
2. State the main focus of specific concerns about food hazards
3. What is food contamination and state its major types



4.4 Summary

Ensuring an acceptable level of food quality and safety is necessary to provide adequate protection for consumers and to facilitate trade. These objectives can be achieved by implementing and monitoring quality assurance measures along the entire food chain, when it is appropriate and when it is possible.

Food products are among the most-traded commodities in the world. As markets become increasingly globalized with each passing year, and as the world's population continues to grow, the global food supply chain will only continue to increase in scale and complexity.

Precisely because of these megatrends influencing the mass production and distribution of food, food safety compliance has never been more important.

Every country has different regulatory bodies that preside over the definition and enforcement of domestic food safety standards. In order to sell or manufacture food products in any given country, domestic and international businesses alike are subject to the food safety legislation and enforcement measures of that nation.

In this unit we examined, food product safety and quality; define safety and quality of food product, major types of food contaminant and the quality evaluation of food.



4.5 References/ Further Reading

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<http://foodsciencehm.blogspot.com/2019/04/unit-6-evaluation-of-food.html?m=1>



4.6 Possible Answers to Self-Assessment Exercises

1. Food safety refers to all those hazards, whether chronic or acute, that may make food injurious to the health of the consumer. It is not negotiable. Quality includes all other attributes that influence a product's value to the consumer. This includes negative attributes such as spoilage, contamination with filth, discoloration, off-odours and positive attributes such as the origin, colour, flavour, texture and processing method of the food.
2. Specific concerns about food hazards have usually focused on:
 - a) Microbiological hazards;
 - b) Pesticide residues;
 - c) Misuse of food additives;
 - d) Chemical contaminants, including biological toxins; and
 - e) Adulteration.
 - f) It has been further extended to cover genetically modified organisms, allergens, veterinary drugs residues and growth promoting hormones used in the production of animal products.
3. Food contamination is generally defined as foods that are spoiled or tainted because they either contain microorganisms, such as bacteria or parasites, or toxic substances that make them unfit for consumption. A food contaminant can be biological, chemical, or physical in nature

UNIT 5 OPTIMIZING PRODUCT DEVELOPMENT

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5.7 Possible Answers to Self-Assessment Exercises



5.1 Introduction

Responding to urgent market needs in the food and beverage industry has never been more important. More and more manufacturers are embracing digital transformation to improve efficiency and quality. To successfully navigate market shifts, food and beverage producers must quickly leverage new technologies to increase output and enhance efficiency.

In this unit we shall examine optimizing product development in food and beverage manufacturing; using product development management software to optimize operation and optimization, a source of competitive advantage.



5.2 Learning Outcomes

At the end of this unit, you should be able to:

- discuss the various ways the use of product development management software to optimize operations
- discuss optimization as a source of competitive advantage



5.3 Introduction - Optimization – Definition and Description

The Food & Beverage industry is growing at an unprecedented rate. With new players entering the arena each day, the need for optimizing product development rises. Companies reap multiple benefits when processes and activities involved in new Product Development and Product Management stages are controlled and made operationally efficient.

- ❖ **But what does optimization mean in the Food & Beverage industry?** Optimization encompasses all operational areas from raw material procurement to transportation.
- ❖ Optimizing the product development cycle in the Food & Beverage industry equates to instituting strict measures to assess, control and direct the way ingredients are sourced, processed, cooked, stored and transported.

In order to manage the product development lifecycle, companies across the world are using software such as SpecPage's SpecPDM application. SpecPage is one of the world's leading providers of innovative software solutions, catering exclusively to the needs of the global Food & Beverage industry.

SpecPDM allows managers to store product-pertinent data in a centralized location. This data can be accessed, edited and used by anyone with access to the application. Everything from ingredients lists, to recipes, to organic certifications can be uploaded into this software.

SpecPDM enables managers to effortlessly access extremely important information at any stage of the product lifecycle. The figure below highlights the major targets of the five steps used for production improvement.

- **Using Product Development Management Software to Optimize Operations**

It's been observed companies using product management software find it easier to push forth changes to their operations. Here's how these software applications play a pivotal role:

- **Streamlining Processes**

Software applications like SpecPDM help streamline the entire product development process by enabling collaboration between teams. Although R&D and product development teams tend to use the application extensively, this software allows all departments to access information at any stage of the product development process. In the end, this makes product lifecycle management a more transparent and efficient process.

- **Inventory Management**

Product management applications like SpecPDM allow companies to record details pertaining to ingredients used, chemical formulas in development, and numerous others. Apart from record-keeping, these applications help companies pinpoint materials needing replacement with higher quality standards. Additionally, potential contaminants can be identified when products undergo quality tests and in turn, the suppliers of these contaminated items can subsequently be identified with ease.

- **Adherence to Global Compliance Requirements**

Product development software helps companies adhere to regulatory requirements. Maintaining past records of regulations helps managers keep track of all necessary compliance requirements. Regulations related to ingredient usage and labeling requirements can also be complied with.

In the common instance government regulations are altered – non-adherence to these policy changes places companies at risk of being penalized by regulatory bodies for non-compliance.

Users of applications such as SpecPDM can avoid such pitfalls, by easily updating legal information in the system. These critical updates then serve as the compliance basis for all future product development projects.

- **Easy Transfer of Knowledge**

Managers use information and data they produce from the initial stages of the product development process to plan for future stages. Product management software allows companies to share this product-pertinent knowledge amongst other users, spread across various divisions.

- **Set Standardized Procedures**

The best way to optimize product development is to set standardized operational procedures. Product management applications help managers analyze how various processes work and help eliminate costly steps. They also help companies chart clear rules for product development and product management.

- **Automated Workflows**

Automation of workflow and processes are simplified when companies utilize product development software. Processes such as activity scheduling, order management and inventory tracking can all be easily automated in SpecPDM. A supplier's performance can also be tracked and analyzed as information supplier's provided is included in the database.

- **Reduce Costs**

Product management applications allow users to chart various aspects of the new product development process. This aids managers in preventing costly errors which can potentially damage the credibility of the company itself. Thus, by reducing potential errors, the associated costs with rectifying these errors are drastically reduced.

▪ **Calculation of ROI (Return On Investment)**

Applications such as SpecPDM have been designed to calculate Return on Investment (ROI) to allow companies to capture their ROI for future products. Conservative improvement percentages are used in the system, which help calculate potential returns. By inputting all operational data, companies can analyze where the majority of their expenses are originating from. This guides managers in pinpointing specific ways to eliminate wasteful spending and to ensure they only partake in those activities offering better returns.

A great advantage of this software is how it allows managers to account for expenses and savings they can make within each stage of product development. Within a matter of a few weeks, managers can estimate potential costs and savings for the organizational long-run.

5.3.1 A Source of Competitive Advantage

Changing the way operations are managed has become the greatest need in the market. With so many competitors springing up, any advantage a company can procure will help them acquire new customers.

Optimization in product development and product management will help companies find better, more efficient ways to do business.

From environmentally-friendly resources to doorstep delivery, everything can be handled efficiently by the company.

Optimization also allows companies to pass cost benefits to their customers.

❖ Successfully optimizing operations helps companies better manage overhead costs.

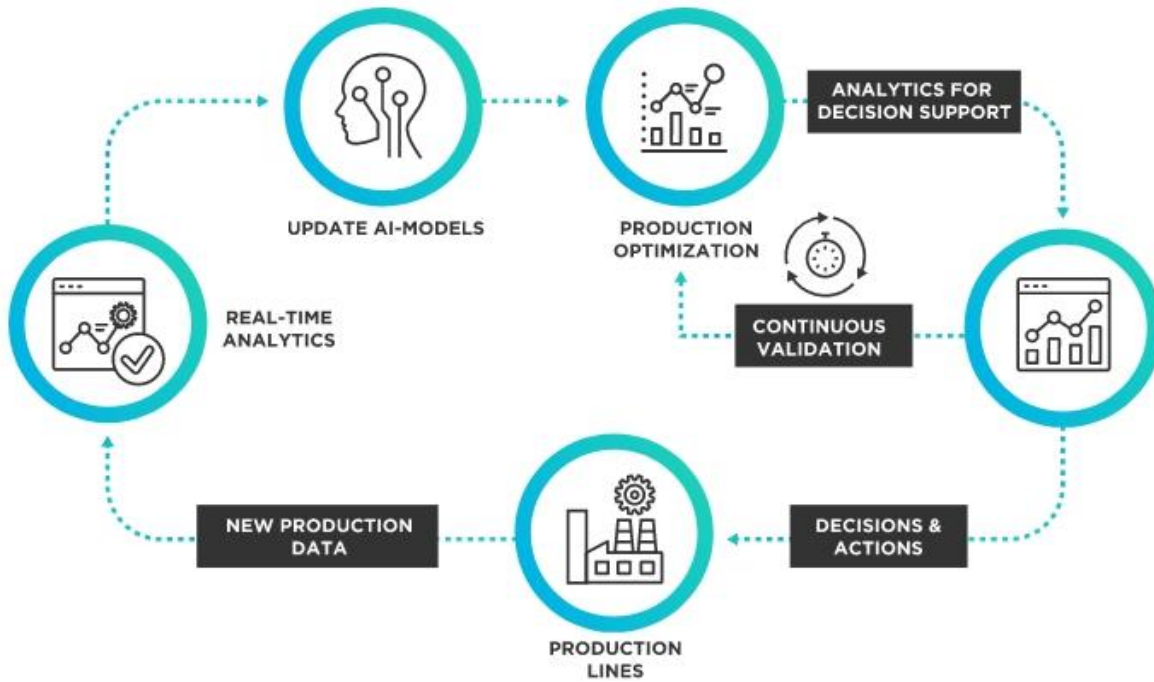
- Seasoned and more established organizations are strategically able to pass these cost benefits to customers, while new players in markets often have multiple start-up costs.
- Deploying an application such as SpecPDM can help level the playing field.

- Particularly in the Food & Beverage industry, key activities such as recipe management, a source of competitive advantage, becomes easier to manage.
- Using these applications, managers can access a centrally-controlled repository of information, helping them track recipes, formulas and ingredients lists with ease.
- Alterations to formulas can be designed and determined within the software itself, thereby streamlining all operational activities and saving valuable time.

- Using specific data recorded in the software to create a framework for recipes leads to a measurable reduction in time to market.

Improved operational efficiency

- Optimizing product development directly translates to an increase in ROI. Applications such as SpecPDM reduce much of the manual labour involved in maintaining internal data. Duplication of information and redundancies are largely eliminated during data management and the integrity of your product data remains intact.
- Optimization of product development is the lifeline which sustains key players in the Food & Beverage industry. Companies must be willing to commit as an organization if they desire to experience the greater returns and benefits.



The figure above shows the use of continuous intelligence in achieving operational excellence.

Self-Assessment Exercises

1. What is optimization in the Food & Beverage industry
2. Outline ways software application optimize operations



5.5 Summary

Manufacturing optimization is the practice of using data to build better products, faster, with the goal of being more efficient and more competitive. Optimization is encompasses in all operational stages.

In this unit we have examined optimizing product development in food and beverage manufacturing; the use of product development software to optimize operations, optimization as a source of competitive advantage.

5.5 Glossary

Adulteration: The act of intentionally debasing the quality of food offered for sale either by the admixture or substitution of inferior substances or by the removal of some valuable ingredient.

Competition: The rivalry between companies selling similar products and services with the goal of achieving revenue, profit, and market share growth.

Development: A process in which something passes by degrees to a different stage (especially a more advanced or mature stage)

Food: Any nutritious substance that people or animals eat or drink or that plants absorb in order to maintain life and growth.

Forecasting: A technique that uses historical data as inputs to make informed estimates that are predictive in determining the direction of future trends

Ideation: The creative process of generating, developing, and communicating new ideas, where an idea is understood as a basic element of thought that can be either visual, concrete, or abstract.

Marketplace: The system of buying and selling in competitive conditions

Marketing: Refers to activities a company undertakes to promote the buying or selling of a product or service.

Product: An object, or system, or service made available for consumer use as of the consumer demand; it is anything that can be offered to a market to satisfy the desire or need of a customer.

Research: A "creative and systematic work undertaken to increase the stock of knowledge". It involves the collection, organization and analysis of information to increase understanding of a topic or issue.



5.6 References/ Further Reading

<https://www.specpage.com/optimizing-product-development/>

<https://innius.com/wp-content/uploads/2021/02/Innius-Lean-DMAIC-cycle-for-Production-Improvements-with-IIoT-1030x973.png>

https://www.tibco.com/sites/tibco/files/media_entity/2021-05/production-optimization-diagram.svg



5.7 Possible Answers to Self-Assessment Exercises

1. Optimization encompasses all operational areas from raw material procurement to transportation. Optimizing the product development cycle in the Food & Beverage
2. industry equates to instituting strict measures to assess, control and direct the way ingredients are sourced, processed, cooked, stored and transported.
3. Streamlining processes, inventory management, adherence to global compliance requirement, easy transfer of knowledge, set standardized procedures, automated workflows, reduced costs, and calculation of return on investment.

MODULE 2

Unit 1 Food Processing Equipment

Unit 2 Food Processing Equipment Continued

Unit 3 Boosting Efficiency in Food and Beverage Manufacture

Unit 4 Basic Elements of Equipment Cleaning & Sanitizing

UNIT 1 FOOD PROCESSING EQUIPMENT

CONTENTS

1.1 Introduction

1.2 Learning Outcomes

1.3 Food Processing Equipment

1.3.1 Functions by which Food Processing Equipment are grouped

1.4 Types of Food Processing Equipment

1.4.1 Preparation Equipment

1.4.2 Mechanical Processing Equipment

1.4.3 Heat Processing Equipment

1.4.4 Preservation Equipment

1.4.5 Packaging Equipment

1.5 Summary

1.6 References/Further Readings

1.7 Possible Answers to Self-Assessment Exercises



1.1 Introduction

Food processing is a function where raw food ingredients are transformed into edible food products. Each of the food processing machines is created with a specific purpose but the basic objective remains the same. Food processing equipment is meant to streamline food processing and make it less labour intensive. The equipment food needs can be customized for home owners or large-scale businesses in the food industry. Food processing goes through several stages with each stage detailing a specific food handling function.

In this unit we shall examine food processing equipment; the functions by which they are grouped and the types of food processing equipment.



1.2 Learning Outcomes

At the end of this unit, you should be able to:

- discuss the functions by which food processing equipment are grouped
- discuss extensively on the various types of food processing equipment



1.3 Food Processing Equipment

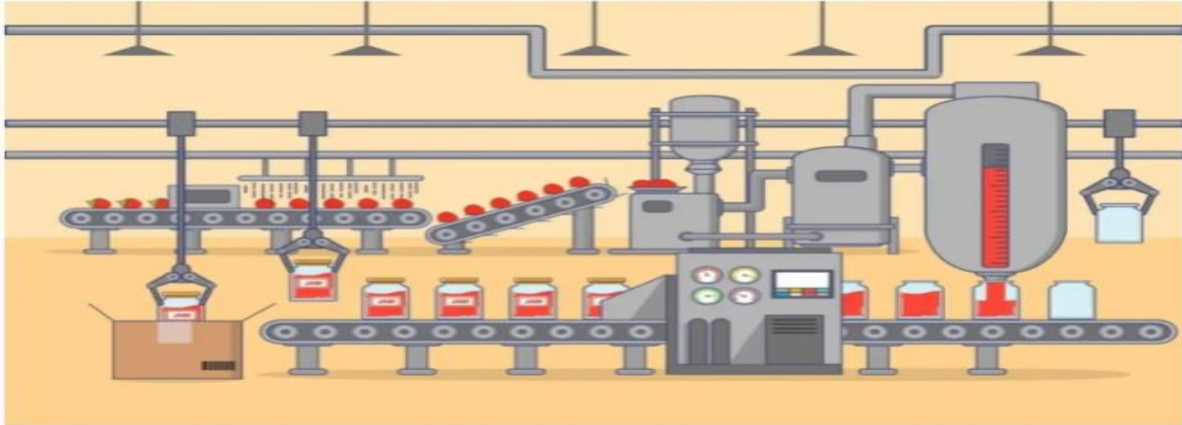
The activities involved in changing raw food ingredients into intermediate or finished products for humans or animals consumption is termed as **food processing**. The activities consist of unit operations. Hence, unit operations are independent or discreet activities in food processing.

Examples of unit operations are washing, slicing, drying, heating, cooling and fermentation.

Each unit operation is achieved using specific equipment.

Generally, clean, slaughtered and butchered or harvested components are taken and are used to produce attractive and marketable food products. A broad variety of machinery and equipment,

gages, instruments are used in the food processing industry. The food processing industry is extremely diverse, complex and evolved. There's a continuous need for process innovation with the consumer market becoming more demanding and sophisticated. The consumers desire novelty, convenience, value for money, excitement and products that are safe, tamper-proof packaging, good fitting in shelves and refrigerators.



An illustration of a complete automated food processing system for jam production

1.3.1 Functions by which Food Processing Equipment are grouped

The food processing production cycle can be broken into several stages (unit operations), characterized by specific functions at which individual *unit operations* are performed. For example, within the preliminary stage, the primary function is to prepare the food material for further processing.. Other secondary activities such as material handling and system control operations complement the preliminary operations in the production cycle. These secondary activities.

Some of the most common functions by which food processing equipment are grouped include:

- Preparation (e.g. Sorting, Grading, Washing, Cleaning)
- Mechanical processing (e.g. Milling, Mixing, Filtration, Seiving),
- Heat processing (e.g. Canning, Pasteurization, Frying, Blanching)

- Preservation (e.g. Drying, Chilling, Freezing)
- Packaging (Rigid, Semi-rigid and Flexible containers + labels)

Self-Assessment Exercises 1

1. What is food processing?
2. State the functions by which food processing equipment are grouped

1.4 Types of Food Processing Equipment

Although the food processing equipment is primarily aimed toward the transformation—i.e., increasing the palatability, consumability, and digestibility—or preservation—i.e., extending the shelf life—of food, some pieces of equipment are also employed to perform preliminary or auxiliary functions, such as handling, preparation, and packaging.

1.4.1 Preparation Equipment

As indicated previously, within the food processing production cycle, initial preparatory operations focus on preparing the raw food material for subsequent processes—typically mechanical or chemical processing—by separating the desirable material from the low quality, substandard, or undesirable material. In doing so, manufacturers are better able to ensure the production of uniform and high-quality food and food products, as well as remove foreign matter and contaminants which may degrade or damage the food material or equipment.



Various berries being mechanically sorted

Some of the unit operations which manufacturers employ during the raw material preparation stage include cleaning, sorting, grading, or peeling (or skinning).

Table 1 – Food Preparation Equipment by Unit Operation

Unit Operation	Description	Equipment Employed*
Cleaning	<ul style="list-style-type: none"> Removes foreign matter and contaminants—e.g., soil, oil, insects, skins, chemicals, etc.—from the surface of raw food material via wet and dry cleaning processes 	<p>Wet Processes</p> <ul style="list-style-type: none"> Soak/floatation tanks (soaking) Spray washers (spray washing) Washing systems (washing) Sterilizers (sterilizing) Ultrasonic cleaners

Dry Processes

- Air classifiers
 - Magnetic separators
 - Screening separators
- Grading
- Closely related to, and often precluding, sorting processes
 - Tungsten lights (candling)
 - Image processors
 - Laboratory equipment
 - Assesses several characteristics of food matter (e.g., flavor, damage, skin color, aroma, etc.) to determine the overall quality
- Peeling/Skinning
- Removes inedible or undesirable material to increase the overall quality and/or appearance of the final food product
 - Pressure vessels (flash steam peeling)
 - Stationary/rotating blades (knife peeling)
 - Carborundum abrasive rollers/bowls (abrasion peeling)

Conveyors and furnaces

Sorting	<ul style="list-style-type: none"> • Operates similarly to and overlaps with dry cleaning processes • Classifies and separates foreign matter and contaminants from raw food material based on a measurable physical characteristic (typically size, shape, weight, or color) 	(flame peeling) <ul style="list-style-type: none"> • See Dry Processes • Sorting machinery • Disc separators (shape sorting) • Sieves/screens (size sorting) • Machine vision sorting systems • Sorting conveyors
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Note: *If applicable, the specific process related to the piece of equipment is indicated in parentheses.

1.4.2 Mechanical Processing Equipment

Mechanical processing operations are employed (without the application of heat or chemicals) to reduce, enlarge, homogenize, or otherwise change the physical form of solid, semi-solid, and liquid food matter. By altering the form and size of the food matter, manufacturers can facilitate and increase the efficiency and effectiveness of subsequent processes, improve the overall quality and edibility, and allow for a greater range of food products to be produced.



A close-up of an electric dough mixer

Within the general mechanical processing classifications—i.e., size reduction, size enlargement, homogenization—there are numerous unit operations, such as cutting, forming, and grinding/crushing, which fall below them. Table 2 below describes the overarching classifications and outlines some of their more specific unit operations and the equipment used to execute them.

Table 2 – Mechanical Food Processing Equipment by Unit Operation

Unit Operation	Description	Equipment Employed
Size Reduction*	<ul style="list-style-type: none"> Reduces the average particle size of solid food matter through mechanical processes involving compression, shear, or impact force 	Grinding/Crushing <ul style="list-style-type: none"> Impact mills Pressure mills Attrition mills Jaw crushers Roll crushers Strainers/pulpers

Cutting/Chopping

- Knives/blades
- Band saws
- Slicing machines
- Meat grinders

Size Enlargement*

- Increases the average particle size of solid food matter through mechanical processes, such as extrusion, agglomeration, or forming

Extrusion

- Non-thermal extruders
- Single-screw extruders
- Twin-screw extruders
- Refrigerated extruders

Agglomeration

- Rotating pans
- Rotating drums
- High-speed agitators
- Tableting

equipment

- Pelletizing

equipment

Forming

- Bread molders
- Pie and biscuit formers
- Confectionary molders
- Enrobing machines

Homogenization*

- Also referred to as emulsification
- Reduces the average particle size and increases the consistency of semi-solid and liquid food matter
- Homogenizers
- Emulsifiers
- Colloid mills
- High shear mixers

Mixing**

- Also referred to as blending
- Combines and disperses two or more components into one another to achieve and maintain a uniform mixture and/or an alteration to the functional or aesthetic qualities of the food

Fluid Mixers

- Agitated tanks
- Paddle mixers
- Anchor mixers
- Turbine mixers

Dough/Paste Mixers

- Horizontal dough mixers
- Sigma-blade mixers

product (e.g., texture)

- Cutter mixers

- Type of equipment depends on the form of the food components—gas/liquid, liquid/liquid, liquid/solid, solid/solid

Solids Mixers

- Diffusive (passive) mixers
- Convective (active) mixers
- Drum blenders

Note: *In these sections, the specific unit operation related to the piece of equipment is indicated immediately prior.

**In this section, the form of the food material suitable for the piece of equipment is indicated immediately prior.

1.4.3 Heat Processing Equipment

Depending on whether the application (and the specific unit operation) is aimed towards heating or cooling the food material, heat transfer equipment can be used to direct heat towards or away from the material, respectively. This section of the article will focus primarily on the applications and equipment aimed towards heating food products, while the following section—*Preservation Equipment*—will touch on the applications and equipment aimed towards cooling food products, as well as those intended to preserve and extend the shelf life of food products.

Heat processing equipment—i.e., equipment which heats food—can cause not only physical changes in the food material, but chemical, biochemical, and biological changes as well. These changes can transform and affect the overall quality of the resulting food products—such as by

altering the chemical structure or enhancing the flavour—and serve as a preservation method by inhibiting or destroying the microorganisms or enzymes which cause spoilage.



Bread dough bakes in an industrial oven

There are many unit operations employed during the heat processing stage, including blanching, baking, roasting, and frying, and Table 3 below describes some of them and outlines the equipment used to execute them.

Table 3 – Heat Processing Equipment by Unit Operation

Unit Operation	Description	Equipment Employed
Baking	<ul style="list-style-type: none"> • Similar to, and often referred interchangeably with, roasting • Employs heated air (heated by convection, conduction, and radiation)—and, in some cases, water vapor—to heat and produce physical and chemical changes in food material, such as texture or flavor 	Baking ovens <ul style="list-style-type: none"> • Direct heating ovens • Indirect heating ovens • Batch ovens • Continuous and semi-continuous

	<ul style="list-style-type: none"> Assists in the preservation of food matter by destroying microorganisms and reducing the amount of moisture at the food surface Suitable for producing bread, crackers, biscuits, and other flour-based or dough-based products 	ovens
Blanching	<ul style="list-style-type: none"> Employs heated water or steam to reduce the number of microorganisms and inactivate undesirable enzymes which can cause spoilage Also cleans, removes excess air from, softens, and improves the overall quality Typically follows preparation operations and precedes preservation operations, such as packaging, dehydrating, or freezing Suitable for fruits and vegetables 	<p>Blanchers</p> <ul style="list-style-type: none"> Steam blanchers Hot water blanchers
Dehydration	<ul style="list-style-type: none"> Employs heat to remove (i.e., evaporate) water from solid, semi-solid, or liquid food material with the intention of producing a solid food product with sufficiently low water content 	<p>Dryers</p> <ul style="list-style-type: none"> Convective dryers Contact (conductive) dryers Vacuum dryers Freeze dryers

	<ul style="list-style-type: none"> • Increases the shelf life of food products due to the reduced water content which inhibits microbial growth and enzyme activity • Reduces weight and volume and/or transforms the form of the final food product 	
Evaporation	<ul style="list-style-type: none"> • Removes volatile solvents (typically water) from food material by boiling to increase the concentration of solid contents • Increases the shelf life of food products due to the reduced water content, but also increases the rate of chemical deterioration • Reduces the weight and volume of the final food product • Typically precedes operations, such as crystallization, precipitation, and coagulation • Suitable for liquid-based food products 	<p>Heat exchangers</p> <ul style="list-style-type: none"> • Evaporators • Condensers

Frying	<ul style="list-style-type: none"> • Employs heated (~160–180 °C) fat or oil to transfer heat directly to food material • Reduces moisture content, forms a surface crust (changes texture and structure), and inactivates microorganisms which improves shelf life and overall quality 	<p>Fryers</p> <ul style="list-style-type: none"> • Batch fryers • Continuous fryers
Pasteurization	<ul style="list-style-type: none"> • Processes food material under medium temperatures (70–100 °C) to inactivate most enzymes and microorganisms (but not spores) which cause spoilage • Produces food products with limited shelf lives (short-term preservation method) • Little to no impact to quality and characteristics beyond the shelf life • Suitable for dairy, fruit/vegetable-based, wine, beer, and egg products 	<p>Pasteurizers</p> <ul style="list-style-type: none"> • In-container pasteurizers • Continuous flow pasteurizers <p>Heat exchangers</p> <ul style="list-style-type: none"> • Plate heat exchangers • Concentric tube heat exchangers
Roasting	<ul style="list-style-type: none"> • Similar to, and often referred interchangeably with, baking • Employs heated air (heated by convection, conduction, and 	<ul style="list-style-type: none"> • Roasting machinery • Roasting ovens • See Baking

radiation)—and, in some cases, water vapor—to heat and produce physical and chemical changes in food material, such as texture or flavor

- Equipment Employed

- Assists in the preservation of food matter by destroying microorganisms and reducing the amount of water at the food surface
- Suitable for meats, nuts, vegetables, etc.

Sterilization

- Processes food material under high temperatures (100+ °C) to inactivate all microorganisms and enzymes (including microbial spores)
- Can be heated by steam, hot water, or direct flames
- Produces food products with long shelf lives (long-term preservation method)
- May result in a significant impact on quality and characteristics

Sterilizers/sterilizing retorts

- In-container sterilizers
- Continuous flow sterilizers
- Heat exchangers

1.4.4 Preservation Equipment

Although there is significant overlap between heat processing equipment and preservation equipment, the previous section already covers the former category—i.e., preservation methods (and their respective equipment) which apply heat. Therefore, this section will focus on other preservation methods, processes, and equipment.



Meat and meat products waiting in refrigerator storage

The preservation stage of the food processing production cycle ultimately aims to prevent or inhibit the *spoilage* and increase the shelf life of food products. There is a wide range of preservation methods available ranging from refrigeration to irradiation, each of which acts to destroy microorganisms and enzymes within the food material or, at the very least, limit and depress their activity.

Table 4 –Food Preservation Equipment by Method

Preservation Method	Description	Equipment Employed
Chemical*	<ul style="list-style-type: none"> • Employs natural and non-natural chemical substances to prevent or inhibit spoilage • Can change the pH and other 	Natural <ul style="list-style-type: none"> • Salt (salting) • Smokers (smoking)

	qualities of food material	<ul style="list-style-type: none"> • Acids (e.g., acetic acid, vinegar, etc.)
		Non-Natural
		<ul style="list-style-type: none"> • Sorbic acid • Sulfur dioxide • Benzoic acid
Heat Processing (Application of Heat)	See Heat Processing Equipment section	-
Irradiation	<ul style="list-style-type: none"> • Employs ionizing radiation to destroy microorganisms and inactivate enzymes which cause spoilage • Little to no heating of food material 	<ul style="list-style-type: none"> • Irradiation equipment, such as isotopes and electron accelerators
Refrigeration** (Removal of Heat)	<ul style="list-style-type: none"> • Reduces the temperature of food material to depress the biochemical and microbiological processes of microorganisms and enzymes which cause spoilage • Helps maintain quality and characteristics of food material 	<p>Chilling (-1°C–8°C)</p> <ul style="list-style-type: none"> • Chillers • Mechanical refrigerators • Cryogenic systems <p>Freezing (below freezing point)</p> <ul style="list-style-type: none"> • Freezers • Mechanical refrigerators

Water Reduction**

- Reduces the amount of water in food matter in solid, semi-solid, or liquid food material to inhibit microbiological and enzymatic process which cause spoilage

- Cryogenic systems

Drying

- Convective dryers
- Contact (conductive) dryers
- Vacuum/freeze dryers

Solute Addition

- Sugar
- Salt

Concentration

- Evaporators
- Condensers

Note: *If applicable, the specific process related to the piece of equipment is indicated in parentheses.

**In these sections, the specific unit operation related to the piece of equipment is indicated immediately prior.

1.4.5 Packaging Equipment

Following the preparation and processing stages, food material generally undergoes one or more post-processing operations, which help to produce the final food product and complete the food processing production cycle. While there are several post-processing operations involved with the production cycle, this section will focus on packaging operations and equipment.



A water bottling production line

Food packaging can serve several functions, including:

- **Containment:** Holds (i.e., contains) food contents until they are used
- **Protection and Preservation:** Creates a physical barrier between processed food products and physical, chemical, microbial, and macrobial variables during storage, transportation, and distribution which can cause spoilage, contamination, or loss of quality
- **Convenience:** Enables food products to be portioned out (by weight or volume) for easier consumer use, and stored, transported, and distributed
- **Communication:** Helps identify the food contents and indicate handling, storage, and use instructions, as well as allows for an opportunity for branding and marketing

Additionally, food packaging is available in several forms—e.g., boxes, jars, bottles, cans, etc.

Depending on the packaging form used to package the food material, packaging operations, and the equipment employed to execute them, can significantly vary. Some of the other factors which may influence the type of packaging equipment employed include the type and form of food product and the storage, handling, distribution, and marketing requirements.

Table 5 – Common Types of Food Packaging Equipment

Equipment Employed	Function	Description*
Printers (e.g., flexographic, photogravure, planographic, screen, or ink-jet)	Packaging Material Creation	<ul style="list-style-type: none"> Enables the identification of food contents and the indication of handling, storage, and usage instructions (e.g., ingredient list, production date, barcodes, etc.) Allows for branding and marketing (e.g., brand name, logo, etc.)
Volumetric Fillers	Filling	<ul style="list-style-type: none"> Used to fill a set volume of the packaging containers with liquid, paste, or small pieces of solid food material
Net-weight/Gross-weight Fillers	Filling	Used to fill packaging containers with a specific weight of liquid, paste, or small pieces of solid food material
Seamers	Sealing	Creates a double seam in filled food and beverage cans
Form-Fill-Seal (FFS) Systems	Sealing	Capable of forming, filling, and sealing flexible film packaging containers
Checkweighers	Quality Control	<ul style="list-style-type: none"> Verifies that filled packaging containers are at the required fill weight and removes underweight products from the production line

Self-Assessment Exercises 2

1. What is the aim of food processing equipment?
2. Enumerate the functions of food packaging



1.5 Summary

The range of processing equipment available is categorized by function, mode of operation, and application. Custom manufacturing of food processing equipment is created to match a specific business in the food industry and to increase efficiency and output.

This unit provides a basic understanding of food processing equipment, including the types available and considerations for design, selection, and use. Additionally, it outlines some of the key terminology used in the food and food processing industries and offers a list of related professional societies and organizations which may provide additional information and resources.



1.6 References/ Further Reading

Romina, R. Overview of Food processing Equipment, Thomas. Retrieved June 15, 2020 from <https://www.thomasnet.com/articles/machinery-tools-supplies/overview-of-food-processing-equipment/>



1.7 Possible Answers to Self-Assessment Exercises

Self-Assessment Exercises 1

1. Food processing is the process of changing raw ingredients into food, in a way, that can be consumed by humans or animals
2. The functions by which food processing equipment are grouped include: Preparation, Mechanical processing, Heat processing, Preservation, Packaging

Self-Assessment Exercises 2

1. Food processing equipment is primarily aimed toward the transformation—i.e., increasing the palatability, consumability, and digestibility—or preservation—i.e., extending the shelf life—of food, some pieces of equipment are also employed to perform preliminary or auxiliary functions, such as handling, preparation, and packaging.
2. Food packaging can serve several functions
 - a) Containment: Holds (i.e., contains) food contents until they are used
 - b) Protection and Preservation: Creates a physical barrier between processed food products and physical, chemical, microbial, and macrobial variables during storage, transportation, and distribution which can cause spoilage, contamination, or loss of quality
 - c) Convenience: Enables food products to be portioned out (by weight or volume) for easier consumer use, and stored, transported, and distributed.
 - d) Communication: Helps identify the food contents and indicate handling, storage, and use instructions, as well as allows for an opportunity for branding and marketing

UNIT 2 FOOD PROCESSING EQUIPMENT CONTINUED

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2.3 Food Quality Measurement Instruments

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2.4.2 Maintenance Equipment

2.4.3 Special Equipment in Commercial Kit

2.5 Summary

2.6 References/Further Readings

2.7 Possible Answers to Self-Assessment Exercises



2.1 Introduction

Food and beverage testing lab equipment is used to evaluate the quality and integrity of solid and liquid food samples. Food safety is a key topic of concern among consumers and the future of food safety starts with testing in the laboratory or on the field. Although food testing is critical for food safety, food testing is also applicable for standard quality control.

In this unit we shall examine some of this instruments used in food laboratory, some common commercial food production equipment, maintenance equipment and special equipment in commercial kitchen.



2.2 Learning Outcomes

At the end of this unit, you should be able to:

- discuss on some commercial food production equipment
- discuss on maintenance equipment
- analyse the instruments used in food laboratories for food quality assurance
- evaluate some special equipment in commercial kitchen



2.3 Food Quality Measurement Instruments

An important aspect of food processing and food preparation is the topic of food quality control.

Food quality in a production setting can be degraded and compromised by any number of contributing factors, the most common of which include the presence of:

- Pesticides
- Pathogens
- Heavy metals
- Organic toxins
- Foreign objects

In addition to these factors, food quality needs to be validated in terms of nutritional content and consistency, be assessed for the presence of allergens, verified with respect to adulteration and certification for genetically modified organism (GMO), and tested for shelf life.

There are a number of instruments used in food laboratories that can be applied to assure food quality which applies to solids as well as beverages. Some of the most common examples of these instruments and their use are described below.

- 1. Alcoholic beverage analysers** – Can be used to measure the alcohol content, density, colour, and pH of alcoholic beverages.
- 2. Carbonated beverage analysers** – measure product density, temperature, current/fresh/inverted sugar concentrations, degree of inversion, and CO₂ levels.
- 3. Food analysis equipment** – various instruments that can be used to measure the fat, protein, and oil concentrations in food samples and detect the level of gluten in foods.
- 4. Pesticide detection instruments** – detects the presence of pesticides in food samples.
- 5. Electron Spin Resonance Spectrometers** – also known as electron paramagnetic resonance (EPR), these instruments can be used to test the purity of products without physically destroying or altering samples.
- 6. Cell and colony counters** – can be used to measure the colonies of microorganisms that have grown on an agar plate prepared from a sample.
- 7. Incubators** – are used to provide a controlled environment (i.e. temperature, humidity, CO₂ level) for food safety testing.
- 8. Chemical imaging (NIR/Raman) systems** – devices that use analysis of samples by detecting and analysing light that is in the near-infrared, visible, or near-ultraviolet light areas of the electromagnetic spectrum.
- 9. Magnetic analysers** – detect low levels of iron in food samples by measuring the imbalance in resonance between two air core coils which can be translated into a signal that reflects the level of iron present in the sample.

- 10. Moisture analysers** – also known as moisture balances, these devices are used to establish the percentage of moisture in a food sample, either by weighing the sample before and after an evaporation process or by using an absorption spectrometer to analyse the gas emitted during evaporation to establish its content.
- 11. Polari meters** – devices that pass polarized light through a sample and measure the angle at which the emitted light emerges. Optically active substances will cause a change in the polarization angle of the emitted light, which can be used to establish concentrations of sugars such as glucose and sucrose.
- 12. Refractometers** – are devices that measure the angle of refraction from light that is passed through a liquid, gel, or solid substance and using that to establish parameters such as the salinity and sugar content.
- 13. Rheometers & Viscometers** – are instruments that can measure the viscosity of a fluid and the behaviour of fluids when shear or stress forces are applied to it. Having this information can reveal the properties of the fluid that relate to its structure and elasticity.
- 14. Saccharimeters** – are instruments that specifically measure the concentration of sugars present in a solution. They do so by measuring the refractive index of the liquid as light as passed through it.
- 15. Titration Equipment** – can be used to detect and measure the concentration of a substance within a liquid through acid/base titration. The addition of titrant of known concentration to a known volume of solution with unknown concentration can determine that unknown concentration through a reaction neutralization.
- 16. Other equipment** – additional equipment often employed in food quality applications includes ovens, centrifuges, water baths, and dry baths.

Self-Assessment Exercises 1

1. State some factors that degraded and compromised food quality in a production setting
2. List 6 instruments used in food laboratories

2.4 Common Commercial Kitchen Equipment

Commercial kitchen equipment needs to produce food for a large number of consumers. It needs to be robust, durable, and easy to operate. The equipment should consume less electricity, improve the productivity of food production operations, and must be eco-friendly. Lastly, it should serve its purpose effectively.

Most kitchen equipment are operated electronically. There is a wide range of cooking, cutting, baking, and cleaning equipment available for the kitchen staff.

2.4.1 Commercial Food Production Equipment

Burners: They are used for cooking, boiling, and steaming. They often operate on Liquid Petroleum Gas (LPG). Now induction burners and hot plates are available, which operate on electricity. They come with open top, mesh top, or flat top.



Cooking Ranges: Cooking ranges are the most versatile equipment operating on either LPG or electricity. The name implies, it can perform a range of functions such as cooking, frying, boiling, grilling, and baking. It comes in two basic versions –

- **Restaurant range** – Less expensive, good for less food volume, and is stand alone.
- **Heavy duty range** – Expensive, suits a large volume of food production, and can be banked with other ranges using a battery.

Cooking ranges come with multiple burners usually 4 to 8, depending upon the volume of food to be handled.



Ovens: They are used for cooking, baking, roasting, and browning. They operate either on LPG or electricity. There are various oven models such as **Rack** with the option of rotating or steady racks, **Deck**, and **Tunnel** depicting their shape and working style.

- **Rack oven** – It contains a set of stacked racks often placed equidistant, one above the other in a tall stainless steel frame. This oven is good to produce large volume of food items such as breads, cookies, and croissants.
- **Deck oven** – It contains racks or rotisseries that can cook various meats such as chicken, duck, lamb, etc. simultaneously and evenly. They also come in baking deck and pizza deck variants. The number of decks are generally up to four.
- **Tunnel oven** – It comes in direct heat and indirect heat variants. It is suitable for high temperature baking.

There are myriad numbers of ovens available in the market, which vary according to the energy they consume, the manner of heating food, sizes, and shapes.



Rack Oven



Deck Oven



Electric Tunnel Oven



Direct Fire Tunnel Oven

2.4.2 Maintenance Equipment

Dish Washer: It can wash multiple dishes and bowls simultaneously. It is an automatic machine but needs human interaction for loading used dishes into dish racks and unloading clean dishes after wash cycle. It eliminates a great effort required for traditional dish washing. There are two basic types of dishwasher –

- **Door-type** – It is large machine. It can clean from 50 to 125 dish racks depending upon the size of the machine.
- **Under-counter** – It is smaller and can fit under the kitchen platform.



2.4.3 Special Equipment in Commercial Kitchen

There are a few special equipment used in commercial kitchen to make the tasks easy.

Nut cracker: It is used to crack the shells of hard nuts such as almonds, walnuts, hazelnuts, pine nuts, palm nuts, and pistachio. Some machines are also capable of shelling watermelon and pumpkin seeds, and peeling peanuts, cashew nuts and almonds.



Shredders: A shredder cuts the fruits and vegetables into string-like fine pieces, which are useful in salads and vegetarian cookery.



Kitchen Knives: Knives are used across various small volumes dicing, cutting, slicing, carving, and filleting. There are various knives used for different cutting and carving purposes –

- **Paring knife** – It is used for fine cutting work, removing onion skins, and cutting small fruits.
- **Utility knife** – It is used in general purpose cutting and scraping.
- **Steak knife** – It is used for cutting steaks.
- **Santoku knife** – Originated in Japan, this knife is used for cutting, dicing, and mincing.
(Santoku = Three virtues)
- **Chef's General knife** – It is a multi-purpose knife used on multiple commodities such as vegetables, fruits, meat, and poultry.
- **Serrated knife (Bread Knife)** – It has a long thin blade with serrated edge that provides sawing-like motion. It is used to slice certain foods with firm skins or outer layers such as bread, tomatoes, and capsicums.
- **Boning/Filleting knives** – They come with a narrow, sharp, and flexible blade and a protruding heel near the handle. They can run along the bones of flat fish or ribs smoothly.
- **Carving knife** – This knife comes with a long, thin and sharp blade to ensure neat and accurate cutting.
- **Slicing knife** – It has a long sharp blade that tapers at the end and helps slicing fruits and vegetables finely.
- **Turning knife** – It is an essential component to present the food in a unique way. This knife has a small curved blade that is used to carve the vegetables into the shape of a container.
- **Cleaver** – It is a butchers' knife. It is very strong and sharp to cut through large pieces of meat such as pork and beef.



Self-Assessment Exercises 2

1. State the commercial food production equipment you know and their functions
2. State some special equipment found in commercial kitchen and their uses



2.5 Summary

In this unit, we examined food processing equipment; food quality measurement instrument, common commercial kitchen equipment, maintenance equipment and special equipment in commercial kitchen.



2.6 References/ Further Reading

https://www.tutorialspoint.com/food_production_operations/food_production_operations_kitchen_equipment_fuel.htm#



2.7 Possible Answers to Self-Assessment Exercises

Self-Assessment Exercises 1

1. Some factors that degraded and compromised food quality in a production setting pesticides, pathogens, heavy metals, organic toxins, foreign objects
2. Some instruments used in food laboratories are: alcoholic beverage analysers, carbonated beverage analysers, saccharimeters, rheometers & viscometers, refractometers, incubators, electron spin resonance spectrometers, titration equipment, cell and colony counters, etc.

Self-Assessment 2

1. Some commercial food production equipment and their functions are:
 - a. Burners: They are used for cooking, boiling, and steaming
 - b. Cooking Ranges: It can perform a range of functions such as cooking, frying, boiling, grilling, and baking.
 - c. Ovens: They are used for cooking, baking, roasting, and browning
2. Some special equipment found in commercial kitchen and their uses are:
 - a. Nut cracker: It is used to crack the shells of hard nuts such as almonds, walnuts, hazelnuts, pine nuts, palm nuts, and pistachio. Some machines are also capable of

shelling watermelon and pumpkin seeds, and peeling peanuts, cashew nuts and almonds.

- b. Shredders: A shredder cuts the fruits and vegetables into string-like fine pieces, which are useful in salads and vegetarian cookery
- c. Kitchen Knives: Knives are used across various small volumes dicing, cutting, slicing, carving, and filleting

UNIT 3 BOOSTING EFFICIENCY IN FOOD AND BEVERAGE MANUFACTURE

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3.7 Possible Answers to Self-Assessment Exercises



3.1 Introduction

Efficiency refers to an economic term describing a level a manufacturing facility is producing as many quality products as possible without wasting precious resources. The food industry has expanded exponentially in the last few years. Although this has created opportunities for investors who want to venture into this industry, it has also become more competitive and saturated. This is because of the endless supply of products and fewer opportunities for success

and growth. Boosting efficiency and productivity will play a huge role in ensuring survival in the competitive marketplace. There has to be a balance in many systems, processes, and policies to improve outputs to boost efficiency.

In this unit; boosting the efficiency in food and beverage manufacture, we shall examine how to improve staff productivity, increase operational efficiency and reducing production cost to boost efficiency.



3.2 Learning Outcomes

At the end of this unit, you should be able to:

- discuss how operational efficiency can be improve
- analyse the seven strategies to improve operational efficiency
- analysis the six strategies employed in reducing production costs
- evaluate the types of production costs
- evaluate way to improve staff productivity



3.3 Staff Productivity

Naturally the people in a business play a critical role in its overall performance, so improving their productivity is a key goal for managers. There are two ways to go about this:

- Effective motivation of employees.
- Automation of non-value-adding tasks like data-entry, or counting stock, so that staffs are freed up for more value-adding work.

These are key ways to boost manufacturing productivity.

3.3.1 Improving Staff Productivity

- **Employee productivity and ROI**

Measuring employee productivity helps a business understand their return on investment. For example, a company significantly invests in upgrading its machinery and installing new software to optimise efficiency. If this investment was worth it, the business would see an increase in employee productivity.

- **Low employee productivity can point to bigger problems**

Low productivity suggests disengagement, interruptions to workflows, process inefficiencies, poor management and more. Employee productivity serves as a diagnostic test within the business.

3.3.2 Ways to improve Staff Productivity

Improving staff productivity is a task in itself, with entire companies dedicated to worker incentives, psychology, and optimizing people and culture practice. The following are some important ways on how to keep employee productivity high.

- ◆ **Provide the right tools**

The right tools help employees perform their tasks efficiently and on time. There's nothing more counterproductive (and painful) than being hindered by slow equipment or outdated gear. That goes for both physical machinery and the computer hardware and software.

◆ **Improve the workplace environment**

Ensure the work environment is geared towards productivity by making provisions for some basics such as: good lighting; a clean and safe environment; an efficient layout that minimizes transport time for key work activities, and avoids congestion; quiet breakaway spaces where possible; some greenery; healthy food options nearby.

◆ **Spend time wisely**

- **Allow flexible hours..** Many progressive companies now offer flexible hours and remote working
- **Minimize meetings.** Hold only essential meetings and ensure only the right people are attending so the staff can spend time more productively

◆ **Communicate effectively**

- **Encourage teamwork.** Create opportunities for team members to get to know and trust each other
- **Find what method of communication works best.** How does each team respond best? It might be in-person, instant messaging, or by email

◆ **Foster workplace culture**

Workplace culture starts with hiring people with the right attributes and attitudes, and extends to training and development, and keeping staff morale high. A firm with unhappy employees will always struggle with productivity.

Self-Assessment Exercises 1

- | |
|---|
| <ol style="list-style-type: none">1. How can you measure employee (staff) productivity?2. State the ways of improve staff productivity |
|---|

3.4 Improving operational efficiency

Operational efficiency is about delivering good quality products to the right customers in the most cost-effective and timely manner. There are four factors that contribute to operational efficiency: resource utilization, production, distribution and inventory.

- **Measuring operational efficiency**

There are a few financial ratios that business owners use to assess their operational efficiency.

The simplest way to calculate operational efficiency is:

$$\text{Operational efficiency} = \text{Operating expenses} / \text{Revenue}$$

A lower result indicates greater efficiency. This ratio can be used to assess the business as a whole or for individual areas of operations if such operational areas can identify and restrict revenue and costs to that department.

Measuring operational efficiency over time is necessary to determine how efforts are paying off, and to identify patterns and inefficiencies.

However, accurate measurement of operational efficiency could be hindered by:

- **Having** too many measures and metrics. It becomes difficult to separate the outcomes from the metrics that influence them.
- **Relying on unreliable data** Take the time and effort to establish reliable measurement systems to get accurate, reliable data
- **Using data from several sources.** Pulling data from several sources can add greater risk of human error.

3.4.1 Reduce production costs to boost efficiency

One way to improve productivity is to reduce production costs. Production costs are the costs incurred in manufacturing a product or providing a service. These can include expenses such as raw materials, labour, suppliers and general overhead. Production costs can also include government taxes and royalties.

■ strategies to reduce production costs

✚ Track your costs

Accounting software like **Xero** or **QBO** can be used to track costs throughout the entire business.

✚ Eliminate bottlenecks and redundancies

Analyze each stage of your production process and drop non-value-adding activities to cut out unnecessary costs.

✚ Tighten your inventory control

Optimal inventory control means the right quantity of stock, no excesses no waste.

✚ Improve employee engagement

Engaged employees means lower staff turnover, which in turn leads to reduced labour costs.

Engaged staff are also more effective and productive. This means you should:

- Hire the right people
- Provide training
- Offer appropriate incentives
- Share clear production goals

Embrace automation

Automated solutions can require an upfront cost but reduce your operational costs in the long run. Other solutions, such as subscription-based software, can break even immediately.

Negotiate with suppliers

Have a good relationship with your supplier and be better placed to negotiate for discount prices. Consider:

- Signing a long-term contract with your top suppliers
- Offering cash payment in return for discounts
- Asking for a turnover discount at the end of a financial year if you've contributed significantly to their business

Self-Assessment Exercises 2

1. State the four factors that contribute to operational efficiency
2. State the strategies to be employed in reducing production costs



3.5 Summary

Food and manufacturers have many more to consider than other businesses. Though the industry of food and beverage manufacturing is complex, you don't need sophisticated algorithms to improve your efficiency. Ultimately, increased productivity will result in the improvement of a variety of elements for business, including a boost in revenue and both customer and employee satisfaction. Throughout your organization, prioritize efficiency to the point where you consider regular progress updates and make positive changes to secure high levels of performance. At the

same time, ensure you are doing this in a way that's conducive to productivity, as opposed to hindering it.

Overall, be prepared to honour and adopt processes and technologies that will result in higher values across the board – performance notwithstanding

In this unit we examined boosting efficiency in food and beverage manufacture; how to improve staff productivity, utilizing the discussed strategies will help in boosting your efficiency and productivity in your food manufacturing line.



3.6 References/ Further Reading

<https://www.unleashedsoftware.com/manufacturing-productivity-guide/how-to-improve-productivity-inmanufacturing>



3.7 Possible Answers to Self-Assessment Exercises

Self-Assessment Exercises 1

1. Employee productivity can be measure thus:
 - a. Measuring goals: Goal setting is particularly important as a mechanism for providing feedbacks. By establishing and monitoring targets, you can give your employees real-time input on their performance while motivating them to achieve more.
 - b. Measure quality of work: Meeting deadline is important and does reflect on individual performance, but if what's being produced is of lower quality, meeting deadline takes a back stage. When analysing employee productivity, make sure to consider the quality of your team's work.
 - c. Measure the amount of work completed: last, but not least, you can measure employee productivity by taking a look at the number of tasks completed by an employee in a specific time period.

2. Staff Productivity can be improved by the following way: provide the right tools, improve the workplace environment, spend time wisely, communicate effectively and foster workplace culture.

Self-Assessment Exercises 2

1. The four factors that contribute to operational efficiency are resource utilization, production, distribution and inventory.
2. The employed strategies to reduce production costs are: track your costs, eliminate bottlenecks and redundancies, tighten your inventory control, improve employee engagement, embrace automation, negotiate with suppliers

UNIT 4 BASIC ELEMENTS OF EQUIPMENT CLEANING & SANITIZING

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4.1 Introduction

A sanitation plan is important in any food service preparation area. It ensures that all surfaces are cleaned on a regular basis and reduces the risks of transferring bacteria or other pathogens from an unclean surface to clean equipment.

A sanitation plan has two components:

- i. A list of cleaning and sanitizing agents or supplies with instructions on their safe use and storage
- ii. A cleaning schedule, outlining how each item needs to be cleaned, who is responsible, and how frequently it happens

In this unit, we will examine the basic elements of equipment cleaning and sanitizing; cleaning methods, environmental consideration, chemical sanitizing and steam sanitizing.



4.2 Learning Outcomes

At the end of this unit, you should be able to:

- discuss cleaning and sanitation
- discuss the chemistry of the various classes of detergents
- discuss the factors that necessitate steam sanitizing
- analyse the advantages of commercial steam cleaning
- analyse the advantages of steam cleaning in food processing
- evaluate the typical uses of steam sanitation for food processors



4.3 Equipment Cleaning

Since cleaning and sanitizing may be the most important aspects of a sanitation program, sufficient time should be given to outline proper procedures and parameters. Detailed procedures must be developed for all food-product contact surfaces (equipment, utensils, etc.) as well as for non-product surfaces such as non-product portions of equipment, overhead structures, shields,

walls, ceilings, lighting devices, refrigeration units and heating, ventilation and air conditioning (HVAC) systems, and anything else which could impact food safety.

Cleaning frequency must be clearly defined for each process line (i.e., daily, after production runs, or more often if necessary). The type of cleaning required must also be identified.

The objective of cleaning and sanitizing food contact surfaces is to remove food (nutrients) that bacteria need to grow, and to kill those bacteria that are present. It is important that the clean, sanitized equipment and surfaces drain dry and are stored dry so as to prevent bacteria growth.

Necessary equipment (brushes, etc.) must also be clean and stored in a clean, sanitary manner. Cleaning/sanitizing procedures must be evaluated for adequacy through evaluation and inspection procedures. Adherence to prescribed written procedures (inspection, swab testing, direct observation of personnel) should be continuously monitored, and records maintained to evaluate long-term compliance. The correct order of events for cleaning/sanitizing of food product contact surfaces is as follows:

1. Rinse
2. Clean
3. Rinse
- and
4. Sanitize.

■ Definitions

- **Cleaning**

Cleaning is the complete removal of food soil using appropriate detergent chemicals under recommended conditions. It is important that personnel involved have a working understanding of the nature of the different types of food soil and the chemistry of its removal.

4.3.1 Cleaning Methods

Equipment can be categorized with regard to cleaning method as follows:

- Mechanical Cleaning: Often referred to as clean-in-place (CIP). Requires no disassembly or partial disassembly
- Clean-out-of-Place (COP): Can be partially disassembled and cleaned in specialized COP pressure tanks.
- Manual Cleaning: Requires total disassembly for cleaning and inspection

◆ Sanitization

It is important to differentiate and define certain terminology:

- Sterilize refers to the statistical destruction and removal of all living organisms.
- Disinfect refers to inanimate objects and the destruction of all vegetative cells (not spores).
- Sanitize refers to the reduction of microorganisms to levels considered safe from a public health viewpoint.

Appropriate and approved sanitization procedures are processes, and, thus, the duration or time as well as the chemical conditions must be described. The official definition (Association of Official Analytical Chemists) of sanitizing for food product contact surfaces is a process which

reduces the contamination level by 99.999% (5 logs) in 30 sec. The official definition for non-product contact surfaces requires a contamination reduction of 99.9% (3 logs). The standard test organisms used are *Staphylococcus aureus* and *Escherichia coli*. General types of sanitization include the following:

- Thermal Sanitization involves the use of hot water or steam for a specified temperature and contact time.
- Chemical Sanitization involves the use of an approved chemical sanitizer at a specified concentration and contact time.

4.3.2 Chemistry of detergents

Detergents and cleaning compounds are usually composed of mixtures of ingredients that interact with soils in several ways:

- Physically active ingredients alter physical characteristics such as solubility or colloidal stability.
- Chemically active ingredients modify soil components to make them more soluble and, thus, easier to remove.

In some detergents, specific enzymes are added to catalytically react with and degrade specific food soil components.

◆ Physically Active Ingredients

The primary physically-active ingredients are the surface active compounds termed surfactants. These organic molecules have general structural characteristic where a portion of the structure is hydrophilic (water-loving) and a portion is hydrophobic (not reactive with water).

Such molecules function in detergents by promoting the physical cleaning actions through emulsification, penetration, spreading, foaming, and wetting.

◆ Chemically Active Ingredients

Alkaline Builders: Highly Alkaline Detergents (or heavy-duty detergents) use caustic soda (sodium hydroxide) or caustic potash (potassium hydroxide). An important property of these highly alkaline detergents is that they saponify fats: forming soap. These cleaners are used in many CIP (clean-in-place) systems or bottle washing applications. Moderately Alkaline Detergents include sodium, potassium, or ammonium salts of phosphates, silicates, or carbonates. Tri-sodium phosphate (TSP) is one of the oldest and most effective. Silicates are most often used as a corrosion inhibitor. Because of interaction with calcium and magnesium and film formation, carbonate-based detergents are of only limited use in food processing cleaning regimes.

◆ **Enzyme Ingredients**

Enzyme-based detergents, which are amended with enzymes such as amylases and other carbohydrate-degrading enzymes, proteases, and lipases, are finding acceptance in specialized food industry applications. The primary advantages of enzyme detergents are that they are more environmentally friendly and often require less energy input (less hot water in cleaning). Uses of most enzyme cleaners are usually limited to unheated surfaces (e.g., cold-milk surfaces). However, new generation enzyme cleaners (currently under evaluation) are expected to have broader application.

◆ **Fillers:** Fillers add bulk or mass, or dilute dangerous detergent formulations that are difficult to handle. Strong alkalis are often diluted with fillers for ease and safety of

◆ handling. Water is used in liquid formulations as a filler. Sodium chloride or sodium sulfate are often fillers in powdered detergent formulations.

◆ **Miscellaneous Ingredients**

Additional ingredients added to detergents may include corrosion inhibitors, glycol ethers, and butylcellosolve (improve oil, grease, and carbon removal)

Self-Assessment Exercises 1

1. State the categories of equipment with regard to cleaning method
2. State the types of specific enzymes added to some detergents to catalytically react with and degrade specific food soil components

4.4 Chemical sanitizing

No single chemical sanitizer can meet all of the criteria required of chemical sanitizer for use in cleaning food related equipment, it is important therefore, to evaluate the properties, advantages, and disadvantages of available sanitizer for each specific application.

4.4.1 Specific Types of Chemical Sanitizers

The chemicals described here are those approved by FDA for use as no-rinse, food-contact surface sanitizers. In food-handling operations, these are used as rinses, sprayed onto surfaces, or circulated through equipment in CIP operations. In certain applications the chemicals are foamed on a surface or fogged into the air to reduce airborne contamination.

i. Chlorine-Based Sanitizers

Chlorine Compounds: Chlorine, in its various forms, is the most commonly used sanitizer in food processing and handling applications. Commonly used chlorine compounds include liquid chlorine, hypochlorites, inorganic chloramines, and organic chloramines. Chlorine-based sanitizers form hypochlorous acid (HOCl, the most active form) in solution.

Chlorine dioxide: Chlorine dioxide (ClO₂) is currently being considered as a replacement for chlorine, since it appears to be more environmentally friendly. Its rapid decomposition in the

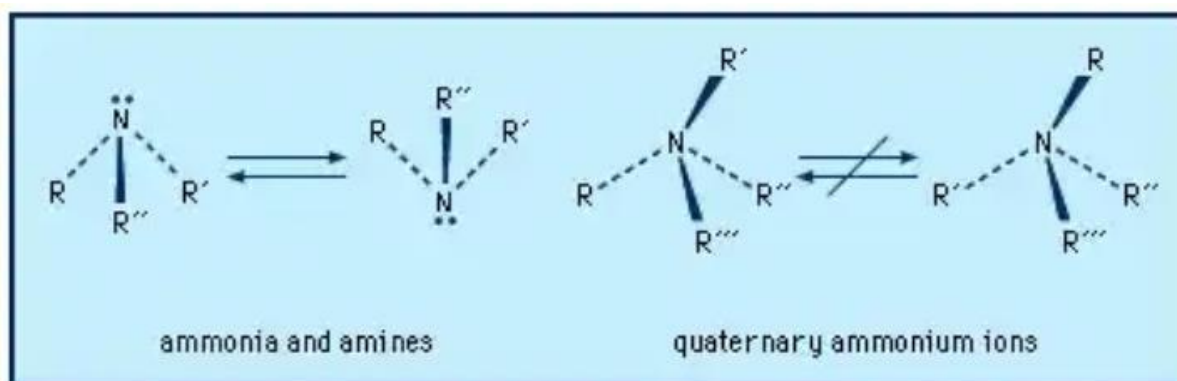
presence of light or at temperatures greater than 50°C (122°F) makes on-site generation a recommended practice. However, ClO₂'s primary disadvantages are worker safety and toxicity. Its highly concentrated gases can be explosive and exposure risks to workers are higher than that for chlorine

ii. Iodine

This sanitizer exists in many forms and usually exists with a surfactant as a carrier. Their mixtures are termed iodophors. Iodophors, like chlorine compounds, have a very broad spectrum: being active against bacteria, viruses, yeasts, molds, fungi, and protozoans. Iodine is highly temperature dependent and vaporizes at 120°F. Thus, it is limited to lower temperature applications.

iii. Quaternary Ammonium Compounds (QACs)

Quaternary ammonium compounds (QACs) are a class of compounds that have the general structure as follows:



They are surfactants, and possess some detergency. QACs are active and stable over a broad temperature range. Thus, they are less affected by light soil than are other sanitizers.

Self-Assessment Exercises 2

1. State the chemical sanitizers you know
2. What are the factors that could influence the effectiveness of chemical sanitizers

4.5 Steam Sanitizing

In a food processing facility, it is most important to maintain a sterile work environment. This ensures adherence to food safety regulations to keep the health of consumers out of risk. Steam cleaning is among one of the most effective and efficient ways of sterilizing surfaces in a food processing plant.



■ Advantages of commercial steam cleaning

- **Removes the need for chemical products**

Steam cleaning uses water alone to disinfect surfaces. This is because the temperature of the steam is high enough to kill all bacteria, germs and mould.

- **Quick and energy-efficient sanitizing**

Steam sanitizing has a short drying time with minimal moisture. Steam cleaned surfaces can therefore be used immediately after spraying. This helps prevent bacteria transmission and improves overall efficiency.

- **Ideal for delicate surfaces**

Steam cleaning is gentle on surfaces. It's therefore an ideal cleaning method for washing and sanitizing surfaces that can be damaged by high water pressure.

4.5.1 Factors that necessitate Steam Sanitizing



Steam sanitation is a reliable cleaning method for a variety of food processing applications, from wine and beer making to industrial kitchens, bakeries, and food packaging operations:

Water-Sensitive Environments: such as in dry food processing facilities, including those that make snacks, powdered drink mixes, dry ingredients, seasonings, and more.

Sticky Residue Applications: such as in cleaning conveyor belts for dried fruit, sugary products, and binding ingredients.

Reducing or Removing Allergens: such as in compressed air systems, vacuums, and even manual washing and wiping methods.

- **Typical Uses of Steam Sanitation in Food Processes**

- Clean and sanitize all processing and packaging equipment.
- Clean electrical control panels and other electrical parts.
- Clean and defrost refrigeration and condenser fins and coils.
- Sanitize refrigeration systems and remove unwanted ice buildup.
- Clean and sanitize storage and blending tanks.
- Clean grease buildup on walls, ceilings, baseboards, vents and dryers.
- Clean and kill pathogenic bacteria.
- Kill insect infestations, both flying and crawling, including their eggs.
- Clean diamond deck flooring.
- Automatically clean, dry, and sanitize flat/solid or modular and mesh style conveyor belts.
- Clean and sanitize a multitude of surfaces, including stainless, aluminum, brass, plastic, vinyl, polypropylene, painted surfaces, and many others. Dry vapor will not harm your surfaces.

4.5.2 Advantages of Steam Sanitizing in Food Processing Facility

- **Advantages of Steam Cleaning in Food Processing**



These are three of the key advantages of steam sanitation in food processing facilities:

- **Clean-in-Place Technology:** With advanced CIP technology, there is no need to disassemble equipment to clean it.
- **Reduced Downtime:** Steam cleaning is faster than manual cleaning.
- **Chemical-Free Cleaning:** Cleaning chemicals are expensive, can be hard on machinery, and are not environmentally friendly, while dry steam removes the same tough grease, oil, and remnants without harsh chemicals.

Self-Assessment Exercises 3

1. What are the factors that necessitate Steam Sanitizing
2. What are the advantages of steam cleaning in food processing



4.6 Summary

A documented cleaning and sanitizing program should ensure that parameters are clearly outlined. The program may describe pH limits, temperature limits, concentration ranges, and exposure times. Documenting these helps ensure that correct quantities of chemicals are used and the desired effect is achieved. A comprehensive cleaning and sanitation program is necessary to prevent contamination, control allergens and meet regulatory requirements.

In this unit, we examined the basic elements of equipment cleaning and sanitizing; cleaning methods, environmental consideration, chemical sanitizing and steam sanitizing.

4.7 Glossary

Baking: A heat processing unit operation which employs heated air (heated by convection, conduction, and radiation)—and, in some cases, water vapor—to heat and produce physical and chemical changes in food material, such as texture or flavor. It also demonstrates some preservative qualities in regards to processed food products.

Blanching: A heat processing unit operation which employs heated water or steam to reduce the number of microorganisms and inactivate undesirable enzymes which can cause spoilage, as well as cleans, removes excess air from, softens, and improves the overall quality of food material

Chemistry: The study of matter—what it consists of, what its properties are, and how it changes.

Cleaning: A preparatory unit operation which removes foreign matter and contaminants—e.g., soil, oil, insects, skins, chemicals, etc.—from the surface of raw food material via wet and dry cleaning processes

Commercial: Generally relates to anything business or commerce.

Dehydration: A heat processing unit operation which employs heat to remove (i.e., evaporate) water from solid, semi-solid, or liquid food material with the intention of producing a solid food

product with sufficiently low water. It also helps to increase the shelf life and reduce the weight and volume of processed food products.

Efficiency: The ability to avoid wasting materials, energy, efforts, money, and time in doing something or in producing a desired result. In a more general sense, it is the ability to do things well, successfully, and without waste.

Enzyme: They are catalysts that, within the mild conditions of temperature, pH, and pressure of the cells, carry out chemical reactions at amazing high rate. They are characterized by a remarkable efficiency and specificity.

Equipment: Refers to a set of tools or other objects commonly used to achieve a particular objective.

Evaporation: A heat processing unit operation which removes volatile solvents (typically water) from food material by boiling to increase the concentration of solid contents. It also helps to increase the shelf life and reduce the weight and volume of processed food products.

Food production: The process of taking raw ingredients and converting them into edible food fit for human consumption

Frying: A heat processing unit operation which employs heated (~160–180 °C) fat or oil to transfer heat directly to food material. It also reduces moisture content, forms a surface crust (changes texture and structure), and inactivates microorganisms which improves the shelf life and overall quality of food material.

Grading: A preparatory unit operation which assesses several characteristics of food matter (e.g., flavor, damage, skin color, aroma, etc.) to determine the overall quality.

Homogenization: A mechanical processing unit operation which reduces the average particle size and increases the consistency of semi-solid and liquid food matter.

Ingredient: A substance that forms a part of a mixture

Mixing: A mechanical processing unit operation which combines and disperses two or more components into one another to achieve and maintain a uniform mixture and/or an alteration to the functional or aesthetic qualities of the food product (e.g., texture)

Operational Efficiency: A measurement of resource allocation and can be defined as the ratio between an outputs gained from the business and an input to run a business operation.

Pasteurization: A heat processing unit operation which processes food material under medium temperatures (70–100 °C) to inactivate most enzymes and microorganisms (but not spores) which cause spoilage. It acts as a short-term preservation method with little to no impact on food quality and characteristics beyond the shelf life.

Peeling/Skinning: A preparatory unit operation which removes inedible or undesirable material to increase the overall quality and/or appearance of the final food product.

Preservation: The stage in the food processing production cycle aimed towards preventing or inhibiting spoilage of food products and increasing their shelf life. Preservation methods include the addition of chemical compounds; heat processing, irradiation, refrigeration, and water reduction.

Productivity: A measure of economic performance that compares the amount of goods and services produced (output) with the amount of inputs used to produce those goods and services.

Roasting: A heat processing unit operation which employs heated air (heated by convection, conduction, and radiation)—and, in some cases, water vapor—to heat and produce physical and

chemical changes in food material, such as texture or flavor. It also assists in the preservation of food matter by destroying microorganisms and reducing the amount of water at the food surface.

Shelf Life: The amount of time a food product can be stored after manufacturing and processing and retain an acceptable safety and quality standard (typically defined by the manufacturer, government, or a private organization) under specified storage, processing, and packaging conditions.

Size Enlargement: A mechanical processing unit operation which increases the average particle size of solid food matter through mechanical processes, such as extrusion, agglomeration, or forming.

Size Reduction: A mechanical processing unit operation which reduces the average particle size of solid food matter through mechanical processes involving compression, shear, or impact force.

Sorting: A preparatory unit operation which classifies and separates foreign matter and contaminants from raw food material based on a measurable physical characteristic (typically size, shape, weight, or color).

Spoilage: The deterioration or loss of the quality or nutritional value of food and food products due to microbial, enzymatic, chemical, or physical processes.

Sterilization: Refers to any process that removes, kills, or deactivates all forms of life and other biological agents such as prions present in or on a specific surface, object, or fluid.

Unit Operations: Within the overarching food processing process, the individual operations executed to fulfill, and grouped by, a specific function. For example, preparatory operations include washing and separating.



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4.9 Possible Answers to Self-Assessment Exercises

Self-Assessment Exercises 1

1. Equipment can be categorized with regard to cleaning method as follows:
 - a. Mechanical can be by use of machines e.g. abrasion cleaners (use set of brushes) or manual using hand. Often requires dismantling before cleaning and assembly after cleaning.

- b. Clean-in-place (CIP) systems Cleaning is achieved by use of fluid at very high velocity through the units. referred to as clean-in-place (CIP). Requires no disassembly or partial disassembly
 - c. Clean-out-of-Place (COP): Can be partially disassembled and cleaned in specialized COP pressure tanks.
 - d. Manual Cleaning: Requires total disassembly for cleaning and inspection
2. The types of specific enzymes added to some detergents to catalytically react with and degrade specific food soil components are: physically active ingredients, chemically active ingredients (alkaline builders), enzyme ingredients, fillers, miscellaneous ingredients

Self-Assessment Exercises 2

1. The chemical sanitizers are: chlorine-base sanitizers: chlorine compounds and chlorine dioxide, iodine and quaternary ammonium compounds, etc.
2. The factors that influence the effectiveness of chemical sanitizers are:
 - a. Concentration: the presence of too little sanitizers will result in an inadequate reduction of harmful microorganisms. Too much can be toxic and hazardous
 - b. Temperature: generally chemical sanitizers work best in water that is between 55⁰F (13⁰C) and 120⁰F (49⁰C)
 - c. Contact time: in order for the sanitizer to kill harmful microorganisms, the cleaning item must be in contact with the sanitizer (either heat or approved chemical) for the recommended length of time

Self-Assessment Exercises 3

1. The factors that necessitate Steam Sanitizing are:

- a. Water-Sensitive Environments: such as in dry food processing facilities, including those that make snacks, powdered drink mixes, dry ingredients, seasonings, and more.
 - b. Sticky Residue Applications: such as in cleaning conveyor belts for dried fruit, sugary products, and binding ingredients.
 - c. Reducing or Removing Allergens: such as in compressed air systems, vacuums, and even manual washing and wiping methods.
2. The advantages of steam cleaning in food processing are:
- a. Clean-in-Place Technology: With advanced CIP technology, there is no need to disassemble equipment to clean it.
 - b. Reduced Downtime: Steam cleaning is faster than manual cleaning.
 - c. Chemical-Free Cleaning: Cleaning chemicals are expensive, can be hard on machinery, and are not environmentally friendly, while dry steam removes the same tough grease, oil, and remnants without harsh chemicals.

MODULE 3

Unit 1 Food Production Methods; Service Facilities

Unit 2 Food Production Methods

Unit 3 Food Service Methods

Unit 4 Beverage Service Methods

UNIT 1 FOOD PRODUCTION METHODS; SERVICE FACILITIES

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1.1 Introduction

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1.3 Food Service Facilities

1.3.1 Hazard analysis and critical control point

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1.4.1 Objectives of a Catering Facility

1.5 Summary

1.6 References/Further Readings

1.7 Possible Answers to Self-Assessment Exercises



1.1 Introduction

Food and Beverage Services can be broadly defined as the process of preparing, presenting and serving of food and beverages to the customers. Food and Beverage service sector contributes a great deal to the profit in hospitality industry.

In this unit we will examine, Food Production Methods: Service and Facilities; planning of food service facility and the objectives of a catering facility



1.2 Learning Outcomes

At the end of this unit, you should be able to:

- discuss hazard analysis and critical control point
- discuss the 7 principles of 'process' HACCP for restaurants
- analyse the planning of food service facilities characteristics
- evaluate the objectives of a catering facility



1.3 Food service facilities

Food production may be defined as that phase of the food flow (i.e. from the purchasing of the foods to service to the customer) mainly concerned with the processing of raw, semi-prepared or prepared foodstuffs. While beverage production may be defined as the processing of the raw, semi-prepared or prepared beverage product, so that it is in a ready-to-serve state before being served to the customer. The fine dividing line between food and beverage production and food and beverage service is not always distinguishable. The point at which production ends, and service begins, is often difficult to define. And so, the decision as to which food and beverage production method to use in a particular catering operation is often taken at the initial planning stage – at this point the market to be catered for, and hence the type of catering facility to be offered, has been decided upon.

The initial planning of a food service facility is critical to the long-term success of the operation, and one which must be afforded time, finance and commitment in order to avoid costly mistakes later. As a minimum it is essential that the food production and service model chosen is suitable for the type of operation the organization requires whilst at the same time meeting all the requirements of the food hygiene regulations. On a practical note it is often important to invite the local Environmental Health Officer (EHO) to the premises in advance of setting out the kitchen or installing equipment. This will foster good working relationship in the future and minimize any risk of not complying with regulation or good practice.

1.3.1 Hazard analysis and critical control point

Hazard Analysis and Critical Control Point (HACCP) is a systematic approach to identifying and controlling hazards, whether they are microbiological, chemical or physical in nature. Although in many food and beverage operations a number of the hazards are likely to be the same, each establishment is required to undertake an analysis that can identify any potential hazard for that particular organization. The local EHO will be able to offer advice on how best to approach this together with some ideas on what records you would need to keep for the particular service in

question.

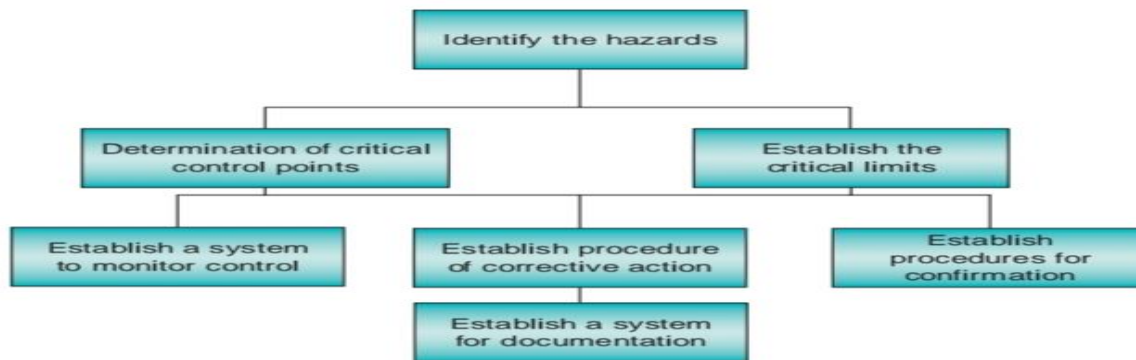


Figure 3.1 HACCP procedure

■ The 7 Principles of ‘Process’ HACCP for a Food Service Facility

The 7 principles of HACCP are used to identify, evaluate, and control the chemical, biological, and physical food safety hazards within restaurants or other food service facilities. Using a typical chicken cooking process (Receive – Store – Prepare – **Cook** – Hold – Serve) as an example, the principles are:

1. Conduct a hazard analysis

Listing any potential food safety hazards related to your menu with the potential to cause illness or injury to your customer if not effectively controlled.

For restaurants, this means creating a list of food safety hazards related to your menu. It also includes how the food is stored, prepared, and cooked (if applicable), and which equipment is used. Overlooking one potential hazard could render the entire HACCP plan ineffective, even if you adhere to it diligently.

Example: Raw chicken is prepared for same-day consumption. The potential food safety hazard is the risk of Salmonella bacteria if the chicken is not cooked properly. (a potential biological hazard).

2. Determine the critical control points (CCPs)

Next, identify the points where hazards could be prevented, eliminated, or reduced to an acceptable level. While some processes form part of prerequisite programs (PRPs), critical control points are those processes where a control can be applied.

Example: A critical control point could be where the raw chicken is cooked. The cooking step needs to be sufficient in order to destroy Salmonella or reduce the bacteria to a level safe for consumption.

3. Establish critical limits

Next, you'll set the minimum and maximum CCPs necessary to maintain a safe environment and prevent, eliminate, or reduce food safety hazards to an acceptable level.

Example: In order to kill Salmonella, raw chicken needs to be cooked to an internal temperature of 165°F for at least 15 seconds. The critical limit would therefore be 165°F for 15 seconds.

4. Establish monitoring procedures

Keep detailed records to ensure that the critical limits are adhered to. Ideally, the monitoring procedures are continuous and done electronically.

Example: In order to monitor the internal temperature of the chicken, a clean (and sanitized) temperature probe should be placed in the thickest part of the chicken meat to ensure that a temperature of 165°F was reached for at least 15 seconds.

5. Establish corrective actions

Inevitably, issues will arise. Create and record corrective actions to mitigate discovered hazards.

When deviations do inevitably occur, it's vital that corrective action be taken immediately:

- **First determine the root cause of non-compliance and then correct it by demonstrating the CCP is once again under control (re-examine the process if needed);**
- **Establish the disposition of the product that is non-compliant;**
- **Document the corrective actions that are to be taken in response.**

Example: If the internal temperature of the chicken did not meet the requirements, it should continue cooking until 165°F is reached for at least 15 seconds. This additional time should be recorded.

6. Establish verification procedures

To maintain consistency and safety, establish checklists, verification, and operational routines for each day part and shift throughout the week to verify whether your HACCP system is working.

Example: the shift manager needs to review the temperature logs to ensure that the critical limit was met every time.

7. Establish record-keeping and documentation procedures

Document all efforts to maintain food safety and quality, including the initial hazard analysis, the HACCP plan, the assignments, roles, and duties, to the support documentation confirming the procedures were fulfilled.

Examples of documentation related to the chicken cooking process would include: temperature monitoring charts (including notes on deviations and corrective actions), and supplier invoices.

Self-Assessment Exercises 1

1. What is Hazard Analysis and Critical Control Point (HACCP)
2. State the 7 Principles of 'Process' HACCP for a Food Service Facility

1.4 Planning of food service facility

The planning of food service facilities is complex. This is due to some of its unique characteristics, including the following:

1. The wide variety, choice and grades of raw materials available.
2. The high perishability of some raw materials.
3. The wide variety of semi-prepared and prepared products available.
4. The perishability of the end product.
5. The fast turnover of some foods, for example items delivered fresh in the morning may be prepared and served to the customer at lunchtime, and the revenue banked by the afternoon.
6. The product is rarely taken to the customer, the customer has to go to the product to purchase it, and consume it, usually on the premises.
7. The product cannot be stored for any length of time.
8. A wide variety of customers may be catered for within the same establishment.
9. There may be a variety of production and service methods in operation in any one outlet.
10. The process has to comply with the HACCP policy.

Efficient food service planning involves a number of interrelated processes, each dependent on the other, which together form a totally integrated system. Cost limits are always present for each stage of the planning process, and funds are allocated specifically for the actual building, the interior furnishings, equipment, etc.; such funds must be used wisely, as short-term savings often result in long-term costs.

Badly planned facilities suffer daily because of initial poor planning, their poor labour utilization, loss in food quality standards, high running costs and general lack of acceptance by customers.

Adequate food holding temperature controls at the point of service for both hot and cold food are essential requirements in planning a food service area. The likely outcome of a poorly designed food service area increases in the number of shortfalls.

1.4.1 Objectives of a catering facility

The first step in the planning of a catering facility is a written statement of the operation's objectives. The primary objective of a food service operation must be the provision of a catering outlet aimed at satisfying a particular market segment of the population. Allied to this main objective are the catering facility's other objectives, which include:

1. Customer appeal: The main objective of a catering facility is to provide a catering service for a clearly defined sector of the market. Once the sector of the market to be catered for has been identified the planning of the facility should then aim at this particular segment (future customers) towards meeting their appeal.

2. Cost control: Whatever the type of catering facility, costs must be controlled; in a catering operation these include the initial planning and building costs, and the daily running costs, such as food, labour and fuel.

3. Facilitate production and service: This involves ergonomically designing the layout of production and service areas and equipment, both in the kitchen and the restaurant and bars.

4. Materials handling: The movement of materials in a catering operation should be planned so that minimal handling is involved. Mechanical aids should be used where they will alleviate the human handling of materials.

5. Labour utilization: The ever-increasing labour costs in catering operations today necessitate the planning of efficient food production and service areas that result in greater employee productivity.

6. Supervision and management: Efficient feedback information systems need to be incorporated that are able to supply management with the type of information necessary for them to make decisions concerning the efficient running of the catering operation.

7. Hygiene and safety standards: Hygiene and safety standards are both factors that must be built into a catering operation at the planning stage; this is essential for the well-being of both the customer and the employees.

8. Cleaning and maintenance: Closely related to the safety and sanitary conditions of the food service facility is the consideration at the planning stage for easy cleaning and maintenance of the premises.

9. Flexibility: Flexibility at the initial planning stage can save on an operation's long-term costs. Most catering facilities undergo some form of change during their life cycle, and advance planning for this can help the transition or changeover period considerably.

Self-Assessment Exercises 2

1. State the characteristics of planning of food service facilities
2. State the objectives of a catering facility



1.5 Summary

Facility planning is an important component of health care strategic planning, for it provides an accurate assessment of the institution's physical environment and its development potential. Like many other businesses operating in the digital era, success for food and beverage industry starts and ends with the state of your facilities such as ambience, cleanliness and other important environmental factors.

In this unit, we examined Food production methods; food service facilities planning of food service facility and objectives of a catering facility.



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1.7 Possible Answers to Self-Assessment Exercises

Self-Assessment Exercises 1

1. Hazard Analysis and Critical Control Point (HACCP) is a systematic approach to identifying and controlling hazards, whether they are microbiological, chemical or physical in nature.
2. The HACCP principles are: conduct a hazard analysis, determine the critical control points, establish critical limits, establish monitoring procedures and establish corrective action

Self-Assessment Exercises 2

1. The characteristics of planning of food service facilities are:
 - a. The wide variety, choice and grades of raw materials available.
 - b. The high perishability of some raw materials.
 - c. The wide variety of semi-prepared and prepared products available.
 - d. The perishability of the end product.
 - e. The fast turnover of some foods, for example items delivered fresh in the morning may be prepared and served to the customer at lunchtime, and the revenue banked by the afternoon.

- f. The product is rarely taken to the customer, the customer has to go to the product to purchase it, and consume it, usually on the premises.
 - g. The product cannot be stored for any length of time.
 - h. A wide variety of customers may be catered for within the same establishment.
 - i. There may be a variety of production and service methods in operation in any one outlet.
 - j. The process has to comply with the HACCP policy.
2. The main objectives of a catering facility is the provision of a catering outlet aimed at satisfying a particular market segment of the population, allied to this main objective are the catering facility's other objectives, which include customer appeal, cost control, facilitate production and service, materials handling, labour utilization, supervision and management, hygiene and safety standards, cleaning and maintenance and flexibility

UNIT 2 FOOD PRODUCTION METHODS

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2.7 Possible Answers to Self-Assessment Exercises



2.1 Introduction

Modern day food and beverage processes are progressing to get better in the quality, and the service. Food production may be definite as that phase of the food flow mainly apprehensive with the dispensation of raw; semi prepared, or prepared foodstuffs. The resulting product may be in a ready to provide state, for example in the conventional method (cook serve); or it may experience some form of protection, for example cook-chill or cook-freeze, before being served to the consumer.

In this unit we shall examine, Food production methods; Conventional methods and beverage production methods.



2.2 Learning Outcomes

At the end of this unit, you should be able to:

- discuss the advantages & disadvantages of centralized production
- discuss the basic principles of cook-freeze and cook-chill systems
- discuss the beverage production methods
- evaluate the main division of activities in the conventional partie food production method
- evaluate the main division of activities in the cook-freeze food production method
- evaluate the main division of activities in the cook-chill food production method



2.3 Food production methods

■ Introduction

In examining food production methods currently in operation, reference must be made to the traditions of catering which have had a profound effect on the production methods in operation today.

Food production methods in the catering industry evolved over a period of time when there was an abundance of labour. The design of the traditional kitchen, grew up around the division of tasks into parties (similar tasks with numerous foods were carried out by a particular group of people). This was the development of the partie system. The rigid demarcation between the sections meant that the staffing ratio was high in comparison with the number of meals served.

During the first half of the 20th century there was little or no technical change in the kitchens of hotels and restaurants. Most managers and chefs had been trained in the old traditional methods that gave reasonably satisfactory results, and to them there seemed little reason to change. It is

only during the last thirty years that changes in the old traditional methods evolved. These changes were slow to appear and started in the manufacturing industry rather than in the kitchens of hotels and restaurants.

The following represents a study of the main food and beverage production methods currently in operation.

2.3.1 Conventional Methods

- **Traditional partie method.** In the conventional partie method, the majority of food is purchased raw, very little falling into what we now call the ‘convenience foods’ category. Facilities are provided for the receipt and storage of goods, the preparation, cooking, holding and service of food, and for dishwashing facilities (See figure 3.1)

During each day the use of labour is intermittent, rising to a peak just before the service of each meal. The same situation exists with the cooking equipment, good utilization for short periods, but overall poor utilization of capital plant. This in turn leads to poor use of electricity and gas appliances. Altogether it is an expensive way of running a kitchen; expensive because of the manpower needed to operate it, and its space, equipment and energy requirements

- **Conventional production with convenience foods.** Convenience foods may be introduced into a traditional production kitchen which may range from a partial to a virtually complete reliance on the use of the wide variety of convenience foods now available. It is basic to the systems approach that the operation be considered as a whole, taking into account the effects that a change in one part of the system might have on another part. Therefore, if convenience foods are to be introduced into a traditional kitchen previously using all fresh produce, the effects upon labour, equipment, space, and more important, the customer, should all be considered.

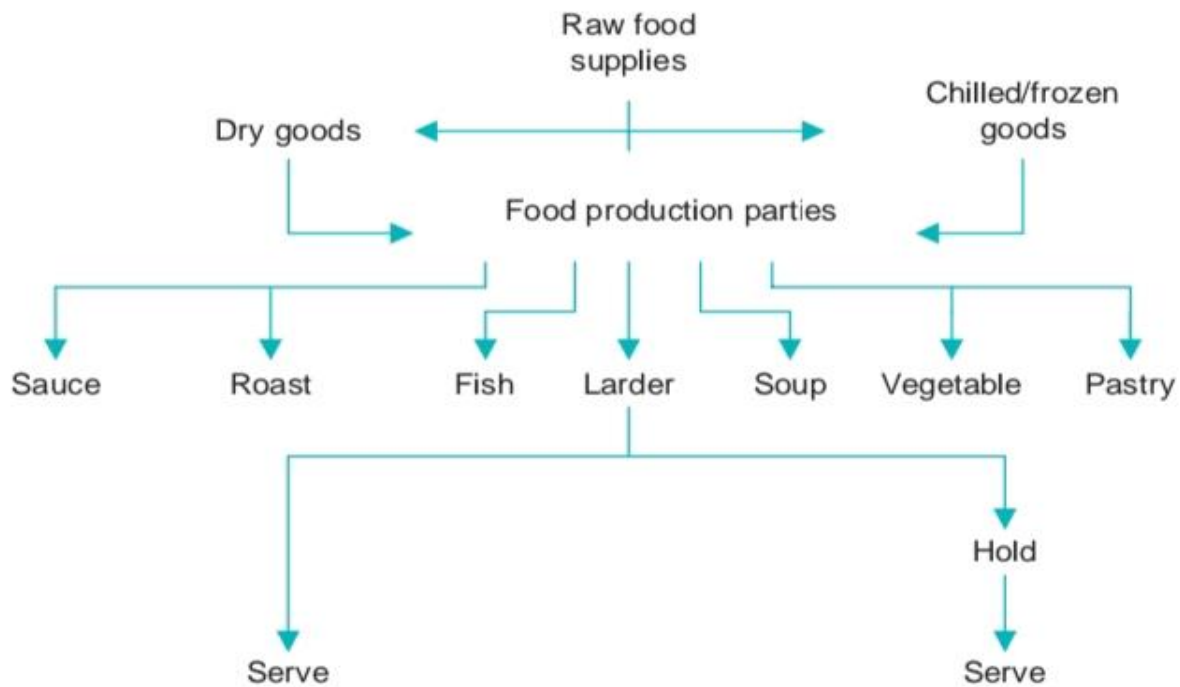


Figure 3.1 The main division of activities in the conventional Party food production method

- **Centralized Production Methods**

Centralized production methods involve the separation of the production and service components of the food flow system either by place or time or both. Food that is centrally produced is either then distributed to the point of service in batches or is preportioned; it may be transported in a ready-to-serve state, for example hot, or it may need some form of regeneration in a satellite or end-kitchen, for example chilled or frozen food. However, the central production units (CPUs) are no longer in popular demand mainly due to their high operating costs.

- **Cook-freeze production**

The term ‘ cook-freeze ’ refers to a catering system based on the full cooking of food followed by fast freezing, with storage at a controlled low temperature of 18°C or below, followed by subsequent complete reheating close to the consumer, prior to prompt consumption. Cook-freeze is a complete food production process from the initial raw food through to the final service of the product and is largely done by food manufacturing companies rather than by caterers (Figure 3.2).

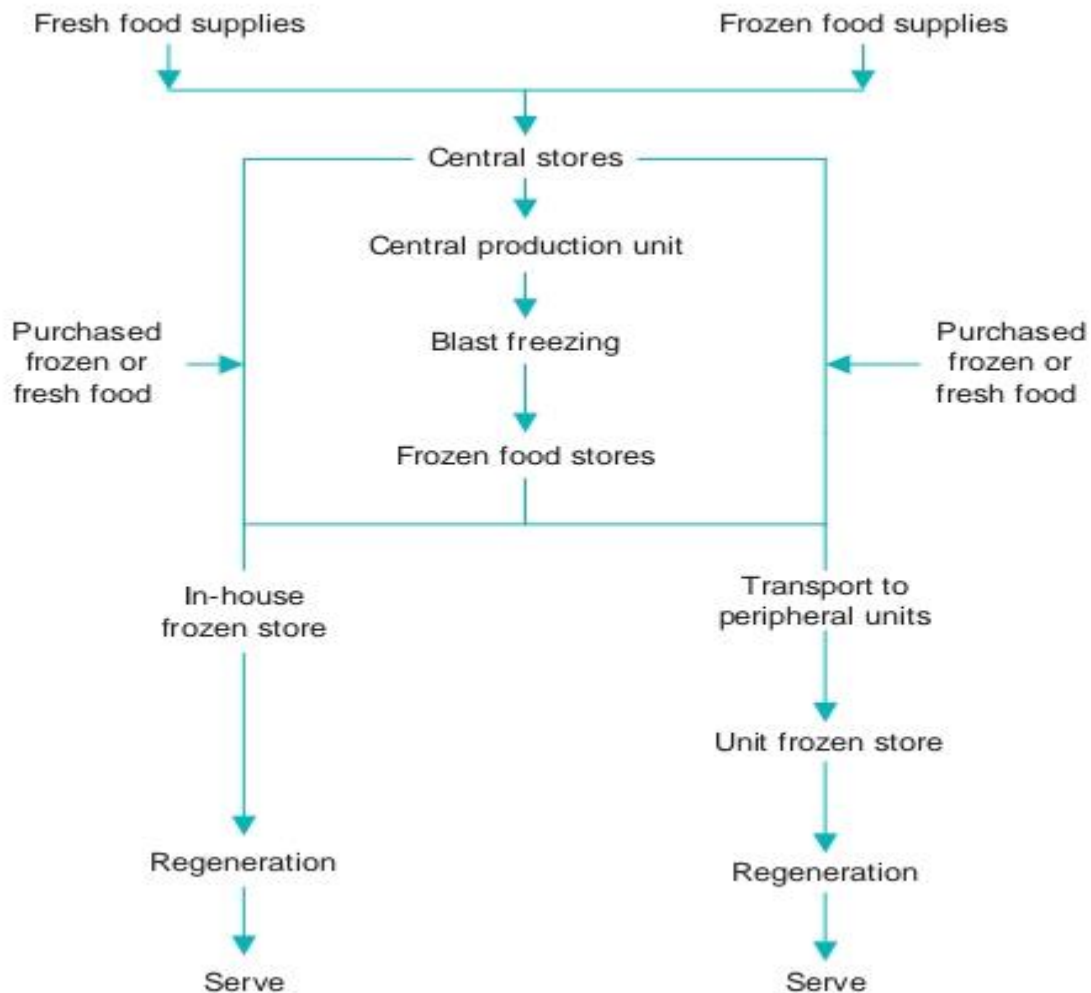


Figure 3.2 The main division of activities in the cook-freeze food production method

- **Cook-chill production**

The term ‘ cook-chill ’refers to a catering system based on the full cooking of food followed by fast chilling, with storage in controlled low storage temperature conditions just above freezing point and between 0°C and 3°C, followed by subsequent complete reheating close to the consumer prior to prompt consumption. It has a short shelf life compared to cook-freeze of up to five days including the day of production, distribution time and regeneration.

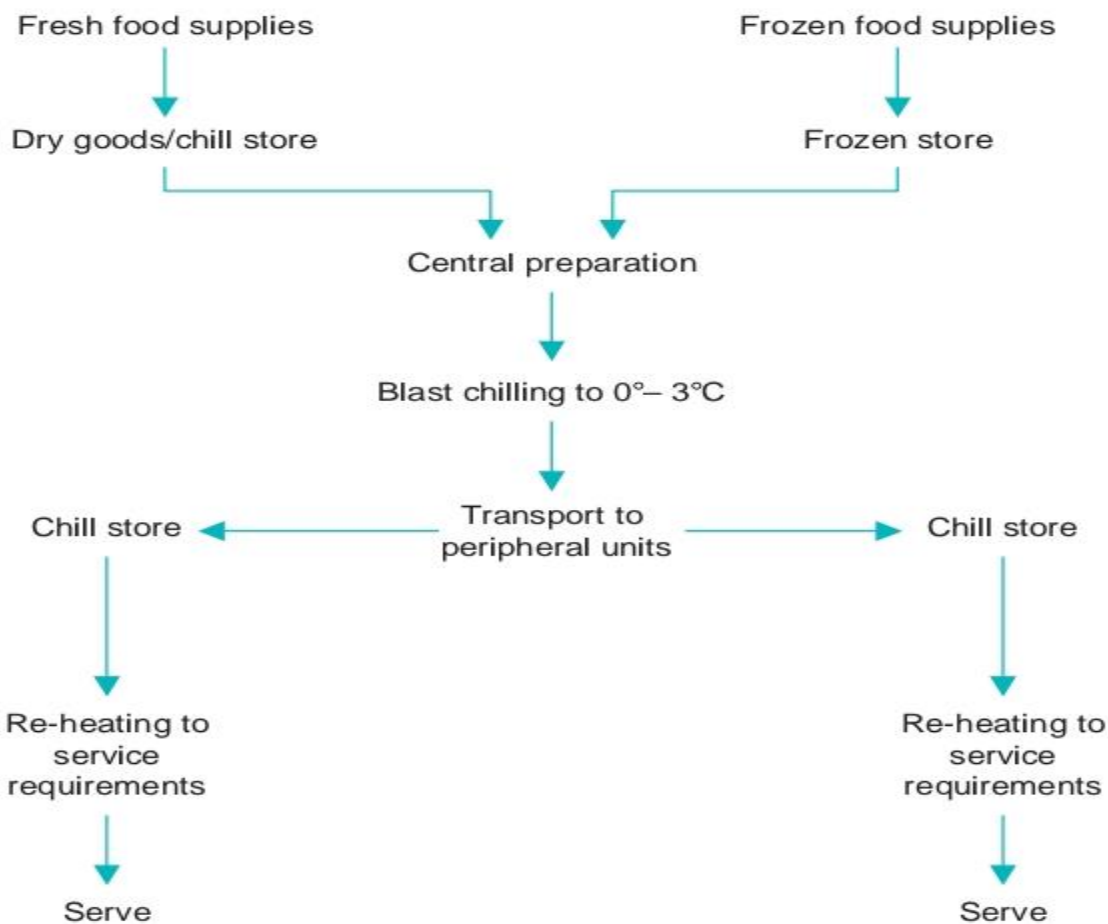


Figure 3.3 The main division of activities in the cook-chill food production method

- **Sous vide**

The sous-vide food processing technique (meaning under vacuum) was developed by the French in the late 1970s as a way to reduce shrinkage in foods while maintaining the flavour and lends itself readily to adaptation as a cook-chill variant. The system involves the preparation of quality raw foods, pre-cooking (e.g. browning) when necessary, putting the raw foods into special plastic bags or pouches, vacuumizing and sealing the pouches and then steam cooking to pasteurization temperatures. The food product can be served direct to the customer at this stage or rapidly chilled to 1°C to 3°C and stored at between 0°C and 3°C for a maximum of twenty-one days (Figure 3.3).

Self-Assessment Exercises 1

1. Outline the main division of activities in the cook-freeze food production method
2. Outline the main division of activities in the cook-chill food production method

2.4 Beverage Production Methods

The term ‘beverage’ in this context is used to describe both alcoholic and non-alcoholic drinks. The degree of preparation necessary before these different beverages can be served to the customer varies, but in the majority of cases it is the non-alcoholic beverages that fall into the categories of raw and semi prepared products, and the alcoholic beverages that are in the main already fully prepared.

1. **Raw beverages:** These are beverage products that require a higher degree of preparation, in comparison to the other categories, before being served to the customer. Examples of such beverages are tea, coffee, cocoa, which may require up to fifteen minutes before reaching a ready-to-serve state. The preparation of these raw beverage products may be away from the service area and customer, for example a stillroom in the kitchen of a large hotel, although in some speciality restaurants or coffee shops the tea or coffee making facilities may be an integral part of the total food service being offered by the catering operation.

RAW beverages

- These are beverage product that are required a higher degree of preparation before being served to the customer.
- Example such as Tea, Coffee, Cocoa



2. **Semi-prepared beverages:** These are beverage products that do not need to be prepared from the raw product state, but neither are they ready to serve. Examples of semi-prepared beverages are fruit cordials that only require the addition of water; iced coffee and cocktails may also be included in this category.

3.

Semi-prepared beverage

- These product do not need to be prepared from the raw product state, but neither are they ready-to-serve
- Example are Fruit cordials which required the additional of water; ice and cocktails may included in this categories



4. **Fully prepared beverages:** These are beverage products requiring virtually no preparation before being served to the customer, for example bottled fruit juices, spirits, wines, etc.

Fully prepared beverages

- These products requiring virtually no preparation before served to the customer
- Example bottles fruit juice, spirit, wine



- **The Style** - The style of beverage production in a catering operation should be complementary to the food production method; therefore in a high-class restaurant a full range of alcoholic and non-alcoholic beverages would be available. In a cafeteria operation, however, a limited range of beverages would be offered, and such non-alcoholic beverages as tea, coffee or orange squash, may actually be 'prepared' by customers themselves, for example, by the use of a vending machine or a tea, coffee or soft drinks machine.

The beverage production method in a catering operation should be afforded the same importance and consideration as the choice of the food production method. The necessary requirements for good beverage production include the following:

- good quality raw materials
- a good blend of tea or coffee;
- the right equipment necessary for performing the job correctly

- properly cleaned stills or machines,
- the provision of cocktail shakers, strainers, etc. if cocktails are being offered;
- finally, the employees must be trained for the tasks they are to perform.

The standard of beverage production in a catering establishment and the standards of hygiene and cleanliness in beverage equipment should be regularly checked. The method of beverage production must be such that it will operate within the financial limits, and meet the profit targets of the establishment, as laid down in the financial policy.



Bottling plant



Line of bottling beverages in plastic bottles



Apple juice in glass bottles in a factory for the food industry bottling



Conveyor belt, beer in bottles, brewery factory industrial production line

Self-Assessment Exercises 2

1. Categorize beverages with examples according to the degree of preparation necessary before serving to the customer
2. What are the necessary requirements for good beverage production



2.5 Summary

Food production has evolved over time with the help of new technologies; the necessary conversion of raw materials to edible, nutritional, functional and culturally acceptable food products within an acceptable time frame is an important link between production and consumption within the food value chain.

Without increased attention to the role of food processing for a maintainable food supply, we are unlikely to succeed in addressing the mounting challenges in delivering sustainable diet.

In this unit we examined, food production methods; conventional methods (traditional partie method & conventional production with convenience foods), centralized production methods, cook-freeze and cook-chill systems and beverage production methods.



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2.7 Possible Answers to Self-Assessment Exercises

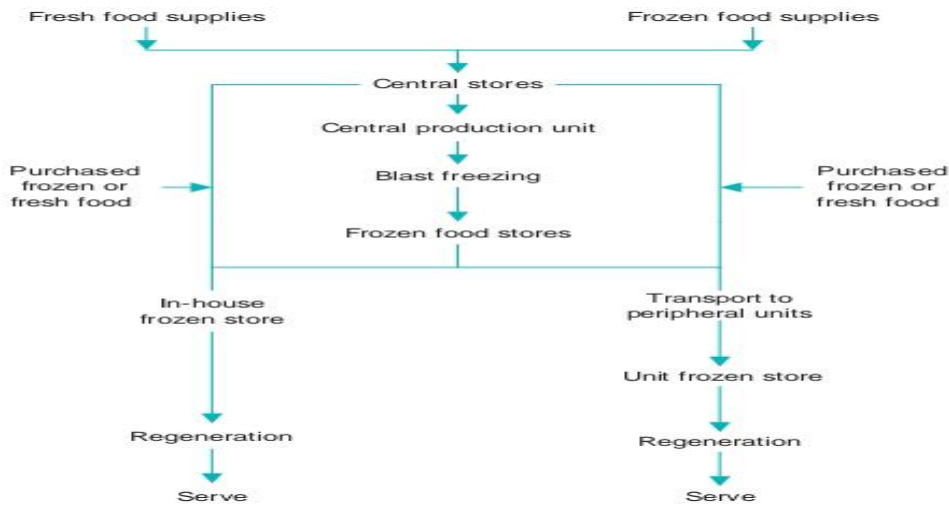
Self-Assessment Exercises 1

1. The main division of activities in the cook-freeze food production method

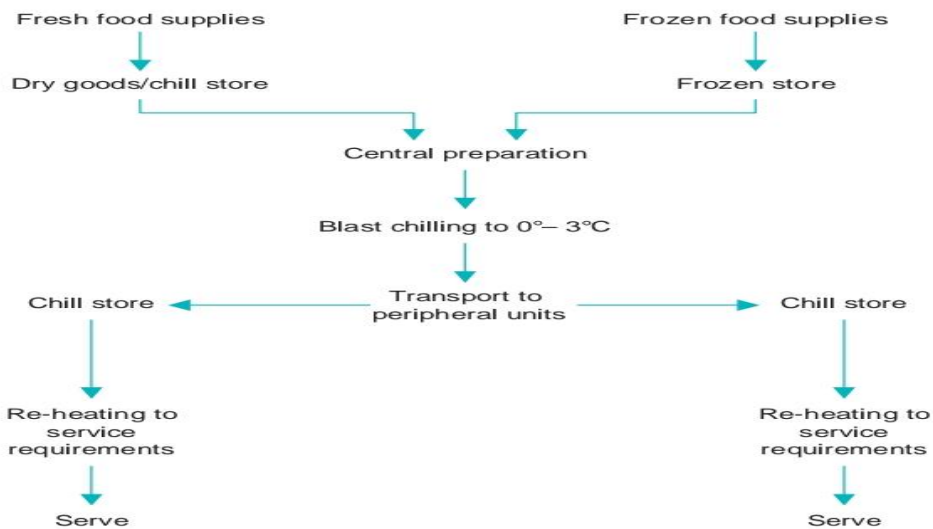
Self-Assessment Exercises 2

1.
 - a) **Raw beverages:** These are beverage products that require a higher degree of preparation, in comparison to the other categories, before being served to the customer. Examples of such beverages are tea, coffee, cocoa

Semi-prepared beverages: These are beverage products that do not need to be prepared from the raw product state, but neither are they ready to serve. Examples of semi-prepared



2. The main division of activities in the cook-chill food production method



b) beverages are fruit cordials that only require the addition of water; iced coffee and cocktails

c) **Fully prepared beverages:** These are beverage products requiring virtually no preparation before being served to the customer, for example bottled fruit juices, spirits, wines, etc.

2. The necessary requirements for good beverage production include the following:

- i. good quality raw materials
- ii. a good blend of tea or coffee;
- iii. the right equipment necessary for performing the job correctly –

- iv. properly cleaned stills or machines,
- v. the provision of cocktail shakers, strainers, etc. if cocktails are being offered;
- vi. finally, the employees must be trained for the tasks they are to perform

UNIT 3 FOOD SERVICE METHODS

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3.1 Introduction

3.2 Learning Outcomes

3.3 Food and Beverage Service

3.4 Food Service Methods

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3.4.1.2 Waiter service

3.4.1.3 Special service arrangement

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3.7 Possible Answers to Self-Assessment Exercises



3.1 Introduction

Foodservice is all about food and beverages that are consumed out of the home. Consumers visit foodservice outlets for a number of reasons, such as the added convenience, to sample new tastes and flavours, to celebrate and to socialize. Foodservice covers a wide range of eating occasions and outlets: Hotel, Restaurants, etc.

In this unit we will examine various food service methods.



3.2 Learning Outcomes

At the end of this unit, you should be able to:

- discuss the basic requirements of any food service method
- discuss the various classes of food service methods
- analyse the main advantages and disadvantages associated with vending
- demonstrate the different styles of table service
- evaluate the client or in-house operated service and contract operated service



3.3 Food and Beverage Service

■ Introduction

- Food service may be defined as that phase of the food flow (i.e. from the purchasing of the foods to service to the customer) mainly concerned with the delivery and presentation of the food to the customer, after the completion of food production. In some situations food service may include an element of transportation due to the separation of the food service facilities from the food production, for example of a centralized cook-freeze operation serving peripheral units.
- Beverage service may be defined as that phase of the beverage flow wholly concerned with presentation of the beverage to the customer after the completion of beverage production. In beverage service there may be little or no element of transportation as the beverage production and any real distance rarely separates service facilities.

As with food and beverage production, there are a number of food and beverage service methods. And for these methods to be successful, some basic requirements should be met. They include:

- ✓ Ensure there is a robust customer/staff feedback process in place.
- ✓ The system chosen must be in keeping with the total concept of the catering facility and be perceived as value for money by the customer.
- ✓ An ability to display food and beverages attractively.
- ✓ Offer good quality control.
- ✓ Provide an efficient service.
- ✓ Provide an atmosphere of hospitality and attractiveness
- ✓ Ensure good standards of hygiene and safety are maintained.
- ✓ Operate within the cost and profit targets of the establishment.

Self-Assessment Exercises 1

1. What is food beverage services
2. Outline the basic requirements of the food and beverage service methods

3.4 Food Service Methods

In order to deliver the food produced in a kitchen to the customer some form of food service is required. This may vary from full silver service in a luxury restaurant or hotel, where the food is brought to the customer's table, to a self-service cafeteria where the customer collects his or her own food from a service counter.

Whatever the food service method, the business of eating out should be a pleasurable one. The main objective of an operation should be to present the customer with food of good quality at the correct temperature and served attractively, to ensure acceptability.

3.4.1 Classification of food service methods

Food service methods may be classified based on various reasons, styles and arrangements. For simple reasons and basic understanding the majority of identifiable food service methods may be easily classified into these categories: **self-service, waiter service and special service arrangements,**

3.4.1.1 Self-service

The self-service method is the simplest food service method currently in operation. Self-service methods may be described as those operations in which the service staff do not come to the table and serve customers their meals rather customers in fact select their own food, cutlery, etc. and carry them to a dining area themselves. Such a method may be completely self-service such as in a vending operation, or it may be aided self-service, where counter staff are available to help the customer in portioning and serving the food on to a plate. The various methods under this category include:

- **The traditional cafeteria**

The traditional cafeteria arrangement consists of a straight line of counters where customers enter at one end of the line, pick up a tray and pass along the full length of the counter selecting menu items on the way and then move to the dining area where they sit and enjoy their meal.

- **The free-flow cafeteria**

This type of cafeteria design is also known as the 'hollow-square'. Separated counters for hot or cold foods are usually placed along three sides of a room, with the fourth side open for traffic entering or leaving, so that a U-shape arrangement of food stations is formed. In a free-flow cafeteria, food stations may be positioned at right angles to the counter, or be staggered at an angle, forming an 'echelon' or 'saw-tooth' arrangement. Customers entering the square can go

directly to the hot or cold sections without having to wait in line for their food, although during peak periods short lines may form at the most popular stations.

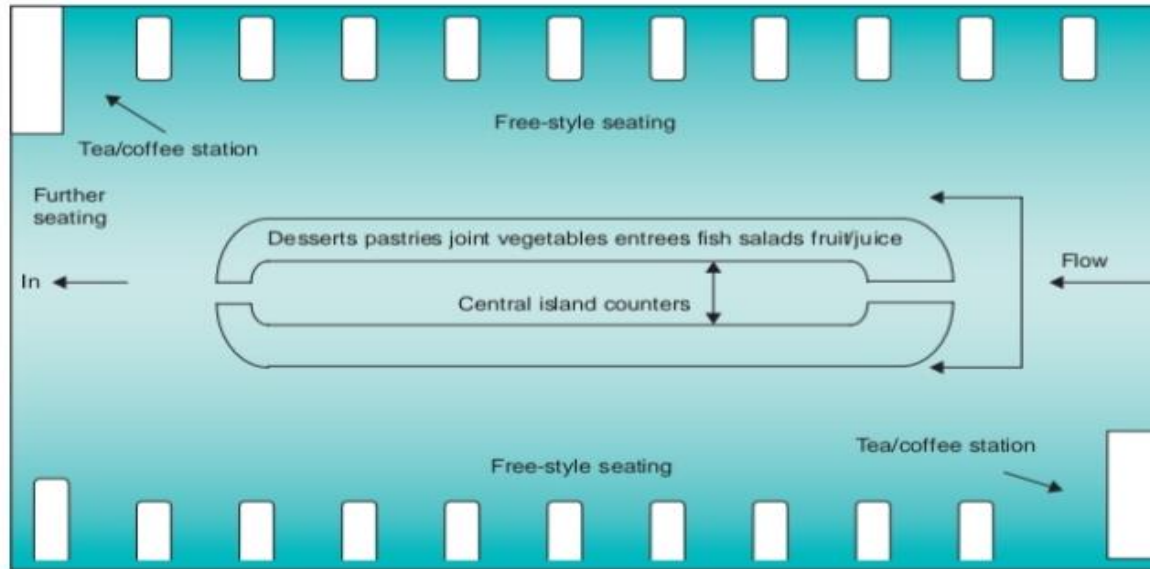


Figure 3.1 Typical cruise ship free-flow cafeteria

- **The carousel**

The carousel or ‘ roundabout servery ’ consists of a number of rotating shelves (usually three) at different heights, all of which are approximately 6 ft. in diameter, and rotate at one revolution per minute. Food is passed from the kitchen to a plating table still on the servery side of the carousel, from which the carousel is fed with hot and cold plated foods.

The carousel unit consists of a number of servery areas where the customer remains stationary, taking his choice of meal from the revolving carousel, and placing it on his tray. Payment is made to a cashier or cashiers on the restaurant side of the carousel.

- **Vending :** Vending today has become synonymous with selling from a machine. It is also known as ‘ automatic retailing ’or selling from an ‘ electronic cafeteria ’and involves a machine providing the customer with a product in exchange for some form of payment, coins, credit cards, etc.

The general market vending machines and their products may be situated in areas to which the general public largely has access; for example, shopping courts, motorway service areas, garage forecourts, airports, seaports, ferries, rail and bus terminals, libraries, swimming and leisure centres, stadiums, exhibition centres, cinemas and theatres.

The range of vending machine equipment or hardware is divisible into two major groups:

1. Beverage vendors.
2. Food vending machines or merchandisers:

Food vending machines may vend a variety of food products – confectionery, snacks, plated meals, etc. and are usually vended in one of three types of machine:

- a) Snack machines
- b) Refrigerated machines
- c) Hot meal machines

Advantages associated with vending include the following:

- ✚ Flexibility: Vending can provide a twenty-four hour food and beverage service, either alone or in conjunction with other catering services.
- ✚ Situation: Vending machines can be sited anywhere close to the customer market.

- ✚ Quality control: In terms of quality, vending machines can sell a consistent product, particularly beverages, pre-packed snacks and bought in meals from a supplier
- ✚ Hygiene control: Reduced handling of vended foods also reduces the possibilities of food contamination.
- ✚ Operating control: Labour savings thus reducing labour costs. Wastage, pilferage and cash losses should also be negligible
- ✚ Speed: Vending machines can 'sell' products quickly and efficiently.
- ✚ Sales promotion: Products for sale in a vending machine can look attractive and stimulate 'impulse purchases'.

Disadvantages associated with using vending include the following:

- Impersonality: Vending machines lack the 'personal touch' and some customers will always prefer to be served food and beverages in the traditional manner rather than from a machine.
- Inflexibility of the product: Vending machines are customized to their particular products.
- Reliability: Not always reliable causing dissatisfaction to customer due to poor mechanisms.
- Limiting: Vending machines have limitations especially for large-scale food and beverage service. In some situations they are best suited as a backup to the main catering services.

If an organization decides to use vending as a catering facility, it has to decide whether to remain 'in house', or to employ a contractor. The main cost structures for each of these groups may be itemized as follows:

- **Client or in-house operated service**

- Capital outlay for machine, outright purchase, lease, rented or instalment, plus depreciation of machines and loss of interest on capital. Choice of machine made by client.
- Installation costs such as for electricity and water supplies.
- Operating costs such as ingredients, commodities, cups, daily sales and cost records, maintenance, cleaning and servicing.
- Selling prices set by client, all cash takings to the client.

- **Contract operated service**

- No capital outlay for machine – contractor supplies it.
- Some installation costs paid by client, for example water and electricity.
- Operating costs such as ingredients, commodities, cups, maintenance, cleaning and servicing done by contractor.
- Selling prices set between client and contractor.

- **The carvery**

Carvery restaurants essentially offer a three-course meal (exclusive of drink) at a set inclusive price. The first course is served by the waiter and usually offers a selection of five or six items. The main course is selected from the carvery counter and served by customers themselves, although usually aided by a control conscious chef. A waiter also serves the sweet course, like the first course.

- **The buffet**

The buffet is a method of food service that is a modification of true self-service. It is a food service arrangement in which foods are displayed attractively on one, or a series of tables and presentation is an all-important factor.

Customers collect a plate from one end of the table and move along it helping themselves to the foods of their choice.



- **Take-away or take-out service**

The take-away, or take-out service is a method of food service that exploits to the full the concept of ‘fast foods’. The products offered by these establishments are highly standardized, as are most of the features of the operations – service, sales control, product packaging, etc.



The take-away operation offers a limited basic menu to the customer, but within this menu there may be a number of variations on the basic items.

Self-service is therefore a method of food service in which customers collect their own food from some form of service counter, in return for which they pay a lower price either before the meal or after the meal.

3.4.1.2 Waiter service

Waiter service involves the transportation and service of food to the customer – whether at a table, counter or bar – rather than customers collecting their own food. This method of food service has also been termed ‘aided’ or ‘personalized’ service. The various methods in this category include:

- **Counter or bar service**

In bar service customers sit on stools or chairs at a counter, the shape of which may be a straight line, or as is more usual, U-shaped. The latter shape allows the waiter to serve a considerable volume of trade single-handedly and very rapidly, offering a good display of foods which may encourage impulse buys.

- **Table service**

Table service is a method of food service in which the waiter brings customers’ food to the table and places it in front of them, either pre-plated, or if it is silver service, served with a salver on to a plate and then placed in front of customers.

There are basically two types of menus available in table service from which customers may select their meal. The first is the **à la carte menu** in which all the items on the menu are individually priced and customers select and combine dishes according to their choice. The other is the **table d’hôte menu**, which consists of a number of items combined together to produce a

set meal, at a set price. There are a number of different styles of table service, these include the following:

1. American service in which the guest's meal is portioned and plated in the kitchen, brought into the restaurant by the waiter and placed in front of the customer.



American Service Style

2. French service, which is the most elaborate of the table service methods, involves preparing the guest's food in the kitchen, arranging it on silver salvers that are then brought into the dining room and placed on a small cart called a gueridon. On this gueridon is a small heater called a réchaud, used for heating or flaming the guest's food, which is then served from the silver salvers on to the guest's plate and placed in front of the guest



Gueridon Service Style.

3. The Russian style of service illustrates the food service method commonly referred to as silver service; the food is prepared and portioned in the kitchen and placed on to silver salvers, which are then taken into the restaurant. A dinner plate is placed in front of the guest and the food is served on to the guest's plate.



Silver Service Style

4. English service, which is the least common of all the table service methods described and is usually only used for private functions. The food is prepared in the kitchen, but not portioned; instead the complete joint of meat, for example a whole turkey, is presented to the guests before carving. The host or one of the service personnel then carves and portions the

meat and places it on to a plate with the vegetables, and the plate is then placed in front of the guest.



English Service Style

These are the four main traditional methods of table service, although variations do of course occur within the different styles.

Some of the following food service methods are also, in the strict sense of the word, table service, but they have been included here by the titles under which they are more commonly known:

- **Banquet service**

Banquet service is usually associated with large hotels, although today many food service operations are employing this type of food service as a profitable side-line. It is a range of food service style for large catered events, such as weddings, award ceremonies etc.

- **Room and lounge service**

Room service is a method of food service, which, like banqueting, is most commonly associated with the larger hotels, although some motels and smaller hotels do also offer a degree of room service. It is a service which allows guests to order food and drink to be brought to their rooms.

Today, however, even in the larger hotels, it is not a method of service that is as common as it was in former years.



- **Car or drive-in service**

Car service commonly consists of two types of service: the first where customers remain in their vehicles in the drive-in area to consume their meal; and the second where customers buy their food and beverages and then leave the drive-in to consume them elsewhere.

Waiters (usually called carhops) take the customers' orders and return with the food placed on trays – these fit on to the car door or steering wheel. The customers eat their food in their cars, the carhops removing finished trays. Payment for the meal is made directly to the carhops.



Waiter service is therefore a method of food service in which customers receive some form of personalized service from the catering facility, in return for which they pay a higher price for the meal than would be paid, for example, in a self-service operation.

3.4.1.3 Special service arrangements

In some catering situations it is a necessity for the prepared food to be transported and served directly to the customer – it may, for example, be a patient in a hospital ward, a passenger on board a plane or an elderly person living at home. In such cases as these, ‘special’ service arrangements may be used. There are a number of special service arrangements available and in the majority of cases are based on similar concepts and have very similar characteristics.

- **Centralized tray service**

Today, there are a number of centralized tray meal systems available for use in hospital catering. Although differing from each other in certain aspects, the basic menu selection procedure for patients is very similar. Menu cards are distributed to patients on the previous day; patients can then make their own selection of food for the following day from the choice on the menu card. Also included on the card are the desired portion sizes of the meal and any particular dietary requirements customers may have.

- **Trays**

The catering situations in which trays may be used as an aid to food service vary therefore from self-service cafeteria arrangements using plastic trays, to high-class restaurants using silver trays, to travel catering situations where complete meals are served on a tray, for example onboard a train or plane.

Finally, a combination of self-service and waiter service is now becoming more popular in some catering operations. Customers select their first course from a buffet arrangement, order their main course from the counter or from the waiter, which is then served to them pre-plated at their table, desserts and coffee subsequently being ordered and served in the same way.

Self-Assessment Exercises 2

- | |
|--|
| <ol style="list-style-type: none">1. Enumerate the advantages and disadvantages associated with vending2. What are the four main traditional methods of table service |
|--|



3.5 Summary

The food service industry encompasses all of the activities, services, and business functions involved in preparing and serving food to people eating away from home. This includes all types of restaurants from fine dining to fast food. It also includes institutional food operations at locations such as schools and hospitals, as well as other specialty vendors such as food truck operators and catering businesses.

Food and beverage service is the essential link between the guest and the menu (Food and Beverages) and other services on offers in an establishment.

Nowadays various types of food of different cuisines is being served in different restaurants. For this reason, servicemen should know the different types of service so that every food can be served with its proper techniques, qualities, and temperature.



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3.7 Possible Answers to Self-Assessment Exercises

Self-Assessment Exercises 1

1. Beverage service may be defined as that phase of the beverage flow wholly concerned with presentation of the beverage to the customer after the completion of beverage production.
2. The basic requirements are:
 - i. Ensure there is a robust customer/staff feedback process in place.
 - ii. The system chosen must be in keeping with the total concept of the catering facility and be perceived as value for money by the customer.
 - iii. An ability to display food and beverages attractively.
 - iv. Offer good quality control.
 - v. Provide an efficient service.
 - vi. Provide an atmosphere of hospitality and attractiveness
 - vii. Ensure good standards of hygiene and safety are maintained.
 - viii. Operate within the cost and profit targets of the establishment.

Self-Assessment Exercises 2

1. Advantages associated with vending include the following:
 - i. Flexibility: Vending can provide a twenty-four hour food and beverage service, either alone or in conjunction with other catering services.
 - ii. Situation: Vending machines can be sited anywhere close to the customer market.
 - iii. Quality control: In terms of quality, vending machines can sell a consistent product, particularly beverages, pre-packed snacks and bought in meals from a supplier

- iv. Hygiene control: Reduced handling of vended foods also reduces the possibilities of food contamination.
- v. Operating control: Labour savings thus reducing labour costs. Wastage, pilferage and cash losses should also be negligible
- vi. Speed: Vending machines can 'sell' products quickly and efficiently.
- vii. Sales promotion: Products for sale in a vending machine can look attractive and stimulate 'impulse purchases'.

Disadvantages associated with using vending include the following:

- i. Impersonality: Vending machines lack the 'personal touch' and some customers will always prefer to be served food and beverages in the traditional manner rather than from a machine.
 - ii. Inflexibility of the product: Vending machines are customized to their particular products.
 - iii. Reliability: Not always reliable causing dissatisfaction to customer due to poor mechanisms.
 - iv. Limiting: Vending machines have limitations especially for large-scale food and beverage service. In some situations they are best suited as a backup to the main catering services.
2. There are a number of different styles of table service, these include the following:
- a) American service in which the guest's meal is portioned and plated in the kitchen, brought into the restaurant by the waiter and placed in front of the customer.
 - b) French service, which is the most elaborate of the table service methods, involves preparing the guest's food in the kitchen, arranging it on silver salvers that are

then brought into the dining room and placed on a small cart called a gueridon.

On this gueridon is a small heater called a réchaud, used for heating or flaming

- c) the guest's food, which is then served from the silver salvers on to the guest's plate and placed in front of the guest
- d) The Russian style of service illustrates the food service method commonly referred to as silver service; the food is prepared and portioned in the kitchen and placed on to silver salvers, which are then taken into the restaurant. A dinner plate is placed in front of the guest and the food is served on to the guest's plate.
- e) English service, which is the least common of all the table service methods described and is usually only used for private functions. The food is prepared in the kitchen, but not portioned; instead the complete joint of meat, for example a whole turkey, is presented to the guests before carving. The host or one of the service personnel then carves and portions the meat and places it on to a plate with the vegetables, and the plate is then placed in front of the guest.

UNIT 4 BEVERAGE SERVICE METHODS

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4.1 Introduction

Beverage services means establishments or places of business primarily engaged in the sale of beverages for on-premises consumption. Typical uses include restaurants, cafes, fast - food outlets, including drive-through or drive-in establishments. There are many different types of beverage service types or procedures.

In this unit we shall discuss various beverage service methods.



4.2 Learning Outcomes

At the end of this unit, you should be able to:

- discuss the various classes of beverage service methods
- discuss any three methods in each class
- evaluate vending and dispensing machines



4.3 Beverage Service Methods

■ Introduction

The method of beverage service employed by a catering establishment should be complementary to the food service method. In a high-class haute cuisine restaurant, for example, it is common to find an adjacent cocktail bar for pre-dinner drinks, where the customer is served at the bar or table by a waiter; after the meal beverages are served at the customer's table, or served in a separate coffee lounge. In a catering facility operating a self-service method of food service,

customers would either help themselves to beverages as they moved along the cafeteria line, serve themselves from a vending machine or be served by an operative behind the counter. There is not often a separate coffee lounge in self-service restaurants, although where space requirements permit, one may be provided to help increase customer throughput. Alcoholic beverages are not sold through vending machines in public areas due to licensing restrictions.

4.3.1 Classification of beverage service methods

As with the previously described food service, there are basically two main types of beverage service: self-service, and waiter/ barperson service. Unlike food service, however, there are no special service arrangements designed specifically for the service of beverages other than a bar or dispense bar, although beverage service is of course included as part of those special arrangements described earlier, such as in hospital catering

4.3.1.1 Self-service

Self-service beverage methods are those in which customers collect their own beverages from a counter or machine, rather than a waiter serving beverages to the customers at tables. Such a method may be completely self-service, such as the vending of beverages, or it may be aided such as in the traditional cafeteria arrangement where an operative would portion drinks into cups and glasses and hand these to the customers.

The following are some self-service methods of beverage service:

- **The cafeteria**

In the traditional cafeteria arrangements beverages are included in the main counter line, usually at the end, just before the cashier. The serving of beverages is, however, recognized to be one of the slowest points in the cafeteria line and the tendency now is to separate the beverages out from the main line completely and to serve them from a separate counter.

The free-flow cafeteria: This is a ‘breaking down’ of the traditional cafeteria line which consist of a series of individual counters of which beverages are one. In some cafeteria arrangements the beverage counters may actually be sited in the dining area. This is an attempt to speed up the throughput of customers in the main cafeteria area to the dining area. Counter staff may either man such beverage stations or vending machines may be used.

Bar or counter service: This method of beverage service is mostly found in public houses or hotels and restaurants that have licensed bars. Customers purchase their drinks at the bar and then carry them back themselves to a table for consumption. Payment for the beverage is made directly to the barperson.

The carousel: Pre-portioned cold drinks may be offered for sale on a carousel. These are usually situated on the refrigerated shelves and such beverages as glasses of wine, fruit juices, milk, iced coffees, etc. may be featured. Hot beverages such as tea and coffee would be dispensed from a separate counter either adjacent or close to the carousel, or again may be sited in the main dining area.

Vending: Beverage vending machines may vend hot or cold drinks separately or together in the same machine and may also dispense alcoholic and non-alcoholic drinks.

- Hot non-alcoholic beverage machines vend coffee, tea, chocolate and sometimes soups. They offer a range of variations, for example with and without sugar, creamers or whiteners, beverages of different strengths, fresh brew leaf teas, ground and continental coffees, etc.



- Cold and non-alcoholic beverage machines vend a variety of drinks, mainly syrup and concentrate based, although some powders are used. Examples of cold drinks

being vended include still and carbonated bottle waters and juices, cartoned milks and milk shakes, fruit and health drinks.



- Hot and cold non-alcoholic beverage machines were developed to meet the growing need for cold drinks in some establishments already using vending machines.

- **Room service**

Beverage service in hotel and motel rooms is most commonly waiter service, however, many establishments have now installed mini-bars or small automatic dispensing machines (also called Bell Captains), from which a guest may obtain a drink, pays to the counter cashier or bill added automatically to his account while he takes the drink to his room.

- **The buffet**

Beverage service in buffet type arrangement is usually waiter service, however, in some cases pre-portioned drinks may be on display on the buffet table to encourage sales. Such beverages that may be offered include glasses of wine, fruit juices, iced coffee, etc.

- **The takeaway**

In take-away operations, beverages are usually served to the customer with the food ordered. When the customer's order has been prepared, the food and beverage items are packaged and handed to the customer.

4.3.1.2 Waiter/waitress service

Waiter/waitress beverage service methods are those in which beverages are transported and served to the customer, whether at a table, counter or bar, by a member of the service staff. It is a method of beverage service more commonly associated with higher priced catering facilities rather than some of the self-service operations previously described, and hence is more widely found in haute cuisine and other full service restaurants.

- **Counter or bar service**

In bar service customers may either sit on stools or chairs at the counter or bar and be served directly by the bar staff, or they may sit at individual tables within the bar area and be served by waiting staff who collect the drinks from the bar for the customer.



- **Dispensing machines**

For the convenience of classification those automatic machines dispensing alcoholic and ‘mixer’ beverages, may be termed ‘dispensing machines’, while those offering non-alcoholic beverages may be termed ‘vending machines’ . Automatic dispensing machines may be used to accurately dispense exact amounts of alcoholic beverages to be served to the customer.



- **Table service**

Here, table service is being used to describe the service of beverages at the customer’s dining table. The customer’s order for beverages is taken at the table and the beverages usually collected from the side of the bar or from a dispense bar, which is out of sight from the customer.

- **Banquet service**

Beverage service at banqueting functions is often very similar to food service in that specific beverages have already been chosen and are served at set times during the course of a meal, to accompany certain foods.

- **Room and lounge service**

In waiter service operations the customer orders the required beverages from room or floor service and the drinks are taken to the room; payment may be made directly to the waiter, or as is more usual, is debited to the customer's account.

- **Coffee carts**

The use of coffee carts or tea trolleys for the service of beverages have been included here because within this type of service beverages are often served directly to customers at their desk or table. This method of beverage service is still being used today in office blocks and factory buildings although to a large extent it is being replaced by vending.



▪ Liqueur trolleys

Liqueur trolleys may be used in a variety of restaurants and hotels and are usually brought to the customer's table at the end of a meal. An attractively stocked and interesting display of liqueurs can often stimulate customers' interest and increase alcoholic beverage sales.



Self-Assessment Exercises

1. State the self-service methods of beverage service
2. State the waiter/waitress service methods of beverage service



4.4 Summary

The beverage industry represents a huge sector of services within the hospitality industry that include preparing, presenting, and serving beverages to the customers on-premise (at restaurants and hotels) or off-premise (takeaway, restaurant catering service, and food delivery). With the increase in importance of business meetings, a range of personal and social events, a large number of customers visit these establishments frequently for refreshments.

In this unit, we examined beverage service methods: the classification of beverage service methods.

4.5 Glossary

Ambience: It is the character and atmosphere in the sense of mood that a place or setting seems to have.

Analysis: The process of considering something carefully or using statistical methods in order to understand it or explain it.

Buffet: A meal for which different foods are placed on a table so that people can serve themselves

Banquet: A formal large meal or feast, where a number of people consume food together.

Blast chilling: It is a term used to describe the method of cooling food to a low temperature quickly meaning that it passes through the food danger zone quickly therefore harmful bacteria is not given the opportunity to develop and multiply

Blast freezing: It is the process of pushing cold air at high velocity across a food product in order to freeze the product as quickly as possible

Cafeteria: A restaurant where you choose your food from a counter and take it to your table after paying for it.

Catering: The business of providing food service at a remote site or a site such as a hotel, hospital, pub, aircraft, cruise ship, park, filming site or studio, entertainment site, or event venue.

Carvery: An eating establishment at which customers pay a set price and may then have unrestricted helpings of food from a variety of meats, salads, and other vegetables

Conventional: It is an adjective for things that are normal, ordinary, and following the accepted way.

Cook-chill: It is a system in food preservation technology in which foods are fully cooked (usually at temperature less than 100 °C), rapidly chilled, refrigerated for storage, and reheated before serving.

Cook-freeze: It is a specialised food production and distribution system for prolonging the life of prepared and cooked food by rapid freezing, storage at very low temperatures and regenerating (reheating) at the time of service.

Facilities: Buildings, pieces of equipment, or services that are provided for a particular purpose.

Food Service: It includes the businesses, institutions, and companies which prepare meals outside the home.

Hazard: Any source of potential damage, harm or adverse health effects on something or someone.

Planning: The process of deciding in detail how to do something before you actually start to do it.

Regeneration: It is a process aimed to maintain the quality of food, trying to raise to natural temperature the blast chilled, frozen or quickly packaged food in the most delicate way.

Traditional: It is following or belonging to the customs or ways of behaving that have continued in a group of people or society for a long time without changing

Vending Machine: A coin-operated machine for selling merchandise

Waiter: A person whose job is to serve meals to people in a restaurant



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4.7 Possible Answers to Self-Assessment Exercises

1. The self-service methods of beverage service include the following: The cafeteria, bar or counter service, the carousel, room service, the buffet and the takeaway.
2. The waiter/waitress service methods of beverage service include the following: Counter or bar service, dispensing machine, banquet service, room and lounge service, coffee carts and liqueur trolleys

MODULE 4

Unit 1 Food Production; The Kitchen

Units 2 Cooking Processes

Unit 3 Building the Menu

Unit 4 Building the Menu Continue

UNIT 1 FOOD PRODUCTION; THE KITCHEN

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1.3 Brief History of Cooking

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1.8 Possible Answers to Self-Assessment Exercises



1.1 Introduction

Cookery is defined as a chemical process involving the application and withdraws of heat; proper mixing of ingredients decision-making and technical knowledge and skill. In French, the word ‘cuisine’ means the art of cooking and preparing dishes and the place ‘kitchen’ where they are prepared.

In this unit we shall examine food production; the kitchen - levels of skills, attitudes and behaviour in the kitchen, food handlers and kitchen hygiene, uniforms and protective clothing, features of kitchen, types of kitchen and staffing in kitchen



1.2 Learning Outcomes

At the end of this unit, students should be able to:

- discuss the four major cookery styles
- discuss the levels of skills and experiences needed in the kitchen
- discuss food handlers and kitchen hygiene
- discuss the various features of kitchen
- analyse the attitudes and behaviour expected in the kitchen
- analyse the roles of executive chef



1.3 Brief History of cooking

- **Cooking**

The act of using heat to prepare food for consumption. Cooking is as old as civilization itself, and observers have perceived it as both an art and a science. In the past, early humans conquered

fire and started using it to prepare food. Cooking foods makes them more digestible, so the calories and some of the nutrients in them are easier to absorb. Cooking also gets rid of anti-nutrients and toxins.

- **Cookery Styles**

The four major cooking styles that have evolved over the years are Chinese, Indian, Italian and French.

- a) Chinese Cuisine- Here, colour, aroma and flavor share equal importance in the preparation of each dish. Chinese cooking can be divided into northern and southern styles of cooking.
- b) Indian Cuisine- Indian cooking is a mix of different cultures and traditions. The cuisine changes as one travels from north to south or east to west. The Indian curry is used to cook vegetables or meat.
- c) Italian Cuisine- Ranging from the white sauces in northern Italy to the red sauces of southern Italy, each region has its own styles and specialties.
- d) French Cuisine- Each city within France has its own unique style of cooking and its much favoured ingredients. French cooking also known as HAUTE CUISINE is considered by many to be the standard by which all other cuisines are measured.

- ◆ **Professional Cookery**

There are 3 classes of professional cookery associated with the craftsmen and they are graded according to the quality of material used.

- **Cuisine simple/plain cookery**

Here the basic necessities are used and the craftsmen prepare the dishes of highest standard with the minimum materials.

- **Cuisine bourgeoisie**

This is a type of cookery, provides better raw materials to produce the dishes of better quality.

- **Haute cuisine/high class cookery**

In this cookery the best possible raw materials are used and the best quality dishes are prepared.

1.3.1 Levels of Skills and Experiences needed

Skills may be grouped into 3 general categories.

1) Supervisory level: The head of the food service, whether called executive chef or kitchen director, must have management and supervisory skills as well as thorough knowledge of food production.

His duty schedule should fall under the following:

- Organizing and motivating people under him.
- Planning menus and production procedures.
- Controlling costs and managing budgets.
- Purchasing food supplies & equipment.
- Scheduling food production.
- Train and instruct workers.
- Control quality.

2) Technical level: The cooks are the backbone of the kitchen. These workers carry out the actual food production. They must have knowledge of and experience in cooking techniques. They must be able to function well with their fellow workers and co-ordinate with other departments.

Cooking food in hotels is a team activity.

3) Entry level: this level of workers usually requires no particular skills and experience. The jobs assigned to them are stewarding or basic preparation of vegetables. As their knowledge, skill and

experience increases, they may be given more complex tasks which will eventually make them skilled chefs.

1.3.2 Attitudes and Behaviour in the Kitchen

The emphasis of a food service education is on learning a set of skills. But attitudes are more important because a good attitude helps not only to learn skills but also to preserve and overcome difficulties. The successful foodservice workers follow an unwritten code of behaviour and set of attitudes, which may be called “professionalism”.

Set of qualities include:-

- 1. Positive attitude towards the job:** a chef with a positive attitude works quickly, efficiently, neatly and safely.
- 2. Staying power:** Food service personnel require good health, physical and mental stamina and a willingness to work for longer hours.
- 3. Ability to work with people:** it is essential to be able to work well as a team and to cooperate with colleagues.
- 4. Communication:** ability to communicate effectively.
- 5. Eagerness to learn:** must exhibit that eagerness to learn.
- 6. Must develop a full range of skills:** develop and maintain other skills that are necessary for the profession.
- 7. Experience:** there is no substitute for years of experience. Practice more to gain more experience.
- 8. Aiming for quality:** whatever you do must have a distinctive sign of quality.
- 9. Creativity:** there is no limit to creativity.
- 10. Return to basic:** experiments and innovation needs good understanding of basics first.
- 11. Care of equipment:** show interest in caring for equipment.

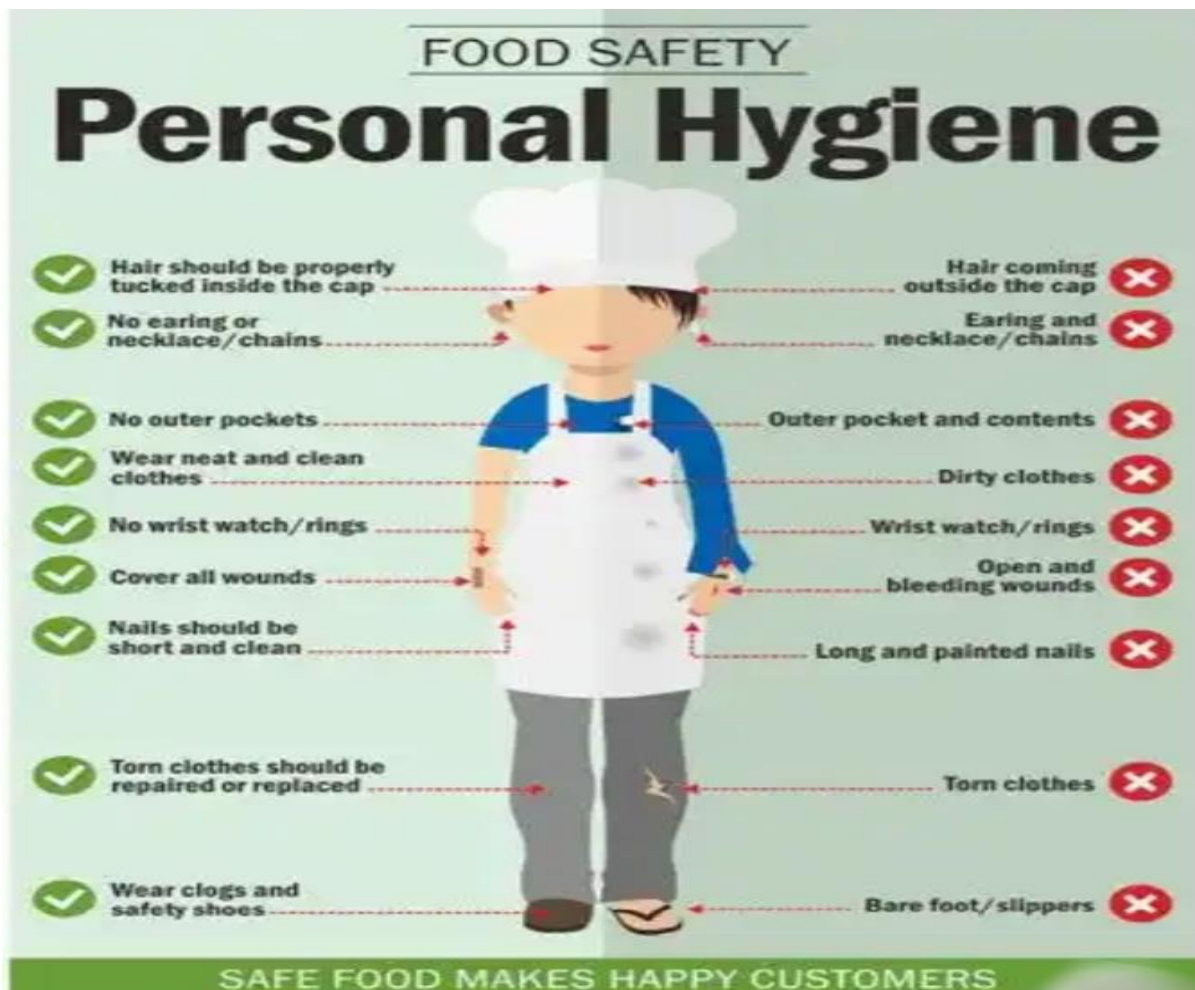
12. Safety: always abiding by the safety rules.

Self-Assessment Exercises 1

1. State the 3 classes of professional cookery
2. What is professionalism and how important is professionalism in the food and beverage industry?

The ability of the food handler to ensure the wholesomeness of the food prepared and served will depend upon following a few basic rules of personal hygiene and good food handling. These rules can be divided into 3 groups.

1. General personal hygiene: a hygienic appearance of professionals is indicative of a high standard of personal cleanliness shown by cleanliness of hair, hands, face clothing and shoes.



Good personal hygiene helps prevent food borne diseases; therefore these points must be put into practice.

- Shower or bath daily.
- Wear clean clothes and uniform.
- Do not work if suffering from a communicable disease.

- Handle food as little as possible.
- Wash hands before and during work and every time after using the toilet.
- Keep hair clean and do not handle them in kitchen.
- Do not touch nose and mouth with hands.
- Do not cough or sneeze over food, use a tissue.
- Do not wear rings, earrings, jewellery and watches.
- Do not smoke in food preparation areas.
- Taste food with a clean spoon.
- Do not sit on a work surface.
- Footwear should be clean, safe and topped with steel toe.
- Chef cap should always be worn when handling food.
- Open cuts, burns etc. Must be covered with waterproof dressing.
- Persons suffering from diarrhea, sore throat, vomiting, cold etc. Must not handle food.

2. Clean hands: healthy food: The following actions require immediate hand washing before continuing work.

- i. Contact with infected or otherwise unsanitary areas of the body.
- ii. Use of handkerchief or tissue.
- iii. Hand contact with unclean equipment and work, surfaces, soiled clothing or cleaning towels.

iv. Handling raw food, particularly meat, poultry and fish items.

v. Cleaning away soiled dishes and utensils.

3. Food handling

- Hygiene in handling food: this is necessary to prevent germs from multiplying in foods and reaching dangerous levels. The following actions are recommended:

1. Dry Food Storage: Avoid moisture, use air tight container, and avoid insect & rodent.
2. Freezer Storage: Well packed food with label, store at -18°C, follow FIFO (first in first out) and thaw properly before use.
3. Cold Room Storage: store cooked items away from raw item. Store everything in container. Chill food before refrigeration. Keep temperature under 5°C.
4. Hot Food Storage: Do not reheat in bain marie. Cover all the food, keep food above 65°C.
5. Food Handling:

- Work with fresh and safe food.
- Use clean equipment and work table.
- Wash and wipe tools (knives, chopping board etc.) after every use.
- Wash ingredients.
- Reboil stocks, sauces, soups, milk before reuse.
- Do not mix batches of cooked food.
- Use separate tools for vegetables and meats.
- Use separate tools for raw and cooked food.
- Quickly chill all high risk food for cold storage.
- Keep work area clean.
- FIFO (first in first out)

1.4.2 Uniforms and Protective Clothing

- CHEF CAP
 - Should cover the hair.
 - Retain sweat on the face.
- SCARF
 - Retaining sweat around the neck.

- Decreases risk of catching cold when going inside a walk in.
- Also brings neatness to uniform.



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- CHEF COAT
 - Protect the chest from heat (double breasted cotton made chef coat).
 - White colour (shows when dirty, less heat absorber)



- APRON

- protect chef coat and trouser
- not to be used to wipe hands.



- TROUSER

- Generally black or black and white check.



- SHOES

- Ankle high shoes.
- Low heel.
- Leather out skin with rubber, PVC or even wooden sole.
- Always wear black socks and change them very frequently.



■ Safety Procedure in Handling Equipment

- Do not use equipment unless you understand the operation.
- Use all guards and safety devices on equipment.
- Do not touch or remove food, from any kind of equipment, while it is running.
- Remove particles of food with cloth, palette knife, needle or brush from cutting machine.
- Unplug electrical equipment before disassembling or cleaning.
- Make sure the switch is off before plugging in equipment.
- Do not touch or handle electrical equipment including switches, if your hands are wet or if you are standing in water.
- Before use, test that the equipment is properly assembled and then plug in and switch on.
- Wear properly fitting clothing and tuck in apron string to avoid getting them caught by machinery.
- Use equipment only for the purpose intended to.
- Stack pots, pans and other equipment properly on racks so that they are stable and not likely to fall.

Self-Assessment Exercises 2

1. Why is it important that we have professional code of ethics in food service?
2. Why is safety and hygiene important in the kitchen?
3. Enumerate the safety procedure in handling equipment

1.5 Kitchen

- **Introduction:**

The kitchen is the most prominent and enclosed section or area in which edible food ingredients are brought together, gathered, combined through proper processing and cooked by various means of cooking methods for consumption. In simple terms, a kitchen is an area set aside for preparation of meals, it is also associated with cleaning, storing, mise en place (washing, peeling, and cutting), cooking, holding food materials and dishes, plating, washing up, waste clearing, etc.

- **Features of the kitchen**

- **Height of Ceiling and Work Range**

The height of the ceiling and work range is related to the efficiency of the staff in the kitchen and gives a feeling of spaciousness and is psychologically beneficial to the kitchen personnel.

- **Ventilation**

The kitchen is the area with an abundance of smoke and steam generated in it and hence it should be equipped with the provision of proper and adequate ventilation.

- **Movability**

The workspace or station should not be congested. It should be such that will not create any hindrance in the functioning especially during the peak hours.

- **Location**

The location of the kitchen is of prime significance, and it should be located sufficiently remote from the principal area of the organization so as not to pollute the nearby area with an undesired odours and noise of culinary operations.

- **Fuel Availability**

Fuel as an important constituent of the kitchen, should always be available for the proper functioning of the kitchen. Whichever type is being used should be made available always.

- **Equipment**

Modern kitchens are equipped with modern and advanced equipment. The incorporation of convenience foods and space in the kitchen also has an impact on deciding the equipment to be used.

- **Provision of Water**

Water is undoubtedly the most crucial aspect of any kitchen. The inlet and the drainage facility of water must be taken into consideration, as water is used for cleaning of utensils, equipment, cooking, and many other processes. No kitchen can survive without proper water facility.

- **Flooring and Tiling**

Flooring and tiling are again important facets of the kitchen area. They are a must for cleanliness and help in taking precaution against accidents in the kitchen. The flooring used in the kitchen

must necessarily be anti-skid or anti-slippery. Tiling adds a new dimension to the hygiene of the kitchen and also eases in its cleaning.

- **Layout**

One of the most important factors in making the whole kitchen operation successful is a proper layout which allows proper workflow. The layout should allow for the section and subsection of the whole kitchens to execute their work properly. The layout is an important consideration in designing the flow of water, electricity and fuels, etc., as well.

1.5.1 Kitchen Layout and Shapes

One of the most important aspects of a kitchen to be successful in operation is its layout design. The layout of the kitchen design is a crucial criterion to judge its level of competency, efficiency and effectiveness hence there are different types of layouts and shapes which include the following:

- **One-walled Kitchen**

It is also referred as the Pullman kitchen or straight line kitchen. It is designed along a single wall and basically preferred at small studios or in loft spaces, where there is a shortage of space. Here, the cooking range, sink, and refrigeration are aligned to a single line along the wall.



- **Square Kitchen**

An uncommon concept, it is rarely found, as the center space of the kitchen cannot be utilized to the maximum. The feasibility aspect in this kitchen is also not that impressive, as any spillage of anything in the center will make the entire kitchen unhygienic. The work zone triangle is also not convenient to work due to its improper and long-distance location.



- **Rectangular Kitchen**

The more commonly used layout, which allows for maximum usage of space is the rectangular kitchen. This is very useful for kitchens with a lot of activities in it. Such kitchens are preferred in many outlets like hospitals, large restaurants, etc. Here, the work zone triangle is at its best.



- **Parallel Kitchen or Galley Kitchen**

In such kitchens, the sides of passages are utilized for installing the work zone triangle and the center space is used as pathways or aisles. Actually, it is characterized by two walls opposite to each other, and the space in between is called a walk-through area. This is the sleekest and lean layout of the kitchen among all layouts.



- **U-shaped or Horseshoe Kitchen**

It can be described as most efficient, compact and step-saving kitchen layout. Its doors are located at the end of ‘U’ and hence, there is no chance of criss-crossing in such a plan, as work flows from one point to another. The approachability of the work-zone triangle is also effective and efficient in this type of layout.



- **L-shaped Kitchen**

This efficient kitchen layout, which is based on the two walls adjoining at the right angles is the L-shaped kitchen. Basically used in small kitchen spaces, it is used in small canteens, kiosks, and tea/coffee shop outlets. Here, as per the layout, the work-zone triangle is effectively placed.



1.5.2 Staffing in Kitchen

Success of a kitchen is determined by the staff working there. The kitchen layout and equipment placed can be described as the body of the kitchen, but the kitchen personnel can be referred as the life of the kitchen. The kitchen personnel are sometimes called the kitchen brigade.

Staffing is the actual strength of the employees working at different levels.

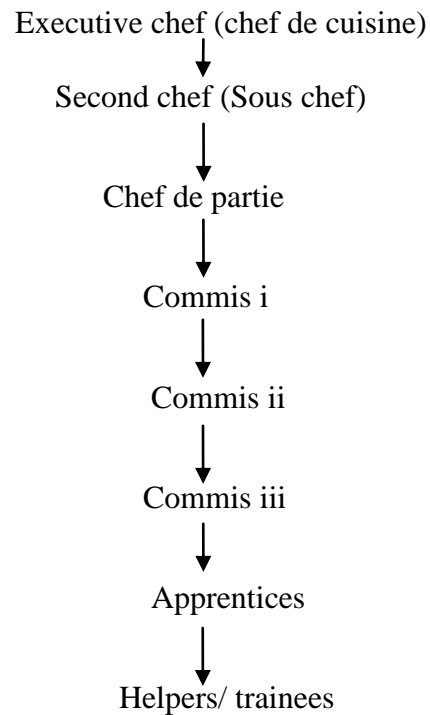
Kitchen organization: The organization of a hotel or restaurant kitchen depends upon the: size of the operation, type of the menu, type of the service, type of clientele.

- **Classical Brigade**

Chef auguste escoffieur gave the concept of classical brigade, which means the actual work force requirement of any particular establishment. He divided the whole of the kitchen into parties/corners and the system is followed in the organizations. Purpose of classical brigade to fix the

duties and responsibilities and fix the area of work by party/ corner we mean grill party, roast party, vegetarian party etc. It was the time when few machines were available so more need was there to know about the manpower requirements.

Classical brigade



■ Modern Staffing in various Hotels

In the present scenario, the modern hotels have various CDP's (Chef de Partie) under the SOUS CHEF (second in command) who have specialized in a particular field.

Classic Kitchen Brigade



Roles of Executive Chef include:

- 1) Planning menu: he has to take into consideration all the factors which influence the menus and the chef has to take a critical note of all the activities which are important in the menu planning.
- 2) Forecasting: before indenting and buying, the chef must be able to produce the accurate estimates of the volume of production.
- 3) Purchase: Buying excessive raw materials results in pilferages whereas shortage of raw materials results in the loss of business and decrease in the number of clientele.
- 4) Planning work schedule: in fact the overall activities in the kitchen

Duties and responsibilities of various chefs

❖ SOUS CHEF: He is the second in command and is generally responsible for the day to day functioning of the kitchen. His duties are almost same as that of the executive chef.

❖ CHEF DE PARTIE (CDP): for different section in the kitchen, there are different CDP's who generally work with the help of the different apprentices and commis. Various CDP's and their duties are as follows:

- SAUCE COOK/CHEF SAUCIER: prepares the “entrée
- ROAST COOK/ CHEF ROTISSEUR: responsible for all the roast and grill items.
- FISH COOK/CHEF POISSONNIER: responsible all the fish preparation
- GRILL COOK/ CHEF GRILLARDIN: is the in-charge of grilling of various dishes.
- VEGETABLE COOK/CHEF ENTREMETTIER: responsible for the preparation of all the vegetables and potato other than deep fried.
- SOUP COOK/CHEF POTAGE: prepare all the soups, their accompaniments and garnishes.
- LARDER COOK/CHEF GARDE MANGER: concerned with the pre-preparation of the food which is cooked by other department.
- PASTRY COOK/ CHEF PATISSEUR: and prepares all the continental sweets, pastries and bakery product.
- RELIEF COOK/CHEF TOURANT: takes over a section when a particular CDP goes on leave or has an off day. He is generally a senior chef who is all-rounder.
- BREAKFAST CHEF/ CHEF DE PETIT DE JEUNER: He is responsible for complete breakfast service.
- STAFFS COOK: he generally prepares food for the staff.
- COMMIS: this people help in doing mise-en-place.

A chain is only as strong as its weakest link. You've heard this idea related to business a million times. Like all those other endeavors and enterprises, a restaurant can't run well or long without the right mix of experienced and reliable staff. A good kitchen team can make your break your business, as they say, in short order.

Self-Assessment Exercises 3

- | |
|---|
| <ol style="list-style-type: none"> 1. What are the six kitchen layout and shapes 2. What are the roles of executive chef? |
|---|



1.6 Summary

Kitchen is a working space that provides easy access to all facilities, which has no choke points to hinder the flow of the food products. It is compliant with all the relevant health and safety regulations and which reduces stress and increases the safety of those employed within it. The importance of hygiene to both humans and the business cannot be over emphasized. The effective cleaning of commercial kitchens is not only important from the aspect of safety. The hygiene standards required are set down in a number of Acts of Parliament, the most notable of which is the Food Hygiene (General) Regulations. The regulations impose a duty on the owner or occupier to keep the premises, equipment, containers and all utensils used in the preparation of food, clean. Individual food handlers have duties in respect of personal hygiene standards and managers have a legal duty to ensure that all staff complies with the regulations at all times.

Hierarchy refers to the flow of authority from top to bottom in an organization and with respect to the kitchen. It refers to the flow of authority commencing from executive chef and goes to the bottom i.e. kitchen staffing refers to not only assigning the positions but also filling them with the suitable manpower.

In this unit we examined food production; the kitchen - levels of skills, attitudes and behaviour in the kitchen, food handlers and kitchen hygiene, uniforms & protective clothing, features of kitchen and staffing in kitchen.



1.7 References/ Further Reading

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1.8 Possible Answers to Self-Assessment Exercises

Self-Assessment Exercises 1

1. The 3 classes of professional cookery are cuisine simple/plain cookery, cuisine bourgeoisie haute cuisine/high class cookery
2. Professionalism is conceived to be a combination of craftsmanship, a customer orientation involving observant management, and loyal perseverance. Showing professionalism is important in any career, but it's necessary in the food and beverage industry to keep customers happy and the staff efficient. Much of that responsibility falls on the chefs. The frantic stressful atmosphere of a kitchen makes this difficult.

Self-Assessment Exercises 2

1. A professional code of ethics is designed to ensure employees are behaving in a manner that is socially accepted and respectful of one another. It establishes the rules for behaviour and sends a message to every employee that universal compliance is expected. The code of ethics could define the way employees handle and manage their products,

services and customers. It is thus mandatory in providing hygienic food and better food quality to achieve customer satisfaction and loyalty.

2. Good hygiene can prevent food poisoning. Bacteria that cause food poisoning can be on everyone – even healthy people. Bacteria can be spread from a person to the food by touching of one’s nose, mouth, hair or cloths, and then the food, necessitating the use of uniforms and protective clothing. Good personal hygiene also makes good business sense
3. The safety procedure in handling of equipment are:
 - i. Do not use equipment unless you understand the operation.
 - ii. Use all guards and safety devices on equipment.
 - iii. Do not touch or remove food, from any kind of equipment, while it is running.
 - iv. Remove particles of food with cloth, palette knife, needle or brush from cutting machine.
 - v. Unplug electrical equipment before disassembling or cleaning.
 - vi. Make sure the switch is off before plugging in equipment.
 - vii. Do not touch or handle electrical equipment including switches, if your hands are wet or if you are standing in water.
 - viii. Before use, test that the equipment is properly assembled and then plug in and switch on.
 - ix. Wear properly fitting clothing and tuck in apron string to avoid getting them caught by machinery.
 - x. Use equipment only for the purpose intended to.
 - xi. Stack pots, pans and other equipment properly on racks so that they are stable and not likely to fall.

Self-Assessment Exercises 3

1. The six kitchen layout and shapes are: One-walled Kitchen, Square Kitchen, Rectangular Kitchen, Parallel Kitchen or Galley Kitchen, U-shaped or Horseshoe Kitchen, L-shaped Kitchen
2. The roles of Executive Chef include:
 - i. Planning menu: he has to take into consideration all the factors which influence the menus and the chef has to take a critical note of all the activities which are important in the menu planning.
 - ii. Forecasting: before indenting and buying, the chef must be able to produce the accurate estimates of the volume of production.
 - iii. Purchase: Buying excessive raw materials results in pilferages whereas shortage of raw materials results in the loss of business and decrease in the number of clientele.
 - iv. Planning work schedule: in fact the overall activities in the kitchen

UNITS 2 COOKING PROCESSES

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2.4.4 Other Methods

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2.7 Possible Answers to Self-Assessment Exercises



2.1 Introduction

Cooking techniques and ingredients vary widely, from grilling food over an open fire to using electric stoves, to baking in various types of ovens, reflecting local conditions. Preparing food with heat or fire is an activity unique to humans. Some modern cooks apply advanced scientific techniques to food preparation to further enhance the flavor of the dish served. Types of cooking also depend on the skill levels and training of the cooks. Cooking is done both by people in their own dwellings and by professional cooks and chefs in restaurants and other food establishments.

In this unit we shall examine the Cooking Processes; reasons for cooking food, types of heat transfer, effects of heat on food substances and the various methods of cooking



2.2 Learning Outcomes

At the end of this unit you should be able to:

- discuss the reasons for cooking food
- discuss the types of heat transfer
- discuss the effects of heat on food substances
- discuss principles of the various cooking methods



2.3 Cooking

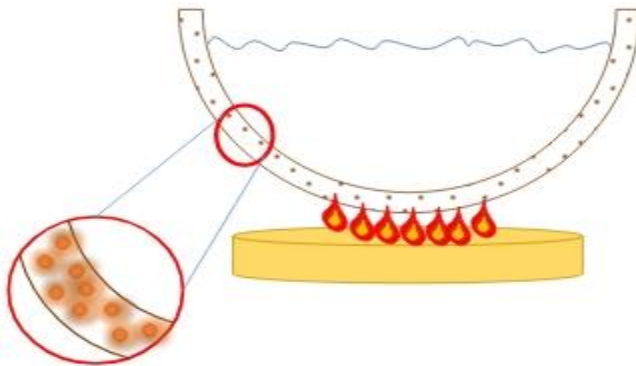
Cookery is the art, science and craft of using heat to prepare food for consumption. Cooking food makes them edible and digestible, so that the nutrients in them are easily absorbed.

- **Reasons for cooking food**
 1. To develop new flavours which render food palatable and stimulating to the digestive juices.
 2. Is pleasing to the eye, because of the physiological changes the food undergoes.
 3. Destroys bacteria and other micro-organism, makes it safe for consumption besides assisting in keeping it for a long time.
 4. Changes the texture of food, promotes mastication and renders it easy for digestion and assimilation.
 5. Makes it easy to plan an attractive, palatable and balanced diet when food is cooked.
 6. Helps to introduce variety in the daily diet

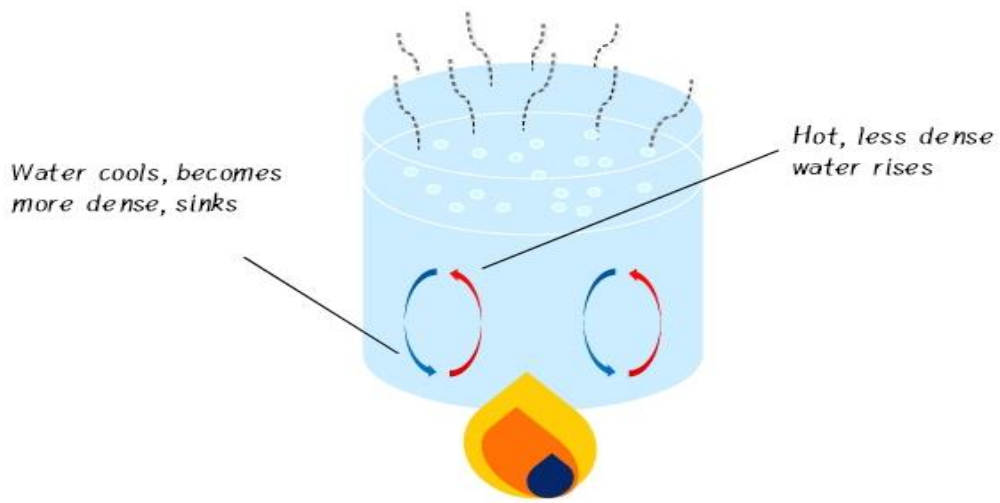
- **Types of heat transfer**

In heating food, heat energy is generally generated through source such as: electricity and gas (natural or butane), wood, coal, and charcoal, etc., can be transferred through: Conduction; Convection, or Radiation

- ◆ **Conduction:** is based on the principle that adding heat to molecules increases their kinetic energy, thus their ability to transfer heat to neighbouring molecules. This is transfer of heat through direct contact from one object or substance to another. Transfer can occur in any of the three states: solid, liquid, or vapour. Heat is transferred from a heat source (gas stove/electrical appliance), through a cooking utensil to food



- ◆ **Convection:** Is the distribution of heat by the movement of liquid or vapour. It relies on the principle that heated air or liquid expands, becomes less dense, and rises to the surface. The cooler and heavier air or liquid originally on top moves to the bottom, where it is heated, thus creating continuous circular currents.



Convection may be either natural movement or forced movement

- Natural movement: difference in density or temperature within a liquid or vapour (hot air rises, cool air falls; same thing as in liquid)
- Forced movement: caused by a mechanical device, such as fans, stirring actions.

➤ Conduction vs. convection

Boiled potato

Boiling time: 40 minutes



Baked potato

Baking time: 40 minutes (excluding pre-heat)



Boiled potato takes less time to cook, because water conducts heat more efficiently than air does.

- ◆ **Radiation:** Is the generation of heat energy by electromagnetic wave. Electromagnet does not possess energy but induce heat by molecular action upon entering food

There are two types of electromagnetic radiation that is applied in the heating of food

- Infrared waves
- Microwaves

◆ **Radiation -- Infrared waves**

Infrared waves

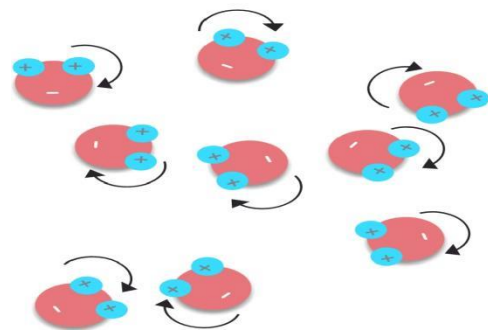
- Infrared waves have longer wavelength than visible light
- It emits radiation which cooks the food
- In restaurants, infrared radiation is used to keep foods warm and to heat up frozen foods
- Examples of equipment that produce infrared waves: broiler, infrared lamps
- Infrared waves are also present in cooking which requires flames

◆ **Radiation – Microwaves**

Microwaves

- Very short wavelength generated by electromagnetic tube
- Penetrate into the food and causes water molecules to rotate, hence the friction between water molecules creates heat

Rotation of water molecules causes friction, hence creates heat



- Microwave does not work on water-less material, thus some plastic and paper plates can be used
- Most microwaves penetrate only about 2 inches into food, the rest in the core is heated by conduction
- Commonly used in hospital galleys, lunch box production, vending operations, and convenience store

■ Effects of heat on food substances

When heat is added to food, it causes changes in colour, texture, flavour, shape, and nutritional value. Heat affects protein, carbohydrates (sugars and starches), fats, and water in different ways. Careful selection of the cooking method based on the contents of the food and the desired outcome will lead to the best quality product.

- **Coagulation:** Proteins are denatured or coagulated by heat or a change in pH. The proteins change from a semisolid to a solid state during cooking. An example includes cooking an egg white. This process occurs between 160° to 185°F. The heat causes the unfolded protein chains to become entangled and lump together. The same coagulation occurs when an acid such as lemon juice or vinegar is added to milk. The pH is altered and the casein (milk protein) denatures and coagulates into spongy lumps. In meats, excessive heat will cause meat proteins to lose moisture and become tough.
- **Gelatinization:** Gelatinization is the thickening of liquids. Starch, in the presence of water, gelatinizes when heated. The starch granules absorb water. When heated, the starch granules swell and then burst, leaking starch into the surrounding liquid. Swelling is usually complete at 190 to 195°F. Excessive or prolonged heat, not enough heat, inadequate dispersion of dry starch in melted fat or cold water, and excessive agitation may interrupt proper starch gelatinization.
- **Caramelization:** Caramelization is a browning that occurs when sugars are heated. This applies to both natural sugars in food and sugar added to foods. Excessive caramelization may result in an unappealing dark color or burned flavor.
- **Evaporation:** Most foods contain water. As the water in foods reach 212°F, the water turns to steam and evaporates. Heat that is too high or prolonged cooking may dry out the product through excessive evaporation of moisture.

Self-Assessment Exercises 1

1. What are the reasons for cooking of foods?
2. Describe the various modes of heat transfer in foods
3. Distinguish between Caramelization and Maillard reaction

2.4 Methods of Cooking

During food preparation, heat is transferred by either **moist or dry-heat methods**. Depending on the composition of foods, different methods are used.

❖ Moist-heat method

- It is a method of cooking in which heat is transferred by water, any water-based liquid, or steam.
- Liquids are used not only to heat the food, but may also contribute to the flavour, colour texture, and appearance.
- Moist-heat method helps to soften the fibrous protein in meats and the cellulose in plants, making them more tender.
- Liquids generated from heating foods can also be used as a flavourful stock to make soups or sauces.
- **Drawback:** colour, flavour compounds, vitamins, and minerals may leach out and be lost in the liquid.
- **Examples:** of moist-heat method include scalding, poaching, simmering, stewing, braising, boiling, double-boiling, blanching, and steaming.

❖ Dry-heat method

- It is a method of cooking in which heat is transferred by air, radiation, fat, or metal.
- Higher temperatures are reached in dry-heat methods than they are in moist-heat methods, because water can be heated only to its boiling point of 100°C, or slightly higher under pressure, whereas ovens can reach up to 260°C.

- **Examples** of dry-heat method include baking, roasting, broiling, grilling, barbequing, rotisserie cooking, stir frying, shallow frying, and deep frying

2.4.1 Moist Heat Methods

❖ Boiling



www.astro.su.se/.../small_500/Boiling_water.jpg

Definition- Boiling is cooking prepared foods in a liquid (water, bouillon, stock, milk) at boiling point.

Principles-

- a) The item must be completely covered with liquid throughout the process.
- b) Placed the item in a boiling liquid, brought to the boil rapidly, then simmered gently.
- c) Salt meat must be placed in cold water so as to extract any excess salt.
- d) Enhance meat and poultry flavour by adding herbs and to the cooking liquor.
- e) Remove the scum that arises during the boiling process.
- f) Green vegetables must be placed into boiling, in order to preserve the green colour of the vegetable and to prevent excessive loss of vitamins and mineral salts.
- g) Stocks, sauces and soups should be simmered gently.

Method- Food is boiled in two ways:

- a) food is placed into boiling liquid, reboiled, then the heat is reduced, so that the liquid boils gently – simmering;

- b) food is covered with cold liquid, brought to the boil, then the heat is reduced, so that the food simmers.

Advantages

Older, tougher joints of meat can be made palatable and digestible; appropriate for large-scale cookery; economic on fuel; nutritious, well flavoured stock is produced; labour saving, requires little attention; safe and simple; maximum colour and nutritive value are retained with green vegetables – but the boiling time must be kept to the minimum.

Disadvantages

Foods can look unattractive; it can be slow; loss of soluble vitamins in the water.

❖ Poaching



www.gothamist.com/food/archives/poaching.jpg

Definition- Poaching is cooking food in the required amount of liquid at just below boiling point.

Principles-

- a) The food item must be completely immersed in the liquid throughout the cooking process.
- b) Started by bringing the article to the boil, then reduce the heat and allow the poaching to take place at the correct temperature.
- c) Whole fish must be placed into cold liquor to poach. Cuts of fish must be placed into boiling liquor, brought back to the boil and then allowed to poach.

- a) The liquid for the poaching of eggs must simmer at one side of the pan where the eggs should be added one at a time. This will allow them to float free in the liquid and form into the round shape required.
- b) Fruits for compotes are poached by covering them with hot stock syrup and bringing them just to boiling point.

Method-

- a) Shallow poaching: foods (fish, chicken) are cooking in the minimum of liquid (water, stock, milk or wine). The liquid is not allowed to boil; it is kept at a temperature close to boiling.
- b) Deep poaching: foods are cooked in enough water to cover them, brought to the boil and then simmered (eggs) or placed into simmering liquid and cooked gently.

Advantages

Poached food is easily digestible.

Disadvantages

Skill is required for poaching food; It is not a suitable method for many foods.

❖ Steaming



www.gascoals.net/Portals/1/John%20Wright/gree.

Definition- Steaming is cooking prepared foods by steam (moist heat) under varying degrees of pressure.

Steaming Principles

- a) Suitable for items that can be cooked slowly without loss of colour, flavour or texture.
- b) Can only be done successfully with tight fitting doors or lids of oven or steamers.
- c) Cover puddings with greaseproof paper to prevent condensed steam from making the pudding wet.
- d) Place roots and vegetables, on perforated trays to allow condensed steam to run off.

Method

- a) Atmospheric or low pressure steaming: food may be cooked by direct or indirect contact with the steam: - direct: in a steamer or in a pan of boiling water (steak); - indirect between two plates over a pan of boiling water.
- b) High pressure steaming: in purpose-built equipment which does not allow steam to escape; steam pressure builds up, the temperature increases and cooking time is reduced.

Advantages

Retention of nutritional value; some foods become lighter and easier to digest; Low pressure steaming reduces the risk of overcooking; High pressure steaming enables food to be cooked quickly; Labour-saving and suitable for large-scale cookery.

Disadvantages

Foods can look unattractive; it can be a slow method.

❖ Stewing



static.flickr.com/55/130835783_e3299acfc4.jpg

Definition

Stewing is a long, slow cooking method where food is cut into pieces and cooked in the minimum amount of liquid, water, stock or sauce. The food and the cooking liquid are served together.

Principles

- a) The item being stewed must be just covered by the liquid.
- b) This process must be carried out slowly.
- c) Items suitable for stewing are those which are of a tough nature.
- d) The item and the cooking liquid are served together as a complete dish.

Method-

All stews have a thickened consistency. Stewed foods may be cooked

- in a covered pan on the stove;
- in a covered pan in the oven.

Advantages

Meat juices are retained as part of the stew; Results to a correct slow cooking with very little evaporation; Economic on fuel; Nutrients are conserved; Tough foods are tenderised; Economical in labour because the foods can be bulk cooked.

Disadvantages

Stewing is a slow cooking method.

❖ Braising

Definition - Braising is a method of cooking in the oven. The food is cooked in liquid in a covered pan or casserole. It is a combination of stewing and pot roasting.

Principles

- a) Meat, poultry and game items suitable for braising are those of a tough nature.
- b) Items of meat, poultry and game must be fried brown in fat before being braised.

- c) The size of the braising pan should be in keeping with the size of the item.
- d) Flavour is enhanced by the addition of sliced vegetables and herbs as a bed of roots.
- e) The items to be braised must be half covered with the appropriate liquid.
- f) The process must be carried out in a tightly-lidded container.
- g) The process must be carried out slowly.
- h) The liquor from braised items must be utilised for the preparation of the sauce.
- i) Braised vegetables are better if served with a good sauce made separately.



www.victoriahansen.com/.../braising_228380.jpg

Method

- a) Brown braising: joints and portion cuts of meat are marinated and may be larded and then sealed quickly by browning on all sides in a hot oven or in a pan on the stove. Joints are then placed on a bed of root vegetables in a braising pan, with the liquid and other flavourings, covered with a lid and cooked slowly in the oven.
- b) White braising: vegetables and sweetbreads are blanched, refreshed and cooked on a bed of root vegetables with white stock in a covered container in the oven.

Advantages

Older, tougher joints of meat and poultry can be used; maximum flavour and nutritive value are retained; variety of presentation and flavour is given to the menu.

❖ Simmering



Meatball soup simmering on a stove

Definition - Simmering is a food preparation technique by which foods are cooked in hot liquids kept just below the boiling point of water and above poaching temperature.

Principle:

- a) The Simmering must occur between about 185 to 205°F (85 to 96°C).
- b) A tight-fitting lid locks the moist heat in for best simmer.

Methods

Slow Simmer: A low heat with very little activity in the pot, often used for stocks and braises.

Simmer: A medium-low heat, with some gentle bubbling in the pot.

Advantages

Simmering ensures gentler treatment than boiling to prevent food from toughening and/or breaking up; is usually a rapid and efficient method of cooking.

Disadvantages

Can cause food to lose its vitamins and other nutrients by leaching into the cooking liquid.

❖ Blanching

- ❖ **Definition:** Blanching is a cooking process in which a food, usually a vegetable or fruit, is scalded in boiling water, removed after a brief, timed interval, and finally plunged into iced water or placed under cold running water (known as shocking or refreshing) to halt the cooking process.



The first step in blanching green beans



Broccoli being shocked in cold water to complete the blanching

Methods: The process has three stages: preheating, blanching, and cooling. The most common blanching methods for vegetables/fruits are hot water and steam, while cooling is either done using cold water or cool air.

Advantages Blanching

Blanching foods helps reduce quality loss over time. Can be used as a pre-treatment prior to freezing, drying, or canning; heating vegetables or fruits to inactivate enzymes; modify texture; remove the peel and wilt tissue; inactivate enzymes; preserves color, flavor, and nutritional value. Other benefits of blanching include removing pesticide residues and decreasing microbial load.

Disadvantages of Blanching

Drawbacks include leaching of water-soluble and heat sensitive nutrients and the production of effluent.

- ❖ Infusion
- ❖ **Definition** - Is a process that involves the soaking or steeping of a substance in hot liquid to extract the flavor of the substance being immersed in the liquid



Principle:

- a) Allow the material to remain suspended in the solvent over time (steeping).
- b) An infusion is also the name for the resultant liquid.
- c) The liquid is infused with the flavor contained in the item being soaked in the liquid.

Method

Several accessories and techniques are used for removing the steeped or leftover botanicals that were used to infuse liquids, which include metal steepers, tea infusers, and French presses. The most commonly used technique is the teabag, which is made with filter paper and filled with various tea flavors.

Advantage of Infusion

Infusions can become ingredients for seasoning and flavoring foods.

Disadvantage

Oil Infusions, particularly those that are homemade, are susceptible to botulism.

2.4.2 Dry Heat Methods

❖ Roasting

- ❖ **Definition** - Roasting is cooking in dry heat in an oven or on a spit with the aid of fat or oil.



www.kitchencontraptions.com/pictures/071003_r...

Principles

- (a) Items of meat, poultry and game for roasting must be tender and of first quality.
- (b) All items must be seasoned before roasting.
- (c) Joints of meat must be raised off the bottom of the roasting tray.
- (d) Items must be cooked with fat and be basted occasionally during the process.
- (e) This process must be started in a hot oven to seal the outer surface.
- (f) Juices from the process of roasting must be used to make the accompanying gravy.

Method

- a) Placing prepared foods (meat, etc.) on a roasting spit over/in front of radiating heat;
- b) Placing prepared foods in an oven with: - dry heat - forced air convected heat - convected heat combined with microwave energy

Advantages

Good quality meat and poultry is tender when roasted; Meat juices from the joint are used for gravy; Use of energy and oven temperature can be controlled; Cooking can be observed (transparent oven doors); Straightforward access, adjustment or removal of items.

Disadvantages

Requires regular attention; Expensive energy.

❖ Baking

Definition - Baking is cooking food by dry heat in an oven (the action is modified by steam).

Principle

- a) The baking temperature is determined by the nature of the item being cooked.
- b) A hot oven is required for baking puff paste items.



i3.photobucket.com/.../y63/MissJonesy/baking.jpg

Method

- a) Dry baking: during the baking process steam rises from the water content of the food; it combines with the dry heat of the oven to cook the food (cakes, pastry, baked jacket potatoes).

- b) Increased humidity baking: during the baking process with some foods (bread) the oven humidity is increased by placing a bowl of water into the oven to increase the water content of the food and to improve eating quality.
- c) Bain marie: during the baking process food is placed in a container of water (bain marie) to cook the food more slowly.

Advantages

A wide range of savoury and sweet foods can be produced; Bakery products are appealing to the eye and to the mouth; Bulk cooking can be achieved with uniformity of colour and degree of cooking; Baking ovens have effective manual or automatic controls; Straightforward access for loading and removal of items.

Disadvantages

Requires regular attention; Expensive energy.

❖ Grilling

Definition - Grilling is a fast method of cooking by radiant heat (also called broiling).

Principles

- a) Items for grilling must be small in size;
- b) Only items of first quality can be grilled successfully.
- c) Items for grilling must be brushed with oil and seasoned.



culinaryspace.files.wordpress.com/2007/10/ste...

- d) The heat must be high so as to enable the instantaneous sealing and colouring of the item to take place.

- e) The grill bars must be very hot, clean and oiled lightly so as to prevent sticking.

Method

Grilled foods can be cooked:

- a) over heat (charcoal, barbecues, gas or electric grills)
- b) under heat (gas or electric grills, gas or electric salamanders over fired grills)
- c) between heat (electrically heated grill bars or plates)

Advantages

Food can be quickly cooked to order; charring foods gives them a pleasing appearance and better flavour; Better control as food is visible during cooking.

Disadvantages

More suitable for expensive cuts of meat; requires skill.

❖ Pot Roasting

- ❖ **Definition** - Pot roasting is cooking on a bed of root vegetables in a covered pan. This method retains maximum flavour of all ingredients.



arm1.static.flickr.com/122/266983683_19bb810.

Principle A long, slow cooking of the meat in a small amount of liquid which can be stock, wine or cider.

Method: Food is placed on a bed of root vegetables and herbs, coated with butter or oil, covered with a lid and cooked in an oven.

Advantages of Pot Roasting

Maximum flavour is retained; Nutrients are retained; Cheaper cuts of meat can be used; Vegetables used in pot roasting can be served as an accompaniment.

Disadvantages

Pot roasting is a slow cooking method.

❖ Broiling

❖ **Definition** - To broil means to cook with radiant heat from above. Note: The terms broiling, grilling, and griddling are sometimes confused. Grilling is often called broiling, and griddling is called grilling. This unit uses the terms that refer to the equipment involved. Thus, broiling is done in an overhead broiler, grilling on a grill, and griddling on a griddle.



Method

Broiling is a rapid, high-heat cooking method used mainly for tender meats, poultry, fish, and a few vegetable items.

Barbecue

Definition - To barbecue means to cook with dry heat created by the burning of hardwood or by the hot coals of this wood. In other words, barbecuing is a roasting or grilling technique requiring a wood fire.



Above is example of barbecued meat process

2.4.3 Dry heat using fat

Shallow Frying-

Definition - Shallow frying is cooking food in a small quantity of pre-heated fat or oil in a shallow pan or on a flat surface.



www.npr.org

Principles

- a) Items of fish, meat and poultry for cooking must be tender and of good quality.
- b) The items must be seasoned before being shallow-fried.
- c) The best side of the item should be cooked first.
- d) The item must be placed to cook in hot fat so as to seal the outside.
- e) Items must be well drained after cooking.

Method of Shallow Frying

Shallow fry: cooking food in a small amount of fat or oil in a frying pan or saute pan.

Advantages

Quick cooking method; No loss of soluble nutrients; Good colour.

Disadvantages

Suitable for expensive cuts of meat; Not easily digested; Requires constant supervision

❖ Deep Frying

Definition - Deep frying is cooking food in pre-heated deep oil or fat.

Principles

- a) Clean fat must be used and should be strained regularly.
- b) All items, except raw potatoes, must be seasoned and coated.
- c) Potatoes must be thoroughly dried before frying



www.shimworld.com/.../slides/IMG_7924.JPG

- d) There must be sufficient depth of fat in the pan-from half to two-thirds full.
- e) The frying unit must not be overloaded with food.
- f) The fat must be hot enough to seal the outside of the item being fried.

Method

Conventional deep-fried foods (except potatoes) are coated with milk and flour, egg and crumbs, batter or pastry to protect the surface of the food from the intense heat.

Advantages

Quick cooking method; No loss of soluble nutrients; Ensures good colour.

Disadvantages

Food may not be easily digested; Safety hazard: danger of hot oil spill.

2.4.4 Other Methods

❖ Microwave Cooking

Definition

Microwave cookery is cooking or reheating food using electromagnetic waves in a microwave oven powered by electricity. Microwaves activate the water molecules or particles of food, causing heat by friction which cooks or reheats the food.



www.greenlivingonline.com/imgs/1007/b/120545.jpg

Microwave cooking refers to the use of a specific tool rather than to a basic dry-heat or moist-heat cooking method. The microwave oven is used mostly for heating prepared foods and for thawing raw or cooked items. However, it can be used for primary cooking as well.

Advantages

Very fast method of cooking; Fast method of defrosting;

Food is cooked in its own juices, so its flavour is retained; Minimises food shrinkage and drying-out.

Disadvantages

Not suitable for all foods; Limited space; Can only penetrate 5 cm into food (from all sides)

❖ Cooking Sous Vide

Method

A new technology that has had a rapid growth in popularity among the world's top chefs is sous vide (soo veed) cooking. French for "under vacuum," the term is applied to cooking foods that have been vacuum-sealed in plastic bags.

In its simplest terms, this food preparation technique is a two-step process:

1. Vacuum-pack the food item, plus any seasonings or marinades, in an appropriate plastic bag.
2. Cook the food item, while in the bag, at a constant low temperature, usually in a special water bath.

Advantages

Precision Cooking: permits a precise temperature control; can be used for both tender and tough meat as temperature can be controlled.

Disadvantages

Requires close monitoring.

Self-Assessment Exercises 2

1. Differentiate between moist heat method and dry heat method of cooking
2. Why is the knowledge of different cooking methods needed?
3. How does cooking affect the nutrient content of foods?



2.5 Summary

There are very many methods of cooking, most of which have been known since antiquity. These include baking, roasting, frying, grilling, barbecuing, smoking, boiling, steaming and braising. A more recent innovation is microwaving. Various methods use differing levels of heat and moisture and vary in cooking time. The method chosen greatly affects the end result because some foods are more appropriate to some methods than others.

In this unit we examined the Cooking Processes; reasons for cooking food, types of heat transfer, effects of heat on food substances and the various methods of cooking in view of making you a better cook.



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2.7 Possible Answers to Self-Assessment Exercises

Self-Assessment Exercises 1

1. The effects of heat on food substances are: Coagulation, Gelatinization, Caramelization and Evaporation
2. In heating food, heat energy can be transferred through: Conduction; Convection, or Radiation

Conduction: is based on the principle that adding heat to molecules increases their kinetic energy, thus their ability to transfer heat to neighbouring molecules. This is transfer of

heat through direct contact from one object or substance to another. Transfer can occur in any of the three states: solid, liquid, or vapour. Heat is transferred from a heat source (gas stove/electrical appliance), through a cooking utensil to food

Convection: Is the distribution of heat by the movement of liquid or vapour. It relies on the principle that heated air or liquid expands, becomes less dense, and rises to the surface. The cooler and heavier air or liquid originally on top moves to the bottom, where it is heated, thus creating continuous circular currents.

Radiation: Is the generation of heat energy by electromagnetic wave. Electromagnet does not possess energy but induce heat by molecular action upon entering food

There are two types of electromagnetic radiation that is applied in the heating of food; Infrared waves and Microwaves.

Self-Assessment Exercise 2

1. Moist-heat method

It is a method of cooking in which heat is transferred by water, any water-based liquid, or steam.

Liquids are used not only to heat the food, but may also contribute to the flavour, colour texture, and appearance.

Moist-heat method helps to soften the fibrous protein in meats and the cellulose in plants, making them more tender.

Liquids generated from heating foods can also be used as a flavourful stock to make soups or sauces.

Drawback: colour, flavour compounds, vitamins, and minerals may leach out and be lost in the liquid.

Examples: of moist-heat method include scalding, poaching, simmering, stewing, braising, boiling, double-boiling, blanching, and steaming.

Dry-heat method

It is a method of cooking in which heat is transferred by air, radiation, fat, or metal.

Higher temperatures are reached in dry-heat methods than they are in moist-heat methods, because water can be heated only to its boiling point of 100oC, or slightly higher under pressure, whereas ovens can reach up to 260oC.

Examples of dry-heat method include baking, roasting, broiling, grilling, barbequing, rotisserie cooking, stir frying, shallow frying, and deep frying

2. Knowing different cooking methods allows freedom from recipes, and unleashes creativity. It provides the ability to cook ANYTHING.... And helps develop your judgment in deciding appropriate cooking methods. Cooking methods achieve different results. Some cooking methods are great for a quick dinner while others are better for a more flavorful dinner. There are countless ways to prepare foods so that you forget they're the same food.
3. Although cooking improves digestion and the absorption of many nutrients, it may reduce levels of some vitamins and minerals. It's important to select the right cooking

method to maximize the nutritional quality of your meal. However, there is no perfect cooking method that retains all nutrients. In general, cooking for shorter periods at lower temperatures with minimal water will produce the best results.

UNIT 3 BUILDING THE MENU

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3.1 Introduction

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3.3 Menu

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3.4 Menu Offering

3.4.1 Menu Planning

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3.7 Possible Answers to Self-Assessment Exercises



3.1 Introduction

In the food service establishments, a menu is a list of food and beverage offerings. But a good, well-thought-out and properly designed menu functions at a much higher level, through themes, structure, and presentation, invites customers to a sensory and emotional experience. Menus vary in length and detail depending on the classic type of establishment.

In this unit we will examine Building the Menu; Menu: objectives, importance and types, we shall also consider menu offering.



3.2 Learning Outcomes

At the end of this unit, you should be able to:

- state the objectives of menu
- explain the importance of menu

- compare the types of menus
- discuss the content expected of a menu
- describe the principles and factors considered in balancing a menu



3.3 Menu

The menu is the primary selling tool of any establishment that offers food and beverage for sale. For the customer, it identifies the items that are available, shows prices and any other charges and together with other external features may characterize the style of food service offered. For the establishments, the menu should meet the objectives of the marketing policy, the catering policy and the financial policy.

The marketing policy should guide the catering policy so that the products on offer and the style of operation best meet the needs of the target market. The catering policy is concerned with the size and style of menu to be offered together with an appropriate style of service and this will impact on space requirements, level and type of equipment purchased, and the level of skill and number of staff required. The financial policy aims to achieve revenue and profitability to budget through pricing, cost control and volume.

- **Importance of the menu**

The menu has the following characteristics and importance:

Sells: It is a great silent sales person and stimulates sales. Great pains are taken in compiling the menu.

Image: It is the signature of the restaurant. It therefore has to be attractive, informative and gastronomically correct. It promotes the image of the property and becomes a talking point in many social gatherings.

Identity: It identifies the restaurant's theme. This is especially important for specialty restaurants.

Experience: It certainly contributes to the dining experience. People find it novel and a talking point. Many even collect unique menu cards for display in their homes.

Informative: The menu informs the guest what is on offer and how much each item is priced. The menu also describes each item, explains exotic dishes and gives prices of such.

3.3.1 Types of Menu

Although there are many types of eating establishments offering many types of meal experiences, there are basically only two types of food menus: the table d' hôte; and the à la carte. From these two types of menus there are in practice many adaptations of each.

1 Table d' hôte

Table d' hôte means food from the hosts' table and may be identified by: Being a restricted menu; offering a small number of courses (usually three or four); has a limited choice within each course; a fixed selling price; all the dishes being ready at a set time. There are adaptations to the table d' hôte menu which include the following:

a) **Banquets:** A banquet menu is a fixed menu at a set price offering usually no choice whatsoever to the customers, unless on a pre-arrangement basis.

b) **Buffets:** Buffet type meals vary considerably depending on the occasion, and the price paid, from the simple finger buffet to the exotic fork buffets where hot and cold food is available and where many large dishes will be carved and portioned for the individual guest. c) **Coffee**

houses: A coffee house menu is a more recent form of table d' hôte menu that is commonly used today in hotels and restaurants. This type of menu is noted by certain characteristics such as: offering a limited range of foods, being reasonably priced etc.

2) **À la carte**

À la carte means a free choice from the card or menu and is identified by: Being usually a larger menu than a table d' hôte menu and offering a greater choice; all dishes being prepared to order; each dish being separately priced; usually being more expensive than a table d' hôte menu; often containing the exotic and high cost seasonal foods.

Part of an à la carte menu may contain a plat du jour or ' speciality of the house ' section. This consists usually of one or two main dishes, separately priced, which are already prepared and change daily.

Self-Assessment Exercises 1

1. What are the characteristics and importance of menu?
2. Difference Between A la Carte and Table d hote

3.4 Menu Offering

Changes in food presentation style initiated by nouvelle cuisine and continued through the development of celebrity chefs now finds plated service being regarded as the normal choice in

many of the world's top luxury restaurants. The chef literally creates the dish on the plate complete with vegetables, sauces and accompaniments creating a presentation or picture of the dish. Menus need to reflect this change in presentation style and the change in status of plated meals.

In particular menu descriptions need to be both informative and accurate because all items are already on the plate and customers may dislike one component or have intolerance for some food items. Descriptions have also developed a wider range of and greater use of adjectives similar in many ways to that used to describe works of art, and for the chef restaurateur this is the image that they want to portray as part of the establishment's and their own identity.

- **Content of Food Menus**

The content of food menus varies with the type of menu, the segment of the market it is aimed at, the occasion, the food cost available, the country or region, etc. Table d' hôte menus are often of three to four courses only. A hotel room service breakfast menu will offer three or four courses from both a traditional breakfast and a continental style breakfast together with a number of ancillary items such as newspapers, magazines or early morning beverages and will also offer a range of breakfast delivery times depending on the establishment. A' la carte menus often differ for lunch and/or dinner periods, although it is not uncommon for the same à la carte menu to be offered throughout the day.

3.4.1 Menu Planning A course is a food or group of foods served at one time or intended to be eaten at the same time. In a restaurant, the courses are normally served in sequence, allowing enough time for each to be eaten before the next is served. In a cafeteria, the customers may

select all their courses at once—appetizer, salad, main dish and vegetables, and dessert, for example—but eat them in a particular order.

The following are some of the principles that apply to planning the courses that make up a menu.

The main purpose of these principles is to lend variety and interest to a meal. They are not arbitrary rules that must be followed for no reason, they are guides:

- **Modern Menus: Courses and Arrangement**

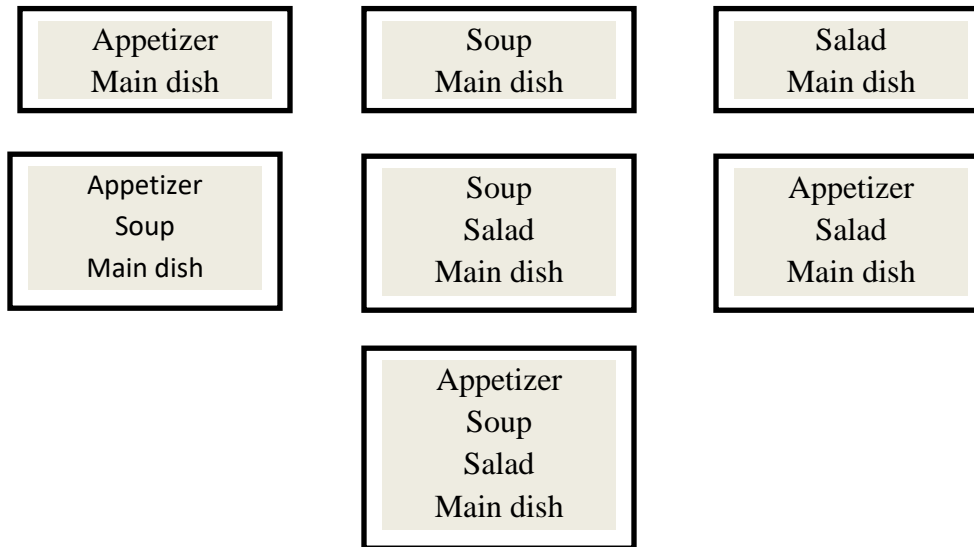
The main dish is the center piece of the modern meal. If the meal consists of only one dish, it is considered the main course, even if it is a salad or a bowl of soup. There is usually only one main course, although large banquets may still have more than one, such as a poultry dish followed by a meat dish. One or more dishes may be served before the main dish. These are usually light in character so the customer is not satiated before the main course.

Study the following outline of the modern menu. The notes that follow explain several aspects that may be puzzling. Then, in the next sections, we discuss how to select specific dishes for each course to arrive at a balanced menu.

THE MODERN MENU:	FIRST COURSES	Appetizer
		Soup
		(Fish)
		Salad
	MAIN DISH	Meat, poultry, or fish
		Vegetable accompaniment
	DESSERT DISHES	Salad
		Fruits and cheeses
		Sweets

NOTES

• Appetizer, soup, and salad are the three courses usually served before the main course. One, two, or all three of them may be served, and they are usually served in this order. Thus, meals may have the following courses:



- A fish course is sometimes included in more formal dinners, after the appetizer and soup courses. It should be a relatively small portion, and the main dish should not also be fish.
- Salads may be served either before or after the main course (but not both).
- Sometimes, one or more of the first courses are served at the same time as the main dish,
- If both cheese and sweets are served for dessert, they may come in either order.

- **Variety and Balance**

Balancing a menu means providing enough variety and contrast for the meal to hold interest from the first course to the last. In balancing a menu, foods must complement each other or provide pleasing contrasts, but should avoid repeating flavors and textures as much as possible

The following factors must be considered in balancing a menu.

- 1. Flavours:** Avoid repeating foods with the same or similar tastes. This applies to any predominant flavour, whether of the main ingredient, of the spices, of the sauce etc.
- 2. Textures:** Texture refers to the softness or firmness of foods, their feel in the mouth, whether or not they are served with sauces, and so on. Avoid repeating foods with the same or similar texture.
- 3. Appearance:** Serve foods with a variety of colors and shapes. Colorful vegetables enhance the appearance of meats, poultry, fish, and starches, which tend to be mostly white or brown.
- 4. Nutrients:** The importance of a nutritionally balanced menu is obvious in the case of menus for hospitals and nursing homes, and in fact for all customers.
- 5. Cooking method:** Cooking methods play an important role in determining the flavors, textures, and appearance of food. For the typical full-service restaurant, it is a good idea to offer a variety of roasted, braised, grilled, sautéed, and simmered foods.

- **Kitchen Capabilities and Availability of Foods**

Physical conditions, place limitations on the menu, depending on the equipment, the labor force, and the foods available, certain items will be inconvenient, difficult, or even impossible to serve.

- **Customer satisfaction**

Collecting some market research on the customers and studying food and menu trends can help menu planners to keep the menu fresh and satisfying for the customers. Always consider the sociocultural background and food habits and preferences of the customer.

- **Management Decisions**

When the menu is thought of as a management tool, a number of other factors related to menu planning come into play. They include:

- food cost and budgetary goals of the foodservice operation
- production capability, including available equipment and personnel
- type of service and food delivery system
- availability of foods
- the philosophy of the business and foodservice operation
- **Menu presentation**

Menus should be easy to read, clear and precise and enable a customer to calculate approximately how much they are likely to spend and show clearly if any additional charges are to be made.

Self-Assessment Exercises 2

1. What is a Menu course?
2. State the factors of the food to be considered in balancing a menu.



3.5 Summary

Menus are a way to communicate the attributes of the establishment to the customer. A well-designed menu invites the customer to experience what the establishment wishes to convey. Fine dining restaurants will often emphasize the source of the food, how it was prepared, and bring attention to exotic ingredients. It may add French or other foreign language expressions to make the dishes appear exotic or sophisticated. This is all done in an effort to impress customers with the idea that the dishes served require skill, specialized equipment and high-quality ingredients.

In this unit we examined Building the Menu; Menu: objectives, importance and types, we also considered menu offering: content of food menus, principles in menu planning etc.



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3.7 Possible Answers to Self-Assessment Exercises

Self-Assessment Exercise 1

1. The menu has the following characteristics and importance:
 - i. Sells: It is a great silent sales person and stimulates sales. Great pains are taken in compiling the menu.
 - ii. Image: It is the signature of the restaurant. It therefore has to be attractive, informative and gastronomically correct. It promotes the image of the property and becomes a talking point in many social gatherings.
 - iii. Identity: It identifies the restaurants theme. This is especially important for specialty restaurants.
 - iv. Experience: It certainly contributes to the dining experience. People find it novel and a talking point. Many even collect unique menu cards for display in their homes.

- v. Informative: The menu informs the guest what is on offer and how much each item is priced. The menu also describes each item, explains exotic dishes and gives prices of such.
2. Both these two terms à la Carte and table d'hôte are restaurant terminologies. Both describe two menu types available for the customers. The main difference between a la Carte and table d hote is that à la Carte includes a wide variety of courses which are priced separately whereas the table d'hôte include only a set number of courses for a fixed price. Therefore, unlike the numerous choices the customer can have from the à la Carte menu, the choices he can get from table d'hôte menu is very limited.

Self-Assessment Exercise 2

1. A Menu course is a food or group of foods served at one time or intended to be eaten at the same time. In a restaurant, the courses are normally served in sequence, allowing enough time for each to be eaten before the next is served. In a cafeteria, the customers may select all their courses at once—appetizer, salad, main dish and vegetables, and dessert, for example—but eat them in a particular order.
2. The factors of the food to be considered in balancing a menu are: Flavours, Texture, Appearance, Nutrients and Cooking Methods

UNIT 4 BUILDING THE MENU (CONTINUES)

CONTENTS

4.1 Introduction

4.2 Learning Outcomes

4.3 Menu Pricing

4.3.1 Menu Pricing Models

4.3.2 Special Pricing Consideration

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4.4 Summary

4.5 Glossary

4.6 References/Further Readings

4.7 Possible Answers to Self-Assessment Exercises



4.1 Introduction

In this unit we shall continue with the previous unit Building the Menu, we will examine, menu pricing, the pricing models, special pricing considerations and menu pricing application.



4.2 Learning Outcomes

At the end of this unit, you should be able to:

- discuss menu pricing
- discuss any three pricing models
- discuss the special pricing considerations
- evaluate table d ' hôte and à la carte menu pricing applications



4.3 Menu Pricing

Menu pricing, the process of calculating the price at which you want to sell different dishes at your restaurant has to fulfill two needs: for the caterer the need to make adequate profits and for the customer the need to satisfy getting value for money. In both cases the requirement for accuracy is paramount. Profitability as far as the menu is concerned has three elements: margin per item, sales mix and volume. A restaurateur's policy on pricing should take a holistic view of the business and include expected return on investment, market demand, competition, where price should be measured against quality, industry standards for style of operation, location, particularly where this may impact on business overheads including staff costs, rents and council charges.

Much of the time spent on analysis of profitability and pricing, often referred to as menu engineering, it is easy for restaurant owners to lose sight of the fact that they are actually talking about money etc. and that percentages do not always reveal the true story as shown in Figures 1 and 2.

4.3.1 Menu Pricing Models

There are a number of well-established pricing models commonly used, some of which are better suited to commercial undertakings whilst others are more frequently used in 'not for profit organizations'. In this respect benchmarking against others in the sector may provide a good 'feel' for a suitable pricing model.

- **Cost plus pricing:** Cost plus pricing takes the ingredient or food cost element of a menu item and simply adds a predetermined multiplier or mark-up. Most commonly used where a simple pricing model will provide the desired return and there are few additional costs. Typically, this could be something like a house wine where little further expense

will be incurred and the restaurateur simply multiplies the buying price by say three, so cost price is \$4 selling price becomes \$12 plus or including any sales tax. This simple pricing approach may aid decision making when for example on the telephone to a supplier or perhaps in a market. By simply applying a set multiplier they can get a good estimate of selling price (see Figures 1 and 2).

Alternatively by adding a fixed mark-up of say 150% the wine becomes \$10. This simplistic pricing method also allows the chef or buyer to make quick purchase.

MANAGER ONE

For illustration, let's take a look at a series of simplified menu abstracts from three different managers pricing the same menu. In the first example, you'll see that this manager budgeted for a 33% food cost and took the safe route to achieve that goal by setting the pricing on each of the individual menu items to meet that same percentage. Safe, because no matter what the customers order, theoretically his food cost should come in on budget and everyone should be happy. Right? Well, before we answer that, let's look a little further.

Item	Selling price	Sold	Total sales	Cost per unit	Margin	Total cost	Profit	FC%
Roast chicken	\$9	9	\$81	\$3	\$6	\$27	\$54	33%
Grilled veal chop	\$36	1	\$36	\$12	\$24	\$12	\$33	33%
Sautéed Salmon	\$13.50	4	\$54	\$4.50	\$9	\$18	\$36	33%
Total		14	\$171			\$57	\$114	33%

MANAGER TWO

Our second manager used a different approach to menu pricing. Using the same menu items, but raising the price on the chicken by \$3 and lowering the price on the veal by \$12 the natural reaction of her customers was for them to buy less chicken and more veal. And what about the food cost percentage? It went up of course, to a whopping 40%, but the profit went up as well – in fact, by quite a bit. She deposited more money in the bank even though her food cost comes in at five points higher than that of manager number one. Manager number two focuses on real dollars, not just percentages.

Item	Selling price	Sold	Total sales	Cost per unit	Margin	Total cost	Profit	FC%
Roast chicken	\$12	5	\$60	\$3	\$9	\$15	\$45	25%
Grilled veal chop	\$24	5	\$120	\$12	\$12	\$60	\$60	50%
Sautéed Salmon	\$13.50	4	\$54	\$4.50	\$9	\$18	\$36	33%
Total		14	\$234			\$93	\$141	40%

Figure 1 Sales matrix

- **Competition pricing**

Competition pricing as the name suggests copies the prices of competitors. As a short-term strategy this may achieve increased business but it can easily spiral out of control into a price war. What are unknown are the competitors cost structure and margins maybe severely

Competitive Pricing Comparison

Product	Competitor #1	Competitor #2	Competitor #3
DRAUGHT BEER			
20oz Domestic (Labatt / Molson)	18oz \$6,00	18oz -	20oz \$7,96
20oz Specialty (Keith's / Mill St.)	18oz \$6,00	18oz \$8,75	20oz \$7,96
20oz Import (Stella / Guinness)	18oz \$7,00	18oz \$9,00	20oz \$7,96
LIQUOR			
Ball Liquor	1oz \$9,00	1oz \$10,00	1oz \$7,08
Black Bar Scotch (Oban)	1oz \$15,00	1oz \$28,00	1oz \$15,04
Black Bar Tequila (Patron Silver)	1oz \$22,00	1oz \$30,00	1oz \$10,62
Martinis	1oz \$15,00	1oz \$16,00	\$14,16
Cocktail (Mejito)	1oz \$15,00	1oz \$14,00	1oz \$10,62
WINE			
Glass House Red/White (btl cost \$9)	6oz \$12,00	6oz \$9,00	6oz \$12,00
Glass Mid-Range Red/White (btl cost \$18)	6oz -	6oz -	6oz -
Glass High End Red/White (btl cost \$25)	6oz \$15,00	6oz \$16,00	6oz \$21,00
Water / Coffee			
Coffee	-	-	-
Water	-	\$4,00	-

	Competitor #4	Competitor #5	Competitor #6	Average	DIFF
18oz	\$9,00	18oz	20oz \$9,00	\$8,65	-\$2,65
18oz	\$9,00	18oz	20oz \$10,00	\$8,93	-\$2,93
18oz	-	18oz	20oz \$11,00	\$9,32	-\$2,32
1oz	\$7,00	1oz	1.5oz \$14,00	\$9,52	-\$0,52
1oz	\$16,00	1oz	1.5oz n/a	\$19,68	-\$4,68
1oz	N/A	1oz	1.5oz \$20,00	\$20,21	\$1,79
	\$12,00		\$21,00		
1oz	\$12,00	1oz	2.5oz \$21,00	\$14,41	\$0,60
6oz	\$10,00	6oz	6oz \$16,00	\$11,75	\$0,25
6oz	-	6oz	6oz -	#DIV/0!	#DIV/0!
6oz	\$30,00	6oz	6oz \$58,00	\$31,25	-\$16,25
	\$3,50		-	\$3,50	#VALUE!
	N/A		-	\$4,00	#VALUE!

A sample of Competition pricing

- Rate of return pricing:** The basis for this method is an attempt to establish a break-even matrix based on predicted costs and sales. So, for example, if a restaurant investment is N300,000 and the required return on this is 20% then the restaurant seeks profits of N60,000 per year. By modelling the costs, sales price and volume the emerging data will indicate what levels this needs to be in order to achieve the desired return. It would then be necessary to take it a stage further and carry out a feasibility study to see if the model fits the operational style of the restaurant. This model is unlikely to give definitive menu prices although they may be indicative and therefore help in the initial restaurant setup decision.

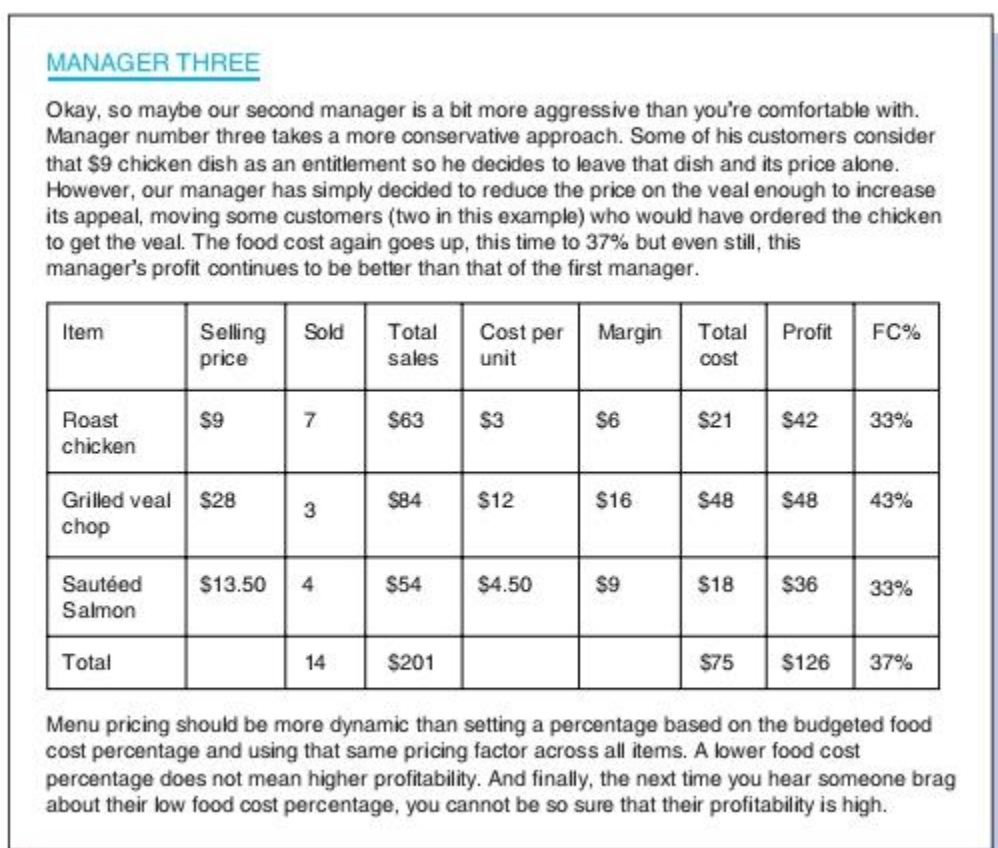


Figure 2 Sales matrix 2 (Source Adapted from Marriott Streamlines Menuing. Lodging Hospitality, 2007)

- **Elasticity pricing:** This pricing method considers the market and its sensitivity to price change. If the restaurant operates in a market where price is a determinant of demand a lower price may increase volume sufficiently to give better profitability. The market may also allow supply to be a determinant of price thereby allowing price increase without undue effect on volume. Fast-food operations, particularly branded burger restaurants in urban areas have been demand led and very price sensitive, particularly when market share becomes an important aspect, however when these same restaurants are located on motorway service stations they become supply led and prices can increase.
- **Backward pricing:** Backward pricing considers what the customer or market will bear in terms of price. Often used in manufacturing, for example confectionary or canned drinks less common in restaurants but useful when trying to establish or develop a new product. Requires fairly accurate ingredient and processing costs to be established and relies heavily on volume forecasts.
- **Prime cost:** Prime cost and its variant actual cost endeavour to provide more accurate cost models. Prime cost attempts to calculate labour cost in addition to food cost and actual cost attempts to include overheads. Both of these may be modelled via data from electronic point of sale (EPOS) systems over time and may also be benchmarked against industry standards for the sector. For example, it may be established that Pizzeria 's have an average food cost of 20%, an average labour cost of 30%, average overhead costs of 30% and require a return on investment of 20%. In this model if pizza ingredients cost N1 the operator has N1.50 towards labour, N1.50 towards overheads and N2 towards return on his investment that equates to a selling price of N5 plus sales tax where applicable. Whilst this model is more sophisticated and has the propensity to be more accurate modelling against industry standards or using data from the operations EPOS system can be misleading. In the first cost matching across all categories may not be

possible and in the second EPOS data by its nature is historic and previous sales may not be attainable in the subsequent trading period, a drop in volume will load each remaining sale with additional levels of cost.

Weekly Budget Worksheet		
Blue Fish Grill	Start:	30-Dec
	End:	5-Jan
	Total	Percent
SALES Forecast:	100,000	100.0%
Food	75,000	75.0%
Soft Beverage	4,800	4.8%
Liquor	8,000	8.0%
Bottle Beer	4,000	4.0%
Draft Beer	4,000	4.0%
Wine	4,000	4.0%
Merchandise & Other	200	0.2%
Gross Sales	100,000	100.0%
Less Comps & Discounts	1,000	1.0%
Net Sales	99,000	99.0%
COST OF SALES:		
Food -		
Food	16,500	22.0%
Soft Beverage	720	15.0%
Total Food	17,220	21.6%
Beverage -		
Liquor	1,440	18.0%
Bottle Beer	1,040	26.0%
Draft Beer	920	23.0%
Wine	1,440	36.0%
Total Beverage	4,840	24.2%
Merchandise & Other	100	50.0%
TOTAL COST OF SALES	22,160	22.2%
LABOR:		
Management	9,000	9.0%
Hourly Personnel	21,000	21.0%
Payroll Taxes & Benefits	6,600	6.6%
TOTAL LABOR	36,600	36.6%
PRIME COST (Gross Sales)	58,760	58.8%
PRIME COST (Net Sales)	58,760	59.4%

- Departmental profit margins:** The approach to menu pricing must follow from the outline of the basic policies and from the determined departmental profit targets. Each department will have a significant role in the total organization and its individual profit targets will normally be unrelated. For example, in a hotel the profit required from the à la carte restaurant may well be far lower than that of its coffee shop. The existence of the à la carte restaurant may be mainly of an image status for the hotel as against being a

major profit contributor. What is necessary is for the total sum of the individual departments' contributions to equal (at least) the desired contribution to the revenue for the whole establishment.

- **Differential profit margins:** It is unusual to apply a uniform rate of gross profit to all of the items found on a food menu or beverage list, although this simplistic method of costing can at times still be found in the non-commercial sector of the industry. In the non-commercial sector of the industry one of the advantages is that where a uniform rate of gross profit is applied (e.g. 60%), reference to the takings can quickly show the costs at 40% gross profit irrespective of the sales mix and an immediate comparison can be made to the actual usage of materials. The reasons for not applying a uniform rate of gross profit in the commercial sector are: it ignores such things as capital investment; it emphasizes the cost too much; it ignores competition; etc. Further, it could distort the range of prices and values of items on a menu in that a low food/beverage cost item would end up being priced at a very low price, while a high food/beverage cost item would be exorbitantly priced. In addition, it does not allow any flexible approach to the selling of items. Differential profit margins take into account the sales mix of items from a food menu or beverage list and hopefully provide the competitive balance of prices so that in total it is attractive to the customer and achieves the desired gross profit and revenue for the department.

Panel A: Alternative 1 (keep all product lines)				
	Gas Barbecues	Charcoal Barbecues	Barbecue Accessories	Total
Sales revenue	\$450,000	\$90,000	\$60,000	\$600,000
Variable costs	110,000	40,000	15,000	165,000
Contribution margin	\$340,000	\$50,000	\$45,000	\$435,000
Direct fixed costs	60,000	40,000	16,000	116,000
Allocated fixed costs	90,000	18,000	12,000	120,000
Profit (loss)	<u>\$190,000</u>	<u>\$(8,000)</u>	<u>\$17,000</u>	<u>\$199,000</u>

Panel B: Alternative 2 (drop the charcoal barbecues line)				
	Gas Barbecues	Barbecue Accessories		Total
Sales revenue	\$450,000	\$60,000		\$510,000
Variable costs	110,000	15,000		125,000
Contribution margin	\$340,000	\$45,000		\$385,000
Direct fixed costs	60,000	16,000		76,000
Allocated fixed costs	105,882 ^a	14,118 ^b		120,000
Profit	<u>\$174,118</u>	<u>\$14,882</u>		<u>\$189,000</u>

Panel C: Differential Analysis				
	Alternative 1 Total (keep all product lines; panel A)	Alternative 2 Total (drop charcoal barbecues; panel B)	Differential Amount	Alternative 1 Is
Sales revenue	\$600,000	\$510,000	\$90,000	Higher
Variable costs	165,000	125,000	40,000	Higher
Contribution margin	\$435,000	\$385,000	\$50,000	Higher
Direct fixed costs	116,000	76,000	40,000	Higher
Allocated fixed costs	120,000	120,000	0	
Profit	<u>\$199,000</u>	<u>\$189,000</u>	<u>\$10,000</u>	Higher

4.3.2 Special Pricing Considerations

- Sales tax

Depending on the government in power, it is likely that some form of sales tax may be enforced during its period of office. It is important to the customer to know whether prices displayed or quoted are inclusive of this sales tax or not. Additionally, the caterer needs to realize that any money collected on behalf of the government has at some time to be paid to that government and that it should not be included when calculating revenue or average spend figures, etc.

- Service charge

This is an additional charge, made to customers, at a fixed percentage of the total cost of the food and beverage served. The fixed percentage is determined by management, printed on the menu/beverage list, with the objective of removing from the customer the problem of determining what size of tip to give when in a particular establishment. As this charge is to be

distributed to the staff at a later date, usually on a points system, it should be treated similarly to a sales tax and not included in the calculation of revenue for food and beverages or in the calculations of average spend figures.

- **Cover charge**

This is an additional charge to a meal in restaurants to cover such costs as the bread roll and butter and items included but not priced on a menu. Care should be exercised as to whether to implement this or not as it is most likely to cause aggravation to some clients when it is applied.

- **Minimum charge**

Restaurants to discourage some potential clients from using the premises and to discourage clients from taking up a seat and only purchasing a very low priced item often enforce this.

4.3.3 Menu Pricing Applications

The exact method of pricing used by an establishment will depend on such matters as which sector of the industry the establishment is in; the level of profit/subsidy required; its basic policies; etc. It is important though to remember that the price in itself can be a valuable selling tool and a great aid in achieving the desired volume of sales. Whilst menu pricing is not quite a science there are a number of ways that the restaurateur can remove some of the guesswork by adopting one or more of the pricing models previously discussed.

- **Table d' hôte menus**

This type of menu is characterized by being a restricted menu, offering a small range of courses with a limited choice within each course and at a fixed selling price. The price may be just one price for any three courses chosen, or may vary in price depending on the main course chosen.

The method of pricing chosen should take into account the departmental profit required and the differential profit margins of the menu. Based on the forecasted sales take-up by guests, the average should be taken to fix the price. The average may well be the true figure, rounded off, when the objective is to attract as many customers as possible to choose from the menu; or alternatively, it may be an average plus figure when it is being offered with an à la carte menu and it is not desired to encourage too many guests away from the à la carte menu by making the price differentiation too attractive.

- **À la carte menus**

This type of menu is characterized by being a larger menu than a table d' hôte menu offering a greater choice of courses and dishes within each course, and each item being individually priced. The method of pricing here is again to take into account the departmental profit required and the differential profit margins for each course and then to price each item separately using standard recipes. In addition, note should be taken of the potential sales mix within each course so as to achieve the desired profit margin.

- **Banqueting menus**

This is a specific type of table d' hôte menu offering normally no choice to the customers. The specific difference in pricing this menu is that apart from the food and often the liquor, all the additional items are normally priced and charged separately. Examples of such items are flowers for each table, a band, meals and refreshments for the band, services of a toast master, hire of a microphone, printing of a special menu for the function.

Self-Assessment Exercises

1. What is menu pricing and state any five menu pricing methods?
2. What is the goal of menu pricing?
3. What factors determine the selling price of a meal?



4.4 Summary

Running any business is simply about selling something for more than you bought it so you can make a profit. Running a restaurant is no different, and if you want to be profitable and succeed over the long term, your restaurant menu pricing needs to be accurate.

Pricing menus involves so much more than just number crunching. Strategic restaurant menu pricing also involves looking at your demand and competition, while paying careful attention to your menu pricing models, balance, food trends, menu design, etc. The process certainly won't always be easy, but it will be worthwhile in the long run: your restaurant will become more profitable.

In this unit we continued from the previous unit, we examined, menu pricing, the pricing models, special pricing considerations and menu pricing application.

4.5 Glossary

Appetizer: a small dish of food or a drink taken before a meal or the main course of a meal to stimulate one's appetite.

Apprentice: Is someone acquiring specialized skills under the tutelage of experienced colleagues

Attitude: The way a person views something or tends to behave towards it, often in an evaluative way

Behaviour: The way in which one acts or conducts oneself, especially towards others.

Brigade: A group of people organized to act together.

Chef: A trained professional cook and tradesman who is proficient in all aspects of food preparation, often focusing on a particular cuisine.

Commis: This is a junior member of the kitchen staff who assists senior chefs with food preparation and organization.

Competitor: Is one selling or buying goods or services in the same market as another

Confectionery: Is the term use (like the majority of businesses) to describe sweets and chocolates.

Food Handler: Is anyone who, through their work activity, has direct contact with food during any of its phases until it reaches the final consumer.

Helper: Is someone who cleans and sanitizes kitchen equipment, assists in basic food preparation, and with receiving and storing products in kitchens, restaurants, clubs, fast food outlets and catering companies.

Hygiene: The practice of keeping yourself and your surroundings clean, especially in order to prevent illness or the spread of diseases.

Menu: A list of the dishes that may be ordered (as in a restaurant) or that are to be served (as at a banquet)

Pricing: A process of fixing the value that a manufacturer will receive in the exchange of services and goods.

Protective clothing: It is any clothing specifically designed, treated or fabricated to protect personnel from hazards that are caused by extreme environmental conditions, or a dangerous work environment.

Skill: The knowledge and ability that enables you to do something well

Staffing: Refers to the continuous process of finding, selecting evaluating and developing a working relationship with current or future employees.

Uniform: It is a variety of clothing worn by members of an organization while participating in that organization's activity.



4.6 References/ Further Reading

Bernard Davis, Andrew Lockwood, Peter Alcott & Ioannis S. Pantelidis (2008), Food and Beverage Management Fourth Edition, retrieved from <http://www.microlinkcolleges.net/elib/files/undergraduate/Tourism%20&%20Hotel%20Management/Bernard%20Davis,%20Andrew%20Lockwood,%20Ioannis%20Pantelidis,%20Peter%20Alcott%20Food%20and%20Beverage%20Management%202008.pdf>

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4.7 Possible Answers to Self-Assessment Exercises

1. Menu pricing is the engine behind your company's success, as sales are your restaurant's sole source of revenue. Pricing for food directly impacts your ability to fund essential aspects of your business, including equipment, utilities, labor, ingredients, and more. It is a careful calculation of what it costs to prepare a dish, along with other expenses, to

arrive at a final price that allows for those costs to be covered and a profit to be made. Some Menu pricing methods are: Cost plus pricing, Competition pricing, Rate of return pricing, Elasticity pricing, Backward pricing, Prime cost, Departmental profit margins, Differential profit margins

2. The intended result is more customers which leads to more revenue. The hope with the value pricing of menu and beverage items is that customers will also purchase other menu items with a higher contribution margin and increase profits overall.
3. To accurately price food, it is essential to identify three main points: Direct Expenses - Cost of ingredients, Indirect Expenses - Peripheral costs and overheads and Profit Margin - Targeted for to be competitive and viable.

MODULE 5

Unit 1 Beverage Menus

Unit 2, Recipe Standardization

Unit 3 Costs & Sales Concept

Unit 4 Recipe and Menu Costing

Unit 5 Menu and Recipe Pricing

UNIT 1 BEVERAGE MENUS

CONTENTS : 1.1 Introduction

1.2 Learning Outcomes

1.3 Beverage Menu

1.3.1 Menu Knowledge

1.3.2 Beverage Menus/Lists

1.3.3 Menu Merchandising

1.4 Summary

1.5 References/Further Readings

1.6 Possible Answers to Self-Assessment Exercises



1.1 Introduction

In the food and beverage establishment, beverage is a most important matter because it not only attracts customers; it elevates the status of the establishment and brings about the promotion of sales. A beverage menu is any menu or section of a menu that sells alcoholic and non-alcoholic drinks.

In this unit we shall examine, beverage menu; pricing of beverages, menu knowledge, beverage menus/lists and menu merchandising



1.2 Learning Outcomes

At the end of this unit, you should be able to:

- discuss food menu and beverage menu
- discuss sales mix
- discuss menus and the law
- describe the beverage menus
- discuss menu merchandising
- analyses the types of beverage menus/lists
- evaluate the importance of menu knowledge



1.3 Beverage Menu

Pricing of beverages: The method used to price beverages is similar to that for pricing foods. As in the case of foods, first, the departmental profit target and gross profit percentage should be set, followed by differential profit margins based on the sales mix achievable.

Pricing may be more accurately calculated for beverages as little, if any, processing of the drinks takes place; drinks being purchased by the bottle (e.g. beer, wine) or by a specific stated measure (e.g. 6-out) from a bottle of known standard size (e.g. wine, 75 cl). The mixing of drinks is, like food, usually prepared using a standard recipe particular to an establishment.



Samples of beverage menu

1.3.1 Menu Knowledge

When we consider that a menu is the primary sales tool for any restaurant operation it follows that product/menu item knowledge is important. Aside from issues concerning allergies, special diets or preferred tastes discerning customers will expect waiting or sales staff to have a thorough understanding of all dishes both in terms of ingredients and preparation and cooking. Good menu knowledge is an essential aid in the sales process, it provides an opportunity to discuss and where appropriate to up-sell more expensive or more profitable dishes. It also gives the customer assurance that the establishment is managed professionally.

- **Sales mix**

Although generally food costs only account for 20–30% of menu item cost averaged across the menu there are often considerable variations. It may be seen from the example above that different food or beverage items may carry significantly different levels of profit contributions.

1.3.2 Beverage Menus/ Lists

The criteria used to prepare a wine menu, or drinks list, are the same as those used when preparing a food menu. Most beverages require fewer staff to process them and the profits from them is therefore higher than those from food. Beverage lists should be specifically prepared for the particular unit in which they are being sold. With beverages, it is important that there should be a follow-through with the correct serving temperature being adhered to and the correct traditional glassware used, particularly when available to make the brand.

- **Types of beverage menus/lists**

The various types of beverage menus are numerous, but for simplicity they may be grouped as being of six kinds: full wine menus, restricted wine menus, banquet/function menus, bar menus,

room service beverage menus and special promotion beverage menus. Within this general heading wine menus may be subdivided as follows:

- 1. Full wine menu or lists:** This kind of menu would be used in an up-market hotel or restaurant where the customers' average spending would be high and where the time available to consume their meal would likely be in excess of one and a half hours. Like all menus, a full wine menu is difficult to design. Certain wines must be on the menu if a restaurant is of a particular standing; it is the question of the selection of wines within the various types based on the manager's experience and the analysis of customer sales that make it difficult to keep a correct balance and restrict the choice to reasonable limits. The

price range for this type of menu is high because of the quality of the products. The layout would usually be in the following order:

- a) House wines
- b) Champagnes and other sparkling wines
- c) Red wines
- d) White wines
- e) Port, sherry, liqueur
- f) Cognac, Armagnac, gin, vodka, vermouth, whisky
- g) Beers, lagers
- h) Mineral waters, fruit juices.

2. Restricted wine menus or lists: This kind of menu would be used in a middle type market operation where the demand for a full wine menu is very limited. It is also likely to be used when a highly skilled wine waiter is not required and where the waiting staff serves all food and beverages. The planning of a restricted wine menu is difficult and can best be done by an analysis of previous wine sales. This type of menu usually features a few well-known branded wines which the majority of customers can identify.

The price range would be lower than that of a full wine menu and would need to bear some relationship to the food menu prices. Another feature of a restricted menu is likely to be the sale of wine by the carafe and by the glass.

3. Banquet/function menus: This type of menu is of the restricted type in that it will offer fewer wines than a full menu. The contents of the menu will depend very much on the type of banqueting being done, but in general it is usual to offer a selection of wines with a varying price range so that it will suit a wide range of customers and their tastes. Again, banqueting wine menus will usually list some well-known branded wines.

- 4. Bar menus and lists:** This type of menu is basically of two types – the large display of beverages and their prices which is often located at the back of or to the side of a bar and is often a legal requirement in many countries; or small printed menu/lists which are available on the bar and on the tables in the bar area. The large display of menus and prices would be in a general type of bar where the everyday types of drinks are served; the small printed menus/lists being found in lounge and cocktail bars.
- 5. Room service beverage menu:** The size and type of a room service menu will depend on the room service offered. For a luxury type unit the menu will be quite extensive, being a combination of items from the full wine list and from the bar list. In a middle type market unit the menu is likely to be quite small, being a combination of items mainly from the bar list plus a few wines only from the restricted unit wine menu/list.
- 6. Special promotion beverage menus:** This type of menu may take many forms from a free pre-function reception to promote a particular beverage, to the promotion of after-lunch and after-dinner liqueurs by the use of attractive tent cards, or to the promotion of the cocktails of the month. Some suppliers willingly give assistance with beverage promotional menus by providing free advertising and promotional material and by offering the particular beverage free or at a special purchase price.

1.3.3 Menu Merchandising

The efficiency by which menus are merchandised to customers can affect the demand for the use of the food and beverage facilities as well as influence the selection of items and thereby the sales mix of an outlet. The menu is one of the most important sales tools that caterers have but which they often fail to use to the best or fullest advantage. It is necessary for all menus to be correct against the checklist of general presentation, cleanliness, legibility, size and form, layout and content. Through merchandizing, caterers can efficiently utilize the menu to optimize their sales. The merchandising of catering operations involves the point of sale promotion of their

facilities using non-personal media. Unlike advertising it is not a paid for form of communication, but like sales promotion is more concerned with influencing customer behaviour in the short term.

The major types of merchandising that may be employed by a catering operation include the following.

- **Floor stands:** Floor stands or bulletin boards are particularly effective if used in waiting and reception areas to advertise special events, forthcoming attractions, etc. In these areas in hotels, restaurants and clubs, people may be waiting in a queue or for the arrival of other guests, and therefore have the time to read the notices including menu cards on these stands.
- **Posters:** Posters have a wider circulation than the previously described floor stands. They may be displayed in reception areas, elevators, cloakrooms, in the restaurant dining area itself, in fact they may be placed in any strategic positions where people have the time available to read their messages.
- **Wall displays:** Illuminated wall displays are used extensively by fast-food operations showing enlarged colour photographs of the food and beverages available. They are also used by wine bars, cocktail bars and lounges and look particularly attractive at night.

Blackboards are often found in pubs, bars, school cafeterias and theme restaurants where the dish of the day and other specials can be changed regularly along with their prices.

- **Tent cards:** Tent cards are often placed on restaurant dining tables to promote special events, attractions, etc. Regarded as a valuable merchandising tool because guests will almost inevitably pick the card up and read it at some point during the meal, and they may even take it away with them. They may be used to advertise special dishes or wines, or announce forthcoming events such as a Christmas Day menu or New Year party.

- **Clip-ons:** Menu clip-ons are most commonly used in restaurants to advertise speciality items, plats du jour, special table d'hôte lunches offered in an à la carte restaurant and so on; they may also be used on wine lists to promote a particular wine or region. Both tent cards and clip-ons are useful tools for the hotel or restaurant to feature the higher profit earning food and beverage items.

Self-Assessment Exercises

1. State six types of beverage menus/lists
2. State the major types of merchandising employed by a catering operation



1.4 Summary

Your menu is your primary means of representation: It says exactly who you are and what you hope to convey personality-wise. It also should create enough of an impression so that it stays with your client long after the waiter or waitress walks off with it. In addition, it must convey your brand in a manner that makes customers excited to be there, want to come back and to recommend it to family and friends.

In this unit we examined Beverage Menu; pricing of beverage, menu knowledge, beverage menu/lists & menu merchandising.



1.5 References/ Further Reading

Bernard Davis, Andrew Lockwood, Peter Alcott & Ioannis S. Pantelidis (2008), Food and Beverage Management Fourth Edition, retrieved from <http://www.microlinkcolleges.net/elib/files/undergraduate/Tourism%20&%20Hotel%20Management/Bernard%20Davis,%20Andrew%20Lockwood,%20Ioannis%20Pantelidis,%20Peter%20Alcott%20Food%20and%20Beverage%20Management%202008.pdf>

<http://Bahance.net>



1.6 Possible Answers to Self-Assessment Exercises

1. The six types of beverage menus/lists are: Full wine menu or lists, Restricted wine menus or lists, Banquet/function menus, Bar menus and lists, Room service beverage menu, and Special promotion beverage menus
2. The major types of merchandising that may be employed by a catering operation include the following: Floor stands, Posters, Wall displays, Tent cards, and Clip-ons

UNIT 2 RECIPE STANDARDIZATION

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2.1 Introduction

2.2 Learning Outcomes

2.3 Standardized Recipes

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2.5 Summary

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2.7 Possible Answers to Self-Assessment Exercises



2.1 Introduction

A standardized recipe is instructions for consistently preparing a set quantity of food or drink at an expected quality. The purpose of a standardized recipe is to produce uniform taste and quantity each time the recipe is made, regardless of who's making it.

A standardized recipe usually includes: A list of all ingredients including spices and herbs. Exact quantities of each ingredient (with the exception of spices that may be added to taste) Specific directions for the order of operations and types of operations (e.g., blend, fold, mix, sauté)



2.2 Learning Outcomes

At the end of this unit, you should be able to:

- discuss the components of a good standardized recipe

- discuss the benefits of using a standardized recipe
- discuss standard yields
- discuss standard portions
- analyse the three types of measurement used in kitchen
- analyses processes of recipe verification phase
- analyse processes of product evaluation phase
- evaluate the factor method of recipe adjustment

2.3 Standardized Recipe

■ Definition

A standardized recipe is a set of written instructions used to consistently prepare a known quantity and quality of food for a specific location. A standardized recipe will produce a product that is close to identical in taste and yield every time it is made, no matter who follows the directions.

▪ Importance of Standardized Recipes

Three main areas of school foodservice operation are negatively impacted when standardized recipes are not used: i. Cost; ii. Nutrients per Serving; iii. Customer Satisfaction

2.3.1 Components of a good Standardized Recipe

- Menu item name – the name of the given recipe that should be consistent with the name on the menu
- Total Yield – number of servings, or portions that a recipe produces, and often the total weight or volume of the recipe

- Portion size – amount or size of the individual portion
- Ingredient list/quantity – exact quantities of each ingredient (with the exception of spices that may be added to taste)
- Preparation procedures – Specific directions for the order of operations and types of operations (e.g., blend, fold, mix, sauté)
- Cooking temperatures and times, including HACCP critical control points and limits to ensure the dish is cooked properly and safely
- Special instructions, according to the standard format used in an operation
- Mise en place – a list of small equipment and individual ingredient preparation

- Service instructions, including hot/cold storage
- Plating/garnishing

In addition to the list above, standardized recipes may also include recipe cost, nutritional analysis, variations, garnishing and presentation tips, work simplification tips, suggested accompaniments or companion recipes, and photos. Standardize recipes can help with work simplification and incorporate HACCP into procedures.

2.3.2 Recipe as a Control Tool

Standardized recipes are an important control tool for food service managers and operations. A standardized recipe assures not only that consistent quality and quantity, but also a reliable cost range. In order for an operation to set a menu selling price that allows the operation to make a profit, it's vital that the cost of each recipe and portion is calculated and relatively consistent.

- **Benefits** of using a standardized recipe include:

-a consistent quality and quantity;- a standard portion size/cost;- assuring nutritional content and addressing dietary concerns, such as special diets or food allergies

- helping ensure compliance with “Truth in Menu” requirements
- aiding in forecasting and purchasing;- fewer errors in food orders
- incorporating work simplification principles and aids in cross-training
- assisting in training new employees;- incorporating HACCP principles;- reducing waste
- more easily meeting customer expectations

- **Standard Yields**

The yield of a recipe is the number of portions it will produce. Yields can also be expressed as a total volume or total weight the recipe produces. An example would be a soup recipe that yields 24, 8 oz. portions which could also be stated as a yield of six quarts or a 1 ½ gallon. A weight example would be a recipe that yields 20, 4 oz. portions of taco meat or a total yield of 5 pounds.

Standard yields for the main, often higher cost, ingredients such as meat, may also take into consideration portion cost and be determined in part by calculating the cost per cooked portion.

- **Standard Portions**

A standard recipe includes the size of the portions that will make up a serving of the recipe. Controlling portion size has two advantages in food management:

- portion costs for the item will be consistent until ingredient or labor costs change, and
- customers receive consistent quantities each time they order a given plate or drink.

Standard portions mean that every plate of a given dish that leaves the kitchen will be almost identical in weight, count, or volume. Only by controlling portions is it possible to control food costs. If one order of bacon and eggs goes out with six strips of bacon and another goes out with three strips, it is impossible to determine the actual cost of the menu item.

▪ **Types of Measurements Used in the Kitchen**

There are three types of measurements used to measure ingredients and to serve portions in the restaurant trade, viz: by volume, by weight, or by count.

Recipes may have all three types of measurement. A recipe may call for 3 eggs (measurement by count), 8 ounces of milk (measurement by volume), and 1 pound of cheese (measurement by weight).

There are formal and informal rules governing which type of measurement should be used. There are also specific procedures to ensure that the measuring is done accurately and consistently.

✓ **Number or Count**

Number measurement is only used when accurate measurement is not critical and the items to be used are understood to be close in size.

For example, “3 eggs” is a common measurement called for in recipes, not just because 3 is easy to count but also because eggs are graded to specific sizes. Most recipes call for large eggs unless stated otherwise.

Numbers are also used if the final product is countable. For example, 24 pre-made tart shells would be called for if the final product is to be 24 filled tart shells.

✓ **Volume**

Volume measurement is usually used with liquids or fluids because such items are awkward to weigh. It is also used for dry ingredients in home cooking, but it is less often used for dry measurement in the industry. Volume is often the measure used when portioning sizes of finished product.

✓ **Weight**

Weight is the most accurate way to measure ingredients or portions. When proportions of ingredients are critical, their measurements are always given in weights. This is particularly true in baking where it is common to list all ingredients by weight, including eggs (which, as mentioned earlier, in almost all other applications are called for by count). Whether measuring solids or liquids, measuring by weight is more reliable and consistent

Self-Assessment Exercises 1

1. What are the components of a good Standardized Recipe?
2. State the benefits of using a standardized recipe

2.4 Phases of Recipe Standardization

The recipe standardization process can be summarized in three phases: recipe verification, product evaluation, and quantity adjustment. Recipe verification consists of reviewing the recipe in detail, preparing it, verifying its yield, and recording changes. Product evaluation focuses on determining the acceptability of the product produced from the recipe. Changing the recipe yield and ingredient amounts occurs in the quantity adjustment phase. A recipe may go through these phases several times before becoming standardized at the necessary quantity for an operation.

Decisions made during each phase determine the flow of a recipe through this recipe standardization process. Once a recipe has been standardized for an operation, the standardization process should not have to be repeated unless changes occur in availability of ingredients or equipment.

A. Recipe Verification Phase

The first phase of the recipe standardization process is the recipe verification phase. This phase includes four major processes: review the recipe, prepare the recipe, verify the recipe yield, and record changes to the recipe.

◆ Review the Recipe

Begin by working on only one recipe at a time. Review the recipe to be standardized. Look to see if the recipe contains the following information: Recipe title; Recipe category; Ingredients;

Weight/volume for each ingredient; Preparation instructions (directions); Cooking temperature and time, if appropriate; Serving size; Recipe yield; Equipment and utensils to be used

Reviewing the recipe for this information must be done before preparing the recipe. If information is missing, make note of any information that must be determined during the recipe preparation process. The amount of time needed for this review process will differ, depending on the source of the recipe.

◆ Prepare the Recipe

Once the recipe has been reviewed, it can be prepared. Throughout the process of making the recipe, keep careful notes about any variations. Record this information directly on the recipe for future reference. Cooking time to reach the internal temperature and product quality may vary slightly depending on the type and age of equipment.

◆ Verify Yields

“Verify yields” includes verifying ingredient, recipe, and serving yields. When verifying a recipe, the AP (As Purchase) quantity needed to yield the necessary EP (Edible Product) quantity of an ingredient must be determined. Yields can vary depending on factors such as product

quality, preparation techniques, and cooking times and temperatures. Products from different manufacturers may differ in quality, and these quality differences may affect yield of the product. Verification of the recipe yield occurs once all of the ingredients have been combined and the recipe preparation completed. The yield can be determined several ways depending on the recipe. Recipe yield should be specified in both total quantity (weight and/or volume) and number of servings. Recipe yield can be determined by weighing the final product or measuring its volume.

◆ **Record Changes**

Notes of any changes or concerns should be recorded on the recipe during the verification phase. The format of the permanent recipe varies among operations. The more detailed the information is on the recipe, the more assurance of having a consistent quality product. Once the recipe verification phase has been completed, the recipe is ready for the next phase of the standardization process, the product evaluation phase.

B. Product Evaluation Phase

Product evaluation follows the recipe verification phase and is an important part of the recipe standardization process. It will help determine acceptability of the recipe and will provide objective information that can be used to further improve the recipe. Recipe evaluation should include the manager, foodservice staff members, and customers (Two types of evaluation occur in the evaluation phase: informal and formal

◆ **Informal Evaluation**

Informal evaluation involves only the foodservice managers and employees. During informal evaluation, the product is prepared for the first time in the operation and an assessment is made of whether efforts to standardize the recipe should continue.

Three decisions are possible as a result of the informal evaluation of a recipe. First, if the product was found to be **totally unacceptable** based on several of the informal evaluation criteria, the decision may be made to discontinue any further work on standardizing the recipe. If **most** of the informal evaluation criteria were rated as acceptable, the recipe may go back to the verification phase to allow for changes to be made to the recipe and a new version of the recipe prepared. Finally, if **all** evaluation criteria were rated as acceptable in the informal evaluation, then the recipe may be prepared for formal evaluation.

◆ **Formal Evaluation**

Formal evaluation occurs when the foodservice staff believes a recipe has potential for service in their operation. Procedures for conducting a formal evaluation of the recipe include:

- i. Select a group(s) of people to taste the sample recipe. Keep the group size manageable usually 10 or fewer people should sample a food item at a given time.
- ii. Choose an evaluation form. The evaluation form used should be appropriate for the age of the group members who are sampling the food items.
- iii. Prepare the sample recipe. Once a group has been selected to sample the product(s) and an evaluation form has been selected, the recipe can be prepared for evaluation.
- iv. Set up the sampling area. The area to be used for sampling should be prepared with drinking water, eating and serving utensils, napkins, evaluation forms, and pens or pencils.

- v. Have participants taste and evaluate the food. Tasting procedures should be explained to those who will be evaluating the product, and the evaluation form should be reviewed with them prior to tasting.
- vi. Summarize the results. The evaluation form used will help determine the way results are summarized.
- vii. Determine future plans for the recipe based on evaluation results. Based on the formal evaluation results, the recipe will be accepted as is, rejected, or changed. If the formal evaluation comments are positive and the recipe is accepted as is, no further changes in ingredients will be needed. At this point a decision is made on whether the recipe is in the correct quantity or not. If a different yield is needed, the recipe moves to the quantity adjustment phase of the recipe standardization process. If no additional quantity adjustment is needed, the recipe is considered standardized. If the evaluation

comments are very poor, the recipe likely will be rejected and no further work will be done to standardize it for an operation. If the evaluation comments were neither very good nor very poor, additional work on the recipe may be needed. This likely would mean that the recipe would go back through the verification phase with changes being made to ingredients, preparation instructions, or cooking procedures. Once a way to improve the product has been identified, the change can be implemented and the product remade and evaluated again.

C. Quantity Adjustment Phase

When a recipe has been evaluated positively in the evaluation phase but is not in the desired quantity, it would move to the quantity adjustment phase of recipe standardization. There are several methods that can be used to adjust a recipe to get to the desired number of servings (yield). Some methods are done manually; others involve use of the computer.

Table 1: Comparison of Standardized Recipe Adjustment Methods

Method	Advantages	Disadvantages	Initial Recipe	Final Recipe
Factor method	<ul style="list-style-type: none"> ◆ Can be used for any recipe ◆ Easy to use 	<ul style="list-style-type: none"> ◆ Math skills required 	<ul style="list-style-type: none"> ◆ Can start with any recipe and desired yield 	<ul style="list-style-type: none"> ◆ Final recipe can yield any number of servings desired
Direct reading tables method	<ul style="list-style-type: none"> ◆ Minimal math skills needed 	<ul style="list-style-type: none"> ◆ Direct reading tables must be available ◆ Must know how to read tables ◆ Can only be used for yields in multiples of 25 	<ul style="list-style-type: none"> ◆ Must have yield of 25 servings or multiples of 25 servings 	<ul style="list-style-type: none"> ◆ Yield of 25 servings or multiples of 25 servings (i.e., 200, 175, 500)
Percentage method	<ul style="list-style-type: none"> ◆ Further adjustments to a single recipe are easy after initial ingredient percentages are calculated 	<ul style="list-style-type: none"> ◆ Many steps in process ◆ Math skills required ◆ Must use weights for all ingredients ◆ Must calculate and adjust for handling loss 	<ul style="list-style-type: none"> ◆ Can start with any recipe and yield ◆ Initial recipe ingredients must be in weights 	<ul style="list-style-type: none"> ◆ Yield can be any amount desired ◆ All final ingredients are in weights
Computerized recipe adjustment	<ul style="list-style-type: none"> ◆ Adjustments easy after recipe entered on computer ◆ No math skills needed 	<ul style="list-style-type: none"> ◆ Computer programs can be expensive ◆ Some programs require ingredients to be entered in weights only ◆ Ingredient quantities may be listed in decimals 	<ul style="list-style-type: none"> ◆ Can start with any recipe and desired yield 	<ul style="list-style-type: none"> ◆ Final recipe can yield any number of servings desired

As shown in Table 1, there are advantages and disadvantages to each method. The decision of which method is used is usually made by the foodservice director based on resources available and needs of the foodservice operation. Recommendations in *A Tool Kit for Healthy School Meals: Recipes and Training Materials* suggest first making a recipe for 25 servings and then reproducing at 50 and 100 servings before increasing the recipe to the quantity needed.

◆ Factor Method of Recipe Adjustment

The factor method for adjusting recipes involves mathematical calculations and is the most commonly used method of manual adjustment. The factor method consists of three basic steps. They are:

- 1) Determine the “factor” to be used. The factor is a multiplier that will be used to increase or decrease the quantity of ingredients in a recipe. The factor is determined

by dividing the desired yield (in number of servings) by the current recipe yield (in number of servings). $\text{Desired yield} \div \text{Current yield} = \text{Factor}$ For example, if a manager wishes to make 250 servings and the current recipe produces 100 servings, divide 250 by 100; the factor would be 2.5. $250 \div 100 = 2.5$

- 2) Multiply each ingredient quantity by the “factor.” Each ingredient quantity in a recipe is multiplied by the factor to determine the ingredient quantity needed to produce the new yield. Ingredient quantities given as fractions would need to be converted to decimals prior to doing this calculation.
- 3) Change amounts into more common measurements. Often, the result of the mathematical calculations is a quantity that is hard to measure or not commonly used. These quantities may need to be converted to a more common measurement. Rounding to the nearest common measure also may occur.

Self-Assessment Exercises 2

1. What are the phases of recipe standardization?
2. Compare the standardized recipe adjustment methods



2.5 Summary

Recipe Standardization: Standardize recipes to eliminate the guesswork and maintain better quality, portion, and cost controls.

A recipe is said to be standardized when it has been tried, tested, evaluated and adapted for use by a food service under controlled conditions. The food service sets certain criteria for

standardization of its recipes including customers demand and effective use of its resources to meet those demands.

A standardized recipe produces a specific quality and quantity of food each time it is used. Once that standardized recipe is created it will become one of the most important documents in a foodservice operation. Without a written standardized recipe for each of the creative menu items, an operator will never have control over food quality, cost or profit.

In this unit, we examined Recipe standardization; components of a good standardizes recipe, recipe as control tool and phases of recipe standardization.

2.6 References/ Further Reading

Beth Egan, Pennsylvania State University Introduction to Food Production and Service (2/25/2022) retrieved from <https://workforce.libretexts.org/@go/page/11364>

<https://www.txcte.org/sites/default/files/resources/documents/Recipe-Standardization-Process1.pdf>



2.7 Possible Answers to Self-Assessment Exercises

Self-Assessment Exercise 1

1. The components of a good Standardized Recipe are: Menu item name – the name of the given recipe that should be consistent with the name on the menu
 - i. Total Yield – number of servings, or portions that a recipe produces, and often the total weight or volume of the recipe
 - ii. Portion size – amount or size of the individual portion

- iii. Ingredient list/quantity – exact quantities of each ingredient (with the exception of spices that may be added to taste)
- iv. Preparation procedures – Specific directions for the order of operations and types of operations (e.g., blend, fold, mix, sauté)
- v. Cooking temperatures and times, including HACCP critical control points and limits to ensure the dish is cooked properly and safely
- vi. Special instructions, according to the standard format used in an operation
- vii. Mise en place – a list of small equipment and individual ingredient preparation
- viii. Service instructions, including hot/cold storage
- ix. Plating/garnishing.

In addition to the list above, standardized recipes may also include recipe cost, nutritional analysis, variations, garnishing and presentation tips, work simplification tips, suggested accompaniments or companion recipes, and photos.

2. Benefits of using a standardized recipe include:

- i. a consistent quality and quantity;- a standard portion size/cost;- assuring nutritional content and addressing dietary concerns, such as special diets or food allergies
- ii. helping ensure compliance with “Truth in Menu” requirements
- iii. aiding in forecasting and purchasing;- fewer errors in food orders

iv. incorporating work simplification principles and aids in cross-training

v. assisting in training new employees;- incorporating HACCP principles;- reducing waste

vi. more easily meeting customer expectations

Self-Assessment Exercise 2

1. The recipe standardization process can be summarized in three phases: recipe verification, product evaluation, and quantity adjustment. Recipe verification consists of reviewing the recipe in detail, preparing it, verifying its yield, and recording changes. Product evaluation focuses on determining the acceptability of the product produced from the recipe. Changing the recipe yield and ingredient amounts occurs in the quantity adjustment phase. A recipe may go through these phases several times before becoming standardized at the necessary quantity for an operation.

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UNIT 3 COSTS & SALES CONCEPT

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3.2 Learning Outcomes

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3.8 Possible Answers to Self-Assessment Exercises



3.1 Introduction

The concept of cost is a key concept in Economics. It refers to the amount of payment made to acquire any goods and services. In simple terms, the concept of cost is a financial valuation of resources, materials, risks, time and utilities consumed to purchase goods and services.

In this unit we shall examine, Cost and Sale concept; elements of cost, classification of cost, ways of expressing sales concepts, the cost, volume profit relationship (break-even), important control measures for cost control.



3.2 Learning Outcomes

At the end of this unit, you should be able to:

- discuss the elements of cost
- discuss the various classes of cost
- discuss the two basic group sales concept in food and beverage operations
- analyses break-even concept and its usefulness
- evaluate the important control measures for cost control



Preamble

Systems and procedures are used by managers to ensure that the actual costs of doing business are consistent with the expected costs. Sale is the revenue obtained from the exchange of products or services for a value. Sales can be of two types-monetary and non-monetary. Cost-volume-profit ratio is based on how profits respond to prices, costs, and volume.

A cost-volume-profit graph describes the relationship between sales volumes in units to other expenses such as fixed expenses, variable expenses, total expenses and total sales.

The graph also gives knowledge about how costs and profit respond to change in sales volume.

The contribution margin ratio is the relation of total contribution margin to sales.

The ratio can be used to estimate the implications of change in total sales on net operating income. The Same ratio is also used in break-even analysis. The break-even point is that level of sales at which there is no profit or loss for the organization. It can be calculated using various techniques which are based on cost-volume-profit.

3.3 Cost

■ Definition of Cost

In a food and beverage business, cost means the price to the hotel or restaurant of goods and services when the goods are consumed or the services rendered. It may be defined as ascertainment of costs relating to a suitable unit of output. The cost of any item may be expressed in a variety of ways as in units of weight or volume, or total value.

The cost of chicken can be expressed as a value for 250 grams, or a value per individual portion.

The cost of liquor can be expressed in terms of the cost per bottle, per drink or per ounce.

Cost includes as well as price, the cost of not going somewhere else, the cost of transport and time, the cost of potential embarrassment, the cost of having to look and behave in a required manner and the cost in terms of effort at work to earn the money to pay the required price.

- **Elements of Cost**

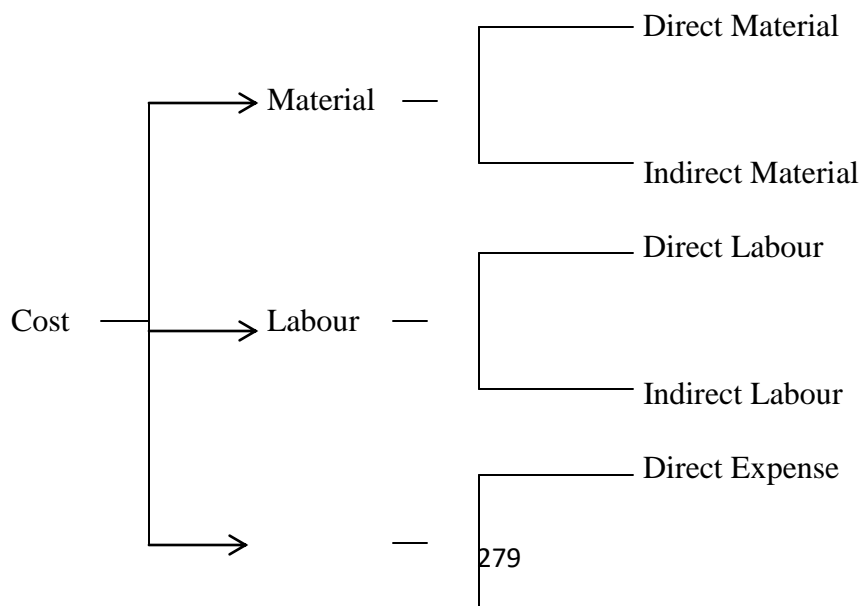
There are broadly three elements of costs by nature of expenses-material, labour and expense.

i. Material:

Material is a substance from which the product or dish or drink is made. Food and beverages are the most common raw materials or ingredients. Raw ingredient used for preparing any food item

is known as material for food. Material may also comprise semi-processed ingredients such as sauces or pickles which are used in the food industry.

The material could be direct and indirect



Indirect Expense

a) Direct Material: The direct material cost is the cost incurred for commodities which are used in preparation of food, for example, meat, fish, oils, herbs and spices. It is the cost which is an integral part of the finished product which is served to the guest.

b) Indirect Material: The indirect material cost is the cost which is ancillary to the business and is not an integral part of the product but is necessary for preparation. For, example, fuel cost such as gas or electricity used for preparing food and cleaning supplies.

ii) Labour: It is the compensation given to employees for completion of a particular job for which they have been assigned and to convert the raw materials to the finished products to be served to the guests. It includes salaries, commission, bonus and wages which are paid to employees. The employees include workers, managers and supervisors. The labour cost can also be either direct or indirect.

a) Direct Labour: Direct labour includes chefs and cooks, and bar and beverage service staff who are directly responsible for preparation and service of food and beverage to guests. The salary or wages earned by direct labour can be identified with the particular product prepared, job, or the process.

b) Indirect Labour: Indirect Labour cost or wages is the labour employed for carrying out tasks which are secondary to the goods or services. For example, the storekeeper of F & B outlet and kitchen stewarding.

iii) Expense: All other costs excluding labour and material cost used in preparing a product or providing service are said to be expenses. An expense can be direct or indirect.

a) Direct Expenses: Expenses which are directly related or allocated to various cost units are called direct expenses. They are allocated to particular job or service rendered which are also known as productive responses. The hiring of a particular machinery or equipment for preparing certain dishes would come under this category.

b) Indirect Expense: Expenses which cannot be directly charged and are neither indirect wages nor indirect materials are said to be indirect expenses. Rent and taxes, insurance, depreciation, and repairs and maintenance are examples of indirect expenses

3.3.1 Classification of Cost

The classification of cost is done on various bases such as behavioural in respect to the change in volume such as fixed costs and variable costs. Other costs such as joint cost, outlay cost, and prime cost are based on the industry production process. The classification of cost is as follows:

- **Actual Cost:** Actual cost is the cost or expense which is actually spent. For example, the amount spent on buying the raw ingredients or materials for preparing a menu.
- **Budgeted Cost:** Budgeted cost is a forecasted future expense that is expected to be incurred.
- **Controllable Cost:** The cost that can be changed in a short period of time. The cost of food and beverage can be changed in several ways, eg. by changing the portion size.
- **Non-Controllable Cost:** Non-Controllable costs are costs which cannot be changed in a short period of time. These costs are usually fixed costs which include rent, taxes.
- **Fixed Cost:** Fixed costs are costs which are not affected by changes in sales volumes. Examples are rent, taxes and insurance premium. Though fixed cost might change in due course of time, it is not related to the volume of sales.
- **Variable Cost:** Variable cost is directly proportionate with the sales and revenue generated. An example of a variable cost is the F & B cost. As sales increases, the cost of goods purchased increases.
- **Direct Cost:** Direct Cost is the cost of a particular department or a section and the manager concerned is responsible for the cost. The direct cost may increase or decrease proportionately to the sales made during a particular period of time.

Examples of these costs are food cost, beverage cost and wages.

- **Indirect Cost:** - Indirect Costs are the cost which are not directly related to a particular department and cannot be charged to any particular department, for example, energy cost such as electricity charges.
- **Joint Cost:** is the cost shared between two joints or two departments; for example, F & B Production and service is the labour cost shared between beverage and kitchen departments.
- **Outlay Cost:** is the financial expenditure incurred by an organization for improving the infrastructure, product, sales, etc.
- **Opportunity Cost:** Opportunity cost is the profit that is lost by an organization for choosing another option as an alternative venture using its available resources.
- **Sunk Cost:** It is a cost that has already been met with and cannot be reversed or altered.
- **Standard Cost:** It is the realistic estimate based on historical data. The standard cost of a recipe for a dish or beverage can be prepared, finalized, and then standardized.
After the dishes are standardized, the same is used as benchmarks to be compared with those prepared later.
- **Prime Cost:** Prime cost is the sum of food, beverage, and labour cost. It is the largest portion of all costs for a food service organization and is of concern for both managers and owners.

Self-Assessment Exercises 1

1. What are the elements of cost by nature of expenses?
2. State the various class of cost know to you

3.4 Sales

Sales can be defined as the revenue resulting from the exchange of products and services for a value. In the F & B industry, the dishes and drinks served are products and services of both bar and restaurant which are served for value. The value may be cash or a promise to pay in cash. These sales are expressed in monetary terms for the value of goods or services. The main objective of a unit is to have profitability in business. For that to happen, the total sales must be greater than total costs. The manager should be constantly aware of the costs of operating the restaurant and to keep them below sales.

3.4.1 Ways of Expressing Sales Concepts

There are two basic group of terms normally used in food and beverage operations to express sales concept:

- A. Monetary
- B. Non-monetary

A. Monetary:

Total Sales: The total sales refer to the total volume of sales which is expressed in naira. **Total**

Sales by Category: It refers to the total sales of a category compared to the total sale volume; for example, total dessert sale as compared to all dishes sold.

Average Sale: An average sale in business is determined by adding the individual sales and then dividing it with number of individual sales.

Average Sale per Customer: The average sale per customer is the total sale divided by the number of sales made, customers, or covers. It is also given as follows:

$$\text{Average Sale} = \frac{\text{Total Sale in naira}}{\text{Total Number of covers}}$$

Average Sale per Server: The total sale per server is the total sale amount for which sales are expressed in monetary terms for the value of goods or services. The express value does not include taxes. Sales expressed in terms of the quantity of units sold are very useful for purposes of control. The average check price is calculated for food per meal and for liquor each day. It is calculated by dividing the total value of all the sales for that meal or day by the number of customers. This will indicate how the menu is working, the effectiveness of all over all selling efforts, and determination of price.

All the food and beverage outlets are constantly attempting to increase sales in order that the profit may be maintained or increased. For a restaurant to succeed it must meet a sufficient number of the characteristics to be appealing to a large market and hence cover constant higher costs. Most of the customer to patronize one particular outlet due to the following reasons:-

- Location- Convenient
- Service and Style
- Products differentiated
- Variety of Menu items

- Acceptable Prices
- Décor-Pleasant
- Portion Sizes
- Product Quality

The selling price of a product or service is generally set by management. As regards to food and beverage items, the sales prices are printed on a menu or placed on signs appearing thought the food and beverage outlet. The sale price is mainly determined on the basis of cost. However, there are other considerations such as maximization of sales differentiated products, price sensitivity, excluding certain customers or to cater to a specific clientele.

B. Non-monetary:

Total Number Sold: The total number sold is the total number of dishes, for example, menu items, sold in a given time period. The figures help us in many ways as it helps managers identify the popular and not so popular items. It also helps to identify the total number of specific items sold from historical data which helps to forecast and make decisions regarding purchase of raw materials and production thereafter.

Cover: A cover is term used to describe a single dinner regardless of the quantity of food he/she consumes.

Total Covers: It refers to the total number of covers/customers served in a given time period which could either be an hour, a meal period say lunch or dinner, a day, a week, or any such time period.

Average Covers: Average covers are determined by dividing the total number of covers for a certain time period by the desired numbers as follows:

$$\text{Cover per hour} = \frac{\text{Total number of covers}}{\text{Total Number of hours operated}} \quad (5.3.1)$$

$$\text{Cover per day} = \frac{\text{Total number of covers}}{\text{Total Number of days operated}} \quad (5.3.2)$$

$$\text{Cover per Server} = \frac{\text{Total number of Covers}}{\text{Total Number of Servers}} \quad (5.3.3)$$

Sales Mix: Sales mix is used to describe the relative quantity sold of any item as compared to other items in the same category. The idea is to achieve the combination, or mix, that would yield the greatest amount of profits. The profits would be greater if higher margin items are sold more than the lower margin items as these would lead to a relatively large proportion of total sale. A shift in sales mix from higher margin items to lower margin item to a dip in total profits

even through sales may increase. Similarly, if it is reversed, a shift in sales mix from high margin item to low margin items can cause total profits to increase even through sales may decrease.

Self-Assessment Exercises 2

1. What is sales?
2. State the reasons most customers patronize a particular food and beverage outlet
3. What is Sales-Mix?

3.5 Cost/ Volume/ Profit Relationship (Break Even-Analysis)

Cost Volume Profit analysis (CVP) is a technique which is used to examine the relationship between the three elements of financial performance, mainly the sales and the cost associated with the volume and the profit. This helps us to analysis and understand how costs respond to various changes in activity and the planning and decision making process. CVP helps to predict the sales in naira and the volume required to achieve the desired profit based on the known costs.

Its main focus is on interaction among the following elements:-

- Price of Products
- Total Fixed Costs

- Volume or level of activity
- Mix of product sold
- Per unit variable costs

For planning and decision-making, it is important to look at the relationship among profit, sales, and costs and how it changes in different situations.

The CVP stress on the contribution margin is made towards fixed cost and profit. It is expressed by the following formula:-

$$\text{Contribution Margin} = \text{Sales Revenue} - \text{Variable Costs}$$

Contribution margin can also be said to be the amount left from the sales once the variable cost is deducted that is available to contribute towards the fixed cost and the contribution is towards the profit.

For Example: A Restaurant name Food Garden, which has a set menu at a fixed price of ₦100 per customer/cover. In a particular month, the meal sales are between 6,000 and 9,000 Units. The Variable costs is ₦20 and fixed cost is ₦160,000. The contribution margin profit statement for Food Garden restaurant is given in Table 5.3.1 below:

Table 5,3.1 Contribution margin profit statement for Food Garden Restaurant

Total Meals	6,000 (´)	Units (₦)	9,000 (´)	Unit (₦)
Sales revenue	600,000	100	900,000	100
Less Variable Costs	120,000	20	180,000	20
Contribution Margin	480,000	80	720,000	80
Less fixed costs	160,000		160,000	
Net Profit/Loss	320,000		560,000	

Therefore, the contribution statement presents the impact of sales volume of profit.

Considering the relevant range, the selling price and variable cost have remained constant per unit sold as total fixed costs. The interpretation of the data for the manager is as follows:

For every ₦100 sold, ₦20 goes directly towards covering the variable costs which means that there is a contribution of ₦80.

$$\text{Selling price} - \text{Variable cost per unit} = \text{Contribution per unit } ₦100 - ₦20 = ₦80$$

Every time a meal is sold, there is a contribution of ₦80 towards fixed costs; once these are covered, the contribution goes towards profit. Food Garden has a fixed cost of ₦160,000. When

it sells 6,000 meals, the total contribution is ₦480,000 and when it sells 9,000 meals, the total contribution is ₦720,000.

Therefore, we can calculate the profit or loss, if any, from the following formula:-

Profit/Loss = Total Contribution – Fixed costs

480,000 – 160,000 = 320,000 when 6,000 units are sold

720,000 – 160,000 = 560,000 when 9,000 units are sold

Therefore, if the total meal sale increases by 50%, the profit almost nearby doubles up as in the case of Food Garden, if the sales is reduced from 6,000 to 2,000 meals, the total contribution would be ₦160,000. Since the fixed cost remains constant for the restaurant and both the fixed cost and the contribution margin are the same, the total profit or loss would be zero as there would not be any profit or loss made by the restaurant on selling 2,000 meals. Where there is no profit or loss, it is known as **breakeven point**. As Break-even point is reached, the net operating income will increase by the amount of unit contribution margin for each additional meal sold.

Contribution Margin: Contribution margin is the amount remaining from the sales revenue after the variable expense has been deducted. It is the amount available to cover the fixed expenses and to provide profit for the period. If the contribution is not sufficient to cover the fixed costs for a period, **loss** would occur for the same period.

Contribution Margin Ratio: Contribution Margin Ratio is the contribution margin as a percentage of total sales. It could also be used in cost/volume/profit calculation. The ratio is given as follows:-

$$\text{Contribution Margin Ratio} = \frac{\text{Contribution Margin}}{\text{Sales}} \quad (5.3.4)$$

For Food Garden, if 6,000 meals are sold, the C M ratio would be as follows:

$$\text{Contribution Margin Ratio} = \frac{\text{Contribution Margin}}{\text{Sales}} \quad (5.3.5)$$

$$= \frac{480,000}{600,000}$$

$$= 0.80 = 80\%$$

In Food Garden where only meals are sold and there are no other products, the Contribution Margin Ratio is given as follows:

$$\text{Contribution Margin Ratio} = \frac{\text{Unit Contribution Margin}}{\text{Unit Selling Price}} \quad (5.3.6)$$

$$= \frac{160}{2000}$$

$$= 0.8 = 80\%$$

The C M ratio is extremely useful as it shows how; contribution margin could be affected by a change in total sales. As calculated here, for 6,000 meals sold, there is a C M Ratio of 80% which means that for every naira increase in sales, the total contribution margin will increase by 80 kobo ($\text{₦1 sales} \times \text{C M ratio of } 80\%$). The net operating income will also increase by 80 kobo considering that fixed costs do not change.

Cost/Volume/Profit Equation: In an establishment or an F & B outlet, there is a relationship between sales, cost of sales, cost of labour, cost of overhead, and profit. The relationship can be expressed as follows:-

$$\text{Sales} = \text{Cost of Sales} + \text{Cost of Labour} + \text{Cost of overhead} + \text{Profit} \quad (5.3.8)$$

Since the cost of sales is variable cost, cost of labour includes both fixed and variable, and the cost of overhead is fixed, then the equation can be restructured into

$$\text{Sales} = \text{Variable cost} + \text{Fixed Cost} + \text{Profit} \quad (5.3.9)$$

Target Profit Analysis: The CVP Formulas can also be used to determine the sales volume needed to achieve a target profit.

$$\text{Sales} = \text{Variable expense} + \text{Fixed expense} + \text{Profits} \quad (5.3.10)$$

Variable Rate: The Variable rate is the ratio of variable cost to the sales in naira. It is calculated by dividing the variable cost by the sale in naira and is usually expressed in decimal form.

$$\text{Variable rate} = \frac{\text{Variable Cost}}{\text{Sales}} \quad (5.3.11)$$

Contribution Rate: When the variable cost is known, the balance would be fixed costs and the profit. As there is an increase in sales, more amounts would be available to meet fixed costs and the profit. Therefore, it can be concluded that if the cost remains constant, there is an increase in sales because of the contribution rate, resulting in increase of profit.

The increase is known as contributed rate/percentage/ratio.

Contribution rate is given by the following formulas:-

$$\text{Contribution Rate (C R)} = 1 - \text{Variable Rate (VR)} \quad (5.3.12)$$

Break – Even Analysis: Break–even analysis represents the relationship between cost, volume, and profit and is an important exercise in the business it depicts the following:-

1. The Financial state of the business.
2. The profitability of the business at different levels of output.
3. The break-even point (i.e., the point at which neither profit is made nor loss is incurred)
4. The relationship between fixed, semi-fixed and variable costs and the contribution.
5. The margin of safety and the profit-volume ratio.

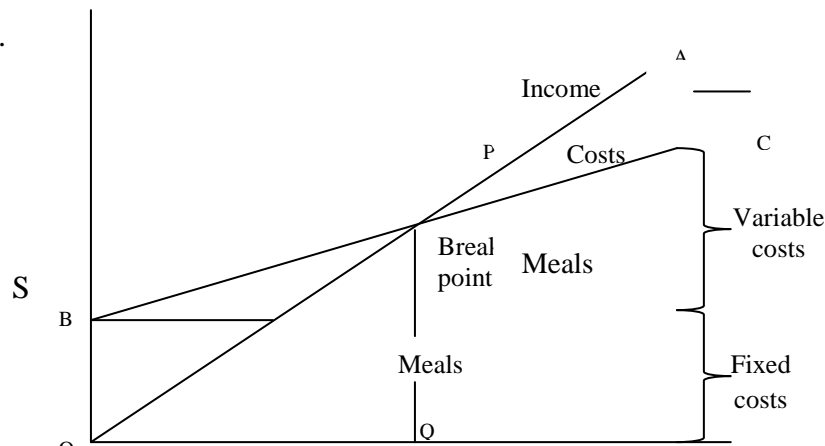
Advantages of Break-even Analysis: The advantages of break-even analysis are as follows:-

- It helps the management decide on the exact volume of goods to be manufactured.
- It helps the management decide on preparing or making or buying policies.
- It helps the management decide on the exact selling price of dishes or drinks prepared.
- It helps the management to take decisions regarding current and new production system.

-Break-even analysis is a procedure widely used by production management and management accountants.

-It is based on categorizing production costs between those which are variable (costs which change when the production output changes) and those that are fixed (costs which are not directly related to the volume of production).

- Breakeven analysis enables the relationship between fixed, semi-fixed and variable costs at specific volumes of business to be conveniently represented on a graph. This enables the break-even point to be identified and the level of sales necessary to produce a predetermined level of net profit.



In graph above, S represents sales. The line OA represents the variation of income at varying levels of production activity (output). The span OB represents the total fixed costs necessary in running the business. As the output increases, variable costs are incurred, meaning that total costs (fixed + variable) also increase. At low levels of output, costs are greater than income. At the point of intersection P, costs are exactly equal to income, and hence neither profit nor loss is made.

A break-even chart graphically represents the shifting levels of profit or loss made by different volumes of sales, level of accuracy owing to the scale of the graph, and the skill of the person preparing it. It is calculated with the following formula:

$$B/E = C / S - V = \text{units of output at the break-even point} \quad (5.4.13)$$

Where, C -the total capacity costs, that is, the costs of establishing the particular production capacity for an establishment (e.g. this would include rent, rates, insurance, salaries, building and machinery depreciation) S - sales price per unit V - variable cost per unit The break-even point can be calculated either by the equation method or contribution margin method and both methods provide the same result. The contribution margin method for calculating break-even point discusses that each unit sold provides a certain amount of contribution margin that goes towards recovering the fixed cost. The Number of units required to break even is calculated by dividing the total fixed expense with the contribution margin.

$$\text{Break – even point in units sold} = \frac{\text{Fixed expenses}}{\text{Unit contribution margin}} \quad (5.3.14)$$

Instead of the unit contribution margin, the C M Ratio can also be used. The result obtained is the break-even point in total sales rather than in total units sold.

$$\text{Break – even point in total sales (naira)} = \frac{\text{Fixed expenses}}{\text{C M ratio}} \quad (5.3.15)$$

$$\text{C M Ratio} = \frac{\text{Contribution Margin}}{\text{Selling Price}} \quad (5.3.16)$$

3.5.1 Important Control Measures for Cost Control

Cost control is the practice of analysing and reducing restaurant purchases to increase profits. Restaurant Cost Control is vital as it allows you to identify the area of expenses where cost could be curtailed.

The following are the Important Control Measures for Restaurant Cost Control

- **Inventory Control to Manage Costs**

Managing stock is main part of inventory control, in restaurant business. Maintaining inventory is a bit tedious task to do but advancement in technology has made it much easier to conduct the inventory, as everything is maintained in computer, and software helps to reduce the time and gives the effective output. There are few points on which organization can keep in mind while doing inventory such as old methods like FIFO (First In First Out) and LIFO (Last In First Out).

Employee Management

The investment in employee cost is always more and to retain them is also a difficult task. Therefore restaurant management should take measures to encourage and motivate workers to stay. For example: hiring the right people for the right job; investing in training and development of the staff; providing incentives, e.g. giving insurance policy, pension scheme and any other facility provided by the government.

- **Waste Management and Pilferages**

Organization should have set parameters to manage waste and pilferages and internal thefts. Advancement in technology has given more opportunity in theft management and through online sales.

- **Creative Construction of Menu**

In constructing a menu, one should always consider those factors that affect sales, which include: the location of the restaurant; the targeted customer; the number of ingredients used in the menu;

the number of dishes offered on the menu, etc. Restaurant should pay keen attention towards pricing of menu in low as well as peak season.

Self-Assessment Exercises 3

1. State the advantages of break-even analysis
2. State the important control measures for restaurant cost control



3.6 Summary

If you're going to run and grow a successful business, you need to know where you're spending money and how much you're making back. Without the ability to view all the fine details of your cash flow, you risk making decisions blindly or without the proper context.

That's why companies include the cost of sales in their balance sheets and income statements. This sales metric is used to calculate gross profit. If certain costs aren't vital to the manufacturing of your product or service, eliminating them will automatically increase your gross profit.

In this unit we examined, Cost and Sale concept; elements of cost, classification of cost, ways of expressing sales concepts, the cost, volume profit relationship (break-even), important control measures for cost control.



3.7 References/ Further Reading

Review of Important Measures for Controlling Costs for Running a Successful Restaurant Business by Publishing India Group (2019), Atithya: A Journal of Hospitality Date added: 05/07/20. Retrieved from <http://www.publishingindia.com/GetBrochure.aspx?query=UERGQnJvY2h1cmVzfC81MzE0LnBkZnwwNTMxNC5wZGY=>



3.8 Possible Answers to Self-Assessment Exercises

Self-Assessment Exercise 1

1. The elements of cost are
 - i. Material: It is a substance from which the product or dish or drink is made. Food and beverages are the most common raw materials or ingredients. Raw ingredient used for preparing any food item is known as material for food. Material may also comprise semi-processed ingredients such as sauces or pickles which are used in the food industry. The material could be direct and indirect.
 - ii. Labour: It is the compensation given to employees for completion of a particular job for which they have been assigned and to convert the raw materials to the finished products to be served to the guests. It includes salaries, commission, bonus and wages which are paid to employees. The employees include workers, managers and supervisors. The labour cost can also be either direct or indirect.
 - iii. Expense: All other costs excluding labour and material cost used in preparing a product or providing service are said to be expenses. An expense can be direct or indirect.
2. The various class of cost are: Actual Cost, Budgeted Cost, Controllable Cost, Non-Controllable Cost, Fixed Cost, Variable Cost, Direct Cost, Indirect Cost, Joint Cost, Outlay Cost, Opportunity Cost, Sunk Cost, Standard Cost, Prime Cost.

Self-Assessment Exercise 2

1. Sales can be defined as the revenue resulting from the exchange of products and services for a value. In the F & B industry, the dishes and drinks served are products and services of both bar and restaurant which are served for value. There are two basic group of terms normally used in food and beverage operations to express sales concept: Monetary and Non-monetary
2. Most customers patronize one particular outlet due to the following reasons:-
 - i. Location- Convenient
 - ii. Service and Style
 - iii. Products differentiated
 - iv. Variety of Menu items
 - v. Acceptable Prices
 - vi. Décor-Pleasant
 - vii. Portion Sizes
 - viii. Product Quality
3. Sales Mix: Sales mix is used to describe the relative quantity sold of any item as compared to other items in the same category. The idea is to achieve the combination, or mix, that would yield the greatest amount of profits. The profits would be greater if higher margin items are sold more than the lower margin items as these would lead to a relatively large proportion of total sale. A shift in sales mix from higher margin items to lower margin item to a dip in total profits even through sales may increase. Similarly, if it

is reversed, a shift in sales mix from high margin item to low margin items can cause total profits to increase even through sales may decrease.

Self-Assessment Exercise 3

1. The advantages of break-even analysis are as follows:-
 - i. It helps the management decide on the exact volume of goods to be manufactured.
 - ii. It helps the management decide on preparing or making or buying policies.
 - iii. It helps the management decide on the exact selling price of dishes or drinks prepared.
 - iv. It helps the management to take decisions regarding current and new production system.
2. The following are the Important Control Measures for Restaurant Cost Control: Inventory Control to Manage Costs, Employee Management, Waste Management and Pilferages, and Creative Construction of Menu

UNIT 4 RECIPE AND MENU COSTING

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4.1 Introduction

4.2 Learning Outcomes

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4.7 Possible Answers to Self-Assessment Exercises



4.1 Introduction

Cost is the primary factor to consider when choosing how much to charge for the items on your menu. Accurate pricing of menu items is vitally important for restaurants to succeed. If your prices are too high, your competitors will get your business. If your prices are too low, you'll miss out on profits.

In this unit we shall examine recipe and menu costing; costing individual items on a plate, yield testing and cooking loss test.



4.2 Learning Outcomes

At the end of this unit, you should be able to:

- discuss recipe and menu
- discuss standard portion cost
- discuss yield testing
- analyse yield and waste percentages



4.3 Simple explanation of Recipe & Menu Costing

A recipe is a set of instructions that describes how to prepare or make something, especially a dish of prepared food.

Menu costs are the costs incurred by a business when it changes the prices it offers to its customers. A classic example is a restaurant that has to physically print new menus when it changes the prices of its dishes. The main takeaway from menu costs is that some prices are sticky.

- **Standard Portion Cost**

A standard recipe served in standard portions has a standard portion cost. A standard portion cost is simply the cost of the ingredients (and sometimes labour) found in a standard recipe divided by the number of portions produced by the recipe. Standard portion costs change when food costs change, which means that standard portion costs should be computed and verified regularly, particularly in times of high inflation. The standard portion cost can be quickly computed if portions and recipes are standardized. Simply determine the cost of each ingredient used in the recipe and ingredients used for accompaniment or garnish.

4.3.1 Costing Individual Items on a Plate: If you need to determine the total cost of a plate that has multiple components, rather than a recipe, you can follow the procedure in the example below:

Standard order of bacon and eggs: the plate contains two eggs, three strips of bacon, toast, and hash browns. The cost of ingredients used for accompaniment and garnish can be determined by

using the standard portion cost formula, which is the purchase price of a container (often called a unit) divided by the number of portions in the container. That is,

$$\text{standard portion cost} = \text{unit cost} / \text{portions in the unit}$$

An example is a carton of eggs. If eggs cost N200.00 a dozen and a standard portion in a menu breakfast item is two eggs, the standard portion cost can be found.

Recall the equation:

$$\text{standard portion cost} = \text{unit cost} / \text{portions in the unit}$$

Now, find the portions in the unit.

$$\text{portions in the unit} = \text{number in unit} / \text{number in a portion}$$

$$= 12 / 2$$

$$= 6$$

That is, there are six 2-egg portions in a dozen eggs.

Substitute the known quantities into the equation.

$$\text{standard portion cost} = \text{unit cost} / \text{portions in unit}$$

$$= \text{N}200 / 6$$

$$= \text{N}34$$

You could get the same answer by calculating how much each egg in the dozen is worth ($\text{N}200 / 12 = \text{N}17$) and then multiplying the cost per egg by the number of eggs needed ($\text{N}17 \times 2 = \text{N}34$). No matter what method is used, the standard portion of two eggs in this order of bacon and

eggs has a standard portion cost of ₦34.

You can find the standard portion cost of the bacon in the same way. If a 500 g package of bacon contains 20 rashers and costs ₦375, the standard portion cost of a portion consisting of four rashers can be found quickly portions in the unit = $20/4 = 5$

standard portion cost = unit cost/portions in unit = $₦375/5 = ₦75$

The bacon and eggs on the plate would have a standard portion cost of ₦109. You could determine the cost of hash browns, toast, jam, and whatever else is on the plate in the same manner. Often, restaurants will serve the same accompaniments with several dishes. In order to make the costing of the entire plate easier, they may assign a “plate cost,” which would include the average cost of the standard starch and vegetable accompaniments. This makes the process of pricing daily specials or menu items that change frequently easier, as you only need to calculate the cost of the main dish and any specific sauces and garnishes, and then add the basic plate cost to the total to determine the total cost of the plate.

Self-Assessment Exercises 1

1. What is a standard portion cost?
2. What are the benefits of Costing Individual Items on a Plate?

4.4 Yield Testing

Yield in culinary terms refers to how much you will have of a finished or processed product. Professional recipes should always state a yield; for example, a tomato soup recipe may yield 4 gallons or 15 L, and a muffin recipe may yield 24 muffins. Yield can also refer to the amount of

usable product after it has been processed (peeled, cooked, butchered, etc.) For example, you may be preparing a recipe for carrot soup. The recipe requires 2 lbs or 1 kg of carrots, which you purchase. However, once you have peeled them and removed the tops and tips, you may only have 1.6 lb or 800 grams of carrots left to use. In order to do accurate costing, yield testing must be carried out on all ingredients and recipes.

When looking at yields, always consider the losses and waste involved in preparation and cooking. There is always a money value that is attached to vegetable peel, meat and fish trim, and packaging like brines and syrups. Any waste or loss has been paid for and is still money that has been spent. This cost must always be included in the menu price.

4.4.1 Using Yield to Calculate Food Costs

Once you have your yield percentage, you can translate this information into monetary units. Considering the losses incurred from trimmings and waste, your actual cost for your processed ingredient has gone up from what you originally paid, which was your raw cost or AP cost. These calculations will provide you with your processed cost or EP cost.

Alternatively, the purchased cost per unit (APC/unit) can be divided by the corresponding yield percentage to calculate the edible portion cost per unit.

Example 1: If the whole turkey costs ₦990 per pound and the EP yield is 36%, then ₦990 divided by .36 equals ₦275 per pound. This is also referred to as the “true cost” of the turkey to serve the customer.

If we plan to serve a 5 oz. portion, then we can calculate the edible portion cost per ounce. Divide ₦275 by 16 = ₦172 per oz. then multiple by 5 oz. = ₦86

Example #2: If a whole head of cauliflower costs ₦129 per pound and the EP yield is 60%, then ₦129 divided by .60 equals ₦215 per pound. A 4 oz. portion served to the customer would cost ₦53.75

There could be a considerable difference in costs between the raw product and the processed product, which is why it is important to go through all these steps. Once the EP cost is determined, the menu price can be set.

4.4.2 Yield Testing and Percentages

Meat and seafood products tend to be the most expensive part of the menu. They also have significant amounts of waste, which must be accounted for when determining standard portion cost. When the meat is delivered, unless it has been purchased pre-cut, it must be trimmed and cut into portions. The losses due to trimming and cutting must be accounted for in the portion cost of the meat. For example, if a 5 kg roast costing ₦800 a kilogram (total cost is ₦4000) is trimmed of fat and sinew and then weighs 4 kg, the cost of usable meat (the EP cost), basically, has risen from ₦800 a kilogram to ₦1000 a kilogram ($\frac{₦4000}{4 \text{ kg}}$). The actual determination of portion cost is found by conducting a meat cutting yield test. The test is conducted by the person who breaks down or trims the wholesale cut while keeping track of the weight of the parts. The information is placed in columns on a chart, as shown in Table 4. The column names and their functions are discussed below.

Table 4 Prices and percentages for the Meat Cutting Yield Test

Part	Weight	% of Total	Value per Kg	Total Value	Cost Factor	EP Cost (per kg)	Portion size
Whole Piece (AP)	2.5kg	-	₦1214	₦3035	-	-	-
Breakdown	-	-	-	-	-	-	-
Fat & Gristle	850g	34%	₦20	₦17	-	-	-
Loss in cutting	100g	4%	0	-	-	-	-
Trim	250g	10%	₦749	₦187	-	-	-

The parts of the meat are listed on the yield test sheet under the heading “Breakdown.” In the example in Table 4, a pork loin has been broken down into fat and gristle, loss in cutting, trim, and usable meat. Various measures and calculations are then recorded in the different columns:

- **Weight:** Next to the breakdown column the weights of the individual parts are listed.
- **Percentage of total weight:** The third column contains the percentage of the original piece by weight. The column is headed “% of total weight,” which reminds us how to calculate the percentages. That is, % of total weight = weight of part/total weight. For example, in Table 4, the fat and gristle weigh 850 g (or 0.850 kg). The total weight of the pork loin before trimming is 2.5 kg.

Note: The next few charts show meats measured in kg from Table 4, but this would be the same process if the meat was measured in pounds.

Percentage of Fat and Gristle Equation
$\begin{aligned} \text{\% of fat and gristle} &= \text{weight of part/total weight} \\ &= 0.850 \text{ kg}/2.5 \text{ kg} \\ &= 0.34 \\ &= 34\% \end{aligned}$
Using the same procedure, you can calculate:
$\begin{aligned} \text{\% of loss in cutting} &= 0.100 \text{ kg}/2.5 \text{ kg} \\ &= 0.04 \\ &= 4\% \end{aligned}$
$\begin{aligned} \text{\% of trim} &= 0.250 \text{ kg}/2.5 \text{ kg} \\ &= 0.1 \\ &= 10\% \end{aligned}$
$\begin{aligned} \text{\% of usable meat} &= 1.300 \text{ kg}/2.5 \text{ kg} \\ &= 0.52 \end{aligned}$

Note: The percentage of usable meat is an important concept. It is often referred to as the yield percentage or yield factor.

- Value per kg: These list the value of the parts per unit of weight. These values are based on what it would cost to purchase similar products from a butcher shop.
- Total value: This is determined by multiplying the value per kg column by the weight column. This has to be done carefully as the units must match. For example, the temptation is to simply multiply the weight of the fat and gristle (850 g) by ₦20 and get ₦17000 instead of converting the grams into kilograms (850 g = 0.850 kg) and then multiplying to give the actual value of ₦17. The entry for the “Usable Meat” in the total value column is determined by subtracting the value of the breakdown parts from the total cost of the pork loin (₦3035). The total cost is found by multiplying the weight of the whole piece (2.5 kg) by the value per kg (₦1214).

The total value of the usable meat equation

total value of usable meat = total cost – total value of breakdown parts

$$= \text{₦}3035 - (\text{₦}17 + \text{₦}187)$$

$$= \text{₦}3035 - (204)$$

$$= \text{₦}2831$$

- Cost of usable kg (or EP cost): cost of a usable kilogram is determined by dividing the total value of the usable meat by the weight of the usable meat as measured in kilograms (see below).

Cost of usable kg (or EP cost) equation

cost per usable kg = total value of usable meat/kg weight of usable meat

$$= \text{₦}2831/1.3 \text{ kg (remember } 1300 \text{ g} = 1.3 \text{ kg)}$$

$$= \text{₦}2178$$

Notice the difference between the wholesale cost (₦1214/kg) and the cost of usable meat (₦2178). This difference shows why the basic formula for determining standard portion costs will not work with meat.

- Portion size and portion cost: The last two columns in Table 4 show portion cost and portion size. Portion size is determined by management; in this example, individual portions of the pork loin weigh 250 g (or 0.250 kg).

The portion cost is determined by multiplying the cost of a usable kg by the portion size.

That is,

$$\text{portion cost} = \text{portion size} \times \text{cost of usable kg}$$

Using the correct units is very important. The portion size should be converted into kilograms or pounds as the cost per usable kg has been found.

Portion size equation

$$\text{portion cost} = \text{portion size} \times \text{cost of usable kg}$$

$$= 0.250 \text{ kg} \times \text{₦2178/kg}$$

$$= \text{₦544}$$

- Cost factor: If the price of pork loin changes, the monetary values entered on the meat cutting yield sheet become invalid. The cost factor will probably not change drastically but the wholesale cost of purchasing the meat might. By having a cost factor on hand, you can quickly apply it to the wholesale price of the purchased product and determine what an appropriate selling price should be. The cost factor per kilogram is determined by dividing the cost per usable kg by the original cost per kilogram (see below).

Cost factor equation

$$\text{cost factor per kg} = \text{cost per usable kg} / \text{original cost per kg}$$

In this example,

$$\text{cost factor per kg} = \text{cost per usable kg} / \text{original cost per kg}$$

$$= \text{₦2178} / \text{₦1214}$$

This cost factor can be used to find the cost of a usable kg or lb if the wholesale cost changes with the following formula.

Finding the cost of usable kg if wholesale cost changes

new cost of usable kg = cost factor per kg x new wholesale cost

For example, if the cost of pork loin should rise to ₦1300 a kilogram from the ₦1214 per kilogram given on the cutting yield test sheet, the new cost per usable kg can be quickly calculated:

new cost of usable kg = cost factor per kg x new wholesale cost

$$= 1.79 \times \text{₦}1300$$

$$= \text{₦}2327$$

Notice the size of the increase is in usable kg cost. The wholesale cost rose by (₦1300 – ₦1214) ₦86 a kg, but the new cost of usable meat rose by ₦149 a kg.

The cost factor per kilogram or pound and the cost factor per portion are the most important entries on a meat cutting yield test as they can be used to adjust to changing wholesale costs.

Chart: Cost factor per portion equation

The cost factor per portion is found by multiplying the portion size by the cost factor per kilogram. In this example,

cost factor per portion = portion size x cost factor per kg

$$= 0.250 \text{ kg} \times 1.79$$

$$= 0.45$$

The cost factor per portion is important because it can be used to find the cost per portion from the wholesale cost of meat. This is done by multiplying the two quantities. For example, if the wholesale price of pork loin should rise to ₦1300 a kg, the portion cost will become:

Today, the meat cutting yield test is losing some of its popularity because of the introduction of pre-portioned meats. But there remain several benefits to performing meat cutting tests:

- Exact costs are determined so menu pricing can be more accurate.
- Tests done periodically verify that the meat wholesaler is providing meat to stipulated specifications. If the amount of trim and waste rises, so do food costs.
- By comparing the results from two or more wholesalers who have provided the same sample cuts, a critical evaluation can be done to determine which one is supplying better meat.
- Comparing yields between people doing the cutting will tell you who is being the most efficient.
- Since individual pieces of meat or fish may vary slightly, doing yield tests on several of the same items and taking an average will give you the best idea of your standard yield.

4.4.3 Cooking Loss Test

Number cooked: One Time: 2 hours and 30 minutes Temperature: 175°C. Some meats cannot be accurately portioned until they are cooked. This applies particularly to roasts, which shrink during cooking. The amount lost due to shrinkage can be minimized by incorporating the principles of low-temperature roasting, but some shrinkage is unavoidable. The cooking loss test serves the same function as the meat cutting yield test. Their similarities and differences will

become evident in the discussion below. Table 5.3.2 shows a sample cooking loss test form.

Cooking Loss Test Item: Leg of Lamb Portion: 125g Cost factor: 0.2931

Table 5.3.2 Cooking Loss Test Form for a Leg of Lamb

Break down	Weight	% of Total	Value (per kg)	Total Value	EP Cost (per kg)	Portion Size	Portion Cost	Cost Factor (per kg)	Cost Factor (per portion)
Original Weight	3750g	100%	₦650	₦2438	-	-	-	-	-
Trimmed weight	2850g	76.00%	-	₦2438	-	-	-	-	-
Loss in Trimming	900g	24.00%	-	0	-	-	-	-	-
Cooked weight	2350g	62.67%	-	₦2438	-	-	-	-	-
Loss in cooking	500g	13.33%	-	0	-	-	-	-	-
Bones and trim	750g	20.00%	-	0	-	-	-	-	-
Saleable weight	1600g	43.00%	-	₦2438	₦1524	125g	₦191	₦234.46	₦29.31

When using a cooking loss test form, note the following, referring to Table 5:

- The form specifies the time and temperature of the roasting.
- The column headings are similar to the column headings on the meat cutting yield test form (Table 4), as you are measuring similar things.
- The first line in Table 5 lists the weight and wholesale cost of the roast (total value).
- The trimmed weight is the weight of the roast that is placed in the oven. Some fat and gristle have been trimmed off in the kitchen. In the example, about 900 g have been

trimmed. Technically, if the trim has some value, it should be used to reduce the total value of the roast. However, for simplicity, it is ignored in this example.

- After cooking for 2 hours and 30 minutes (the time stated on the test form), the roast is weighed and the cooked weight is entered on the form. The weight loss in cooking is determined by difference and the value entered on the form.
- The cooked roast is then deboned and trimmed. The weight of this waste is recorded.
- The weight of the remaining roast is determined. This is the amount of cooked roast you have available to sell and which can be divided into portions.
- Notice that the total value (that is, the cost) of the roast remains the same throughout the process. Only the weight of the roast changes.
- The percentage of total weight figures are calculated in the same way they were determined in Table 4.
- The cost of usable kg is determined by dividing the saleable weight into the total value of the roast.
- Portion size is determined by restaurant managers, and the portion cost is calculated by multiplying the cost of usable kg and the portion size. This is the same procedure used to determine portion cost on the meat cutting yield test form.
- The cost factor per kg is the ratio of the cost of usable kg and the original value per kg.

Self-Assessment Exercises 2

1. What is yield testing?
2. What are the benefits of performing Meat cutting yield tests?



4.5 Summary

The content in this Unit can seem confusing when it's first introduced, but observing some examples of trimming meat or produce, actually weighing the waste and edible portion, and practicing the EPQ (edible portion quantity) to APQ (as purchased quantity) calculations will improve understanding of these concepts. It's important to be able to do these calculations to develop accurate portions costs for recipes and menu items. Once the cost of recipes and menu items are established, the next step to building an operation's menu is to set menu prices.

In this unit we examined, Recipe and Menu Costing; explanation of recipe and menu, standard portion cost, cost individual items on a plate, yield testing, using yield to calculate cost, yield tests and percentages, cooking loss test.



4.6 References/ Further Reading

Beth Egan, Pennsylvania State University Introduction to Food Production and Service (2/25/2022) retrieved from <https://workforce.libretexts.org/@go/page/11364>



4.7 Possible Answers to Self-Assessment Exercises

Self-Assessment Exercise 1

1. A standard portion cost is simply the cost of the ingredients (and sometimes labour) found in a standard recipe divided by the number of portions produced by the recipe. Standard portion costs change when food costs change, which means that standard portion costs should be computed and verified regularly, particularly in times of high inflation.
2. The benefits of Costing Individual Items on a Plate include:
 - i. Effective way of managing production costs.

- ii. Creates consistency and reduce costing fluctuations.
- iii. Same amount of ingredients each time regardless of the chef or restaurant.
- iv. Purchasing pre-portioned ingredients reduces preparation time and keeps consistency and reduces wastages with dishes.
- v. Portions is always in line with customer expectations.

Self-Assessment Exercise 2

1. Yield is the amount of food material that's available for consumption after the food is prepared and processed and turned into the final product. Yield test is a testing process to determine accurately the amount of raw materials needed to produce a certain amount of final processed product.
2. Benefits to performing meat cutting yield tests:
 - a. Exact costs are determined so menu pricing can be more accurate.
 - b. Tests done periodically verify that the meat wholesaler is providing meat to stipulated specifications. If the amount of trim and waste rises, so do food costs.
 - c. By comparing the results from two or more wholesalers who have provided the same sample cuts, a critical evaluation can be done to determine which one is supplying better meat.
 - d. Comparing yields between people doing the cutting will tell you who is being the most efficient.

- e. Since individual pieces of meat or fish may vary slightly, doing yield tests on several of the same items and taking an average will give you the best idea of your standard yield.

UNIT 5 MENU AND RECIPE PRICING

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5.1 Introduction

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5.3 Pricing Consideration

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5.4.1 Special Pricing Strategies

5.5 Summary

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5.8 Possible Answers to Self-Assessment Exercises



5.1 Introduction

Your pricing strategy is a numbers game based on understanding overall restaurant costs, conducting recipe costing, calculating final plate / dish costs, and then setting a menu price to maximize margin.

In this unit, we will examine Menu and Recipe Pricing; pricing considerations, calculating menu items costs, pricing “all you can eat” menus and special pricing strategy.



5.2 Learning Outcomes

At the end of this unit, you should be able to:

- discuss factors to considered in addition to costs when setting menu prices
- discuss the importance of considering both food cost percentages and contribution margins when deciding on a menu mix
- analyse the various special pricing strategies



5.3 Pricing Considerations

Once the total cost and portion cost of a recipe has been established, then it is time to set prices for the menu. Many factors to consider when setting menu prices include: costs; since the main objective of the business is to make money, (or at least meet the budget or breakeven in the case of some onsite segments) customers, what do they consider as a good value? The restaurant business is not just about the food, but also the service, the experience, the ambiance. Customers are typically willing to pay more for a menu item if there are other “added value” features such as convenience; the location also affects what customers are willing to pay for. Portions sizes, product quality, and the menu mix are also factors to consider. These issues will further be explored as we consider the setting of menu prices.

■ Setting the Menu Price

Although you likely have a target overall food cost in your establishment, not every menu item will carry exactly the same food cost percentage. Some items are more costly than others, but most establishments will have a range of prices that all the menu items fit into. Consequently, it is important to balance the menu so that the low and high food cost items work together to help reach the target food cost. This process is called “blended pricing” and results from using menu engineering or menu analysis. Menu engineering means balancing the high and low food cost items; it also includes strategically featuring or promoting items to help reach your targets.

5.3.1 Calculating Menu Item Costs

The cost per portion derived from yield tests done on the main ingredient of a menu item usually represents the greatest part of the cost of preparing the item (see the unit above on yield tests for more information). However, of equal importance is the portion cost factor which can be used to determine the cost of a portion of the main ingredient. Quite often the cost per portion of the main ingredient is used by itself to determine the selling price of a menu item. This works well with items on an à la carte menu as the basic main ingredient (such as a steak) is sold by itself and traditional add-ons (such as a baked potato and other vegetables) are sold separately. In many cases, some of the components will be the same, so a basic plate cost can be used to add to

the cost of the main protein to get a total cost for the dish. In dishes where the main ingredients are not sold as entities but as part of a prepared dish, the cost of all the items in the recipe must be determined to find an accurate portion cost price. In this case, a recipe detail and cost sheet is used to determine the cost price of menu items. (Refer back to the previous unit on costing individual menu items.) Once the potential cost of a menu item is determined, the selling price of the item can also be calculated by using the food cost percentage.

- **Food Cost Percentages:** As you may recall, food cost percentage is determined by dividing the portion cost by the selling price:

Food cost percentage

If the portion cost is ₦480 and the selling price is ₦1400, the food cost percentage is: food cost

percentage = portion cost/selling price

$$= \frac{₦480}{₦1400}$$

$$= 0.34285$$

Another way of expressing the food cost is as a cost mark-up

Cost mark-up

The cost mark-up is determined by reversing the food cost percentage equation:

$$\text{cost mark-up} = \text{selling price/portion cost}$$

The cost mark-up can also be determined by dividing the food cost percentage into 1. The equation then becomes: $\text{cost mark-up} = 1/\text{food cost percentage}$

In the example above, where the portion cost is ₦120 and the selling price is ₦350, the cost mark-up can be solved in the following ways:

$$\text{cost mark-up} = \text{selling price/portion cost}$$

$$= \cancel{₦1400}/\cancel{₦480}$$

$$= 2.9166$$

$$= 2.92$$

$$\text{or cost mark-up} = 1/\text{food cost percentage}$$

$$= 1/34.285\%$$

$$= 1/0.34285$$

$$= 2.91674$$

$$= 2.9$$

The cost mark-up can be used to determine a selling price when a portion cost is known by multiplying the cost mark-up and the portion cost:

Determine a selling price

selling price = portion cost x cost mark-up. For example, if the ingredients for a portion of soup costs N105 and the restaurant has a cost mark-up of 3.6, the menu price of the soup is:

$$\text{selling price} = \text{portion cost} \times \text{cost mark-up}$$

$$= \text{N}105 \times 3.6$$

$$= \text{N}378$$

The restaurant would charge at least N378 for the menu item if it wants to keep its mark-up margin at 3.6, which is about a 28% food cost percentage. This price might be adjusted because of competition selling the same item for a different price, price rounding policies of the restaurant or the whims of management. For example, many restaurants have prices that end in 5 or 9 (such as N499 or N595). Prices on such menus tend to be rounded to the nearest number ending in 5 or 9. No matter what the final menu price is, at least a base price has been established

The problem with the above approach is that it does not explain how to select a food percentage or a selling price from which to derive the percentage. In many cases, the food percentage is based on past experiences of the manager, or by a supposed awareness of industry averages. For example, many people simply set their food percentage at 30% and never work out a more appropriate figure. Similarly, the selling price of a menu item is often the product of guessing what the market will bear: N450 for a bowl of soup may seem like a good deal or as much as a reasonable person might pay in that restaurant. Unfortunately, none of these methods takes into account the unique situations affecting most restaurants. A more accurate way of computing a target food cost percentage is to estimate total sales, labour costs, and hoped-for profits. These figures are used to determine allowed food costs. The total of projected food costs is divided by

the projected sales to produce a food cost percentage. The food cost percentage can be turned into a mark-up margin by dividing the percentage into 1, as shown above.

Example

For example, to determine the food cost percentage of a restaurant that has projected sales of ₦1,000,000 and labour costs of ₦600,000, overhead of ₦100,000, and a goal of before-tax profits of ₦50,000, the following procedure is used:

Food costs = sales – (labour costs + overhead + profit)

= ₦1,000,000 – (₦600,000 + ₦100,000 + ₦50,000)

= ₦1,000,000 – (₦750,000)

= ₦250,000

food percentage = food costs/sales

= ₦250,000/₦1,000,000

= 0.25

= 25%

mark-up margin = 1/food percentage

= 1/25%

= 1/0.25

= 4

In this example, the menu prices would be determined by multiplying the portion costs of each item by the mark-up margin of 4. Adjustments would then be made to better fit the prices to local market conditions.

If the application of the derived mark-up margin produces unreasonable prices, then one or more of the projected sales, labour costs, overhead, or profits are probably unreasonable. The advantage of using this system is that it points out (but does not pinpoint) such problem assumptions early in the process. A similar approach uses a worksheet as shown in Figure 1

Worksheet to Calculate Menu Prices		
Name of Item: _____		
Known Costs (per sales dollar):	Operating Cost	_____ %
	Labour Cost	_____ %
	Profit Wanted	_____ %
	Total	_____ %
Subtract this Total from 100 to arrive at TARGET FOOD COST %	Target food cost	_____ %
Determine mark-up margin (1/food cost percentage)	Mark-up margin	_____
Food Cost		
One complete serving includes... Yield...	Or total recipe includes... Portions...	
Amount	Item	Cost
		\$
		\$
		\$
		\$
		\$
		\$
		\$
		\$
		\$
		\$
Total Food Cost		
Mark-up margin (above)		
Multiply food cost by mark-up margin to arrive at: MENU PRICE		

Figure 3.1 Worksheet to Calculate Menu Prices
Image from Basic Kitchen and Food Service Management – (CC BY 4.0)

In the middle section of the worksheet in Figure 1, a food cost percentage is determined by subtracting other known cost percentages from 100%. Food costs are then determined in the bottom half of the sheet and a menu price derived by multiplying the total cost by the mark-up margin. In this pricing method, a “profit wanted” percentage is added to the cost of each menu item. This builds some potential profit into the menu prices. If you were to price everything according to costs only, the restaurant would only ever be able to break even and never turn a profit.

▪ Contribution Margins

On the surface, it seems that the lower the food cost, the more room there is for profit. In one sense this is true, as the percentage profit is obviously greater for an item that has a food cost percentage of 25% (or 75% percentage profit) than an item that has a food percentage cost of 45% (or 55% percentage profit). However, in terms of monetary profit, the issue is not that straightforward. What has to be determined is how much money the menu item generates. This calculation involves finding the contribution margin of each item.

Contribution Margins	
Contribution margin is determined by subtracting the cost from the selling price. An item that costs ₦200 to make and sells for ₦300 has a contribution margin of:	
contribution margin = selling price – cost price	
= ₦300 – ₦200	
= ₦100	

Consider the contribution margin of two menu items that have different food costs and food cost percentages shown in Table 5.3.4

Item	Food Cost	Selling Price	Food Cost %	Contribution Margin
Chicken	₦450	₦1650	27%	₦1200
Steak	₦900	₦2400	38%	₦1500

The Table above compares Chicken and Steak on Food Cost, Selling Price, Food Cost Percentage and Contribution Margin

In terms of percentage profit, the chicken is higher. However, in terms of money in the till, the steak creates more money that can be used to pay bills. The key to a good menu is not necessarily to just keep food cost percentages low; it is to also to keep contribution margins high.

Self-Assessment Exercises 1

1. What is blended pricing?
2. What is the purpose of contribution margin?

5.4 Pricing “all you can eat” menus

Menu offerings such as buffets and salad bars offer a different challenge when it comes to pricing. Actually the pricing can be done using the calculations described previously. The challenge is calculating the unit cost or “plate cost” which has to be established prior to setting a price. The simple formula for “plate cost” is dividing the total food cost by the number of customers served. Calculating the total food cost requires keeping track of what is used on the buffet or salad bar on an average day or meal period. To do this track product usage by recording the number of servings at the beginning of the serving period, adding any additional servings as needed during the service time, and then subtract the number of portions left at the end of the serving period. Multiply the total number of servings (portions) used by the cost per serving for a total food cost for each offer on the buffet or salad bar. Then calculate the total naira amount of product used and divide by the number of customers served. See the sample chart below.

Example: Buffet Menu Offerings : Once the total cost of the buffet is established, divide by the number of customers served. Example: ₦29,370 divided by 66 customers = ₦445 (This is the plate cost or cost per serving that should be used for setting the menu price for the buffet.

Table 5.3.5 Calculating Menu Item’s Total Production Cost

Menu Item	Number of portions at start	Number of portions added	Number of portions at close	Total portions used	Recipe cost per portion	Total product cost
Macaroni & Cheese	50	25	5	70	₦75	₦5,250
Chicken Wings	50	50	8	92	₦80	₦7,200
BBQ Ribs	50	40	3	87	₦110	₦9,570
Potato Salad	40	20	10	50	₦60	₦3,000

Macaroni Salad	30	20	5	45	₦50	₦2250
Tossed Salad	25	10	5	30	₦70	₦2100
Total Buffet Cost						₦29,370

5.4.1 Special Pricing Strategies

Various pricing strategies are also used to drive business in a foodservice operation. These include things like bundling (combo meals), value pricing and couponing, all of which are probably familiar concepts to most. These pricing approaches strive to either increase the number of customers patronizing the operation or increase the average check or the amount each customer spends. The end goal – increase revenue!

- **Bundling**

Bundling is combining a group of menu items, typically an entrée, side and beverage, and selling the items together for one price, sometimes called a combo meal. The combined price is typically a bit cheaper than if the menu items were purchased separately, but the “bundle” price often increases the average check for each customer, thus bringing in more revenue overall for the operation. The availability of combo meals could also positively influence a customer’s decision to visit a foodservice operation.

- **Value Pricing**

These are items that will contribute a reduced contribution margin to the foodservice business and are sometimes called “loss leaders.” The idea is that the price of a few popular menu items is reduced to encourage customers to visit the operation for these great values thus increasing the total number of customers for the operation. Happy hour at many bars and restaurants often has some sort of value pricing on a few beverage options. The intended result is more customers

which leads to more revenue. The hope with the value pricing of menu and beverage items is that customers will also purchase other menu items with a higher contribution margin and increase profits overall.

- **Coupons**

“Buy one, get one free (or second item half price), or 20% off an entrée between the hours of 4pm to 5pm or on Monday evenings (typically slower times for restaurants), are typical examples of coupons. Coupons may be paper or electronic. This pricing strategy allows a foodservice operation to target the general public, perhaps in an attempt to gain new customers, or reward a specific customer, perhaps those who are part of a loyalty program or celebrating a special occasion, such as a birthday. Either way, the overall goal of coupons is typically to increase the number of customers, thus increasing overall revenue.

- **The Pricing Challenge**

Foodservice managers responsible for pricing menu items will find that they need to draw on not only the math of recipe costing and pricing factors but also the psychology behind designing the actual physical menu, which is a major marketing tool in this business. Understanding the target customers’ needs and wants along with the price/value relationship for those customers is a significant responsibility for whoever makes the final decision on menu prices for a foodservice operation.

Self-Assessment Exercises 2

- | |
|--|
| <ol style="list-style-type: none">1. What is Bundling?2. What is Coupons? |
|--|



5.5 Summary

One of the key concepts you need to understand to set proper menu prices is food cost percentage. This important metric shows how much of your overall sales are spent on ingredients and food supplies. Keeping tabs on your food costs will help you set menu prices and maximize profits. Food cost is the ratio of a restaurant's cost of ingredients (food inventory) and the revenue that those ingredients generate when the menu items are sold (food sales). Food cost is almost always expressed as a percentage known as food cost percentage.

Successful restaurants make a habit of tracking their menu prices and sales and making ongoing adjustments as food costs fluctuate. While it might seem like a hassle, carefully controlling your restaurant's food cost percentages assures that your restaurant is able to pay its bills and turn a profit on each sale. In an industry with notoriously low profit margins, every cent counts.

5.6 Glossary

Banquet: A formal large meal or feast, where a number of people consume food together.

Bar: Any area of a restaurant, excluding the dining area that is primarily devoted to the serving of alcoholic beverages for consumption by guests on the premises and in which food service, if any is only incidental to the consumption of such beverages

Beverage: Any potable liquid, especially one other than water, as tea, coffee, beer, or milk:

Contribution margin: Is a product's price minus all associated variable costs, resulting in the incremental profit earned for each unit sold.

Control: A person or thing used as a standard of comparison for checking results

Costing: The proposed or estimated cost of producing or undertaking something.

Employee: Is someone who gets paid to work for a person or company

Garnish: To decorate or embellish (something, especially food)

Inventory: Refers to a company's goods and products that are ready to sell, along with the raw materials that are used to produce them

Knowledge: The facts, information, and skills acquired through experience or education; the theoretical or practical understanding of a subject.

Pilferage: The action of stealing things of little value.

Management: The process of dealing with or controlling things or people

Menu: A list of the dishes that may be ordered (as in a restaurant) or that are to be served (as at a banquet)

Merchandising: The activity of promoting the sale of goods, especially by their presentation in retail outlets.

Mise en place: Is a French term for "in its place." In the world of cooking, it refers to gathering and setting up everything required to prepare a dish, or multiple dishes in large quantities in

restaurant kitchens, making sure each ingredient is ready to play its role before the actual cooking

Phase: A distinct period or stage in a series of events or a process of change or development.

Pricing: A process of fixing the value that a manufacturer will receive in the exchange of services and goods

Recipe: A set of instructions for preparing a particular dish, including a list of the ingredients required.

Restricted: It is limited in extent, number, scope, or action.

Sale: It is a transaction between two or more parties in which the buyer receives tangible or intangible goods, services, or assets in exchange for money.

Standardization: Is the process of developing, promoting and possibly mandating standards-based and compatible technologies and processes within a given industry

Standard Portion Size: Represents the amount (weight, count, size or value) of each food item which is sold to the guest for a stated price and should be established for all items, including appetizers, main courses, vegetables, salads, desserts, beverages, etc.

Standard yield: It is the yield obtained when an item is processed as per the particular standard methods of preparation, cooking and portioning of an establishment

Test: A procedure intended to establish the quality, performance, or reliability of something, especially before it is taken into widespread use.

Yield: In culinary terms refers to how much you will have of a finished or processed product.



5.7 References/ Further Reading

Beth Egan, Pennsylvania State University Introduction to Food Production and Service (2/25/2022) retrieved from <https://workforce.libretexts.org/@go/page/11364>



5.8 Possible Answers to Self-Assessment Exercises

Self-Assessment Exercise 1

1. Blended pricing results from using menu engineering or menu analysis. It is the balancing of the menu so that the low and high food cost items work together to help you reach your target food cost.
2. Given the contribution margin, a manager can easily compute breakeven and target income sales, and make better decisions about whether to add or subtract a product line, about how to price a product or service, and about how to structure sales commissions or bonuses. Contribution margin analysis is a measure of operating leverage; it measures how growth in sales translates to growth in profits

Self-Assessment Exercise 2

1. Bundling is combining a group of menu items, typically an entrée, side and beverage, and selling the items together for one price, sometimes called a combo meal. The combined price is typically a bit cheaper than if the menu items were purchased separately, but the “bundle” price often increases the average check for each customer, thus bringing in more revenue overall for the operation. The availability of combo meals could also positively influence a customer’s decision to visit a foodservice operation.
2. Couponing: “Buy one, get one free (or second item half price), or 20% off an entrée between the hours of 4pm to 5pm or on Monday evenings (typically slower times for restaurants), are typical examples of couponing. Coupons may be paper or electronic.

This pricing strategy allows a foodservice operation to target the general public, perhaps in an attempt to gain new customers, or reward a specific customer, perhaps those who are part of a loyalty program or celebrating a special occasion, such as a birthday. Either

way, the overall goal of couponing is typically to increase the number of customers, thus increasing overall revenue.

MODULE 6

Unit 1 The Work Process: Responsibilities Of Food & Beverage Management

Unit 2 F/B Service Operations Front Of the House

Unit 3 F& B Service Operations: Back Of the House

Unit 4 Cost Control

UNIT 1 THE WORK PROCESS: RESPONSIBILITIES OF FOOD & BEVERAGE MANAGEMENT

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1.2 Learning Outcomes

1.3 Food & Beverage management

1.4 Manager Job Analysis

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1.4.2 Financial Management

1.4.3 Administrative Management

1.4.4 Operations Management

1.5 Summary

1.6 References/Further Readings

1.7 Possible Answers to Self-Assessment Exercises



1.1 Introduction

Management is essential for an organized life and necessary to run all types of management. Good management is the backbone of successful organizations. Managing an organization means getting things done with and through other people to achieve its objectives.

In this unit, we shall examine, The Work Process: Responsibilities of F&B Management; steps in management function, manager job analysis, human resources management, financial management, administrative management and operations management.



1.2 Learning Outcomes

At the end of this unit you should be able to

- discuss the steps in management function
- discuss the role of a manager in the following areas of management
 - a) human resources management
 - b) financial management
 - c) administrative management
 - d) operations management



3.1 Food & Beverage management

■ Preamble

Food & Beverage management deals with various aspects of managerial practices in a catering operation, such as planning for purchasing, receiving, issuing and storing. But the most important aspect is to bring down the cost so that maximum profit can be achieved by an organization. Food & Beverage Management is concerned with the management of an operation,

which is constructed from three identifiable operating systems (food production, service sequence and customer process) that are interlinked and each of these three systems is made up from a variety of subsystem.

- **Definition of Management**

Management is defined as the means by which effective utilization of resources in the form of men, machines, materials, and methods is fulfilled in line with the objectives of an organization. F&B management refers to the utilization of various F&B resources such as staff, raw and cooked materials, various cooking and serving equipment, time taken for preparing and serving, and the ways of effective operation, and quality performance.

- **Steps in the Management Function**

- ◆ **Planning:**

Planning is the task of creating various goals, objectives, and processes to reach the aims and objectives of an organization. For effective planning, information should be accessed completely. Managers should communicate with all levels in their hierarchy as well as with employees. This is required as it is easy to follow a plan conceived by employees. Planning should offer flexibility and the implementation has to be effective. In the F&B department, planning is usually done after considering various policies of the organization. For example, the financial policy by which profitability and cost constraints could be determined is an important policy to be considered. The planning process also includes marketing policies as per the needs of different markets. Planning could be short term and long term, considering the need of the establishment. In the planning stage, the type of food establishment-whether it is a restaurant or a cafeteria may be decided. Accordingly, managers decide the menu, price, and labour and overhead costs.

- ◆ **Organizing:** Organizing is usually done after planning, though, at times, both the steps may be done simultaneously. Organizing includes allocation of resources, allotting duties, and incorporating systems and procedures to meet the requirements or the objectives set in the planning process. While organizing the resources for an establishment, it is necessary to count all the resources including man-power. Considering the delegation of duties done as per the hierarchical structure in the kitchen as well as in the F&B service department, the manager allocates duties to the supervisor who delegates the same to the subordinates as regards the tasks to be performed and the resources used.
- ◆ **Coordinating:** Coordinating is the process of delegating work to people and managing resources to meet the organization's objectives. For better coordination, proper communication channels should exist so that messages are transferred both up and down as well as amongst peers in the organizational structure. Delegation is an important aspect; it means that the authority is passed down in the hierarchical structure, but the onus still lies on the individual on the top.
- ◆ **Directing:** Directing is the process of getting work done by other people by instructing, training, guiding, supervising, and reviewing the skills required for a particular job. The first task of directing is to establish the number of employees for a particular job. After they have been recruited, the supervising staff should know how to motivate them, gain cooperation, and bring out the best in employees. The quantity of manpower should be optimum; neither too many nor too few is preferred as additional manpower will increase labour cost and less manpower will have an impact on guest satisfaction. Motivation plays an important role in any establishment, and especially in Food & Beverage Department where team work is important. It can be done by training staff, encouraging various group activities, and conducting meetings

between staff and management to share problems and come up with remedial measures. Apart from motivation, disciplining employees is very important. Discipline does not involve punishment but refers to correcting the improper behaviour of an employee so that he/she becomes more productive to the organization.

- ◆ **Controlling:** Controlling is a process by which the management ensures that plans and objectives are in line with the schedule, and the target set would be achievable. In F&B management, controlling involves checking actual performance with the budgeted and forecasted levels so that any deviation from the path is rectified on time and steps are taken to prevent the problem from occurring again. It is also a process by which the operation in the establishment functions smoothly and profitably.

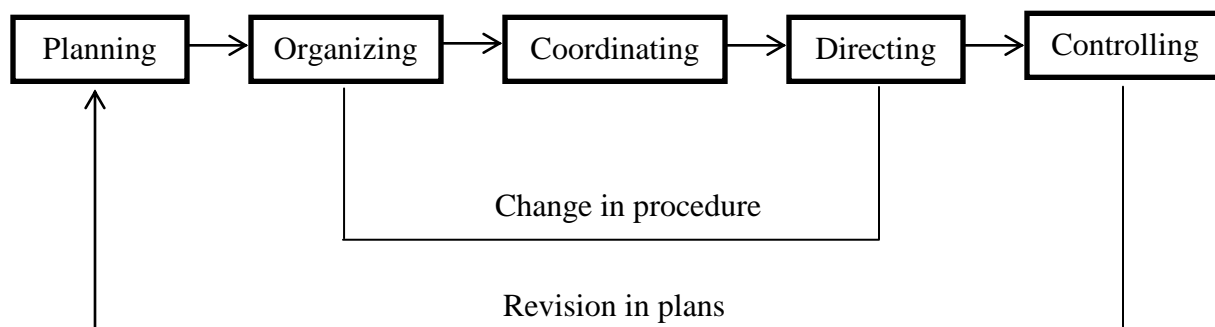


Figure 6.1.1 Management Function Process

Self-Assessment Exercises 1

1. What is Management in Food & Beverage industry?
2. Enumerate the management function process

1.4 Manager Job Analysis

The job of restaurant general manager or managing partner, if they own a stake in the business, is very challenging and demanding, and requires strong leadership and organizational skills. First,

let us analyse the job by examining the key areas of the job. An analysis of the foodservice manager's job by functional areas and tasks are seen in the following areas:

1.4.1 Human Resource Management

- **Recruiting/Training**

1. Recruit new employees by seeking referrals.
2. Recruit new employees by advertising.
3. Recruit new employees by seeking help from district manager/supervisor.
4. Interview applicants for employment.

- **Orientation/Training**

1. Conduct on-site orientation for new employees.
2. Explain employee benefits and compensation programs.
3. Plan training programs for employees.
4. Conduct on-site training for employees.
5. Evaluate progress of employees during training.
6. Supervise on-site training of employees that is conducted by another manager, employee leader, trainer, and so on.
7. Conduct payroll signup.
8. Complete reports or other written documentation on successful completion of training by employees.

- **Scheduling for Shifts**

1. Review employee work schedule for shift.
2. Determine staffing needs for each shift.
3. Make work assignments for dining room, kitchen staff, and maintenance person(s).
4. Make changes to employee work schedule.

5. Assign employees to work stations to optimize employee effectiveness.
 6. Call in, reassign, or send home employees in reaction to sales and other needs.
 7. Approve requests for schedule changes, vacation, days off, and so on.
- **Supervision and Employee Development**
 1. Observe employees and give immediate feedback on unsatisfactory employee performance.
 2. Observe employees and give immediate feedback on satisfactory employee performance.
 3. Discuss unsatisfactory performance with an employee.
 4. Develop and deliver incentive for above-satisfactory performance of employees.
 5. Observe employee behaviour for compliance with safety and security.
 6. Counsel employees on work-related problems.
 7. Counsel employees on non-work-related problems.
 8. Talk with employees who have frequent absences.
 9. Observe employees to ensure compliance with fair labour standards and equal opportunity guidelines.
 10. Discipline employees by issuing oral and/or written warnings for poor performance.
 11. Conduct employee and staff meetings
 12. Identify and develop candidates for management programs.
 13. Put results of observation of employee performance in writing.
 14. Develop action plans for employees to help them in their performance.
 15. Authorize promotion and/or wage increases for staff.
 16. Terminate employment of an employee for unsatisfactory performance.

1.4.2 Financial Management

- **Accounting**

1. Authorize payment on vendor invoices.
2. Verify payroll.
3. Count cash drawers.
4. Prepare bank deposits.
5. Assist in establishment of audits by management or outside auditors.
6. Balance cash at end of shift.
7. Analyse profit and loss reports for establishment.

- **Cost Control**

1. Discuss factors that impact profitability with district manager/supervisor.
2. Check establishment figures for sales, labour costs, waste, inventory, and so on.

1.4.3 Administrative Management

- **Scheduling/Coordinating**

1. Establish objectives for shift based on needs of establishment.
2. Coordinate work performed by different shifts, for example, cleanup, routine maintenance, and so on.
3. Complete special projects assigned by district manager/ supervisor.
4. Complete shift readiness checklist.

- **Planning**

1. Develop and implement action plans to meet financial goals.
2. Attend off-site workshops and training sessions.

- **Communication**

1. Communicate with management team by reading and making entries in daily communication log.
2. Prepare written reports on cleanliness, food quality, personnel, inventory, sales, food waste, labour costs, and so on.
3. Review reports prepared by other establishment managers.
4. Review memos, reports, and letters from company headquarters/main office.
5. Inform district manager/supervisor of problems or developments that affect operation and performance of the establishment.
6. Initiate and answer correspondence with company, vendors, and so on.
7. File correspondence, reports, personnel records, and so on.

- **Marketing Management**

1. Create and execute local establishment marketing activities.
2. Develop opportunities for the establishment to provide community services.
3. Carry out special product promotions.

1.4.4 Operations Management

- **Facility Maintenance**

1. Conduct routine maintenance checks on facility and equipment.
2. Direct routine maintenance checks on facility and equipment.
3. Repair or supervise the repair of equipment.
4. Review establishment evaluations with district manager/ supervisor.
5. Authorize the repair of equipment by outside contractor.
6. Recommend upgrades in facility and equipment.

- **Food and Beverage Operations Management**

1. Direct activities for opening establishment.
 2. Direct activities for closing establishment.
 3. Talk with other managers at beginning and end of shift to relay information about ongoing problems and activities.
 4. Count, verify, and report inventory.
 5. Receive, inspect, and verify vendor deliveries.
 6. Check stock levels and submit orders as necessary.
 7. Talk with vendors concerning quality of product delivered.
 8. Interview vendors who wish to sell products to establishment.
 9. Check finished product quality and act to correct problems.
 10. Work as expediter to get meals served effectively.
 11. Inspect dining area, kitchen, rest rooms, food lockers, storage, and parking lot.
 12. Check daily reports for indications of internal theft.
 13. Instruct employees regarding the control of waste, portion sizes, and so on.
 14. Prepare forecast for daily or shift food preparation.
- **Service**
 1. Receive and record table reservations.
 2. Greet familiar customers by name.
 3. Seat customers.
 4. Talk with customers while they are dining.
 5. Monitor service times and procedures in the dining area.
 6. Observe customers being served in order to correct problems.
 7. Ask customers about quality of service.
 8. Ask customers about quality of the food product.
 9. Listen to and resolve customer complaints.

10. Authorize complementary meals or beverages.
11. Write letters in response to customer complaints.
12. Telephone customers in response to customer complaints.
13. Secure and return items left by customers.

- **Sanitation and Safety**

1. Accompany local officials on health inspections on premises.
2. Administer first aid to employees and customers.
3. Submit accident, incident, and OSHA reports.
4. Report incidents to police.
5. Observe employee behaviour and establishment conditions for compliance with safety and security procedures.

The above comprehensive analysis of a restaurant manager's job details all the major areas that a restaurant manager will deal with. Depending on the type of restaurant, more emphasis may be placed on one area over another – and that may change from day to day.

Next, is the job of an assistant restaurant manager. Most restaurants go with an opening and closing manager. In either case, they perform much the same basic duties plus any special opening or closing requirements.

An assistant restaurant manager does some of the duties of a restaurant manager, and generally there is both an opening manager and a closing manager.

Restaurants are traditionally organized by front and back of the house. The front of the house comprises the servers, bussers, wine stewards, bartenders, and cocktail servers, while the back of the house includes the chef and kitchen cooks, dishwashers, stewards, dishwashers, receivers, and storekeepers.

Self-Assessment Exercises 2

- | |
|---|
| <ol style="list-style-type: none">1. State the importance of management2. Enumerate the role of a food service Manager in the financial management |
|---|



1.5 Summary

Management is often called the unseen force; its presence is evidenced by the results of its efforts – motivation among employees, discipline in the group, high productivity, adequate surplus, etc.

A manager's job is highly crucial to the success of any organization. The more complex the organization, the more crucial the manager's role is. A good manager makes things happen. A leader has certain inherent qualities and traits which assist him in playing a directing role and wielding commanding influence with others. Leadership is an integral part of management and plays a vital role in managerial operations, while management is an integral component of technical as well as social processes.

In this unit we examined, the work process; Responsibilities of F & B Management; steps in management function, manager job analysis, human resources management, financial management, administrative management and operations management.



1.6 References/ Further Reading

Higher Education| Pearson, chapter 7 Restaurant Operation retrieved from <https://www.pearsonhighered.com/assets/samplechapter/0/1/3/4/013474506X.pdf>

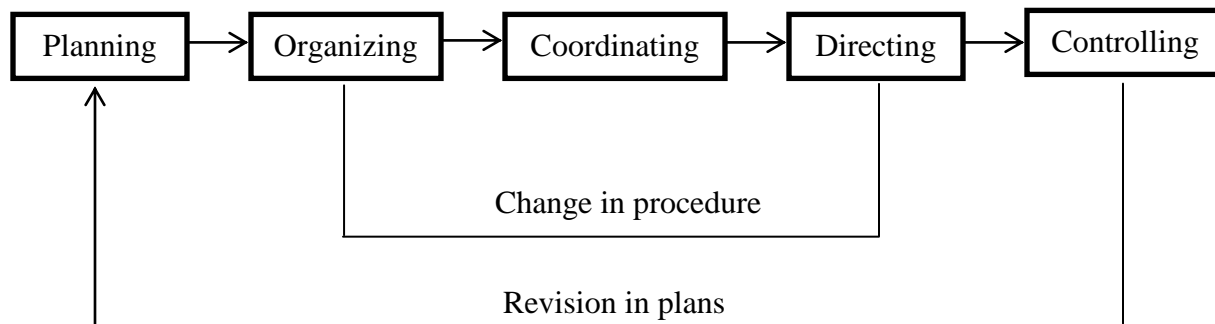
Food and Beverage Management, Uttarakhand retrieved from <https://uou.ac.in/sites/default/files/slm/HM-301.pdf>



1.7 Possible Answers to Self-Assessment Exercises

Self-Assessment Exercise 1

1. Management is defined as the means by which effective utilization of resources in the form of men, machines, materials, and methods is fulfilled in line with the objectives of an organization. F&B management refers to the utilization of various F&B resources such as staff, raw and cooked materials, various cooking and serving equipment, time taken for preparing and serving, and the ways of effective operation, and quality performance.
2. The management function process are:



Self-Assessment Exercise 2

1. Management helps in Achieving Group Goals, It arranges the factors of production, assembles and organizes the resources, integrates the resources in effective manner to achieve goals. It directs group efforts towards achievement of pre-determined goals, It helps to make effective use of the available resources, It reduces cost and maximizes productivity, It helps in the growth and development of the organization, It provides a clear leadership structure in the organization, It helps maintains discipline by a delegation of authority, It helps in setting a proper recruitment plan, It also enhances adaptation a

dynamic environment helps the organization change and adapt quickly to the tide of the market, It also has to do with having a future and a sustainable plan for the future.

2. Financial Management: Accounting

- i. Authorize payment on vendor invoices.
- ii. Verify payroll.
- iii. Count cash drawers.
- iv. Prepare bank deposits.
- v. Assist in establishment of audits by management or outside auditors.
- vi. Balance cash at end of shift.
- vii. Analyse profit and loss reports for establishment.
- viii. Cost Control
- ix. Discuss factors that impact profitability with district manager/supervisor.
- x. Check establishment figures for sales, labour costs, waste, inventory, and so on.

UNIT 2 FOOD & BEVERAGES SERVICE OPERATIONS FRONT OF THE HOUSE

CONTENTS

2.1 Introduction

2.2 Learning Outcomes

2.3 FOH operations

2.4 Restaurant Forecasting

2.5 Summary

2.6 References/Further Readings



2.1 Introduction

The terms “front of house” and “back of house” are used in the restaurant community to distinguish between different areas in a restaurant. We shall consider the front of the house in this unit. The front of the house designates all of the areas in a restaurant where customers can go. The front of house is the area where customers directly interact with staffs (i.e. where diners sit).

In this unit, we will examine Food and Beverage Service Operations: Front of the House; restaurant organization, restaurant forecasting and various services, etc.



2.2 Learning Outcomes

At the end of this unit, you should be able to:

- discuss restaurant operations for the Front of the House (FOH)
- discuss the steps to take in table service
- discuss the purpose of forecasting
- demonstrate the service types



2.3 FOH operations

Restaurant operations are generally divided between what is commonly called front of the house and back of the house. The front of the house includes anyone with guest contact, from the hostess to the bus person. The sample organization chart in Figure 1 shows the differences between the front and back of the house areas.

The general manager or restaurant manager runs the restaurant. Depending on the size and sales volume of the restaurant, there may be more managers with special responsibilities, such as kitchen manager, bar manager, and dining room manager. These managers are usually cross-trained in order to relieve each other.

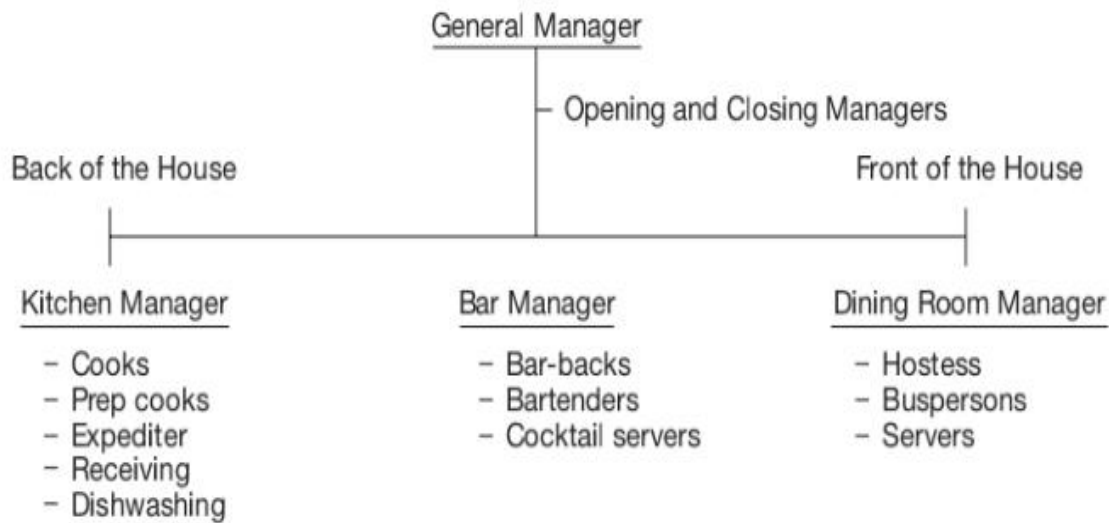


Figure 6.2.1 Restaurant Organization Chart

In the front of the house, restaurant operation begins with creating and maintaining what is called curbside appeal, or keeping the restaurant looking attractive and welcoming. Most restaurant chains have checklists that each manager uses. In the front of the house, the parking lot, including the flower gardens, needs to be maintained in good order. As guests approach the restaurant, greeters may hold the door open and welcome them to the restaurant.



The front of the house includes anyone with guest contact, from the hostess to the bus person

Once inside, the greeter, or as some restaurants call them, a “smiling people greeter” (SPG), greets guests appropriately and, if seating is available, escorts them to a table. If there is a wait, the hostess will take the guests’ names and ask for their table preference.

Aside from greeting the guests, one critical function of the hostess is to rotate arriving guests among the sections or stations. This ensures an even and timely distribution of guests—otherwise one section may get overloaded. Guests are sometimes asked to wait a few minutes even if tables are available. This is done to help manage the kitchen’s workload—because most kitchens have limited space and cannot cope with too much volume at one time.

The greeters maintain a book, or chart, showing the sections and tables so they know which tables are occupied. Greeters escort guests to the tables, present menus, and may explain special sales promotions. Some may also remove excess place settings from the table.

In some restaurants, servers are allocated a certain number of tables, which may vary depending on the size of the tables and the volume of the restaurant. Normally, five is the maximum. In other restaurants, servers rotate within their section to cover three or four tables.

Servers introduce themselves and offer a variety of beverages and/or specials, or invite guests to select from the menu. This is known as suggestive selling. The server then takes the entree orders. Often, when taking orders, the server begins at a designated point and takes the orders clockwise from that point. In this way, the server will automatically know which person is having a particular dish. Good servers are also encouraged, when possible, to pre-bus tables. Bussers and servers may clear the entree plates, while servers suggestively sell desserts by describing, recommending, or showing the desserts. Coffee and after-dinner cocktails are also offered.

Suggestions for steps to take in table service include the following:

- Greet the guests.
- Introduce and suggestively sell beverages.
- Suggest appetizers.
- Take orders.
- Check to see that everything is to the guests' liking within two bites of the entrees.
- Ask if the guests would like another drink.
- Bring out dessert tray and suggest after-dinner drinks and coffee.

In addition to the seven steps of the table service, servers are expected to be NCO—(neat, clean, and organized)—and to help ensure that hot food is served hot, and cold food is served cold.

Self-Assessment Exercises 1

1. What is the Front of the House?
2. State the steps to take in table service

2.4 Restaurant Forecasting

Most businesses, including restaurants, operate by formulating a budget that projects sales and costs for a year on a weekly and monthly basis. Financial viability is predicted on sales, and sales budgets are forecasts of expected business. Forecasting restaurant sales has two components: guest counts or covers and the average guest check. Guest counts or covers are the number of guests patronizing the restaurant over a given time period—a week, month, or year. To forecast the number of guests for a year, the year is divided into twelve 28- and one 29-day accounting periods.



Forecasting restaurant sales has two components: guest counts or covers and the average guest check

The accounting periods then are broken down into four 7-day weeks. Restaurant forecasting is done by taking into consideration meal period, day of week, special holidays, and previous forecast materializations.

In terms of number of guests, Mondays usually are quiet; business gradually builds to Friday, which is often the busiest day. Friday, Saturday, and Sunday frequently provide up to 50 percent of revenue. This, however, can vary according to type of restaurant and its location.

The average guest check is calculated by dividing total sales by the number of guests. Most restaurants keep such figures for each meal. The number of guests forecast for each day is multiplied by the amount of the average food and beverage check for each meal to calculate the total forecast sales. Each day, actual totals are compared with the forecasts. Four weekly forecasts are combined to form one accounting period; the 13 accounting periods, when totalled, become the annual total.

Restaurant forecasting is used not only to calculate sales projections, but also to predict staffing levels and labour cost percentages. Much depends on the accuracy of forecasting. Once sales figures are determined, all expenditures, fixed and variable, must be deducted to calculate profit or loss.

- **Point of Sale and Software Systems**

There are several Point of Sale Systems (POS) available for restaurants. Some are for large restaurants and chains like franchises, while others are better suited for smaller independent restaurants and cafés. For example, Shop keep is a cloud-based POS system for iPads that can tailor menus, monitor inventory, manage employees, market to guests, and analyze data, whereas Square is good for quick-service restaurants or cafés. It can come with a square stand that transforms an iPad into a simple cash register. NCR, a long-standing provider of POS, has a cloud-based POS system, as do several other companies.

-Open Table (OT) manages walk-ins, waitlists, and reservations. This allows operators to communicate with guests before and after their visit. One advantage of Open Table is that guests can make reservations, even when the restaurant is closed. OT stores useful guest information, such as seating preferences, VIP's, dietary restrictions, and special events. OT also enables smarter table management with floor plans to pre-assign tables, monitor table status, and assign server sections.

-Next Table is a cloud-based reservation and table management system for an iPad. It can manage not only table reservations, but also restaurant operations.

-Oracle is also a cloud-based reservation system that enables guests to see time and availability and request reservations from a restaurant's Web site. Guests can see current availability and next table reservation times.

-No Wait is an on-demand mobile app that helps bring guests into a restaurant and aids in their seating.

-There is the free Table Agent restaurant reservation system app in Cloud that offers restaurants alternatives to paid systems.

-Other systems include Dine Time, Cake, and Quora, which even texts guests when their table is ready, so they can relax at the bar or wherever.

Service :Great service adds tremendous value to the dining experience; something most guests are willing to pay for. The following are various established styles of service:



Great service adds tremendous value to the dining experience.

American service is a method in which the food is prepared and decoratively placed onto plates in the kitchen, carried into the dining room, and served to guests. American service is a less formal—yet professional—approach preferred by today’s restaurant guests. The restaurants’ commitment to service is evidenced by the fact that most have increased training for new employees. Servers are not merely order takers; they are the salespeople of the restaurant.

French Service: This service is used in very formal restaurants where the food is attractively arranged on platters in the kitchen and brought to the table by servers and presented to guests, after which the preparation of the food is completed on a gueridon table beside the guest’s seat. A gueridon is a trolley-like table with a gas burner for tableside cooking. This is the most impressive and expensive form of service. Due to the higher cost of training and employing servers who can do French service, and given that sometimes the food is cold by the time the

guest gets to eat, this form of service is rarely used today except in very formal service situations.

Russian Service: The food is cooked in the kitchen, cut, placed onto a serving dish, and beautifully garnished. The dish is then presented to the guests and served individually by lifting the food onto the guest's plate with a serving spoon and fork. Russian service can be used at a formal restaurant where the servers use white gloves. Russian and French service share the same challenges: to get the food to the guests quickly so it is still hot, and to keep it priced reasonably. Russian service also is used only at very formal restaurants.

- **Good servers:** Good servers quickly learn to gauge guests' satisfaction levels and needs; they check to ensure guests have everything they need as their entree is placed before them. Even better, they anticipate guests' needs. For example, if the guest has used the entree knife to eat the appetizer, then a clean one should automatically be placed to the guest's right side. In other words, the guest should not receive the entree and then realize that he or she needs another knife.

Another example of good service is when the server does not have to ask everyone at the table who is eating what. The server should either remember or make a seating plan so that the correct dishes are automatically placed in front of guests.

- **Suggestive Selling**

Suggestive selling can be a potent weapon in the effort to increase food and beverage sales. Many restaurateurs cannot think of a better, more effective, and easier way to boost profit margins. Most guests are not offended or uncomfortable with suggestive selling techniques, provided servers are properly trained not to overdo it! In fact, guests may feel special that the server is in tune with their needs and desires. It may be that the server suggests something to the

guest that he or she has never considered before. The object here is to turn servers into sellers.

Guests will almost certainly be receptive to suggestions from competent servers.

Self-Assessment Exercises 2

1. What is restaurant forecasting?
2. State the Order Taking Service Standards expected of a Server



2.5 Summary: The front of the house includes anyone with guest contact, from those in charge of maintaining curbside appeal to the bus person. The general manager or restaurant manager runs the restaurant. There may be more managers with special managers who are cross-trained in order to relieve each other. The host greets guests and rotates arriving guests among the sections. Servers take and present orders, offer high-quality service, and use suggestive selling to increase food and beverage sales. Bussers clear tables.

Restaurants formulate a budget projecting sales and costs for a year on a weekly and monthly basis. Such forecasting involves estimating the number of guests and average guest check. Average guest check is calculated by dividing the total sales by number of guests. The number of guests forecast for each day is multiplied by the amount of the average food and beverage check for each meal to calculate the total forecast sales. Each day, actual totals are compared with the forecasts. Forecasting is also used to predict staffing levels and labor costs.

In this unit, we examined Food and Beverage Service Operations: Front of the House; restaurant organization, restaurant forecasting and various services, etc.



2.6 References/ Further Reading

Higher Education| Pearson, chapter 7 Restaurant Operation retrieved from <https://www.pearsonhighered.com/assets/samplechapter/0/1/3/4/013474506X.pdf>



2.7 Possible Answers to Self-Assessment Exercises

Self-Assessment Exercise 1

1. The front of the house, also called the FOH, refers to all actions and areas that a customer will be exposed to during their stay at a restaurant, such as the lobby and dining area. Your front of house space is the perfect place to use decor to set the theme of your restaurant.
2. Steps to take in table service include the following:
 - a. Greet the guests.
 - b. Introduce and suggestively sell beverages.
 - c. Suggest appetizers.
 - d. Take orders.
 - e. Check to see that everything is to the guests' liking within two bites of the entrees.
 - f. Ask if the guests would like another drink.
 - g. Bring out dessert tray and suggest after-dinner drinks and coffee.

In addition to the seven steps of the table service, servers are expected to be NCO—(neat, clean, and organized)—and to help ensure that hot food is served hot, and cold food is served cold.

Self-Assessment Exercise 2

1. What is restaurant forecasting?

Forecasting for restaurants is estimating key metrics like future sales, customer traffic, or menu item ordering mix based on historical sales data, economic trends, or market analysis. Sales forecasts, based on integrated POS data pulled from your restaurant operations software, are particularly powerful tools in the food and beverage industry

2. Order Taking Service Standards:

- i. Staff should have a warm smile and polite attitude, Approach guest table within 10 seconds whenever they need to order.
- ii. Always prepare a note pad and a pen.
- iii. Be attentive at the guest table.
- iv. Offer recommendation.
- v. Always repeat the guest order.
- vi. Inform guest of the expected service time.

UNIT 3 FOOD & BEVERAGES SERVICE OPERATIONS: BACK OF THE HOUSE

CONTENTS

3.1 Introduction

3.2 Learning Outcomes

3.3 Back of the House (BOH) operations

3.3.1 Kitchen and Food Production

3.3.2 Position of Assistant Manager Reports to Manager

3.4 Purchasing

3.5 Summary

3.6 References/Further Readings

3.7 Possible Answers to Self-Assessment Exercises



3.1 Introduction

In the previous unit the front of the house was examined. In this unit we shall examine the Back of the House; food production, kitchen and food production, responsibilities & duties of assistant manager and purchasing. The back of house is the staff area, where cooks and other support staff work.

The back of the house, also known as the BOH, encompasses all the behind-the-scenes areas that customers will not see. This acts as the central command center in a restaurant because it's where the food is prepared, cooked, and plated before making its way to the customer's table. All back-of-house staff should wear clean uniforms and aprons while on the job. The back of house also serves as a place for employees and managers to do administrative work.



3.2 Learning Outcomes

At the end of this unit, you should be able to:

- discuss back-of-the-house operations
- discuss kitchen and food production of back of the house in relation to
 - a) staffing and scheduling
 - b) training and development
 - c) production procedures
- discuss the back of the house, management involvement and follow-up
- analyse the responsibilities and duties of the assistant manager
- evaluate purchasing, as it relates to back of the house



3.3 BOH operations

The back of the house is generally run by the kitchen manager and the term refers to all the areas with which guests do not normally come in contact. This includes purchasing, receiving, storing/issuing, food production, stewarding, budgeting, accounting, and control.

One of the most important aspects to running a successful restaurant is having a strong back-of-the-house operation, particularly in the kitchen. The kitchen is the backbone of every full-service restaurant, so it must be well managed and organized. Some of the main considerations in efficiently operating the back of the house include staffing, scheduling, training, food cost analysis (internal controls), production, management involvement, management follow-up, and employee recognition.

Food Production

Planning, organizing, and producing food of a consistently high quality is no easy task. The kitchen manager, cook, or chef begins the production process by determining the expected volume of business for the next few days.



Planning, organizing, and producing food are critical tasks for the kitchen manager.

The kitchen manager checks the head line-cook's order, which will bring the prep (preparation) area up to the par stock of prepared items. Most of the prep work is done in the early part of the morning and afternoon. Taking advantage of slower times allows the line cooks to do the final preparation just prior to and during the actual meal service. The kitchen layout is set up according to the business projected as well as the menu design. The layout consists of the receiving area, walk-ins, the freezer, dry storage, prep line, salad bar, cooking line, expediter, dessert station, and service bar area.

The cooking line is the most important part of the kitchen layout. It might consist of a broiler station, pickup area, fry station, salad station, sauté station, and pizza station—just a few of the intricate parts that go into the setup of the back of the house. The size of the kitchen and its equipment are all designed according to the sales forecast for the restaurant and by the menu. The menu dictates the equipment needed as well as the experience level of the cooks. The kitchen will also be set up according to what the customers prefer and order most frequently.

For example, if guests eat more broiled or sautéed items, the size of the broiler and sauté must be larger to cope with the demand. Teamwork is especially important in the kitchen. Due to the hectic pace, pressure builds, and unless each member of the team excels, the result will be food that is delayed, not up to standard, or both.

While organization and performance standards are necessary, it is helping each other with the prepping and the cooking that creates teamwork.

3.3.1 Kitchen and Food Production

- **Staffing and Scheduling**

Practicing proper staffing is absolutely crucial for the successful running of a kitchen. It is important to have enough employees on the schedule to enable the restaurant, as a whole, to handle the volume on any given shift. It is often better to overstaff the kitchen, rather than understaff it, for two reasons. First, it is much easier to send an employee home than it is to call someone in. Second, having extra employees on hand allows for cross-training and development, which is becoming a widely used method.

Problems can also be eliminated if a staffing plan is created to set needed levels. These levels should be adjusted according to sales trends on a monthly basis. It is very important to have a competent staff in the kitchen. This means putting the best cooks in the appropriate stations on the line, which will assist in the speed of service, the food quality, and the quality of the operations.

- **Training and Development**

Due to a high turnover rate, implementing a comprehensive training program is vital in the kitchen. Trainers should, of course, be qualified and experienced in the kitchen. Often, the most competent chefs are used to train new hires. Such trainings are usually done on the job and may include study material. Some restaurants may even require new hires to complete a written test, evaluating the skills acquired through the training process.

Ensuring adequate training is necessary because the success of the business lies in the hands of the trainer and the trainee. If employees are properly trained when they begin their employment, little or no time and money will be needed to spent on correcting errors. Thorough training also helps in retaining employees for longer periods of time.

Training, however, does not stop after passing a test. Developing the skills of all the employees is critical to the growth and success of the kitchen and, ultimately, the restaurant. A development program may consist of delegating duties or projects to the staff, allowing them to expand their horizons within the kitchen and the restaurant business. Such duties include projections of sales, inventory, ordering, schedule writing, and training. This will help management get feedback on the running of the kitchen and on how well the development program works in their particular operation. Also, this allows for internal growth and promotion. Having “trainers” and people who train the trainers is important to the restaurant’s goal of offering exceptional quality service.

- **Production Procedures**

Production in the kitchen is key to the success of a restaurant since it relates directly to the recipes on the menu and how much product is on hand to produce the menu. Thus, controlling the production process is crucial. To undertake such a task, production control sheets are created for each station, for example, broiler, sauté, fry, pantry, window, prep, dish, and dessert. With the control sheets, levels are set up for each day according to sales.

The first step in creating the production sheets is to count the products on hand for each station. Once the production levels are determined, the amount of product required to reach the level for each recipe is decided. Once these calculations are completed, the sheets are handed to the cooks. When determining production, par levels should be changed weekly according to sales trends. This will help control and minimize waste levels. Waste is a large contributor to increasing food cost; therefore, the kitchen should determine the product levels necessary to make it through only one day. Products have a particular shelf life, and if the kitchen overproduces and does not sell the product within its shelf life, it must be thrown away. More importantly, this practice allows for the freshest product to reach the customers on a daily basis.

After the lunch rush, the kitchen checks to see how much product was sold and how much is left for the night shift. After all production is completed on all stations, the cooks may be checked out. It is essential to check out the cooks and hold them accountable for production levels. If they are not checked out, they might slide on their production, negatively impacting the restaurant and the customer.

The use of production sheets is also critical in controlling how the cooks use the products, since production plays a key role in food cost. Every recipe has a particular “spec” (specification) to follow. When one deviates from the recipe, quality goes down, consistency is lost, and food cost goes up. That is why it is important to follow the recipe at all times. Standardized recipes are developed for each menu item to maintain consistency and minimize waste. It is very important to use them; otherwise, a dish will taste one way today but be quite different tomorrow. And fluctuation in standards leads to guest complaints.

- **Management Involvement and Follow-Up**

As in any business, management involvement is vital to the success of a restaurant. Management should know first-hand what is going on in the back of the house. It is also important that they be “on the line,” assisting the staff in the preparation of the menu and in the other operations of the kitchen, just as they should be helping when things are rushed. When management is visible to the staff, they are prone to do what they need to be doing at all times, and food quality is more apparent and consistent. Managers should constantly be walking and talking food cost, cleanliness, sanitation, and quality. This shows the staff how serious and committed they are to the successful running of the back of the house. An overview of job description for a typical assistant restaurant manager is shown below.

As management spends more time in the kitchen, more knowledge is gained, more confidence is acquired, and more respect is earned. Employee–management interaction produces a sense of stability and a strong work ethic among employees, resulting in higher morale and promoting a positive working environment. To ensure that policies and standards are being upheld, management follow-up should happen on a continual basis. This is especially important when cooks are held accountable to specifications and production and when other staff members are given duties to perform. Without follow-up, the restaurant may fold.

It happens all too often: Supervisors only notice when a mistake is made or something is going wrong. It is important for management to recognize the good things and give praise when it is deserved. Employees appreciate positive reinforcement and recognition.

3.3.2 Position of Assistant Manager Reports to Manager

The following are job description of the responsibilities and duties of the Assistant Manager

A. Planning and organizing

- 1) Studies past sales experience records, confers with manager, keeps alert to holidays and special events, and so on; forecasts loads and prepares work schedules for service employees in advance to meet requirements.
- 2) Observes guest reactions and confers frequently with servers to determine guest satisfactions, dissatisfactions, relative popularity of menu items, and so on and reports such information with recommendations to the manager
- 3) Observes daily the condition of all physical facilities and equipment in the dining room, making recommendations to the manager for correction and improvements needed.
- 4) Anticipates all material needs and supplies and assures availability of same.
- 5) Inspects, plans, and assures that all personnel, facilities, and materials are in complete readiness to provide excellent service before each meal period
- 6) Anticipates employment needs, recommending to the manager plans for recruitment and selection to meet needs as they arise.
- 7) Discusses menu changes with servers in advance to assure full understanding of new items.
- 8) Conducts meetings of service employees at appropriate times.
- 9) Defines and explains clearly for servers and bus persons their responsibilities for relationship
 - with each other
 - with guests
 - with the hostess/host
 - with the manager
 - with the cashier
 - with the kitchen personnel

B. Coordinating

- 1) Ensures that servers are fully informed as to all menu items—how they are prepared, what they contain, number of ounces per portion.
- 2) Periodically discusses and reviews with employees company objectives, and guest and personnel policies.
- 3) Keeps manager informed at all times about service activities, progress, and major problems

D. Supervising

- 1) Actively participates in employment of new servers and buspersons, suggests recruitment sources, studies applications, checks references, and conducts interviews.
- 2) Following an orientation outline, introduces new employees to the restaurant, restaurant policies, and fellow employees.
- 3) Using a training plan, trains new employees and current employees in need of additional training.
- 4) Promptly corrects any deviations from established service standards.
- 5) Counsels employees on job issues and personal problems.
- 6) Follows established policy in making station assignments for servers.
- 7) Establishes, with approval of manager, standards of conduct, grooming, personal hygiene, and dress.
- 8) Prepares, in consultation and with approval of the manager, applied standards of performance for servers and bus persons.

9) Recommends deserving employees for promotion, and outstanding performers for special recognition and award.

10) Strives at all times through the practice of good human relations and leadership to establish esprit de corps—teamwork, unity of effort, and individual and group pride.

11) Remains constantly alert to the entire dining room situation—is sensitive to any deviation or problem and assists quickly and quietly in its correction, alleviating guests' complaints.

12) Greets and seats guests cordially and courteously, to assure a sincere welcome and to express a genuine interest in their dining pleasure.

D. Controlling

1) Controls performance, conduct, dress, hygiene, sanitation, and personal appearance of employees according to established policies, standards, and procedures.

2) Studies all evidence of waste of time and materials, and makes recommendations for preventing further waste.

E. Others

1) In emergency situations, may serve guests, act as cashier, or perform specifically assigned duties of the manager.

2) Personifies graciousness and offers hospitality to guests and employees by showing “we’re glad you’re here” and “we’re proud to serve you.”

Self-Assessment Exercises 1

1. What is the Back of the House?
2. List the job description of the responsibilities and duties of the Assistant Manager as it pertains to Planning and organizing

3.4 Purchasing

Purchasing for restaurants involves procuring the products and services that the restaurant needs in order to serve its guests. Restaurant operators set up purchasing systems that determine the following:

- Standards for each item (product specification)
- Systems that minimize effort and maximize control of loss from within the restaurant (theft, pilferage, or spoilage) and losses from other sources
- The amount of each item that should be on hand (par stock and reorder point)
- Who will do the buying and keep the purchasing system in motion
- Who will do the receiving, storage, and issuing of items

It is desirable for restaurants to establish standards for each product, which is called product specification. When ordering meat, for example, the cut, weight, size, percentage of fat content, and number of days aged are all factors that are specified by the purchaser.

Establishing systems that minimize effort and maximize control of loss may be done manually or by computer or a combination. However, merely computerizing a system does not make it theft-proof instead, employing honest workers is a top priority.

An efficient and effective system establishes a stock level that must be on hand at all times. This is called a par stock. If the stock on hand falls below a specified reorder point, the computer system automatically reorders a predetermined quantity of the item.

In identifying who will do the buying, it is most important to separate task and responsibility between the person placing the order and the person receiving the goods. This avoids possible theft. The best way to avoid losses is to have the chef prepare the order, the manager or the manager's designee place the order, and a third person responsible for the stores receive the goods together with the chef (or the chef's designee).

Commercial (for-profit) restaurant and foodservice operators who are part of a chain may have the menu items and order specifications determined at the corporate office. This saves the unit manager from having to order individually; specialists at the corporate office not only develop the menu but also write the specifications for the ingredients to ensure consistency. Both chain and independent restaurants and foodservice operators use similar pre-purchase functions.

- Plan menus.
- Determine quality and quantity needed to produce menus.
- Write specifications and develop market orders for purchases.
- Determine inventory stock levels.
- Identify items to purchase by subtracting stock levels from the quantity required to produce menus.

A purchase order comes as a result of the product specification. A purchase order is an order to purchase a certain quantity of an item at a specific price. Many restaurants develop purchase orders for items they need on a regular basis. These are then sent to suppliers for quotations, and samples are sent in for product evaluations. After comparing samples from several vendors, the operator can choose the supplier that best suits the restaurant's needs.

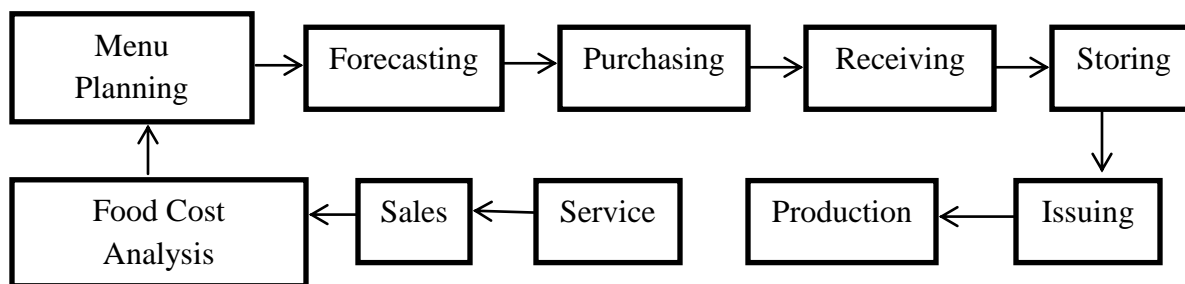


Figure 6.3.1- Food Cost Control Process

- **Receiving:** When placing an order, the restaurant operator specifies the day and time for the delivery to be made (e.g., Friday, 10:00 a.m. to 12:00 noon). This prevents deliveries from being made at inconvenient times.

Receiving is a point of control in the restaurant operation. The purpose of receiving is to ensure that the quantity, quality, and price are exactly as ordered. The quantity and quality relate to the order specification and the standardized recipe. Depending on the restaurant and the type of food and beverage control system, some perishable items are issued directly to the kitchen, and most of the non-perishable items go into storage.

- **Storing/Issuing:** Control of the stores is often a problem. Records must be kept of all items going into or out of the stores. If more than one person has access to the stores, it is difficult to know where to attach responsibility in case of losses.

Items should only be issued from the stores on an authorized requisition signed by the appropriate person. All items that enter the stores should have a date stamp and be rotated using the first in–first out (FIFO) system.

Obviously, restaurants should maintain strict controls. Better-known controls include taking inventory regularly and calculating food, beverage, and labor cost percentages. For a restaurant to be successful, management must “manage” by controlling food, beverage, and labour costs and keeping them in line with company expectations based on budget.

Other strict controls include using a “par stock” reordering system; using one entrance/exit for employees and not permitting employees to bring bags into the restaurant with them; employing a good accountant; and checking the garbage!

Self-Assessment Exercises 2

1. State the determine of purchasing systems set up by restaurant operators
2. With the aid of a diagram highlight the Food Cost Control Process



3.5 Summary

The back of the house is generally run by the kitchen manager and refers to all the areas with which guests do not normally come in contact (purchasing, receiving, storing/issuing, food production, stewarding, budgeting, accounting, and control). Some of the main considerations in efficiently operating the back of the house include staffing, scheduling, training, food cost analysis (internal controls), production, management involvement, management follow-up, and employee recognition.

In this unit we examined the Back of the House; food production, kitchen and food production, responsibilities & duties of assistant manager and purchasing.



3.6 References/ Further Reading

Higher Education| Pearson, chapter 7 Restaurant Operation retrieved from

<https://www.pearsonhighered.com/assets/samplechapter/0/1/3/4/013474506X.pdf>



3.7 Possible Answers to Self-Assessment Exercises

Self-Assessment Exercise 1

1. The back of the house is generally run by the kitchen manager and the term refers to all the areas with which guests do not normally come in contact. This includes purchasing, receiving, storing/issuing, food production, stewarding, budgeting, accounting, and control. One of the most important aspects to running a successful restaurant is having a strong back-of-the-house operation, particularly in the kitchen. The kitchen is the backbone of every full-service restaurant, so it must be well managed and organized.

2. Some of the main considerations in efficiently operating the back of the house include staffing, scheduling, training, food cost analysis (internal controls), production, management involvement, management follow-up, and employee recognition.
3. Planning and organizing
 - a. Studies past sales experience records, confers with manager, keeps alert to holidays and special events, and so on; forecasts loads and prepares work schedules for service employees in advance to meet requirements.
 - b. Observes guest reactions and confers frequently with servers to determine guest satisfactions, dissatisfactions, relative popularity of menu items, and so on and reports such information with recommendations to the manager
 - c. Observes daily the condition of all physical facilities and equipment in the dining room, making recommendations to the manager for correction and improvements needed.
 - d. Anticipates all material needs and supplies and assures availability of same.
 - e. Inspects, plans, and assures that all personnel, facilities, and materials are in complete readiness to provide excellent service before each meal period
 - f. Anticipates employment needs, recommending to the manager plans for recruitment and selection to meet needs as they arise.
 - g. Discusses menu changes with servers in advance to assure full understanding of new items.
 - h. Conducts meetings of service employees at appropriate times.

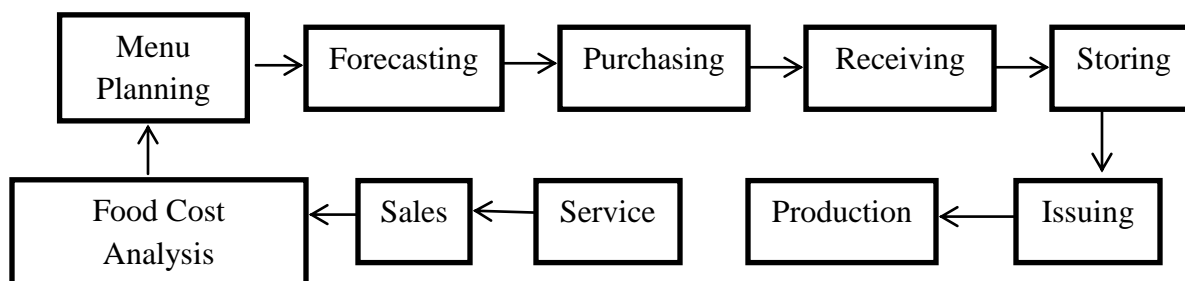
i. Defines and explains clearly for servers and buspersons their responsibilities for relationship

- with each other
- with guests
- with the hostess/host
- with the manager
- with the cashier
- with the kitchen personnel

Self-Assessment Exercise 2

1. Restaurant operators set up purchasing systems that determine the following:
 - i. Standards for each item (product specification)
 - ii. Systems that minimize effort and maximize control of loss from within the restaurant (theft, pilferage, or spoilage) and losses from other sources
 - iii. The amount of each item that should be on hand (par stock and reorder point)
 - iv. Who will do the buying and keep the purchasing system in motion
 - v. Who will do the receiving, storage, and issuing of items

2. Food Cost Control Process



UNIT 4 COST CONTROL

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4.1 Introduction

Cost control is the practice of identifying and reducing business expenses to increase profits, and it starts with the budgeting process. Cost control is an important factor in maintaining and growing profitability. A business owner compares the company's actual financial results with the budgeted expectations, and if actual costs are higher than planned, management has the information it needs to take action.

In this unit, we shall examine Cost Control; the expectations, duties and responsibilities of the general manager, food and beverage cost percentage, labour cost control, menu sales mix analysis, pricing the menu, classifying menu items and pricing menu items.



4.2 Learning Outcomes

At the end of this unit, you should be able to

- discuss the expectations of the general manager
- discuss the duties & responsibilities of the general manager
- discuss the methods of pricing menu items
- analyse the menu sales mix analysis
- evaluate the classes of menu items



4.3 The General Manager

➤ Common Expectations of the General Manager

- General Managers answer directly to the owner or to regional directors in major corporations.
- General Managers are expected to run good numbers for the periods. The numbers analysed are food cost, labour cost, and beverage cost. These areas are controlled in order to produce sufficient profit for the restaurant.
- General Managers promote good morale and teamwork in the restaurant. Having a positive environment in the restaurant is of utmost importance. This will not only keep the employees happy, but it will also contribute to providing better service to the guests.

➤ Duties and Responsibilities

The general manager of a restaurant is directly responsible for all the operations in the restaurant.

He is also in charge of the floor managers, the kitchen manager, and the other employees of the restaurant. The general manager ensures that all policies and regulations are being met. This will keep operations running smoothly. He organizes and controls the staffing of the restaurant.

The floor managers usually write the employee schedule; however, the general manager is still directly responsible for proper staffing for the period.

Self-Assessment Exercises 1

1. Why are managers important in a restaurant?
2. What does it mean to be a general manager of a restaurant?

4.4 Food and Beverage Cost Percentages

Managing restaurants is a complex operation. There are many variables that need to be in line if the operation is to be successful. One way that managers control the operation's performance is by checking the food, beverage, and labour costs. These costs, more than any other, need to be carefully monitored on a daily, sometimes hourly, basis. The food cost percentage is calculated as the cost of food sold divided by food sales for a specific period, such as a week, 14 days, a month, or a year to date. The result is compared to the budgeted percentage for the period. An example is of a casual restaurant:

Total Food Sales ₦9,500,400

Total Beverage Sales ₦4,600,000

Cost of Food Sold ₦2,200,896

Cost of Beverage Sold ₦800,892

Labour Costs ₦3,535,000

The food cost percentage is (remember the simple formula, cost over sales times 100):

$$\frac{\text{Cost of food sold } \text{₦}2,200,896}{\text{Total food sales } \text{₦}9,500,400} = 0.24 \text{ or } 24\% \text{ food cost}$$

A food cost of 24 percent shows us that ₦24 of each ₦100 of food sales is spent on the cost of food prepared. Most chain restaurants calculate the cost of ingredients and use standardized recipes so that they expect a menu item to have a ₦24 food cost percentage. Some menu items have a higher or lower food cost percentage and the restaurant/ company must decide what results it expects. For example, 24 percent is too low for some restaurants and means that guests may find the prices too high. Restaurants generally average about 28 percent food cost; however, high-end steak houses run a 34 percent food cost—they make up for that with a lower labour cost in the kitchen.

The beverage cost percentage is calculated in the same way as the food cost: cost of beverages sold divided by the total beverage sales for a period. Like the food cost percentage, it is best utilized as a tool for cost control when compared to the budgeted percentage for the same period. Any significant variances from the budgeted amount should be investigated.

The beverage cost in the casual restaurant above is:

$$\frac{\text{Cost of beverage sold } \text{₦}889,200}{\text{Total beverage sales } \text{₦}4,600,000} = 19.33\%$$

So, for every beverage naira earned, the cost was 19 percent. Restaurants vary in their beverage cost percentage from a low of 18 on up to 30 percent, with an average around 22 to 26 percent beverage cost. Of course, there are different percentages for beer, wine, spirits, and cocktails.

4.4.1 Labour Cost Control: Like other service industries, labour is the highest cost in operating a restaurant. Labour costs range from about 24 to 30 percent of total sales. One of the challenges of restaurant operations is

scheduling the right amount of staff for each shift. As the number of guests and sales increases, more staffs are needed but, when sales drop, so should the number of staff.

In the above example, the food and beverages sales are ₦9,500,400 and ₦4,600,000, making the total sales ₦14,140,000. Given a labour cost of ₦3,535,000, by using the formula of labour costs over sales we have:

$$\text{₦}3,535,000 / \text{₦}14,140,000 = 0.25 \text{ or } 25\%$$

A labour cost of 25 percent means that for every naira of sales, 25 percent goes to cover labour costs. Other operating costs include non-food or labour costs such as office supplies, china, glassware, knives, forks, spoons, table napkins, heat, light and power, cleaning, rent, lease or mortgage, music, menus, accounting and legal fees, licenses, uniforms, and so on. Total other operating costs range from 14 to 20 percent of sales.

Given that total sales are 100 percent, and each cost has to be deducted from it, an example of restaurant costs would look like this:

Total Sales ₦14,140,000			
Category	Cost	Calculation	% Cost of Total
Food	₦2,289,600	$\text{₦}2,289,600 \div \text{₦}14,140,000 \times 100$	16.19%
Beverage	₦889,200	$\text{₦}889,200 \div \text{₦}14,140,000 \times 100$	6.28%
Labour	₦3,535,000	$\text{₦}3,535,000 \div \text{₦}14,140,000 \times 100$	25%

Other	₦2,828,000	$\frac{₦2,828,000}{₦14,140,000} \times 100$	20%
			Total = 67.47%

leaving 32.53 percent for any other costs, taxes, and profit. Another important part of restaurant control is stopping employee theft. In order to avoid or reduce theft some restaurants use spotters (people who sit in a bar or restaurant and watch everything that goes on), others use sequentially numbered checks and insist that the servers return all checks at the end of the shift.

Self-Assessment Exercises 2

1. What is food and beverage control?
2. What are the advantages of cost control in the F&B Sector?
3. State the factors affecting Labour Cost Control

4. Menu Sales Analysis

Managers need to monitor the effectiveness of menu items to maximize profits. A method called the sales mix analysis helps do that. A sales mix analysis is an analysis of the popularity and profitability of a group of menu items. To effectively do this, the analysis should be done at least four times per year. The analysis involves determining which menu items are most popular and which contribute the most money to expenses and profit. Basically, you compare menu items in terms of sales and profitability. The results of this analysis determine whether managers need to make changes in menu pricing, content, or design.

While there are several methods available to do menu analysis, one of the most popular is **menu engineering**. It systematically breaks down a menu's components to analyse which items are making money and which items are selling. Then, managers know which menu items to leave alone, which need to have an increase or decrease in price, which to promote, and which to eliminate.

Managers can determine the sales performance of each menu item after the restaurant has been open for some time and they have enough sales data to analyse. Gathering information for three

months or longer provides more useful results than data from a shorter time period.

The sales volume of a menu item is the number of times the item is sold in a time period.

Generally, managers sort the sales of items by category (appetizers, entrées, etc.). The quantity of each item sold can be recorded by hand or by a point-of-sale (POS) system. Managers can also use sales volume information to compare the number of each menu item sold to the total number of items sold on the entire menu in the same time period. So, each menu item's sales can be expressed as a percentage of total sales. This is called the **sales volume percentage**.

4.5.1 Pricing the Menu

Pricing the menu is a critical process for any operation. Price serves two main purposes—it provides information to guests, and it determines profitability. The price of items on a menu indicates the market category in which the restaurant falls. This, in turn, sets guests' expectations as to the quality of the food, level of service, atmosphere to expect, etc. Guests, for example, will expect more by way of service, quality, and atmosphere for a ₦5,000 steak than for a ₦1,000 steak. With increased guest expectations comes the need to execute all levels of food preparation and service on a higher level as well. Management needs to make sure that pricing aligns with the goals of the operation and the skill level of the staff.

Price also determines profitability by ensuring that an operation is bringing in more money than it spends for the product or service. The price of a menu item must account for all of the costs involved in producing that item for the guest. This includes food costs, labour costs, and overhead costs. Then, management must add in the amount of money it wants, and can reasonably get, in profit. An item that is overpriced in a particular market will likely not sell enough to be profitable. In contrast, an item that is under-priced may sell well, but it will lose money because it costs the operation more than it is bringing in. Striking the right balance requires careful planning and consideration.

4.5.2 Classifying Menu Items

There are four key categories of menu classification—stars, plow horses, puzzles, and dogs.

After grouping all the menu items into one of those four key categories, it is time to make decisions. When making decisions, refer to how close on the graph an item is to the next category (see Figure 1). For example, an item that falls into the puzzle category but has a popularity number very close to the star category should be handled differently than one that has a popularity number far below the star category. The following explains the four categories:



Figure 1: Menu Classification graph

- **Stars:** These items are both popular and profitable. For the most part, stars should be left alone. Locate them in a highly visible position on the menu. Test them occasionally for price rigidity—that is, are guests willing to pay more for these items and still buy them in significant quantity? If so, these items may be able to carry a larger portion of any increase in cost of food and labour. They are the celebrities of the menu, the highest-priced stars, and they may be less price sensitive than any other items on the menu.

- **Plow horses:** These items are popular, but less profitable. These items are often an important reason for a restaurant’s popularity. Because they are less profitable, one option may be to increase their price. However, this should be done very carefully. If a plow horse is highly price sensitive—that is, if guests see it as a good price-value and that is the reason they come to your restaurant—then try to pass on only the food-cost increases of the item to the menu price. If it is only marginally profitable (close to the dog on the graph), drop it from the menu and make a substitution for it. When increasing the price, always test for a negative effect on sales.

Make any price increase in gradual instalments (e.g., from ₦455 to ₦475, then ₦495). If the item is an image maker or signature item, hold its current price as long as possible. On the other hand,

if the listing is a non-signature item with a low contribution margin, move the plow horse to a lower-profile position on the menu. Attempt to shift demand to more profitable items through merchandising and menu positioning. Another solution might be to reduce the item's standard portion without making the difference noticeable. Also, try adding value to the item through menu packaging. In other words, merchandise the plow horse by packaging it with side items to increase its contribution margin.

- **Puzzles:** These items are unpopular, but very profitable. As a result, the number of puzzles on a menu should be limited. One of the best solutions to helping out a puzzle is to decrease its price. While this may appear counterproductive to making a profit, consider that the guest may not perceive it as a fair value. If an item is not selling, no profit is being made anyway. Another option is to leave its price alone and reposition it on the menu, perhaps featuring it in a more popular location. Additionally, try to advertise it by using table tents, chalkboards, or suggestive selling. Or, you can rename it. A puzzle's popularity can be affected by what it is called, especially if it is unfamiliar to guests. Remember that even if a puzzle is not selling well, it can make a lot of money, relatively speaking. If sales can be substantially increased without decreasing the price, the item could easily become a star.

- **Dogs:** These items are unpopular and unprofitable. Eliminate all dog items if possible. Replace them with more popular items. Take advantage of hot, trendy, or cutting-edge listings. Restaurant and foodservice operations are sometimes intimidated by influential guests who want managers to continue carrying a dog item on the menu. The way to solve this problem is to carry the item in inventory (assuming it has a shelf life), but not on the menu. Offer the special guest the opportunity to have the item made to order on request. You can charge extra for this service. This would raise the dog's price to puzzle status.

Some items in the dog category may have market potential. These tend to be the more popular dogs, and may be converted to puzzles by increasing prices. Another detail to consider is that the menu may have too many items. It is not unusual to discover a number of highly unpopular menu

listings that have little, if any, relation to other more popular and profitable items held in inventory. Do not be afraid to eliminate dogs, especially when demand is not satisfactory.

4.5.3 Pricing Menu Items

There are many methods of pricing menu items. Here, two main methods are compared: the food cost percentage method and the contribution margin method:

- **Food cost percentage method:** Set the percentage of the menu price that the food cost must be, and then calculate the price that will provide this percentage using the following formula:

$$\text{Item food cost} \div \text{Food cost percentage} = \text{Menu price}$$

Because food cost percentage is dependent on the costs of the food and its preparation within the restaurant or foodservice operation, an accurate food cost percentage will be different for each menu category: appetizers, salads, entrées, signature dishes, specials, desserts, beverages, etc.

- **Contribution margin method:** This is a pricing method that works for à la carte menu items as well as menu items that comprise a meal (soup, salad, entrée, etc.). This method uses operation-wide data to determine a naira amount that must be added to each major menu item's food cost. The managers of a restaurant or foodservice operation can use the same contribution margin for all menu items, or they can calculate separate contribution margins *in two steps*:

i. $(\text{Total non-food cost} + \text{Target profit}) \div \text{Number of guests} = \text{Contribution margin}$

ii. $\text{Contribution margin} + \text{Food cost} = \text{Menu price}.$

In addition to these methods, there are two other methods that an operation can use, but only for major menu items. These methods are the set naira amount markup and the set percentage increase method: • **Set Naira amount markup:** This method simply adds a fixed naira amount to the food cost of an item. In order to utilize this method, you must know the food cost and the naira amount of the markup. The equation works as follows:

$$\text{Food cost} + \text{Markup} = \text{Menu price}$$

The markup is calculated based on the following:

$$\text{Profit per menu item} + \text{Labor cost per menu item} + \text{Operating cost menu item} = \text{Markup}$$

• **Set percentage increase method:** This method builds on the set naira amount markup method and takes it a step further. Basically, managers calculate the markup as described for the set naira amount markup for one or several menu items. Then they determine what the percentage markup is in comparison to the items' food costs.

$$\text{Food cost} \times \text{Percentage} = \text{Markup}$$

$$\text{Markup} \div \text{Food cost} = \text{Percentage}$$

Using the markup and food costs from the set naira amount markup method allows managers to calculate a percentage markup for all menu items.

Self-Assessment Exercises 3

1. State the categories of menu classification
2. Why is contribution margin important in determining the profitability of the restaurant?



4.6 Summary

One way that managers keep tabs on the operation's performance is by checking the food, beverage, and labour costs. These costs, more than any other, need to be carefully monitored on a daily, sometimes hourly, basis. The food cost percentage is calculated as the cost of food sold divided by food sales for a specific period. The result is compared to the budgeted percentage of the period. Beverage cost percentage is calculated the same way. Labour is the highest cost in operating a restaurant. Cost is calculated by dividing the total labor cost by the total sum of food and beverage sales.

It is critical to the success of an operation that management have the knowledge and means to analyze how well items on its menu are performing. Menu engineering is the most popular method, as it systematically breaks down a menu's components to analyze which items are making money and which items are not.

Pricing on the menu provides information to guests and determines profitability. The classifications that come from menu engineering are star, plow horse, puzzle, and dog.

The food cost percentage method, contribution margin method, straight markup method, average check method, set naira amount method, and set percentage increase method are all ways to price menu items.

In this unit, we examined Cost Control; the expectations, duties and responsibilities of the general manager, food and beverage cost percentage, labour cost control, menu sales mix analysis, pricing the menu, classifying menu items and pricing menu items.

4.7 Glossary

Accounting: The system of recording and summarizing business and financial transactions and analyzing, verifying, and reporting the results

Beverage: Any potable liquid, especially one other than water, as tea, coffee, beer, or milk

Communication: The imparting or exchanging of information by speaking, writing, or using some other medium.

Contribution margin: Is a product's price minus all associated variable costs, resulting in the incremental profit earned for each unit sold.

Controlling: To determine the behaviour or supervise the running of an organization

Coordinating: The harmonious functioning of parts for effective results

Cost control: Is the practice of identifying and reducing business expenses to increase profits, and it starts with the budgeting process

Development: Is a process that creates growth, progress, positive change or the addition of physical, economic, environmental, social and demographic components.

Directing: Is the process of getting work done by other people by instructing, training, guiding, supervising, and reviewing the skills required for a particular job.

Duty: A task or action that one is required to perform as part of one's job.

Expectation: A feeling or belief about the way something should be or how someone should behave

Facilities Management: The tools and services that support the functionality, safety, and sustainability of buildings, grounds, infrastructure, and real estate.

Follow-Up: A continuation or repetition of something that has already been started or done.

Food Production: Refers to the process of conversion of raw materials into finished food products

Forecasting: Forecasting is a technique that uses historical data as inputs to make informed estimates that are predictive in determining the direction of future trends.

Human resources: Is the set of people who make up the workforce of an organization, business sector, industry, or economy

Issue: The supply or distribute (something) for use or sale

Involvement: Is the act of participating in something

Management: The process of dealing with or controlling things or people

Marketing: The action or business of promoting and selling products or services, including market research and advertising.

Operations Management: Is an area of management concerned with designing and controlling the process of production and redesigning business operations in the production of goods or services

Organising: Is the establishment of effective authority relationships among selected works, persons and work places in order for the group to work together efficiently, or the process of dividing work into sections and departments

Orientation: Is basic information or training that is given to people starting a new job, school, or course

Planning: The establishment of goals, policies, and procedures for a social or economic unit

Pricing: A process of fixing the value that a manufacturer will receive in the exchange of services and goods

Production Procedure: Is an internal regulatory document of the enterprise that determines the methods of production, technological standards, facilities, conditions and processing procedures. This document ensures compliance of finished product with regulatory requirements

Purchasing: Is the act of buying the goods and services that a company needs to operate and/or manufacture products

Responsibility: The opportunity or ability to act independently and take decisions without authorization.

Recruitment: Refers to the process of identifying, attracting, interviewing, selecting, hiring and onboarding employees

Safety: The condition of being protected from or unlikely to cause danger, risk, or injury

Sanitation: Is the science and practice of effecting healthful and hygienic conditions; study and use of hygienic measures such as drainage, ventilation, pure water supply, etc.

Scheduling: Is the process of arranging, controlling and optimizing work and workloads in a production process or manufacturing process

Selling: It refers to the process of persuading a person or organization to buy something

Service: It is supply, by way of or as part of any service, of goods, being food or any other article for human consumption or any drink, provided by a restaurant, eating joint including mess, canteen, whether for consumption on or away from the premises where such food or any other article for human consumption or drink is supplied.

Staffing: Refers to the continuous process of finding, selecting evaluating and developing a working relationship with current or future employees

Storing: The keeping or accumulation of something for future use.

Supervise: To observe and direct the execution of (a task or activity).

Training: The action of teaching a person or animal a particular skill or type of behaviour.



4.8 References/ Further Reading

Higher Education| Pearson, chapter 7 Restaurant Operation retrieved from <https://www.pearsonhighered.com/assets/samplechapter/0/1/3/4/013474506X.pdf>

Chapter 2, Foundations of Restaurant Management & Culinary Arts, Level 1, 2nd Edition retrieved from https://textbooks.restaurant.org/Textbooks/media/fmrca/FRMCA2_L02_Ch02.pdf



4.9 Possible Answers to Self-Assessment Exercises

Self-Assessment Exercise 1

1. Restaurant Managers ensure restaurants run smoothly and efficiently. They seek to provide customers with pleasant dining experiences that live up to brand standards. Their efforts, which include effectively managing employees, are ultimately geared towards safeguarding the profitability of the restaurant.
2. The Restaurant General Manager will plan and direct all restaurant operations. Maintain high standards of food, service, health and safety, ensure the efficient and profitable business performance of the restaurant and the optimal utilization of staff and resources.

Self-Assessment Exercise 2

1. Food and beverage control can be defined as the guidance and regulations of the cost and revenue for operating catering activities in hotels, restaurants, and other catering establishments. The main purpose of any business is to make profit.
2. It enables the company to increase its profits and use those funds to improve the efficiency of the restaurant operations. The restaurant is able to improve its financial strength, therefore, increasing its credit ratings.
3. Factor affecting cost of labour:
 - i. Assessment of man power requirement.
 - ii. Time and motion study.
 - iii. Control over idle time and overtime.
 - iv. Wage system.

Self-Assessment Exercise 3

1. There are four key categories of menu classification—stars, plow horses, puzzles, and dogs.
2. An item's contribution margin is more effective than food cost percentage in calculating the profitability of each individual dish. In addition, finding your overall menu contribution margin can give you an idea of how your menu is performing and give a metric to measure performance of individual dishes against.

Executive summary

Food & Beverage (F&B) Management is a segment of the hospitality industry that focuses on operations in restaurants, hotels, resorts, catering companies, hospitals, hotels, and more. It includes the business side of food, like ordering and inventory, managing budgets, and planning and costing menus.

It also includes Human Resources functions, like hiring, training, and managing both front of house and back of house staff. On the customer side, these managers will focus on improving the guest experience with a focus on building loyalty and maintaining high service standards.

Managing a company in the food and beverage industry is a fascinating task.

Food and beverage products are so deeply rooted in the culture of most countries that making and selling them is not only a matter of making and selling good and tasty products, but products that nurture people's body, soul, and heart. Given this, it's not difficult to see that the task quickly becomes complex.

You were introduced to the functions, operations, and organisation of the food and beverage department in the hospitality industry. This course also provides information on service principles, menu design and objectives, and restaurant layout and design considerations. You will also look into the organisation and key duties of restaurant staff.

The course began by introducing the food and beverage operations within a hotel. You learnt about the different functions of the food and beverage department including its relationship to other hotel departments such as room service and the stewarding department. This course also discussed key restaurant positions and the specific duties of a food and restaurant manager, contemporary challenges that managers and entrepreneurs in food and beverage businesses should be able to face; we provided models and tools to design and implement appropriate courses of action to satisfy customers and build an advantage over the competition. You also learnt how to implement the best practices and procedures in restaurant staffing.

You then studied the classification of the different modes of food and beverage operation and the characteristics of services based on market segments. You gained an understanding of the different types of menu, the objectives of menus, and the comparison of different menu types.

In the food and beverage industry, the menu is the plan used to achieve the organization's profit objectives and to satisfy customers' desires. With this course, you learnt the main factors that influence the menu planning process, the different approaches to menu pricing, the process of menu design, and even the steps involved in a table setting. You also learnt the considerations involved in restaurant layout, design and ambience. You'll also graduate with essential skills (Diverse Professional cooking, Smart Serve and Safe Food Handlers) that will make you even more employable in the restaurant industry, which is often said to be an extension of show biz. From dynamic staff to innovative menus, a modern restaurant experience is as much about the show as it is about the perfectly prepared food and flawlessly executed service.

