FOOD TECHNOLOGY PRESERVATION AND PROCESSING

SKILLS DEVELOPMENT PROJECT

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Training Module for Trainee's (Food Processing and Preservation)

Food Preservation: is the process of treating and handling food in such a way that it slows down or stops spoilage, loss of quality, edibility, or nutritional value, thereby extending its shelf life.

It involves the application of **physical, chemical, or biological methods** (such as drying, refrigeration, freezing, canning, pickling, or adding preservatives) to protect food from the growth of microorganisms, oxidation, enzymatic activity, and other factors that cause deterioration

In simple words: **Food preservation means keeping food safe, fresh, and edible for a longer period without losing its taste and nutritional value.**

Food Processing: is the set of methods and techniques used to transform raw ingredients into food products that are safe, edible, palatable, and convenient for consumption.

It includes **primary processing** (such as cleaning, milling, cutting, or packaging of raw food items) and **secondary processing** (such as baking, canning, freezing, fermenting, or fortifying foods).

In simple words: **Food processing means converting raw food into forms that are easier to use, safer to eat, have longer shelf life, and often taste better.**

Training Objectives

The overall objective of the training is to build the knowledge and practical skills of participants in food processing and preservation so they can reduce food losses, improve food safety, and create opportunities for value addition and income generation.

Specific Objectives

By the end of the training, participants will be able to:

1. **Understand basic concepts** of food science, food safety, and the principles behind food processing and preservation.
2. **Identify different methods** of food preservation (e.g., drying, freezing, canning, pickling, vacuum sealing) and their appropriate use for different food types.

3. **Practice safe handling and hygiene** during food processing to prevent contamination and ensure product quality.
4. **Apply practical skills** in small-scale food processing and preservation techniques suitable for household, community, or business use.
5. **Recognize the importance** of preservation in reducing post-harvest losses and ensuring food availability.
6. **Explore value addition opportunities** in agriculture and food products to enhance marketability and income generation.
7. **Promote sustainable practices** by using locally available, cost-effective, and environmentally friendly preservation methods.

Learning Outcomes

By the end of the training, participants will be able to:

1. **Explain** the concepts, principles, and importance of food processing and preservation.
2. **Identify** suitable preservation methods for different categories of food (fruits, vegetables, cereals, dairy, meat, etc.).
3. **Demonstrate** safe food handling and hygiene practices during processing and preservation activities.
4. **Apply** at least 2–3 practical preservation techniques (e.g., drying, canning, pickling, freezing) in a hands-on setting.
5. **Assess** food quality and recognize common causes of food spoilage.
6. **Prepare** selected processed and preserved food products using locally available resources.
7. **Develop** simple action plans or business ideas for applying food processing and preservation skills at household, community, or enterprise level.
8. **Value** the role of food processing in reducing waste, improving food security, and generating income opportunities.

Job Opportunities in Food Processing and Preservation

1. **Food Processing Technician/Operator**
    - Work in food industries (dairy, bakery, beverages, meat, fruit & vegetable processing units).
    - Operate machinery and oversee processing activities.
2. **Quality Control/Quality Assurance Officer**
    - Ensure food products meet safety, hygiene, and quality standards.
    - Conduct testing for contamination, shelf life, and compliance with regulations.
3. **Food Safety Inspector**
    - Work with government agencies or regulatory bodies to monitor food safety.

- Inspect production plants, storage facilities, and retail outlets.

4. **Food Product Development Assistant**
   - Support in developing new food products, recipes, and packaging solutions.
   - Focus on innovation, nutrition, and consumer demand.
5. **Agro-processing Entrepreneur**
   - Start small businesses such as fruit drying, jam/jelly making, pickling, dairy products, or frozen foods.
   - Provide value addition to local agricultural produce.
6. **Cold Chain/Storage Supervisor**
   - Manage preservation facilities like cold storage, warehouses, or refrigeration units.
   - Ensure proper handling of perishable products.
7. **Packaging and Labeling Assistant**
   - Specialize in food packaging technology to increase shelf life and improve product presentation.
8. **Community Development Facilitator (Food Security Projects)**
   - Work with NGOs, development agencies, or cooperatives to train communities in food preservation.
9. **Food Marketing and Sales Executive**
   - Promote and sell processed and preserved food products in local or international markets.
10. **Research and Laboratory Assistant**
    - Support studies on food processing technologies, preservation techniques, and nutrition.

Training Material

Consumables	Fruits, Vegetables, Species, Herbs, Food additives, Preservatives, Oil etc.
Non-Consumables	Charts, Stationery, Banners, White Board, Markers, Utensils, etc.

Training Curriculum

Sr. No	Training Module	Learning Units	Theory/Practical (Hrs)
	M1: Introduction to Food Entrepreneurship & Small-Scale Business Types **Objective** To provide learners with a strong foundation in food entrepreneurship by exploring its importance in Pakistan, different types of small-	**LU 1.1: Importance of Food Entrepreneurship in Pakistan (1 Hr)** **Learning Objectives** By the end of this unit, trainees will be able to:	

	scale food businesses, requirements for registration and certification, and strategies for understanding local market demand. Trainees will conclude the module with a home assignment to design a business idea sketch. **Total Duration: 6 Hours (Theory + Practical Activities)**	• Define food entrepreneurship and explain why it is vital for Pakistan's economy. • Recognize the social, cultural, and economic benefits of starting food businesses. • Identify opportunities and challenges for entrepreneurs in the Pakistani food sector. **Knowledge / Content** Food entrepreneurship refers to the process of turning food-related ideas into viable businesses. It can include food production, processing, preservation, packaging, and distribution. In Pakistan, where agriculture plays a central role in the economy, food entrepreneurship is especially significant. **Importance of Food Entrepreneurship in Pakistan** • **Employment Creation**: With unemployment rates rising, especially among youth and women, small-scale food businesses provide self-employment opportunities. For example, home-based women making pickles or cakes can turn hobbies into income sources. • **Reducing Post-Harvest Losses**: Every year, Pakistan loses up to 40% of fruits and vegetables due to poor storage. Entrepreneurs who make jams, juices, or dried fruits help reduce waste and increase value. • **Food Security**: Processing and preservation ensure year-round availability of seasonal foods (e.g., mango pulp or dried apricots available even off-season). • **Cultural Identity & Innovation**: Pakistani entrepreneurs are modernizing	

		traditional foods (e.g., flavored lassis, frozen parathas) to attract both local and international markets. • **Export Growth**: Food products like spices, pickles, and confectionery have growing export potential, opening opportunities for entrepreneurs beyond the local market. **Challenges Faced by Entrepreneurs** • Lack of access to finance. • Limited knowledge of food safety standards. • Competition from established brands. • Limited access to technology or processing equipment. **Skills / Practical Tasks** • **Activity 1 (Icebreaker)**: Students share an example of a food business in their town/village and discuss why it is successful. • **Activity 2 (Class Debate)**: "Food entrepreneurship is more important than technology entrepreneurship in Pakistan." Split students into two groups and let them argue their sides. **Trainer's Notes** • Use visuals (charts showing post-harvest losses, success stories like Shan Masala, Kolson, or small bakeries that grew big). • Relate discussions to the **students' own environments** — urban vs rural. • Highlight government initiatives supporting entrepreneurs (e.g., Kamyab Jawan Program). **Assessment Criteria** • Trainee can define food entrepreneurship in simple terms.	

		• Trainee lists at least **3 benefits** of food entrepreneurship for Pakistan. • Trainee provides **one local example**. **LU 1.2: Types of Food Businesses (Home-Based, Local, Scalable) (1.5 Hrs)** **Learning Objectives** Trainees will be able to: • Describe different types of small-scale food businesses. • Compare advantages and disadvantages of home-based, local, and scalable models. • Select which type of food business best suits their own skills and resources. **Knowledge / Content** **1. Home-Based Food Businesses** • Operated from kitchens or small setups at home. • Require low investment and fewer licenses in early stages. • Examples: cake/bakery items, frozen parathas, catering for small events, pickles, jams, snack packs. • **Advantages**: Flexibility, low cost, family help. • **Challenges**: Limited production, informal sales, limited market access. **2. Local/Street-Level Food Businesses** • Operated at roadside stalls, dhabas, juice carts, small eateries, or tandoors. • Medium investment; greater daily customer interaction. • Examples: shawarma stalls, bun-kabab shops, juice corners, golgappa carts, BBQ dhabas. • **Advantages**: High visibility, direct customer feedback, quick cash flow.	

		• **Challenges**: Licensing, competition, hygiene concerns. **3. Scalable Food Businesses** • Businesses designed to expand, with strong branding, packaging, and distribution. • Often require advanced certifications and greater investment. • Examples: packaged snacks, cloud kitchens, frozen food brands, franchise restaurants. • **Advantages**: Potential for large profits, brand-building, export opportunities. • **Challenges**: High investment, strong regulations, marketing expenses. **Skills / Practical Tasks** • **Activity 1 (Group Exercise)**: Make a table comparing home-based, local, and scalable businesses (investment needed, risks, market potential). • **Activity 2 (Case Study)**: Analyze a local food startup (e.g., a biryani outlet that grew into a franchise). Discuss why it succeeded. • **Activity 3 (Mini Presentation)**: Each group presents a food business idea and explains which category it fits into and why. **Trainer's Notes** • Show students **pictures/videos** of real examples (home bakeries, food trucks, franchises). • Encourage them to **think about what type of business they can realistically start now**. **Assessment Criteria** • Trainee correctly differentiates between all 3 business types. • Trainee provides at least **one example** for each type.	

		• Trainee identifies which type of business they would consider starting. **LU 1.3: Business Registration, Licensing & Food Safety Certification (1.5 Hrs)** **Learning Objectives** Trainees will be able to: • Explain the importance of registering a food business. • Identify the basic registration and licensing requirements in Pakistan. • Recognize food safety certifications needed for credibility and scaling. **Knowledge / Content** **1. Business Registration Options in Pakistan** • **Sole Proprietorship**: Owned by one person. Easy to set up, fewer formalities. • **Partnership**: Two or more owners share responsibilities and profits. • **Private Limited Company**: Registered with SECP; suitable for larger businesses. **2. Licenses & Permissions** • **Trade License**: From municipal/local government. • **Food Authority License**: From provincial authorities (e.g., Punjab Food Authority). • **Halal Certification**: For meat/processed exports. • **FSSAI/PFA Lab Tests**: For food safety compliance. **3. Food Safety Certification** • **Basic Hygiene Training** (compulsory for restaurant/food handlers). • **HACCP Certification** (Hazard Analysis & Critical Control	

		Points) — ensures food safety during processing. • **ISO 22000** — international food safety management system. • **Labeling & Packaging**: Products must show expiry date, batch number, nutrition information, storage instructions, and preservative details. **Skills / Practical Tasks** • **Activity 1 (Role-Play)**: One student plays the role of a food authority officer; another plays a food entrepreneur applying for a license. • **Activity 2 (Document Review)**: Trainer shows a real or sample food label — trainees identify missing information. • **Activity 3 (Checklist)**: Trainees prepare a step-by-step registration checklist for a small jam-making business. **Trainer's Notes** • Keep explanations simple; avoid legal jargon. • Use **sample forms** and **real labels** to make learning practical. • Stress that registration improves **trust** with customers and allows scaling. **Assessment Criteria** • Trainee identifies at least **2 licenses** required to run a food business. • Trainee explains why certification is critical for food safety and exports. • Trainee completes a basic registration checklist. --- **LU 1.4: Understanding Local Market Demand (Urban vs Rural) (1 Hr)** **Learning Objectives** Trainees will be able to:	

		• Differentiate between urban and rural food demand. • Conduct simple market research using surveys and observation. **Knowledge / Content** **Urban Market** • High demand for fast food, convenience food, frozen items. • Consumers value **branding, packaging, hygiene, online delivery**. • Example: Pizza chains, biryani delivery apps, frozen kebabs. **Rural Market** • Focus on affordability and bulk sales. • Preference for traditional foods (gur, achar, daal, bulk atta). • Less demand for branding, more focus on price and shelf-life. **Market Research Tools** • **Surveys**: Asking local customers what they want. • **Observation**: Visiting markets and seeing which stalls are busiest. • **Competitor Analysis**: Identifying what other businesses sell and at what price. **Skills / Practical Tasks** • **Activity 1 (Group Discussion)**: "Which sells more in your town: branded packaged food or traditional homemade food?" • **Activity 2 (Survey Design)**: Students design a 5-question survey to ask shopkeepers/customers. • **Activity 3 (Mini Chart)**: Students compare urban vs rural food demand using examples. **Trainer's Notes** • Bring examples of **urban packaged products** and **rural traditional items**.	

		• Explain that entrepreneurs must adapt products to their market. **Assessment Criteria** • Trainee explains at least **one difference** between urban and rural markets. • Trainee prepares a short survey with minimum **5 questions**. **LU 1.5: Home Assignment – Business Idea Sketch (1 Hr)** **Learning Objectives** Trainees will be able to: • Apply their knowledge to create a food business sketch. • Think practically about type, product, market, and certification needs. **Knowledge / Content** The business sketch should include: 1. **Business Type**: Home-based, local, or scalable. 2. **Product/Service**: What will be sold (e.g., jams, snacks, frozen meals). 3. **Target Market**: Urban or rural. 4. **Licenses & Certifications**: Basic registration, hygiene training, food authority license. 5. **USP (Unique Selling Point)**: What makes their idea special (price, taste, convenience, cultural value). **Skills / Practical Tasks** • **Activity**: Each trainee prepares a **1-page business sketch** including: o Name of business. o Logo sketch (simple). o Product description. o Market type (urban/rural). o Required licenses. o Why customers will buy it. **Trainer's Notes**	

		• Encourage **creativity + practicality**. • Remind students: "Start small, test your idea, then scale." • Give feedback individually. **Assessment Criteria** • Trainee submits a **complete business sketch**. • Idea is **realistic and feasible**. • Trainee demonstrates clear understanding of target market. **Time Allocation Summary** • LU 1.1: Importance of Food Entrepreneurship → **1 Hr** • LU 1.2: Types of Food Businesses → **1.5 Hrs** • LU 1.3: Business Registration & Certification → **1.5 Hrs** • LU 1.4: Market Demand (Urban vs Rural) → **1 Hr** • LU 1.5: Business Idea Sketch → **1 Hr**	

	M2: Packaging, Labeling & Food Safety Standards
	Total Duration: 6 Hours
	
	General Module Objectives
	
	By the end of this module, trainees will be able to:
	
	1. **Understand the role of packaging** in maintaining product quality, extending shelf life, and attracting customers.
	2. **Differentiate between packaging materials** and select appropriate types for various food products based on safety, cost, and market requirements.
	3. **Recognize the importance of labeling** as both a
		LU 2.1: Types of Packaging Materials (1 Hr)
		Knowledge / Content
		• **What is packaging?** Packaging means covering or wrapping food to protect it from dirt, germs, damage, and to keep it fresh.
		• **Why do we need packaging?**
		  ○ Protects food from dust, insects, and moisture.
		  ○ Keeps food safe during transport.
		  ○ Makes food look attractive to buyers.
		  ○ Gives space for labeling information.
		Types of Packaging Materials:	

	marketing tool and a legal requirement, and design labels that are clear, informative, and compliant with food regulations. 4. **Apply basic food safety and shelf life principles** to packaging and labeling decisions. 5. **Demonstrate creativity and compliance** by designing and presenting their own product label and packaging sketch. 6. **Critically evaluate peer work** to give and receive constructive feedback for improvement.	1. **Glass Jars/Bottles** – used for jam, pickles, sauces. Strong, see-through, but can break easily. 2. **Plastic** – used for snacks, juices, bottles. Light and cheap, but must be food-grade. 3. **Metal Cans** – used for drinks, canned fruits/vegetables. Strong, long shelf life. 4. **Paper & Cardboard** – used for bakery boxes, milk cartons. Eco-friendly, but weak for wet foods. 5. **Flexible Laminated Pouches** – used for chips, spices, ketchup sachets. Keeps food fresh for longer. **Skills / Practical Tasks** • Show real samples (jar, pouch, carton) → trainees touch & compare. • Group activity: Match "product → best packaging material" (e.g., chips → pouch, jam → glass jar). **Trainer's Notes** • Bring actual empty packaging (chips packet, milk box, jam jar). • Explain with simple daily-life examples (tea in a plastic bag vs in a tin). --- **LU 2.2: Importance of Labeling – What to Include (1 Hr)** **Knowledge / Content** **What is a label?** A label is the printed information on food packaging. **Why is labeling important?** • Tells the customer what the food is. • Gives trust and confidence. • Helps people choose according to health needs. • Required by law. **What should be included on a food label?**	

		1. **Product Name** (e.g., Apple Jam). 2. **Ingredients** (list in order: apple, sugar, pectin, citric acid). 3. **Expiry / Best Before Date.** 4. **Manufacturing Date & Batch Number.** 5. **Net Weight / Volume.** 6. **Storage Instructions** (e.g., "Keep in cool dry place"). 7. **Manufacturer Details** (name, address). 8. **Allergen Information** (e.g., contains milk, nuts, gluten). **Skills / Practical Tasks** • Trainer shows a real food label (milk pack, ketchup bottle). • Trainees list what details they find. • Group makes a checklist of 8 things every label must have. **Trainer's Notes** • Keep language simple ("label is like ID card of food"). • Stress honesty: Never write false claims (like "sugar-free" if sugar is added). --- **LU 2.3: Shelf Life Basics (45 Mins)** **Knowledge / Content** • **What is shelf life?** Shelf life = the time food stays safe and good to eat. After this, it may spoil. **Factors that affect shelf life:** 1. **Packaging** (airtight vs open). 2. **Temperature** (heat makes food spoil faster). 3. **Moisture** (water encourages fungus and bacteria). 4. **Preservatives** (like vinegar, salt, sugar). **Examples:** • Bread → 2–3 days. • Chips in pouch → 1–2 months.	

		• Jam in sealed jar → 6–12 months. **Skills / Practical Tasks** • Ask trainees to share examples: "How long does milk last in fridge vs room temperature?" • Trainer shows spoiled vs fresh food (pictures). **Trainer's Notes** • Keep it simple: "Food is like us – some live short, some long. Packaging is their home." **LU 2.4: Legal Requirements (Basic Awareness) (45 Mins)** **Knowledge / Content** • In Pakistan, food must follow rules set by **Food Authorities** (Punjab, Sindh, KPK, Balochistan). • **Basic legal requirements for packaged food:** 1. Must have expiry date. 2. Must have manufacturer name & address. 3. Must have batch number for traceability. 4. No harmful chemicals allowed. • Some businesses also need **licenses**: o Trade license. o Food authority approval. o Halal certification (for meat-based products). **Skills / Practical Tasks** • Trainer shows a fake sample label with missing info → trainees identify mistakes. • Discussion: "What can happen if a shop sells expired food?" **Trainer's Notes** • Avoid too much legal language. Use real cases: "Remember when PFA closed shops selling expired milk?"	

		LU 3.5: Hands-On – Create Label & Sketch Packaging (1 Hr)
		Knowledge / Content
		• Recap: What must be on a label.
		• Tips for design:
		  ○ Keep it simple and clear.
		  ○ Use big fonts for product name.
		  ○ Use attractive colors.
		  ○ Add logo if possible.
		Skills / Practical Tasks
		• Each trainee selects one product (e.g., jam, chips, juice).
		• Draw packaging shape (box, jar, pouch).
		• Design a label with:
		  ○ Name, ingredients, expiry date, weight, storage instructions.
		Trainer's Notes
		• Encourage creativity but check if details are correct.
		• Remind them: "A label must be beautiful **and** informative."
		
		LU 2.6: Peer Review Session (45 Mins)
		Knowledge / Content
		• Peer review = checking each other's work to learn together.
		• Things to check:
		  1. Does the label have all 8 required things?
		  2. Is it clear and easy to read?
		  3. Is the design attractive?
		Skills / Practical Tasks
		• Trainees swap their label sketches with a partner.
		• Give feedback: "Good points" + "Suggestions for improvement."
		• Volunteers present their designs to class.
		Trainer's Notes	

		• Create a friendly environment (no making fun of each other). • Encourage positive + constructive comments. **Wrap-Up / Assessment (30 Mins)** • Quick quiz: "What are 3 types of packaging? Name 3 things every label must have." • Trainees show their labels and explain. • Trainer gives feedback and summarizes.	
1	**M 3 :Food Processing and Preservation:** **Objective:** The objective of food processing and preservation is to maintain the safety, quality, and nutritional value of food while extending its shelf life. It aims to reduce post-harvest losses, prevent spoilage, and make food more convenient, accessible, and marketable. Through proper techniques, food processing and preservation enhance food security, support value addition, and create income-generating opportunities. These practices also ensure that surplus produce can be stored for future use, minimize waste, and provide consumers with a variety of safe, affordable, and nutritious food products throughout the year.	**Introduction to Food Processing and Preservation** □ Understand the basic principles and importance of food processing and preservation. □ Identify and apply suitable preservation methods for different food types. □ Demonstrate safe handling and hygiene practices during processing activities. □ Explore opportunities for value addition and small-scale food-based enterprises. **Knowledge / Content Areas** 1. **Introduction to Food Processing and Preservation** o Definitions and concepts o Importance for food security, nutrition, and income generation 2. **Principles of Food Spoilage and Preservation** o Causes of food spoilage (microbial, enzymatic, chemical, physical)	

		○ Basic principles of preservation (temperature control, moisture removal, use of preservatives, packaging) 3. **Food Safety and Hygiene** ○ Personal hygiene and safe handling of food ○ Sanitation of tools, equipment, and processing areas ○ Food safety standards (local, HACCP basics) 4. **Methods of Food Processing** ○ Primary processing: cleaning, grading, milling, peeling, cutting ○ Secondary processing: cooking, baking, fermenting, pasteurizing ○ Tertiary processing: ready-to-eat/packaged foods 5. **Methods of Food Preservation** ○ Traditional methods: drying, salting, smoking, pickling, fermentation ○ Modern methods: freezing, refrigeration, vacuum sealing, canning, pasteurization, chemical preservatives ○ Packaging and labeling for preservation 6. **Nutrition and Food Value** ○ Effect of processing on nutrients ○ Methods to retain maximum nutrition during processing 7. **Post-Harvest Handling and Storage** ○ Handling fresh produce to reduce losses ○ Cold chain and storage management	

		8. **Value Addition and Entrepreneurship**
		  o Developing processed food products (jams, juices, pickles, dried fruits, dairy items)
		  o Small-scale food enterprise opportunities
		  o Marketing and branding basics.
		
		Skills / Practical Tasks
		
		1. **Food Safety & Hygiene**
		
		• Practice proper handwashing and personal hygiene.
		• Sanitize tools, equipment, and work areas.
		• Apply safe food handling during processing.
		
		2. **Basic Food Preparation & Handling**
		
		• Sorting, grading, and washing fruits, vegetables, and cereals.
		• Cutting, peeling, slicing, and blanching raw produce.
		
		3. **Traditional Preservation Techniques**
		
		• Drying fruits, vegetables, and herbs (sun-drying/dehydrators).
		• Salting and pickling vegetables.
		• Smoking fish/meat (if relevant to training context).
		• Fermentation (curd, sauerkraut, or local products).
		
		4. **Modern Preservation Techniques**
		
		• Refrigeration and freezing practices.	

		• Canning and bottling (jams, juices, sauces). • Pasteurization of milk or juices. • Vacuum packing demonstrations (if equipment available). 5. **Processing and Value Addition** • Preparation of jams, jellies, marmalades, and chutneys. • Making pickles, sauces, or flavored beverages. • Drying and packaging of fruits/vegetables. • Preparation of simple dairy products (yogurt, cheese, butter). 6. **Packaging and Labeling** • Use of jars, bottles, and food-grade packaging. • Sealing and labeling finished products with date and batch. 7. **Storage and Quality Check** • Demonstrating proper storage (ambient, refrigerated, cold chain). • Identifying signs of spoilage. • Shelf-life estimation of preserved products. **Trainer's Notes** □ Begin with an introduction on the importance of food processing and preservation for food security and income generation. □ Emphasize hygiene, safety, and quality standards throughout all sessions.	

		□ Use participatory methods: demonstrations, group work, and hands-on practice. □ Link theory with practical examples relevant to local foods and resources. □ Encourage trainees to share experiences and discuss challenges. □ Highlight value addition and small-scale business opportunities. □ Assess learning through questions, demonstrations, and feedback. □ Summarize key takeaways at the end of each session.	
	M 4: Value Addition of Fruits and Vegetables: **Objectives:** The main objective of value addition of fruits and vegetables is to reduce post-harvest losses, extend shelf life, and enhance the usability of fresh produce. It aims to transform raw fruits and vegetables into diversified, marketable products such as jams, juices, pickles, and dried items, thereby increasing their economic value. Value addition also supports food security, creates employment opportunities, and encourages small-scale entrepreneurship. Additionally, it ensures year-round availability of seasonal produce, improves nutrition, and meets consumer demand for convenient, safe, and quality products.	**Introduction of Value Addition of Fruits and Vegetables** □ Process of converting fresh fruits and vegetables into products with higher market and nutritional value. □ Includes activities like cleaning, grading, drying, packaging, and making products such as jams, juices, and pickles. □ Helps reduce post-harvest losses and extend shelf life. □ Creates opportunities for income generation, entrepreneurship, and improved food security. **Knowledge / Content Areas** • **Introduction to Value Addition** o Meaning, scope, and importance of value addition in fruits and vegetables.	

		• **Post-Harvest Handling**
		  ○ Sorting, grading, washing, and storage techniques to maintain quality.
		• **Processing and Preservation Methods**
		  ○ Drying, canning, pickling, juicing, jam/jelly making, freezing, and fermentation.
		• **Food Safety and Quality Standards**
		  ○ Hygiene practices, packaging, labeling, and compliance with food safety regulations.
		• **Nutrition and Consumer Demand**
		  ○ Effect of processing on nutrients and meeting market needs for safe, convenient foods.
		• **Entrepreneurship and Marketing**
		  ○ Small-scale business opportunities, product branding, pricing, and market linkages.
		
		Skills / Practical Tasks
		
		• **Post-Harvest Handling**
		  ○ Sorting, grading, and washing fruits and vegetables to maintain quality.
		• **Processing Techniques**
		  ○ Cutting, peeling, slicing, and blanching produce.
		  ○ Preparing jams, jellies, squashes, juices, pickles, chutneys, and sauces.
		  ○ Drying and dehydration of fruits and vegetables.	

		- Freezing and cold storage practices. **Preservation & Packaging** - Applying preservation methods (salting, sugaring, vinegar, canning, fermentation). - Filling, sealing, and labeling jars, bottles, or packets. **Quality & Business Skills** - Checking for spoilage and maintaining hygiene standards. - Preparing simple business/marketing plans for selling value-added products. **Trainer's Notes** - Start with the importance of value addition for reducing post-harvest losses and increasing income. - Demonstrate each process step-by-step (washing, cutting, cooking, preservation, packaging). - Emphasize hygiene, food safety, and quality standards throughout the training. - Encourage active participation through group work and hands-on practice. - Use locally available fruits and vegetables to ensure relevance and affordability. - Highlight small-scale business opportunities and marketing strategies. - Check understanding through questions, demonstrations, and feedback.	

		• Summarize key learning points at the end of each session.	
3	**M 5: Dehydration of Vegetables:** **Objective:** The primary objective of dehydrating vegetables is to extend their shelf life by removing moisture, which prevents the growth of microorganisms and reduces spoilage. Dehydration helps in preserving the natural flavor, color, and nutritional value of vegetables for longer periods. Another key objective is to reduce the bulk and weight of vegetables, making them easier and more cost-effective to store, package, and transport. Dehydration also provides consumers with convenient, ready-to-use products that can be rehydrated when needed. Additionally, it minimizes post-harvest losses and creates opportunities for small-scale processing, value addition, and income generation.	**Introduction of Dehydration of Vegetables** • Dehydration is the process of removing moisture from vegetables to inhibit microbial growth and spoilage. • It helps extend shelf life while retaining much of the flavor, color, and nutrients. • Dehydrated vegetables are lighter, compact, and easier to store and transport. • This method supports food security by reducing post-harvest losses and providing year-round availability. **Knowledge / Content Areas** **Introduction to Dehydration** • Definition, importance, and objectives of vegetable dehydration. **Causes of Spoilage** • Role of moisture in microbial growth and enzymatic activity. **Methods of Dehydration** • Traditional methods: sun drying, shade drying. • Modern methods: solar drying, mechanical/hot-air drying, freeze drying. **Processing Steps**	

		• Selection, sorting, washing, peeling, slicing, blanching, drying, packaging, and storage.
		
		Quality and Safety
		
		• Factors affecting quality (temperature, time, air flow).
		• Nutritional changes during dehydration.
		• Hygiene and food safety standards.
		
		Storage and Utilization
		
		• Packaging materials and methods for dehydrated vegetables.
		• Rehydration practices and cooking uses.
		
		Economic and Practical Aspects
		
		• Cost-effectiveness, reduction of post-harvest losses, and small-scale business opportunities.
		
		Skills / Practical Tasks
		
		• **Selection & Preparation**
		  ○ Identify suitable vegetables for dehydration.
		  ○ Practice sorting, grading, washing, peeling, and slicing techniques.
		• **Pre-Treatment**
		  ○ Perform blanching to retain color, texture, and nutrients.
		  ○ Apply pretreatments like salting, sugaring, or dipping in preservatives (if applicable).
		• **Drying Methods**	

		- Demonstrate sun drying, shade drying, or solar drying. - Operate mechanical/hot-air dryers for faster dehydration. **Post-Drying Handling** - Test dryness level for safe storage. - Package dehydrated vegetables using appropriate containers (jars, polythene bags, vacuum packs). - Label and store products correctly. **Utilization** - Rehydrate dried vegetables and prepare simple recipes. **Trainer's Notes** - Begin with the importance of dehydration for reducing spoilage and extending shelf life. - Explain different drying methods (sun, solar, mechanical) with local examples. - Emphasize hygiene, pre-treatment steps (washing, slicing, blanching), and food safety practices. - Demonstrate step-by-step dehydration using available equipment. - Involve trainees in hands-on practice: sorting, slicing, drying, packaging, and labeling. - Highlight storage techniques and rehydration uses in cooking. - Discuss economic opportunities and small-scale business potential.	

		• Encourage questions, group discussions, and reflections after each session.	
4	**M 6:Value Added Products Recipes:** **Objectives:** To enhance the utilization of locally available agricultural produce by developing innovative, market-oriented recipes that increase product value, improve nutritional quality, extend shelf life, and generate additional income opportunities for communities and entrepreneurs.	**Introduction of Value Added Products Recipes** ➨ Transform raw agricultural produce into diverse food items with higher market value. ➨ Improve taste, nutrition, and shelf life through innovative recipe development. ➨ Create opportunities for small-scale entrepreneurs and communities. ➨ Support food security and reduce post-harvest losses. **Knowledge / Content Areas** ➨ Principles of value addition and product diversification. ➨ Selection of raw materials and quality standards. ➨ Recipe development techniques for improved taste, nutrition, and shelf life. ➨ Food safety, hygiene, and preservation methods. ➨ Packaging, labeling, and storage practices. ➨ Market trends, consumer preferences, and pricing strategies. **Skills / Practical Tasks** ➨ **Raw Material Selection**- Identify fresh, good-quality fruits/vegetables for processing. ➨ **Recipe Preparation**- Practice hygienic preparation of: ➨ Fruit Jam (e.g., mango or strawberry jam)	

		➨ Pickles (e.g., mixed vegetable pickle) ➨ Squash/Syrup (e.g., lemon squash) ➨ Chutney (e.g., mint or tamarind chutney) ➨ **Preservation Techniques**- Apply methods like boiling, drying, and using natural preservatives. ➨ **Packaging & Labeling**- Pack jams, pickles, or chutneys in clean, airtight jars with labels. ➨ **Costing & Marketing**- Calculate production cost per recipe and suggest pricing for the local market. **1) Pickle**  **Introduction to Pickling** ➨ **Definition**: Preservation of fruits and vegetables using salt, vinegar, or fermentation. ➨ **Purpose**: ➨ Extend shelf life. ➨ Enhance flavor through fermentation or seasoning. ➨ **Scientific Background**: ➨ Reduces pH to inhibit spoilage microorganisms. ➨ Enhances probiotics through lactic acid fermentation. ➨ **Fermentation Types in Pickling** ➨ **Lactic Acid Fermentation**:	

		➡ Role of Lactobacillus spp. in lowering pH. ➡ Enhances flavor and nutritional profile. ➡ **Alcohol Fermentation**: ➡ Occurs in pickles with higher sugar content. ➡ Converts sugars to ethanol (e.g., fruit pickles). ➡ **Acetic Acid Fermentation**: ➡ Addition of vinegar or acetic acid inhibits spoilage bacteria. ➡ **Key Scientific Factor**: ➡ Salt concentration controls microbial activity (ideal: 5–8%). ➡ **Ingredients for Pickling** ➡ **Essential Components**: ➡ **Raw Materials**: Fresh fruits, vegetables (e.g., cucumbers, lemons, mangoes). ➡ **Salt**: Enhances osmotic pressure and fermentation. ➡ **Vinegar**: Provides acidity (4–6% acetic acid). ➡ **Spices**: Turmeric, chili, mustard seeds, etc., for flavor and antimicrobial properties. ➡ **Oil (for oil pickles)**: Acts as a sealant and preservative **General Pickle Preparation Steps** ➡ **Selection of Ingredients**: ➡ Use fresh, blemish-free fruits/vegetables. ➡ **Washing and Peeling**:	

		➡ Thorough cleaning to remove dirt and pesticide residues. ➡ **Cutting and Brining**: ➡ Cutting into uniform sizes for even fermentation. ➡ Brining with 5–10% salt solution. ➡ **Fermentation or Marination**: ➡ Ensuring anaerobic conditions (covered with brine or oil). ➡ **Storage**: ➡ Airtight containers to prevent microbial contamination. ➡ **Scientific Principles of Pickling** ➡ **Microbial Inhibition**: ➡ Low pH (below 4.6) suppresses spoilage bacteria. ➡ Salt concentration maintains favorable conditions for Lactobacillus spp. ➡ **Flavor Development**: ➡ Organic acids and enzymes enhance taste and texture. ➡ **Shelf Stability**: ➡ Reduced water activity prevents mold growth. ➡ 💡 **Benefits of Pickles** ➡ ✅ **1. Long Shelf Life** ➡ Pickling preserves fruits and vegetables for **months or even years**. ➡ Useful in regions with seasonal harvests. ➡ ✅ **2. Improved Digestion**	

- Fermented pickles contain **probiotics** (good bacteria) that promote gut health.
- Help stimulate digestive enzymes.
- ✅ **3. Appetite Booster**
- Tangy and spicy pickles **enhance taste and appetite**, especially in traditional meals.
- ✅ **4. Rich in Antioxidants**
- Ingredients like turmeric, mustard seeds, garlic, and chili contain **antioxidants** that fight free radicals.

🥕🫚 **MIX VEGETABLE PICKLE RECIPE (Yield: ~1 kg)**

- □ INGREDIENTS
- Vegetable (chopped) Quantity
- Carrot 200 g
- Cauliflower florets 200 g
- Raw mango (peeled, sliced) 200 g
- Turnip or radish (optional) 100 g
- Lemon or lime (sliced) 100 g
- 🔁 Total chopped vegetables: ~900 g
- Final yield with spices & oil: ~1 kg

🫚 SPICES

- Spice : Quantity
- Mustard seeds (yellow or black) 2 tbsp
- Fennel seeds (saunf) 1 tbsp
- Fenugreek seeds (methi) 1 tbsp
- Nigella seeds (kalonji) 1 tsp

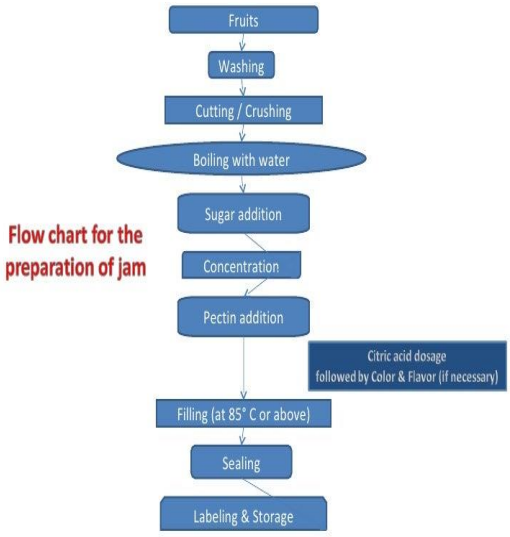
		➡ Turmeric powder 1½ tsp ➡ Red chili powder 2 tsp (adjust heat) ➡ Salt 1½ tbsp (or to taste) ➡ Mustard oil 250–300 ml ➡ Vinegar (optional, for shelf life) 2–3 tbsp 🛠 **EQUIPMENT NEEDED** ➡ Knife and cutting board • Mixing bowl • Heavy-bottomed pan (for heating oil) • Sterilized glass jars for storage • Strainer and spoon **□ STEP-BY-STEP METHOD** 🔪 Step 1: Prepare the Vegetables 1. Wash, peel, and cut vegetables into small uniform pieces. 2. Blanch tougher vegetables (like carrots, cauliflower, beans) in hot water for 1–2 minutes. 3. Drain and spread on a cloth to dry completely (sun-dry or fan-dry for several hours) — moisture spoils pickle. 🌶 Step 2: Dry Roast and Crush Spices 1. Lightly dry roast mustard, fennel, and fenugreek seeds.	

		2. Cool and coarsely grind (not fine powder. 🛢 Step 3: Heat Mustard Oil 1. Heat mustard oil until smoking point (this removes raw smell). 2. Let it cool slightly (warm, not hot). **Step 4: Mix Everything** ➡ In a large mixing bowl, add: ➡ All dried vegetables ➡ Ground roasted spices ➡ Kalonji, turmeric, chili powder, hing, and salt ➡ Lemon or lime slices ➡ Pour **warm oil** over and mix thoroughly. ➡ Add vinegar (optional) for extra shelf life. **Step 5: Rest and Store** ➡ Transfer to **sterilized, dry glass jars**. ➡ Keep in **sunlight for 3–5 days**, shaking the jar daily for even mixing. ➡ Store in a cool, dry place. Refrigerate for longer shelf life. ➡ **Ready to eat in**: 4–5 days **Shelf life**: 3–6 months if moisture-free and well-oiled ⚠ **Precautions While Consuming Pickle**	

		➨ **High Salt & Oil**: Excessive intake can lead to high blood pressure or cholesterol. ➨ **Preservatives**: Commercial pickles may contain artificial colors and preservatives. **Balance is key**: Enjoy pickles in moderation as part of a balanced diet ➨ **Common defects in pickles** ➨ **Soft Pickles**: ➨ Cause: Low salt or high temperatures. ➨ Solution: Increase brine concentration. ➨ **Mold Growth**: ➨ Cause: Inadequate sealing or exposure to air. ➨ Solution: Ensure airtight conditions. ➨ **Overly Salty Pickles**: ➨ Cause: High salt concentration. ➨ Solution: Dilute with water or vinegar. ***2) Jam Preparation*** ➨ **Scientific Principles of Jam Making** ➨ **Pectin Gelation**: ➨ High-molecular-weight polysaccharide extracted from fruit cell walls. ➨ Requires sugar and acidic pH for gel formation. ➨ **Role of Sugar**: ➨ Binds water and lowers water activity ($aw \leq 0.85$). ➨ Enhances sweetness and texture. ➨ **Acid Functionality**:	

- Optimizes pH to activate pectin cross-linking.

Flow chart (Jam)



Flow chart for the preparation of jam

- **Scientific Parameters to Monitor**
- **Total Soluble Solids (TSS)**: 68–70 °Brix for proper preservation.
- **pH**: Maintain between 3.0–3.3 for gel formation.
- **Water Activity (aw)**: Should be ≤0.85 to prevent microbial spoilage.

1 kg jam Standard Formulation:

Ingredient	Quantity (g)
Raw apples (peeled & cored)	1,000 g
Sugar	750 g
Pectin (commercial, citrus/apple)	10–15 g
Citric acid	3–5 g
Water	50–100 ml
Sodium Benzoate	1 g

		Method of Preparation ➨ **Fruit preparation:** Wash, peel, core, cut into small pieces. ➨ **Softening:** Add 50–100 ml water, cook until soft (fruit releases juice). ➨ **Pulping:** Mash or pass through a pulper. ➨ **Cooking with sugar:** Add sugar gradually; stir continuously. ➨ **Pectin addition:** Dissolve pectin in a small amount of sugar to prevent lumping; add to mixture. ➨ **Acid addition:** Add citric acid near end of cooking. ➨ **End-point:** Cook until 68–70°Brix (use refractometer) and 104–105°C. ➨ **Filling:** Fill hot into sterilized jars, seal immediately. ➨ **Cooling:** Invert jars briefly to sterilize lids, cool to room temperature. **Shelf Life** ➨ **Homemade:** 6–12 months (cool, dry, dark storage). ➨ **Commercial (with preservatives):** 12–18 months. ➨ **Spoilage signs:** Mold growth, fermentation, syneresis (water separation), off-odors. ➨ **Storage conditions:** T ≤ 25°C, RH ≤ 65%, away from sunlight. **3) Mango Syrup**  **Standard Recipe (1 kg Mango Pulp)** ➨ **Slide 2 – Ingredients (for 1 kg Mango Pulp)** ➨ Mango pulp – **1 kg**	

		➨ Sugar – **1.5 kg** (adjust for desired sweetness) ➨ Citric acid – **3 g** (≈ ½ tsp) ➨ Water – **1.5 L** (adjust for desired consistency) Preservative – Sodium Benzoate) **1 g** *(optional, as per local regulations* **Method / Recipe** ➨ **Pulp Preparation** – Use ripe, fresh mangoes. Wash, peel, and pulp. ➨ **Sugar Syrup** – Dissolve sugar in water, heat to boiling, and filter. ➨ **Mixing** – Add mango pulp to hot syrup and blend well. ➨ **Acid Adjustment** – Add citric acid to balance taste and improve shelf life. ➨ **Boiling** – Heat to **85–90 °C** for 5–10 minutes. ➨ **Cooling & Preservative** – Cool to 35–40 °C, add S.B if using. ➨ **Bottling** – Fill in sterilized glass bottles, seal, and label. **Quality Parameters** ➨ **TSS (°Brix):** 65–68°Brix ➨ **pH:** 3.5–4.0 ➨ **Acidity:** 0.25–0.35 % (as citric acid) ➨ **Color:** Bright yellow to orange, free from browning **Shelf Life & Storage** ➨ **Shelf Life:** 6–9 months (with preservative & proper storage) ➨ **Storage:** Cool, dry place, away from direct sunlight	

		➨ **Refrigerate after opening** and use within 4 weeks
		
		4)Tomato Ketchup 
		
		• **Definition**: A semi-solid sauce made from tomato paste, sugar, vinegar, and spices.
		• **Composition**:
		  • Tomato paste: 28–30%
		  • Sugar: 12–15%
		  • Acidity: 1.0–1.5%
		  • Salt and spices: ~2%
		• **Standard TSS**: 25–28%.
		
		a) 1 kg tomato ketchup Standard Formulation:
		
		Ingredients:
		
		1. Tomato puree (500g)
		
		2. Sugar (150g)
		
		3. Vinegar (100g)
		
		4. Salt (20g)
		
		5. Onion powder (5g)
		
		6. Garlic powder (2g)
		
		7. Paprika powder (1g)
		
		8. Cumin powder (1g)
		
		9. Water (200g)
		
		10. Xanthan gum (optional, 1-2g)
		
		Instructions:
		
		1. Combine tomato puree, sugar, vinegar, salt, onion powder, garlic	

		powder, paprika powder, and cumin powder in a saucepan. 2. Whisk until sugar dissolves. 3. Add water and bring to a boil. 4. Reduce heat and simmer for 20-30 minutes or until desired consistency. 5. If using xanthan gum, mix with a small amount of water and add to ketchup. 6. Blend ketchup to desired smoothness. 7. Bottle and store in refrigerator. Note: You can adjust sweetness, acidity, and spice levels to taste. This formulation provides a basic recipe; feel free to modify according to your preferences! **b)5 kg tomatoes Paste Formulation:** **Ingredients:**  - 5kg ripe tomatoes - 10-20 grams salt (optional) - 50-100 ml olive oil (optional) - 1 medium-sized onion (150-200 grams), finely chopped (optional) - 3-5 cloves garlic (15-25 grams), minced (optional) **Method:** 1. Prepare the tomatoes: Wash, core, and chop the tomatoes into small pieces.	

		2. Cook the tomatoes: Heat the olive oil in a large pot over medium heat. Add the chopped onion and garlic (if using) and sauté until softened. Add the chopped tomatoes and cook, stirring occasionally, until they break down and release their juices. 3. Simmer and reduce: Continue cooking the tomato mixture over low heat, stirring occasionally, until the liquid has evaporated and the mixture has thickened. This process can take 1-2 hours. 4. Blend the mixture: Use an immersion blender or transfer the mixture to a blender and puree until smooth. 5. Reduce and thicken: Return the pureed mixture to the pot and continue cooking over low heat, stirring frequently, until the desired consistency is reached. 6. Add salt (if using): Stir in the salt to taste. 7. Cool and package: Let the tomato paste cool, then transfer it to airtight containers or bottles. **Tips:** - Use fresh, flavourful tomatoes for the best results. - Adjust the amount of salt, onion, and garlic to taste. - This recipe yields approximately 1-2 litres of tomato paste, depending on the water content of the tomatoes and the desired consistency.	

		Packaging: The resulting tomato paste can be packaged in 5 bottles of 300ml each, approximately.
		
		7) Mayonnaise
		
		 
		
		Ingredients (in grams):
		- 250g egg yolks (about 4-5 large egg yolks)
		- 250g neutral-tasting oil (such as canola or grapeseed oil)
		- 15g lemon juice or vinegar
		- 5g salt
		- Method:
		  - Prepare the ingredients: Separate the egg yolks from the whites. Make sure the egg yolks are at room temperature.
		  - Whisk the egg yolks: In a large bowl, whisk the egg yolks with the lemon juice or vinegar and salt until well combined.
		  - Slowly add the oil: While continuously whisking the egg yolks, slowly pour the oil into the bowl in a thin stream. Start with a very slow drizzle and gradually increase the flow as the mixture thickens.
		  - Emulsify the mixture: Continue whisking until the mixture thickens and emulsifies. You'll notice the mixture will start to lighten in color and thicken. This should take about 5-7 minutes.
		  - Check the consistency: Stop whisking when the	

		mayonnaise has reached the desired consistency. If it's too thick, you can add a little more lemon juice or vinegar. If it's too thin, you can add a little more oil.
		➡ Taste and adjust: Taste the mayonnaise and adjust the seasoning if needed.
		
		Tips:
		
		- Use room temperature ingredients: This is crucial for emulsification.
		
		- Whisk slowly and patiently: Don't rush the process, as this can cause the mixture to break.
		
		- Use a neutral-tasting oil: This will help the mayonnaise to have a neutral flavor.
		
		Quality Parameters
		
		• **Tomato Paste**:
		  • TSS: 25–30%
		  • Acidity: 0.4–0.6%
		• **Tomato Ketchup**:
		  • TSS: 25–28%
		  • Acidity: 1.0–1.5%
		• **Microbial Safety**:
		  • Ensure proper pasteurization to prevent spoilage.
		
		Shelf Life:
		
		▪ Unopened:
		▪ Tomato Ketchup: 12-18 months at room temperature
		▪ Tomato Paste: 12-24 months at room temperature or 24-36 months in the fridge
		▪ Opened:	

- Tomato Ketchup: 6-12 months in the fridge
- Tomato Paste: 6-12 months in the fridge (diluted) or 12-18 months (undiluted)
-

Factors Affecting Shelf Life:

- Storage conditions (temperature, humidity, light)
- Packaging (air-tight containers or bottles)
- Handling and contamination
- Preservatives used (if any)
-

Signs of Spoilage:

- Off smell or taste
- Slime, mold, or yeast growth
- Color change or darkening
- Texture change or separation

8) **Tandoori sauce:**

Ingredients:

- Yogurt: 1 cup
- Tomato puree: 1/2 cup
- Ginger paste: 2-3 tablespoons
- Garlic paste: 2-3 tablespoons
- Cumin powder: 1 teaspoon
- Coriander powder: 1 teaspoon
- Cayenne pepper or red chili powder: 1/2 teaspoon (adjust to taste)
- Garam masala: 1/2 teaspoon
- Lemon juice: 2-3 tablespoons
- Salt: to taste
- Cilantro: chopped (optional, for garnish)

Instructions:

1. Mix the ingredients: In a bowl, combine yogurt, tomato puree, ginger paste, garlic paste, cumin powder, coriander powder, cayenne pepper, garam masala, lemon juice, and salt. Mix well.

2. Adjust the consistency: If the sauce is too thick, add a little water. If it's too thin, add a bit more yogurt or tomato puree.

3. Taste and adjust: Adjust the seasoning and spice level to your taste.

4. Refrigerate: Refrigerate the sauce for at least 30 minutes to allow the flavors to meld.

5. Serve: Serve the tandoori sauce chilled or at room temperature, garnished with chopped cilantro if desired.

9) Imli Chutney Formulation:

- Tamarind paste: 200g
- Water: 400g
- Sugar: 200g
- Salt: 20g
- Cumin powder: 5g
- Coriander powder: 5g
- Red chili powder: 2g (adjust to taste)

Method of Making:

1. Combine ingredients: In a saucepan, combine tamarind paste, water, sugar, salt, cumin powder, coriander powder, and red chili powder.

2. Boil and simmer: Bring the mixture to a boil, then reduce the heat and

simmer for 10-15 minutes or until the chutney thickens.

3. Strain: Strain the chutney through a fine-mesh sieve to remove any solids.

4. Cool and store: Let the chutney cool, then store it in an airtight container in the refrigerator.

Tips:

- Adjust sweetness and spice: Adjust the amount of sugar and red chili powder to suit your taste preferences.

- Use fresh tamarind: Use fresh and high-quality tamarind paste for the best flavor.

- Experiment with spices: Experiment with different spices and seasonings to create unique variations.

10) Pizza

Ingredients

- For the dough:
- 2 cups of warm water
- 1 teaspoon of sugar
- 2 teaspoons of active dry yeast
- 3 1/2 cups of all-purpose flour
- 1 teaspoon of salt
- 2 tablespoons of olive oil

- For the sauce:

  - 2 cups of crushed tomatoes
  - 2 cloves of garlic, minced
  - 1 teaspoon of dried oregano
  - 1 teaspoon of dried basil
  - Salt and pepper to taste

		➡ Toppings: ➡ Mozzarella cheese (shredded or sliced) ➡ Your choice of toppings (e.g., pepperoni, mushrooms, bell peppers, onions, olives) **Instructions** 1. Make the dough: In a large bowl, combine the warm water, sugar, and yeast. Let it sit for 5-10 minutes until the yeast is activated. Add the flour, salt, and olive oil, and mix until a dough forms. Knead the dough for 5-10 minutes until it becomes smooth and elastic. Place the dough in a greased bowl, cover it, and let it rise in a warm place for 1-2 hours, or until it has doubled in size. 2. Prepare the sauce: In a bowl, combine the crushed tomatoes, garlic, oregano, basil, salt, and pepper. Mix well. 3. Shape the dough: Punch down the dough and divide it into 2-4 equal portions, depending on the size of pizza you want to make. Roll out each portion into a thin circle. 4. Top the dough: Spread a layer of pizza sauce over the dough, leaving a small border around the edges. Add your desired toppings and sprinkle with mozzarella cheese. 5. Bake the pizza: Preheat your oven to 425-450°F (220-230°C). Place the pizza on a baking sheet or pizza stone and bake for 12-15 minutes, or until the crust is golden brown and the cheese is melted and bubbly.	

		Tips and Variations - Use a pizza stone in the oven to achieve a crispy crust. - Experiment with different toppings and combinations to find your favorite. - Consider using a variety of cheeses, such as mozzarella, parmesan, and gorgonzola, for a richer flavor. - For a more authentic Neapolitan-style pizza, use a wood-fired oven and cook the pizza for a shorter time at a higher temperature. **Trainer's Notes** ➨ Encourage participants to share local food practices for value addition. ➨ Demonstrate simple, low-cost recipe development techniques. ➨ Emphasize hygiene, safety, and proper presentation in preparation. ➨ Show how recipes reduce waste and increase income opportunities. ➨ Motivate innovation using locally available resources. ➨ Link recipes with consumer needs and market demand.	
	M 7: Baking **Objective:** To equip participants with the knowledge and skills of baking techniques that produce nutritious, high-quality baked goods, while promoting creativity, income	**Introduction of Baking** • A method of cooking food using dry heat in an oven. • Commonly used for bread, cakes, biscuits, and pastries. • Enhances taste, texture, and shelf life of food products.	

	generation, and sustainable use of locally available ingredients**.**	• Offers opportunities for home-based and commercial businesses. **Knowledge / Content Areas** • Basic principles and techniques of baking. • Functions of ingredients (flour, yeast, sugar, fat, eggs, etc.). • Measurement methods and mixing techniques. • Baking temperatures, timings, and use of equipment. • Hygiene, safety, and quality control in baking. • Storage, packaging, and shelf-life management of baked products. • Costing, pricing, and small-scale bakery business opportunities. **Skills / Practical Tasks** • Measuring and mixing ingredients accurately. • Preparing basic recipes such as bread, cake, biscuits, and muffins. • Practicing kneading, proofing, and shaping dough. • Operating and maintaining ovens safely. • Applying correct baking temperatures and timings. • Decorating and presenting baked products attractively. • Packaging and storing baked goods to maintain freshness. • Calculating cost per product and setting suitable prices. **Trainer's Notes**	

		• Encourage participants to share their baking experiences and challenges. • Demonstrate step-by-step baking methods with simple, locally adaptable recipes. • Emphasize accuracy in measuring and mixing for consistent results. • Highlight hygiene, safety, and proper use of baking equipment. • Show how creativity in flavors and decoration can attract customers. • Connect baking skills with opportunities for home-based and small-scale businesses.	

	M 8: Business Planning, Costing & Market Readiness
	Total Duration: 6 Hours
	
	LU 8.1: Costing Basics (Raw Cost, Labor, Profit Margin) – 1 Hr
	Objective
	Trainees will learn how to calculate the basic cost of their food products and understand how profit is added to make a sustainable business.
	
	By the end of this lesson, trainees will be able to:
	1. **Understand what costing means** – learn that costing is simply calculating how much money is spent to make a product.
	2. **Identify all types of costs** – raw materials (like sugar, fruit, jars), labor (their own time and effort), and overheads (like gas, electricity, transport).
	3. **Learn why costing is important** – know that without proper costing, a
		Knowledge / Content
		• **Raw Cost** = cost of ingredients.
		  ○ Example: For 1 kg apple jam → apples (200 PKR) + sugar (80 PKR) + lemon juice (20 PKR) = 300 PKR raw cost.
		• **Labor Cost** = payment for time and effort spent in making the product.
		  ○ Example: If 2 hours are spent and each hour is valued at 100 PKR, labor cost = 200 PKR.
		• **Overhead Cost** = electricity, gas, packaging, rent.
		• **Total Cost** = Raw cost + Labor + Overhead.
		• **Profit Margin** = Extra amount added to make profit (usually 20–40%).
		Formula:
		Selling Price = Total Cost + Profit Margin
		Practical Task
		• Give trainees a recipe (jam or pickle).	

	business may sell at a loss or fail to grow. 4. **Calculate total cost of one product** – practice writing down prices of each ingredient and packaging item, add their own time as labor, and calculate the overall cost. 5. **Add profit margin** – understand that every business must add some extra money (profit margin) on top of costs to earn income. 6. **Decide selling price** – learn how to set a fair selling price that covers all costs and gives them a reasonable profit. 7. **Build confidence in math for business** – gain the ability to use simple addition and multiplication to make business decisions	• They calculate: raw cost, labor cost, overhead, total cost, and final selling price. **Trainer's Notes** • Keep numbers small and easy. • Use daily-life examples: "If you buy potato for 100 PKR, make fries, sell them for 150 PKR, your profit is 50 PKR." **LU 8.2: Break-Even Point & Price Setting – 1 Hr** **Objective** Trainees will understand how many units they must sell to cover their costs before profit begins. **Knowledge / Content** • **Break-Even Point (BEP)** = the number of products to sell to cover total costs. • Formula: Break-Even Units = Total Fixed Cost ÷ (Selling Price – Variable Cost) **Simple Example:** • Fixed Cost (rent, gas) = 1000 PKR. • Variable cost per jar (ingredients, packaging) = 50 PKR. • Selling price per jar = 100 PKR. • BEP = 1000 ÷ (100 – 50) = 20 jars. So, after selling 20 jars, the 21st jar onward gives profit. **Price Setting:** • Price should cover cost + profit + be acceptable in market. • Consider competitor prices (too high = no sales, too low = no profit). **Practical Task** • Give trainees a costing case. Ask: "If you make 50 jars at 100 PKR cost each, and sell for 120 PKR, what's your profit?"	

		Trainer's Notes
		• Avoid too much math; keep examples realistic.
		• Compare to shop examples: "How many samosas must a shopkeeper sell to pay rent and start earning?"
		
		--- 	
		
		LU 8.3: Inventory & Production Planning – 1 Hr
		Objective
		Trainees will learn how to manage stock of raw materials and plan production to avoid waste and shortages.
		Knowledge / Content
		• **Inventory = stock of raw materials + finished goods.**
		• Why important?
		  ○ Avoids shortage during production.
		  ○ Prevents wastage (e.g., expired raw material).
		  ○ Saves money by buying in bulk.
		• **Basic Inventory Tools:**
		  ○ Stock register (manual notebook).
		  ○ FIFO method (First In, First Out – use old stock first).
		• **Production Planning:**
		  ○ Decide how much to produce per week.
		  ○ Match with demand.
		  ○ Avoid overproduction (extra jams may expire).
		Practical Task
		• Trainees make a simple weekly inventory list (e.g., 5 kg apples, 2 kg sugar, 10 jars).
		• Trainer shows how to update after production.
		Trainer's Notes
		• Use simple charts/drawings.
		• Relate to home kitchen example: "If you buy rice but don't use it	

		for 1 year, it may spoil. That's why inventory planning is important."
		
		LU 8.4: Final Product Display & Business Pitch – 1 Hr
		Objective
		Trainees will learn how to present their product attractively and explain their business idea confidently.
		Knowledge / Content
		• **Product Display Tips:**
		  ○ Use clean tablecloths.
		  ○ Arrange products neatly in rows.
		  ○ Use price tags.
		  ○ Add labels clearly.
		• **Business Pitch:**
		  ○ Short talk (2–3 minutes) about:
		  ▪ Product name.
		  ▪ What problem it solves.
		  ▪ Why people should buy it.
		  ▪ Price and quality.
		Example Pitch:
		"My product is Mango Pickle. It is homemade, fresh, and without harmful chemicals. Each jar costs 150 PKR. People love its taste and it can last for 6 months."
		Practical Task
		• Each trainee displays their product on a table.
		• Gives a short 2-minute pitch to classmates.
		Trainer's Notes
		• Encourage shy students.
		• Remind: "Smile, speak clearly, and believe in your product."
		
		LU 8.5: Judges' Feedback & Improvement Areas – 45 Mins
		Objective	

		Trainees will learn how to receive constructive feedback and improve their business ideas.
		Knowledge / Content
		• **Why feedback is important:**
		  ○ Helps us improve.
		  ○ Shows us customer point of view.
		  ○ Makes products more successful.
		• **Types of feedback:**
		  ○ Positive (what is good).
		  ○ Suggestion (what can be improved).
		Practical Task
		• Trainers or guest judges walk around displays.
		• Give comments: taste, label, price, display.
		• Trainees write down improvement points.
		Trainer's Notes
		• Keep comments supportive, not discouraging.
		• Use "sandwich feedback" → Good point → Suggestion → Encouragement.
		
		LU 8.6: Awards, Group Photos, Future Roadmap – 45 Mins
		Objective
		Celebrate achievements, build confidence, and inspire trainees to think of real-world application.
		Knowledge / Content
		• Awards motivate students to keep learning.
		• Roadmap helps them plan next steps:
		  ○ Start small business at home.
		  ○ Join food stalls or exhibitions.
		  ○ Apply for micro-loans or women entrepreneur schemes.	

		○ Keep improving skills. **Practical Task** • Distribute certificates, medals, or symbolic prizes. • Group photos with products. • Trainer explains future opportunities (local markets, social media selling, farmer markets). **Trainer's Notes** • Make this a joyful, motivational ending. • Share success stories of small entrepreneurs. **Additional Sessions (Linked to Module)** **Entrepreneurship Lecture (30 Mins)** **Objectives:** • Inspire entrepreneurial thinking. • Guide students on how to start their own food venture. • Introduce business model canvas (very simple version). **Content (simple words):** • What is entrepreneurship? → turning ideas into business. • Examples: Woman selling homemade pickles, youth selling chips. • Steps: Idea → Costing → Selling → Profit → Growth. **Environment Session (30 Mins)** **Objectives:** • Raise awareness about eco-friendly practices in business. • Show link between food business and environment. **Content (simple words):** • Avoid plastic waste → use glass jars, paper bags. • Save energy → use efficient stoves, solar dryers. • Reuse & recycle → reuse jars, recycle cardboard.	

		• Green business = more customer trust. **Practical Task:** • Group discussion: "How can we make jam/pickle business eco-friendly?" ✅ **Total Module 8 = 6 Hours** **Detailed Training** • Costing Basics → 1 hr • Break-Even & Price → 1 hr • Inventory & Planning → 1 hr • Display & Pitch → 1 hr • Feedback → 45 mins • Awards & Roadmap → 45 mins • Extra Sessions: Entrepreneurship + Environment → 1 hr	

Trainer Qualification Level

Qualification Level of trainer	Qualification / Certification	Purpose / Importance
Minimum Mandatory	18 years of education in Food Science, Food Technology, Nutrition, or related fields	Provides foundational knowledge of food processing principles, hygiene, and safety standards necessary for effective training delivery.
Preferred	PhD in food science and technology with at least 15 years of experience in the relevant field	Offers advanced technical expertise and deeper understanding of preservation, packaging, and value addition critical for comprehensive training.

Consumables

S.No	Item Description	Remarks
1	Fresh Fruits & Vegetables (for preservation & jams) hands on	Seasonal fruits & veggies

2	Dry Ingredients (sugar, salt, spices, pectin)	Includes pickling and jam ingredients
3	Baking Ingredients (flour, baking powder, eggs, butter)	For biscuit and cupcake preparation
4	Packaging Materials (labels, boxes, bottles, jars)	For product packaging and labeling
5	Hygiene & Safety Supplies (gloves, masks, sanitizers)	For food safety compliance
6	Digital Marketing Materials (USB drives, internet data)	For social media content & digital demos
7	Miscellaneous Consumables (spices, oils, yeast, etc.)	For value addition and bakery items
8	Printing & Laminating for Nutritional Labels	DIY label making materials
9	Other Ingredients for Fermentation (starter cultures)	For making yogurt, kimchi, etc.

Recommended Books

- Food **Processing Technology: Principles and Practice**

Fellows, P. J. (2017). *Food Processing Technology: Principles and Practice* (4th ed.). Woodhead Publishing. ISBN: 978-0081005088.

- Handbook **of Food Preservation**

Rahman, M. S. (Ed.). (2016). *Handbook of Food Preservation* (2nd ed.). CRC Press. ISBN: 9781466559916.

- Food **Safety Management: A Practical Guide for the Food Industry**

Motarjemi, Y., & Lelieveld, H. (2014). *Food Safety Management: A Practical Guide for the Food Industry* (2nd ed.). Elsevier. ISBN: 978-0123815046.

- Principles **of Food Packaging**

Robertson, G. L. (2016). *Principles of Food Packaging* (3rd ed.). CRC Press. ISBN: 9781498715754.

- Small-**Scale Food Processing: Principles and Techniques**

Rahman, M. S. (Ed.). (2007). *Small-Scale Food Processing: Principles and Techniques*. Springer. ISBN: 978-1402041219.

- Entrepreneurship**: Theory, Process, and Practice**

Kuratko, D. F. (2016). *Entrepreneurship: Theory, Process, and Practice* (10th ed.). Cengage Learning. ISBN: 978-1305503789.

- Marketing **Management**

Kotler, P., & Keller, K. L. (2016). *Marketing Management* (15th ed.). Pearson. ISBN: 9780133856460.

Additional Resources

- Food **Safety and Standards Authority of India (FSSAI)**

- Website: https://www.fssai.gov.in/
- Description: Official portal for food safety regulations, licensing, and standards critical for small-scale food businesses in India.

- **FAO Food and Agriculture Organization – Food Processing**

- Website: http://www.fao.org/food-processing/en/
- Description: Offers resources, manuals, and case studies on food processing, preservation, and value addition techniques.

- **USDA Food Safety and Inspection Service (FSIS)**

- Website: https://www.fsis.usda.gov/
- Description: Comprehensive guides on food safety practices, labeling requirements, and HACCP plans useful for food entrepreneurs worldwide.

- **National Center for Home Food Preservation**

- Website: https://nchfp.uga.edu/
- Description: Extensive resources on safe home-based food preservation methods such as canning, freezing, and drying.

- **The Spruce Eats – Food Preservation Techniques**

- Website: https://www.thespruceeats.com/food-preservation-4162594
- Description: Practical articles and tutorials on pickling, fermenting, dehydrating, and other food preservation processes.

- **Small Business Administration (SBA) – Starting a Food Business**

- Website: https://www.sba.gov/business-guide/plan-your-business/start-food-business
- Description: Step-by-step guides on launching a food business, including permits, licenses, business planning, and marketing.

- **Packaging of Food Products – Packaging Digest**

- Website: https://www.packagingdigest.com/food-beverage-packaging
- Description: Industry trends and best practices in food packaging, sustainability, and labeling innovations.

- **Coursera: Food Entrepreneurship Courses**

- Website: https://www.coursera.org/courses?query=food%20entrepreneurship
- Description: Online courses offering insights into food innovation, entrepreneurship, and business management.

KP-RETP – Component 2: Classroom SECAP Evaluation Checklist
Purpose:
To ensure that classroom-based skills and entrepreneurship trainings under KP-RETP are conducted in an environmentally safe, socially inclusive, and climate-resilient manner, in line with the Social, Environmental, and Climate Assessment Procedures (SECAP).

Evaluator: _____
Training Centre / Location: _____
Trainer: _____
Date: _____

Category	Evaluation Points	Status		Remarks /Recommendation
		Yes	NO	
Social Safeguards	Is the training inclusive (equal access for women, youth, and vulnerable groups)?			
	Does the classroom environment ensure safety and dignity for all participants (no harassment, discrimination, or child Labor)?			
	Are Gender considerations integrated into examples, discussions, and materials?			
	Is the Grievance Redress Mechanism (GRM) process, along with the relevant contact number, clearly displayed in the classroom			
	Are the Facilities and activities being accessible and inclusive for specially-abled (persons with disabilities)			
Environmental Safeguards	Is the classroom clean, ventilated, and free from pollution or hazardous materials?			
	Is there proper waste management (bins, no littering)			
	Are materials used in practical sessions environmentally safe (non-toxic paints, safe disposal of wastes)?			
	Are lights, fans, and equipment turned off when not in use (energy conservation)?			
Climate Resilience	Are trainees oriented on how their skills link with climate-friendly practices (e.g., renewable energy, efficient production, recycling)?			
	Are trainers integrating climate-smart examples in teaching content?			
	Are basic health and safety measures available (first aid kit, safe exits, fire safety)?			
	Is the trainer using protective gear or demonstrating safe tool use (where relevant)?			

Institutional Aspects	Is SECAP awareness shared with trainees (via short briefing, posters, or examples)?			
	Are trainees encouraged to report unsafe, unfair, or environmentally harmful practices?			
Overall Compliance	Overall SECAP compliance observed	☐ High ☐ Medium ☐ Low		

Overall remarks/ recommendations			
Name	**Designation**	**Signature**	**Date**