



Republic of Rwanda
Ministry of Education



RTB | RWANDA
TVET BOARD

FOPJM303

JAM, JELLY AND MARMALADE MAKING

MAKE JAM, JELLY AND MARMALADE

Competence

Learning Hours

RQF Level: 3



Credits: 6

Sector: Agriculture and Food Processing

Trade: Food Processing

Module Type: General

Curriculum: **AGR FOP3003**- TVET Certificate 3 Food Processing

Copyright: © Rwanda TVET Board, 2022

Issue Date: September 2022

Purpose statement	This competency covers the skills, knowledge and attitude required to properly process fruits into jam, jelly and marmalade in the food processing industry. Upon completion this competency trainee will be able to Prepare workplace and raw materials, produce and store correctly jam, jelly and marmalade. In addition, a trainee will be skillful to accomplish jam, jelly and marmalade at high efficiency and effectiveness under regular and directive supervision.					
Learning assumed to be in place	N.A					
Delivery modality	Training delivery		100%	Assessment		Total 100%
	Theoretical content		30%	Formative assessment	30%	50%
	Practical work:		70%		70%	
	• Group project and presentation	20%				
	• Individual project /Work	50%				
			Integrated Assessment		50%	

Elements of Competency and Performance Criteria

Elements of competency	Performance criteria
1. Prepare workplace and raw materials	1.1. Materials, tools and equipment are appropriately selected according to their intended use
	1.2. Work area is properly arranged according to production process
	1.3. Ingredients are correctly prepared according to product specification.
2. Produce Jam, Jelly and Marmalade	2.1. Pulp or juice are properly extracted according to the product specification
	2.2. Ingredient are properly mixed according to product specification
	2.3. Pulp or juice is effectively cooked according to product specification.
	2.4. Product is properly cooled according to Jam, Jelly and marmalade specification

3. Store Jam, Jelly and Marmalade	3.1. Packaging material is well identified according to product specification
	3.2. Product is well packaged according to the type of product
	3.3. Product storage parameters are adequately monitored according to product requirement

Learning outcomes	At the end of the module the learner will be able to: 1. Prepare workplace and raw materials 2. Produce Jam, Jelly and Marmalade 3. Store Jam, Jelly and Marmalade
Learning outcome 1: Prepare workplace and raw materials	Learning hours: 10
Indicative content	
• Selection of tools and equipment used in jam, jelly and marmalade ✓ Description of tools and equipment used in jam, jelly and marmalade + List of tools and equipment + Functionality and specification + Safety precautions of the tools and equipment + Adjustment ✓ Selection criteria of tools and equipment • Selection of materials used in jam, jelly and marmalade ✓ Description of Cleaning agents + Types of cleaning agent + Usage of cleaning agent + Safety and health precaution + Effectiveness use of cleaning agent + Selection criteria of cleaning agent ✓ Differentiation of ingredients used in jam, jelly and marmalade + List of ingredient + Usage of ingredient + Selection criteria of ingredients • Handling of received fresh fruit to be processed ✓ Factors affecting fruits deterioration ✓ Identification of storage conditions	

✓ Application of storage techniques

- **Arrangement of working area**

- ✓ Cleaning of workplace

- ✚ Purpose of cleaning work area

- ✚ Preparation of cleaning product

- ✚ Differentiate techniques of Cleaning

- ✚ Differentiate method of Cleaning

- ✚ Apply cleaning product

- ✓ Purpose of working area arrangement

- ✓ Setting of work area (flow chart)

- **Preparation of ingredient**

- ✓ Purpose of preparation of ingredient

- ✓ Application of preparation technique of ingredient

- ✚ Sorting and grading

- ✚ Weighing

- ✚ Washing

- ✚ Peeling/ cutting/coring

Resources required for the learning outcome

Equipment	Balance, cleaning machine, screening machine, floating tank , cooking vat, blender, mixer, Peeling machine, crushing machine, pressing machine, extraction machine, Tank, freezer, refrigerator, Filling machine, PPE, sealer, and sterilizer, computer, Gas cooker, Fire extinguisher, First aid kit.
Materials	Fruit, sugar, pectin, citric acid, Potassium sorbate, Sodium benzoate, water, flipchart, chalks, Markers, paper, cleaning products, gloves, packaging material, Glue.

Tools	Brush, buckets, waste bin, tables, Mop, Wooden spoon, Basin , Pans, Refractometer, thermometer, P ^H meter, timer ,spoon, cutters, tables, cutting boards, tray., Bottles, lids, labels, cartons, scotch, chronometer, DVD player, watch, pen.
Facilitation techniques	• Demonstration and simulation • Brainstorming • Individual and group work • Practical exercise • Trainer guided • Group discussion • Audio-visual
Formative assessment	• Written assessment • Oral presentation • Performance assessment

Learning outcome 2: Produce Jam, Jelly and Marmalade	Learning hours: 40
Indicative content	
• Extraction of pulp or juice from fruits ✓ Application of pulp/ juice extraction techniques of fruit  Crushing  Pressing  Squeezing  Blending • Mixing of ingredients ✓ Ratio calculations of ingredients ✓ Apply mixing technique • Cooking of pulp or juice ✓ Purpose of cooking of pulp or juice ✓ Description of the cooking parameter (condition)	

- ✓ Determination of end point of jam, jelly, marmalade

- **Cooling of jam, jelly and marmalade**

- ✓ Purpose of cooling
- ✓ Application Techniques of cooling
- ✓ Testing the quality parameters of jam, jelly and marmalade

Resources required for the indicative content

Equipment	Cooking vat, mixer, crushing machine, pressing machine, extraction machine, Tank, freezer, refrigerator, blender, juicer, PPE, Colloidal mill, Gas cooker, Projector, Computer, fire extinguish, first aid kit.
Materials	Fruit, sugar, pectin, citric acid, Potassium sorbate, Sodium benzoate, water, flipchart, chalks, Markers, paper.
Tools	Wooden spoon, Basin, Pans, Refractometer, thermometer, timer, spoon, tables, cutting boards, trays, filter, knives, sauce pan, waste bin, P ^H meter, electronic balance, DVD, Flash.
Facilitation techniques	• Demonstration and simulation • Individual and group work • Practical exercise • Brainstorming • audio-visual • Trainer guided • Group discussion • Field visit
Formative assessment methods	• Written assessment • Oral presentation • Performance assessment • Product based assessment

Indicative content

- **Identification of packaging material**
 - ✓ Differentiate types of packaging material
 - ✓ Functions of packaging materials
 - ✓ Characteristic of packaging materials
- **Packaging of the product**
 - ✓ Purpose of packaging
 - ✓ Application of packaging technique
 - ✓ Identification of labelling requirements
 - ✓ Application of label on the packages
- **Monitoring storage parameters**
 - ✓ Purpose of storing jam, jelly and marmalade
 - ✓ Application of techniques of storage jam, jelly, marmalade
 - ✓ Application Guidelines for Food Storage
 - ✓ Record keeping

Resources required for the indicative content

Equipment	Filling machine, sealer, and sterilizer.
Materials	Cleaning products, gloves, packaging material, Glue.
Tools	Bottles, labels, cartons, scotch.
Facilitation techniques	• Demonstration and simulation • Individual and group work • Practical exercise • Individualized • Trainer guided • Group discussion • Field visit

Formative assessment methods	• Written assessment • Oral presentation • Performance assessment • Product based assessment
------------------------------	--

Integrated/Summative assessment (For specific module)

The cooperative AHEZA located in NYANZA District wishes to process fruits into different products as solution to reduce postharvest loss of farmers. In order to meet good end product quality, they wish to recruit the qualified technician in charge of fruits processing.

As a technician in food processing, Cooperative AHEZA requests you to make different fruits products.

Task1: Make strawberry jam, jelly and marmalade

Task2: Make pineapple jam, jelly marmalade

Note that all materials, tools and equipment used to produce jam, jelly and marmalade are available in the cooperative.

Instructions:

- Make two (2) bottles per each product
- Each product should be packaged in plastic bottle, containing 500g
- P^H of each product must be between 3-5
- Sugar concentration must be between 65-70 ° brix
- Allocated time: 5 hours

Resources

Tools	Brush, buckets, PPE, waste bin, tables, Mop, Wooden spoon, Basin , Pans, Refractometer, thermometer, timer ,spoon, cutters, tables, cutting boards trays, Bottles, labels, cartons, pallet, scotch.
Equipment	Balance, cleaning machine, screening machine, floating tank , cooking vat, mixer, Peeling machine, crushing machine, pressing machine, extraction machine, Tank, freezer, refrigerator, Filling machine, sealer, and sterilizer.
Materials/ Consumables	Fruit, sugar, pectin, citric acid, Potassium sorbate, water, flipchart, chalks, Markers, paper, cleaning products, gloves, packaging material, Glue.

Assessable outcomes	Assessment criteria (Based on performance criteria)	Indicator	Observation		Marks allocation
			Yes	No	
		Tools and equipment are selected			5

Learning outcome 1: Prepare workplace and raw materials (30%)	1.1 Materials, tools and equipment are appropriately selected according to their intended use	Ingredients are selected			3
		Cleaning product are selected			3
	1.2. Work area is properly arranged according to production process	Cleaning product are prepared			3
		Cleaning product are applied			3
		Cleaning procedure is respected			3
		Cleaning techniques are applied			2
		Cleaning methods are accordingly			3
		The work area is set			3
	1.3. Ingredients are correctly prepared according to product specification	Ingredients are sorted and graded			2
		Ingredients are weighed			2
		Ingredients are washed			3
Learning outcome 2: Produce Jam, Jelly and Marmalade (40%)	2.1. Pulp or juice are properly extracted according to the product specification	Crushing/blending is performed			3
		Pressing/Squeezing is performed			3
		Ratio calculation is performed			3
		Mixing of ingredients is performed			3
	2.2. Pulp or juice is effectively cooked according to product specification	Cooking parameters are respected			4
		End point is determined			3
		Cooking health precaution is respected			4
	2.3 .Product is properly cooled according to Jam, Jelly and marmalade specification	Cooling conditions are respected			4
		Cooling technique is applied			3
		Organoleptic test is carried out			4
		sugar content is measured			3
		PH is measured			3
Learning outcome 3: Store Jam, Jelly and Marmalade	3.1. Packaging material is well identified according to product specification	Glass bottles are selected			3
	3.2. Product is well packaged according to the type of product	Filling process is applied			3
		Filling condition is respected			3
		500g per bottle is respected			4
		Labelling information is marked			3

(30%)	3.3. Product storage parameters are adequately observed according to product requirement	Storage condition are respected			4
		Guideline of storage are applied			3
		Keeping record is done			4
		Time is respected			3
Total marks		100			
Percentage Weightage		100%			
Minimum Passing line % (Aggregate): 70%					

References:

1. Dauthy, Mircea Enachescu. Fruit and vegetable processing. FAO, 1995.
2. Hedh, Jan. The Jam and Marmalade Bible: A Complete Guide to Preserving. Skyhorse Publishing Inc., 2012.
3. Kiritsakis, A., Nanos, G. D., Polymenopoulos, Z., Thomai, T., & Sfakiotakis, E. M. (1998). Effect of fruit storage conditions on olive oil quality. Journal of the American Oil Chemists' Society, 75(6), 721-724.
4. Sharma, H.P., Patel, H. and Sugandha, 2017. Enzymatic added extraction and clarification of fruit juices—A review. Critical reviews in food science and nutrition, 57(6), pp.1215-1227.
5. Verma, B. P., & Schmilovitch, Z. (1987). Potential of quality sorting of fruits and vegetables using fluidized bed medium. Transactions of the ASAE, 30(3), 823-0831.