



Republic of Rwanda
Ministry of Education



RTB | RWANDA
TVET BOARD

FOPST303

PRODUCTION OF SOYMILK AND TOFU

Produce soymilk and tofu

Competence

RQF Level: 3

Learning Hours



50

Credits: 5

Sector: Agriculture and Food Processing

Trade: Food Processing

Module Type: Specific

Curriculum: AGRFOP3003- TVET Certificate 3 Food Processing

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Purpose statement	Soymilk and tofu are important products due to their high nutritional value. This module intends to equip the trainees with practical skills, knowledge and attitude necessary in processing soybeans into soymilk and tofu. She/he will be able to prepare the work area, prepare tools/ equipment and process soybeans into soymilk and tofu. She/he will be able to work effectively in the soybean processing industry 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%				
			Summative Assessment		50%	

Elements of Competency and Performance Criteria

Elements of competency	Performance criteria
1. Prepare workplace	1.1. Materials ,Tools, and equipment are well selected according to intended use
	1.2. Work area is well arranged according to production process
	1.3. Raw material are properly prepared according to product specification
2. Produce soymilk	2.1. Soya bean are well soaked according to soaking conditions
	2.2. Soya bean are well ground according to soya milk specification
	2.3. Soya milk is clearly filtrated according to filtration procedure
	2.4. Soya milk is correctly diluted according to soymilk specifications
	2.5. Soya milk is effectively pasteurized according to product specification
	2.6. Soymilk is properly checked and stored according to product specification

3. Make tofu	3.1. Soymilk is correctly coagulated according to tofu specification
	3.2. Curd are well pressed according to product specification
	3.3. Quality parameters are well checked according to Tofu specification
	3.4. Tofu is properly stored according to products specifications

Learning outcomes	At the end of the module the learner will be able to: 1. Prepare workplace 2. Produce soya milk 3. Make tofu
Learning outcome 1: Prepare workplace	Learning hours: 10
Indicative content	
• Selection of tools and equipment ✓ Description of tools, equipment for soymilk and tofu processing + List of tools and equipment + Functionality/specifications + Adjustment ✓ Selection criteria of tools and equipment ✓ Safety precautions of the tools and equipment (effect on the user and product) • Selection of materials ✓ Description of Cleaning products + Types of cleaning products + Safety and health precautions of cleaning products + Preparation of cleaning products ✓ Factors affecting cleaning effectiveness ✓ Description of Ingredients used in soymilk and tofu + Selection criteria of ingredients + Soybean varieties + Utility of ingredients ✓ Identification of packaging materials + Types of packaging materials + Selection criteria of packaging materials • Arrangement of work area ✓ Purpose of arranging workplace ✓ Work area layout (Processing flowchart)	

- ✓ Application of Cleaning methods
- ✓ Application of `cleaning techniques
- ✓ Efficiency of the cleaning

- ✚ Visual inspection

- ✚ Other tests (swab,...)

- **Preparation of raw material**

- ✓ soybeans sorting
- ✓ weighing
- ✓ washing technique of soybeans

- ✚ immersion

- ✚ spraying

Resources required for the learning outcome

Equipment	Sorting table ,Mechanical and electronic scales, Washing vat, Soaking tank, Grinder, Pasteurizer, Presser, Fryer, Refrigerator, Computer, Projector, DVD player
Materials	Soybeans, Detergents, Salt, Muslin , Water, Disinfectants, Sanitizers, PPE, Packaging materials(cans, aluminium foil), Flipcharts, Pens, Markers, Chalks, Coagulants(Citric acid, sodium chloride, vinegar, Lemon juice, Magnesium chloride, calcium sulphate), Labels
Tools	Buckets, Jercans ,Brush, Mops, Torchon, Thermometer, pH-meter, Sacs, Moulders, Sauce pan, Spoons, Wooden spoon, Filters, Lactometer, Waste bins ,Measuring cylinder, Perforated spoons, Blackboard, Calculator, First aid kits,
Facilitation techniques	• Demonstration and simulation • Individual and group work • Practical exercise • Trainer guided

	• Field visit • Group discussion • Brainstorming • Audio-visual
Formative assessment methods	• Written assessment • Oral assessment • Performance assessment

Learning outcome 2: Produce soymilk	Learning hours: 25
Indicative content	
• Soaking the soybeans ✓ Purpose of soaking ✓ Soaking methods ✚ Hot extraction ✚ Cold extraction ✚ Soaking before hot extraction • Grinding soybean ✓ Purpose of grinding ✓ Dehulling techniques ✓ Application of Grinding methods ✚ Hot grinding soaked soybeans ✚ Cold grinding of soaked soybeans ✚ Hot blanching grinding soybeans ✚ Dry bean grinding soybeans • Filtration of soymilk ✓ Purpose of filtration	

- ✓ Filtration requirements
 -  Size of filter
 -  Temperature
- ✓ Filtration techniques
 - **Dilution of soymilk**
- ✓ Purpose of dilution
- ✓ Perform dilution of soymilk
- ✓ Types of soymilk based on dilution ratio
 - **Pasteurisation of soymilk**
- ✓ Purpose of pasteurisation
- ✓ Application of Pasteurisation methods
 - **Checking the quality of pasteurised soymilk**
- ✓ Quality parameters of soymilk
 - **Monitoring the storage of soymilk**
- ✓ Packaging of soymilk
 -  Purpose of packaging
 -  Filling technique of soymilk
 -  Sealing the soymilk
 -  Labelling
 -  Type of labels
 -  Labelling information
- ✓ Record keeping
- ✓ Monitoring of Storage conditions

Resources required for the indicative content

Equipment	Soaking tank, grinder, pasteurizer, water tank, gas cooker, refrigerator, clock, computer, projector, filling machine, sealing machine
Materials	Water, soybeans, firewood, flipcharts, , pens, markers, chalks

Tools	Filters, thermometer, sauce pan, pH-meter, wooden spoons, stirrers, buckets, jercans, jags, measuring cylinder, funnel, cups, blackboard, cans, calculator
Facilitation techniques	• Demonstration and simulation • Individual and group work • Practical exercise • Trainer guided • Group discussion • Brainstorming
Formative assessment methods	• Written assessment • Oral presentation • Product based assessment

Learning outcome 3: Make tofu	Learning hours: 15
Indicative content	
• Coagulation of soymilk ✓ Preparation of soymilk curd ✚ Types of coagulant ✚ Curdling • Pressing the curd ✓ Application of pressing techniques ✓ Application of tofu hardening techniques ✚ By using water ✚ By using oil • Check the quality of tofu ✓ Purpose of evaluating the quality of tofu ✓ Quality parameters of tofu • Storage of tofu ✓ Packaging of tofu	

+ Purpose of packaging

+ Packaging technique of tofu

+ Sealing the tofu

✓ Identification of Labelling requirements

+ Application of labels on packages

✓ Record keeping

✓ Monitoring of Storage conditions

Resources required for the indicative content

Equipment	Coagulation tanks , - Presser for curd , Tofu washing vats , tables, fryer, Balances, computer, projector
Materials	Soymilk , Cold water, oil, Coagulants(citric acid, sodium chloride, vinegar, lemon juice, magnesium chloride, calcium sulphate), muslin, flipcharts , , pens, markers, chalks,
Tools	Spoons/spatula, Cutters, Moulders, Knives, perforated spoons, saucepans, blackboard, calculator
Facilitation techniques	• Demonstration and simulation • Individual and group work • Practical exercise • Trainer guided • Group discussion • Brainstorming • Field visit
Formative assessment methods	• Written assessment • Oral presentation • Performance assessment • Product based assessment

Integrated situation

Nyagasozi health center located in southern province, Muhanga district, Nyamabuye sector, helps Kabeza village poorest residents in fighting undernutrition by providing food for the first week of June 2022. Nyagasozi health center director has ordered RAMBA Ltd to process soymilk and tofu from Sc. Squire, Sc Saga and SB 24 Soybeans varieties. The production manager of RAMBA Ltd appointed you as assistant technician to process soymilk and tofu from those varieties.

- Task:**
1. To process soymilk and tofu from soy bean variety Sc. Squire
 2. To process soymilk and tofu from soy bean variety Sc. Saga
 3. To process soymilk and tofu from soy bean variety SB 24

Instructions:

- ✓ 2 L of pasteurized soymilk and 1 kg of tofu made from soy bean variety Sc. Squire
- ✓ 2L of pasteurized soymilk and 1 kg of tofu made from soy bean variety Sc. Saga
- ✓ 2 L of pasteurized soymilk and 1 kg of tofu made from soy bean variety SB 24
- ✓ The soy milk should have a minimum fat content of 1.5%
- ✓ The dilution ratio should be 1:5
- ✓ The soy milk should be packaged and delivered in 500ml plastic bottle at $\leq 6^{\circ}\text{C}$
- ✓ Tofu (s) should be fried, made on the same day, packaged and delivered as $\frac{1}{2}$ Kg block at $\leq 6^{\circ}\text{C}$
- ✓ Time allocate 5 hours

Resources

Tools	Brushes, , Buckets, Serviettes, moppers, basins, , Knives, Moulders, Stirrer, Thermometer, Sauce pan, Sievers, filters, calculator, funnel, jags, measuring cylinder, knives, cutting board, serviettes, waste bins, cups
Equipment	P.P.E (Personal Protective Equipment), Sprayers, Blender, Soya bean dehuller machine, weighing scale, Refrigerator, grinder, Boiler, Homogenizer, Centrifuge, Sorting table, incubator, Presser for curd, Hydrometer, washing vats, Soaking tanks, gas cooker
Materials/ Consumables	Materials: Soy beans, water, sodium chloride, Sodium bicarbonate, Calcium sulfate, Magnesium chloride, oil, Detergents, Soaps, Disinfectants, Clean water, muslin, Glass or plastic Bottles, aluminium foil,

Assessable outcomes	Assessment criteria (Based on performance criteria)	Indicator	Observation		Marks allocation
			Yes	No	
Learning outcome 1: Prepare workplace (30%)	1.1. Material, tools and equipment are well selected according to intended use	Ind.1 tools are selected			1
		Ind.2 equipment are selected			1
		Ind.3 Tools are adjusted			2
		Ind.4 Equipment are adjusted			3
		Ind.5 Cleaning products are selected			2
		Ind.6 Ingredients are selected			2
		Ind.7.Packaging materials are selected			1
	1.2. Work area is well arranged according to production process	Ind.1 Personal hygiene is performed			1
		Ind.2 Cleaning products are prepared			3
		Ind.3 Tools and equipment are cleaned			3
		Ind.4 Work area is cleaned			3
		Ind.5 Work area is arranged			3
	1.3. Raw material are well prepared according to product specification	Ind.1 Raw materials are sorted			2
		Ind.2 Raw materials are weighed			2
		Ind.3 Raw materials are washed			1
Learning outcome 2: Produce soymilk (40%)	2.1. Soybeans are well soaked according to soaking conditions	Ind.1 Quality of water is respected			2
		Ind.2 Temperature of water is respected			2
		Ind.3.Soybeans varieties are used			2
		Ind.4 Time of soaking is respected			2
	2.2. Soybeans are well ground according to soymilk specification	Ind.1 Dehulling is done			2
		Ind.2.Grinding is performed			2

	2.3. Soymilk is clearly filtrated according to filtration procedure	Ind1. Appropriate Filter is used			2
		Ind.2 Clarity of soymilk is achieved			1
	2.4. Soymilk is correctly diluted according to product specifications	Ind1. Sc squire variety is diluted			2
		Ind.2 Sc saga variety is diluted			2
		Ind.3 SB 24 variety is diluted			2
	2.5. Soymilk is well pasteurized according to product specification	Ind.1 Pasteurization temperature is respected			2
		Ind.2 Holding time is respected			2
	2.6. Soymilk is properly checked and stored according to product specification	Ind1. Clear white color is observed			2
		Ind.2 Taste is suitable			2
		Ind.3 Texture is achieved			2
		Ind.4.Flavor is achieved			2
		Ind.5 The packaging types and sizes are respected			2
		Ind.6 Product quantities are respected			2
		Ind.7 Soymilk minimum fat content is respected			2
		Ind.8.Storage temperature is respected			1
Learning outcome 3: Make tofu (30%)	3.1. Soymilk is correctly coagulated accordance to tofu specification	Ind.1.Appropriate coagulants are used			2
		Ind.2.Incubation conditions are respected			2
		Ind.3 Drainage is done			2
	3.2. Curd are well pressed according to product specification	Ind.1 Moulders and muslin are used			2
		Ind.2.Pressing is performed			3
		Ind.3 Frying is done			3

	3.3. Quality parameters are well checked according to Tofu specification	Ind.1 Brown color is observed			2
		Ind.2 Taste is suitable			2
		Ind.3.Texture is achieved			2
		Ind.4 Size of product is respected			2
	3.4. Tofu is properly stored according to products specifications	Ind.1.Delivered temperature is respected			2
		Ind.2 1kg of tofu is respected			3
		Ind.3.Storage temperature is respected			3
Total marks		100			
Percentage Weightage		%			
Minimum Passing line % (Aggregate): 70%					

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