

NATIONAL COMPETENCY STANDARDS FOR FOOD PROCESSING TECHNICIAN (NC2)

Department of Occupational Standards Ministry of Labour and Human Resources Thimphu, Bhutan. August 2022



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FOREWORD

The Department of Occupational Standards of the Ministry of Labour and Human Resources proudly presents National Competency Standards (NCS) for Food Processing Technician as part of TVET reform initiative for improving the quality of Vocational Education and Training System in Bhutan. The standards represent the fruits of hard work and invaluable experiences gained by the department since its establishment in the latter half of 2003. The main aim of developing Competency Standards is to set up a well defined nationally recognized Vocational Qualification and Certification system that will help set a benchmark for the Technical Vocational Education and Training (VET) System in our country aligned to international best practices.

National Competency Standards is one of the base pillars in the Bhutan Vocational Qualification Framework (BVQF) and is the first step in its implementation. The standards are developed to ensure that employees or vocational graduates possess and acquire the desired skills, knowledge and attitude required by industries and employers. In order to ensure this close match in supply and demand of skills, knowledge and attitude, standards have been developed in close consultation and partnership with industry experts and validated by the Technical Advisory Committees for the concerned economic sectors.

A vocational education and training system based on National Competency Standards shall ensure that training is of a high quality and relevant to the needs of the labour market. As a result, future TVET graduates will be better equipped to meet the need and expectations of industries and employers. This positive impact on the employability of TVET graduates will enhance the reputation of vocational education and training and make it attractive to school leavers.

While acknowledging the existing level of cooperation and collaboration, the ministry earnestly requests employers and training providers to extend the fullest support and cooperation in developing or implementing the National Competency Standards. The ultimate objective is to build a competent and productive national workforce that will contribute to the socio-economic development of our country.

We gratefully acknowledge the valuable contributions made by experts from industries during the consultation and validation processes of the standards. We look forward to improved engagement and active participation of the industry and employers in the development of a quality assured demand driven TVET system in the near future.

Department of Occupational Standards Ministry of Labour and Human Resources

Acknowledgement

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PACKAGING OF QUALIFICATIONS



OVERVIEW OF NATIONAL COMPETENCY STANDARDS

UNIT TITLE	ELEMENTS OF COMPETENCE
1. Process Fruits	1. Prepare to perform fruits and vegetable processing
and Vegetables	2. Process fruits and nuts
Produce	3. Process vegetables
	4. Perform packaging, labeling and storage
2. Process	1. Prepare to perform cereals processing
Cereals and Oil Seeds produce	2. Process cereal and oil seeds produce
	3. Perform packaging, labeling and storage
3. Process	1. Prepare to perform herbs and spices processing
Herbs and spices	2. Process herb and spice produce
produce	3. Perform packaging, labeling and storage
4. Process Diary	1. Prepare to perform dairy processing
products	2. Process dairy produce
	3. Perform packaging, labeling and storage

UNIT TITLE :	Process Fruits and Vegetables Produce	
DESCRIPTOR:	This unit covers the competencies required to prepare for fruits and vegetable processing and processing with safety at all times.	
CODE :	7514- U1-L2	
ELEMENTS OF COMPETENCE	PERFORMANCE CRITERIA	
1. Prepare to perform fruits and	1.1 Use <i>Personal Protective Equipment</i> (PPE) following standard procedures	
vegetable processing	1.2 Apply Good Manufacturing Practices (GMP) & Good Hygiene Practices (GHP) following standard procedures	
	1.3 Check the functionality of food processing machines and equipment as per the job requirement following standard procedures	
2. Process fruits and nuts	2.1 Operate <i>fruits processing equipment</i> as per the job requirement following standard procedure	
	2.2 Perform sorting, grading and cleaning/washing as per the job requirement following standard procedures	
	2.3 Perform dehydration following standard procedures	
	2.4 Perform <i>fermentation</i> following standard procedures	
	2.5 Perform extraction of <i>fruit juices</i> as per the job requirement following standard procedures	
	2.6 Produce jams and jellies as per the job requirement following standard procedures	
	2.7 Produce peanut butter and peanut brittle as per the job requirement following standard procedures	
	2.8 Conduct <i>quality test</i> as per the requirement of the product following standard procedures	
3. Process vegetables	3.1 Operate <i>vegetables processing equipment</i> as per the job requirement following standard procedure	
	3.2 Perform sorting, grading and cleaning/washing as per the job requirement following standard procedures	
	3.3 Perform dehydration following standard procedures	

	3.4	Perform <i>fermentation</i> following standard procedures
		Conduct <i>quality test</i> as per the requirement of the product following standard procedures
		Conduct sensory evaluation of the products following standard procedures
4. Perform packaging, labeling and		Identify and ensure hygiene of the <i>packaging materials</i> as per the job requirement following safety standards
storage		Perform sterilization of <i>packaging materials</i> (Glass jar) following standard procedures
		Perform packaging in hygienic conditions following standard procedures
		Perform <i>labeling of products</i> following standard procedures
		Store the products as per the product requirement following standard procedures

RANGE STATEMENT		
PPE may include but not limited to:		
Apron	Hand gloves	
Head gears	Foot wears	
• Mask		
Fruits processing equipment may include but not limited to:		
• Peeler	Juicer/pulper	
Cutting machine	• Blender	
• Dryer	Steam jacketed kettle	
Measuring equipment		
Fruit dehydration may include but not limited to:		
Dried fruits	• Rollup	
Candy	Powder	
Fruit fermentation may include but not limited to:		
• Wine	Pickle	

Vinegar					
Fruit juices include but not limited to:					
Squash	Ready To Serve (RTS)				
Fruit quality test may include but not limited to:					
Total Soluble solids (TSS)	Total Acidity				
Moisture content	• pH				
Water activity					
Vegetable Processing Equipment may include but not limited to:					
Peeler	Blender				
Cutting machine	Steam jacketed kettle				
Dryer	Washer				
Vegetable dehydration may include but not limited to:					
Dried vegetables	Candy				
Powder					
Vegetable fermentation may include but	t not limited to:				
Pickle	Sauerkraut/Kimchi)				
• Miso					
Vegetable quality test may include but r	not limited to:				
Water activity	Total Acidity				
Moisture content	Salt content				
Packaging materials may include but no	pt limited to:				
Plastic	Tetra Pack				
Glass jar	Papers				
• Can					
Labeling of products may include but not limited to:					
Name of the product	Country of origin				
Ingredient declaration	Date mark				
Net content	Declaration of allergens				
Manufacturer's name and address	Batch number				
Critical Aspects :					

- Demonstrate compliance with occupational health and safety regulations applicable to worksite operation
- Apply Good Manufacturing Practices (GMP) & Good Hygiene Practices (GHP) following standard procedures

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
Ethics and Integrity	Team work
Occupational Health and Safety	Communication
(OHS) Regulations	Problem solving
GMP and GHP	Interpersonal relationship
Food additive and preservatives	Creativity
Food processing methods	Time Management
Food Preservation methods	
Packaging materials requirement	
• HACCP	
 Food rules and regulations of Bhutan 	
Cost analysis	

UNIT TITLE :	Process Cereal and Oil Seeds Produce	
DESCRIPTOR:	This unit covers the competencies required to prepare cereal processing and process cereal and oil seeds produce following safety at all times	
CODE :	7514-U2-L2	
ELEMENTS OF COMPETENCE	PERFORMANCE CRITERIA	
1. Prepare to perform cereals	1.1 Use <i>Personal Protective Equipment</i> (PPE) following standard procedures	
processing	1.2 Apply Good Manufacturing Practices (GMP) & Good Hygiene Practices (GHP) following standard procedures	
	1.3 Check the functionality of food processing machines and equipment as per the job requirement following standard procedures	
2. Process cereal and oil seeds produce	2.1 Operate <i>cereal processing equipment</i> as per the job requirement following standard procedure	
	2.2 Perform sorting, grading and cleaning as per the job requirement following standard procedures	
	2.3 Produce flour and grits using milling machine following standard procedures	
	2.4 Produce alcoholic beverage following standard procedures	
	2.5 Produce extruded products following standard procedures	
	2.6 Produce <i>rice and maize products</i> following standard procedures	
	2.7 Produce <i>cereal snacks</i> following standard procedures	
	2.8 Produce edible oil following standard procedures	
	2.9 Conduct <i>quality test</i> as per the requirement of the product following standard procedures	
	2.10Conduct sensory evaluation of the products following standard procedures	
3. Perform packaging,	3.1 Identify and ensure hygiene of the <i>packaging materials</i> as per the job requirement following safety	

labeling and		standards
storage	3.2	Perform sterilization of <i>packaging materials</i> (Glass bottle) following standard procedures
	3.3	Perform packaging in hygienic conditions following standard procedures
	3.4	Perform <i>labeling of products</i> following standard procedures
	3.5	Store the products as per the product requirement following standard procedures

RANGE STATEMENT		
PPE may include but not limited to:		
Apron	Hand gloves	
Head gears	Foot wears	
• Mask		
Cereal Processing Equipment may include but not limited to:		
• Dryer	Flaking machine	
Milling machine	Roaster	
De-husking machine	Extruder	
Baking oven	Food grade barrels	
Measuring equipment	Oil expeller	
Extruded products may include but not	limited to:	
Noodles	Puffed products	
Pasta		
Rice and Maize products may include but not limited to:		
• Zow	• Sip	
Popcorn		
Cereal Snacks may include but not limited to:		
• Khabzey	Cookies	
Energy bar		

Edible oils may include but not limited to:			
Pea nut oil	Sun flower oil		
Mustard oil	Soya bean oil		
Perilla oil			
Cereal and oil seeds quality test may in	clude but not limited to:		
Moisture content	Alcohol content		
Water activity	Sensory analysis		
Packaging materials may include but not limited to:			
Plastic	Papers		
Glass bottle			
Labeling of products may include but not limited to:			
Name of the product	Country of origin		
Ingredient declaration	Date mark		
Alcohol content	Declaration of allergens		
Net content	Batch number		
Manufacturer's name and address			
Critical Aspects :			
Demonstrate compliance with occupational health and safety regulations applicable to worksite operation			
Apply Good Manufacturing Practices (GMP) & Good Hygiene Practices (GHP) following standard procedures			

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
Ethics and Integrity	Team work
Occupational Health and Safety	Communication
(OHS) Regulations	Problem solving
GMP and GHP	Interpersonal relationship
Food additive and preservatives	Creativity
Food processing methods	Time Management
Food Preservation methods	
Packaging materials requirement	
• HACCP	
 Food rules and regulations of Bhutan 	
Cost analysis	

UNIT TITLE :	Process Herbs and Spices Produce	
DESCRIPTOR:	This unit covers the competencies to prepare to process and processing herbs and spices produce following safety procedures at all times.	
CODE :	7514-U3-L2	
ELEMENTS OF COMPETENCE	PERFORMANCE CRITERIA	
1. Prepare to perform herbs and	1.1 Use <i>Personal Protective Equipment</i> (PPE) following standard procedures	
spices processing	1.2 Apply Good Manufacturing Practices (GMP) & Good Hygiene Practices (GHP) following standard procedures	
	1.3 Check the functionality of food processing machines and equipment as per the job requirement following standard procedures	
2. Process herbs and spices produce	2.1 Operate herbs and spices processing equipment as per the job requirement following standard procedure	
	2.2 Perform sorting, grading and cleaning/washing as per the job requirement following standard procedures	
	2.3 Produce <i>tea</i> following standard procedures	
	2.4 Produce essential oil following standard procedures	
	2.5 Produce <i>herbs and spices powder</i> following standard procedures	
	2.6 Conduct <i>quality test</i> as per the requirement of the product following standard procedures	
	2.7 Conduct sensory evaluation of the products following standard procedures	
3. Perform packaging, labeling and storage	3.1 Identify and ensure hygiene of the <i>packaging materials</i> as per the job requirement following safety standards	
	3.2 Perform sterilization of <i>packaging materials</i> (Glass bottle) following standard procedures	
	3.3 Perform packaging in hygienic conditions following standard procedures	

3.4	Perform <i>labeling of products</i> following standard procedures
3.5	Store the products as per the product requirement following standard procedures

RANGE STATEMENT		
PPE may include but not limited to:		
ApronHead gearsMask	Hand glovesFoot wears	
Herbs and Spices processing Equipme	nt may include but not limited to:	
 Cutting machine Dryer Grinder Steam jacketed kettle 	Oil distillerRoasterTea roller	
Tea may include but not limited to:	l	
HerbalBlackGreen	WhiteYellowFloral	
Essential oil may include but not limite	d to:	
 Ginger Lemon grass Juniper Pine 	CypressSichuan pepperArtemisia	
Herbs and spices powder may include but not limited to:		
 Coriander Bay leaf Cardamom Ginger Herbs and spices quality test may inclu 	 Turmeric Mint Basil Chili powder 	

Moisture content	Water activity	
Packaging materials may include but not limited to:		
Plastic	• Cans	
Glass bottle	Papers	
Labeling of Products may include but not limited to:		
Name of the product	Country of origin	
Ingredient declaration	Date mark	
Net content	Declaration of allergens	
Manufacturer's name and address	Batch number	
Critical Aspects :		
Demonstrate compliance with occupational health and safety regulations applicable to worksite operation		
Apply Good Manufacturing Practices (GMP) & Good Hygiene Practices (GHP) following standard procedures		

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
Ethics and Integrity	Team work
Occupational Health and Safety	Communication
(OHS) Regulations	Problem solving
GMP and GHP	Interpersonal relationship
Food Preservation methods	Creativity
Types of herbs and spices	Time Management
Packaging materials requirement	
Byproduct utilization	
• HACCP	
 Food rules and regulations of Bhutan 	

UNIT TITLE :	Process Dairy Products	
DESCRIPTOR:	This unit competencies required to prepare and process dairy produce following safety at all times.	
CODE :	7514-U4-L2	
ELEMENTS OF COMPETENCE	PERFORMANCE CRITERIA	
1. Prepare to perform dairy	1.1 Use <i>Personal Protective Equipment</i> (PPE) following standard procedures	
processing	1.2 Apply Good Manufacturing Practices (GMP) & Good Hygiene Practices (GHP) following standard procedures	
	1.3 Check the functionality of food processing machines and equipment as per the job requirement following standard procedures	
2. Process dairy produce	2.1 Operate <i>dairy processing equipment</i> as per the job requirement following standard procedure	
	2.2 Perform platform test as per the job requirement following standard procedures	
	2.3 Perform dehydration following standard procedures	
	2.4 Perform <i>fermentation</i> following standard procedures	
	2.5 Produce ice cream with different flavors following standard procedures	
	2.6 Produce fresh butter and clarified butter following standard procedures	
	2.7 Produce mozzarella and gouda cheese following standard procedures	
	2.8 Conduct <i>quality test</i> following standard procedures	
3. Perform packaging, labeling and	3.1 Identify and ensure hygiene of the <i>packaging materials</i> as per the job requirement following safety standards	
storage	3.2 Perform sterilization of <i>packaging materials</i> (Glass jar) following standard procedures	
	3.3 Perform packaging in hygienic conditions following standard procedures	
	3.4 Perform <i>labeling of products</i> following standard	

	procedures
3.	5 Store the products as per the product requirement following standard procedures

RANGE STATEMENT			
PPE may include but not limited to:			
Apron	Hand gloves		
Head gears	Foot wears		
• Mask			
Dairy Processing equipment may inclue	le but not limited to:		
Homogenizer	• Grinder		
• Dryer	Evaporator		
Pasteurizer	Blocks		
Incubator	Steam jacketed kettle		
Churner	• Thermometer		
Cream separator	Measuring equipment		
pH meter			
Platform test may include but not limite	d to:		
Adulteration test	Milk analyzer		
Dairy dehydration may include but not l	imited to:		
Cheese powder	Milk powder		
Gulab Jamun			
Dairy fermentation may include but not	limited to:		
Yogurt	Cheese		
Dairy quality test may include but not limited to:			
Water activity	Acidity test		
Moisture content			
Packaging materials may include but not limited to:			
Plastic	Tetra Pack		

Glass jar	Papers		
• Can			
Labelling of products may include but	not limited to:		
Name of the product	Country of origin		
Ingredient declaration	Date mark		
Net content	Batch number		
Manufacturer's name and address			
Critical Aspects :			
• Demonstrate compliance with occupational health and safety regulations applicable to worksite operation			
Apply Good Manufacturing Practices (GMP) & Good Hygiene Practices (GHP) following standard procedures			

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
Ethics and Integrity	Team work
Occupational Health and Safety	Communication
(OHS) Regulations	Problem solving
GMP and GHP	Interpersonal relationship
Food additive and preservatives	Creativity
Food Preservation methods	Time Management
Packaging materials requirement	
Basics of food microbiology	
Byproduct utilization	
• HACCP	
 Food rules and regulations of Bhutan 	

Annexure

1.1National Competency Standards (NCS)

The National Competency Standards specify the skill, knowledge and attitudes applied to a particular occupation. Standards also specify the standards or criteria of performance of a competent worker and the various contexts in which work may take place. Standards provide explicit advice to assessors regarding the skill and knowledge to be demonstrated by candidates seeking formal recognition either following training or through work experience.

1.2 Purpose of National Competency Standards

National Competency Standards serve a number of purposes including:

- Providing advice to curriculum developers about the competencies to be included in curriculum.
- Providing specifications to assessment resource developers about the competencies within an occupation to be demonstrated by candidates.
- Providing advice to industry/employers about job functions, which in turn can be used for the development of job descriptions, performance appraisal systems and work flow analysis.

1.3 Bhutan Vocational Qualifications Framework (BVQF)

Bhutan Vocational Qualifications Framework is an agreed system of Assessing, Certifying and Monitoring nationally recognized qualifications for all learning in the TVET sector against national competency standards, in training institutions, in the workplace, in schools or anywhere where learning takes place.

1.4 Components of the Bhutan Vocational Qualifications Framework (BVQF)



* RPL = Recognition of Prior Learning

1.5 BVQF Levels

The Bhutan Vocational Qualifications Framework has three levels classified based on the competency of the skilled workers. The three levels are:

- National Certificate Level 3 (NC III)
- National Certificate Level 2 (NC II)
- National Certificate Level 1 (NC I)

BVQF Level Descriptors

The qualification levels are decided based on level descriptors. The detail of the qualification level descriptor is as follows:

National Certificate Level 1

Carry out processes that:	Learning demand:	Responsibilities which are applied:
 Are narrow in range. Are established and familiar. 	 Basic operational knowledge and skill. Utilization of basic available 	 In directed activity. Under general supervision and quality control.
 Offer a clear choice of routine responses. 	 Known solutions to familiar problems.	With some responsibility for quantity and quality.
 Involve some prioritizing of tasks from known solutions. 	 Little generation of new ideas. 	 With no responsibility for guiding others.

National Certificate Level 2

Carry out processes that:	Learning demand:	Responsibilities which are applied:
• Require a range of well-developed skills.	• Some relevant theoretical knowledge.	In directed activity with some autonomy.Under general
Offer a significant choice of	Interpretation of available information.	supervision and quality checking.
procedures requiring prioritization.	• Discretion and judgments.	 With significant responsibility for the quantity and quality of
• Are employed within a range of familiar context.	 A range of known responses to familiar problems 	 With some possible responsibility for the output of others.

National Certificate Level 3

Carry out processes that:	Learning demand:	Responsibilities which are applied:
 Requires a wide range of technical or scholastic skills. Offer a considerable choice of procedures requiring prioritization to achieve optimum outcomes. Are employed in a variety of familiar and unfamiliar contexts. 	 A broad knowledge base which incorporates some theoretical concepts. Analytical interpretation of information. Informed judgment. A range of sometimes innovative responses to concrete but often unfamiliar problems. 	 In self-directed activity. Under broad guidance and evaluation. With complete responsibility for quantity and quality of output. With possible responsibility for the output of others.

1.6 PURPOSE

This qualification is designed for people interested in a career as a Fashion Designer at the Certificate level. It comprises of two units that cover the essential knowledge and skills required at workplace.

It provides industry specific skills and demands a level of performance that will enable new recruits to the industry to be immediately productive.

1.7 CODING USED FOR NATIONAL COMPETENCY STANDARDS

The coding and classification system developed in Bhutan is logical, easy to use, and also aligned with international best practises. The Bhutanese coding and classification system is based on the International Standard Classification of Occupations, 2008 (ISCO-08) developed by the International Labour Organisation (ILO).

The coding of the National competency standards forms the basis of the identification code for the Vocational Education and Training Management Information System (VET – MIS) both in terms of economic sector identification and that of the individual standard.

Coding the individual national competency standards

Coding the individual skills standard has a multiple purpose:

- to identify the level,
- to identify to which module the standard belongs,
- to identify in which order the standard is clustered within that module.

A job can include a number of competencies described in the national competency standards.

However, in order to follow a logical order, only national competency standards related to each other and following a logical sequence in terms of training delivery, from the simple to the complex, are clustered into a module. Some standards are so complex that they need to stand alone.

Implementation and operational procedures for National Competency Standards (NCS)



Key:

MoLHR – Ministry of Labour and Human Resources DOS – Department of Occupational Standards

1.8 ASSESSMENT GUIDE

Form of assessments

- Continuous assessment together with collected evidence of performance will be used.
- Evidence of the performance shall be based on practical demonstration.
- Knowledge can be assessed through diagrams, in writing or orally (vivavoce).

Assessment context

• Competency may be assessed in the actual work place or in a simulated workplace setting.

Assessment condition

- The candidate shall have access to all required tools, equipments, materials and documents.
- Candidate must complete the assessment in industry accepted time frame.



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