



Australian Government

Department of Education, Employment and Workplace Relations

FDFCH4002A Produce acid-coagulated soft cheese

Release: 2

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Modification History

April 2012: Minor typographical corrections.

Unit Descriptor

This unit of competency covers the skills and knowledge required to produce acid-coagulated soft cheeses to a commercial standard.

Application of the Unit

This unit applies to production managers in cheese enterprises. The unit typically applies to managers with responsibility for developing operational procedures, controlling the cheese making process, and complying with occupational health and safety (OHS), food safety, record keeping and quality assurance requirements for soft cheeses. This unit includes all aspects of acid-coagulated soft cheese production and cheese making equipment and ingredients. Examples of acid coagulated cheeses include smooth cottage cheese, particulate cottage cheese with a cream dressing (generally known as American style cottage cheese), and cream cheese.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.

Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Maintain sanitation in acid-coagulated soft cheese making	1.1 A high level of sanitation is maintained when transferring starter cultures to the fermentation tanks or cheese vats to prevent contamination with undesirable microorganisms and bacteriophages 1.2 All surfaces are kept clean and sanitised, except for curing boards 1.3 Stringent personal hygiene and quarantine procedures are applied 1.4 Multi-phase cleaning systems are applied to ensure sanitised surfaces and equipment 1.5 Food safety related information is recorded, as required, including milk counts and cheese bacterial counts
2. Implement procedures to prepare milk for acid-coagulated soft cheese making	2.1 Raw milk is sampled and composition and counts are measured/analysed 2.2 Clarification and standardisation procedures for raw milk are carried out 2.3 Pasteurisation procedures for milk are carried out 2.4 Raw milk area is maintained separate from pasteurised milk operations
3. Inoculate the milk to promote coagulation	3.1 Lactic culture is added to the milk and mixed evenly 3.2 Coagulating enzymes are added to the milk, if required 3.3 Even temperature is maintained at specified level throughout the tank or vat 3.4 A log of pH and temperature is maintained to control ripening and yield
4. Develop procedures to process curds	4.1 Curd breaking or cutting is carried out using correct technique and equipment to minimise loss of protein and fat as fines 4.2 Whey fat content is measured and recorded to assess curd breaking or cutting efficiency when making cheese from milk containing fat 4.3 The cooking schedule is planned to ensure optimal syneresis 4.4 Draining procedures are developed to ensure curd is at required moisture, pH level and consistency 4.5 The curd is washed, if required
5. Manage packaging procedures for acid-coagulated soft cheeses	5.1 Ripening agents are added to acid-coagulated soft cheeses, if required 5.2 Curing is optimised by planning for and adjusting the key composition ratios of acid-coagulated soft cheeses 5.3 Surface treatments are used, as required 5.4 Packaging is applied as appropriate for acid-coagulated soft

ELEMENT	PERFORMANCE CRITERIA
	cheeses 5.5 The product is labelled with complete and accurate information as specified by legislation
6. Monitor and adjust process control to produce cheese with consistent taste and quality	6.1 The process objectives of acid-coagulated soft cheese making are established 6.2 The amount of moisture in acid-coagulated soft cheese is controlled by regulating syneresis 6.3 The rate and amount of acid development in the curd is controlled by cooking and washing the curd before salting, if required 6.4 Calcium phosphate levels are adjusted to influence basic cheese structure, if required. 6.5 Texture of the cheese is controlled by regulating pH, ripening agents, salt, moisture and fat 6.6 Cheese flavour is controlled through choice of ingredients (milks, cultures, coagulating agents and salt) and pH levels 6.7 Yield is optimised by establishing process control parameters
7. Carry out sensory analysis and grading of soft cheeses	7.1 A range of flavours in cheese is identified 7.2 Different textures of cheeses are recognised 7.3 Cheese is assessed for evenness of colour and finish 7.4 Organoleptic properties of acid-coagulated soft cheese are analysed to identify possible changes to process control
8. Meet workplace requirements for food safety, quality and environmental management	8.1 Food safety related information is recorded 8.2 Records of cheese manufacture are maintained 8.3 Health and safety and environmental protection procedures are developed through a risk management approach 8.4 Waste is disposed of and environmental impacts of the cheese making operation reviewed

Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills include:

Ability to:

- measure and mix acid coagulants and additives
- inoculate milk and control ripening in the vat
- promote syneresis to the required firmness and composition of curd
- separate whey from curd and press, if applicable, and salt curd
- monitor storage and ripening, if applicable, conditions for acid-coagulated soft cheese
- add ripening agents (lipases) and surface treatments to acid-coagulated soft cheeses
- maintain records for cheese making
- carry out packaging of cheese
- maintain hygiene and sanitation procedures in line with best manufacturing practice
- use multi-phase cleaning systems
- develop safe work practices and personal hygiene and sanitation procedures
- maintain the viability and integrity of coagulating agents
- calculate cheese yields
- develop packaging and labelling for acid-coagulated soft cheeses
- comply with environmental requirements for a processing operation.

Required knowledge includes:

Knowledge of:

- the main cheese types and the common processes for making different types of cheeses
- the main components of milk and cheese (both curds and whey)
- types and impact of inhibitory substances in milk, including bacteriophage
- purpose and basic principles of cheese making
- specifications of product at each stage of cheese making
- milk characteristics and components important in cheese making
- milk preparation for cheese making (standardisation, pasteurisation and homogenisation, if required)
- types of starters and adjuncts used and their role in the fermentation process
- effect of milk characteristics on cheese processing performance
- moisture control in cheese making
- processes of coagulation and syneresis and their role in cheese making
- curd size and its impact on moisture
- effects of pH and temperature on cheese processing performance and product quality
- microbial contaminants of cheese (lipolytic bacteria, yeasts, moulds, bacillus, listeria, E. Coli, salmonella, coliforms and staphylococci) and their impact on cheese quality
- sampling and testing procedures for microbes
- yeasts and moulds and other microorganisms of significance in cheese making

- temperature and humidity of curing
- ripening agents for different cheese types
- contamination/food safety risks associated with the process and related control measures
- techniques used to monitor the cheese making process, such as inspecting, measuring and testing, as required by the process.
- common causes of variation and corrective action required for each cheese making process
- organoleptic properties and their relationship to processes and ingredients in cheese making
- sampling procedures for cheese making
- contamination risk of inoculants and contaminants
- food safety and quality assurance standards and procedures
- cleaning and sanitation procedures in line with Australian standards for cleaning in the dairy industry
- routine maintenance procedures
- product/batch changeover procedures
- OHS hazards and controls
- procedures for recording production and performance information
- environmental issues and controls relevant to the process, including waste collection and handling procedures related to the process.

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment	A person who demonstrates competency in this unit must be able to produce a range of acid-coagulated soft cheeses to a commercial standard. Assessment cannot take place on fully integrated industrial equipment.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>Critical aspects of assessment must include evidence of the ability to produce acid-coagulated soft cheese to a commercial standard, including:</p> <ul style="list-style-type: none"> • developing quality procedures for: <ul style="list-style-type: none"> • sanitation, food safety, quality assurance and environmental management in acid-coagulated soft cheese production • developing work instructions for: <ul style="list-style-type: none"> • preparing milk for cheese making • coagulating milk through inoculation • controlling ripening of soft cheeses in the vat • managing acid-coagulated soft cheese making processes • packaging and labelling acid-coagulated soft cheeses • carrying out sensory analysis of acid-coagulated soft cheeses • reviewing process control based on sensory analysis and results of testing.
Context of and specific resources for assessment	<p>Assessment of performance requirements in this unit should be undertaken within the context of cheese production. Competency is demonstrated by performance of all stated criteria, including the critical aspects and knowledge and skills elaborated in the Evidence Guide, and within the scope as defined by the Range Statements applicable to the workplace environment.</p> <p>Assessment must occur in a real or simulated workplace where the assessee has access to:</p> <ul style="list-style-type: none"> • production process and related equipment, manufacturers' advice and product specifications • sampling and testing equipment and procedures • methods and related software systems, as required, for collecting data and calculating yields, efficiencies and material variances appropriate to the type of

	cheese and the production environment.
Method of assessment	<p>The following assessment methods are suggested:</p> <ul style="list-style-type: none">• observation of candidate making soft cheeses• written and/or oral questioning to assess knowledge and understanding• workplace samples of acid-coagulated soft cheeses with a documented history of process and a completed self-evaluation• composition analysis of milk and cheese for the samples presented• third-party supporting statement.
Guidance information for assessment	<p>Evidence should be gathered over a period of time against a number of batches of acid-coagulated soft cheese. Part of the evidence requirements for this unit requires that samples of at least three batches of acid-coagulated soft cheeses be produced to a commercial standard, in a real or simulated environment. Students must be assessed on their ability to control all aspects of cheese making, including sanitation and materials storage and handling.</p>

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Legislation	<p>Legislative requirements are typically reflected in procedures and specifications. Legislation relevant to this industry includes:</p> <ul style="list-style-type: none"> the Food Standards Code, including labelling, weights and measures legislation legislation covering food safety, environmental management, OHS, anti-discrimination and equal opportunity.
Policies and procedures	<p>Work is carried out according to:</p> <ul style="list-style-type: none"> company procedures regulatory and licensing requirements legislative requirements industrial awards and agreements.
Cheese tests	<p>Cheese tests may include:</p> <ul style="list-style-type: none"> testing for pH levels, moisture levels, salt levels and fat and protein levels microbiological testing chemical testing physical testing of cheese throughout production testing for organoleptic properties.
Cheese types	<p>Cheese types include any type of acid-coagulated soft cheeses. Varieties of cheese covered by this classification include:</p> <ul style="list-style-type: none"> cottage and cream cheeses and quark <p>This unit does not cover acid-coagulated soft cheeses made in an industrial process.</p>
Clarification procedures for raw milk	<p>Clarification procedures for raw milk may include:</p> <ul style="list-style-type: none"> cloth filters centrifugal clarifiers and separators bactofugation membrane (micro) filtration.
Milk standardisation requirements	<p>Milk standardisation requirements may:</p> <ul style="list-style-type: none"> include standardisation of microflora, fat and protein, and casein/fat ratios

	<ul style="list-style-type: none"> require the addition of skim milk or skim milk solids, or the separation of cream.
Pasteurisation methods	<p>Pasteurisation methods may be:</p> <ul style="list-style-type: none"> batch or continuous.
Added ripening agents	<p>Added ripening agents may include:</p> <ul style="list-style-type: none"> milk enzymes milk coagulants lactic cultures secondary cultures microorganisms present in the milk and lipases Lipases may be added by: <ul style="list-style-type: none"> direct addition of enzymes enzyme cocktails (lipases and proteases) attenuated proteolytic cultures.
Key composition ratios of cheese	<p>Key composition ratios of cheese include:</p> <ul style="list-style-type: none"> salt to moisture ratio (S/M) moisture in the non fat substance (MNFS) fat in the dry matter (FDM) pH (acidity).
Surface treatments	<p>Surface treatments may include</p> <ul style="list-style-type: none"> ashing stamping.
Process control parameters to optimise yield	<p>Process control parameters to optimise yield include:</p> <ul style="list-style-type: none"> curd cutting heating and cooking salting too soon after milling high temperatures during pressing washing.
Principles of optimising yield	<p>Principles of optimising yield include:</p> <ul style="list-style-type: none"> obtain highest MNFS with good quality standardise milk (P/F) to obtain maximum value for milk components minimise fat and protein losses in the whey.
Packaging	<p>Packaging may include:</p> <ul style="list-style-type: none"> vacuum and/or gas flush in gas and moisture proof film plastic rigid containers oxygen permeable wrap (e.g. greaseproof paper).
Multi-phase cleaning systems	<p>Multi-phase cleaning systems require:</p> <ul style="list-style-type: none"> cleaning with a chlorinated alkaline detergent with a

	chelator, followed by water and acid rinses.
Records of cheese manufacture	Records of cheese manufacture may include: <ul style="list-style-type: none">• timing of operations• temperature logging• milk and curd pH profile• curd weight• milk composition• cheese microbial counts• hooped yield• curing and grading data.
Food safety related information	Food safety related information may include: <ul style="list-style-type: none">• milk counts• cheese bacterial counts• manufacture and storage details.
Cleaning standards	Cleaning standards include: <ul style="list-style-type: none">• AS 4709 - 2001 Guide to cleaning and sanitising of plant and equipment in the food industry• AS 1162 - 2000 Cleaning and sanitising dairy factory equipment• AS 2541 - 1998 Guide to the cleaning-in-place of dairy factory equipment.

Unit Sector(s)

Cheese.