

Supporting document 1

Guide to the requirements for raw milk products in Standard 4.2.4 – Primary Production and Processing Standard for Dairy Products (at 2nd call for submissions) – Proposal P1022

Primary Production & Processing Requirements for Raw Milk
Products

Contents

GUIDE TO THE REQUIREMENTS FOR RAW MILK PRODUCTS IN STANDARD 4.2.4 – PRIMARY PRODUCTION AND PROCESSING STANDARD FOR DAIRY PRODUCTS – PROPOSAL P1022	1
INTRODUCTION	3
USING THE GUIDE	4
DIVISION 5 – ADDITIONAL REQUIREMENTS FOR RAW MILK PRODUCTS	5
DEFINITIONS	5
SUBDIVISION 1 – GENERAL	6
SUBDIVISION 2 - PRIMARY PRODUCTION OF MILK FOR RAW MILK PRODUCTS	6
<i>Baseline measures for primary production</i>	6
20 ANIMAL HEALTH REQUIREMENTS.....	7
21 REQUIREMENTS FOR ANIMAL IDENTIFICATION AND TRACING	11
22 REQUIREMENT TO CONTROL SPECIFIC INPUTS.....	11
23 HEALTH AND HYGIENE REQUIREMENTS	13
24 REQUIREMENT FOR MILKING PRACTICES.....	14
25 REQUIREMENTS RELATING TO THE COOLING AND STORAGE OF MILK FOR RAW MILK PRODUCTS.....	15
26 REQUIREMENTS RELATING TO NON-CONFORMING MILK FOR RAW MILK PRODUCTS	17
ADDITIONAL CONSIDERATIONS FOR PRODUCTION OF MILK FOR RAW MILK PRODUCTS	17
SUBDIVISION 3 – TRANSPORT OF MILK FOR RAW MILK PRODUCTS	19
29 REQUIREMENTS FOR TEMPERATURE CONTROL.....	20
30 RAW MILK HANDLING REQUIREMENTS	21
ADDITIONAL CONSIDERATIONS FOR TRANSPORT OF MILK FOR RAW MILK PRODUCTS	22
SUBDIVISION 4 – PROCESSING OF MILK FOR RAW MILK PRODUCTS	23
32 REQUIREMENT FOR ADDITIONAL AND SPECIFIC CONTROL MEASURES	23
33 REQUIREMENTS RELATING TO MILK RECEIPT AND STORAGE	27
34 REQUIREMENTS TO CONTROL SPECIFIC FOOD SAFETY HAZARDS	29
35 REQUIREMENTS RELATING TO NON-CONFORMING MILK	30
ADDITIONAL CONSIDERATIONS FOR PROCESSING OF MILK FOR RAW MILK PRODUCTS.....	30
APPENDIX 1	32
STANDARD 3.2.2 HEALTH AND HYGIENE REQUIREMENTS.....	32

GUIDE TO THE REQUIREMENTS FOR RAW MILK PRODUCTS IN STANDARD 4.2.4 – PRIMARY PRODUCTION AND PROCESSING STANDARD FOR DAIRY PRODUCTS

Introduction

Food safety requirements for the dairy sector are specified in Standard 4.2.4 - Primary Production and Processing Standard for Dairy Products. Standard 4.2.4 sets out requirements for:

- dairy primary production businesses (covering on-farm milk production activities)
- dairy transport businesses (covering the collection and transport of milk and dairy products) and
- dairy processing businesses (covering activities up to, but not including, retail).

Standard 4.2.4 requires dairy businesses to control the potential food safety hazards associated with their business by implementing a documented food safety program. These existing measures provide the baseline set of requirements for raw milk product manufacture.

A number of additional requirements are specified in Standard 4.2.4¹ for raw milk products to ensure their safety. These requirements apply through- chain from production to transport and processing of milk for raw milk products.

This guide provides additional explanation and information on the additional requirements for raw milk products in Standard 4.2.4. The document *Validation of Raw Milk Product Safety*, has also been prepared to assist processors and enforcement agencies with the validation of processing controls.

¹ Note that this draft document incorporates the wording used in the draft variation to Standard 4.2.4 in the 2nd Call for Submissions for Proposal P1022.

Using the guide

- This guide explains the requirements for raw milk products included in Division 5 of Standard 4.2.4. It covers definitions and the measures specified under each subdivision for milk production, collection and transport, and processing of raw milk products.
- The requirements in the standard for raw milk products are provided as shaded boxed text throughout the guide preceding their explanation.
- Where existing requirements provide the basis for the additional measures for raw milk products, text and information is provided on baseline measures.
- The additional information and explanations provided in the guide may help businesses comply with the requirements for raw milk products but it is not intended that this guide specifies how businesses can comply.

Division 5 – Additional requirements for raw milk products

Requirements for raw milk products are included in Division 5 of Standard 4.2.4. Additional requirements for primary production, transport and processing of raw milk products are incorporated in separate subdivisions. Definitions that apply to the requirements for raw milk products under Division 5 are included in subclause 1(2) of Standard 4.2.4.

Definitions

Additional definitions that apply to the requirements for raw milk products specified in Division 5 have been included under subclause 1(2) of Standard 4.2.4.

“**diseased animal** means an animal that has signs of an infection.”

“**documented alternative** means a method that -

- (a) minimises the growth of pathogenic microorganisms in the milk to the same or greater extent as that the method prescribed by this Standard;
- (b) does not adversely affect the microbiological safety of any raw milk product produced from that milk;
- (c) is documented in a food safety program required by this Standard; and
- (d) the business has demonstrated will result in the outcomes required by paragraphs (a) and (b) of this definition.”

“**infection** means the entry, development or multiplication, of a pathological microorganism that is capable of being transferred to humans through raw milk.”

“**milk for raw milk products** means raw milk that is used or is to be used to make a raw milk product.”

“**raw milk** means milk that has not been processed in accordance with subclause 15(1) or clause 16 of this Standard.”

“**raw milk herd** means any group of animals from which milk for raw milk products is or will be sourced.”

“**raw milk product** means a dairy product made with raw milk, but does not include milk.”

The definition of **diseased animal** has been included in order to apply animal health requirements under clause 20. It refers to having “signs of infection” and so a definition of **infection** is also supplied, clarifying that the microorganism of primary concern are those that can be transmissible to humans via consumption of raw milk. These may include *Listeria monocytogenes*, *Salmonella* spp, pathogenic *Escherichia coli* (STEC), *Mycobacterium bovis* and *Brucellosis* spp.

The term **documented alternative** has been defined for use where prescriptive measures are specified in Division 5. The intention is to allow businesses to use alternative processes or procedures where they can demonstrate that those processes or procedures will not adversely affect the microbiological safety of the final raw milk product.

The term **milk for raw milk products** is defined to distinguish between requirements for the production; transport and processing of milk for general dairy processing and milk specifically for raw milk products.

The definition of **raw milk product** captures all dairy products except market milk. Essentially a raw milk product is a dairy product where pasteurisation or other processing measures, as specified under subclause 15(1) or clause 16 of standard 4.2.4, are not met. These elements are captured by the definition of **raw milk**.

The term **raw milk herd** is defined to make clear where requirements apply to milking animals kept and milked specifically for milk for raw milk products.

Subdivision 1 – General

17 Application of Divisions 1 to 4

To avoid doubt, unless the contrary intention appears, the requirements imposed by Divisions 1 to 4 of this Standard apply to the production, transport and processing of milk for raw milk products and to raw milk products.

Clause 17 is included to make clear that the existing provisions of Standard 4.2.4 apply (baseline measures) and that the requirements specified under Division 5 are in addition to those.

Subdivision 2 – Primary production of milk for raw milk products

Additional measures for primary production of milk for raw milk products are specified under subdivision 2 of Division 5.

18 Application

A dairy primary production business that produces milk for raw milk products must ensure that each requirement of this subdivision is met.

19 Requirement for additional and specific control measures

The documented food safety program required by clause 3 must include control measures that ensure that the requirements of this subdivision are met.

Clause 18 specifies to what businesses the requirements of subdivision 2 apply i.e. dairy primary production businesses that produce milk for raw milk products. Clause 19 makes clear that the business's food safety program must include the additional measures specified under subdivision 2 in addition to baseline measures.

Baseline measures for primary production

Clause 3 of standard 4.2.4 requires dairy primary production businesses to control potential food safety hazards by implementing a documented food safety program. General measures that must be covered in the program are specified under clauses 4 to 6 of the Standard. Essentially the food safety program must cover the following elements:

- Animal health
- Inputs
- Premises and equipment
- Health and hygiene
- Milking operations
- Cleaning and Sanitising

- Traceability
- Skills and knowledge

The primary production of milk for raw milk products requires a greater level of control to ensure that the potential for pathogen contamination is minimised. The additional measures that are required to ensure this level of control is met are specified in the clauses within subdivision 2. Supplementary information relating to baseline requirements is also provided.

20 Animal health requirements

- (1) Milk for raw milk products must not be obtained from a diseased animal.
- (2) A diseased animal must not be introduced into a raw milk herd.
- (3) A diseased animal in a raw milk herd must be:
 - (a) separated immediately from the herd; and
 - (b) kept separate from any other animal that will be milked for milk for raw milk products.

Clause 20 specifies the additional animal health requirements that must be covered by the food safety program of a business producing milk for raw milk products. Information on these measures is provided below following discussion of baseline requirements.

Baseline requirements

Requirements in Division 2 of Standard 4.2.4 specify that control measures implemented on farm must ensure that milk for human consumption is only sourced from healthy animals and a system must be in place that enables the tracing of animals to be milked. To address these requirements the following elements should be covered by the food safety program:

- Milk is only sourced from healthy animals and animals showing signs of infectious disease are segregated and their milk kept from supply and a diagnosis made of the cause.
- A system for livestock identification is in place and all livestock purchases are supported by vendor declarations as to disease status.
- Treated animals are identified; only approved drugs are used, and specified withholding periods observed for all treatments. Adequate treatment records are kept.
- A mastitis control program is implemented.

Additional considerations for raw milk products

The health and disease status of milking animals has a significant impact on the contamination of raw milk due to:

- pathogens being shed in the faeces which then contaminates the animal and the environment;
- pathogens being shed directly into milk as a result of mastitis;
- pathogens being shed directly into milk from other zoonoses (e.g. *Brucella* spp, *Mycobacterium bovis*).

Programs in Australia have successfully eradicated bovine brucellosis and bovine tuberculosis and *Brucella melitensis* (cause of brucellosis in sheep and goats) has never been reported in sheep and goats in Australia. Ongoing surveillance and biosecurity requirements ensure ongoing management of these zoonoses (information available from [Animal Health Australia](http://www.animalhealthaustralia.com.au/) [http://www.animalhealthaustralia.com.au/]). Where a raw milk product has been manufactured in another country, evidence should be available to show that the milk was sourced from animals belonging to herds that are officially free of tuberculosis and brucellosis in accordance with the OIE *Terrestrial Animal Health Code*.

(1) Milk for raw milk products must not be obtained from a diseased animal

Milking animals should show no apparent general animal health problem such as diarrhoea, fever, discharge, udder inflammation or wound to the udder, or produce milk that appears abnormal. Such animals should be removed from the raw milk herd and not be milked for supply until the problem has been resolved or veterinary clearance has been obtained. Animals showing unusual behaviour or a significant drop in milk production or appetite should also be monitored carefully. Any unusual animal deaths also need to be assessed and veterinary involvement sought if not resolved.

In the case of certain diseases, such as salmonellosis, veterinary and laboratory diagnosis may be necessary. During this time the milk should be withheld from supply until a diagnosis is made and clearance obtained.

Animals may be carriers of pathogens without exhibiting any clinical signs of disease. These are difficult to detect and frequently require repeated laboratory tests to confirm carrier status. This is why adherence to strict hygiene practices on farm to prevent/minimise faecal contamination of the milk is paramount. In relation to STEC, herd management practices may be considered that are aimed at reducing faecal excretion. These may include:

- vaccination
- detection and elimination of high shedders
- changes in feed/use of probiotics
- good husbandry practices to minimise animal stress and potential spread on the bacteria within the herd and farm environment.

Significant animal health issues should be advised to the enforcement agency and the business to which the milk is being supplied. Written records of animal health issues, veterinary visits (e.g. diary, computer, cow records) and veterinary reports should be filed as part of the food safety program records. It would be expected that animals in the milking herd would be subjected to a veterinary inspection at least annually.

Recommended monitoring criteria

Test	Acceptable limit	Corrective Actions
General health and quality: weekly on farm bulk milk		
Somatic cell count*	<ul style="list-style-type: none"> • 200 000 cells/ml for bovines • 1 000 000 cells/ml for other species 	
Total plate count at 30°C for 72 hours	25 000 cfu/ml	

Test	Acceptable limit	Corrective Actions
<i>E. coli</i>	<10 cfu/ml	If the <i>E. coli</i> limit is exceeded, further investigation should be required to verify hygiene measures. Cessation of supply for raw milk product manufacture should result if this limit is routinely exceeded, or a level greater than 100cfu/ml is returned. A test result of <10cfu/ml should be required before recommencement of supply.
Pathogen monitoring: routinely on farm bulk milk		
<i>Salmonella</i> spp.	Not detected in 25ml A positive test may result in animals being tested for Salmonella.	Any test failure for pathogens should result in cessation of supply for raw milk product manufacture and necessitate investigation of hygiene, cleaning or animal health issues and may require a veterinary visit. A clear test should be required before recommencement of supply.
<i>L. monocytogenes</i>	Not detected in 25ml	
<i>S. aureus</i>	<100 cfu/ml	Elevated levels of <i>S. aureus</i> should result in investigation of individual animal health in respect to mastitis. Levels in excess of 1000 should result in cessation of supply until problem identified and resolved.

* It is also recommended that dairy primary production businesses monitor individual animal somatic cell counts.

(2) A diseased animal must not be introduced into a raw milk herd.

New animals should only be sourced from herds with the best assurance of freedom of disease and where good herd management is in place. It is recommended that under existing requirements, signed declarations and assurances for purchased animals would be obtained for the following diseases:

Species	Disease or condition	Management Program
Cattle	Mastitis	Yes
	Salmonella	Yes
	Johne's Disease	Yes
	Clostridia bacteria	Vaccination status
	Leptospirosis	Vaccination status

Species	Disease or condition	Management Program
Sheep	As above for cattle	As above
	Caseous Lymphadenitis (CLA)	Vaccination status
	Footrot	Yes
Goats	As above for cattle	As above
	Footrot	Yes
	Caprine Arthritis Encephalitis (CAE)	Yes
Buffalo	As above for cattle	As above
	Ticks	Consult State Departments for information
Camelids	As above for cattle	As above

A system for the introduction of new animals to the raw milk herd should include a quarantine period. It would be expected that newly purchased animals are quarantined and their milk withheld from supply for raw milk products until their health status is confirmed following transport. A minimum quarantine period of 4 to 6 weeks from the raw milk herd may be appropriate.

Purchased animals should be individually identified and introduced into the farm stock register. The dairy primary production business should keep all records of stock purchases including any documentation relating to tests carried out to verify health status.

(3) A diseased animal in a raw milk herd must be:

(a) separated immediately from the herd; and

(b) kept separate from any other animal that will be milked for milk for raw milk products.

To ensure milk is only obtained from healthy animals, subclause 20(3) makes clear that any animal showing signs of disease must be immediately removed from the herd and their milk withheld from supply. The animal is not to be introduced back into the raw milk herd until its health status can be verified which may involve veterinary clearance depending on the nature of the illness. The food safety program should document the system in place that ensures this is achieved.

21 Requirements for animal identification and tracing

Each animal that will be or has been milked for milk for raw milk products must be subject to a stock identification system that ensures that the animal is uniquely identifiable and traceable.

Clause 21 specifies that individual animals in the raw milk herd must be able to be identified and that the system that ensures this is documented in the food safety program.

The stock identification system used by the dairy primary production business needs to be documented in the food safety program. The system selected by a business producing milk for raw milk products should:

- ensure each individual animal is uniquely identifiable
- be appropriate to the animal species concerned
- be sufficiently robust to ensure that there is a low incidence of loss of tags etc.

If loss of ear tags or alternative identification occurs, this should be recorded. If there are significant losses of tags etc., an alternative system should be considered. Individual animal identification through the National Livestock Identification System (NLIS) may be appropriate.

Individual animal identification numbers should be recorded in a register of the animals in the raw milk herd and a record kept of which animals are in the milking herd when milk is supplied for raw milk products. The dairy primary production business should monitor the milking records to ensure that only animals intended to be in the herd for the supply of raw milk are in the raw milk herd.

The record system used should be permanent, legible, and stored in a manner which protects the records from damage, deterioration or loss.

22 Requirement to control specific inputs

- (1) Fermented feeds must not be fed to animals milked for raw milk.
- (2) Subclause (1) does not apply if the dairy primary production business uses a documented alternative to feed animals milked for raw milk.
- (3) Only potable water must be used:
 - (a) on equipment used to milk animals;
 - (b) to clean the teats of animals; or
 - (c) for washing by persons milking animals.

Clause 22 specifies additional requirements in relation to feed and water use. Information on these measures is provided below following discussion of baseline requirements.

Baseline requirements

Paragraph 4(1)(a) of standard 4.2.4 specifies that control measures must be included in the documented food safety program that manage the potential food safety hazards arising from inputs which include any feed, water and chemicals used in connection with the primary production of milk. To address these requirements it would be expected that the following elements are included in the businesses food safety program:

- Records for purchased stock feeds including vendor declarations
- Management of pasture including records of chemical pasture treatments and effluent management
- Management of chemical and microbiological hazards in conserved fodder
- Records for the use of all agricultural and veterinary chemicals
- Management of water sources (stock water and milking shed water) such that they are fit for purpose.

In relation to feed, it should be of suitable quality and of known origin. To ensure this, the following is recommended:

- All sources of feed (paddocks grazed, feed conserved and feed purchased) should be traceable as part of the food safety program. Accurate paddock and purchase records should be kept.
- Feed production and storage facilities should be appropriate for the nature of the feed and not contribute to microbial contamination.
- No feed waste, silage sludge or mouldy feed should be offered to or consumed by milking animals. Spoilt grain must not be fed to animals because of the risk of mycotoxin contamination. Mycotoxin binders should be used as appropriate.
- Animals should not have access to effluent areas. A period of 21 days is recommended between application of effluent to pastures and grazing or, harvesting of feed. Detailed paddock grazing records should be kept as part of the food safety program and should provide details of effluent spreading.

(1) Fermented feeds must not be fed to animals milked for raw milk.

(2) Subclause (2) does not apply if the dairy primary production business uses a documented alternative to feed animals milked for raw milk.

A specific provision is included for fermented feeds, such as silage, as poor preparation and storage of these feeds can create conditions highly selective for the growth of undesirable microorganisms such as *L. monocytogenes*. This can then provide a source of infection of listeriosis in milking animals. Fermented feed that has not been prepared and stored correctly should not be offered to milking animals. It is recommended that fermented feeds are not offered immediately pre-milking to reduce spore or bacterial contamination of teat ends.

The default approach under subclause 22(1) is that fermented feeds should not be fed to animals in the raw milk herd. Subclause 22(2) provides for use only if the business can demonstrate that the use of fermented feeds will not adversely affect the health of the animal and suitability of the milk. In that case the preparation and storage of fermented feeds for the raw milk herd should be addressed and documented in the food safety program and cover production practices and storage facilities (including the design of silos or bunkers). The quality of each batch of fermented feed being used should be assessed and recorded, noting sensory assessment (e.g. odour) and pH reduction.

A rapid pH reduction and storage under anaerobic conditions is considered to be essential for the safe production of fermented feeds. Silage testing for pH should be carried out as a good guide to silage fermentation quality. For silages with a dry matter content of less than or equal to 35%, there is a high probability of poor silage if the pH for grass silage is greater than 4.65 and for legume silage if it is greater than 4.8.

No silage should be fed with a pH of greater than 5.0. The Dairy Australia and NSW Department of Primary Industries “Top Fodder, Successful Silage” Manual (2004) provides guidance for safe silage production.

(3) Only potable water must be used:

(a) on equipment used to milk animals;

(b) to clean the teats of animals; or

(c) for washing by persons milking animals.

Potable water is defined in the Code as water acceptable for human consumption. It is essential that water used in the milking shed does not introduce contaminants and result in the contamination of raw milk with microorganisms. The water supply used within the dairy for sanitising and rinsing the milking plant, for washing teats, mixing up of teat dips and hand washing for operators should be potable.

Businesses able to use treated town water can usually assume that the supply is potable. Businesses with untreated water supplied may need to treat the water before use to ensure it is of a suitable microbiological quality.

The food safety program should document what water supply is used in milking operations and any treatments required. Where the supply is not town water, the microbiological quality should be monitored. It is recommended that testing for *E. coli* be undertaken quarterly unless there is a change of water supply or quality problems occur. *E. coli* should be absent in 100 ml.

23 Health and hygiene requirements

The production of milk for raw milk products must comply with the requirements of Division 4 of Standard 3.2.2.

Clause 23 applies the health and hygiene requirements for food businesses in Standard 3.2.2 to milking activities for production of milk for raw milk products.

Baseline requirements

Paragraph 4(1)(d) of standard 4.2.4 requires a dairy primary production business to control potential food safety hazards arising from persons involved in milking. This means that the food safety program should document personal hygiene practices such as:

- hand washing policy
- clothing requirements
- policies for personnel suffering from symptoms of foodborne illness
- the need to cover cuts and wounds
- where eating is permitted.

Requirements for raw milk products under clause 23

The application of Division 4 of Standard 3.2.2 to businesses producing milk for raw milk products highlights that the potential for contamination from persons involved in milking activities should be assessed akin to food handlers in a food business.

The requirements of Division 4 are provided at Attachment 1. These requirements put obligations on both milk handlers (persons undertaking milking activities) and the dairy primary production business to take all reasonable measures to ensure the safety and suitability of the milk is not compromised.

Specific matters to be given attention regarding milking personnel include:

- In relation to the health of milk handlers (subclause 14(1)), persons with a transmissible disease or known to be a carrier of pathogens or parasites should not undertake milking activities.
- In relation to clothing (subclause 15(1)(c) of Standard 3.2.2), clothes worn for milking should be reserved for that activity and changed and cleaned regularly.
- People with scratches and open wounds on the hands or forearms should not undertake milking activities. If this is not possible, the wounds must be completely covered with waterproof dressing.
- In relation to people on the premises (subclause 18(3)), visitors to a dairy farm producing milk for raw milk products should be excluded. If necessary, use of single-use clothing and boots (or other suitable garment) should be provided.

Hand washing

The hands of personnel undertaking milking activities need to be considered as a possible source of microbial contamination of the teat and udder. Persons milking animals should wash and dry their hands and forearms with soap and water, or with an equally effective product, prior to milking and during milking when soiling occurs. Regular washing of hands is also necessary where milking staff are checking animals for mastitis and treating cows. The provision and use of disposable paper towel for hand drying is a preferred option in the milking plant.

If gloves are used, new, clean, latex-type gloves at each should be worn for morning or evening milking and changed where damaged during milking. Gloves should also be cleaned or changed when soiling occurs.

People milking by hand should ensure hands are washed between animals or if gloves are used, changed between animals.

24 Requirement for milking practices

The teats of an animal milked for milk for raw milk products must be clean and dry before the animal is milked.

Clause 24 specifies a prescriptive teat washing and drying requirement prior to milking.

Baseline requirements

Paragraph 4(1)(e) of standard 4.2.4 requires a dairy primary production business to control the potential food safety hazards arising from milking practices. To address this general requirement the food safety program should document practices including:

- maintaining good personal hygiene;
- ensuring correct cleaning, sanitising, operation and maintenance of equipment; and

- minimising contamination from the animal.

Under best practice it would be expected that the following milking practices are implemented:

- Animals teats and udders should be checked for injury or damage, heat or swelling and animal behaviour monitored, particularly evidence of udder discomfort or resistance to milking.
- Good milking management should be practised, including gentle handling of animals, avoiding excessive air intake at cup attachment, minimising over-milking, gentle removal of cups and care to avoid cups sucking up faecal or other material.
- Handwashing/glove cleaning or changing as appropriate.
- Inspection of the milk filter after use to check for abnormalities.

Requirement for milking practices under clause 24

The teat surface is the major avenue of entry for microorganisms into raw milk. Pre-milking udder hygiene reduces milk contamination by transient bacteria located on the udder. Good personal hygiene practices need to be employed during milking and milking equipment needs to be well maintained, cleaned and sanitised.

The udder and teats of each animal to be milked must be checked for cleanliness. If cleaning is necessary the teats should be washed and wiped with a single service towel. After milking, teats may be sanitised with an approved teat spray, ensuring an adequate contact time. The Dairy Australia Countdown 2020 site provides guidance material on appropriate teat disinfection practices.

Trends in the somatic cell count of the herd and individual cows should be monitored.

25 Requirements relating to the cooling and storage of milk for raw milk products

- (1) Milk for raw milk products must be cooled to a maximum temperature of 6°C within two hours of milking.
- (2) Milk for raw milk products that is stored must be kept at a temperature not exceeding 5°C while in storage.
- (3) Subclause (1) does not apply if the dairy primary production business uses a documented alternative to the method prescribed by that subclause.
- (4) Subclauses (1) and (2) do not apply to milk that is processed within two hours of it being milked.
- (5) Milk for raw milk products must be kept separate from milk used or intended to be used for dairy products that are not raw milk products.

Clause 25 specifies prescriptive cooling and storage temperature requirements for milk for raw milk products as well as a requirement for a separate storage system.

Baseline requirements

Paragraph 4(2)(b) of standard 4.2.4 specifies that milk must be cooled and stored at a temperature that prevents or reduces the growth of microbiological hazards in the milk.

This means that the dairy primary production business must document its cooling regime as part of its food safety program and record monitoring, servicing and compliance with the documented cooling requirement. Thermometers and gauges used to record and check milk temperature should be calibrated and records of calibration kept.

Raw milk product requirements under clause 25

A prescriptive cooling and storage requirement is specified for the production of milk for raw milk products to provide greater assurance that the potential for growth of any micro-organisms present is minimised. This requires a cooling capacity to reach 6°C within 2 hours of milking.

To meet this requirement, dairy primary production businesses producing milk for raw milk products should:

- have milk cooling equipment serviced annually and repaired when any malfunction occurs;
- calibrate vat recording devices every three months and maintain records;
- check the vat temperature prior to milking and assess milk cooling compliance twice daily to ensure the milk is cooled to 6°C or below within 2 hours from the completion of milking. Any abnormality must be recorded along with any corrective action; and
- store milk at 5°C or below.

If existing milk cooling systems are inadequate to meet the milk cooling and storage requirements, equipment upgrading may be necessary. Options include larger vat compressors, improved plate cooling, cooling towers, ice bank systems, glycol systems etc.

Subclause 25(4) clarifies that cooling requirements do not apply if processing commences within 2 hours of milking. Additionally, subclause 25(3) provides for the business to have alternative procedures or arrangements in place if it can demonstrate that these will not affect the safety of the final product.

(5) Milk for raw milk products must be kept separate from milk used or intended to be used for dairy products that are not raw milk products.

The traceability requirements in Standard 4.2.4 require a dairy primary production business to have a system that enables the tracing of animals to be milked and the milk produced. For a dairy primary production business producing milk for raw milk products, a further consideration is the potential for cross contamination between milk for general dairy processing and milk for raw milk products. It is essential that the integrity of milk for raw milk products is maintained and the potential for any cross contamination is minimised. For dairy primary production businesses which also produce and supply milk for general dairy processing or where non-conforming milk must be managed, a separate system may be required.

The system put in place should consider, for example, milking procedures (such as milking the raw milk herd before other animals) and storage. For storage:

- Bulk milk storage tanks intended for approved raw milk storage should be clearly labelled and not used for any other purpose.
- Bulk milk storage tanks should be kept closed/sealed at all times.
- Raw milk to be used for the manufacture of Category 2 products should be collected separately from milk intended for other Category products/non complying milk.

26 Requirements relating to non-conforming milk for raw milk products

Milk must not be supplied for raw milk products if the milk was produced other than in accordance with this Division or is otherwise unacceptable.

Clause 26 places an obligation on the primary production business not to supply milk for the processing of raw milk products that has not been produced in accordance with additional requirements for raw milk products, or is otherwise unacceptable.

Milk that has not been produced in accordance with the recommended control measures, or is otherwise not fit for the manufacture of raw milk products, should be withheld and either—

- (a) disposed of appropriately on farm
- (b) redirected to supply for general dairy processing, provided that the milk meets the requirements in Standard 4.2.4.

It is important that a system is in place that ensures that milk which does not meet the requirements for raw milk products is not supplied for raw milk product manufacture. These procedures and criteria should be documented in the food safety program. Depending on the non-conformance, the milk could be used for the manufacture of pasteurised milk products or must be disposed of.

The use or disposal of non-conforming raw milk should be recorded, including details of date and milk volumes involved. The reason for failure of the milk to meet requirements should be documented and appropriate corrective action taken and recorded.

Additional considerations for production of milk for raw milk products

Premises and equipment

Clause 4 of standard 4.2.4 requires a dairy primary production business to control the potential food safety hazards arising from the design, construction, maintenance and operation of premises and equipment as part of its food safety program. The control measures must include support programs that ensure that premises and equipment are clean and sanitary and that pests are controlled.

While the baseline requirements for premises and equipment should provide an adequate level of control dairy premises used for production of milk for raw milk products, these premises should be assessed differently. There should be a higher level of attention to cleaning regimes, the servicing of milking machines and other equipment, and premise layout to ensure the potential for contamination is minimised.

Cleaning and sanitising

Dairy primary production businesses are already required to have a cleaning and sanitising program. For those producing milk for raw milk products, the food safety program should document the specific cleaning regime that ensures the outside of milking equipment, railings in the dairy and the milking platform are free of manure and clean. It is important that the milking plant in farm dairies, including the bulk milk tank, is cleaned and sanitised:

- in a manner that minimises the risk that milk may deteriorate or be contaminated;
- with detergents and sanitisers supplied by a reputable chemical supply company, used according to manufacturers' specifications;

- with water of a suitable quality and at the correct temperature (manufacturer's recommendation); and
- a manner that minimises the risk that the detergents and sanitisers used, may contaminate milk.

The cleaning and sanitising systems available involve variations including rinsing with cold water, washing with a detergent in hot water (acid and alkali variations), use of a sanitiser and rinsing or draining. The system used must be effective, appropriate for the farm's circumstances, including cleaning in place system and automation if installed, and as advised by the chemical company.

The effectiveness of the cleaning program should be monitored by regular physical checks of the milking plant and by monitoring microbiological test data (e.g. total plate count and *E. coli*).

Milking machines

Milking machines and milk cooling equipment should be correctly installed, maintained, cleaned and serviced. For businesses producing milk for raw milk products, a more frequent servicing of milking machines and milk cooling and storage equipment should be implemented to ensure milk quality and safety is maintained.

It is recommended that automated (robotic) milking systems and novel milking systems should not to be used for milk intended for raw milk products unless the design has been submitted for assessment by the enforcement agency.

Housing and environment

Intensive housing of animals may increase the risk of contamination of udders, leading to mastitic infection due to closer proximity of animals, concentration of faeces, and contact with bedding etc. Where housing is used for animals in a raw milk herd, the design, maintenance and operation of housing pens and bedding should be included in the food safety program. It is important that the facility is cleaned, well ventilated and animals are monitored for stress or disease.

The design and maintenance of holding areas can also amplify the spread of pathogens due to increased soiling of udders and teats with faecal material, and overcrowding which can lead to udder damage and animal stress. The food safety program should include how holding yards, feeding yards, loafing yards and feed pads are managed and operated to avoid overcrowding and to minimise the soiling of udders. Raceways, gateways and watering points should be maintained to minimise soiling of the udders.

Handwashing and toilet facilities

To facilitate appropriate handwashing practices, it is important that designated, appropriate hand washing facilities are available to milking staff, independent of equipment washing facilities and hoses. Hand basins should be easily accessible.

Milking staff should also have access to toilet facilities that are well maintained so that they are clean and operating properly. The location of the toilet should take into account any likelihood of droplet-borne contamination which could affect the safety of the milk.

Skills and knowledge

Standard 4.2.4 specifies that persons undertaking primary production activities must have skills and knowledge of food safety and hygiene matters commensurate with their work activities. The food safety program should identify who has the appropriate authority and control to deliver the required outcomes. Persons undertaking milking activities, applying agricultural chemicals or administering veterinary treatments, should have appropriate competencies and understand how their actions may impact on food safety.

Persons undertaking activities related to the production of milk for raw milk products should fully understand any implications the activities they undertake may have on the microbiological status of the milk.

Dairy primary production businesses producing milk for raw milk products should have skills and knowledge (competencies) in the areas of:

- animal health and herd management;
- safe production of silage and other conserved feed;
- hygienic milking practices;
- microbiological hazards and their control measures (food safety); and
- cleaning and sanitation requirements.

Records that should be kept include:

- how staff have been trained (including staff attending courses and on-the-job training provided); and
- how competencies are tested.

Subdivision 3 – Transport of milk for raw milk products

Additional measures for the collection and transport of milk for raw milk products are specified under subdivision 3 of Division 5.

27 Application

A dairy transport business that collects and transports milk for raw milk products must ensure that each requirement of this subdivision is met.

28 Requirement for additional and specific control measures

The documented food safety program required by clause 7 must include control measures that ensure the requirements of this subdivision are met.

Clause 27 specifies to what businesses the requirements of subdivision 3 apply i.e. dairy transport businesses that collect and transport milk for raw milk products. Clause 28 makes clear that the business's food safety program must include the additional measures specified under subdivision 3 in addition to baseline measures.

Baseline measures for transport

Standard 4.2.4 requires businesses involved in the collection and transport of milk to control potential food safety hazards by implementing a documented food safety program.

Measures that must be covered in the program are specified under clauses 8 to 11 and essentially cover cleaning and sanitising of vehicles and equipment; personal hygiene; time and temperature control; skills and knowledge requirements, and traceability. The food safety program should include the following elements:

- Cleaning and sanitation program
- Maintenance program
- Pest control
- Personal hygiene practices
- Health requirements
- Traceability system

The collection and transport of milk for raw milk products requires a greater level of control to ensure that there is no cross-contamination between milk for suitable for raw milk products with that for general dairy processing or temperature abuse. The additional measures that are required to ensure this level of control is met are elaborated below in relation to existing baseline requirements. Supplementary information relating to general dairy requirements is provided as context in which the additional measures for collection and transport of milk for raw milk products apply.

29 Requirements for temperature control

- (1) The temperature of milk for raw milk products must not exceed 8°C at any point between the collection of that raw milk from the dairy primary production business that produced it and its delivery to a dairy processing business for processing.
- (2) Subclause (1) does not apply if:
- (a) the milk is collected from the dairy primary production business within 2 hours of it being milked; or
 - (b) the dairy transport business uses a documented alternative to the method prescribed by subclause (1).

Baseline requirement

Clause 10 of standard 4.2.4 requires a dairy transport business to transport dairy products using time and temperature controls that prevent or reduce the growth of microbiological hazards in the product. The food safety program should document how the business will maintain temperature control which may include, for example, organising milk collection times in relation to milking schedules to ensure the temperature of the milk at pick-up is at 5°C or below. The food safety program should also specify how the temperature of the milk will be monitored and recorded.

Raw milk product requirements under clause 29

The prescriptive time temperature requirement for the collection and transport of milk for raw milk products requires communication and planning between the primary production business, the transport business and the processing business (noting that clause 33 states the milk should be no older than 24 hours before the processing of raw milk products commences). The food safety program should document how this is ensured and records kept of raw milk temperatures and collection times. For example:

- The time of completion of milking should be documented and displayed by the primary production business in a manner that is accessible to transport personnel. The transport business should record the time of completion of milking and the time of collection in addition to the normal records that must be taken at the farm upon collection of milk (e.g. temperature, volume, organoleptic assessment etc.).
- The transport or processing business should validate that the transportation procedures used will ensure that milk in the tanker/container will be received by the processing business at or below 8°C. The use of automated temperature data-logging equipment on a milk tanker with regular calibration checks and downloadable records would meet this requirement.

When milk is collected above 8°C, records should clearly document the time from completion of milking, time of collection and delivery. Deviations from the temperature requirement may be agreed with the processing business if it can be shown that it would not adversely affect the microbiological safety of the end product. This may be reflected in the raw milk product validation and alternative limits specified in the food safety program.

30 Raw milk handling requirements

Milk for raw milk products must be kept separate from milk used or intended to be used for dairy products that are not raw milk products.

The collection and transport of milk for raw milk products needs to effectively manage the potential for cross-contamination between milk suitable for raw milk products and milk for general dairy processing. The food safety program should document the system in place that ensures segregation is maintained.

Regardless of whether collection and transport of milk for raw milk products involves vehicles or is small in scale (e.g. transported in small vessels such as buckets), equipment and containers must be able to be effectively cleaned, prevent contamination and the process used be able to segregate milk for raw milk products from milk for general dairy processing. The elements that may need to be addressed in such a system include the following:

- Milk for raw milk products should be collected before collection of any milk for general dairy processing. Once a milk transfer line has been exposed to milk for general dairy processing, it should not be re-used for milk for raw milk products until it has been thoroughly cleaned and sanitised.
- If a farm produces both milk for raw milk products and for general dairy processing, then the former needs to be transferred first with the clean milk transfer lines before the milk for general dairy processing is transferred to a separate compartment on the tanker.
- The use of separate and defined vessels and milk collection equipment for collecting milk for raw milk products. The use of a dedicated milk tanker for the collection and transport of milk for raw milk products must be used if collecting from multiple farms.
- All hoses, pumps, pipes, sampling equipment and milk contact surfaces must be clean and sanitised before approved milk can be collected.

Additional considerations for transport of milk for raw milk products

Health and hygiene

While there are no additional requirements in relation to health and hygiene requirements for businesses collecting and transporting milk for raw milk products, it is recommended that this area is given additional consideration to minimise the potential for contamination. For example:

- Collection and transport personnel should wear clean clothes, be restricted to the farm vat milk storage room and must not enter areas where animals are kept or manure is present. If clothing or foot wear is contaminated, there should be procedures in place to mitigate potential contamination of the raw milk.
- Collection and transportation personnel should be equipped with a means to sanitise hands before touching any equipment or surfaces that may come into contact with the approved raw milk.
- Upon delivery, collection and transport personnel should not enter the processing facility and that a procedure is put in place to enable communication with factory staff and delivery of any milk samples for testing.

Skills and knowledge

Clause 11 of standard 4.2.4 specifies that dairy transport business must ensure persons undertaking milk or dairy product collection and transport activities have skills and knowledge commensurate with their work activities. No additional requirements are specified for the skills and knowledge of businesses collecting and transporting milk for raw milk products however it is recommended that transport personnel have competencies to understand and implement practices (e.g. access restrictions, personal attire) that minimise the risk of transferring pathogens to the raw milk. For example:

- aseptic collecting and sampling of farm vat milk
- general hygienic practices relating to collection and transport activities.

This may be delivered through in-house training or accredited training courses.

Subdivision 4 – Processing of milk for raw milk products

Additional measures for processing of milk for raw milk products are specified under subdivision 4 of Division 5.

31 Application

A dairy processing business that processes milk for raw milk products must ensure that each requirement of this subdivision is met.

Clause 31 specifies to what businesses the requirements of subdivision 4 apply i.e. dairy processing businesses that processes raw milk products.

32 Requirement for additional and specific control measures

The documented food safety program required by clause 13 must include control measures that:

- (a) ensure that the requirements of this subdivision are met; and
- (b) for a dairy processing business that make cheese using raw milk, address each of the following in relation to that processing -
 - (i) starter culture activity,
 - (ii) pH reduction,
 - (iii) salt concentration and moisture content,
 - (iv) storage time; and
 - (v) storage temperature.

Clause 32 makes clear that the business's food safety program must include the additional measures to be specified in addition to baseline measures. For the processing of cheese there are specific matters in relation to processing that must be addressed.

Food safety program

Clause 13 requires dairy processing businesses to control potential food safety hazards by implementing a documented food safety program. For the manufacture of raw milk products it is desirable that the food safety program take into account the entire production chain, from raw milk production to collection, transport and processing through to final product. This demonstrates a relationship between the milk producer and the processing business that helps ensure the final product safety is met. Additional considerations for developing a food safety program for raw milk products are discussed below

Product description and characterisation

The food safety program for a raw milk product should clearly describe and characterise the product so that the control measures and parameters required to ensure safety are clearly identified. For cheese the product description should include:

- Product name
- Cheese style (e.g. internal or surface ripened using mould or bacteria [strains specified])
- Processing factors (e.g. lactic fermentation to pH X; dry salted or brined; rind washed during ageing; aged at least D days at temperatures above Y°C)

- Product characteristics (e.g. moisture, salt content, pH [changes over time])
- Ingredient list
- Packaging used
- Shelf life
- Storage, distribution and handling information
- Intended user

Flow diagram of the process

A flow diagram should be included that describes the manufacturing process step-by-step. The key steps for cheese production can generally be described as: warming, addition of starter cultures and or rennet, warming/ripening, curd cutting, removal of whey, hooping, pressing, salting, maturation/ripening. A generic flow diagram outlining major steps in the cheese making process is provided in Figure 1.

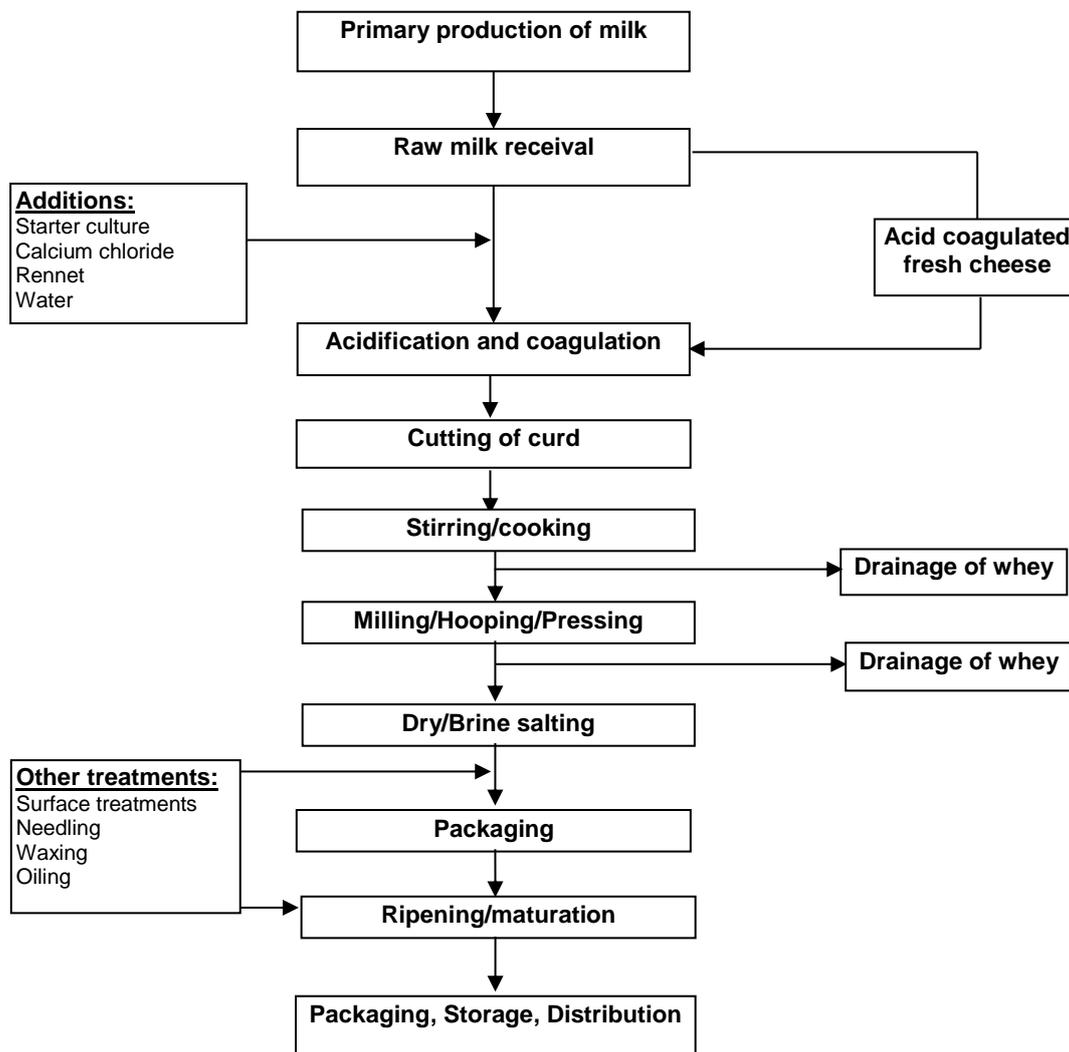


Figure 1. Overview of major steps in the manufacture of cheese

Hazard analysis

Where a business manufactures both heat treated dairy products and raw milk products, the hazard analysis for a raw milk product should identify the potential for cross-contamination between these processes.

This should ensure that appropriate systems and procedures are in place so that there is no cross-contamination, both prior and during processing, between milk and dairy materials intended for the processing of raw milk dairy products and those intended for general dairy processing. In particular:

- The milk handling systems for both products should be clearly explained in the food safety program as to how the two milk streams are to be kept separate.
- Consideration should be given to processing raw milk products separately to pasteurised milk products (achieved through either having a separate area or at different times).

The design of the milk receival area and the processing factory should be planned to optimise the capability for segregating the raw milk and pasteurised milk product manufacturing processes. The personnel access and traffic flow should minimise crossover from low risk to high risk areas and the staff should be sufficiently aware of the importance of adhering to the planned and approved procedures.

Critical control points (CCPs)

Pasteurisation provides the principle critical control point for pathogen control in general dairy processing. The control of pathogens in raw milk product manufacture, however, is achieved through a combination of control measures. These measures would be identified as part of validating the process and should be included in the food safety program as CCPs. Critical limits need to be identified for each CCP as well as how they will be monitored and the corrective actions that will be taken if critical limits are not met.

(b) for a **dairy processing business that make cheese using raw milk, address each of the following in relation to that processing -**

- (i) **starter culture activity,**
- (ii) **pH reduction,**
- (iii) **salt concentration and moisture content,**
- (iv) **storage time; and**
- (v) **storage temperature.**

Subclause 32 (b) specifies processing factors that must be addressed by control measures in the food safety program for the processing of raw milk cheese. Information in relation to each of these should be recorded for each batch of product, such as in a cheese making log, to show the process is in control.

Starter culture activity and pH reduction

The food safety program should document the required level of acidification that must be achieved within a specified time and temperature for the type of cheese being produced. Records for each batch of raw milk product manufactured should clearly identify:

- the type and specific strain(s) used (starter and ripening cultures)
- batch details
- the inoculum level
- temperature of milk and time when starter added

- the pH (or titratable acidity)

The pH or titratable acidity should be measured at set/defined intervals to ensure that the starter is active and achieving the desired rate of acid production for that type of cheese and in the time required. This includes:

- at the time the vat heating begins
- at the time when adding rennet
- at the time of draining whey and hooping curds
- at the time of end pressing or turning unpressed curds
- at the time of milling
- at the time of brining

Salt concentration

Depending on the type of cheese to be made, salting may be achieved by adding dry salt to the curds; pressing dry salt to the outside of newly-made cheese; brining cheese in a salt solution, or a combination of dry salting and brining. The salting procedure (level of addition and method of salting) should be documented in the food safety program and validated to ensure that the method of salt addition achieves the required level in the finished product and does not lead to uneven distribution. It is essential that the salt concentration required for safety is achieved in the final product as the concentration of salt-in-moisture has a major effect on the growth of microorganisms in and on cheese.

The stage at which salting takes place, the amount of salt added or time for brining should be recorded for each production run:

- amount and type of salt added
- time brining begins
- brining time (time cheese is taken out of brine)

The management of brine tanks and maintenance of salt concentrations (% saturation) should also be documented in the food safety program and records kept. Salt concentrations should be monitored routinely (daily may be appropriate) using a hydrometer calibrated in an appropriate scale or a refractometer. The pH of the brine should also be monitored routinely and maintained at a pH value roughly equal to the cheese.

Ripening/storage

Inactivation of pathogens during ripening is achieved through the combined effects of temperature control, pH and water activity. In general, the longer the ripening period the lower the moisture content of the cheese and the resultant water activity due to the salt content. The storage temperature used during ripening will also vary depending on the type of cheese being made, stage in the ripening process and time-scale required for ripening the cheese.

The food safety program should document the storage process and the work instructions related to the required maturation/ripening conditions. Records should be kept of actions taken (frequency and method) including:

- maturation temperature checks
- relative humidity checks
- turning of cheeses
- cheese washing or brushing

- spiking/piercing of internal mould ripened cheese.

Other records that may be included:

- batch records – including traceability of ripening cultures or other surface treatment ingredients
- log of cheese faults and actions taken
- corrective action instructions.

Temperature

During the cheese making process, particularly the early stages of cheese making, milk and curd will be at temperatures that support the growth of pathogens. The food safety program should document these stages and specify the temperature and time parameters to be met during production. Temperature records of milk and curd for each batch of raw milk product could include:

- at the time vat heating begins
- at the time starter culture is added
- at the time rennet is added
- at time of curd cutting
- temperature and time of heating/cooking regimen
- at time of draining whey
- at end of pressing or turning unpressed cheeses

33 Requirements relating to milk receipt and storage

(1) The temperature of milk for raw milk products must not exceed 8°C at any point between its collection by a dairy processing business and the commencement of processing of that milk.

(2) Subclause (1) does not apply if:

- (a) the processing of the milk commences within two hours of it being milked; or
- (b) the dairy processing business uses a documented alternative to the method prescribed by subclause (1).

(3) Raw milk products must not be made from milk that was milked more than 24 hours before processing of that milk commenced.

(4) Subclause (3) does not apply if the dairy processing business uses a documented alternative to the method prescribed by that subclause.

(5) Milk for raw milk products must be kept separate from milk used or intended to be used for dairy products that are not raw milk products.

Clause 33 specifies temperature and time requirements on the milk prior to receipt and processing as well as a requirement for that the integrity of supply and use is maintained.

Temperature control

A maximum temperature for milk at receipt is specified to minimise the potential for growth of any pathogens that may be present between milking and processing. The processing business should have records from the transport business that provide evidence that each consignment of raw milk meets the requirements for collection and transport and was maintained at or below 8°C from collection at the farm to delivery at the processing premises.

Evidence may be provided by a continuous temperature-monitoring instrument or rely on a combination of the recorded times and temperatures and a validated protocol on the performance of the container/tank to maintain the milk temperature below 8°C during transportation. For operations where the business both produces raw milk and manufactures raw milk products, records such as a log sheet that records times and temperatures from collection to storage or point of manufacture may suffice.

Deviations from the temperature requirement may be acceptable if it can be shown that it would not adversely affect the microbiological safety of the end product. This may be reflected in the initial product validation and alternative limits specified in the food safety program.

Time requirement

Along with temperature control, restricting the time from milking to the start of manufacture minimises the potential for growth of any pathogens that may be present. Records should be kept that identify when milking was completed for each consignment of raw milk received and when processing commenced. Depending on the type of cheese to be made and its manufacturing protocol, milk older than 24 hours may be suitable to use though it must not exceed 48 hours. This deviation would need to be reflected in the product validation and documented in the food safety program.

(5) Milk for raw milk products must be kept separate from milk used or intended to be used for dairy products that are not raw milk products.

Dairy processing businesses processing milk for raw milk products should be able identify the source of each milk shipment that is received onto their premises and have a recording system that captures all required information from each collection of milk from the primary production business. Such information would include:

- unique identifier of the producer
- date and time of collection at the farm
- temperature of the milk immediately prior to collection from the farm vat
- date and time of the completion of milking (provided by the producer)
- the volume of milk collected
- the temperature of the milk upon arrival at the processing premises
- microbiological testing data (from on farm monitoring)
- any other notes concerning the milk or samples taken.

Cleaning and sanitising procedures should also be examined in relation to maintaining the integrity of the milk for raw milk product manufacture. For example, having a documented unloading procedure that ensures that all associated equipment is clean and sanitised before the milk for raw milk product processing is transferred from the incoming container/tank to the businesses raw milk storage tank/silo which should be clearly labelled as to the contents. Interior surfaces of storage vessels should also be cleaned and sanitised to schedule each time they are emptied.

An obligation on the processor of raw milk products to only use milk that meets the requirements of Division 5 of Standard 4.2.4 is specified under clause 35.

34 Requirements to control specific food safety hazards

- (1) Prior to the commencement of its processing, milk for raw milk products must be monitored to ensure its suitability.
- (2) The monitoring required by subclause (1) must involve appropriate microbiological testing.
- (3) The level of pathogenic microorganisms in a raw milk product must not exceed the level of pathogenic microorganisms in the milk from which the product was made as at the commencement of the processing of that milk.
- (5) A raw milk product must not support the growth of pathogenic microorganisms.

Monitoring

Subclauses 34 (1) and 34 (2) include a requirement that the suitability of milk for processing of raw milk products should be monitored through microbiological testing. It would be expected that the sampling and testing protocol (frequency and acceptable limits) is documented in the food safety program including:

- the parameters to be monitored
- the frequency
- the acceptable limits
- corrective actions if limits are exceeded

Initially it would be expected that a representative sample of each raw milk tank/silo is tested prior to manufacture. Over time sufficient data may be obtained such that a reduced frequency is adequate, depending on the relationship between the dairy primary production business and the processing business and the type of cheese being produced. Recommended tests and acceptable limits for total plate count and *E. coli* are provided below. Monitoring for pathogens, such as *L. monocytogenes* and *Salmonella* should also be considered.

Test	Acceptable limit
Total plate count at 30°C for 72 hours	100 000 cfu/ml
<i>E. coli</i>	<100 cfu/ml

Processing outcome

Subclauses 34 (3) and 34 (4) prescribe the outcomes of processing which should ensure:

- there is no net increase in any pathogenic microorganisms that may have been present in the raw milk; and
- the final product cannot support the growth of pathogenic microorganisms.

These outcomes should be met through the combination of control measures (hurdles) used during processing. Under food safety program obligations, the business would need to be able to validate and verify that the process used and final product meets the outcome required. An additional document, *Validation of Raw Milk Product Safety*, has been prepared to assist with validation requirements.

The food safety program for each raw milk product should identify the processing factors that impact on microbial growth and inactivation and include these as CCPs. The parameters (critical limits) that must be met and how these are verified (e.g. log sheets / analytical results) should also be specified. In relation to cheese manufacture, specific controls to be included in a business's food safety program are specified under clause 32.

35 Requirements relating to non-conforming milk

A dairy processing business must only use milk for raw milk products that has been produced and transported in accordance with this Division to make raw milk products.

Clause 35 places an obligation on the processor of raw milk products to only use milk that meets the requirements of Division 5 of Standard 4.2.4.

Additional considerations for processing of milk for raw milk products

Skills and knowledge

A baseline requirement is that people involved in the handling of raw milk and processing of milk for raw milk products must have sufficient understanding of and skills in food safety and hygiene matters commensurate with their work activities. In order to manufacture raw milk products, a processing business must ensure that staff have demonstrated competencies relevant to the safe processing of milk for raw milk products.

It would be expected that the technical control of the process is under the supervision of a designated operator (e.g. cheese maker) who has the appropriate skills, knowledge and experience in the manufacture of raw milk dairy products. The cheese maker must have relevant experience, qualifications and training as required by the competent authority. Historical evidence (e.g. demonstrated skills and competencies in cheese making or other product manufacture over time) could be taken into account.

The food safety program should specify the competencies required by personnel in order to ensure the safe processing of milk for raw milk products. Records should be kept of relevant experience, qualifications and experience.

Process verification

A sampling and testing regime should be in place that includes both microbiological and chemical testing e.g. (salt content, pH, water activity, other as appropriate). The sampling frequency and schedule of tests required should be determined by the processing business in collaboration with the competent authority and documented in the food safety program.

Microbiological sampling and testing

Microbiological monitoring of raw milk products may include testing for both indicators and pathogens. Process hygiene criteria that are applicable to raw milk products is provided in the table below.

Test	Limit
<i>E. coli</i>	<10 (target) If exceeds 100 cfu/g further investigation required

Test	Limit
Coagulase positive <i>Staphylococci</i>	1000 cfu/g Testing should be undertaken at the time during processing when it would be expected that the number of staphylococci to be highest.
Staphylococcal enterotoxins (if coagulase positive staphylococci exceed 1000 cfu/g)	Not detected (5 x 25g sample)
<i>L. monocytogenes</i>	Not detected (target)
<i>Salmonella</i>	Not detected

The *National Guidelines – Pathogen Management (Guidelines for Dairy industry response to pathogen detections in dairy product and the processing environment)* document provides additional information on pathogen monitoring, including implementing an environmental monitoring program.

Chemical sampling and testing

Monitoring of critical limits for processing measures identified as CCPs should occur as appropriate throughout the manufacturing process. End product testing to verify pH, salt and moisture characteristics should also be scheduled and documented within the food safety program.

Standard 3.2.2 Health and Hygiene Requirements

Division 4 – Health and hygiene requirements

Subdivision 1 – Requirements for food handlers

13 General requirement

A food handler must take all reasonable measures not to handle food or surfaces likely to come into contact with food in a way that is likely to compromise the safety and suitability of food.

14 Health of food handlers

(1) A food handler who has a symptom that indicates the handler may be suffering from a foodborne disease, or knows he or she is suffering from a foodborne disease, or is a carrier of a foodborne disease, must, if at work –

- (a) report that he or she is or may be suffering from the disease, or knows that he or she is carrying the disease, to his or her supervisor, as the case may be;
- (b) not engage in any handling of food where there is a reasonable likelihood of food contamination as a result of the disease; and
- (c) if continuing to engage in other work on the food premises – take all practicable measures to prevent food from being contaminated as a result of the disease.

(2) A food handler who suffers from a condition must, if at work –

- (a) if there is a reasonable likelihood of food contamination as a result of suffering the condition – report that he or she is suffering from the condition to his or her supervisor; and
- (b) if continuing to engage in the handling of food or other work – take all practicable measures to prevent food being contaminated as a result of the condition.

(3) A food handler must notify his or her supervisor if the food handler knows or suspects that he or she may have contaminated food whilst handling food.

15 Hygiene of food handlers

(1) A food handler must, when engaging in any food handling operation –

- (a) take all practicable measures to ensure his or her body, anything from his or her body, and anything he or she is wearing does not contaminate food or surfaces likely to come into contact with food;
- (b) take all practicable measures to prevent unnecessary contact with ready-to-eat food;
- (c) ensure outer clothing is of a level of cleanliness that is appropriate for the handling of food that is being conducted;
- (d) only use on exposed parts of his or her body bandages and dressings that are completely covered with a waterproofed covering;
- (e) not eat over unprotected food or surfaces likely to come into contact with food;
- (f) not sneeze, blow or cough over unprotected food or surfaces likely to come into contact with food;
- (g) not spit, smoke or use tobacco or similar preparations in areas in which food is handled; and
- (h) not urinate or defecate except in a toilet.

- (2) A food handler must wash his or her hands in accordance with subclause (4) –
- (a) whenever his or her hands are likely to be a source of contamination of food;
 - (b) immediately before working with ready-to-eat food after handling raw food; and
 - (c) immediately after using the toilet.
- (3) A food handler must, when engaging in a food handling operation that involves unprotected food or surfaces likely to come into contact with food, wash his or her hands in accordance with subclause (4) –
- (a) before commencing or re-commencing handling food;
 - (b) immediately after smoking, coughing, sneezing, using a handkerchief or disposable tissue, eating, drinking or using tobacco or similar substances; and
 - (c) after touching his or her hair, scalp or a body opening.
- (4) A food handler must, whenever washing his or her hands –
- (a) use the hand washing facilities provided;
 - (b) thoroughly clean his or her hands using soap or other effective means, and warm running water; and
 - (c) thoroughly dry his or her hands on a single use towel or in another way that is not likely to transfer pathogenic microorganisms to the hands.
- (5) A food handler who handles food at temporary food premises does not have to clean his or her hands with warm running water, or comply with paragraph (4)(c), if the appropriate enforcement agency has provided the food business operating from the temporary food premises with approval in writing for this purpose.

Subdivision 2 – Requirements for food businesses

16 Health of persons who handle food – duties of food businesses

- (1) A food business must ensure the following persons do not engage in the handling of food for the food business where there is a reasonable likelihood of food contamination –
- (a) a person known to be suffering from a foodborne disease, or who is a carrier of a foodborne disease; and
 - (b) a person known or reasonably suspected to have a symptom that may indicate he or she is suffering from a foodborne disease.
- (2) A food business must ensure that a person who is known or reasonably suspected to be suffering from a condition and who continues to engage in the handling of food for the food business takes all practicable measures to prevent food contamination.
- (3) A food business may permit a person excluded from handling food in accordance with paragraph (1)(a) to resume handling food only after receiving advice from a medical practitioner that the person no longer is suffering from, or is a carrier of, a foodborne disease.

17 Hygiene of food handlers — duties of food businesses

- (1) Subject to subclause (2), a food business must, for each food premises –
- (a) maintain easily accessible hand washing facilities;
 - (b) maintain, at or near each hand washing facility, a supply of –
 - (i) warm running water; and
 - (ii) soap; or
 - (iii) other items that may be used to thoroughly clean hands;

- (c) ensure hand washing facilities are only used for the washing of hands, arms and face; and
- (d) provide, at or near each hand washing facility –
 - (i) single use towels or other means of effectively drying hands that are not likely to transfer pathogenic microorganisms to the hands; and
 - (ii) a container for used towels, if needed.

(2) Paragraph (1)(c) does not apply in relation to handwashing facilities at food premises that are used principally as a private dwelling if the proprietor of the food business has the approval in writing of the appropriate enforcement agency.

(3) With the approval in writing of the appropriate enforcement agency, a food business that operates from temporary food premises does not have to comply with any of the requirements of paragraphs (1)(b)(i) or (1)(d) that are specified in the written approval.

18 General duties of food businesses

(1) A food business must inform all food handlers working for the food business of their health and hygiene obligations under Subdivision 1 of this Division.

(2) A food business must ensure that any information provided by a food handler in accordance with Subdivision 1 of this Division is not disclosed to any person without the consent of the food handler, except the proprietor or an authorised officer, and that the information is not used for any purpose other than addressing the risk of food contamination.

(3) A food business must take all practicable measures to ensure all people on the food premises of the food business –

- (a) do not contaminate food;
- (b) do not have unnecessary contact with ready-to-eat food; and
- (c) do not spit, smoke, or use tobacco or similar preparations in areas where there is unprotected food or surfaces likely to come into contact with food.