



NZCP1: Design and Operation of Farm Dairies

19 May 2017

TITLE

Operational Code: NZCP1: Design and Operation of Farm Dairies.

COMMENCEMENT

This Operational Code is effective from 19 May 2017

REVOCATION

This Operational Code revokes and replaces the Operational Code: NZCP1: Design and Operation of Farm Dairies dated 1st December 2015.

ISSUING BODY

This Operational Code is issued by the Animal Products Group, Regulation and Assurance branch of the Ministry for Primary Industries

Dated at Wellington this 19th day of May 2017.

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(acting under delegated authority of the Director-General)

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Introduction

The Operational Code: NZCP1: Design and Operation of Farm Dairies (Code) covers the approval, design, fabrication, installation, layout, operation of farm dairies and equipment installed in farm dairies. This Code has been developed to assist Farm Dairy Operators and Farm Dairy RMP Operators to produce and supply raw milk that is safe, wholesome and fit for purpose. The Code describes one way that Farm Dairy Operators can demonstrate compliance with legislative requirements contained in the:

- a) Animal Products Act 1999;
- b) Animal Products (Dairy) Regulations 2005;
- c) Animal Products (Dairy Processing Specifications) Notice 2011; and
- d) DPC 2: Animal Products (Dairy) Approved Criteria for Farm Dairies signed 31st October 2008.

The obligations contained in this Code are applicable to farm dairies producing raw milk, including colostrum, intended for:

- a) further processing; and
- b) sale in or export from New Zealand.

This introduction is not part of this Code, but is intended to indicate its general effect.

Purpose

This Code describes the minimum standards applicable to all farm dairy activities to ensure that farm dairies and the equipment, facilities and services at farm, dairies are designed, located, constructed, and operated appropriately. Adopting and following this Code will ensure that the raw milk offered for supply satisfies international market expectations and that manufactured dairy products are fit for their intended purpose.

Background

This Code is maintained and administered by MPI on behalf of the New Zealand dairy industry. It outlines the standards not only for the operation of the farm dairy but also for the service providers, who locate, design and build the farm dairy, supply or install the equipment and materials used in it, or provide various services to the Farm Dairy Operator.

This Code is subject to review by MPI, and will be updated as required in consultation with appropriate industry representatives.

In addition to setting out requirements that must be followed, this Code also makes recommendations based on good practice (prefaced by “should” rather than “shall” or “must”). Where these recommendations are not followed it is expected that the Farm Dairy Operator will have an alternative means of control that provides an equivalent outcome.

NZCP2: Assessment of Farm Dairies Associated has associated procedures for farm dairy assessment and has been developed in conjunction with this Code.

Who should read this Code?

Anyone who has an involvement with farm dairies will have specific areas of interest depending on the nature of their involvement in the industry. A quick guide to areas of the Code relevant to each group is as follows:

- a) dairy farmers should be familiar with all Parts but should refer to the following when:
 - i) building or altering a farm dairy – refer Parts 2 through 4;
 - ii) installing a milking machine or altering an existing machine or ancillary equipment – refer Parts 7 through 14;

- b) persons involved in the design and construction of farm dairies – refer to Parts 2 through 4;
- c) suppliers and installers of milking equipment and suppliers of detergents, sanitisers (maintenance compounds) and veterinary medicines – refer to Parts 7 through 14.

RMP Operators, Farm Dairy Assessors, recognised verifiers and consultants should be familiar with all Parts of this Code.

All Farm Dairy Operators, and their farm dairies will be periodically assessed against the requirements of the RMP covering their operations. More rigorous standards than those outlined in this Code may be set by the RMP Operator as a way of managing potential hazards or to satisfy market or customer specific requirements.

Farm Dairy Operators intending to sell or supply raw milk to a third party must assume that the usual RMP covering their milk harvesting, storage and supply will not be sufficient to cover the supply of raw milk to other parties. This activity may need to come under a separate RMP registered with MPI. This includes situations such as supply to multiple dairy processors. Dairy companies may have specific requirements related to supply of raw milk, including only permitting such supply under certain conditions. Any Farm Dairy Operator considering any form of third party supply, should consult their dairy company / RMP Operator covering their operations.

Why is this important?

All farm dairies supplying milk intended further processing must be covered by an RMP registered by MPI. Those who operate in accordance with this Code satisfy the New Zealand requirements for the design and operation of farm dairies.

Variations to this Code

Adoption of this Code is not mandatory. Incorporating the whole or part(s) of this Code into an RMP by reference enables the RMP Operator to demonstrate how the relevant requirements set under the Animal Products Act 1999 will be met. As such the requirements within this Code must be complied with once incorporated into the RMP.

RMP Operators may develop alternative measures that can be proven to provide an equivalent level of confidence in the integrity of milk, milk harvesting and storage operations.

Where the RMP Operator defines alternatives to part or the entire Code, these alternatives must be referenced in the RMP, evaluated by an MPI recognised dairy evaluator and submitted to MPI for registration. If the alternative deviates from MPI dairy processing criteria then application must be made to MPI for the Director-General to approve the alternative. The RMP and letter of approval are then submitted for evaluation.

This Code is not intended to, nor should be used to, inhibit innovation. A desired outcome may be achieved in more than one manner. The manner in which risks are managed and procedures applied within the RMP is the responsibility of the RMP Operator.

Producing milk for other purposes

This Code has been developed to manage the risks associated with raw milk intended for further processing that includes a pathogen reduction step (e.g. heat treatment). When milk is produced and harvested for special uses (e.g. speciality milk products and organic products), or other purposes, further requirements to those outlined in this Code must be complied with.

Also, this Code does not address the requirements for farmers planning to sell unpasteurised raw milk from the farm gate. Any Farm Dairy Operator planning to sell unpasteurised raw milk from the farm gate must comply with the:

- a) Raw Milk for Sale to Consumers Regulations 2015; and
- b) Animal Products Notice: Raw Milk for Sale to Consumers.

More information on these requirements is available at <http://www.foodsafety.govt.nz/industry/sectors/dairy/raw-milk/>.

This Code does not address all of the requirements for farm dairies planning to supply raw milk for the manufacture of raw milk products. Additional measures for the supply of raw milk for these products are provided in the [MPI Code of Practice: Additional Measures for Raw Milk Products](#).

Other information

This Code will be reviewed, as necessary, by MPI. Suggestions for alterations, deletions or additions to this Code, should be sent, together with reasons for the change, any relevant data and contact details of the person making the suggestion, to:

Principal Adviser (Dairy)
Regulation & Assurance Branch
Ministry for Primary Industries
PO Box 2526
Wellington.

Part 1: Quality Management in the Dairy Industry

1.1 On-Farm Quality Management System

- (1) On-farm quality management systems are designed to ensure that the milk supplied is:
 - a) fit for its intended purpose;
 - b) eligible for its intended market(s); and
 - c) safe and of an acceptable quality.
- (2) Under this Code it is required that all Farm Dairy Operators have an on-farm quality management system as a means of demonstrating conformance to company, New Zealand and overseas market specific requirements.

1.2 Raw Milk for Manufacturing Supply

- (1) Raw milk is considered fit for the manufacture of dairy products, including the manufacture of pasteurised liquid milk when:
 - a) all activities at the farm dairy are in accordance with a registered RMP specifically covering those operations;
 - b) the harvested milk meets the requirements outlined in this Code, the Animal Products Act 1999 (APA) and any regulations, specifications, notices or conditions issued under that Act; and
 - c) any relevant export or importing country requirements are demonstrated to be met.

Part 2: Summary of Standards for Farm Dairies

2.1 Standards for all Farm Dairies

- (1) The owner/operator of every farm dairy should ensure that it is built to the requirements of this Code, as well as other relevant standards, codes and regulatory requirements. The farm dairy should be maintained and operated in a hygienic manner and in accordance with the standards of this code.

2.1.1 Buildings and Plant

- (1) The farm dairy must be sited to minimise the risk of flooding, objectionable odours, smoke, dust and other contaminants.
- (2) The milk receiving area and a milk storage area must:
 - a) protect milk against manure, dust or other contamination, objectionable odours, birds, rodents, insects, animals and other vermin;
 - b) be easy to wash and clean; and
 - c) have proper and adequate facilities for the filtering and cooling of milk.
- (3) The milking areas must be located, designed and constructed so that:
 - a) walls and floors can be easily cleaned on a daily basis;
 - b) the drainage is effective;
 - c) the lighting is sufficiently adequate to facilitate milking and the observation of animal health and milk quality;
 - d) the working space is sufficient to minimise the risk of contamination of milk during milking;
 - e) areas for birds to perch on are minimised; and
 - f) opportunities for pest access are minimised.
- (4) The farm dairy's milking plant must be designed, manufactured and maintained to ensure that materials and substances coming into contact with milk do not contaminate the milk or cause it to deteriorate.
- (5) There must be sufficient water of suitable quality to clean the premises and plant and to cool the milk. Water use must also meet any local authority conditions or requirements. Water that may come in to direct contact with milk or milk contact surfaces must comply with the Animal Products (Dairy Processing Specifications) Notice 2011 (Dairy Processing Specifications).
- (6) The surroundings of farm dairies must be kept clean and tidy to discourage birds, rodents and insects.

2.1.2 Animal Health

- (1) Farm Dairy Operators must comply with the MPI Dairy Processing Specifications for milking animal health, notably:
 - a) milk supplied must come only from animals that are outwardly healthy and show no signs of diseases capable of contaminating milk with pathogenic micro-organisms and/or toxic substances;
 - b) animals milked in farm dairies must have visibly clean teats;
 - c) on veterinary instruction sick or diseased stock must be segregated and isolated; and
 - d) records must be kept of all sick or diseased animals and of all treatments administered.
- (2) Refer to clause 5.2 Milking Animal Health for more detail.

2.1.3 Operations

- (1) Milking areas must not be used for any purpose other than milking, breeding, veterinary treatment or animal husbandry.

- (2) The milking plant in farm dairies must be:
 - a) used solely for the harvesting of milk or colostrum;
 - b) designed and constructed to be easily and properly cleaned to specified hygiene standards;
 - c) cleaned after every milking to minimise the risk that milk may deteriorate or be contaminated;
 - d) cleaned only with MPI approved maintenance compounds (detergents and sanitisers);
 - e) cleaned and rinsed in a way that the compounds used do not contaminate milk.
- (3) Milk must be filtered and cooled immediately before entering the vat.
- (4) Milk must be stored in a safe and hygienic manner until collection or use.

2.1.4 Pesticides

- (1) The use of pesticides and similar substances in or near farm dairies should be controlled in a manner that will not contaminate milk either directly or indirectly.
- (2) Pesticides and similar substances must not be:
 - a) prepared, used or stored using farm dairy equipment;
 - b) stored or mixed within 20 m of the farm dairy unless required for farm dairy management purposes;
 - c) stored with veterinary medicines or dispensing units; or
 - d) stored within 45 m of a farm dairy water source classified as surface water under Schedule 1, except as provided for under clause 3.9.1 Surface Water.
- (3) Pesticide containers must be clearly labelled at all times and must not be re-used for any other purpose.
- (4) It is strongly recommended that all farm staff undergo relevant Growsafe training in the use of pesticides.

Part 3: Location and Design

3.1 General

- (1) This clause applies to new and substantially rebuilt farm dairies for supply of raw milk.
- (2) All Farm Dairy Operators must be operating under a MPI registered RMP prior to supplying raw milk for manufacturing purposes.
- (3) The design, siting and construction of the farm dairy must ensure milk produced will be, and remain, fit for its intended purpose and be compliant with other regulatory requirements.

3.2 Assessment of New Farm Dairies and Substantially Altered Farm Dairies

- (1) A new farm dairy or alterations to a farm dairy must be assessed to ensure compliance with this Code and other relevant requirements. The premises and plant must be assessed by a Farm Dairy Assessor recognised as competent under the RMP. The completed farm dairy must be assessed for compliance with this Code before commencement of supply.
- (2) Milk supply must not proceed until the Farm Dairy Assessor confirms the suitability of the premises. Compliance includes the requirement that all local authority consents have been obtained e.g. building, effluent discharge and consent to take water.
- (3) The local authority must be contacted to ensure relevant consents are obtained.
- (4) The assessment may also include confirmation of compliance to the RMP Operator's environmental policy.

3.3 Approval of Site and Plan

- (1) The Farm Dairy Operator must obtain approval from a Farm Dairy Assessor recognised under the RMP before:
 - a) any structural alterations are carried out;
 - b) any significant alterations are made to the milking plant or services; or
 - c) additional buildings are built within minimum approved distances from the farm dairy.
- (2) The Farm Dairy Operator should also obtain provisional approval from a Farm Dairy Assessor recognised under the RMP before construction of a new site commences.
- (3) Approval is needed for the siting of and changes to:
 - a) effluent storage;
 - b) effluent disposal systems; and
 - c) sumps.
- (4) It is the Farm Dairy Operators responsibility to ensure that the Farm Dairy Assessor sights a copy of the plan for the construction or major reconstruction of the farm dairy. The plan is examined for compliance with the relevant standards, then signed and returned once the Farm Dairy Assessor is satisfied that the conditions set out in this Code and the applicable RMP have been met.

3.4 Other Relevant Legislation

- (1) The following legislation or requirements may also need to be complied with:

- a) Animal Products Act 1999 (APA);
- b) Agricultural Compounds & Veterinary Medicines Act 1997 (ACVM Act);
- c) Animal Welfare Act 1999;
- d) New Zealand Food Standards (including the Australia New Zealand Food Standards Code);
- e) The Resource Management Act 1991;
- f) **The Health and Safety at Work Act 2015; and**
- g) Local authority bylaws.

3.5 Location of the Farm Dairy

- (1) The farm dairy, which includes the yards and races, must be sited to minimise the risk of flooding so that there is no likelihood of contamination or strong odours affecting milk quality or water quality from other sources.
- (2) The yards must be sited to facilitate tanker collection. For specific requirements the dairy company and local authority are to be consulted.

3.6 Tanker Roadways

- (1) Tanker roads must comply with the following, as well as any additional dairy company requirements:
 - a) the tanker roadway must be kept free from all obstructions including but not limited to trees, branches, buildings, vehicles, implements and stock;
 - b) dead animals intended for collection can be held beside the tanker roadway but not within 45 m of the farm dairy;
 - c) dead animals held beside the tanker roadway must not impede tanker access, and must be collected within 12 hours;
 - d) dead animals should be covered;
 - e) stock must not be held on the tanker roadway and all tanker roadways must be fenced off. Where there is controlled grazing of the tanker loop and tanker roadway to control rank growth this must be carried out in such a way so as not to affect milk quality;
 - f) tanker roadways must not be used as cattle races;
 - g) while cattle may cross the tanker roadway, any crossing that is within 45 m of the milk collection point must be made of concrete or a similar material that can be easily cleaned. Effluent from this crossing point must not be allowed to pond;
 - h) all crossings must be well maintained and minimise risk of contamination being carried back to the dairy factory via the tanker;
 - i) effluent from the crossing must drain into an effluent disposal system. This may be a separate disposal system to that used for the farm dairy effluent;
 - j) any use of the tanker roadway by animals must not create a food safety hazard; and
 - k) on newly converted dairy farms, stock must not be able to cross the tanker roadway.

3.7 Using a Public Road as a Race

- (1) Application may need to be made for dispensation to allow animals to use a public road as a race. Contact the local district council for further information.

3.8 Minimum Approved Distances

- (1) All livestock, pigs and poultry must be housed, fed and controlled at specified distances from the farm dairy and its water supply. These areas must be clean and well maintained.

- (2) The following minimum distances from the milking area, milk receiving area, milk storage room/area and milk collection point must be observed. If the specified distance doesn't adequately protect milk, milk contact surfaces and bulk milk storage tanks then the distance must be increased and/or additional steps taken to provide protection from the farm environment:

Table 1: Minimum Approved Distances

Area	Minimum Distance
Effluent ponds	45 metres
Offal holes	45 metres
Whey pits	45 metres
Silage, baleage	45 metres
Pigs	45 metres
Dead animals	45 metres
Sand trap (stone trap) intended to hold a volume greater than 7.5 m ³ at any time (refer clause 4.3)	45 metres
Drainage pad or effluent solids storage bunker intended to hold a volume greater than 5 m ³ at any time (refer to clause 4.3)	45 metres
Cattle Loafing barns & livestock housing without impervious cleanable floor surface (if permitted by Regional Council and no adverse animal health impact)	45 metres
Cattle feeding pad or standoff pad without impervious cleanable surface (if permitted by Regional Council and no adverse animal health impact)	45 metres
Cattle and buffalo Loafing barns & housing with impervious cleanable floor surface; and loafing barns and housing for other species	20 metres
Cattle feeding pad or standoff pad with impervious cleanable surface; and feeding pad or standoff pad for other species	20 metres
Housing for milking animal off-spring 0 to 3 months	20 metres
Poultry housing (including ostriches and emus)	20 metres
Hay barns and hay	20 metres
Dog housing	20 metres
Buildings not associated with farm dairy activities and not otherwise specified	20 metres
Fertiliser bins/storage	20 metres
Supplementary feed storage	20 metres
Bulk fuel storage	20 metres
Chemical preparation and storage (pesticides and other chemicals not approved for use in the farm dairy)	20 metres
Dairy effluent sumps between 22,500 and 100,000 L capacity (temporary storage – refer clause 4.3)	20 metres
Recycled water storage in a fully enclosed tank, with a maximum capacity of 30,000 L per tank (distance from milk storage area, refer to clause 6.10 (5))	20 metres
Dairy effluent sumps up to 22,500 L (no storage – refer to clause 4.3)	10 metres

Sand trap (stone trap) intended to hold a volume not exceeding 7.5 m ³ at any time (refer clause 4.3)	10 metres
Drainage pad or effluent solids storage bunker intended to hold a volume not exceeding 5 m ³ at any time, (refer to clause 4.3)	10 metres
Sewage sumps or septic tanks	10 metres

Note: Loafing barns, housing, feed pads and standoff pads for cattle and buffalo must be constructed with have an impervious surface that is connected to an effluent system that complies with clauses 4.3, 4.4, 6.14 and 6.17.1 of this Code as well as any relevant local authority requirements.

Supplementary feed may be stored closer to the farm dairy provided the feed silo is located over a concrete pad, is fully enclosed, connected to the farm dairy by an augur and is protected from pest activity. In addition, the storage vessel should be at least 10 m from the milk vat.

- (3) From June 2013, any Farm Dairy Operator wishing to maintain the above facilities at closer distances is required to gain a written dispensation from the RMP Operator, either directly or via the Farm Dairy Assessor.
- (4) Any dispensation given must be kept as a record by the RMP Operator, and include:
- the area of concern (from column 1 of Table 1: Minimum Approved Distances);
 - the agreed permitted distance;
 - the justification and control measures in place to effectively mitigate the significance of any hazard; and
 - any other conditions or alternative measures given that the Farm Dairy Operator must comply with.
- (5) The Farm Dairy Operator is responsible for having systems in place to ensure that risks associated with facilities sited closer than the minimum distances specified in this clause are managed in accordance with the dispensation conditions.
- (6) If at any time the alternative measures are found to be inadequate or ineffective then the Farm Dairy Operator will be required to either comply with the distances specified or adopt additional control measures that satisfy the RMP Operator and Farm Dairy Assessor.
- (7) Prior to June 2013 facilities located at distances closer than those specified above were deemed acceptable by the RMP Operator. These will continue to be deemed acceptable provided that the controls and factors in place that mitigate the significance of the hazard continue to be effective. These were recorded in e.g. dairy assessment reports. If the controls cease to be effective then the Farm Dairy Operator must take action to remedy the situation to the RMP Operators satisfaction.
- (8) No dispensation will be given for:
- pigs and poultry housing (including commercial farms);
 - dead animals;
 - offal holes;
 - whey pits; or
 - the preparation or storage of chemicals not approved for use in the farm dairy including pesticides.

Note: Inadequate livestock housing could result in milk quality defects. The presence of pigs, poultry and vermin in the immediate vicinity of the farm dairy presents a pathogen risk. The preparation or storage of chemicals and pesticides in or near the farm dairy could lead to inadvertent contamination of the milk or equipment.

3.9 Water Supply

- (1) The farm dairy water supply used for the rinsing and washing of the milking machines and milk storage vessel and the milk harvesters hands and forearms must comply with the Dairy Processing Specifications. In particular, this water must either:
 - a) be free of *E. coli* (i.e. absent in 100 ml) and have a turbidity level that doesn't exceed 5 NTU, and have no water supply or reticulation system hazards identified when completing the assessment of Farm Dairy Water Status; or
 - b) be covered by a Water Management Plan that:
 - i) ensures milk is protected from any possible microbiological, chemical or physical contamination from the water used; and
 - ii) has been approved by the Farm Dairy Assessor on behalf of the RMP Operator (dairy company).
- (2) Any change to farm dairy water supply must be notified to the RMP Operator without delay.
- (3) Water used for teat cleaning and milk cooling must be visually clean.

Note: The "Assessment of Farm Dairy Water Status" form DPF 201 is available on the MPI website at: <http://mpi.govt.nz/document-vault/986>

3.9.1 Surface Water

- (1) Refer to the Schedule 1 - Definitions for a definition of surface water. Where the farm dairy water is sourced from a supply classed as surface water, the following distances must apply:

Table 2: Minimum Approved Distances

Area	Minimum Distance
Farm dairy/stock yards	45 metres
Offal pit/soak hole	45 metres
Human sewage soakage pit or septic tank	45 metres
Sumps	45 metres
Animal Effluent to pasture	45 metres
Feed pad/silage pad	45 metres
Fuel tanks	45 metres
Land disposal sites/rubbish pits	45 metres
Chemical preparation and storage	45 metres
Stock access to water intake	10 metres
Upstream effluent discharge	2 kilometres

Note: Provided the chemical preparation area is of a suitable concrete design that ensures any chemical spill will be contained and cannot affect the water source or supply in any way, minimum distance can be 20 m.

- (2) If a Farm Dairy Operator maintains any of the above in less than the stated distance, the water supply must be managed in accordance with the requirements of the Dairy Processing Specifications and DPC2: Animal Products (Dairy) Approved Criteria for Farm Dairies.

3.9.2 Secure Water

- (1) The quality of secure water sources must not be compromised. Bore heads in particular must be protected from the threat of chemical or effluent contamination. Refer to Schedule 1 - Definitions for a definition of secure water.

3.10 Alternative Premises and Equipment Designs

- (1) Premises (including animal housing), facilities, equipment and essential services are required to meet the requirements set out in this Code. Novel technologies and alternative premises and equipment designs that do not meet the requirements for this code are deemed to be suitable if they have been assessed, confirmed as acceptable and listed on the MPI Register of Alternative Premises and Equipment Designs for Farm Dairies, available at:
<http://foodsafety.govt.nz/industry/sectors/dairy/farms-dairies/>.
- (2) The register identifies:
 - a) designs and technologies that have been assessed and confirmed by MPI as suitable for the specified purpose;
 - b) any conditions or operating considerations that may apply;
 - c) any restrictions on location, construction, installation or use that may have been imposed; and
 - d) whether or not the listing is provisional, for example to facilitate on-farm trials.
- (3) Before committing to any novel technology, new premises, facilities, equipment or services design, it is recommended that Farm Dairy Operators consult their Farm Dairy Assessor, dairy company and the MPI Register referred to under clause 3.10(1).

Part 4: Construction of the Farm Dairy

4.1 Floors, Yard Surfaces and Races

- (1) All the floors of a farm dairy (i.e. in the milking, milk receiving, and milk storage areas, yards and associated storerooms and offices) must be made of concrete or a similar impervious material. These floors and yards must be:
 - a) uniformly graded;
 - b) be able to be readily cleaned after every milking; and
 - c) have a fall to allow drainage to approved outlet points.
- (2) Farm races must be made of concrete for a distance of 10 m from the milk receiving and milk storage areas, and edges of the pit or milking platform. If these areas are not maintained in a safe and hygienic condition the amount of concrete race required may be extended.
- (3) All concreted areas in, and around the farm dairy must fall to a drainage point connected to the dairy effluent system.
- (4) All farm races must be free draining. Any run-off from the races must not pond within 45 m of the farm dairy.
- (5) The minimum recommended fall for yards is 1 in 50 and for other areas 1 in 80.
- (6) Larger herds may benefit from extending the concreted entry/exit races to 20 m from the milk storage room, milk receiving room and edges of the pit or milking platform.
- (7) For further information on concrete for the farm refer to the Cement and Concrete Association Information Bulletin IB 55, "Concrete for the Farm".

4.1.1 Rubber Matting

- (1) Rubber matting is only permitted in farm dairies under the following conditions:
 - a) the material must be designed to allow drainage underneath the matting and should allow flushing with fresh water underneath the matting;
 - b) within the milking area rubber matting may only be installed in the immediate traffic areas, such as the bail and exit area on rotary platforms, as well as the pit floor in herringbone dairies and milk harvester positions in rotary dairies;
 - c) the mat must lay flat with no gaps between seams;
 - d) rubber matting must only be installed over concrete or another impervious surface that complies with this Code and has sufficient fall to drainage points connected to the effluent system;
 - e) suppliers of rubber matting must provide installation and management instructions and these must be available to the Farm Dairy Operator and assessor;
 - f) installations of rubber matting must be free of trip hazards;
 - g) there must be no build up of material underneath the matting, and no opportunity for build up; and
 - h) dairy yards fitted with rubber matting must be free of offensive odours.
- (2) Storm water diversion from the effluent system must not be installed on dairy yards fitted with rubber matting.

4.2 Kerbing

- (1) The perimeter of all the yards and of all races, concreted as required in clause 4.1 Floors, Yard Surfaces and Races, must have a kerb which is a minimum of 150 mm above the level of the surface of the yard. The exception is where kerbs can be reduced to 50 mm at the yard entrance area and bail exit area. The kerb must be made of concrete or another similar material.

- (2) Coved kerbing is effective, easy to clean and is less likely to cause injury to animals. The purpose of a kerb around the yards and at the sides of concrete races is to prevent soil and dung being washed over the sides of the yards and races.
- (3) The 50 mm kerb nib across the end of the race will help prevent soil and dung from being brought into the yards and may prevent yard washing water from causing heavy pugging at the end of the concrete race.

4.3 Effluent Drains and Sumps

- (1) Drains, sumps and traps must be of a sufficient size to cope with the total effluent flow. There must be an adequate fall in the drains to the drainage point.
- (2) Open drains must be constructed of concrete or another similar material so they are easily cleaned and free draining. All drains from the main sump to the effluent disposal point must be fully enclosed and impervious to moisture.
- (3) If drainage is discharged from a milking pit by either a venturi or a pump, a recess should be provided in the floor. The sides and bottom of this recess must be finished to a smooth surface and sealed to prevent any seepage.
- (4) Most drains require a minimum diameter of 100 mm, with a fall towards the draining area of 300 mm in every 25 m (1 in 80). Open drains should be rounded off at the bottom to assist with self-cleaning and prevent the accumulation of silt, gravel and weeds.
- (5) Sumps must be made of concrete or another impervious material and must be designed to be easily cleaned. Sumps must not be located within 10 m of the milking, milk receiving and milk storage areas, **unless** the effluent is to be pumped away on a daily basis or piped to effluent ponds.
- (6) Sumps between 10 and 20 m of the farm dairy may have a storage capacity up to but not exceeding 22,500 L and must not have a footprint exceeding 4 m in diameter or a surface area of 12.5 m².
- (7) Sumps between 20 and 45 m of the farm dairy where storage capacity exceeds 22,500 L are permitted provided:
 - a) storage capacity does not exceed 100,000 L;
 - b) the structure does not have a footprint exceeding 7 m in diameter or a surface area of 38.4 m²
 - c) the level is controlled to a maximum storage volume of 22,500 L; and
 - d) the structure is not utilised as the primary effluent storage facility.
- (8) Sand traps (also known as stone traps) and associated drainage pads must be made of concrete or another impervious material and must be designed to be easily cleaned.
- (9) Sand traps must be located at least 10 m from the farm dairy, must not have a capacity exceeding 7.5 m³, and must be designed to retain sand and stones with a minimum of effluent solids.
- (10) Drainage pads associated with sand traps and solids storage bunkers must be located at least 10 m from the farm dairy and, unless 45 m from the farm dairy, must not be used to store more than 5 m³ of sand trap cleanings or de-watered solids. The drainage pad or solids storage bunker must be constructed so that stored cleanings are effectively contained and any liquid drains back into the effluent system.
- (11) Sand traps exceeding 7.5 m³ and drainage pads greater than 5 m³ and (including weeping wall sludge beds) must be located at least 45 m from all areas of the farm dairy other than any yards.
- (12) The local authority will advise the amount of storage capacity required for farm dairy effluent.

4.4 Disposal of Effluent and Other Wastes

- (1) Drainage outfalls or effluent discharges from all livestock, including pigs and silage pit run-off, must not be sited closer than 45 m from the milking, milk receiving and milk storage areas, and the water supply. This includes effluent ponds, treatment ditches and places where effluent is sprayed on to the land.
- (2) The application of the following wastes to land used for grazing milking animals is not permitted:
 - a) human waste;
 - b) meat processing waste; or
 - c) industrial waste from tanneries and pulp and paper mills.
- (3) The use of the feed from land that has had the wastes in subclause (2) applied is not acceptable unless the waste has been treated by a process that ensures potential hazards are reduced to an acceptable level. The process needs to have been evaluated and confirmed by the RMP Operator to be fit for purpose.
- (4) Water/wastewater recovered from the farm dairy effluent system must not be used for cleaning any part of the farm dairy other than the dairy yard, and may only be used to clean the dairy yard when following the criteria set out in clause 6.10 Cleanliness of Premises.
- (5) Waste from industrial or commercial activities (other than those wastes listed above which are not permitted unless suitably treated) may only be applied to land used for dairy feed and grazing when:
 - a) the dairy company that receives the milk has been advised and has given written approval including the date at which the land may be returned to dairy feed production and any conditions that may also apply;
 - b) any resource consent conditions and dairy company specified conditions have been met; and
 - c) records and reports are available that:
 - i) identify the nature of the waste, and where and how it was applied, on each occasion;
 - ii) the quantity of each application;
 - iii) confirm withholding periods have been adhered to;
 - iv) confirm that any other required information, such as inspection reports and analytical test reports, have been obtained and are acceptable;
 - v) identify the use of any plant material grown on the affected land prior to confirming acceptability for dairy feed production; and
 - vi) identify the date at which the land is or was returned to use for dairy feed production or grazing.

4.5 Offal Holes

- (1) An offal hole containing decaying matter should not be sited closer than 45 m from the milking, milk receiving and milk storage areas, tanker loop and any water supply. Offal holes must be adequately covered to reduce odour and insect infestation and to prevent scavenging by animals.
- (2) Care should be taken on the location of offal holes, as leaching may occur which could contaminate the underground water supply. Offal holes should not intercept the groundwater table, as this may increase the risk of contamination of the underground water supply. To ensure compliance with bylaws when installing an offal hole check with the local authority.

4.6 Amenities

- (1) Hand washing facilities (soap and clean running water) must be available within the farm dairy.
- (2) In any new farm dairy or where major alterations are being carried out, a hand basin must be provided where there is a toilet. The basin must be provided in or adjacent to the toilet, have running water and

be connected to the toilet drainage system. Both the toilet and the hand-basin must be fitted in compliance with local authority by-laws. Any toilet and hand basin must be in good operating order and maintained in a clean and sanitary state.

- (3) It is strongly recommended that all new farm dairies and farm dairies that are being substantially upgraded have a toilet installed in accordance with this clause of the Code and to meet all local authority requirements.
- (4) There must be a door between any toilet and the milking, milk receiving area or milk storage areas and the door must be kept closed. To meet this requirement it is recommended that doors are self-closing. The toilet must be in a separate room with a ceiling and adequate external ventilation.
- (5) Any septic tank must not be installed within 10 m of the milking, milk receiving and milk storage areas or within 45 m of the dairy water source.
- (6) A septic tank is a sewage tank as defined in the Drainage and Plumbing Regulations 1978. When a toilet is installed, the owner or occupier must check with the local authority for the conditions of installation. The farmer must show proof of compliance.
- (7) Effluent from septic tanks must be treated and discharged in accordance with regional council rules. Discharge from any toilet must not enter the farm dairy effluent system or be otherwise spread onto any pasture that is to be grazed by dairy animals or harvested for feed for dairy animals.
- (8) A toilet, which has no septic tank, must not be sited closer than 45 m from the milking area, milk receiving area and milk storage area, tanker loop, or 45 m from the water supply. The only exception to this requirement is a fully sealed effluent storage tank which must be vented to a distance of 10 m from the farm dairy.

4.7 Walls, Ceilings, Roof Under-Surfaces

- (1) All walls, ceilings and roof under-surfaces of the farm dairy must be constructed to prevent or minimise the harbouring of birds, rodents, insects or other animals and also minimise the accumulation of dust and dirt. The walls and ceilings must be made of a material with a final surface that is impervious to moisture and able to be cleaned. This also applies to all rooms attached to the farm dairy such as lunch rooms, compressor rooms, and offices.

4.8 Doors and Ventilation

- (1) Doors must be fitted in the milk storage room where there is a lidded vat. Where roller doors are fitted they must have capped ends to prevent birds nesting.
- (2) There must be adequate ventilation to provide sufficient air movement to dry out the room's interior surfaces.
- (3) As a guide, ventilation openings (louvres or windows) of at least 1/8 of the floor area (high level) and 1/20 of the floor area (low level) should be provided in the milk storage area. This should allow adequate ventilation of the milk storage room.
- (4) If a refrigeration unit is installed inside the milk storage room, there must be sufficient air movement for efficient refrigeration and to help cool the milk storage room as the unit heats the air.

4.9 Screens

- (1) Where there are lidded vats, permanent screens must be provided over ventilation openings (e.g. louvres or opening windows) to prevent the access of birds and rodents into the milk storage room.

4.10 Lighting

4.10.1 Milking Area Lighting

- (1) Permanent lighting must be installed in the milking area. This lighting must be sufficient to adequately illuminate the area where animals are milked.

4.10.2 Milk Storage Area Lighting

- (1) Lights must be placed so that they will shine into lidded vats.
- (2) Where there is any risk of broken glass from lights entering the milk supply via vats or CIP (cleaning in place) tubs, lights must be screened with shatter-proof coverings.
- (3) All lights in the milk room and milk storage area must be of a shatter-proof design or be screened with shatter-proof coverings.
- (4) Lights within 5 m of the CIP tub must be of a shatter-proof design or be screened with shatter-proof coverings. Broken glass is a direct threat to the safety of manufactured dairy material. Every effort must be made to reduce the likelihood of broken glass entering the raw milk supply.
- (5) Lights must be easily cleaned and must be designed so that dust cannot accumulate on the upper surfaces of fittings.
- (6) There must be adequate lighting outside the milk storage room at the milk collection point. The position of this lighting should be discussed with the RMP Operator and may be specified in the terms and conditions of supply.

4.11 Milk Storage Area

- (1) The following is a minimum standard for milk storage areas. RMP Operators may have more stringent requirements that will need to be followed when altering or constructing a new milk storage area.

4.11.1 Milk Storage Room

- (1) The vat must be set back from the main doorway, with adequate clearance between the vat and the walls to allow for cleaning around the circumference of the vat, and adequate clearance between the vat and the ceiling to allow for servicing of the agitator. The minimum allowable distance between the vat and the wall is 0.5 m. The minimum allowable distance between the vat and the ceiling is 1 m.
- (2) Where the vat is adjacent to the milking area, the vat pad must be designed so that no effluent can move to the milk storage area.

4.11.2 Drainage and Floors

- (1) To prevent milk and cleaning residues flowing onto the tanker road or steps, the floor must slope inwards from the outer edge of the room at the milk tanker collection point. Good drainage must be provided in the standing area for the milk tanker.
- (2) There should be an adequately sized drainage basin beneath the outlet pipe of the vat, drained to the dairy effluent system.
- (3) All new milk storage areas and colostrum for supply storage areas must have a drainage basin beneath the outlet pipe of the vat. This must drain to the dairy effluent system.
- (4) All new milk storage areas and colostrum for supply storage areas must have a tanker pad the width of the tanker road (at least 6 m x 5 m wide x 150 mm deep). This must slope towards a drainage point leading to the dairy effluent system.

- (5) Existing farm dairies should have a concrete apron, at least 700 mm wide, and at least as long as the length of the vat stand at the road level under the milk collection point. This should slope towards a drainage point leading to the dairy effluent system.

4.11.3 Vats Located Outside Farm Dairies

- (1) The vat must be bottom filled and the milk agitated sufficiently to meet the requirements outlined in clause 12.3 Agitation.
- (2) The vat must be sited and installed so that its interior will not be contaminated either through the vent or while the door is open.
- (3) Vats can be located outside or isolated from the farm dairy. The same construction, maintenance and sanitation requirements apply to vats away from the farm dairy.

4.11.4 Storage of Goods

- (1) The milk storage area must be used only for the storage of equipment required for the milking process, milk cooling, refrigeration and cleaning.
- (2) **Items** required for the operation, maintenance and cleaning of the milking plant and premises may be kept in the milk receiving room or combined receiving/storage room if an appropriate storage facility is provided.
- (3) **Chemical compounds other than MPI approved maintenance compounds, teat sanitisers, and emollients intended for use in the farm dairy must not be kept in the milk receiving or storage areas.**

4.12 Storage Facilities

- (1) Storage facilities must be provided for goods required for use in the farm dairy, **and must be kept in a suitably hygienic manner.**
- (2) **Any spillage in or around storage facilities must be cleaned immediately.**
- (3) A cupboard, shelves or separate room must be provided to store materials and equipment associated with the milking process, to prevent the clutter of materials inside the farm dairy.
- (4) Cupboards and shelves must be set above the floor so the area under them can be washed.
- (5) **Consumable items stored in these facilities (e.g. milk filters and milking equipment) must be protected from contamination (including from the environment contamination and pests) during storage.**
- (6) **All animal treatments must be clearly and correctly identified and be:**
 - a) currently registered under the ACVM Act for use on lactating dairy animals; or
 - b) exempt under the ACVM Act (e.g. Homeopathic treatments).
- (7) **Prior to preparation for use, all animal treatments must be stored in accordance with their label instructions, unless alternative storage instructions are stated in writing by a veterinarian.**
- (8) All restricted veterinary medicines must be securely stored, such as in a cupboard or room that is locked when the farm dairy is unattended.
- (9) Animal treatments, needles and hazardous items must be removed and disposed of in a responsible manner after use, when their use by date has expired or when the label is no longer legible.

Note: Hand written identification of veterinary medicines is not acceptable.

4.13 Milk not intended for Supply

- (1) Milk not intended for supply must:

- a) be clearly identified in such a way that the signage is clearly visible above the outlet, and
 - b) secured in such a manner that the contents cannot be accidentally collected as milk for manufacturing purposes.
- (2) The RMP Operator may have more specific requirements for the identification and security of milk not intended for supply
 - (3) Milk not intended for supply that is stored within 20 m of the farm dairy must be stored in a suitable vessel that is sealed and on a concrete pad capable of being cleaned. Drainage from the pad must be connected to the dairy effluent system.
 - (4) If it is unavoidable to store milk not intended for supply in the milk room, the containers and surroundings must be maintained in a clean and sanitary condition to prevent unacceptable odours, and to avoid attracting flies and vermin. Milk that is rotten, odorous or offensive must not be stored in or near the farm dairy.

4.14 Fuel Burning Engines

- (1) Any wood burning-type water heater must be installed so the fire box opens outside the milking, milk receiving and milk storage areas. Fuel for fuel burning engines and heaters must not be stored in the farm dairy.
- (2) Fuel, smoke and exhausts can lead to milk contamination by odours and airborne matter.

4.15 Hose Points

- (1) There must be suitable hose points to allow all areas of the farm dairy to be kept in a hygienic manner at all times. This includes the milk storage area, centre of rotary (if applicable) and milkroom.

4.16 Protection from Power Failure

- (1) From 1st June 2016 all new farm dairies are required to have in place the necessary plugs so that a suitable generator can be fitted to the farm dairy without the assistance of an electrician. It is recommended that all Farm Dairy Operators consider purchasing a generator that is capable of operating the farm dairy (including water through the plate cooler and refrigeration).
- (2) Additionally, if stockwater is sourced from groundwater, and there is no alternative water supply, Farm Dairy Operators should ensure they have the capability to get water to stock during a power outage. Usually this will require a generator to be transportable, and a suitable plug be fitted to the electric pump.

Note: The most common type of plug required is an AS/NZS3123 (56 Series) or IEC 60309 3P+N+E 125 Amp plug. A 63 Amp plug may be suitable for smaller dairy units with only essential equipment used.

Farm Dairy Operators should consult their dairy company (or the RMP Operator covering their operations), or seek advice from a professional before installing such equipment or plugs as conditions and circumstances vary between dairy units.

Part 5: Protection of Milk Quality

5.1 Supply of Milk

- (1) The following types of milk must not be sold or supplied to the public or a dairy processor:
 - a) milk from an animal which is outwardly unhealthy;
 - b) milk from an animal which has been diagnosed or confirmed by a veterinarian to have a clinical disease such as brucellosis, salmonellosis or tuberculosis;
 - c) milk which is tainted, impure or fails an organoleptic assessment (senses test);
 - d) milk which contains any inhibitory substance, chemical contaminant or toxin at an unacceptable level;
 - e) milk from an animal within the first four days and eight milking's of giving birth unless there is a supply agreement in place that allows for such milk to be supplied separately;
 - f) milk that is harvested by a milk harvester with a notifiable communicable disease;
 - g) milk with an acidity level of 0.18% or higher;
 - h) milk that contains any foreign matter, or has in any way been adulterated or tampered with; or
 - i) milk that for any other reason is not fit for purpose or is not harvested under the conditions detailed in the RMP or as otherwise advised to the Farm Dairy Operator by the RMP Operator or an Animal Products Officer.

5.2 Milking Animal Health

- (1) All Farm Dairy Operators must comply with the Dairy Processing Specifications for milking animal health as set out in the registered RMP covering their operation.
- (2) Animals introduced from other herds should be subject to a quarantine period and regular monitoring to confirm the animal health status unless full health details and treatment records have been provided.

5.2.1 Diseased Animals

- (1) Milking animals being milked for supply must be outwardly healthy and show no clinical signs of sickness or diseases capable of contaminating milk with pathogenic micro-organisms.
- (2) Records must be kept of all diseased milking animals. These records must demonstrate that the milking animal was removed from the supply herd during the period that it was sick or diseased.
- (3) All records of sick and diseased animals must be made available for audit at annual Farm Dairy Assessment.
- (4) Milking animals shown to be Tb standard test positive are considered to be diagnosed immediately after the animal is confirmed to be a Tb reactor or when directed to slaughter by either a veterinarian or a person authorised under the National Bovine Tuberculosis Pest Management Plan.
- (5) Milk from animals shown to be Tb standard test positive that are awaiting results of a confirmatory test must only be supplied for the manufacture of heat treated dairy products.
- (6) Any milking animal diagnosed under subclause (4) must be isolated and not milked in the farm dairy.

5.2.2 Abnormal Milk

- (1) Milk from diseased or injured udders must not be mixed with the milk intended for supply. Diseased and injured udders can result in blood and mastitis organisms in the milk. A well-managed farm dairy should have methods in place to detect and isolate abnormal milk. Common methods of detection are a pre-milking squirt from the teat on to a dark surface, rapid mastitis testing (RMT) and the use of electronic mastitis detectors.
- (2) Other routine methods of detection include careful observation for:

- a) hardness;
 - b) swelling;
 - c) abnormal temperature;
 - d) tenderness;
 - e) incomplete milking out;
 - f) altered behaviour;
 - g) kicking;
 - h) lameness; and
 - i) sick appearance.
- (3) Mastitis should be detected before clots are observed on the milk filter.

Note: some forms of mastitis do not form clots.

- (4) Following the SmartSMM Seasonal Approach to Managing Mastitis or a similar mastitis management programme will help to ensure that all aspects of mastitis control is actively managed. The SmartSMM plan is available from your dairy company, the National Mastitis Advisory Committee or online at <http://www.smartsamm.co.nz>.
- (5) Mastitis is the persistent, inflammatory reaction of the udder tissue in response to bacterial infection. Contributing factors include; improper pulsation, excessive vacuum, bacterial infection of the teat canal or cross contamination from milking equipment or the milk harvester.
- (6) Expert advice should also be sought on the treatment and control of mastitis.

5.2.3 Restricted Veterinary Medicines and Authorisations

- (1) In order to hold or use restricted veterinary medicines, farmers must have a veterinary authorisation. This authorisation allows a farmer to:
- a) hold the restricted veterinary medicines; and/or
 - b) use the restricted veterinary medicine in the way specified in the authorisation.
- (2) All restricted veterinary medicines held on farm must be recorded on an authorisation that is currently in force. If non-expired restricted veterinary medicines from the previous season are carried forward, they should be included on the current season's authorisation.
- (3) In many cases the authorisation will be provided at or following an annual consultation in the form of an Annual Veterinary Consultation and Authorisation for Purchase document, though an authorisation may be provided in many forms at other times, including:
- a) an individual case veterinary docket or prescription (script);
 - b) a prescription, document or letter provided with the medicine or attached to the packaging;
 - c) an individual stick-on label attached to the medicine or its packaging; and
 - d) clinical case records.
- (4) All veterinary authorisations must be retained by the Farm Dairy Operator for at least 2 years, whether in hard copy or electronic form. Electronic forms of veterinary authorisations may include photographs of authorisation stickers/labels on the outer packaging of restricted veterinary medicines.
- (5) If the veterinarian administers a restricted veterinary medicine, a veterinary authorisation is not required, but the treatment must be recorded along with details of milk withheld as per 5.2.4 Animal Treatments.

Note: All restricted veterinary medicines will have "Restricted Veterinary Medicine" or "RVM" on the label.

For more information on veterinary authorisations consult your veterinarian.

5.2.4 Use of Animal Treatments

- (1) Any animal treatments administered to milking animals must be:
 - a) registered for use on milking animals under the ACVM Act or exempt;
 - b) administered as per label or following written veterinary advice;
 - c) stored in accordance with their label instructions, unless alternative storage instructions are stated in writing by a veterinarian (prior to preparation for use); and
 - d) only used within the date of expiry.
- (2) Animal treatments include any product administered to milking animals, including teat salves, teat sprays, drenches and pour-ons.
- (3) To be absolutely clear, the following medicines are prohibited in many markets and must not be administered or applied to dairy animals, or added to the feed or water:
 - a) chloramphenicol;
 - b) nitrofurans;
 - c) Hormonal Growth Promotants;
 - d) 17 β -oestradiol and its esters;
 - e) nitroimidazole class of compounds, e.g. metronidazole and ronidazole;
 - f) arsenic acid;
 - g) chloroform;
 - h) chlorpromazine;
 - i) colchicine;
 - j) dapsone;
 - k) nandrolone;
 - l) phenylbutazone;
 - m) stanozolol;
 - n) beta sympathomimetic agents (cimetarol, salbutamol); and
 - o) thyreostatic compounds (methyl thiouracil, phenyl thiouracil, propyl thiouracil).
- (4) Milk withholding times specified for antibiotics and any other animal treatments must be followed unless an alternative has been approved by MPI or prescribed by a veterinarian. Nil milk withholding assumes that the animal is treated immediately after milking. If milking once a day or treating large numbers of animals, a veterinarian should be consulted to ensure withholding periods are appropriate.
- (5) Any off-label use of animal treatments must be approved in writing by a veterinarian. A record of this must be kept by the Farm Dairy Operator. This record will most likely be in the form of a veterinary script.
- (6) Where multiple medicines are prescribed to treat the same condition at the same time, written advice must be obtained from the prescribing veterinarian for the milk withholding time to be observed. In the absence of written advice, a 35 day milk withholding time applies.
- (7) Records must be kept of the administration details for ALL animal treatments regardless of whether a milk withholding period applies. Types of treatments where records are required include, but are not restricted to:
 - a) restricted and over the counter veterinary medicines (e.g. antibiotics);
 - b) vaccines and hormone treatments (where permitted);
 - c) inductions;
 - d) drenches (oral and pour-on);
 - e) lice applications;
 - f) foot baths;
 - g) injections;
 - h) ointments, teat salves or oral powders;
 - i) homeopathic and natural remedies; and
 - j) products exempt from registration.

- (8) When administering an animal treatment, Farm Dairy Operators must keep treatment records that include the following (except as provided for in clause 5.2.4 (9) and (10)):
- the unique animal identifier;
 - condition/disease and veterinarian (if consulted);
 - the type of treatment (including name of product and dose);
 - the date of each treatment;
 - date of last treatment;
 - date that milk re-entered the vat; and
 - whether the treatment was administered by a veterinarian (for RVMs, the authorisation would need to be retained).
- (9) For whole herd treatments, Farm Dairy Operators may keep treatment records that include the following as an alternative to clause 5.2.4 (8):
- condition/disease and veterinarian (if consulted);
 - the type of treatment (including product and dose);
 - the date of each treatment;
 - date of last treatment; and
 - any applicable milk withholding period.
- (10) For animal treatments that are not RVMs, and do not require milk withholding periods (e.g. udder creams, teat salves or teat sanitiser), Farm Dairy Operators may keep treatment records that include the following as an alternative to clause 5.2.4 (8):
- the name of the product;
 - the condition treated/reason for use;
 - the dose used if relevant; and
 - the dates that the product was first and last used.
- (11) Expiry date of the treatment is recommended to be recorded.
- (12) All records of animal treatments administered to milking animals must be made available for audit at Farm Dairy Assessments. In addition, for restricted veterinary medicines held at the farm dairy there must be evidence of the veterinary authorisation available (refer 5.2.3 Restricted Veterinary Medicines and Authorisations).

5.2.5 Administration of Animal Treatments

- Lactational Veterinary Medicines (including antibiotics) should only be administered after the delivery line to the vat has been disconnected. This minimises the chance of direct contamination.
 - Dry Cow Therapy must not be administered until the delivery line to the vat has been disconnected. Residues from Dry Cow Therapy pose a significant risk to the manufacture of dairy material, therefore, it is important that the risk of direct contamination is eliminated.
- (3) When administering teat sealants:
- label instructions must be reviewed and followed;
 - care must be taken to ensure that the sealant remains in the teat canal;
 - hands must be washed after treating animals; and
 - spent tubes and containers must be safely and securely disposed of.
- (4) At the first milking post calving, each sealed teat must be hand stripped according to label instructions to ensure full removal of the sealant.
- (5) While animals treated with teat sealants are in the colostrum herd, the milking equipment must be hot washed after milking to ensure that any remaining residue is effectively removed.
- (6) Used needles should be placed into a sharps container or similar for appropriate disposal.

5.2.6 Identification and Segregation of Treated and/or Diseased Milking Animals

- (1) Treated and/or diseased milking animals must be clearly identifiable from the rest of the herd at all times. This applies regardless of whether a separate herd is run for treated and/or diseased animals. Recommended identification methods include non-toxic spray paint on udder or legs, leg bands, tail tape.
- (2) Treated milking animals should be marked immediately prior to each treatment. This practice reduces the likelihood of the wrong milking animal being treated. Treated milking animals must be milked last after the delivery line has been diverted away from the vat. Treated milking animals should also be kept in a separate herd.
- (3) Quarter milkers must not be used to segregate milk from treated and or diseased milking animals. If treated, milk must be withheld from all quarters, even if not all quarters are treated.
- (4) Treatment marks must be removed, or cancelled (e.g. overlaid with green paint) prior to the milking animal re-joining the main herd.
- (5) Test buckets must not be used to segregate milk from treated milking animals, unless the milk delivery line has been diverted from entering the vat.
- (6) All milk harvesters should know how treated milking animals are identified, and the process to follow if they are accidentally milked into the vat for supply.

5.2.7 Management of Animal Treatments and Other Compounds

- (1) Animal treatments must be discarded once expired.
- (2) Farm Dairy Operators must review all animal treatments at least every 3 months, and:
 - a) remove and discard any expired animal treatments or any products with illegible labels in a secure manner (e.g. return to treatment supplier); and
 - b) record the date of the review.
- (3) Containers used to store any chemicals, including detergents, sanitisers, maintenance compounds, animal treatments and any other agricultural compounds must only be reused for their original purpose provided the container remains clearly and accurately labelled and in good condition i.e. they must only be used to store the same compound. Where the container is emptied prior to re-use, the expiry date can and should be updated.
- (4) Detergents, sanitisers, maintenance compounds and veterinary medicines must be used according to the manufacturer's label instructions and conditions of approval.

Note: It is recommended that reviews of animal treatments are completed monthly alongside other monthly checks.

5.2.8 The National Chemical Contaminants Programme

- (1) The dairy National Chemical Contaminants Programme is administered MPI under the Dairy Industry (National Residue Monitoring Programme) Regulations 2002.
- (2) The purpose of the National Chemical Contaminants Programme (NCCP) is to:
 - a) show that agricultural chemicals and veterinary medicines are being used responsibly;
 - b) ensure that any residues and contaminants are being managed effectively and that the regulatory system is appropriate;
 - c) identify any new or emerging chemical hazards that might pose a risk to health or trade; and
 - d) generate information on chemical contaminants in dairy production and processing which enables MPI to provide official assurances to other governments, negotiate "equivalent outcomes" for market access, and mitigate any risk to trade, and enables dairy companies to confirm the effectiveness of the controls in place.

- (3) NCCP provides a significant benefit to all Farm Dairy Operators, as it provides a “national status” for a large number of possible chemicals rather than requiring verification of conformance for every farm through costly testing.
- (4) Dairy Industry (National Residue Monitoring Programme) Regulations 2002 authorises recognised persons to sample and test dairy material or product from farm dairies and dairy factories, whether the dairy material or product is for domestic sale or export sale or for human or animal consumption. As the programme uses both random and risk based farm selection, any farm can be selected for testing at any time. Farm Dairy Operators should note that official NCCP samplers may arrive on farm at any time to collect samples for the programme, and ensure the samplers have access to any raw milk intended for supply.
- (5) The programme works on the principle that milk in the farm silo that is for supply may be sampled at any time (i.e. sampling may be after one milking). It is important that samplers have access to the milk vat to obtain a sample for the programme. As the programme is used to support the certification of New Zealand dairy products, refusal to allow sampling at an individual farm dairy could have serious impact in the ability to export dairy products made from that milk.
- (6) NCCP provides a means to identify misuse of chemical substances, and thereby ensures that New Zealand dairy products continue to be recognised internationally as safe and suitable.
- (7) Inhibitory substance residues can result from many types of treatment, ranging from injections and pessaries to externally applied creams. Even though antibiotics are predominantly used for mastitis control, they are also used to treat many other health problems (e.g. foot problems). In all cases of antibiotic treatment, there is the potential for residues to be left in the milk.
- (8) To prevent antibiotics and other active compounds entering the milk supply, each veterinary medicine registered under the ACVM Act has instructions for its use and **any applicable** withholding period. These are printed on the container, package or package insert. If these instructions are followed carefully, antibiotic (inhibitory substances) contamination should be prevented. Veterinary medicines must not be used outside their expiry date.
- (9) It is extremely important that agricultural compounds and veterinary medicines are used according to the label instruction, as intended by the manufacturer of the product, or according to the written instructions of the veterinarian. Improper use can have serious impacts on trade, which in turn could have a serious impact on the eligibility of milk from an individual farm.
- (10) Low levels of antibiotic residues in food can make some people sensitive to the use of antibiotics given for their own treatment. The associated allergic reactions can be extremely unpleasant and, in some cases, fatal. These are major concerns to public health authorities.
- (11) Low levels of antibiotics in milk may also cause a build-up of drug resistance by bacteria exposed to these low concentrations.
- (12) Other products such as chlorine and sanitisers are antimicrobial agents and may cause inhibitory substance reactions.

5.3 Bobby Calf Collection

- (1) Bobby calves must be free from the residues of veterinary medicines. Residues can occur in bobby calves either directly from injections and tablets given to the calves themselves, or indirectly through the milk from milking animals that have been treated with drugs.
- (2) Under no circumstances must antibiotics, sulphonamides or other drugs be administered directly to calves destined for meat processing. If a bobby calf is exposed to such veterinary medicines (e.g. through ingested milk), it must not be presented for supply until free from residues. If any doubt exists with regard to withholding times the prescribing veterinarian should be consulted.
- (3) **It is an offence to present an animal for slaughter, which has been exposed to chemical substances and is found to contain unacceptably high residues.**

5.4 Colostrum

- (1) Milk (or colostrum) drawn from animals within four days of calving and eight complete udder evacuations must not be supplied to a dairy company for further processing unless this forms part of a specific contracted supply.
- (2) The following points are to be noted:
 - a) heifers may require ten complete udder evacuations to overcome let down problems;
 - b) newly calved milking animals should be milked after the main herd; and
 - c) as induced milking animals may produce colostrum there must be at least eight complete udder evacuations after calving.
- (3) Records must be kept of the calving date and date animals enter the milking herd.

5.5 Toxic, Odorous and other Chemical Substances

- (1) Toxic or odorous substances not registered or exempt under the ACVM Act must not be given to any animal or used on any animal, or mixed in any dairy, or with any utensil that will come into contact with the milk, cleaning solutions or water supply.
- (2) Additionally, the following compounds must not, under any circumstances, be used in, on or around the farm dairy, dairy animals, or the farm environment including off farm grazing, dairy feed or water:
 - a) aldrin;
 - b) HCB (hexachlorobenzene);
 - c) chlordane;
 - d) HCH (hexachlorocyclohexane or benzenehexachloride);
 - e) chlordecone;
 - f) heptachlor;
 - g) DDT including DDE and DDD (also known as TDE);
 - h) lindane;
 - i) dieldrin;
 - j) mirex;
 - k) endosulfan and its isomers;
 - l) pentachlorobenzene; and
 - m) endrin.
- (3) Odorous substances, including those containing fragrances, must not be used in a manner that might result in milk becoming tainted, either directly or via contact surfaces or topical use on milking animals, and must not be used to mask odours due to unsanitary conditions.
- (4) Pesticides, chemicals not registered, approved or permitted for use in the farm dairy, and veterinary medicines not intended for milking animals, must not be stored in the farm dairy or in the same room as detergents, sanitisers or any other equipment or utensils that are to be used in the farm dairy. These must be clearly labelled and stored in an orderly state in a separate building, which is at least 20 m from the farm dairy. Approved cleaning chemicals and treatments for milking animals are excluded from this restriction.
- (5) Where pesticides and other chemicals are to be used they must be used in such a manner as to minimise risk of contamination to milk, milk contact surfaces, the water supply, animals and animal feed.
- (6) Only MPI **approved maintenance compounds (detergents and sanitisers)** may be used to clean the milking plant including the vat.
- (7) It is critically important to read the label regarding restrictions for use and plant rinsing or draining requirements.

- (8) Chemicals not approved for use in the farm dairy, such as pesticides and herbicides, must not be mixed in or near the farm dairy or within 45 m (20 m if sufficiently protected, refer 3.10.1 Surface Water) of the dairy water supply. Such chemicals must not be prepared using any utensil which is to be used in the farm dairy or in connection with milking, cleaning of the milking plant, or treating water. If the water supply is located at the farm dairy then the minimum of 45 m from the water supply and 20 m from the milking area applies.
- (9) A designated chemical mixing area is to be used for the mixing of chemicals not approved for use in the farm dairy. This area should include; dedicated mixing equipment and utensils, a water supply set up to prevent backflow, appropriate safety equipment and have suitable drainage. This area must be a minimum of 45 m from the farm dairy water source (20 m if sufficiently protected, refer 3.10.1 Surface Water) and 20 m from the milking, milk handling and milk storage areas, and farm dairy water storage. It is recommended that equipment and utensils are colour coded to make it clear that they are only to be used in the designated chemical mixing area.
- (10) If rodent baits are used they must not be laid in the milk storage and collection area. They must be laid in a bait station or similar in such a position to minimise the risk of poison being spread or picked up by children, dogs, or other animals. Bait stations must not be accessible by food producing animals.
- (11) As residues could gain access to the raw milk, separate identifiable containers to measure or mix chemicals must be used. It is essential to make up these solutions away from the farm dairy.
- (12) Poisonous substances e.g. animal treatments and detergents should be kept out of the reach of children and also stored in a location which reduces any likelihood of milk contamination.

5.6 Disposal of Agricultural Chemicals

- (1) Pesticides are classified by a hazard rating (**HSNO classification code**) which takes into account the concentrations of active ingredients and their state (whether liquid or solid). This rating appears on the label, which bears warning and precautionary statements related to the degree of hazard.
- (2) Always read the label and follow the instructions.
- (3) The disposal of agricultural chemicals has now become a major issue with the increased concern for care of the environment.
- (4) In general, surplus chemical should be disposed of in the way it was intended – on the land at the recommended rates provided that use of the chemical is still permitted. The chemical company sales representative can be contacted to determine whether other clients may be willing to use any surplus.
- (5) In many cases the regional authority or Ag Recovery can assist with disposal of surplus chemicals.

5.7 Contaminated Sites

- (1) Access of stock to known contaminated sites must be prevented e.g. fence off sheep dips and known chemical and industrial waste dumps.

5.8 Purchased Stock Feed

- (1) All purchased stock feed must only be accepted when delivered with documentation identifying:
 - a) the feed (what it contains);
 - b) source (where it came from); and
 - c) confirmation that it is suitable for feeding to dairy animals.
- (2) This documentation, whether hard copy or electronic, must be kept for at least four years.

- (3) Any contract signed with a feed provider must allow for consignments to be rejected when they cannot be confirmed as suitable for feeding to lactating dairy animals.

5.9 Stock Feed Storage

- (1) Feeds containing grain, Palm Kernel Extract (PKE), and similar products should be stored in a feed silo situated on concrete or in covered concrete bunker. These are to be no closer than 10 m from the vat stand.
- (2) Feed that cannot be stored in a feed silo should be stored over concrete or, if a concrete area is not available, on a sheet impervious to moisture such as polyethylene. Storage must be at least 20 m from the farm dairy and not within 3 m of the edge of the farm roadway, and should not allow any water runoff to contaminate the feed pile, surface water or ground water source.
- (3) In addition:
 - a) feed should not be stored directly on the ground;
 - b) feeds containing grain, PKE, and similar products should be covered at all times to prevent water damage;
 - c) feed must be stored so that it remains cool and dry;
 - d) the feed storage area needs to be kept free of birds, rodents, insects and other vermin;
 - e) the feed storage area should not be made of any materials that are likely to contaminate the stored feed with residues, such as tanalised timber;
 - f) feed should not be stored on-farm for long periods; and
 - g) mouldy or spoiled feed should never be fed to lactating dairy cows.

5.10 Taints and Residues from Feed

- (1) Milking animals must not be fed fodder or stock feed at a level that is likely to directly or indirectly:
 - a) cause milk taints; or
 - b) contaminate the milk with any chemical residue, contaminant or toxin **at levels above permitted limits**.
- (2) Dairy animals must not be fed ruminant protein e.g. supplementary feeds that contain blood or bone from ruminant animals. The Biosecurity (Ruminant Protein) Regulations 1999 make it an offence to feed ruminant protein to a ruminant animal.
- (3) When spraying pasture with pesticides:
 - a) adhere to the recommended pasture withholding periods or where possible use a planned winter spray programme;
 - b) spray each paddock after it has been grazed (some poisonous weeds become more palatable after they are sprayed); and
 - c) keep a record of what was used and when.
- (4) Following fertiliser applications the pasture must be allowed sufficient time and rain/irrigation for the fertiliser to be flushed from the grass to the soil. If unsure, consult your fertiliser representative. Failure to follow a suitable rest period may result in elevated residue levels.
- (5) When feeding fodder crops, plant waste or plants other than pasture, there should be a management plan in place to minimise the risk of milk tainting. Milk that is tainted should not be offered for supply. Some common fodder crops and plants that can taint milk are:
 - a) turnips;
 - b) chicory;
 - c) onions;
 - d) landcress;
 - e) wild onion;

- f) wild garlic;
 - g) pennyroyal; and
 - h) asparagus.
- (6) Feeding of copra has been known to cause aflatoxin contamination of raw milk. Consult your milk quality advisor or dairy company prior to feeding copra (or feeds containing copra) to lactating dairy animals and take particular note of the points identified under 5.8 Purchased Stock Feed.

5.11 Teat Preparation

- (1) The milking procedure must address sources of contamination, such as wet or heavily soiled udders.
- (2) Animal teats must be adequately prepared before applying the cluster.
- (3) If teats are wet and dirty:
 - a) for cows and buffalo, they must be washed and should be dried with a single service towel; or
 - b) for goats and sheep, they must be wiped.
- (4) If teats are dry and dirty, they must be brushed or washed (cows and buffalo), or brushed or wiped (goats and sheep).
- (5) Teat washing facilities (or wiping facilities in the case of goats and sheep) must be available and adequately maintained for this purpose.
- (6) Volume washing is not acceptable and can cause milk contamination problems through over-wetting.
- (7) If medicated teat wipes are being used, they must be used in accordance with their label instructions.

Note: Animal husbandry practices should try to minimise the soiling of udders and teats.

Typically medicated teat wipes are not for routine use. If in doubt, Farm Dairy Operators should consult the authorising veterinarian.

5.12 Milker Health

- (1) Suppliers and staff ill with notifiable diseases (refer to Schedule 1 - Definitions for list of Notifiable Diseases) must report their specific symptoms (diarrhoea, vomiting etc.) to their supervisor, manager or farm owner. Staff with such illnesses must not work with raw milk or work in the farm dairy. Records of such illnesses, including dates, must be kept.
- (2) Personal hygiene is of the utmost importance. Hands and clothes can transfer bacteria to milk and also milking animals.

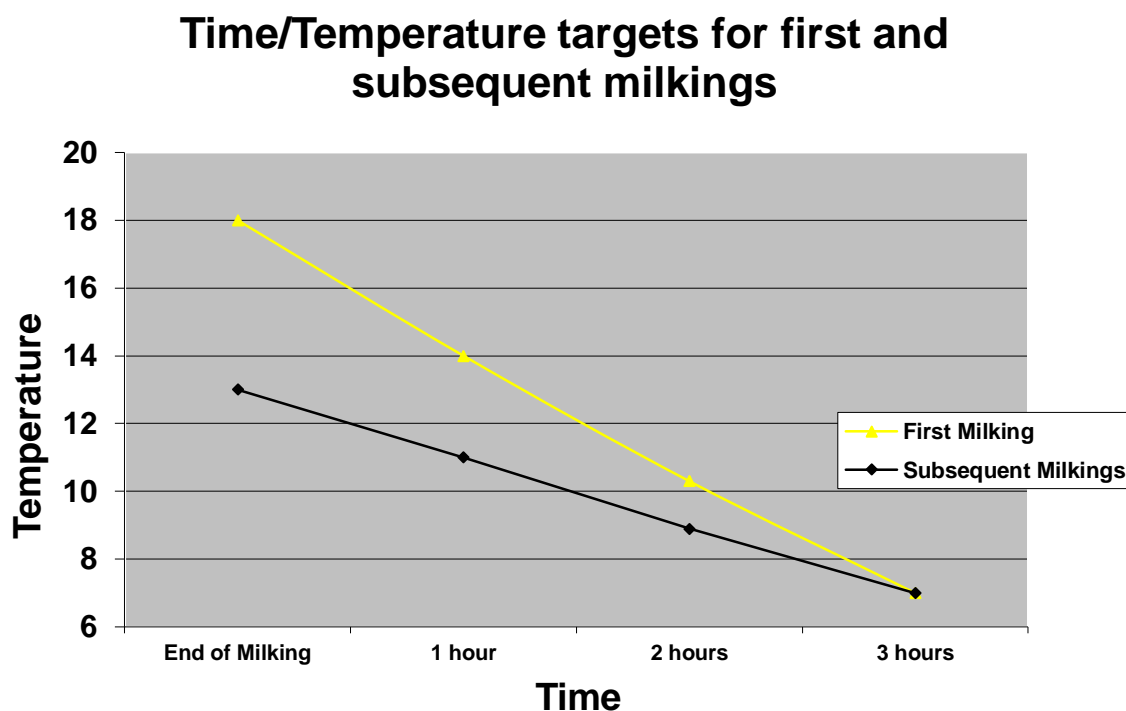
5.13 Milk Filtering

- (1) All milk must be filtered before entering the vat – refer to clause 10 Milk Filtering Systems for details.
- (2) Filter socks must be fitted at all times during milking and washing of the plant.
- (3) Filter socks should be used as per the manufacturers' instructions. Filter socks can harbour high levels of bacteria and inhibitory substances that may contaminate the milk at the next milking. As such disposable filter socks must be replaced after each milking where milking animals are under treatment.

5.14 Milk Cooling

- (1) Raw milk grows bacteria rapidly above 7°C. Therefore, adequate milk cooling is essential for ensuring quality milk is supplied. The following time/temperature requirements are a minimum standard for the cooling of milk. Farm Dairy Operators should be striving to cool their milk more effectively than these requirements.
- (2) Unless used immediately for further processing, milk must be:
 - a) primary cooled after filtering, refer to clause 11.1 General for further primary cooling requirements;
 - b) cooled to 18°C or less at the completion of the first milking into the bulk milk tank, and should not exceed 13°C at the completion of subsequent milkings; or
 - c) cooled to and maintained at 7°C or below within 3 hours of the completion of milking and kept at or below 7°C until it is collected or the next milking.
- (3) In the case of automatic milking systems (robotic milking systems) milk must be cooled to 7°C immediately after harvesting and held at 7°C or below until collection.
- (4) Documented milk cooling checks must be carried out at least twice per season to demonstrate compliance to the above standards. Corrective action must be taken if these standards are not being met at any time.
- (5) The milk cooling curve in Figure 1 can be used as a guide for compliance for the first milking, and subsequent milkings into the vat.
- (6) It is recommended that the temperature of the milk be maintained at 4°C to 5°C, and the temperature of any stored milk be checked prior to each subsequent milking.
- (7) Any system that can be demonstrated to be capable of meeting the regulatory and company's requirements for cooling is acceptable. A record of milk temperature at collection or use must be available for independent confirmation.

Figure 1: Milk Cooling Curve



5.15 New Milk Cooling Standards

- (1) The following raw milk cooling standards apply as of the applicable commencement date in clause 5.15.1 Implementation Date.
- (2) Raw milk must:
 - a) be cooled to 10°C or below within four hours of the commencement of milking; and
 - b) be cooled to 6°C or below within the sooner of:
 - i) six hours from the commencement of milking, or
 - ii) two hours from the completion of milking; and
 - c) be held at or below 6°C without freezing until collection or the next milking; and
 - d) must not exceed 10°C during subsequent milkings.
- (3) In situations where there is continuous or extended milking, such as automated milking systems, the milk must enter the bulk milk tank at 6°C or below. “Continuous or extended milking” is defined as milking for six hours or longer from the time that milk first enters any bulk milk tank.

5.15.1 Implementation Date

- (1) From 1 August 2016 farm dairies that are:
 - a) new; or
 - b) undergoing any significant change to the secondary milk cooling systemmust meet the milk cooling requirements set out in clause 5.15(2).
- (2) From 1 June 2018 all farm dairies must meet the milk cooling requirements set out in clause 5.15(2).
- (3) Consideration should be given to improving the cooling performance of existing equipment, and to technology options that improve existing equipment performance. New technology options must meet the requirements of this Code directly and be acceptable to the RMP Operator/Dairy Company.
- (4) It is recommended that Farm Dairy Operators considering an upgrade to primary cooling or secondary bulk milk tank refrigeration discuss options with their dairy company, Farm Dairy Assessor, or refrigeration supplier before committing capital.

Note: If a new milk cooling technology doesn't meet the requirements of this code, it must be assessed in accordance with clause 3.10: Alternative Premises and Equipment Designs.

5.16 Milk Cooling Performance Monitoring

- (1) From 1 August 2016 the periodic confirmation of milk cooling performance must be undertaken to confirm that the milk cooling system is meeting the requirements under clause 5.14 Milk Cooling, or clause 5.15 New Milk Cooling Standards as follows:
 - a) Farm Dairy Operators must have records to confirm that milk cooling requirements are being met to confirm the capability of milk cooling equipment. Milk cooling performance should be monitored monthly, but as a minimum must be monitored and recorded:
 - i) about the time of expected peak milk production; and
 - ii) in February.
 - b) Each performance check must cover at least two consecutive milking's, and the records must include:
 - i) the temperature of milk in each bulk milk tank immediately prior to the start of milking (if there is any);
 - ii) the time that milking starts;

- iii) the time that milking is completed;
 - iv) the temperature of the milk in the bulk milk tank at the completion of milking; and
 - v) the time that the milk is confirmed to meet the requirements of clause 5.14 Milk Cooling, or clause 5.15(2)(a) and (b) New Milk Cooling, whichever is applicable.
- (2) Temperature measurements and recording can be accomplished using:
- a) an electronic monitoring system;
 - b) a chart recorder;
 - c) a “tiny tag” or similar temperature logging device;
 - d) manual measurements using an electronic thermometer (non-glass); or
 - e) any other equivalent method.
- (3) The accuracy of the temperature measurement device must be known as the data collected is an official record.

5.16.1 Failure to meet milk cooling requirements

- (1) Action must be taken to correct milk cooling performance should the information collected show that milk is not being cooled within the required parameters. In such cases the milk cooling performance checks described above must be repeated to confirm compliance with the milk cooling requirements.
- (2) Milk that has not been cooled in accordance with clauses 5.14 and 5.15 must be withheld from supply, unless the milk has been assessed and confirmed as fit for intended purpose by the RMP Operator / dairy company through measures such as:
- a) sensory evaluation;
 - b) microbiological testing;
 - c) titratable acidity; or
 - d) a validated risk assessment model.

Note: Where any equipment upgrade is being considered to rectify repeat failures to meet milk cooling requirements, it is recommended that the Farm Dairy Assessor or dairy company is consulted before committing to capital expenditure.

5.16.2 Electronic monitoring systems

- (1) Where electronic monitoring systems are installed it is recommended that such systems be capable of holding delivery line and bulk milk tank temperature data for a minimum of 30 days for both milk and CIP solutions.

5.17 Disposal of Milk

- (1) There must be a procedure in place for the disposal of milk.
- (2) For a variety of reasons RMP Operators may not always be able to collect milk. Milk may also be rejected by the RMP Operator for any of the reasons specified in clause 5.1 Supply of Milk.
- (3) Farmers can face prosecution, under the Resource Management Act 1991, if they discharge milk directly into water or if they allow milk to flow into water.
- (4) Milk is a potent pollutant, being 1000 times more potent than farm dairy effluent. As such, intrusion into waterways will have a serious impact.
- (5) The RMP Operator is to be contacted if major disruption occurs, as they will have contingency plans drawn up.
- (6) The following are possible methods for disposal of milk on farm:
- a) discharge into effluent ponds;

- b) spray irrigation;
 - c) waste pond or trench;
 - d) sacrifice area; and
 - e) feeding livestock.
- (7) Farmers should check with their regional authority before disposing of milk onto land.

Note: Under some exceptional circumstances the method for disposal may be stipulated by the RMP Operator or by an Animal Products Officer.

5.18 Trials and Experiments

- (1) Any milk produced under experimental trial conditions must not be offered for supply unless the risk management programme operator (dairy company) has been notified of all relevant facts and has agreed in writing. This includes situations such as:
- a) cleaning chemical trials;
 - b) veterinary medicine trials, or any similar exposure to novel treatments (refer to clause 7.5 Experimental Equipment);
 - c) trials involving new or novel equipment that does not fully comply with this Code; and
 - d) trials involving feed or feed supplements where the residue effect on milk is unknown.

5.19 Training

- (1) The Farm Dairy Operator must ensure that any staff involved in the operation of a farm dairy, are adequately trained to carry out their duties. This should include training in safe plant operation, cleaning, and animal health management.
- (2) Training records should be kept to demonstrate farm staff are capable of completing their duties adequately.

5.20 Safety

- (1) Dairy farms should have written safety hazard procedures covering all relevant occupational safety and health regulations. Refer to occupational health and safety requirements in the Health and Safety in Employment Act 1992.

5.21 Environmental and Animal Welfare Policies

- (1) The following dairy industry environmental and animal welfare policies address a number of issues of international concern which could impact on trade in dairy products.

5.21.1 Physical Health and Behavioural Needs

- (1) As outlined in the Animal Welfare Act 1999, the following conditions for all animals must be met:
- a) proper and sufficient food and water;
 - b) adequate shelter;
 - c) opportunity to display normal patterns of behaviour;
 - d) physical handling in a manner which minimises the likelihood of unreasonable or unnecessary pain or distress; and
 - e) protection from and rapid diagnosis of any significant injury or disease.

5.21.2 Tail Docking

- (1) Tail docking is no longer acceptable. This practice is banned in several European countries and is not common in North America. There is no technical or economic justification with regards to animal health or milk quality. Switch trimming or tail shortening in accordance with National Animal Welfare Advisory Committee (NAWAC) guidelines is permitted.

5.21.3 Inductions

- (1) Inductions must only be carried out as per the Operational Guidelines: Induction of Calving, developed jointly by New Zealand Veterinary Association (NZVA), Federated Farmers, Dairy Companies Association of New Zealand (DCANZ) and DairyNZ.
- (2) Induction should only be used as a management tool in exceptional circumstances requiring justified veterinary intervention.

5.21.4 Bobby Calf Collection

- (1) The collection of bobby calves should not be readily visible from the roadside.
- (2) Bobby calves must be managed, cared for and transported in accordance with the Animal Welfare Act 1999, the Animal Welfare (Calves) Regulations 2016, the Animal Welfare (Dairy Cattle) Code of Welfare 2014, and the Animal Welfare (Transport within New Zealand) Code of Welfare 2011. Refer to the DairyNZ best practice guideline "The welfare of bobby calves" for more information.

5.21.5 Collection of Dead Animals

- (1) The collection point of dead animals should be screened from the roadside.

5.21.6 Residues

- (1) To minimise the risk of residues, clauses 4.4, 5.2.3, 5.5 and 5.8 of this code must be complied with.

5.21.7 Human Waste

- (1) To minimise the risk of contamination from human waste, clause 4.4 Disposal of Effluent and Other Wastes of this code must be complied with.

5.21.8 Access to Wetlands

- (1) All existing significant natural wetlands should be preserved in accordance with district and regional plans. Stock access to such wetlands should be controlled to avoid destruction of native flora.

5.21.9 Farm Dairy Effluent

- (1) Disposal of farm dairy effluent:
 - a) should be carried out so that it presents no significant risks to human health or aquatic systems; and
 - b) must meet the requirements of the Resource Management Act 1991 and regional plans.

5.21.10 Water Quality

- (1) The dairy industry's strategy is to maintain and enhance water quality in dairy catchments. Actions supporting this include the prevention of:
 - a) stock access to waterways;
 - b) animal effluent entering waterways; and
 - c) stock raceways crossing through waterways.

5.21.11 Fertiliser Usage

- (1) Dairy farmers should undertake annual nutrient budgets to determine fertiliser levels and appropriate use.

5.21.12 Local Authority Consent

- (1) All dairy farmers must meet local and regional council by laws and plans and obtain appropriate consents to protect the environment.

Part 6: Plant and Premises Cleaning and Maintenance

6.1 General Requirements

- (1) The farm dairy milking plant and premises must be kept in a clean state to reflect a food hygiene premises and to avoid milk quality problems occurring. Only suitable equipment and MPI approved detergents and sanitisers must be used to avoid contamination of milk.

6.2 Quality and Supply of Water

- (1) The farm dairy must have an adequate supply of both cold and hot water. Water that may come into direct contact with milk or milk contact surfaces must comply with the Dairy Processing Specifications. Refer also to clause 13.3 Minimum Quantities of Cold Water Required for Cleaning Plant and Vats and clause 13.4 Minimum Quantities of Hot Water Required for Cleaning Plant and Vats.

6.3 Water Requirements

- (1) As a guide, summer cold water requirements are:
 - a) drinking – 70 L per milking animal per day;
 - b) premises and plant sanitation (including milk cooling) – 70 L per milking animal per day; and
 - c) total per milking animal each day – 140 L per milking animal per day.
- (2) Requirements for dry milking animals are to be included when determining water quantities needed.

6.4 Cleaning System

- (1) There must be a documented cleaning procedure provided in the farm dairy.
- (2) Reverse flow and cold water cleaning are not recommended plant cleaning systems for any new installation. Existing systems must be actively managed to ensure effective cleaning is achieved.
- (3) There should be a non-glass thermometer available in the farm dairy for checking hot water and plant/vat dump wash temperatures.
- (4) Glass thermometers must not be used or stored in the farm dairy. Refer to your rural trading store or dairy company for a suitable thermometer.

6.5 Cleaning Materials

- (1) Cleaning materials must be capable of maintaining a clean milking plant and must not cause milk quality defects such as milk tainting, deposition and degradation.
- (2) Detergents and sanitisers used to maintain the milking plant, including the vat, must be MPI approved for use in the farm dairy and be kept in a clean, labelled container intended for the chemical concerned. Containers may only be refilled when the original container is empty, is in good condition, and the label remains legible as per 5.2.7 Animal Treatments and Agricultural Compounds.
- (3) Utensils used to measure and dispense chemicals must be clean and should be dedicated to one chemical.
- (4) Instructions provided on the printed labels of cleaning chemicals are to be followed unless alternative written instructions are provided by the Farm Dairy Assessor or a representative of the chemical supplier. Such instructions will include the amounts to use, temperature and frequency of use, along

with any special conditions that must be followed. The label must indicate that the detergent or sanitiser is approved by MPI for use in farm dairies.

Note: Products **previously** approved for farm dairies by MAF or NZFSA are also acceptable.

6.6 Restricted Chemicals

- (1) Restrictions apply to the use of chemicals of high residue concern. These are, along with the nature of the restriction, are listed on the MPI Register of Restricted Chemicals available at <http://www.foodsafety.govt.nz/industry/sectors/dairy/>.
- (2) These chemicals may only be used within the restriction provisions identified. Where there is no provision for use the chemical must not be used, and must not be present in any product used for cleaning or sanitising the milking plant.

6.7 Milking Plant Cleaning

- (1) The milking equipment must be:
 - a) **rinsed** immediately after use; then
 - b) **cleaned and sanitised** using MPI approved detergents and sanitisers for use on farm dairies (following label instructions); then
 - c) **drained** to remove excess solution; and then
 - d) **rinsed and drained** prior to the next milking using compliant or treated water to avoid cleaning chemical residues contaminating the milking plant or carrying over into the milk.
- (2) Typically a minimum volume of 5-10 L of suitable water per cluster is required to rinse the milking plant effectively, but advice should be obtained from the detergent company representative for the specific cleaning products in use. The rinse water volume must be recorded in the documented cleaning procedures required under clause 6.4 Cleaning System.
- (3) The vat is to be rinsed immediately after milk collection and must be cleaned, sanitised, rinsed and drained before further use. Rinsing to remove sanitiser may be immediately prior to the next milking (which is recommended) or may be immediately after cleaning, sanitising and draining. The bulk milk tank(s) must be protected from contamination from the completion of cleaning onward.
- (4) After opening or dismantling for maintenance or inspection the milking plant must be sanitised, drained, then rinsed and drained.
- (5) In situations where a water management plan is in place, either the first milk through the milking plant after cleaning must be discarded (1.5 to 2 L per cluster) or the water must be treated using a suitable MPI approved water sanitising product such as chlorine.
- (6) The exterior of the milking equipment and vat must be kept in a clean condition.
- (7) Harsh abrasives or steel pads must not be used to clean any milk contact surface. These can cause fine scratches in the plant surfaces, which allow protein build-up and therefore possible bacterial colonisation. Metal particles from steel pads could also find their way into the milk.
- (8) It is strongly recommended that all systems be used according to manufacturer's specifications. Some systems must be disconnected prior to the start of milking, e.g. reverse flow connections.
- (9) With CIP systems, agitators should run during the vat washing cycle. If possible, a device should be installed to deactivate the cleaning system when the vat contains milk.
- (10) All wash tubs must be able to be fully drained and must be installed at a height which enables the floor underneath to be cleaned.

- (11) Circulation cleaning of the bulk milk tank is strongly recommended. Extreme care must be taken when manually cleaning vats. Wear protective gear at all times and always follow the safety guidelines outlined on the detergent container label.
- (12) Many cleaning methods fail because the detergent mix is not kept at a high enough temperature. This will allow a build-up of deposits in the plant and consequently a build up of bacteria, which may lower milk quality.
- (13) Heat loss of cleaning solutions through the plant is a problem. To minimise this:
 - a) if recirculating, increase the amount of the liquid wash; and
 - b) run the first amount of water to waste to preheat the plant and then begin the recirculation process.
- (14) When checking the cleaning solution temperature against the recommended cleaning temperature (as per the detergent label or manufacturer's instructions) take the measurement at the end of the cleaning cycle.
- (15) Each farm dairy should have adequate cleaning equipment, including buckets and brushes to keep the plant interior and exterior in a sanitary and clean condition. These should be kept off the floor in a clean area, preferably hanging up by the handle. For plant disassembly and reassembly, the correct tools should also be available.
- (16) Brushes which are used for exterior plant and premises cleaning should be identifiable and not be used for interior cleaning. Brushes may look clean but can harbour extremely high numbers of bacteria. All brushes should be cleaned after use and hung up, bristles facing outward, while not in use to facilitate drying and maintaining hygiene.

6.8 Cooler Cleaning

- (1) Milk coolers must be dismantled and cleaned periodically and after filter failure.
- (2) The following are some disassembly tips:
 - a) turn off the water supply to the cooler;
 - b) measure the distance between the end plates on both sides. Both sides should be exactly the same distance;
 - c) disconnect the milk delivery line and other lines if necessary;
 - d) undo the nuts progressively and diagonally until the swing bolts or other bolts can be swung to one side or removed;
 - e) if the plates do not part, then spring them by pouring warm water (50°C) over the top of the cooler plates, allowing it to run down the sides;
 - f) avoid taking the plates off the spacer rods or carrier bars; and
 - g) check and clean if necessary. Wear gloves when brushing (the plate edges can be extremely sharp).
- (3) Reassemble in reverse order. Remember:
 - a) milk and water always travel in opposite directions;
 - b) there should be no brush hairs or grit on the seals;
 - c) the seals must be secure and located correctly;
 - d) tighten to the measured distance between plates; and
 - e) do not over tighten. This can restrict both water and milk flows, causing excessive back pressure and ruin the gaskets.
- (4) After cleaning, test for leaks by operating with the cold water supply used for milk cooling.

6.9 Care of Rubberware

- (1) All rubberware should be replaced according to the manufacturer's recommendations and must be replaced earlier if there is evidence of significant wear.
- (2) A list of rubberware in the plant should be kept. All changes of rubberware should be recorded.
- (3) The four main 'enemies' of rubberware are tension, sunlight, milkfat and misuse of detergents.
- (4) Incomplete removal of milkfat, teat salves and milk residues by incorrect and inefficient washing procedures has an adverse effect on milking machine rubber components. Rubber deterioration will allow fat and protein impregnation and colonisation by bacteria.
- (5) Correct liner function is critical for efficient and complete milking.
- (6) A well designed plant cleaning system will also maintain rubberware in a clean condition. In accordance with clause 6.7 Milk Plant Cleaning, such a system will typically include the following elements:
 - a) rinse with cold water immediately after use;
 - b) wash with a strong, hot alkaline detergent twice weekly to remove fat deposits (or in accordance with the written advice of the detergent representative);
 - c) rinse well;
 - d) sanitise after the rinse; and
 - e) rinse sanitiser from the plant prior to the next milking.
- (7) Remember:
 - a) excessive brushing of internal surfaces can destroy rubberware; and
 - b) some strong acid detergents and hypochlorites can destroy rubberware if used excessively or left in the milking machine.

6.10 Cleanliness of Premises

- (1) The farm dairy must be kept free from soil, manure and milk residues which could affect milk quality through odours and airborne contamination. The premises must be maintained in a visually clean condition.
- (2) The farm dairy environment must be maintained in a suitable state by:
 - a) cleaning the farm dairy yard after every milking;
 - b) keeping the milking plant exterior and premises clean;
 - c) running effluent away and preventing overflow or blockages;
 - d) keeping surroundings and races in good repair and clear of rank growth and all rubbish;
 - e) keeping stock housing pads and pens clean and at the mandatory distance; and
 - f) eliminating vermin and discouraging birds and insects.
- (3) Effluent, wastewater and water recovered from the farm dairy effluent system must not be used for any purpose in or near any part of the farm dairy other than the yard unless it has been treated to meet potable water standards.
- (4) Water recovered from the farm dairy effluent system must not be used within the farm dairy except to clean the dairy yard, in which case:
 - a) the system operates at low pressure, with no detectable mist or aerosol;
 - b) the water recovery system is of a design that will consistently deliver water that does not contain excessive sediment or offensive odours and is acceptable to the Farm Dairy Assessor;
 - c) the system must be of a fixed design and must not include hand held hoses;
 - d) if pumped, the delivery outlet is to be fixed at no more than 300 mm above the yard surface;
 - e) the **recovered water** system must **only be used for recovered water, and must be** completely separate from the fresh water wash down system which must still be available;

- f) the yard must be of concrete construction with no surface cover, and rinsed with clear water if necessary to remove any residual sediment;
- g) the recovered water will not be used within 5 m of the milking, milk handling or milk storage areas, or in roofed areas;
- h) the activity does not have a negative impact on the:
 - i) hygiene status of the milking and cleaning equipment, milking area, milk handling and milk storage areas;
 - ii) water used in the farm dairy for other purposes;
 - iii) cleanliness of milking animal teats and udders; or
 - iv) any other thing that might lead to contamination of the milk.
- i) the raw milk is not supplied for the manufacture of unpasteurised dairy products, or for consumption without heat treatment;
- j) the recovered water and its storage must not introduce offensive odours;
- k) the Farm Dairy Operator has documented the design and follows written procedures that are sufficient to ensure the requirements detailed in this clause are met; and
- l) all other requirements under this clause and clauses 3.8 Minimum Approved Distances and 4.3 Effluent Drains and Sumps are met.

(5) Storage of recovered water must:

- a) not introduce offensive odours;
- b) be located at least 20 m away from the milk storage area; and
- c) be enclosed and not exceed 30,000 L capacity per tank if within 45 m of the milk storage area.

6.11 Concrete Cleaning

- (1) All concrete must be kept clean and algal growth removed.
- (2) To remove and reduce further algal growth, the concrete floors and yards of the farm dairy may at regular intervals need more attention than the routine cleaning carried out at the completion of each milking. If scrubbing the surface with a brush or using a water blaster, always treat the surfaces to kill the algae and fungal spores, otherwise re-growth will rapidly occur. When using a water blaster or high pressure hose to clean concrete ensure that the vat and milking system is fully closed and sealed to prevent contamination of milk contact surfaces.
- (3) Wash all surfaces of the milking equipment from top to bottom at completion of concrete cleaning to remove any residues that have transferred to the milking system.

6.12 Farm Dairy Surrounds and Litter

- (1) The area around the farm dairy and tanker loop must be kept in a tidy condition with no ponding. There must be no rank growth or accumulated litter scattered inside or surrounding the farm dairy.
- (2) Rank growth can encourage rodents. Ponding causes odours and will encourage flies.
- (3) Litter includes old milking equipment and utensils, used milk filter socks, used syringes, old rubberware, empty containers, clothes, timber and general rubbish.
- (4) If rubbish is to be collected at the farm dairy, it should be placed in a lidded drum or similar receptacle outside the farm dairy.
- (5) The environment around the farm dairy needs to be presented as a human food harvesting area. The risk of transporting faeces from farm to farm and to the factory via the tanker or the tanker driver's boots must be minimised.

6.13 Farm Dairy Presentation

- (1) The farm dairy must be well presented and well maintained.
- (2) From a customer perception and marketing perspective, the appearance of the farm dairy and its surroundings is as important as the quality of the milk produced.
- (3) The tanker road, centre of loop, milk collection area, entry for the farm dairy and area immediately surrounding the dairy must be well maintained with no litter or rank growth. Only essential equipment should be stored in these areas.
- (4) The exterior cladding, roofing, windows, doors, yards, floors, and all interior linings must be in good repair and must be clean and tidy.

6.14 Other Buildings

- (1) Other rooms and buildings permitted within 20 m of the milking area, milk receiving area and milk storage area must be kept in a tidy and clean condition.
- (2) Buildings surrounding the dairy premises, beyond 20 m, should be maintained in a condition that is in keeping with the dairy premises and must not pose a hazard to the food processing activities at the farm dairy.

6.15 Dead Animals

- (1) Dead animals and birds must not be left within 45 m of the milking area, milk receiving and milk storage area or within 45 m of the water supply. This includes dead animals stored for collection. Dead animals cause odour problems, risk spreading disease and encourage flies and rodents.
- (2) Also refer to clauses 3.6 Tanker Roadways and 3.8 Minimum Approved Distances.

6.16 Off Paddock Herd Management Systems

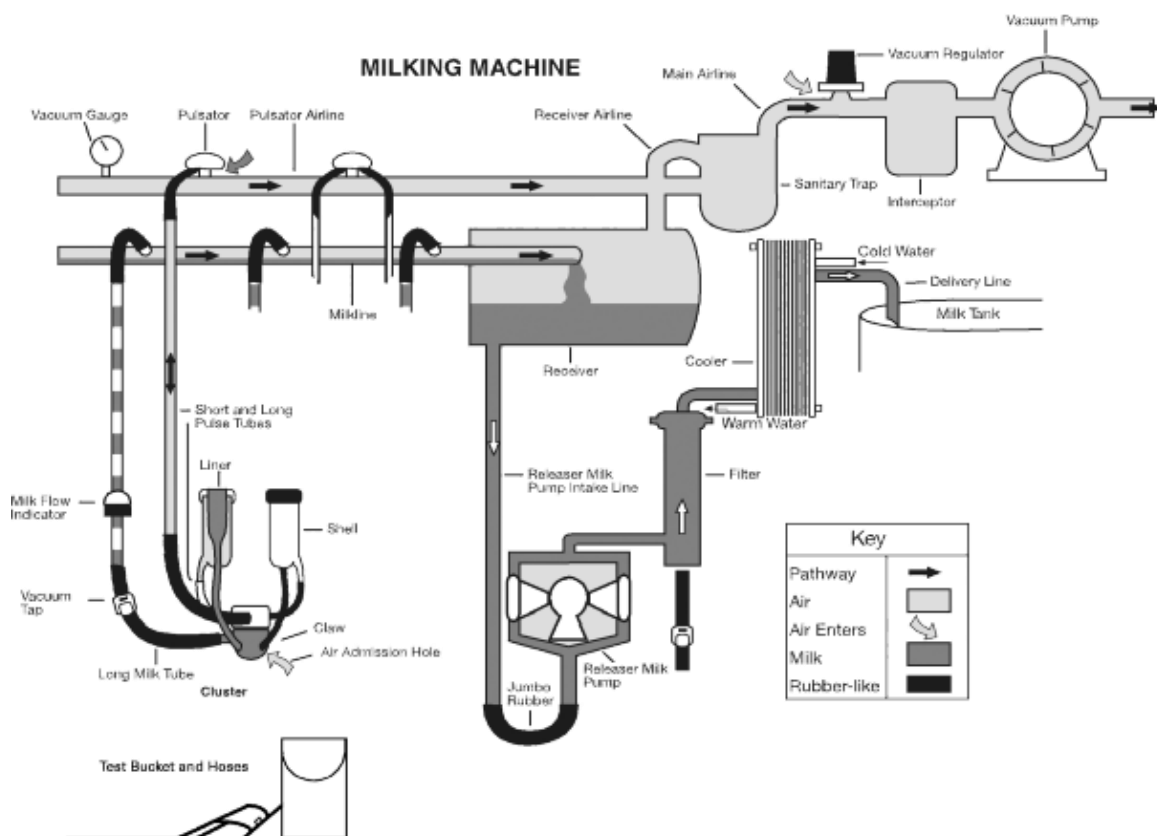
- (1) Farm Dairy Operators intending to supply milk from cows that are held in an off paddock herd management system should advise the RMP Operator (Dairy Company). Additional care must be taken to observe teat and udder hygiene, signs of injury and to ensure that teats are clean at milking.
- (2) From 1 June 2016 all Farm Dairy Operators using an Off Paddock System during lactation must have an appropriate management plan in place and must gain approval from the RMP Operator before using the system. The RMP Operator will ensure that a management plan is in place to ensure milk supplied is fit for its intended purpose.

Part 7: General Requirements for Milking Plant and Equipment

7.1 General Requirements

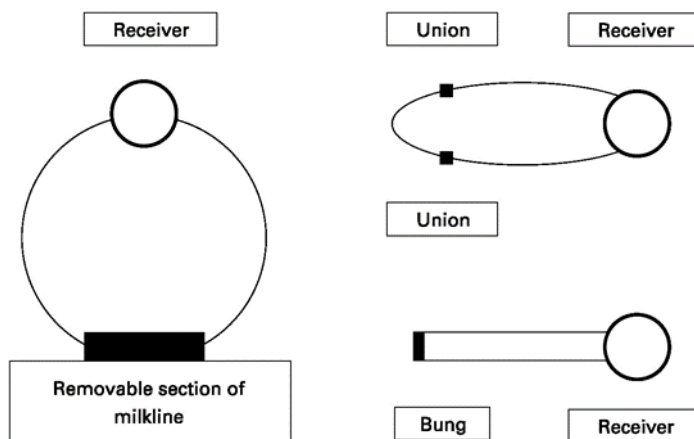
- (1) The milking plant in a farm dairy must be designed, installed and maintained to ensure that the materials and substances coming into contact with the milk do not contaminate it or cause the milk to deteriorate.

Figure 2: Milking Machine



7.2 Installation

- (1) The milking plant, once installed, must comply with this Code.
- (2) Milk contact surfaces must be easily accessible for cleaning, inspection and/or monitoring either when in an assembled position or when removed. System accessories such as milk meters and cup removers must be accessible for inspection and removable parts must be readily disassembled according to the manufacturer's specifications.
- (3) There must always be a removable inspection point in any milking line, at the furthest point from the receiving can. Alternatives to this requirement may be accepted if they can be demonstrated through suitable trials that a similar outcome can be achieved.
- (4) Where there is a CIP system installed that meets the basic engineering requirements of temperature, contact time, wash volume, detergent concentration and solution flow rate, the number of inspection points may be minimised.

Figure 3: Milk Equipment – Joints and Fittings

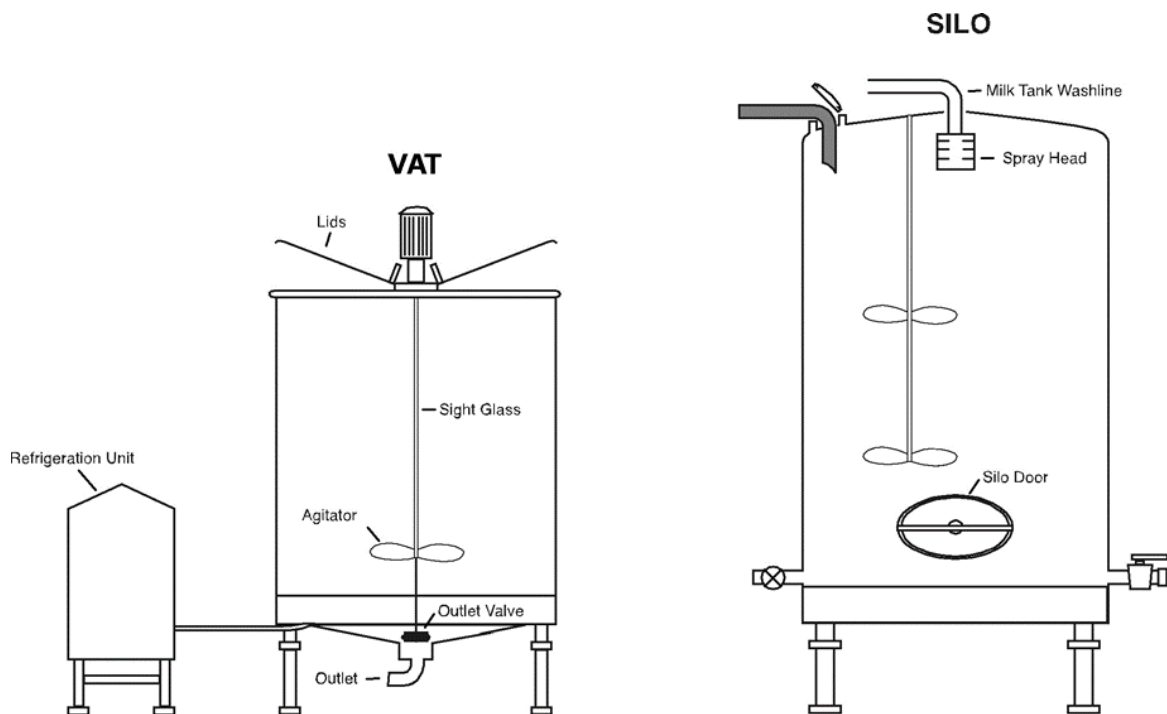
- (5) All joints, unions and fittings must be assembled to prevent possible milk contamination. All pipelines must be able to be drained and all milklines, airlines and delivery lines must be drained between milkings.
- (6) Any sanitary trap mounted above the receiver, with a direct connection to the receiver must have an up-stand, of at least 50 mm, which prevents liquid entering the receiver from the sanitary trap. The sanitary trap must contain a shut-off device to prevent liquid from entering the main airline, and that device must close before any liquid flows over the up-stand into the receiver.
- (7) All airlines must be capable of being dismantled for inspection and cleaning. There must be a union at:
 - a) the end of the receiver airline immediately adjacent to the receiver; and
 - b) on the main airline immediately adjacent to the interceptor.
- (8) The receiver airline must be connected to either an interceptor or a self-draining sanitary trap.
- (9) There must be a threaded union in the pulsator airline for cleaning and inspection purposes.
- (10) When installed, an air purge system must be designed and fitted to ensure no contamination of the milk system with oil. They must be operated in a manner, which does not damage milk or cause bypass of milk filter components allowing unfiltered milk to enter the bulk milk vat. Air purge systems must be set at no more than 300 kPa (45 psi) and should only be adjusted by a competent milking machine technician.
- (11) Air purge systems must also meet the requirements of the 3-A, Sanitary Standards & Accepted Practices 604-04, "Supplying Air Under Pressure In Contact with Milk, Milk Products and Product Contact Surfaces", published jointly by the International Association of Milk, Feed & Environmental Sanitarians, Inc & the USFDA, 01 November 1994.
- (12) For new installations and major upgrades there must be a provisional approval only until the installer has supplied a certificate of compliance. This must include proof that the installation uses only food grade materials for all milk contact surfaces.

7.3 Milking Plant Extensions

- (1) All milking plant extensions must comply with this Code.
- (2) All new installations and extensions must be assessed by a Farm Dairy Assessor recognised under the RMP prior to any milk collection.
- (3) Before making changes to an existing milking plant, e.g. adding extra sets of clusters to an existing milking machine, advice is to be obtained from the milking machine company, dairy company or Farm

Dairy Assessor recognised under the RMP. This includes any necessary upgrading of the milk pumping system, filter capacity, primary cooling efficiency and hot water capacity.

Figure 4: Milking Machine Terminology



MILKING MACHINE TERMINOLOGY

7.4 Identification of Equipment

- (1) Other equipment must be easily identifiable. Rubberware must be identified by a brand applied by the manufacturer. Refer to clause 6.9 Care of Rubberware.

7.5 Experimental Equipment

- (1) Any experimental equipment or equipment under trial in the farm dairy must be identified as such by the manufacturer or equipment supplier. The manufacturer or equipment supplier must gain written permission from the RMP Operator prior to the installation and use of any such equipment. Also refer to clause 3.10 Alternative Premises and Equipment Designs.

7.6 Milking Machine Performance and Maintenance

- (1) Milking machines **must be tested**:
 - a) by a registered milking machine tester with a current **NZMPTA Milking Machine Testing Practising Certificate** at least once per season or at the frequency specified in writing by the registered tester (a full list of registered testers can be viewed at www.nzmpta.co.nz); and
 - b) against the New Zealand Milking Machine Testing Standards (refer to NZ Milking and Pumping Trade Association Inc., "Milking Machine Testing Standards Manual").
- (2) Consumable items such as air filters and rubberware are to be replaced at the end of the expected service life.

Part 8: Milking Systems

8.1 General Requirements

- (1) The milking plant in a farm dairy must be designed, installed and maintained to ensure that the materials and substances coming into contact with the milk directly, or indirectly through services such as water, CIP and air lines, do not contaminate the milk or cause it to deteriorate.
- (2) The supplier and installer of the milking system must be able to demonstrate that all contact surfaces for the milk and services:
 - a) are suitable and safe; and
 - b) will not adversely affect the milk or milking plant; and
 - c) will not contribute to the deterioration of the milk.

8.2 Design

- (1) The milking plant must be designed:
 - a) to minimise physical damage to the milk while it is being harvested;
 - b) to allow for effective internal cleaning and flushing to remove milk or cleaning agents; and
 - c) to drain condensation and other liquids.
- (2) All pipelines must be capable of being readily drained. Airlines and interceptors (where fitted) must be self-draining.
- (3) The receiver airline must be connected to either an interceptor or a self-draining sanitary trap.
- (4) The design of the milking plant can affect milk quality, both microbiologically and physically.
- (5) It is strongly recommended that cluster claws with a form of automatic vacuum shut-off device or automatic cluster removal device form part of the milking system. These have been shown to prevent excessive air, manure and soils from entering the plant during cluster changing or drop off, thus resulting in greater vacuum stability and better quality milk.
- (6) There should be an airflow meter connection point at or near the interceptor.

8.3 Materials

- (1) All milk contact and cleaning system surfaces must be made from suitable materials which are smooth, free from cracks and crevices, impervious, durable, and are cleaned adequately by normal procedures (refer to clause 14 Fabrication of Farm Dairy Equipment).
- (2) Poor welds can make the milking plant difficult to clean. Machine surface finishes must comply with clause 14 Fabrication of Farm Dairy Equipment.

Part 9: Milk Pumping Systems

9.1 Design, Installation and Maintenance

- (1) All new farm dairies and upgrades of existing releaser milk pumping systems must be installed in such a way that the operation of the milk pump is controlled by the quantity of the milk in the receiver. When the receiver is empty the pump must not run.
- (2) Releaser milk pumps must be designed, installed and maintained to minimise damage to milk composition. The unions in the delivery line must be pressure-type unions.

9.2 Delivery Line Unions

- (1) All delivery line unions installed after 1 October 2002 must be pressure type unions capable of withstanding 400 KPa. Nylon/steel cone seal type unions or moulded rubber bends/sleeves must not be installed on the milk delivery line. The only exception to this is where there is no alternative but to use a flexible connection.
- (2) If the delivery system is properly designed the total head should be less than approximately 180 kPa so 400 kPa gives an achievable safety margin.

Part 10: Milk Filtering Systems

10.1 General Requirements

- (1) The purpose of filtration is to remove insoluble material that has entered the milk after it has been extracted from a healthy gland. Milk filtration:
 - a) controls foreign matter;
 - b) protects cooler hygiene and performance without damaging the milk; and
 - c) maintains the wholesomeness of the milk.
- (2) A milk filtering system must be fitted immediately prior to the cooler and ensure compliance with this clause and the Dairy Processing Specifications for milk filtering and cooling.

10.2 Performance

- (1) Filtration must be adequate to meet the milk quality standards required for further processing with respect to sediment and foreign matter, and to ensure no objectionable matter enters the vat. Milk must be free from visible dirt.
- (2) The use of milk filters for milking installations does not absolve the milk supplier from taking the necessary precautions to avoid dirt or other extraneous material entering milk during the milking process, nor can it give protection against legal action. Rather it is intended that pipeline filters should remove particulate matter, which, in spite of good milking practice, may on occasions inadvertently enter milk.

10.3 Construction

- (1) Materials used in the filter vessel that may come into contact with cleaning fluids must be suitable for such contact and, with the exception of single service elements, easily cleaned.
- (2) All raw milk filters installed after 1 June 2013, including filter elements, seals and associated fittings, must comply with the current industry approval standard, namely:
 - a) filter elements must be able to withstand a pressure drop of at least 200 kPa (2 bar) without failing;
 - b) the filter cage and seals must withstand a pressure of 300 kPa (3 bar), without permanent damage or distortion (including failure of components causing milk bypass across the filter that may allow unfiltered milk to enter the bulk milk vat);
 - c) the filter body must withstand a pressure of 400 kPa (4 bar), without permanent damage or distortion;
 - d) the filter size must comply with the requirements of clause 10.6 Filter Sizing; and
 - e) there shall be an appropriate port on the milk pump side of the filter element(s) from which filter performance can be measured. This port must be of a sanitary design.
- (3) Any filtration system installed prior to 1 June 2013 that is identified as being ineffective during assessment or trace back must be upgraded to meet the above standard. Filters must also be constructed in a manner that allows for easy removal and replacement of the filter element.

10.4 Identification

- (1) Filter bodies must be clearly and durably marked with the manufacturer's or vendor's name or trademark, together with some means of identifying the model (e.g. name, symbol or number). The filter element size must be correctly matched to the filter body size.

10.5 Filter Elements

- (1) Filter elements must be designed as follows:
 - a) filtration must be sufficient to ensure that no extraneous matter is visible in the milk or when filtered milk is analysed using a MPI approved sediment, foreign matter or particle test. To achieve this, filter elements will typically have a maximum pore size of 100-150 microns;
 - b) multi-use filter elements must be easy to clean either in place or after removal;
 - c) single and multi-use filter elements must only be used in conjunction with the filter bodies for which the filter elements have been designed;
 - d) filter elements must be able to withstand a pressure drop of at least 200 kPa (30 psi) across them without failing; and
 - e) filter elements must comply with BS 3424, Part 4: 1982, "Testing of Coated Fabrics. Method 6. Method for determination of breaking strength and elongation at break".

10.6 Filter Sizing

- (1) Filters must be sized at a minimum of:
 - a) 6.0 cm²/cow or buffalo effective filtering area; or
 - b) 0.85 cm²/sheep or goat effective filtering area.
- (2) If the effective filtering area is unknown then it can be estimated using the formula:
Effective filtering area = (2 x Width x Length) x 80%.

Part 11: Primary Cooling Systems

11.1 General

- (1) There must be primary cooling after filtering, which should be capable of cooling the milk to 18°C or lower. The milk delivery system must be capable of lowering the milk temperature to within 3°C of the coolant/cooling water temperature.
- (2) As a guideline, the coolant/cooling water flow rate requirement is at least 2.5 times the maximum milk pumping rate of the milk pump. Care should be taken to ensure variable speed milk pumping and on/off control systems are capable of cooling the milk to the 3°C requirement outlined above without using unnecessary amounts of water. Suggested methods of achieving this are:
 - a) installing a variable speed coolant/cooling water pump that will match the variable speed milk pump output; or
 - b) for on/off controlled systems, installing solenoid valves on the cooling water system that are interlocked with the milk pump to allow them to close when there is no milk flow.
- (3) Milking routine should be considered when designing the primary cooling system. Extended milking times could have a detrimental effect on milk quality due to milk being stored at elevated temperatures for long periods of time. In these situations pre-chilling should be considered where milk enters the vat at or below the storage temperature – for more information and likely future requirements refer to clause 5.14 Milk Cooling.
- (4) As indicated in clause 5.14 Milk Cooling, in the case of automatic milking systems (robotic milking systems) milk must be cooled to 7°C immediately after harvesting and held at 7°C or below until collection. Cooling immediately (i.e. snap chilling) represents best practice and should be considered in all situations.
- (5) The primary cooler must be installed in a safe manner. It must be easily accessible for inspection and cleaning and must be positioned so that it does not drain or drip on to other equipment.
- (6) As a guideline, the top of the cooler should be no more than 1.8 m from ground level.

11.2 Construction

- (1) If a plate heat exchanger is installed, the plate arrangement must be such that cooling water flows on either side of a milk channel. The milk must flow in the opposite direction to the water. The water flow must be capable of being turned off by a valve close to the cooler.
- (2) The plate arrangement must allow drainage of those plates that form the milk passages in the plate stack without dismantling the cooler.
- (3) All product-contact surfaces must be easily accessible for cleaning, either when in an assembled position or when removed. Removable parts must be readily de-mountable. A leak-protector groove, open to the atmosphere at both ends, should be provided to allow leakage past the gaskets to drain to waste.
- (4) Except as provided for in clause 11.2 (5), where a coolant used in combination with water, is used in the primary cooling system (e.g. mono-propylene glycol):
 - a) the coolant must be an MPI approved maintenance compound and appropriate for use in that system; and
 - b) the design and construction of the system must include either:
 - i) multi-plate (more than one) separation between the raw milk and the coolant; or

- ii) an automatic leak detection system which ensures the coolant flow is stopped should a gain or loss be detected. The system must not have an automatic reset system, and will require a manual reset after inspection is carried out.
- (5) From 1 August 2017, farm dairies that are new or undergoing any significant change to the milk cooling system must meet the design requirements in clause 11.2 (4). From 1 June 2018, all farm dairies must meet the design requirements in clause 11.2 (4).

11.3 Gaskets and Sealants

- (1) The materials used for gaskets and sealants must comply with clause 14 Fabrication of Farm Dairy Equipment. They must be installed to form a true fit so they do not protrude into the product zone or form recesses or ledges at the gasketed joints. Any surplus or protruding material must be removed to form a smooth surface.
- (2) Sealants that contain a mould inhibitor are toxic and must not be used.
- (3) Self-curing sealants should not be used unless any excess can be removed from the product side of the seal.
- (4) Gaskets should be assessed regularly and replaced as required.

Part 12: Vats

12.1 Vents

- (1) A vent, if provided, must be designed to protect the interior surfaces from contamination including dust, dirt, or other objectionable material. It must be located at or near the top of the vat and the inside surface of the vent must be considered a milk contact surface.

12.2 Inlet and Outlet Ports

- (1) Where a vat is installed outside, the milk inlet port must be located near the bottom, no more than 300 mm up the vertical walls. Vats may be inter-connected, where there is a suitable valve system in place (3-way valve). Delivery lines must be able to be disconnected from the inlet port. Where it is intended that non-conforming milk will be stored in the vat, there should be a suitable means to disable the vat outlet.

12.3 Agitation

- (1) Vats must be provided with agitation sufficient to:
 - a) thoroughly mix the milk to give a variation in fat content of less than 0.1% in milk volumes down to 10% of the rated capacity of the vat;
 - b) prevent thermal layering and ensure that the variation in temperature in the vat does not exceed 1°C; and
 - c) ensure that foaming or “churning” of milk does not occur.
- (2) The agitator shaft must be sealed and adequately covered to prevent contamination.
- (3) Farm Dairy Operators must not interfere with the operation of the agitator.

12.4 Measurement of Milk Volume

- (1) Vats should be provided with a sight tube (which can be directly read from a fixed gauge) unless:
 - a) the tanker is fitted with a milk meter; or
 - b) Milk volume can be measured by weight such as by load cells; or
 - c) there is an accepted alternative means of measuring milk volume.
- (2) The sight tube must be designed so that all milk in it can be discarded to waste and so that it can be adequately cleaned in place.

12.5 Drainage

- (1) All milk-contact surfaces must be able to be drained. The bottom pitch of tanks designed to be cleaned by recirculation of the cleaning fluid should be at least 1:15 (4°).

12.6 Vat Lids

- (1) Vat lids, where fitted, must:
 - a) be sufficiently rigid to prevent buckling;

- b) be designed so that when the lids are in any open position, liquid from the exterior surface will not drain into the vat; and
- c) have bridges with an underside that is accessible for cleaning and inspection without the need to get into the vat.

12.7 Access

- (1) Hinged doors or lids must have the hinge attached to the outside of the vat. The edge of the opening around the access point must not protrude into the vat, so that it protects an area of the inside surface of the vat from in-place cleaning. The access point must be large enough to allow for cleaning and for the vat to be entered for inspection purposes.
- (2) Handholds should be provided outside the vat for ease of entry and exit.

12.8 Inspection Facilities

- (1) All farm vats over 1200 mm from the floor to the top of the tank must be provided with a suitable appliance such as a stepladder to give access for cleaning and inspection.
- (2) For enclosed vats above 1800 mm high, a permanently fixed ladder must be provided for access to the top to allow cleaning and inspection and for reading the sight glass (where present).
- (3) At heights above 3 m, means must be provided to prevent falls and must be suitable for that purpose.
- (4) There should be safe access to any inspection point.

12.9 Installation

- (1) All vats must be provided with in-place cleaning facilities. A suitable pump and container manufactured from a food safe material must be installed. For new or modified/upgraded installations there must be a filter on the CIP intake line that is made from food safe materials.
- (2) The vat must be installed and vented in such a manner as to prevent the entry of birds, rodents, foreign matter or any other form of contamination.
- (3) Where support legs are longer than 600 mm, access must be provided so that inspection and cleaning can be done with reasonable ease and the sight glass can be read accurately.
- (4) Where tanks or equipment are flush to the floor, the base must be fully sealed so that liquid is prevented from seeping underneath.
- (5) Vats installed outside must be protected from environmental contamination and installed on a concrete pad sufficient to support the weight of the full tank, and in compliance with either relevant building Standards and/or company requirements (refer to clause 4.1 Floors, Yard Surfaces and Races). The pad must be sloped to a drainage point.
- (6) Manufacturers of vats should stipulate the number, size and spacing of support legs so that the filled tank will be adequately supported.
- (7) It is recommended that vats should be insulated, housed or covered.

12.10 Temperature Measurement

- (1) All vats must be fitted with a suitable temperature measurement and display device, which:
 - a) must be located so that it can be easily read by the tanker driver at collection;

- b) must be capable of registering the temperature of the milk when the vat contains 10% or more of its rated capacity;
- c) must include a scale range from 0°C to 40°C graduated in divisions of not greater than 0.5°C;
- d) must have protection against thermal damage to 100°C for the temperature sending parts of the device;
- e) must be designed so that any intrusion can be readily cleaned;
- f) calibration should be established and maintained;
- g) should be accurate to +/- 0.5°C over its calibration range; and
- h) when re-calibrated, the records must be available to the RMP Operator.

12.11 Refrigeration Temperature Controllers

- (1) Temperature controllers or thermostats used to control the refrigeration system on vats must comply with the following requirements:
 - a) the case must be splash proof and protect the device against steam and moisture; and
 - b) when the vat contains a larger volume of milk than 10% of its rated capacity, the temperature range at which the refrigeration unit operates must not be more than 1°C above the set point.

Part 13: Cleaning Systems

13.1 General

- (1) Cleaning systems must be designed, constructed, installed and maintained to the supplier's specifications to ensure that all milk contact surfaces can be effectively cleaned. The cleaning system must be constructed of materials which are smooth, impervious, durable and which do not contaminate the milk or cleaning solutions. The supplier and/or installer of the components in the cleaning system must demonstrate that all of the milk contact surfaces are safe for foods.
- (2) Cleaning systems should be installed and maintained to ensure maximum turbulence of the cleaning liquids through the milking machine. A velocity of 1.5 metres/second in normal CIP is recommended. If slug cleaning is used then a minimum of 7 metres/second is recommended. Slug cleaning occurs whenever slugs of cleaning liquids fill the entire cross section of the milkline.
- (3) For new or modified/upgraded installations there must be a filter of suitable materials fitted to the CIP intake line for the milking machine and for the vat. The filter holes must be smaller in diameter than the holes in both the sprayhead and jetter units. Filters must not restrict cleaning solution flow rates below recommended levels.
- (4) The installer must provide the manufacturer's written cleaning instructions, which will include details, if applicable, of:
 - a) cleaning solutions;
 - b) the temperature of cleaning solutions;
 - c) inspection points;
 - d) the quantity of hot water required;
 - e) contact times and flow rates;
 - f) any special cleaning requirements; and
 - g) washline injector settings.
- (5) The cleaning instructions should cover all components, including milklines, the milk receiver, dead end points etc.

13.2 Cleaning Solutions

- (1) Manufacturers and suppliers of cleaning chemicals must provide written cleaning instructions to be used with their programme, and these must be consistent with the product label.
- (2) Only detergents and sanitisers approved by MPI for use in farm dairies may be used. The approval must be stated on the label or obtained directly from the register of approved chemicals (known as dairy maintenance compounds) available on the MPI website at <http://www.foodsafety.govt.nz/industry/sectors/dairy>.
- (3) Detergent and sanitiser manufacturers are required to specify the use temperatures and concentrations for any approved detergent or sanitiser. The temperature of the cleaning solution should be checked at the point of discharge. Hot wash discharge temperatures must be greater than 55°C.
- (4) Refer to clauses 6.5 Cleaning Materials and 6.7 Milking Plant Cleaning for additional information regarding cleaning materials.

Note: Products approved for farm dairies by MAF or NZFSA are also acceptable.

13.3 Minimum Quantities of Cold Water Required for Cleaning Plant and Vats

- (1) Enough cold water is needed prior to cleaning to flush milk residues from the plant to the stage where the discharge liquid runs clear. In addition, sufficient cold water must be available to rinse cleaning chemicals from the plant following cleaning or sanitising. Usually a total of 10 - 20 L per cluster (product flush and cleaning) and 4% of the vat volume is sufficient, but a higher volume may be required for larger vats.

13.4 Minimum Quantities of Hot Water Required for Cleaning Plant and Vats

13.4.1 Water Heaters

- (1) One or more water heaters must be provided at the farm dairy. These must be capable of heating the required amount of water to the correct cleaning temperature. They must be made from materials that do not release toxic substances into the water.
- (2) The minimum quantity of hot water available must be 10 L per set of cups and 2% of the vat volume with a minimum volume for vats of 120 L.
- (3) The most appropriate water heaters are dairy-type water cylinders and associated valves that comply with the relevant NZS 4600 series standard.
- (4) Alternative approved heating systems may be installed where there is evidence that they will meet the requirements of this Code and quality outcome standards as determined by the dairy company.

13.4.2 Cleaning Systems for Standard Milking Machines

- (1) New farm dairies must have recirculation cleaning systems.
 - a) jetter and bucket systems – allow a minimum of 10 L/cluster of hot and cold water, at a flow rate of not less than 3 litres/minute through each jetter.
 - b) reverse flow systems – allow 20 litres/cluster of hot and cold water at a flow rate of not less than 15 litres/minute. Note that reverse flow cleaning is not a recommended cleaning system.
- (2) Recycling systems are recommended.

13.4.3 Twin Cup Systems

- (1) For any machine (and where grading history is satisfactory and assessments/plant checks show no contamination at any time):
 - a) the milk line must be no greater than 75 mm internal diameter (ID) with centres not greater than 600 mm;
 - b) there must be no cluster (only a “Y-Piece that connects directly to the dropper”);
 - c) there must be monthly plant checks, carried out by the farm manager or delegated person, which show no build-ups within the plant;
 - d) the grading history must show consistent bacterial counts that comply with current standards. If milk quality becomes an issue due to lack of hot water then increased hot water volume can be demanded by either the Farm Dairy Assessor or RMP Operator; and
 - e) during the farm dairy assessment, there must be no major or critical sanitation hazards that relate directly to the hot wash system and there must be no sanitation hazards for the clusters and milkline.

13.4.4 Cleaning Systems for Vats

- (1) Effective vat cleaning using mechanical systems is dependent on the following key factors:

- a) correct water volume;
 - b) temperature;
 - c) contact time;
 - d) pump size;
 - e) delivery pipe length and diameter;
 - f) spray ball selection; and
 - g) return pipe length and diameter.
- (2) For new or modified/upgraded installations there must be a filter on the inlet pipe to minimise the risk of spray head blockage. This filter must not restrict cleaning solution flow rates below recommended levels.
 - (3) All new farm dairies must have recirculation cleaning systems for vats.
 - (4) The design and placement of spray heads must achieve complete coverage of all target surfaces.
 - (5) Pump selection and pipe design should meet spray ball flow and pressure requirements. All unions under pressure must be pressure type unions capable of withstanding 400 KPa. Nylon/steel cone seal type unions or moulded rubber bends/sleeves must not be installed on vat wash delivery lines.
 - (6) The maximum water temperature for vat cleaning should be 82°C to avoid damage to the cooling pad.
 - (7) For manual systems the volume of hot water required for manual cleaning of the vat is dependent on the individual system used and should be determined from the outcome standards. Extreme care must be taken when manually cleaning vats. Wear protective clothing at all times and always follow safety guidelines outlined on the detergent container label.

13.4.5 Multiple Vat Installations

- (1) When more than one vat is installed, it is necessary to ensure the vats can be rinsed separately after collection without adding water to other vats that still contain milk. The CIP system(s) for each of the vats must be capable of being operated independently by the tanker driver.

13.4.6 Air Pockets

- (1) Special care must be taken to design and install equipment so that no stabilised air pockets occur during cleaning.
- (2) Where dead ends are necessary, special provisions must be incorporated to wash them in place or instructions given to manually clean them.

13.4.7 Support

- (1) The pipelines used in cleaning circuits must be adequately supported and all joints made secure in a manner, which is safe for the operator and suitable for the specified cleaning procedures and pressures.

13.4.8 CIP-Milking System Segregation

- (1) All connections between the cleaning solution circuit and milking system under vacuum must be constructed to prevent the intermixing of milk and cleaning solutions during the milking operation. To achieve this:
 - a) either the connections between the cleaning solution circuit, milking system or air system must be disconnected during the milking process; or
 - b) the connection between the cleaning solution circuit and the milking system must be vented.

13.4.9 Further Information on CIP Design

- (1) Further information on the design of CIP systems can be found in:

- a) Symposium on Design and Operation of Cleaning Systems in the Dairy Industry. NZ Society of Dairy Science and Technology, Palmerston North, 1980;
- b) IDF Bulletin 100: 1977. Safety and Reliability of Automated Dairy Plant;
- c) IDF Bulletin 117: 1979. Design and Use of CIP Systems in the Dairy Industry; and
- d) 3A 605-04 Accepted Practice, "Permanently Installed Product Pipelines and Solution Pipelines and Cleaning Systems used in Milk and Milk Product Processing Plants", 01 August 1994.

Part 14: Fabrication of Farm Dairy Equipment

14.1 Materials for Contact Surfaces

14.1.1 General

- (1) The criteria in this Part applies to the selection and use of materials for contact surfaces.
- (2) A contact surface is a surface in direct contact with milk, or a surface from which liquids may drain, drip or be drawn into the milk or onto direct milk contact surfaces. As such contact surfaces includes those parts of the cleaning systems carrying cleaning and sanitising solutions.

14.1.2 Toxicity

- (1) In the completed or installed form, the material must not release substances that are toxic, that will taint the milk, or that may render the milk unfit for its intended purpose at any time during routine use.
- (2) Chemical compounds of concern that are specifically restricted are published on the MPI website – refer to clause 6.6 Restricted Chemicals. These chemicals may only be used within the restriction provisions identified. Where a compound is listed and there is no provision for use then the chemical must not be used. In addition materials intended for use in the farm dairy must not contain any Substance of Very High Concern (SVHC) as listed in European Chemicals Agency (ECHA) SVHC candidate list of Regulation (EC) No. 1907/2006 - Registration, Evaluation and Authorisation of Chemicals (commonly referred to as the REACH standard). Also refer to clause 14.1.5 Acceptable Materials.

14.1.3 Cleanability

- (1) The material must be able to be effectively cleaned by MPI approved detergents and sanitisers when following cleaning procedures specified by the manufacturer or detergent supplier.
- (2) "Clean" in this context is considered to be free from visible contamination and biofilms, and having no measurable effect on the quality of milk as it passes over the milk contact surface of the component.

14.1.4 Durability

- (1) The material must be:
 - a) **Resistant to water and water vapour:**
In addition to resisting deterioration, materials should be impervious to water (except for filter element materials);
 - b) **Resistant to milk and chemicals:**
The material and its finish must be resistant to milk, to chemicals approved by MPI for use in farm dairies and to the physical effects of the cleaning procedures specified by the manufacturer, or have a quantified life under conditions specified by manufacturer. The material must be able to withstand regular cleaning and sanitising programmes;
 - c) **Resistant to physical damage:**
The material must be resistant to chipping, flaking or de-lamination, abrasion, machinery vibration and impacts likely to be encountered in its intended use. Glass thermometers are not to be used because of the risk glass poses; and
 - d) **Resistant to extreme temperature fluctuations:**
The material must maintain its original properties after being subjected to temperature changes that may occur in a farm dairy. Normally this will be from -20°C to 100°C unless otherwise specified by the manufacturer.
- (2) The external surfaces of milk contact materials must also be able to be readily cleaned and have a suitably smooth finish that will minimise the opportunity for soil or dust to adhere to the surface.

14.1.5 Acceptable Materials

- (1) Acceptable materials are those which in their intended use suffer no chemical or physical change liable to adversely affect the quality of the milk or the function of the component of which they form a part. For instance:
 - a) the material may be listed in a recognised register of food grade materials, e.g. plastics complying with the 3A Sanitary Standards, or the United States Government Code of Federal Regulations, Title 21, "Food and Drugs", Parts 170-199; and
 - b) stainless steel tube used in the fabrication of dairy equipment shall meet the manufacturing requirements of Australian Standard AS 1528.1 or equivalent.
- (2) Milk produced in New Zealand is expected to meet the international standards, and as such the milk contact materials used must meet international standards. Manufacturers and suppliers of materials intended for use in the farm dairy must ensure that chemical migration is avoided under all foreseeable operating conditions so that milk will not become contaminated, either through direct contact or through indirect contact such as water and/or air.
- (3) Materials must also be free rinsing and designed so that cleaning chemicals are readily removed through rinsing as part of the cleaning regime.
- (4) Substances of very high concern must not be used in contact surface – refer to clause 14.1.2 Toxicity.
- (5) For clarity, PVC is not a suitable material for the transfer of CIP solutions.
- (6) Materials in common use are:
 - a) Austenitic or duplex stainless steel complying with the requirements specified for the relevant grade in ASTM A240M;
 - b) austenitic stainless steel equivalent to the American Iron and Steel Institute 300 series;
 - c) plastics, silicones, rubber and rubber-like materials;
 - d) iron (cast iron is suitable only for limited use in the transport of cleaning solutions, e.g. for pump heads and impellers not carrying milk;
 - e) fabrics (certain fabrics are permitted for filter elements); and
 - f) some sealants, e.g. glues used on plate heat exchangers.
- (7) Further information on suitable materials can be obtained from the following references.
 - a) **Metals**
 - i) LH Boulton and NA Miller. Using Stainless Steel. DSIR Information Series 2. DSIR, Wellington, 1982.
 - b) **Stainless steel**
 - i) Australian Standard AS 1528.1. Tubes (stainless steel) and tube fittings for the food industry.

Note: Suitable equivalents may be approved by the RMP Operator with sufficient evidence provided.

- c) **Plastics**
 - i) Modern Plastics Encyclopaedia. Pg 86-87. McGraw-Hill, New York, 1985.
 - ii) The 3A Sanitary Standards 20-22: 01 June 2003, "Multiple-use Plastics Materials Used as Product Contact Surfaces for Dairy Equipment".
 - iii) United States Government Code of Federal Regulations, Part 177, "Indirect food additives – Polymers".
- d) **Rubber**
 - i) German Federal Institute for Risk Assessment (BfR) "XXI. Commodities based on Natural and Synthetic Rubber".
- e) **Silicones**

- i) German Federal Institute for Risk Assessment (BfR) "XV. Silicones".
- f) **Milk filter materials**
 - i) BS 3424, Part 4: 1982, "Testing of Coated Fabrics. Method 6. Method for determination of breaking strength and elongation at break".
- g) **Non-Toxicity and Non-Tainting**
 - i) AS4020: 2002, "Testing of Products for use in contact with drinking water".

14.2 Materials for Non-Milk Contact Surfaces

14.2.1 General

- (1) Non-milk contact surfaces:
 - a) either carry the cleaning solution water before the cleaning chemical is added; or
 - b) carry only air and (under normal milking, cleaning and draining operations) there is no possibility of liquids reaching a milk contact surface.
- (2) The materials will have similar properties to the milk contact surface materials but they are less stringently defined.

14.2.2 Toxicity

- (1) In the completed or installed form, the material must not release toxic substances.

14.2.3 Cleanability

- (1) The material must be able to be cleaned.

14.2.4 Durability

- (1) The material must be:
 - a) resistant to chipping, flaking or de-lamination, and as such fibreglass is not considered a suitable material;
 - b) able to withstand exposure to water and, if necessary, heat under normal operating conditions;
 - c) resistant to abrasion, machinery vibration and impact likely to be encountered in its intended use; and
 - d) resistant to pressure and stress likely to be encountered during intended use.

14.2.5 Acceptable Materials

- (1) Any acceptable milk contact surface is automatically satisfactory as a non-milk contact surface. Other materials which meet the criteria above are also acceptable.

14.3 Fabrication and Installation

14.3.1 Good Manufacturing Practices

- (1) All components must be safe to handle (e.g. finished to remove burrs and unnecessarily sharp edges) and installed in a way that minimises the risk of accidents when operating and cleaning the milking machines. This includes the provision of guards to cover pump shafts, and safe washing systems. This is also required under the Health and Safety in Employment Act 1992.

14.3.2 Surface Finish

- (1) All milk contact surfaces must be finished to a Ra value of <math><1 \mu\text{m}</math>. All milk contact surfaces must be free from imperfections such as pits, folds and crevices.
- (2) The surface must be free from “grinding spot” rusting from mild steel contamination.

14.3.3 Prevention of Contamination

- (1) Equipment must be designed to protect milk from external contamination. There must be a vessel (sanitary trap or interceptor) between the milk and air systems in all new installations and upgrades. External surfaces of milk harvesting equipment must be able to be kept visually clean by the operator.

14.3.4 Bonding of Materials to Milk Contact Surfaces

- (1) Where rubber and rubber-like or plastic materials forming milk contact surfaces are bonded to a base material, the bond must remain continuous and mechanically sound under intended conditions of use.

14.3.5 Inspection Points

- (1) Where there is a CIP system installed that meets the basic engineering requirements of temperature, contact time, wash volume, detergent concentration and solution flow rate, the number of inspection points may be minimised.

14.3.6 Internal Radii

- (1) For internal angles of 135 degrees or less, a radius of not less than 3 mm is recommended. When the radius is less than 3 mm, the milk contact surface of the internal angle must be readily accessible for cleaning and inspection as required.

14.3.7 Threads, Springs, Mesh and Other Difficult-to-Clean Surfaces

- (1) Threads, springs, mesh and other difficult-to-clean surfaces must only be used on milk contact surfaces where alternatives are not practicable and any hazards are minimised e.g. pump impellers may be attached to shafts by threads, provided the unit is shown to remain sanitary in operation.

14.3.8 Tube Fittings

- (1) All tube fittings used in the manufacture of dairy equipment which is deemed a milk contact surface shall comply with the requirements of the following standards
 - a) “AS 1528.2 Tubes (stainless steel) and tube fittings for the food industry, Part 2: Screwed couplings”;
 - b) “AS 1528.3 Tubes (stainless steel) and tube fittings for the food industry, Part 3 Butt weld tube fittings”; and
 - c) “AS 1528.4 Tubes (stainless steel) and tube fittings for the food industry, Part 4 Clamp liners with gaskets”.
- (2) The flaring of stainless steel, such as for unions, is not considered best practice and should be avoided.

14.3.9 Seals, Glands and Bearings

- (1) Shaft seals, glands and bearings that come in contact with milk must be able to be removed for inspection and maintenance. Any bearing having a milk contact surface must be of a non-lubricating type and comply with clause 14 Fabrication of Farm Dairy Equipment. Mechanical rotary seals must be used rather than packed glands.
- (2) Non-milk contact equipment having seals and bearings must be designed and fabricated so that lubricant cannot leak, drip, be forced into or in any way contaminate the milk contact surface.

14.3.10 Openings

- (1) Openings on equipment, including those with hinged or removable covers, must be designed to prevent the entry of extraneous material, e.g. by using raised edges. Lids and doors on equipment must be close-fitting, self-draining and sufficiently rigid to prevent buckling. They must be designed so that any liquid or dry material on the exterior will not touch milk contact surfaces e.g. lids should have downward edges of at least 10 mm and be close fitting.

14.3.11 Corrosion

- (1) Equipment must be designed and manufactured to discourage stress corrosion, crevice corrosion or any other corrosion which could cause hygiene or contamination problems.

14.3.12 Clearance for Cleaning

- (1) All equipment must be installed to allow easy accessibility for cleaning.
- (2) Where equipment is supported on legs, these either have rounded ends or are sealed to the floor.
- (3) There should be sufficient clearance between the base of the equipment and the floor to allow the floor beneath to be cleaned (refer [Table to 3: Recommended Clearances – Equipment to Floor](#)).

Table 3: Recommended Clearances – Equipment to Floor

Width (m)	Minimum Clearance (mm)
Up to 0.5	150
0.5 – 2.0	200
Over 2.0	250

14.3.13 Cleanability

- (1) All equipment and piping must be able to be cleaned either manually or preferably in-place under normal conditions of installation and use. They must be designed so there is no permanent distortion or displacement at the specified cleaning temperature. Equipment designed to be manually cleaned must be able to be readily disassembled. Milklines and equipment to be cleaned in place must have fittings suitable for this purpose.

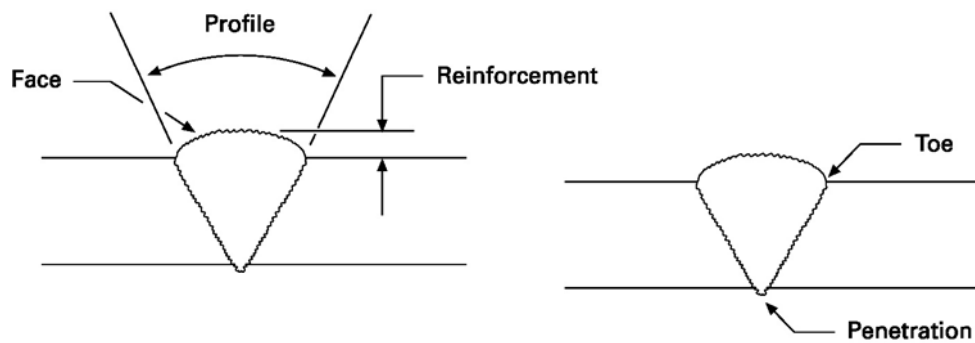
14.3.14 Drainage

- (1) All equipment must be capable of being drained, preferably self-drained, and all milk and air lines sloped to drain points, so that no pools of standing liquid are left after cleaning. All equipment and pipelines must be supported so that they remain in alignment and position and must not drain on to other equipment.

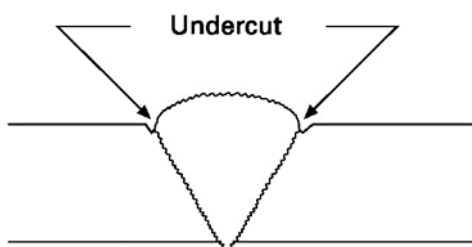
14.3.15 Welding of Stainless Steel

- (1) All welds must meet the standards specified in AS/NZ 2980: 2007, "Qualification of Welders for Fusion Welding of Steels". Welding should be carried out by personnel certified to this standard.
- (2) Internal grinding and/or polishing is recommended on all pipeline welds and must be carried out where purge welding is not used. Unpolished welds are satisfactory providing they meet the criteria laid down in this clause. Where they do not meet the criteria, they must be ground and polished to <1 µm Ra.

Note: For further information on weld inspection standards refer to MAF Quality Management Technical Report T3/83, "Inspection of Welds in Stainless Steel Pipes" and for information on stainless steel fabrication refer to "Standard of Practice for the Fabrication of Stainless Steel Plant and Equipment" published by the New Zealand Stainless Steel Development Association, 2001.

Figure 5: Good Weld Profile

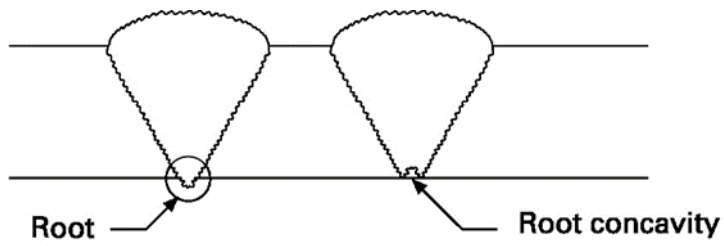
- (3) The full length of both the face and root of the finished weld must comply with the following:
- a) **Shape of profile**
 - i) The external profile must be uniform and free from overlap at the toes of the weld. It must show a maximum of 2 mm reinforcement which must blend smoothly with the parent metal.
 - ii) The start/stop positions in the weld must merge smoothly and show no pronounced hump or crater in the weld surface.
 - b) **Freedom from surface defects**
 - i) The surface of the weld must be reasonably smooth, i.e. it must be free from cracks, cavities and porosity.
 - c) **Overheating**
 - i) There must be no evidence of localised overheating.
 - d) **Stray arc strikes**
 - i) The surface must be free from stray arc strikes.
 - e) **Undercut (weld face)**
 - i) Any undercut less than 0.2 mm deep may be disregarded. No undercut must be deeper than 0.5 mm. Localised undercuts deeper than 0.2 mm, but not more than 0.5 mm deep, must not have a total length of more than 25 mm in the entire test piece.

Figure 6: Undercut Weld Face

- f) **Penetration**
 - i) A slight penetration bead should be present but must not protrude into the bore more than 1 mm. The penetration bead must be clean and free from oxidation of the weld metal and must merge smoothly with the parent pipe. If there is complete root fusion, root concavity at the bore is acceptable, provided that:
 - 1) the depth of root concavity is not greater than 0.5 mm;
 - 2) the thickness of the weld is not less than the pipe wall thickness; and
 - 3) the root concavity merges smoothly into the adjacent surfaces.

Note: A visual examination for penetration should be carried out after sectioning the test piece.

Figure 7: Weld Penetration



g) **Alignment**

- i) Misalignment of the bore must not exceed 0.5 mm and axial misalignment must not exceed 5 degrees.

Part 15: Plant and Premises Checks

15.1 System Checks

- (1) An assessment of each farm dairy each season is required to ensure compliance with the RMP under which the farm dairy operates. This assessment must be carried out by a Farm Dairy Assessor recognised as competent under the RMP.

15.2 Monthly Checks

- (1) In addition, farmers should carry out their own monthly plant and premises checks and record the results of these checks. These checks are a useful training exercise for new staff and can prevent problems which could affect milk quality. The use of a recognised quality management system for on-farm practices is strongly encouraged. This system should address issues such as animal health management, plant and premises hygiene, milk cooling, structures and facilities management and environmental management.
- (2) Key assessment points in such a system will include but not be limited to:
 - a) vat surfaces (interior and exterior), milkline, clusters, receiver and air systems;
 - b) milk storage and collection areas, yards and races, milking area, general surrounds;
 - c) water quality;
 - d) effluent management;
 - e) expired chemicals;
 - f) chemical and pesticide use;
 - g) animal health and welfare management;
 - h) expired veterinary medicines or agricultural compounds;
 - i) waterway and riparian area management;
 - j) litter control; and
 - k) worker safety and health.
- (3) To carry out an effective plant assessment it is recommended that the following items are used:
 - a) a torch (of a type without a glass lens);
 - b) a thermometer (constructed from food-safe materials, refer to clause 6.4 Cleaning System for restrictions on the use of glass thermometers); and
 - c) a device designed for checking rubberware condition and hygiene (a trier) is used.

Part 16: Farm Dairy Assessment Standards

16.1 Assessment of Farm Dairies

- (1) Farm dairy assessments are a regulatory requirement.
- (2) All farm dairies must be assessed by a Farm Dairy Assessor recognised under the RMP to the competency requirements defined in NZCP2: Assessment of Farm Dairies, and as outlined in the Operators RMP, to confirm the farm dairy meets the requirements of this Code. The farm dairy assessment must follow NZCP2 or an alternative system approved in writing by MPI.
- (3) Following the assessment Farm Dairy Operators must sanitise, drain and rinse any part of the milking plant that has been opened or subject to hygiene assessment.
- (4) The Farm Dairy Operator is required to promptly rectify any defects identified during the farm dairy assessment and is expected to address any instructions made. In addition, any recommendations offered should be given full consideration.
- (5) For routine assessments, the Farm Dairy Assessor will endeavour to provide advance notice to the Farm Dairy Operator of the upcoming assessment.
- (6) From time-to-time, the Farm Dairy Assessor is required to observe milking procedures.
- (7) Farm Dairy Assessors must rate each finding as it is first observed. If a non-conformance is rectified during the assessment, the assessor will note this down, but the original rating will stand.

16.2 Unannounced Assessments of Farm Dairies

- (1) Farm Dairy Assessors are required to undertake a certain number of unannounced farm dairy assessments for each dairy company each season.
- (2) For unannounced assessments, the Farm Dairy Assessor may provide very short notice (less than 6 hours) of the upcoming assessment.

Part 17: Non-Compliances

17.1 RMP (Dairy Company) Action

- (1) If the supplier fails to comply with the requirements of the legislation or this Code, the registered RMP, or other specified criteria or requirements such as a Supply Contract, Terms and Conditions of Supply or Company Supplier's Handbook, then any of the following may be undertaken by the RMP Operator:
 - a) issue an order requiring hazard correction;
 - b) increase inspection or audit frequency;
 - c) deem the milk to be unfit and refuse collection as required under the APA;
 - d) suspend collection until such time that the hazard is corrected; or
 - e) withdraw coverage of the farm dairy under the RMP.
- (2) The RMP Operator may also:
 - a) increase raw milk testing frequency; or
 - b) take any other appropriate action, which assures the safety of raw milk supplied.

17.2 Transport Operator Action

- (1) If the tanker driver has reasonable cause to suspect that any particular supply of milk is not safe, the driver must:
 - a) advise the RMP Operator or the Farm Dairy Assessor recognised under the RMP; and
 - b) decline to accept and transport that supply of milk.

17.3 Recognised Person Action

- (1) A Recognised Person is granted freedom of access to all premises under the RMP, including farm dairies. As a minimum this freedom extends to all places and things relevant to dairy processing operations under the RMP including farm dairy, milking and milk storage, feed storage, animals and animal health records.

17.4 Animal Products Officer Action

- (1) An Animal Products Officer has certain powers provided under the APA, including right of entry and the power to direct disposal of non-conforming dairy material. In serious situations an Animal Products Officer may specify the actions that must be adhered to at a farm dairy.

Schedule 1 – Definitions

(1) The following terms are used within this Code:

APA means the Animal Products Act 1999

ACVM Act means the Agricultural Compounds and Veterinary Medicines Act 1997

Agricultural Compounds means:

- a) Any substance, mixture of substances, or biological compound, used or intended for use in the direct management of plants and animals, or to be applied to the land, place, or water on or in which the plants and animals are managed, for the purposes of:
 - i) managing or eradicating pests, including vertebrate pests;
 - ii) maintaining, promoting, or regulating plant or animal productivity and performance or reproduction;
 - iii) fulfilling special nutritional requirements;
 - iv) the manipulation, capture, or immobilisation of animals;
 - v) diagnosing the condition of animals;
 - vi) preventing or treating conditions of animals;
 - vii) enhancing the effectiveness of an agricultural compound used for the treatment of plants and animals; or
 - viii) marking animals; and
- b) includes:
 - i) any veterinary medicine, substance, mixture of substances, or biological compound used for post-harvest treatment of raw primary produce;
 - ii) anything used or intended to be used as feed for animals; and
 - iii) any substance, mixture of substances, or biological compound declared to be an agricultural compound

Animal Products Officer means a person appointed as an Animal Products Officer under section 78 of the APA

animal treatments means any drug, medicine, remedy, therapeutic preparation, or any biochemical substance, which is manufactured, imported, advertised for sale or is sold for any of the following purposes:

- a) curing, diagnosing, treating, controlling, or preventing any disease in animals;
- b) testing any animals in relation to any disease;
- c) destroying or preventing parasites in or on animals;
- d) maintaining or improving the health, condition, or productivity of any animal; or
- e) capturing or immobilising any animal;

this does not include any preparation, substance, or product which is used as a food for animals

bulk milk tank means a vessel used for the storage of milk that may be lidded or enclosed

CIP means cleaning in place

clean means free of soil, food residue, dirt, grease, cleaning or sanitising agents or other objectionable matter

commencement of milking means the time at which the first milk is drawn from an animal that is producing milk intended for supply at a discrete milking

completion of milking means the time at which the last cluster is removed from an animal that is producing milk intended for supply at a discrete milking, and without delaying the milking without just cause

Dairy Processing Specifications means the current version of the Animal Products (Dairy Processing Specifications) Notice 2011

diseased animal means a milking animal which is suffering from an illness, which has the potential to make raw milk unfit for the manufacture of dairy products for consumption

effluent ponds means a constructed ponding system designed for the holding and oxidation of faecal and urinary animal wastes before discharge into an outfall

effluent system refers to the full series of component parts that are intended to contribute to the collection, movement, temporary or permanent storage, separation, treatment and disposal of dairy effluent, whether or not the effluent is raw or treated

farm dairy means a place where milking animals are milked on a permanent or temporary basis; and includes:

- a) any stockyard, milking yard, feedyard, silo pad, or other construction associated with or involved in the activity of extracting milk from milking animals; and
- b) any place where milk from the milking animals is first collected, filtered, deposited, cooled, stored, or treated for transport or for further processing;

but does not include any place where any further processing takes place, or transport to that place

Farm Dairy Assessment means an activity carried out for the purpose of verifying that premises, equipment, facilities, processes, procedure and services comply with the applicable standards

Farm Dairy Assessor means a person recognised as competent under a RMP to carry out an assessment of design, siting, construction, conditions, procedures and systems of, or at, a farm dairy to specified criteria

Farm Dairy Operator means the person in charge of operations at a farm dairy, including the extraction of milk from milking animals

HACCP means the Hazard Analysis and Critical Control Point system adopted by the Codex Alimentarius Commission

Notifiable Diseases means any disease specified in Schedules 1 and 2 of the Health Act 1956, as follows:

Notifiable Infectious Diseases (to a Medical Officer of Health and Local Authority)

Acute gastroenteritis	Campylobacteriosis
Cholera	Cryptosporidiosis
Giardiasis	Hepatitis A
Legionellosis	Listeriosis
Meningoencephalitis – primary amoebic	Salmonellosis
Shigellosis	Typhoid and paratyphoid fever
Yersiniosis	

Notifiable Infectious Diseases (to a Medical Officer of Health)

Acquired Immunodeficiency Syndrome	Anthrax
Arboviral diseases	Brucellosis
Creutzfeldt-Jakob disease and other spongiform encephalopathies	<i>Cronobacter</i> species
Diphtheria	Haemophilus influenzae b
Hepatitis (viral) not otherwise specified	Hepatitis B and Hepatitis C

Highly Pathogenic Avian Influenza (including HPAI subtype H5N1)	Hydatid disease
Invasive pneumococcal disease	Leprosy
Leptospirosis	Malaria
Measles	Middle East Respiratory Syndrome
Mumps	<i>Neisseria meningitidis</i> invasive disease
Non-seasonal influenza (capable of being transmitted between human beings)	Pertussis
Plague	Poliomyelitis
Q fever	Rabies and other lyssaviruses
Rheumatic fever	Rickettsial diseases
Rubella	Severe Acute Respiratory Syndrome (SARS)
Tetanus	Verotoxin-producing or Shiga toxin-producing <i>Escherichia coli</i>
Viral haemorrhagic fevers	Yellow fever
Other	
Cysticercosis	Taeniasis
Trichinosis	Tuberculosis (all forms)

inhibitory substance means a substance that may inhibit the life process of any living micro-organism that is present in milk or that is introduced into milk for the purposes of a manufacturing process. It includes any substance that may be detected in milk by an approved test

milk contact surface means a surface in direct contact with milk, or a surface from which liquids may drip, drain or be drawn in to the milk. It includes those parts of the cleaning system carrying detergent solutions

milking animal means any animal kept for the production of milk intended for trade

milk receiving area means the part of a farm dairy where the machinery necessary for the mechanical operation of a milking machine is situated. This area could include the milk storage room or end of the pit in the milking area

milk storage area means the part of a farm dairy or an area where milk is stored before transport from the farm dairy. The milk storage and receiving room could also be combined. An area could be set within, alongside or at a distance from the dairy

milking area means the part of a farm dairy where animals are prepared for milking and are milked

milking plant includes any milking machine, milk pumping equipment, milk cooling equipment, milk storage equipment or separator and any other plant and equipment with which milk comes into contact in a farm dairy

Off Paddock Management System is a form of housing where dairy cattle are kept on a constructed surface. These include purpose-built buildings (sheds or barns), stand-off areas and feed pads (where these incorporate a constructed base)

offal hole means a hole dug to dispose of parts cut off carcasses or entrails of animals, and other types of refuse or garbage

owner means any agent, manager, lessee, or bailee of an owner; and

- a) in the case of a farm, a farm dairy, or any part of a farm or farm dairy, a sharemilker of an owner; and
- b) where an owner is a body corporate, every person who is a manager, secretary, director or other principal officer (however described) of the body

pathogens are bacteria that have the ability to cause disease

pesticide means any substance used to destroy, control or repel any form of plant or animal life. Families of pesticides are referred to by their chemical composition or use type e.g. herbicides control weeds, insecticides control insects, fungicides control fungi etc

poultry means domestic fowls, ducks, geese and turkeys and the like, includes the carcasses of those birds

raw milk means milk produced in accordance with a registered RMP and that has not been subjected to any processing intended to alter the quality or compositional characteristics of the milk

Recognised Person means a natural person recognised by the Director-General under section 103 or 104 of the APA and includes Risk Management Programme Verifiers and MPI auditors

Restricted Veterinary Medicine (RVM) means veterinary medicines registered under the ACVM Act that have conditions restricting their sale, purchase and use

Risk Management Programme (RMP) means a programme required under Part 2 of the APA to ensure that risks are appropriately and effectively managed

RMP Operator means the owner of the RMP registered under the APA for the processing of dairy material (usually a dairy company)

rubberware includes rubber, synthetic rubber, silicon-based products and plastic

sanitary trap means a vessel between the milk system and the air system, to prevent contamination by movement from one to the other

secure water means water that:

- a) is sourced from a depth greater than 10 m;
- b) is not influenced in any way by surface water; and
- c) meets all other criteria outlined in the Dairy Processing Specifications for secure water

self-draining means a component or part of a system which will drain automatically e.g. a flap which opens when vacuum is released

suitable means fit for the purpose for which it is intended. For materials, generally meaning durable, impervious, able to be cleaned by normal procedures and, in the case of milk contact surfaces, safe for foods

surface water means water that:

- a) is sourced within 10 m or less from the ground surface;
- b) is in any way influenced by surface water; or
- c) that meets any other criteria required to be defined as surface water as outlined in the Dairy Processing Specifications

sump means a specifically constructed holding tank made of concrete or some other impervious material intended for temporary storage of wastewater and effluent

treated animal means a milking animal that is being treated with, or is within the withholding period of, an animal treatment which is registered or exempt under the ACVM Act

vat means the same as **bulk milk tank**

Veterinary Medicine means any substance, mixture of substances, or biological compound used or intended for use in the direct management of an animal

yards means those parts of a farm dairy used for holding livestock for the purposes of milking, breeding or veterinary treatment