4.03 Milk handling and storage

4.03.1 Unpasteurised milk is a potentially hazardous food.

4.03.2 During handling and storage the safety and suitability of food is maintained by ensuring it is handled and stored in appropriate conditions and temperature.

4.03.3 From the time of production the milk must be cooled immediately to 4°C or any lower temperature necessary to minimise the growth of harmful micro organisms.

4.03.4 The product must always be protected against contamination from environmental sources during storage before packaging

4.04 Milk packaging

4.04.1 When packaging milk, a business must use only packaging materials and methods that do not contaminate the milk. Milk for packaging must be free from chemical contamination, foreign matter and microbial contamination.

4.04.2 All packaging should be checked after packaging is completed to ensure the label, size and type of packaging is correct.

4.04.3 Packaging materials should be protected from contamination by during storage.

4.05 Milk Distribution

4.05.1 During distribution milk must be protected from the likelihood of contamination and spoilage.

4.05.2 As milk is a potential hazardous food, temperature must be maintained 4°C or below at all times.

4.05.3 Premises and vehicles must be maintained in a good and clean condition.

4.06 Food safety, after purchase

4.06.1 Appropriate handling information relating to the microbiological safety of the food should be made available to a purchaser of food. This is necessary where these foods are potentially hazardous and the microbiological safety of commodities has to be maintained. For the purchaser this would involve the control of storage temperature, and observing relevant use by dates. This information can be provided as instructions on labels or as information provided at the point of sale.

4.07 Health and hygiene of food handlers

4.07.1 Food born diseases can be transmitted through food or food utensils by infected workers. To reduce the likelihood of contamination of food or food contact surfaces people known to be or suspected of suffering from or to be a carrier of a disease or infection must be restricted from activities that may result in contamination of food and food contact surfaces.

4.07.2 All persons entering a processing area must wash hands to minimise the potential of contaminating food. Sneezing or coughing over food can also cause contamination. Behaviour such as eating, smoking, chewing can also cause contamination and should be prohibited in food preparation areas.

4.08 Cleanliness and sanitation of premises

4.08.1 Premises, equipment and surroundings must be maintained to an acceptable standard of cleanliness and sanitation.

4.08.2 Documented cleaning and sanitising programs using approved detergents and sanitisers should be written for the following:
4.08.2(a) equipment, machines and utensils;
4.08.2(b) floors, walls and ceilings.

4.08.3 Programs should detail frequency, chemicals (detergents and sanitisers), time and temperature of cleaning or sanitising process.

4.09 Good Manufacturing Practices (GMP)

4.09.1 Good Manufacturing Practices are essential in preventing contamination of products with harmful micro organisms, chemicals and foreign matter.

4.09.2 The practices used during production and packaging should be scrutinised to ensure all possible precautions are being taken to reduce possible sources of contamination.

4.09.3 In milk production critical activities take place in what is not an ideal environment. Animals are being handled in close proximity to milk packaging areas and in most cases by the same people. Good hygiene practices are essential to reduce the possibility of cross contamination occurring. Written procedures must be set out and implemented for these activities to ensure correct practices are always followed.

4.10 Temperature Measuring Devices and Calibration

4.10.1 Where potential hazardous food is handled, a temperature-measuring device (thermometer) is required. It must be:
- readily accessible
- able to accurately measure the temperature of potentially hazardous food.

4.10.2 The thermometer should be calibrated against a reference thermometer at regular intervals.

4.10.3 Any measuring device that is critical to the manufacturing process must be regularly tested to ensure that that it is correctly calibrated and reporting. Critical equipment includes thermometers for the cold room and the hot water for cleaning.

4.10.4 A standard thermometer should be used to calibrate the working thermometers at least every month. The standard thermometer must be verified at ice point every six months. Records of the standard thermometer and the working thermometer readings and any corrective action taken must be maintained.

4.11 Maintenance of Premises Appliances and Transport Vehicle

4.11.1 Premises and those parts of vehicles that are used to transport product must be maintained in good repair and good working order in regard to their use.

4.11.2 Maintenance and hygiene checks must be carried out on milking, packaging and cooling equipment and premises, including storage areas, at least every 2 months.

4.11.3 The maintenance and hygiene checks must be recorded.

4.11.4 Shed fixtures and fittings must be checked regularly and replaced if necessary.

4.11.5 Refrigeration units must be serviced regularly.

4.12 Animal and Pest Control

4.12.1 The premises must be kept free from animal and pest. The exception being that animals while being milked are allowed access to the milking shed but must not be housed permanently within 9 metres of the milk room or milk packaging or packaging storage areas.

4.12.2 All businesses must have a pest control program for the premises and must take all reasonable precautions to reduce the potential for vermin to multiply (for example, feed supplies stored away from milk room, animal housing kept clean)

4.12.3 Pest control application must be carried out on a regular basis. Records must be maintained of where, when and what chemicals were used and what types of pests are on the premises. Material Safety Data Sheet (MSDS) must be kept for each chemical used and the chemicals must be kept in a secure cabinet.

4.13 Standard of Food Premises and Equipment

4.13.1 The Regulations and the Code set out requirements for food premises and appliances.

4.13.2 The Regulations and the Code apply to all premises used for the harvesting, storage and packaging of milk.

4.14 Requirements of the Standard

4.14.1 A business producing harvesting packaging distribution or sale of milk for human consumption must comply with the requirements detailed in this Code of Practice.

4.14.2 Location of premises

4.14.2(a) Subject to subclause 4.14.3, food premises must not be located in a place that is likely to cause contamination of food on the food premises.

4.14.2(b) Food premises may be located in a place referred to in 4.14.2(a) only if protective measures are taken.

4.14.2(c) For the purpose of subclause (b) 'protective measures' are measures that:
- will prevent the likelihood of contamination of food on the food premises; and;
- are put in place before food handling operations commence on the food premises.

4.14.2(d) The recommended minimum distances from the milk room for the location of other activities are-permanent housing of cattle -9 metres
- Storage of feed supplies other than in an enclosed container (e.g. Silo, sealed drums) 9 metres
- Poultry and pig houses 45 metres

- Goat sheds and yards 25 metres
- Horse stables and yards 45 metres

4.14.3 Construction and design of premises

4.14.3.1 Food premises must be constructed to a standard that:

4.14.3.1(a) is appropriate for the purposes for which the food premises are used;

4.14.3.1(b) permits the food premises to be easily and effectively cleaned and sanitised; and

4.14.3.1(c) as far as is practicable:
- does not permit the entry of pests; and
- does not provide harbourage for pests.

4.14.3.2 Food premises must be designed in such a way that facilitates production of safe and suitable food.

4.14.3.3 The design of food premises must:
4.14.3.3(a) permit the easy and effective cleaning and sanitising of the food premises and fixtures, fittings;
4.14.3.3(b) appliances on the food premises;
4.14.3..3(c) exclude from food handling areas, as far as is practicable, dirt, dust, smoke, odours or other contaminants;
4.14.3.3(d) as far as practicable
- prevent the entry of pests; and
- not provide harbourage for pests

4.14.3.3(e) provide adequate space for:

- the food handling operations conducted on the food premises and items used for food handling operations;
- any necessary storage of hot and cold water
- cleaning and personal hygiene facilities; storage of garbage, sewage, liquid waste and matter to be recycled, if necessary; and
- removal of garbage, sewage, liquid waste and matter to be recycled from the food premises.

4.14.3.4 The finishes of all internal surfaces should comply with the standards listed in this section.

4.14.3.5 Milk room / Milk packaging room

4.14.3.5(a) Walls and Ceiling

i Walls and ceilings must be provided

ii All walls and ceilings of food premises must be
- durable;

able to be easily and effectively cleaned;
-free from defects; and
-free from any feature that may harbour pests.

4.14.3.5(b) Walls and ceiling provided must have internal surfaces that are:

i smooth;
ii impervious to water and grease; and,
iii sealed at the junction between walls and ceiling.

4.14.3.6 Door openings, windows, and other openings must be constructed, fitted and finished in such a way that:

(a) they are able to be easily and effectively cleaned;
(b) any accumulation of dirt, dust and grease is minimised; and
(c) are fitted with fly screens.

4.14.3.7 Milk Room / Milk Packaging Room Floors

(a) The surfaces of all floors must be:
- durable;
- able to be easily and effectively cleaned; and
- free from defects.

(b) Floors upon which water or other liquids are released by cleaning operations or other activities must be:
- finished with a surface that will not absorb food particles, grease or water, or harbour pests;
- sufficiently and evenly graded to trapped floor waste outlets connected to a drainage system; and
- coved at the junction of walls and floor.

(c) To meet this Code of Practice floors must be tiled or coated with epoxy paint or epoxy resin to make them chemical proof.

4.14.3.8 Ventilation

(a) The premises must have adequate natural or mechanical ventilation to remove steam, vapour, smoke or fumes.

4.14.3.9 Lighting

(a) Food premises must have a lighting system that:
- provides sufficient natural or artificial light for the conduct of the food handling operations and other activities that are conducted on the food premises; and
- is designed and constructed so there is no likelihood it will cause food contamination.

(b) Lights must be protected with a covering.

4.14.3.10 Sewage and waste water

Food premises must have a sewage and waste water disposal system-

- that will effectively remove all sewage and waste water from the food premises and dispose of it into a disposal system;
- that is constructed so there is no likelihood of the sewage or waste water polluting the potable water supply or contaminating:
  - food; or
  - the food premises; and
  - into which all appliances, fixtures or fittings that discharge sewage and waste water so there is no likelihood of food contamination.

(b) If a sewage system is not available waste must be drained at least 25 metres from the milk room.

4.14.3.11 Fixtures fittings and appliances

(a) Food premises must have sufficient numbers of fixtures, fittings and appliances that are adequate for the effective conduct of the food handling operations conducted on the premises.

(b) Fixtures, fittings and appliances of a food premises must be:

- fit for their intended use;
- constructed of material that is:
  - smooth;
  - impervious to water and grease;
  - durable;
  - non-toxic when in contact with food;
  - resistant to corrosion;
  - able to be easily and effectively cleaned; and
  - able to be easily sanitised; and
- designed, constructed, located and installed so:
  - they are able to be easily and effectively cleaned;
  - adjacent walls, floors, ceilings and other surfaces are able to be easily cleaned; and
  - they do not provide harbourage for pests.

4.14.4 Water Supply

4.14.4.1 A supply of hot and cold potable water in sufficient quantities to meet requirements is mandatory.

4.14.4.2. Food premises that need water for food handling operations, cleaning or sanitising must have available an adequate supply of water.

4.14.4.3 Appliances, fixtures and fittings of food premises that are designed to be connected to a water supply must be connected to an adequate supply of water.

4.14.4.4 For the purposes of subclauses above, 'an adequate supply of water' means potable water that is available at a:

(a) volume;
(b) pressure; and
(c) temperature,

that is adequate for the purposes for which the water is used.

4.14.5 A food business may only use water for food handling operations, cleaning or sanitising that is not potable with the approval of the relevant authority.

4.14.4.6 Water from the usual source of supple must be tested for Coliforms and E.coli at least every 6 months. The water must reach the standard for potable water as follows:

(a) water used in food handling areas, or water otherwise required to be potable, must

- not contain any E.coli per 100 millilitre; and
- not contain more then 10 coliform organisms in 100 millilitres

4.14.5 Hand Washing Facilities

4.14.5.1 Food premises must have hand washing facilities that are located:

(a) in an easily accessible position;
(b) in or adjacent to areas where food handling operations are conducted;
(c) if there are toilets on the food premises - immediately adjacent to the toilets or toilet cubicles; and
(d) if there are no toilets on the food premises - at the entrance to areas where food handling operations are conducted.

4.14.5.2 Hand washing facilities must be:

(a) of a size that allows easy and effective hand washing; and
(b) clearly designated for personal hand washing only.

4.14.5.3 A food business may only make arrangements for hand washing other than those specified in the subclause above with the approval of the relevant authority.

4.14.6 Cleaning and Sanitising Appliances

4.14.6.1 Adequate cleaning and sanitising appliances must be provided and cleaning and sanitising chemicals should be stored where they cannot contaminate product.

4.14.6.2 A documented cleaning and sanitising program is to be written for the cleaning and sanitising of all equipment used to handle milk.

4.14.6.3 Food premises must have available sufficient number of cleaning fixtures, fittings and appliances that are adequate to maintain the food premises, and fixtures, fittings and appliances on those premises, to the required standard of cleanliness and to sanitise them if required. ,

4.14.6.4 Food premises that use hot water to sanitise appliances must have a temperature measuring device that:

(a) is readily accessible; and
(b) can accurately measure the temperature of the water.

Section 5- QUALITY VERIFICATION PROGRAM

Quality Testing Program

5.01.1 The microbiological quality of unpasteurised milk sold for direct human consumption shall be monitored by a quality testing program. While the milk is being produced under a food safety program there is still a need to validate the effectiveness of this program by regular testing of product.

5.01.2 It is the responsibility of the producer to have testing carried out by a NATA certified laboratory and take the necessary corrective action as follows:

Table A

Test	Standard	Frequency	Corrective Action
Standard Plate Count	Not exceeding 20,OOOcfu/mL	Twice per month (1 & 3 weeks or 2 & 4 weeks)	Milk sample tested within 7 days, if milk > standard sales of milk suspended until a test < standard. If >50,000 milk suspended from sale immediately until <25000.
Coliforms	Not exceeding 10cfu/ml_		If >100cfu/mL - milk sales suspended until test result <10cfu/mL coliforms and E.coli ND in 0.1 mL If >10 & <100cfu/mL retest milk immediately for coli & E coli. Results-E.coli ND & coli <10
Antibiotics	<0.003|u.g/mL		Milk that has failed test withdrawn from sale. Retest in 2 weeks if above standard milk suspended until test result OK

Table B -

Test	Standard	Frequency	Corrective Action
Salmonella	Not detected in 25mL	6 monthly (new producers 3 monthly first 2 tests")	Milk withdrawn from sale immediately and further sales stopped until cleared by the regulator. Clearance testing carried out: • 2 tests a week for 2 weeks • 1 test a week for 2 weeks All tests to be negative and no milk sold until all tests are completed. If any tests are positive the testing program recommences.
Listeria Monocytogenes	Not detected in 25mL		"Milk that has failed test withdrawn from sale immediately and clearance testing carried out. Sales of milk can recommence when test results comply with standards. Check test to be
E.coli	Not exceeding 10cfu/mL		

Coagulase Positive Staphylococci	Not exceeding 100cfu/mL		
Campylobacter spp.	Not detected in 25mL		
Pesticide	Less than MRL	Annually	Milk withdrawn from sale and milk sales suspended until results OK. Investigate source, of contamination.
Meliojdosis Serfological	Not detected	Annually (Jan-Mar)	Milk withdrawn from sale and sales of milk suspended immediately until test result OK

5.02 Notification of Test Results

5.02.1 The regulator must be notified immediately if any sample of milk fails to meet the prescribed standard.

5.02.2 The Regulator must be notified of all pathogen test results within five days of the test being finalized

5.03 Quality Program Auditing

5.03.1 Internal Audits

5.03.1.a Every 6 months an internal audit must be conducted of the quality records and a stock take of the farm chemical storage area and the veterinary chemicals. Any expired chemicals shall be removed. Any veterinary chemicals should be returned to the veterinarian for disposal and a record kept of the method of disposal.

5.03.1.b Audit reports shall be completed and Corrective Action Reports (CAR) shall be raised for any defect identified during the audit. The reports shall be reviewed, corrective action taken, and records kept of audits and corrective actions.

5.03.2 External Audits

5.03.2.a Audits of the food safety program, standard of premises and production practices will be carried out every 6 months by auditors approved by Safe Foods.

5.03.2.b A Corrective Action Report will be issued if defects are found at the audit. Defects will be rated as minor, major or critical. If any critical defects or more than 3 major defects are found production must cease until corrective action has been taken.

Section 6 QUALITY RECORDS

6.01 The quality manual, procedures, forms and associated documents in use shall be-

- current,
- legible and
- easy to access.

6.02 The date of issue shall be recorded on the documents and a register of the current issue.

6.03 The manual must be accessible to all staff.

6.04 The following records shall be kept for at least one year after the expiry date of the product:
6.04.1 Veterinary and other drug treatments:
- dates,
- drug used,
- withholding periods;
- Vendor Declarations for feeds and the like.

6.05 Chemical treatments on pastures and associated withholding dates;

6.06 Quality Results

6.06.1 milk quality test results;

6.06.2 water quality test results;

6.07 Milk harvesting, cooling and storage, cleaning & sanitation;

6.08 Plant and premises maintenance and hygiene checks and repairs;

6.09 Reports of milk plant services, repairs and maintenance;

6.10 Reports of pest control visits;

6.11 Inspection reports by the Regulator,

6.12 audit reports and corrective actions;

6.13 Reports of calibration checks of thermometers;

6.14 Records of packaging dates and use by dates (traceability);

6.15 Dairy environment and waste management records.

APPENDIX 1

LIST OF REGULATORY REQUIREMENTS AND APPLICABLE STANDARDS

Food Production (Safety) Act 2000
Food Production (Safety) Regulation 2002 (especially Chapter 3 "Dairy Scheme")
Australia New Zealand Food Standards Code (especially standard 1.6.1

ANZFA Food Standards Code
Part 1.2 Labeling and Other Information Requirements
Standard 1.4.1 Contaminants and Natural Toxicants
Standard 1.4.2 Maximum Residue Limits
Standard 1.4.3 Articles and materials in Contact With Food
Standard 1.6.1 Microbiological Limits for Food
Standard 2.5.1 Milk
Standard 2.5.2 Cream
Standard 2.5.4 Cheese
Standard 2.5.5 Butter

APPENDIX 2

SOURCES OF AND PROTECTIVE MEASURES AGAINST CONTAMINATION BY PATHOGENIC MICRO-ORGANISMS IN UNPASTEURISED MILK

PREFACE
This document is a guide only. It has been prepared to assist dairy farmers in determination of the source of pathogenic micro-organisms, if detected in their milk and prevent entry of pathogenic micro-organisms into milk.

REFERENCES
Sources of Pathogenic Micro-organisms in Unpasteurised Milk - extract from a document prepared by the Dairy Authority of South Australia.

Bacteriological Quality of Raw Milk (Proceedings of a Symposium sponsored by the International Dairy Federation (IDF) held at Wolfpassing, Austria 1996).

ANZFA Full Assessment Report Proposal P114-January 1996.

Countdown Down Under: Farm Guidelines for Mastitis Control - published by the Dairy Research and Development Corporation, Melbourne 1998

Disease in Livestock-Hungerford 8th Revised Edition, 1975 ;

The Significance of Pathogenic Micro-organisms in Raw Milk" - International Dairy Federation Monograph 9405, 1994

1. STAPHYLOCOCCUS AUREUS

1.1 Mastitis

Mastitis and lesions of teats are the main source of infection with *Staphylococcus aureus.* Most contamination occurs during milking. Good hygienic management, cleaning and disinfection after milking by teat dipping is important. A correctly operating milking machine is essential.

The most common form of staphylococcal mastitis is a chronic subclinical or relatively mild disease that is characterised by an occasional acute flare-up. Seek veterinary advice for assistance.

The human risk from staphylococci relates to enterotoxin production by the staphylococci. If people drink raw milk in which the staphylococci have multiplied and produced the toxin the risk of food poisoning is increased

1.1.1 Indications
Heat and/or soreness in one or more quarters;
Loss of appetite;
High body temperature;
Change of colour, smell of milk or lumps of pus on pre-milking filter;
Slow passage of milk through filter;
Sudden rise in plate count test result.

1.1.2 Prevention

Careful and thorough washing of udder and teats in pre-milking procedure, proper disinfection of teats and udder after milking, use of intra-mammary treatment on dry off, regular random testing by the farmer of milk samples for subclinical mastitis from individual animals or herd recording (high cell counts).

Do not milk beasts with lesions on udder or teats and conduct a regular milking equipment vacuum check.

1.1.3 IDF Research - Effect of Udder Preparation on Teat and Milk Contamination

Results:

1. Wet cloth and drying Best practice (cleanest milk)
2. Wet cloth - no drying Second
3. No udder preparation Third

1.2 Human Sources

The types of *Staph aureus* that infect different species of animals are quite distinct and cross infections between different animals are rare.

Many different strains of *Staphylococcus aureus* can exist in the carrier state at a variety of body sites. These sites include the nose, pharynx and skin. The organisms can be transferred to equipment and food e.g. milk during handling.

Since many staphylococci skin lesions are mild and their occurrence is so common their presence tends to be ignored by many individuals. When this happens among persons who have contact with food, the staphylococcal lesions become a highly dangerous source of epidemics of staphylococcal disease. Common skin lesions include boils, carbuncles, abscesses and infected lacerations.

Human carriers of human strains of *Staph aureus* can contaminate milk and milk products, and food poisoning rather than the development of actual staph infection is the more likely outcome.

1.2.1 Indications

If the animal staph test results are satisfactory, but the milk is contaminated the milking equipment is probably contaminated.

1.2.2 Prevention

- High standard of hygiene in people and milk room (hygiene education and procedures).
- Equipment cleaning and sanitation.
- Milk temperature audit

1.2.3 Environmental Sources

Staphylococci are widespread in nature.

Though their major habitats include skin, skin glands and mucous membranes of mammals and birds, they have been isolated sporadically from soil, sand, marine and fresh water, sewage, plant surfaces and products, feeds, meat, poultry and dairy products, and on the surfaces, dust, and air of inhabited areas.

If staphs are isolated from environmental sources, it is because the environment has been contaminated by discharges from human or animal Staph lesions. Again it is important to understand that animal strains do not seem to infect people, but enterotoxigenic strains, of whatever origin, can cause food poisoning if they contaminate a food and multiply and produce toxin while growing in it.

The key thing about staph is that most human infections (e.g. wound infections) result from contamination by staph you carry on your own skin or that you acquire from other people who are carriers of pathogenic strains.

Most cases of human food poisoning are due to contamination of food by human strains rather than animal strains.

2. E.COLI

2.4 Source

Many strains are found, although only some are pathogenic to humans. Source is human and animal faeces, and environment including water. It can also be an indication of poor hygiene during production. Untreated water, e.g. dams, may be a source of *E.coli.*

As the intestinal tract of cattle is an important reservoir of E.coli, control measures for the prevention of E.coli infections should include good manufacturing practices in the production and processing of milk. Use of a clean, treated water supply is essential.

E.coli is an important cause of scours in calves and farm staff caring for calves should pay particular attention to hygiene and thoroughly clean up (clothing, boots, hands after working with calves and before milking or handling equipment associated with milking or milk storage.

Healthy animals and healthy people carry large numbers of *E.coli* in their intestinal tracts and some of these strains can cause disease in people. HUS is caused by strains of *E.coli* that are carried by healthy animals and people. Good personal hygiene as well as good dairy practices to minimise contamination of milk directly by E.coli present on the worker and in faeces as well as ensuring water used in the dairy is of potable quality, i.e. low *E.coli* levels will help ensure milk is not contaminated by *E.coli.*

2.2 Indications

Bacterial scours in animals and severe diarrhoeal disease in humans.

2.3 Prevention

- Good farm management;
- Stock control practice (stocking levels;
- Rotational grazing;

- Resting of grazing areas;
- Presence of natural flora i.e. earth worms and dung beetles;
- Good dairy hygiene as discussed in Section 1;
- Potable water only used in dairy operation.

2.4 Conclusion

Strains of E.coli that cause disease in animals are different from those that cause disease in people.

Good farm management practice and good manufacturing practices in the production and processing on milk is essential. Good personal hygiene as well as a high standard of hygiene in dairy procedures is essential to minimise direct contamination of milk by E. coli present on the worker and in animal faeces as well as ensuring that water used in the dairy is of potable quality.

3. SALMONELLA

3.1 Food, General

Almost any food may be contaminated with Salmonella as a consequence of mishandling and/or improper hygiene. Contamination can take place by persons who are handling food and are carriers of the organism.

Man and all animals carry salmonella in their intestinal tracts. Infected animals and people may be ill or may show no signs of infection (healthy carriers).

Contamination of food with salmonella can occur from the presence of salmonella in the animal which, is the source of the product from contamination in abattoirs or dairies or other primary processing facilities, during transport or secondary processing (e.g. meat meal or dried milk), by cross contamination between raw and cooked foods in the home or by people carrying the organism at any point in the chain from raw product to the consumer.

3.2 Raw Milk and Milk Products

Natural infection of the mammary gland is possible but quite rare. Contamination of raw milk usually takes place by salmonellae from external sources. External sources may include faeces, humans, polluted water, dust.

Salmonella is often shed into the milk by animals with acute disease but only rarely in the case of healthy carriers. Hence the presence of *Salmonella sp.* is mostly due to contamination.

3.3 Indication

In infected animals:
- Depression;
- Loss of appetite;
- Scouring;
- High temperature;

- Rapid respiratory movements;
- Dehydration;
- Frothing at the mouth;
- Death.

3.4 Prevention
- Ensure feed and fodder supplies are not contaminated by rodent faeces;
- Ensure clean drinking water is available;
- Good dairy hygiene practices must be followed.

4 LISTERIA MONOCYTOGENES

4.1 Routes of Contamination

The most common source of *Lmonocytogenes* is contamination from the environment. Overstocking of grazing areas particularly during winter when pasture may be scarce. In Australia Listeria is an uncommon pathogen in animals.

Lmonocytogenes has been isolated from a wide variety of sources, including processing environments and equipment. Faecal contamination may be a source of contamination in milk.

The organism is rarely significant in milk however it is important in processed dairy products.

Soft cheeses, particularly those made from unpasteurised milk, have been associated with a number of outbreaks of listeriosis. Post pasteurisation contamination is also a significant problem.

Current medical advice says that pregnant women and the immuno compromised should not eat pate or soft cheeses because of the risk of presence of listeria and the particular susceptibility of pregnant women and their foetus to infection.

4.2 Indications

Beasts infected with listeria organisms will abort usually at about 100 days into pregnancy. Suspect animals should be examined by a veterinarian for confirmation.

4.3 Prevention
- Testing of suspect animals;
- Avoid overstocking and heavy grazing areas during winter months;
- Good hygiene and processing techniques.

4.4 Conclusion

Current medical advice is that pregnant and immuno-compromised humans should not consume raw milk.

Lmonocytogenes is widespread in nature and frequently gains access to the farm milk supply. This can either be from infected animals or more frequently from the environment in which the milk is produced. Good hygiene practice during milking and the proper use of normal clearing routines are adequate to limit the number of *Lmonocytogenes* in milk and it has no special resistance to the routinely used cleaning materials.

The organism can grow in milk, cheese and yoghurt at refrigeration temperature and therefore its presence must be avoided.

Research into the heat resistance of *L. monocytogenes* has now demonstrated that *all Listeria spp.* are destroyed by properly carried out pasteurisation. Problems with *Listeria spp.* in milk therefore are limited to post-pasteurisation contamination, or unpasteurised products.

5. CAMPYLOBACTER JEJUNI

5.1 Source

The main source of campylobacter in milk is from contaminated water, faeces, carrier cattle, and infected pets, and it is generally hard to isolate from milk.

The biological features of C. jejuni are characterised by the lack of carbohydrate metabolism and this makes it difficult to isolate from milk. The organism is now recognised as the most common food-borne bacterial pathogen comparable to salmonella. From the different species within the genus C. jejuni is the only one relevant for enteritis in humans.

5.2 Indications

- Difficult in calving followed by persistent vaginal discharge
- Failure to hold service;
- Inability to conceive;

5.3 Prevention

- Early identification of infected animals;
- Veterinary treatment (the infection usually responds to treatment);
- Culling from herd if treatment is unsuccessful.

APPENDIX 3 –

GUIDELINES FOR THE APPLICATION OF THE HACCP SYSTEM

Prior to application of HACCP to any sector of the food chain, that sector should be operating according to the Codex general Principles of Food Hygiene, the appropriate Codex Codes of Practice, and appropriate food safety legislation.

Management commitment is necessary for implementation of an effective HACCP system. During hazard identification, evaluation, and subsequent operations in designing and applying HACCP systems, consideration must be given to the impact of raw materials, ingredients, food manufacturing practices, role of manufacturing processes to control hazards, likely end-use of the product, categories of consumers of concern, and epidemiological evidence relative to food safety.

The intent of the HACCP system is to focus control at CCPs. Redesign of the operation should be considered if a hazard which must be controlled is identified but no CCPs are found.

HACCP should be applied to each specific operation separately. CCPs identified in any given example in any Codex Code of Hygienic Practice might not be the only ones identified for a specific application or might be of a different nature.

The HACCP application should be reviewed and necessary changes made when any modification is made in the product, process, or any step.

It is important when applying HACCP to be flexible where appropriate, given the context of the application taking into account the nature and the size of the operation.

Application ~:

1. Assemble HACCP team

The food operation should assure that the appropriate product specific knowledge and expertise is available for the development of an effective HACCP plan. Optimally, this may be accomplished by assembling a multidisciplinary team. Where such expertise is not available on site, expert advice should be obtained from other sources. The scope of the HACCP plan should be identified. The scope should describe which segment of the food chain is involved and the general classes of hazards to be addressed (e.g. does it cover all classes of hazards or only selected classes).

2. Describe product

A full description of the product should be drawn up, including relevant safety information such as composition, physical/chemical structure (including pH, etc), microcidal/static treatment) e.g. heat-treatment, freezing, brining, smoking, etc.), packaging, durability and storage conditions and method of distribution.

3. Identify intended use

The intended use should be based on the expected uses of the product by the end user or consumer. In specific cases, vulnerable groups of the population, e.g. institutional feeding, may have to be considered.

4. Construct flow diagram

The flow diagram should be constructed by the HACCP team. The flow diagram should cover all steps in the operation. When applying HACCP to a given operation, consideration should be given to steps preceding and following the specified operation.

5. On-site confirmation of flow diagram

The HACCP team should confirm the processing operation against the flow diagram during all stages and hours of operation and amend the flow diagram where appropriate.

6. List all potential hazards associated with each step, conduct a 'hazard analysis, and consider any measures to control identified hazards (see Principle 1)

The HACCP team should list all of the hazards that may be reasonably expected to occur at each step from primary production, processing, manufacture, and distribution until the point of consumption.

The HACCP team should next conduct a hazard analysis to identify, for the HACCP plan, which hazards are of such a nature that their elimination or reduction to acceptable levels is essential to the production of a safe food.

In conducting the hazard analysis, wherever possible the following should be included:
the likely occurrence of hazards and severity of their adverse health effects;
the qualitative and/or quantitative evaluation of the presence of hazards;
survival or multiplication of microorganisms of concern;
production or persistence in foods of toxins,
chemicals or physical agents; and,
conditions leading to the above.

The team must then consider what control measures, if any, exist which can be applied for each hazard.

More than one control measure may be required to control a specific hazard(s) and more than one hazard may be controlled by a specified control measure.

7. Determine Critical Control points (see Principle 2)

There may be more than one CCP at which control is applied to address the same hazard.

The determination of a CCP in the HACCP system can be facilitated by the application of a decision tree, e.g. Diagram 2, which indicates a logic reasoning approach. Application of a decision tree should be flexible, given whether the operation is for production, slaughter, processing, storage, distribution or other. It should be used for guidance when determining CCPs. This example of a decision tree may not be applicable to all situations. Other approaches may be used. Training in the application of the decision tree is recommended.

If a hazard has been identified at a step where control is necessary for safety, and no control measure exists at that step, or any other, then the product or process should be modified at that step, or at any earlier or later stage, to include a control measure.

8 Establish Critical Limits for each CCP (see Principle 3)

Critical limits must be specified and validated if possible for each critical control point. In some cases more than one critical limit will be elaborated at a particular step. Criteria often used include measurements of temperature, time, moisture level, pH, A and available chlorine, and sensory parameters such as visual appearance and texture.

9. Establish a Monitoring System for Each CCP (see Principle 4)

Monitoring is the scheduled measurement or observation of a CCP relative to its critical limits. The monitoring procedures must be able to detect loss of control at the CCP. Further, monitoring should ideally provide this information in time to make adjustments to ensure control of the process to prevent violating the critical limits. Where possible, process adjustments should be made when monitoring results indicate a trend towards loss of control at a CCP. The adjustments should be taken before a deviation occurs. Data derived from monitoring must be evaluated by a designated person with knowledge and authority to carry out corrective actions when indicated. If monitoring is not continuous, then the amount or frequency of monitoring must be sufficient to guarantee the CCP is in control. Most monitoring procedures for CCPs will need to be done rapidly because they relate to on-line processes and there will not be time for lengthy analytical testing. Physical and chemical measurements are often preferred to microbiological testing because they may be done rapidly and can often indicate the microbiological control of the product. All records and documents associated with monitoring CCPs must be signed by the person(s) doing the monitoring and by a responsible reviewing official(s) of the company.

10. Establish Corrective Actions (see Principle 5)

Specific corrective actions must be developed for each CCP in the HACCP system in order to deal with deviations when they occur.
The actions must ensure that the CCP has been brought under control. Actions taken must also include proper disposition of the affected product. Deviation and product disposition procedures must be documented in the HACCP record keeping.

11. Establish Verification Procedures (see Principles 6)

Establish procedures for verification. Verification and auditing methods, procedures and tests, including random sampling and analysis, can be used to determine if the HACCP system is working correctly. The frequency of verification should be sufficient to confirm that the HACCP system is working effectively. Examples of verification activities include: Review of the HACCP system and its records. Review of deviations and product dispositions. Confirmation that CCPs are kept under control.
Where possible, validation activities should include actions to confirm the efficacy of all elements of the HACCP plan.

12. Establish Documentation and Record Keeping (see Principle 7)

Efficient and accurate record keeping is essential to the application of a HACCP system. HACCP procedures should be documented. Documentation and record keeping should be appropriate to the nature and size of the operation. Documentation examples are:
Hazard analysis
CCP determination;
Critical limit determination

Record examples are:
CCP monitoring activities
Deviations and associated corrective actions
Modifications to the HACCP system

DIAGRAM 1
LOGIC SEQUENCE FOR APPLICATION OF HACCP

1 PROCESS CONTROL Example of a HACCP process control chart.

Critical Step	Potential Hazard	Critical Control Point	Preventative, Control & Monitoring			Measures	
			Monitoring Procedures	Person Responsible	Standard & Specification	Corrective Action	Records
Herd Management	Chemical contamination of milk	Animal Treatments	Identify treated animals. Record all animal treatments, type of treatment and withholding period.	Owner	Milk free of residues	Identify stock Dispose of milk	Stock treatment record
		Feed	Record all additive uses to paddocks and restrictions for grazing. Obtain vendor declaration from suppliers of feed regarding treatments used and withholding period.	Owner	Feed only used after required withholding period and free from chemical residues	Dispose of milk Do not use feed	Paddock treatment record, vendor declarations daily dairy
		Purchased Stock	Record animal purchases, identify animals, record inoculations.	Owner	Healthy milk free of residues	Identify animals Dispose of milk	Vendor declarations stock records
		Stock Water	Check for possible contamination. Test water if considered necessary.	Owner	Water free from unacceptable chemical residues or algae toxins	Prevent access, provide alternative supply, treat water Dispose of milk until water OK	Test records

Critical Step	Potential Hazard	Critical Control Point	Preventative, Control & Monitoring			Measures	
			Monitoring Procedures	Person Responsible	Standard & Specification	Corrective Action	Records
2. Milking	Chemical, physical and bacteriological contamination of milk	animal identification	Treated animals are identified milk withheld.	Owner	animal identified and free from chemical contaminants	Identify animal as specified in procedure Dispose of milk	Treatment records
		animal preparation	Segregate animals which have mastitis, colostrum, chemical residues	Owner	To be free from chemical residues, taints, clinical mastitis, blood, pathogens	Dispose of milk	Stock book calving date
		Equipment hygiene	Equipment clean in good repair as per cleaning and maintenance procedures. Visually inspect equipment prior to use.	Owner	Clean and in good repair. Milk meets bacteriological standards	Clean and maintain equipment	Milk quality test results hygiene check list
3. Filtering	Physical contamination of milk (Foreign matter)	Filtration	Replace filter prior to milking.	Owner	New filter prior to each milking. Milk free of sediment	Replace filter. Check milk for foreign matter	
4. Milk cooling and storage	Chemical, physical and bacteriological contamination	Equipment hygiene	Equipment cleaned as per procedure prior to use of the equipment.	Owner	Equipment clean. Milk meets bacto. Standards.	Clean equipment as per procedure	Milk quality test results

Critical Step	Potential Hazard	Critical Control Point	Preventative, Control & Monitoring		
			Monitoring Procedures	Person Responsible	Standard Specificati
	Growth of spoilage and pathogenic bacteria	Temperature of milk and time between milking & filling	Time & temperature of storage to be checked and recorded.	Owner	<4°C for <2
5. Filling/Packing	Chemical, physical & microbiological contamination	Equipment & Personnel hygiene	Equipment cleaned as per procedure.	Owner	As per specificatior
		Water	Test milk 6 monthly	Owner	Nil E.coli. not greate coli. In 100
		Grading	Grade milk and record results on log sheet	Owner	No disce flavours, matter or oc
		Sealing of container	Check containers for leaks	Owner	No leaks
	Traceability	Use by date of product	Use by date and date of manufacture to be recorded on log sheet.	Owner	Use by date for refrigera
	Underfilled containers	Product volume	Check correct volume in containers.	Owner	volume sp container

Critical Step	Potential Hazard	Critical Control Point	Preventative, Control & Monitoring Measures		
			Monitoring Procedures	Person Responsible	Standard Specificati
6. Freezing	Growth of spoilage & pathogenic bacteria	Freezing time /temperature	Temperature of freezer to be checked	Owner	<-18°Cin from packa
7. Storage	Growth of spoilage & pathogenic bacteria	Refrigeration time /temperature	Temperature of refrigerator to be checked daily and recorded out of specification results	Owner	<4°C
		Freezing time /temperature	Temperature of freezer to be checked daily and recorded out of specification results	Owner	*18°C
8. Product Testing	Microbial Contamination	Whole process	As per industry Code of Practice	Owner	As per ind of Practice

9. Distribution	Growth of spoilage & pathogenic bacteria	Refrigeration /Freezing time /temperature	Temperature milk to be maintained at refrigeration/freezing temperature during delivery. Checked daily and recorded out of specification results	Owner	<4°C or<-1

APPENDIX 4

PRODUCT RECALL PROCEDURE

All complaints shall be reviewed and assessed so that the correct follow-up action can be taken.

The docket given to the customer/retailer with the product shall include the product batch code. This will enable the product to be traced to the customer/retailer if a recall is necessary.

Recall shall be classified as follows:

Class 1 - a situation where there is a reasonable probability that the use of or exposure to the product will cause adverse health consequences. E.g. Salmonella, listeria, toxic chemical contamination, harmful foreign bodies.

Class 2 - a situation where the use of or exposure to the product is not likely to cause adverse health consequences. E.g. Incorrect labelling, product deterioration, aesthetically undesirable foreign matter.

If a significant complaint is received or problem arises with the product the following shall be carried out:

a) Assess the overall problem. Evaluate the hazard and make a decision as to the implications to public health or the company's reputation.

b) Decide whether a recall may be necessary or whether to handle the problem through normal operational procedures. If there is any doubt contact Safe Foods.

If a recall is necessary the following shall be carried out:

a) Decide the recall classification.

b) Notify personnel.

c) Notify Safe Foods.

d) The following information must be provided to Safe Foods:
- class and description of hazard;
- description of product i.e. name, identification, code, size of package etc.
- number of product units affected;
- distribution or sale dates;
- geographical distribution;
- contact person.

e) Notify the Health Department.

f) The amount of implicated product and batch code shall be identified plus any suspect raw material.

g) All implicated product, raw material and/or equipment, at the factory, will be placed on hold and quarantined,

h) Contact all distribution/retail outlets and customers to inform them of the problem and organise return of the product.

i) Contact the supplier of raw material if it may be implicated,

j) Consider the need to stop production and inform customers when production may commence.

k) Decide action to be taken if contacted by the media.

l) The Regulator will supervise the recall. The Health Department may be involved with the recall if the product has reached the consumer,

m) All product shall be quarantined until disposal is arranged with the Regulator. A tally of the returned stock must be maintained,

n) All records relating to the recall shall be maintained for future reference.