

Department of Primary Industry

**AUSTRALIAN CODE OF PRACTICE
FOR DAIRY FACTORIES**

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Section F

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Section F— Hygienic manufacturing practice for market milk including cream and flavoured milk

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Section F— Hygienic manufacturing practice for market milk including cream and flavoured milk

Part I—General

Hygiene

- F1.1 Factory personnel are to maintain good housekeeping practices at all times. Management should encourage all staff to take part in operator hygiene programs and training in food handling courses.
- F1.2 Cleaning, sanitising and dairy plant operating manuals incorporating the manufacturers' recommendations should be readily available to plant operators.

Quality control

- F2.1 A quality testing program should be set up for the factory laboratory to provide a support mechanism for personnel involved in market milk receipt, treatment, storage and packaging.
- F2.2 Proper maintenance of records regarding quantity, quality, age, temperature and source of all stored milk is essential. Routine operator checks should be recorded and initialled by the operator carrying out the checks where appropriate corrective action should be implemented immediately. Results of tests should be made available for inspection by appropriate authorities.
- F2.3 Use of raw milk in excess of 72 hours from the time of its production for use in market milk is undesirable.

Cleaning

- F3.1 Regular checks by visual inspection and bacteriological procedures should be carried out to ensure that all surfaces are effectively cleaned and sanitised.
- F3.2 Prior to use, a check should be carried out to ascertain that all plant, pipes and vats are properly drained of water, sanitiser and detergent.
- F3.3 All detergents and sanitisers used in dairy factories should comply with the appropriate Australian Standard. Detergent and sanitiser strength should be monitored. It is desirable to measure accurately the amount of detergent or sanitiser to be used.

Services

- F4.1 Water and steam for use in dairy factories should comply with the Australian Code of Practice and Australian Standard Requirements.
- F4.2 Use of air which comes into contact with milk should comply with this Code of Practice.

Light

- F5.1 In areas where a light sensitive product is exposed, the light used must be of a type that will not harm the product.

Flavoured milk

- F6.1 Facilities for the preparation and treatment of flavoured milk may be located in the same area as equipment for market milk.

Part II—Raw milk

Receival

- F7.1 A fully integrated CIP system or facilities capable of cleaning and sanitising all plant and equipment used to transport, receive and store milk for market milk purposes should be provided.
- F7.2 Operators engaged in receival of raw milk should hold a Certificate of Competency to grade and sample milk.
- F7.3 Agitation facilities (air or mechanical) should be capable of thoroughly mixing product prior to sampling and pumping.
- F7.4 All plant, pipes, hoses and pumps should be rinsed and sanitised between loads if protracted delays occur.
- F7.5 Any milk meter or other approved measuring device should be properly certified by the appropriate authority.
- F7.6 Proper record books, recording facilities and sampling equipment should be provided and checked prior to each day's operations.

Tankers (road and rail)

- F8.1 Tanker design should facilitate the proper cleaning of all parts of the tank, pipes, taps and hoses. Spray ball positioning is critical and should be such that all interior surfaces are reached; design should also prevent milk lying in CIP pipes.
- F8.2 Tanker insulation should be such that the temperature of the contents does not rise by more than 1°C within a 24 hour period.
- F8.3 Pumps, valves and seals should be "pulled down" and washed daily, and each part checked for efficient cleaning.
- F8.4 Bulk milk pick-up tankers should be rinsed and sanitised between loads unless they are to be refilled within two hours.
- F8.5 Tankers should be properly washed and sanitised and the cleanliness of interior surfaces including baffle plates should be checked after the last daily load. Blockages in spray balls can be responsible for a build-up of milk residues in isolated areas of tankers.
- F8.6 Bleed type sampling devices fitted to farm collection tankers should be regularly checked for accuracy. Refer to AS 1374-1981 Inline Milk Sampling Devices.
- F8.7 A suitable cap for the tanker transfer hose should be provided and the hose checked daily for condition due to wear and tear.

- F8.8 Proper record books, adequate sampling gear, thermometer, insulated ice boxes and ice should be provided daily for each farm collection tanker.
- F8.9 All tanker drivers should hold the necessary Certificate of Competency to grade and sample milk.
- F8.10 Tanker drivers should be outfitted with practical clothing which is to be maintained in a clean condition.

Temperatures

- F9.1 Farm milk should not be collected unless the milk temperature is 4°C or below.
- F9.2 All raw milk upon receipt should be cooled and stored at a temperature of not more than 2°C unless processed immediately.
- F9.3 All thermometers should be regularly checked for accuracy.

Raw milk storage vats

- F10.1 All milk awaiting treatment should be stored at 2°C or below.
- F10.2 A check to ensure that all storage vats and pipes are properly washed and sanitised prior to use should be carried out.
- F10.3 Storage vats which have been partially emptied of stored milk should not be topped up with fresh milk.
- F10.4 After each cleaning, the interior surfaces of manually cleaned vats should be visually checked for cleaning efficiency. Such vats should be regularly checked for cracks and corrosion.
- F10.5 Taps, sample devices, thermometer probes, lids, dip sticks, agitator blades and rubber seals should be properly washed and sanitised after each use.
- F10.6 Milk not complying with the standard prescribed for market milk should be segregated and stored separately.
- F10.7 Vats should be fitted with suitable devices or access to enable reliable aseptic sampling.

Part III—Treatment

Pasteurisation

- F11.1 Manufacturers' instructions on the operation of all equipment should be followed.
- F11.2 All lines, equipment, etc., should be sanitised prior to use. (Hot water sanitisation is preferable to chemical sanitisation). Temperature on return to the balance tank should be not less than 82°C with circulation time of five minutes.
- F11.3 A manual check of the operation of the flow diversion valve, thermograph needle position and ink, alarm bell and lights should be done immediately prior to pasteurising.
- F11.4 A regular check should be carried out for accuracy of the recording thermometer against a standard thermometer.

Note:

It is desirable to have manual thermometers on: hot water in, hot water out, chilled water/brine in, chilled water/brine out, milk ex holding section, milk to holding vats.

- F11.5 The practice of recirculating the pasteuriser with milk should be avoided. A knowledge of the pasteurisers' capacity is necessary to facilitate water circulation at start-up, diversion or when an interruption to the milk supply occurs, to avoid adulteration with water.
- F11.6 Cleansing and sanitisation of the pasteuriser should be in accordance with AS 1162-1973. Particular attention should be paid to checks of pasteuriser plates for efficiency of cleaning, cracks and corrosion. Check also for holes in float of balance tank, all joints and gaskets. Sections not designed for CIP must be manually cleaned, these include filter socks, temperature probe attachments, sampling and bleed valves.
- F11.7 A check should be done to ensure that flow rate and holding times are in accordance with manufacturers' specifications and to ensure that particular State regulations for pasteurised milk are met.
- F11.8 A check of the temperature of the milk entering and leaving the pasturiser should be done in addition to a check to ensure that a storage temperature of $2^{\circ}\text{C} \pm 1^{\circ}\text{C}$ is being achieved.
- F11.9 An adequate provision of heating and cooling medium for the entire days' treatment should be available.
- F11.10 Brine should be drained and flushed from the cooling section prior to cleaning. The hot water and chilling sections should be cleaned monthly to prevent scale build-up.

Homogenisation (piston or clarifier types)

- F12.1 Manufacturers' instructions on the operation of all equipment should be followed.
- F12.2 All lines, equipment, etc., should be sanitised prior to each day's use.
- F12.3 Homogenisers should be capable of achieving the necessary homogenisation index as laid down by the relevant authority.
- F12.4 Cold milk clarifixators used for homogenisation should be sanitised prior to use and the homogenisation operation should be continuous.
- F12.5 Valves, cones, seats, seals, discs in the clarifixators centre distributor shaft, paring chamber as well as correct connection of locating pins, should be checked after each use for wear and cleaning efficiency.
- F12.6 Regular checks for accuracy of pressure gauges and revolution counters are needed to ensure homogenisation occurs. Homogenisation efficiency should be checked daily.

Note:

It is important that flow rates of pasteurisers, homogenisers and separators are synchronised.

Separators (bactofuge and clarifiers)

- F13.1 Automatic desludging types should be checked to ensure they are operating properly.
- F13.2 Butter fat tests should be carried out on the cream and skim milk during separation to confirm that the correct butter fat level in the cream is being achieved. This will also indicate separation efficiency.
- F13.3 Equipment should be regularly checked, by qualified personnel, for wear of seals, gaskets, etc., as in clause F12.5.

- F13.4 A check should be carried out to ensure that adequate cooling of final products is being achieved.

Mix vats

- F14.1 Manufacturers' instructions on the operation of all equipment should be followed. Equipment should be set up to facilitate standardisation and proper mixing of ingredients, i.e. Hi Lo, flavoured milk, cream. The vats should be designed for the purpose for which they will be used.
When ingredients are in powder form, care should be taken to prevent the spread of dust.
- F14.2 All lines, equipment, etc., should be sanitised prior to each day's operation.
- F14.3 Desirable features should include jacketing of vats for temperature control. Agitation may be by means of mechanical agitators, air or the venturi method.
- F14.4 Vats should be accessible for efficient cleaning, sanitisation, sampling, visual examination and the addition of ingredients/additives.
- F14.5 Product may be in post pasteurised form and therefore sanitisation of the vat is essential. Where flavouring ingredients are added to the pasteurised milk in syrup form, such syrups must have been effectively pasteurised.
- F14.6 Flavour syrup preparation should be sufficient only for immediate production requirements to prevent carryover of syrup from one day to the next. Batches of syrup should not be mixed together.

Dry ingredient storage

- F15.1 Storage of dry ingredients should be in such a manner and in such containers as to prevent moisture absorption.

Pasteurised milk storage vats

- F16.1 All lines, vats and equipment should be sanitised prior to each day's use.
- F16.2 Particular care should be taken with the sanitising of pasteurised milk storage vats to ensure that post pasteurisation contamination is minimised.

Part IV—Packaging

Package storage

- F17.1 All packaging material should be stored in a clean and hygienic manner and in such conditions of temperature and relative humidity as are compatible with good manufacturing practice.
- F17.2 The packaging material should be appropriate for the products to be packed and should not transmit any objectionable odour or substances to the product.
- F17.3 Packaging material should be checked on a consignment basis for compliance with purchaser's specifications.
- F17.4 Only packaging material required for immediate use should be kept in the packing area. Unused supplies of boxes of blanks should be returned to the storage area and stored in such a way as to provide protection from contamination.

Product transfer

- F18.1 Product lines from storage vats to fillers should be sanitised before use. Insulation of these lines is considered desirable.
- F18.2 Product lines must be cleaned at the end of each day's packaging, paying particular attention to outlets, taps, pumps and other areas where soil build-up is likely to occur.
- F18.3 If more than one product is put through the one line, it should be ensured that each product is adequately flushed out or is followed by a compatible product. Separate lines could be considered where multiple packaging is envisaged.

Product temperatures

- F19.1 The aim is to package at as low a temperature as possible. Energy savings can be obtained by packaging the product at a low temperature rather than by reducing the packaged product temperature in cold storage facilities.

Packaging equipment in general

- F20.1 All packaging equipment which will be exposed to the products to be filled or where material contact occurs should be sanitised before use.
- F20.2 Maintenance of such equipment should be regular and should be carried out by competent personnel.
- F20.3 Factory operators should be fully trained on the equipment that they are using.
- F20.4 Adequate supplies of ancillary services to the equipment should be available, i.e. compressed air, heating and cooling mediums, etc.
- F20.5 At the end of the day, all equipment should be thoroughly cleaned by CIP or manual methods.
- F20.6 At the start of packaging for the day, lines and filling equipment should be flushed with some of the product to be packaged. The flushings should be diverted to waste or used for some purpose other than human consumption, before the first package is crated and transported to the storage area.
- F20.7 Where flavour syrup is added to the milk at the point of packaging, the syrup should be transferred *automatically* from the syrup container to the injector.

Bottle washing

- F21.1 Bottle washers should be inspected daily for blocked jets, detergent strengths, chlorination of rinse water and maintenance as per manufacturers' requirements.
- F21.2 Temperatures of the various tanks must be up to the required level before the first bottle is placed in the washer.
- F21.3 All bottles which contain large amounts of soil, foreign objects, or are badly scuffed should not be placed in the washer. Chipped, cracked or broken bottles must be destroyed.
- F21.4 Bottle lines from washer to fillers should be covered.
- F21.5 A check should be done to ensure that automatic scanners are working effectively. Inspection lamps, where used, should be properly manned and checked for cleanliness. Inspection personnel should be rostered so that a period of continuous inspection does not exceed 30 minutes.

- F21.6 Laboratory checks on sanitisation of bottles, adequate drainage and caustic residues should be incorporated into the quality control program.

Bottle filling

- F22.1 Filling plant should be sanitised prior to packaging.
- F22.2 The cap chute should be protected from contamination, grease, oil, milk splashes, etc., cleaned daily and sanitised prior to use.
- F22.3 Dies should be cleaned and sanitised daily and checked for correct date setting prior to the commencement of bottle filling operations.
- F22.4 Partially filled bottles or bottles with damaged caps should be removed and should not be put back onto the filling line.
- F22.5 Empty bottles should be cleared from the line between washer and filler when protracted interruptions to packaging occur.
- F22.6 A check should be done to ensure that all automatic equipment is set up correctly for the packaging required.

Cartoning operations

- F23.1 Cartoning plant should be sanitised prior to packaging.
- F23.2 The plant should be set up as per manufacturers' instructions for the package to be filled.
- F23.3 The plant should be drained of sanitiser and excess lubricants and brought up to operation temperature prior to use.
- F23.4 The first carton from each packaging unit (and periodically during the run) should be checked for sealing efficiency. Dye tests should be used to check the bottom sealing of cartons.
- F23.5 Date coding equipment should be checked for the correct code and cartons should be inspected regularly for marking effectiveness.
- F23.6 Carton weights should be checked during the run to maintain correct fill.
- F23.7 Packaging should be carried out under clean air conditions.
- F23.8 Cleaning of sealing elements should be carried out when necessary during the run to minimise the possibility of off flavours from carton burning or contamination by extraneous matter.

Sachet operations

- F24.1 Sachet plant should be sanitised prior to packaging. It should be set up as per manufacturers' instructions.
- F24.2 Before packaging, correct temperature of the sealing elements should be attained and the coding device functioning correctly.
- F24.3 Checks for the adequate sealing of the bags should be made during the run.

Bulk milk packaging

- F25.1 Packaging equipment should be sanitised prior to use and calibrated for correct volume or weight for the package to be filled.

- F25.2 All metal milk cans and lids should be inspected for defects and should be sanitised prior to use.
- F25.3 Extra care should be taken where open packaging of bulk milk is undertaken to prevent contamination of can lids, sealing bungs, milk delivery tubes or bag openings with which the filled product comes in contact.

Plastic bottles, tubes or cups

- F26.1 Regular bacteriological assay should be carried out to ensure sterility of containers.
- F26.2 During the run, the sealing efficiency of the plastic containers should be checked.
- F26.3 Partly filled packages as well as damaged and improperly sealed or otherwise defective packages should be tipped separately and not put back on the filling line.

Packaged product transportation

- F27.1 All crates should be passed through a crate washer prior to filling. Alternative suitable methods of cleaning may be used.
- F27.2 Crate washers should be checked for blocked jets, correct detergent and temperature levels and adequate water pressure during the run.
- F27.3 Prior to being placed on the crate washer line, crates should be inspected for distortion of shape and damage to prevent jamming of equipment and puncturing of the filled packages.
- F27.4 In no instance should a crate be passed through the washer at a speed greater than that at which the washer was designed to operate. Crates should be spaced during transit through the washer to ensure crate ends are washed.
- F27.5 A check should be done to ensure that all automatic decrating and recrating equipment is set up and operating according to manufacturers' instructions and are set correctly for the packaging required.

Storage of the packaged product

- F28.1 All packaged products should be transferred immediately after packaging into a coldroom or loaded directly into refrigerated transport vehicles capable of maintaining or reducing the packaged product temperature at or to 4°C or below. It should be noted that the nearer the product storage temperature is to 0°C the longer the expected shelf life of the product.
- F28.2 The packaged item should be stored in such a way that rotation of stocks can be accomplished easily.
- F28.3 The packaged product should not be stored with other products that are likely to contaminate or impregnate the stored items with undesirable taints.
- F28.4 Cold rooms of sufficient capacity should be provided to maintain effective cold air circulation. Storage of the packaged product should be arranged so as not to impede air flow unduly.
- F28.5 The refrigeration capacity of the rooms where the packaging plant is located must be able to cope with the effects of the changing seasons.
- F28.6 Automatic defrosting of the evaporator unit should be practised to maintain the cooling efficiency of the coldroom.

- F28.7 The coldrooms should be maintained in a clean condition at all times. It is considered that the dry-floor principle should be used as much as practicable to reduce the ice build-up on the evaporator coils.
- F28.8 A suitable temperature recording device should be positioned so that it can be seen easily from the outside, and a warning system installed to indicate when the temperature of the room exceeds a desirable level.
- F28.9 All access doors/doorways should be fitted with a means of reducing the loss of refrigerated air when they are in use.