

Department of Primary Industry

**AUSTRALIAN CODE OF PRACTICE
FOR DAIRY FACTORIES**

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Section I

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Section I— Hygienic manufacturing practice for dried milk products

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Section I— Hygienic manufacturing practice for dried milk products

Part I—Introduction

Scope

- 11.1 This Code of Practice applies to dried milk products as defined. It recommends specific hygienic and manufacturing practices for use in the manufacture (includes production, preparation, processing, packaging, storage, transport and distribution) of dried milk products for human consumption to ensure safe, sound and wholesome dried milk products.

Definitions

- 12.1 Dried milk products include roller dried, spray dried or fluid-bed dried milk products or composite milk products (includes casein or its derivatives).

Part II—Establishment: design and facilities

Air

- 13.1 An adequate supply of filtered air shall be provided for the drying, conveying, cooling or air-sweeping of product. Such air shall be drawn from a source which is free from contaminants such as odours, smoke, dust or dirt, and is not less than two metres above the floor.

Equipment and utensils

- 14.1 Plant for pasteurising or preheating of milk should be provided with a thermometer and an automatic temperature recorder as well as a flow diversion valve or pump "cut out".
- 14.2 The following equipment should be used in conjunction with the flow diversion valve or pump cut out:
- (a) a device which will automatically shut off the steam supply to the evaporator when the diversion valve is operating on divert;
 - (b) a means whereby a clean water supply may be introduced to the product side of the evaporator when flow diversion occurs in the preheat section; and
 - (c) the incorporation of a vacuum break device on evaporators which are fitted with spray condensers to prevent water being sucked back into the evaporator on emergency shutdown.
- 14.3 Instruments should be located so as to indicate the temperature of milk or milk product at the end of the holding section.
- 14.4 Facilities for sampling for the purpose of heat treatment control should be provided.

Spray dryers

- 15.1 Spray dryers shall be equipped with adequate air intake filters. Air which is drawn into the dryer shall comply with the requirements of clause I3.1 of this Section.
- 15.2 In gas-fired dryers, precautions should be taken to ensure that there is complete combustion of the gas.
- 15.3 Refer to A13.3 for requirements relating to treatment of exhaust air from milk powder or casein dryers.

Part III—Establishment: hygiene requirements

Maintenance

- 16.1 Special attention should be given to the maintenance of roofs, guttering and drainage. The area around the exhaust stacks of dryers requires special attention to prevent the accumulation of milk solids and subsequent contamination of the area.
- 16.2 Spray dryers must be regularly inspected for cracks.

Cleaning and sanitising

- 17.1 To prevent contamination of food, all equipment and utensils must be cleaned frequently and sanitised whenever circumstances demand. All wet product contact surfaces must be cleaned immediately after use. All dry product contact surfaces should be dry cleaned immediately after use and wet cleaned as necessary. Spray dryer chambers should be fitted with automatic in-place cleaning devices.
- 17.2 Special clean protective clothing and shoe covers should be worn by any person entering the dryer chamber for the purpose of cleaning or maintenance. These should be donned only at the point of entry. All cleaning equipment should be sanitised before use.
- 17.3 Adequate precautions should be taken to prevent raw materials, product or packaging materials from being contaminated with water, detergents, sanitisers or their solutions during cleaning or sanitising of rooms, equipment or utensils. Detergents and sanitisers should be suitable for the purpose intended and should conform to public health requirements and comply with relevant Australian Standards. Any residues of these agents on a surface which may come in contact with a food should be removed by thorough rinsing with potable water.
- 17.4 Either immediately after cessation of work for the day or at such times as may be appropriate, floors, including drains, auxiliary equipment and walls of product handling areas should be thoroughly cleaned.
- 17.5 Roadways and yards in the immediate vicinity of, and servicing the premises should be kept clean and free from any refuse accumulation.

Part IV—Establishment: hygiene processing requirements

Raw material requirements

- 18.1 All milk used in the manufacture of dried milk products should have been produced under hygienic conditions in compliance with the provisions of the official authority having jurisdiction.
- 18.2 Tests should be carried out on incoming milk to ensure that any unsatisfactory raw material is withheld from processing.
- 18.3 Raw materials and ingredients stored on the premises should be maintained under conditions that will prevent spoilage, protect against contamination and minimise damage. Stocks of raw materials and ingredients should be properly rotated. A log book must be used to record when materials are placed in storage and when they are used for manufacturing.

Prevention of cross contamination

- 19.1 Effective measures should be taken to prevent contamination of pasteurised or heat treated product by direct or indirect contact with material at an earlier stage of the process. Therefore, it is important to restrict the movement of forklifts and pallets to specifically designated areas.
- 19.2 Persons who have come into contact with raw milk or other raw materials should not handle any product which has been pasteurised or heat treated unless and until they have discarded all protective clothing which may have been contaminated by such raw materials.
- 19.3 If there is a likelihood of contamination, hands should be thoroughly washed between handling products at different stages of processing.
- 19.4 Every area in which any dried milk product is prepared, processed or stored should be used at any given time only for that purpose or for the preparation of other dried products or products subject to the same hygienic requirements. If the area is used for the processing of products requiring less hygienic standards, arrangements should be made to ensure that there is no resultant contamination of the dried milk product subject to more stringent hygienic requirements.

Processing

- 110.1 Processing should be supervised by suitably qualified personnel.
- 110.2 All steps in the production process should be performed without unnecessary delay and under conditions which will prevent the possibility of contamination, deterioration, or the development of pathogenic and spoilage organisms.
- 110.3 After inspection and testing, incoming milk or liquid milk products should be processed quickly or, if this is not possible, cooled to 4°C or less and held at this temperature until processing.
- 110.4 All milk and liquid milk products should be pasteurised before concentration. Adequate heat treatment facilities should be provided.
- 110.5 The concentrated product should be dried as soon as possible to avoid contamination, deterioration or spoilage by growth of organisms during the holding period. Two concentrate tanks should be used alternately and each should be cleaned and sanitised at four-hourly intervals.

- 110.6 The concentrated product leaving the evaporator should be fed directly to the dryer. If this is not possible for technical or other reasons, it should be stored under such conditions of time and temperature as will minimise the development of micro-organisms.
- 110.7 Concentrated products may be transported to the drying plant, provided that they are further heat treated prior to drying, at a minimum temperature of 74.5°C for 15seconds, or a heat treatment equivalent in destruction of micro-organisms.
- 110.8 A continuous chart recording should be made of all pasteurisation and heat treatment steps, and these charts should be dated and retained for inspection for a period of at least two years. Recording charts for each batch shall be retained until it is expected that the product of that batch would have been consumed.
- 110.9 Dried milk products should be continuously removed from the drying process. Immediately following removal from the drying process the dry product should be cooled to a temperature which will minimise spoilage during storage unless for technical reasons higher temperatures are required to satisfactorily process special products.
- 110.10 When breakdowns or unplanned discontinuities in processing occur which disrupt the normal flow of product, the batch should not be released for human consumption unless special precautions are taken to ensure acceptable hygienic quality of the batch. Reprocessing, diversion to non human use or additional testing may be required.
- 110.11 Powder which is not obtained as part of the normal continuous process should not be included in the end product. This includes powder from dust collectors and that which has been hand-swept from dryers.

Packaging

- 111.1 All packaging material should be stored in a clean and hygienic manner. The material should be appropriate for the product to be packed and for the expected conditions of storage. It should not transmit any objectionable odours or substances to the product. The packaging material should conform to the relevant Australian Standard.
- 111.2 Product containers should not be used for any purpose which could lead to product contamination. Containers should be inspected immediately before use. Only packaging material required for immediate use should be kept in the packing or filling area.
- 111.3 Precautions should be taken to minimise product dust and spillage. The packages should be closed immediately after filling or gassing, and the exteriors should be brushed or cleaned as necessary. Packaging shall be carried out in a room under positive air pressure, and air being exhausted from the room shall be filtered.
- 111.4 Packaging should be done under conditions which preclude the introduction of contamination into the product.
- 111.5 *Product coding:*
Products sold or otherwise distributed from an establishment must be coded to enable identification of lots and when necessary, segregation of specific lots which may have become contaminated or otherwise unfit for their intended use. Records adequate to identify the processing history of each lot must be retained for a period that exceeds the shelf-life of the product, except that, unless a specific need exists, they need not be retained for more than two years.

Note:

A lot means up to one day's production from a single processing and/or packaging line.

Storage and transport of end product

- 112.1 The end product should be stored and transported under such conditions as will preclude contamination with and/or proliferation of micro-organisms and protect against deterioration of the product or damage to the container.
- 112.2 Storage should be in such a manner and in such containers as to prevent moisture absorption. Dried milk products should not be stored directly on the floor. During storage, periodic inspection should take place to ensure that only product fit for human consumption is despatched and stocks must be suitably rotated. The product should be despatched in lot number sequence.

Sampling and quality control procedures

- 113.1 The establishment should be provided with or have access to a laboratory with appropriate testing facilities, and trained staff competent to draw samples and to perform specified tests to establish the quality and integrity of raw materials, process and finished product.

Quality specifications for raw materials, production-in-process, finished products, manufacturing environment and ancillary materials (e.g. packaging, detergents and sanitisers, etc.) should be prepared and documented, along with sampling plans and procedures, test methods and quality inspection procedures, to form component parts of the quality manual.
- 113.2 Analytical procedures should follow recognised standard methods.
- 113.3 Provision must be made for systematic microbiological tests to determine that heat treatment and sanitising processes have been successfully accomplished, particularly at critical points. This includes phosphatase tests of pasteurisation; coliform, plate counts and salmonella tests on dried products; monitoring the microbiological quality of concentrates and the manufacturing environment.
- 113.4 At least five samples should be taken from the daily output from each plant. The first sample should be immediately after start-up, another in the middle of the run and the final one just before the plant is stopped for cleaning. The remaining two samples should be taken at intermediate stages.
- 113.5 The results of microbiological testing should be assessed daily and in the event of a significant deviation beyond specified limits for the product or process, a prompt investigation should be initiated to enable corrective action to be undertaken.
- 113.6 The records of microbiological examinations should be retained at each plant for at least two years. It would also be appropriate to maintain the microbiological records relating to the various manufacturing processes. All records should be available for inspection as required. Means of identifying batch samples should also be provided.
- 113.7 The person in charge of the quality control program should have authority commensurate with the responsibilities associated with planning, co-ordinating, executing and maintaining the plant quality control programs.

Part V—End product specifications

General requirements

- I14.1 Products shall be free from foreign matter to the extent achievable with good manufacturing practice, as well as free from toxic substances.
- I14.2 No dried milk products should be distributed for human consumption until the results of microbiological examination are known to be satisfactory.
- I14.3 Dried products should comply with the NH & MRC requirements for food additives (MFSR—A3 Food Additives) and pesticide residues (MFSR—A14 Residues in Food).

Microbiological specifications

- I15.1 Dairy Produce Orders No. 4, 1985 (Department of Primary Industry) can be used as a guide to the desirable microbiological specifications for dried milk products. The requirements of these Orders are mandatory for export products but individual buyer specifications may vary for local market products.
- I15.2 In the Dairy Orders, dried milk products as defined are grouped into four categories, based on the end use of the product. These categories are:
 - (i) Products for human consumption, specifically intended for consumption by a population at risk. Such products include infant formulas, invalid foods, geriatric foods and products for similar uses.
 - (ii) Products for human use intended for general consumption that are unlikely to be reheated before consumption, comprising products for direct use by the end user, requiring only the addition of water or milk at a temperature of less than 65°C.
 - (iii) Products for human use, not elsewhere covered, that are likely to be reheated before use.
 - (iv) Products intended for use as stock food only.

Note:

Non-edible dried milk products designated "FOR NON-EDIBLE USE ONLY" do not require to be tested microbiologically.

The specifications for these four categories are set out below:

	<i>n</i>	<i>c</i>	<i>m</i>	<i>M</i>
(a) for Category I products—				
Standard plate count	5	2	1 000	10 000
Coliform bacteria	5	2	absent in 0.5 g	—
Salmonella	15	0	absent in 25 g	—
(b) for Category II products—				
Standard plate count				
(i) Non-low heat	5	2	50 000	100 000
(ii) Low heat	5	2	50 000	200 000
Coliform bacteria	5	2	absent in 0.2 g	—
			<i>or</i>	
	5	3	absent in 0.5 g	—
Salmonella	15	0	absent in 25 g	—
(c) for Category III products—				
Standard plate count	5	2	50 000	200 000
Coliform bacteria	5	1	absent in 0.1 g	—
			<i>or</i>	
	5	3	absent in 0.2 g	—
			<i>or</i>	
	5	4	absent in 0.5 g	—
Salmonella	5	0	absent in 25 g	—
(d) for Category IV products—				
Standard plate count	5	2	200 000	500 000
Coliform bacteria	5	1	absent in 0.1 g	—
			<i>or</i>	
	5	4	absent in 0.1 g	—
			0.2 g or 0.5 g	
Salmonella	5	0	absent in 25 g	—