

# **Guidance Material**

**for the development  
of a**

**Food Safety Programme  
(*Food Act 1981*)**

**for**

**Yoghurt Manufacture**

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## 1.1 Purpose of this Document

The purpose of this document is to supplement information provided in the Interim Code of Practice for Specialist Cheese and provide advice and guidance for the manufacture and storage of yoghurt, in order to provide products that are safe to consume.

The owner and sponsor of the Interim Code of Practice is the:

New Zealand Specialist Cheese Makers Association  
P O Box 12092  
Auckland

## 1.2 Using this Document

This document may be used in conjunction with the Interim Code of Practice for Specialist Cheeses, to form the basis from which businesses can develop a **Food Safety Programme (FSP)** for the production of yoghurt in New Zealand or for sale in New Zealand and Australia.

To develop a FSP, obtain the Interim Code of Practice for Specialist Cheeses and become familiar with its' contents. Using the Code, start at section 2.0, "Components of a Food Safety Programme/Product Safety Programme" and work through each section. Most sections will apply equally to cheese and yoghurt manufacturer. Additional guidance for yoghurt manufacture is included in this document, numbered according to the equivalent section in the Code.

The Code and this document will be used as the document against which a FSP for yoghurt manufacture is audited.

The requirements comply with standards established in legislation, but are otherwise ways by which industry has agreed as suitable for achieving (good/best practice) effective control of food safety hazards.

A purpose of the Code is to make the implementation of a FSP easier. It does this by:

- providing a format and information for hazard analysis and critical control point identification that can be edited and used directly;
- providing information about supporting systems that state the **outcomes** which need to be met, and where possible, providing **examples of procedures** that can be edited and used directly;
- providing information that needs to be included and used directly; and
- providing examples of forms for record keeping that can be edited and used directly.

## 2.4 Generic Process Description

The following flow chart is a broad description of the yoghurt making process; covering all process steps.

At the FSP level, a detailed process description, specific to your business is needed. This may be expressed as a flow chart or a written description.

# Yoghurt Production Process Flow Chart

Day One

Milk in Vat

Filtration

Heat Treatment

Pasteurisation

Yoghurt Heat Treatment

Starter

Day Two

Coagulum Break Up

Option 1

Option 2

Greek thickened yoghurt

Liquid/stirred yoghurt

[Sterilised] cotton Bags

Straining into bags

Sugar

Mixing

Ingredients (Optional)

Chilling

Thinning

[Sterilised] pottles/lids

Packing

Chilling

Plastic bottles

Chill Storage

Packing

Chill Storage

Notes:

1. Batch pasteuriser tank may be used for yoghurt heat treatment step
2. Yoghurt heat treatment is at 85°C for 30 minutes, or 95°C for 5 minutes or equivalent, then cooled to 38-40°C.
3. Starter added at 39-40°C, stirred in for 5 minutes
4. Coagulum break up should be 8 hours after starter addition
5. Ingredients optional except for sugar for liquid/stirred yoghurt
6. Chilling should be to  $\leq 4^{\circ}\text{C}$
7. Whey is output of straining yoghurt into bags
8. Greek yoghurt packed 24 hours after straining into bags
9. Preservatives added?
10. Final product at  $\leq 4^{\circ}\text{C}$  shelf life @ 15-20 days

## 2.5 Hazard Analysis and CCP Determination – Yoghurt

**Note:**

1. Some of these processes may not be applicable to the individual yoghurt maker, and other steps may need to be included.
2. If a process step has been identified but other columns are blank the process step is a “prompt”.

Process step	Raw material & other inputs		Process step hazards and/or potential impact of process step on existing hazards	Q1. Is the hazard at unacceptable levels?		Q2. Control measure available?
	Component	Hazards (B – biological C – chemical P – physical)		Yes/No	Justification	
1. Farm dairy collection (this may be included in the farm PSP)	Raw milk	B – Non-spore pathogens from cow, e.g. <i>Salmonella</i> , <i>Listeria</i> , <i>E. coli</i> , <i>Mycobacterium bovis</i> (TB)	B – Similar pathogens from milk handler, equipment, shed, pests	Yes	Some pathogens expected in raw milk	See pasteurisation step for available control measures
		B – Spore forming pathogens from cow, e.g. <i>Clostridium perfringens</i> , <i>Clostridium botulinum</i>		No	Personal, equipment and shed hygiene Water quality programme Pest management programme	See supporting systems Farm Dairy PSP Microbiological tests (frequency?)
		B – Mycotoxins from cow		Yes	Some spores expected in raw milk	See steps for cheese processing for control, e.g. acidification, aerobic storage/temperature control
				No	Diet controlled	Animal health programme Farm Dairy PSP

Process step	Raw material & other inputs		Process step hazards and/or potential impact of process step on existing hazards	Q1. Is the hazard at unacceptable levels?		Q2. Control measure available?
	Component	Hazards (B – biological C – chemical P – physical)		Yes/No	Justification	
		C – Chemical residues from cow, e.g. antibiotics, pesticides, heavy metals		Yes No	Untested milk Tested milk – minimal residue violations by national monitoring programme	On-farm tests Animal health programme See testing programme for chemical residues
		C – Chemical residues from cleaning: milk handler or equipment, environment; Pests		No	Cleaning programme Chemical control Personal hygiene Pest management programme	See supporting systems Farm Dairy PSP
			P – jewellery, nail polish, bristles, metal, rubber, plastic: milk handler, equipment, environment	No	Personal hygiene Maintenance programme	On line filter plus maintenance Supporting systems
2. Chilled storage of milk Mixed storage	Raw milk		B – Increase in pathogens in raw milk due to temperature abuse	No	Chiller management	Time/temp. requirements See supporting systems Or CCP?



Process step	Raw material & other inputs		Process step hazards and/or potential impact of process step on existing hazards	Q1. Is the hazard at unacceptable levels?		Q2. Control measure available?
	Component	Hazards (B – biological C – chemical P – physical)		Yes/No	Justification	
of milk			<b>B</b> – Contamination by pathogens due to cracks, leakages, dead ends, sight glasses, rubber donuts, test buckets, pests  <b>P</b> – rubber	No	Maintenance programme Cleaning programme  Pest management programme	See supporting systems Farm Dairy PSP
3. Filtration	Raw milk	<b>P</b> – Foreign matter in raw milk		Yes		On line filter plus maintenance - <b>CCP</b>
4. Heat treatment: Pasteurisation (including batch)	Chilled milk	<b>B</b> – Pathogens in raw milk (see step 1)	<b>B</b> – Pathogen survival due to improper set-up, equipment failure	Yes  No	See step 1  Pasteuriser maintenance programme Training Calibration Water quality programme	Yes, heat treatment parameters – will kill all pathogens but not spores – <b>CCP</b>  See supporting systems
4b Yoghurt Heat Treatment						

Process step	Raw material & other inputs		Process step hazards and/or potential impact of process step on existing hazards	Q1. Is the hazard at unacceptable levels?		Q2. Control measure available?
	Component	Hazards (B – biological C – chemical P – physical)		Yes/No	Justification	
5. Starter Addition, milk fermentation	Pasteurised milk  Starter culture	B – Spore survival  B – Culture contamination e.g. <i>Staphylococcus</i>	B. Pathogens. Inadequate cleaning of vat	Yes  No	Pathogens capable of surviving acidification  Training Cleaning programme	
Coagulum Break up						
Thickening	Fermented milk  Cotton Bags	B – Pathogens, e.g. <i>E. coli</i>		No	Supplier guarantee	See supporting system
Thinning	Water	B – <i>Campylobacter</i> , <i>E. coli</i>  C – Heavy metals, lead, arsenic, nitrates		No	Water quality programme	See supporting systems

Process step	Raw material & other inputs		Process step hazards and/or potential impact of process step on existing hazards	Q1. Is the hazard at unacceptable levels?		Q2. Control measure available?
	Component	Hazards (B – biological C – chemical P – physical)		Yes/No	Justification	
Ingredient Addition	Nuts and seeds	P – Shell pieces		No	Supplier guarantees	
	Dried fruit	C – Residues, e.g. sulphur dioxide P – Pips		No	Supplier guarantees	
	Fresh fruit: – treated	B – <i>E. coli</i> , <i>Salmonella</i> C – Residues, e.g. pesticides P – pips		No	Raw fruit contamination with pathogens	Boiling – see preparation of fruit – <b>CCP here</b> Supplier guarantees Checks on supplier
	Herbs and spices  (treated)	B – Pathogens e.g. <i>Bacillus cereus</i> , <i>Salmonella</i> C – Chemical residues P – Stones, metal		No	Supplier guarantees (check supporting system for incoming goods – supplier guarantees may not be reliable)	Supplier guarantees Checks on supplier

Process step	Raw material & other inputs		Process step hazards and/or potential impact of process step on existing hazards	Q1. Is the hazard at unacceptable levels?		Q2. Control measure available?
	Component	Hazards (B – biological C – chemical P – physical)		Yes/No	Justification	
12. Chilling	Unpackaged yoghurt		<b>B</b> – Growth of pathogens due to temp. abuse Contamination by personnel, equipment, pests	No	Chiller management  Personal hygiene Cleaning programme  Pest management programme	Time temp. control  See supporting systems or may be a <b>CCP</b>
11. Packing	Unpackaged yoghurt  Packaging material	<b>B</b> – Pathogen contamination of packaging materials, e.g. <i>Listeria</i>  <b>C</b> – Chemical residues in packaging material	<b>B</b> – Pathogen contamination from personnel, equipment, pests	No	Food contact material hygiene Personnel hygiene Cleaning programme Supplier guarantees for packaging material  Pest management programme	See supporting systems
13. Retail onsite	Protected yoghurt  Packaging material		<b>B</b> – Growth of pathogens due to temp. abuse Contamination by personnel, equipment, pests	No	Retail sales management Personal hygiene Cleaning programme  Pest management programme	See supporting systems

Process step	Raw material & other inputs		Process step hazards and/or potential impact of process step on existing hazards	Q1. Is the hazard at unacceptable levels?		Q2. Control measure available?
	Component	Hazards (B – biological C – chemical P – physical)		Yes/No	Justification	
14. Product transport and redistribution	Protected yoghurt		B – Growth of pathogens due to temp. abuse Contamination by damage to packaging	No	Transport management  Storage and distribution of finished product	See supporting systems

The following are Critical Control Points which will normally apply to a yoghurt making process, as indicated by each heading. Each business should consider these in the context of their own yoghurt making process and consider whether they are applicable.

Conversely other steps in the process may be usefully established as Critical Control Points.

NB. Headings given in the Code are included here with an indication of whether the CCP can apply to cheese or yoghurt or both.

#### **2.6.2 Ingredients (cheese and yoghurt)**

#### **2.6.3 Chilling (cheese and yoghurt)**

#### **2.6.4 Filtration (cheese and yoghurt)**

#### **2.6.5 Heat Treatment**

**(a) CCP: batch pasteurisation (cheese and yoghurt)**

**(b) CCP: continuous pasteurisation (HTST) (cheese and yoghurt)**

**(e) Heat treatment (yoghurt)**

Yoghurt heat treatment is at 85°C for 30 minutes, or 95°C for 5 minutes or equivalent, then cooled to 38-40°C.<sup>1</sup> Batch pasteuriser may be used for yoghurt heat treatment step

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<sup>1</sup> Reference from ICMSF. 1998. Chapter 16: Milk and Dairy Products. In: *Microorganisms in Foods 6: Microbial Ecology of Food Commodities*. International Commission on Microbiological Specifications for Foods of the International Union of Biological Societies. London: Blackie Academic and Professional.

## **2.6.6 Packaging materials for yoghurt (CCP or not?)**

**A business should list all packaging items that it uses. Identify all suppliers likely to be used.**

**e.g. plastic pottles or bottles supplied by XYZ Company.**

A Critical Control Point is recommended if there are package types that contain high levels of hazards, and which are not effectively controlled by the supplier or a control measure elsewhere in the process or by a supporting system.

See also section 3.2