Code of Practice for Cold and Dry Stores

Part 3: HACCP Application, and the Identification and Control of Other Risk Factors

Prelims

Amendment 0

December 2006

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Review of Code of Practice

This code of practice will be reviewed, as necessary, by the New Zealand Food Safety Authority. Suggestions for alterations, deletions or additions to this code of practice, should be sent, together with reasons for the change, any relevant data and contact details of the person making the suggestion, to:

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1 Introduction

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1.1 Purpose of this document

This Part of the Code of Practice (COP) has been developed by the New Zealand Food Safety Authority (NZFSA), in consultation with an industry working group, to provide guidance on the application of Hazard Analysis and Critical Control Point (HACCP) principles to the storage of animal products, including dairy. It also covers the identification and control of risk factors related to the wholesomeness and labelling of animal products.

1.2 HACCP

HACCP is a systematic and science-based control system for assuring food safety. Food safety is achieved by assessing hazards and developing controls for them. HACCP focuses on preventative measures and ensures that process control moves away from dependence on a traditional approach of endpoint product testing. It is internationally recognised as the foremost means of assuring food safety.

Operators must apply HACCP principles to their process when developing their risk management programmes (RMP).

1.2.1 Hazard

A hazard is a biological, chemical or physical agent in, or condition of, food with the potential to cause an adverse health effect.

- Biological hazards include bacterial pathogens (e.g. *Salmonella* spp., *Clostridium* spp, *Listeria monocytogenes*), parasites and viruses.
- Chemical hazards include residues of heavy metals, pesticides, and veterinary medicines. Some food additives may also be hazardous if present in excessive or toxic amounts.

- Physical hazards are objects that may cause illness or injury. Examples of these hazards are glass and metal fragments.

The main sources of hazards are:

- inputs (e.g. raw material, ingredients, packaging);
- the process itself; and
- personnel and environmental sources (e.g. water, pests, wastes, equipment, internal and external environs).

The operator must ensure that identified hazards from these sources are adequately addressed in the RMP by control measures under GOP (i.e. supporting systems) or at Critical Control Points.

1.2.2 HACCP principles

The seven HACCP principles, as defined by Codex are:

1. Conduct a hazard analysis;
2. Determine the Critical Control Points (CCP);
3. Establish critical limits;
4. Establish a system to monitor control of the CCP;
5. Establish the corrective action to be taken when monitoring indicates that a particular CCP is not under control;
6. Establish procedures for verification to confirm that the HACCP system is working effectively;
7. Establish documentation concerning all procedures and records appropriate to these principles and their application.

The operator is required to apply these HACCP principles to the process, considering all inputs and process steps. The application of these principles is discussed in detail in the Risk Management Programme Manual.

The operator must review their HACCP application whenever changes in the product, process and/or premises are made.

1.3 Good Operating Practice (GOP)

GOP is discussed in Part 2 of the COP. Supporting systems covering GOP must be developed and documented prior to HACCP application. The HACCP approach used in this COP is based on the expectation that GOP systems are effectively being implemented.

1.4 HACCP application for products and processes covered by the COP

The HACCP application shown in this document covers the following processes:

- further chilling of animal products, including dairy, (i.e. products are received already chilled and they are further cooled in the store to a lower temperature);
- freezing of chilled products;
- refrigerated or ambient storage; and
- transport of dairy products.

An operator whose processes are adequately covered by the HACCP application in this document can use this for developing their RMP. The relevant HACCP sections of this COP can be incorporated into the RMP by reference (i.e. by using the RMP template given in Part 4).

Note: Some store operators are also involved in the transport of animal products. This COP includes the transport of dairy products because this operation falls within the APA definition of dairy processor, which in turn is included in the definition of primary processor and all primary processors are required to have an RMP. The transport of non-dairy products (e.g. meat, seafood, poultry, bee products) does not need to be covered by an RMP, but the operator must comply with the transportation requirements specified in Part 15 of the Human Consumption Specifications. The NZFSA intends to review these requirements and will consider harmonising them so that a consistent approach can be applied to the transport of all animal products.

1.5 HACCP application for products and processes not covered by the COP

The operator will need to carry out their own HACCP application for those processes that are not adequately covered in this document (e.g. thawing, packing). The HACCP approach and format shown in the RMP Manual or in Generic RMPs published by the NZFSA should be used by the operator as a guide.

The HACCP application must be documented, and supported using information such as historical company records, technical publications or information provided by the NZFSA. The person or people involved in this activity must be familiar with the process, and have the appropriate knowledge and skills regarding the application of HACCP.

Prior to the application of HACCP principles to the process, all relevant GOP supporting systems must be documented.

Note: Operators that are involved in the chilling of animal products to the required preservation temperature, as specified in the Human Consumption Specifications, must carry out their own HACCP application for these processes. The requirements for the cooling of meat and meat products can be found in Industry Standard 6: Processing of Edible Product. The requirements for the cooling of certain seafood are specified in the Human Consumption Specifications.

2 HACCP Application

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2.1 Scope

The application of HACCP principles shown in this section applies to the following:

Type of premises: Stand-alone cold or dry stores whose primary operation is storage

Products: Various types of animal products, including meat, dairy, seafood, poultry, eggs, and bee products

Process: From receipt of animal products into the cold or dry store to dispatch from the premises (and transport of a dairy products)

Key processing operations:

- Further chilling of animal products
- Freezing of chilled animal products
- Refrigerated storage (chilled or frozen) of animal products
- Dry storage (storage under ambient conditions) of animal products
- Transport of dairy products

2.2 Product Descriptions

Cold and dry stores handle a great variety of animal products, most of which are received already packed. A store operator is unlikely to know the characteristics and intended use of many of these products. It is, therefore, very difficult and impractical for a store operator to categorise these products into groups based on their product characteristics, process, or intended use and consumer.

In this HACCP application, animal products have been broadly categorised into three groups based on the different legislative requirements that apply to these product groups. These categories are:

- Non-dairy animal products for human consumption
- Dairy products for human consumption
- Animal products for animal consumption

Each product group can be further categorised, if needed, according to their storage requirements (i.e. chilled, frozen, stored in ambient conditions).

A summary of the intended use and requirements for the three product categories is given in Table 1.

Table 1. Intended use and storage requirements for animal products

Products	**Non-dairy animal products for human consumption**	**Dairy products for human consumption**	**Animal products for animal consumption**
Intended use of product	Human consumption	Human consumption	Animal consumption
Requirements for the chilling, freezing and storage of animal products	HC Spec 76(2) and 104(2) specifies the following critical preservation temperatures: • Chilled mammals, ostriches, emus and poultry: ≤ 7°C • Frozen mammals, ostriches, emus and poultry: ≤ -12 °C • Chilled whole fish: -1°C to 1°C • Chilled fish product: - 1°C to 4°C • Frozen fish or fish products (including shellfish): ≤ -18°C • Brine frozen fish: ≤ -15°C • Shucked paua intended for canning in NZ: ≤ 6°C	Dairy Approved Criteria for Storage and Transportation of Dairy Material and Products 6(13) requires that stores have adequate facilities for storing refrigerated or frozen foods; monitoring food temperatures; and when necessary, controlling ambient temperatures to ensure the safety and suitability of food	AC Spec 66 requires that chilling or freezing are conducted without any unnecessary delay and in a manner that minimises any potential microbial proliferation and contamination of animal material or product.
Labelling	Labelling of transportation outers as specified in HC Spec 32	The Approved Criteria for Storage and Transportation of Dairy Material and Products 9(1) (c) requires that products are labelled in a manner that enables traceability to be maintained	Labelling of transportation outers as specified in AC Spec 31

2.3 Process description

The process flows in Table 2 and 3 show generic processes that are typically followed by New Zealand cold or dry stores.

Table 2. Process flow for the chilling or freezing of animal products

Inputs	Process steps	Outputs
Chillled animal products	1. Receiving ↓ 2. Transfer to blast freezer/chiller ↓ 3. Blast freezing/chilling ↓ 4. Transfer to freezer/chiller ↓ 5. Storage ↓ 6. Dispatch ↓ 7. Transport (optional step for non-dairy)	→ Frozen animal products → Frozen animal products

Table 3. Process flow for the storage of animal products

Inputs	Process steps	Outputs
Animal products (already at preservation temp)→	1. Receiving ↓ 2. Transfer to storage chiller or freezer, or dry store ↓ 3. Storage ↓ 4. Dispatch ↓ 5. Transport (optional step for non-dairy)	→ Animal products → Animal products

2.4 Hazard analysis and CCP determination

2.4.1 Identification of hazards associated with incoming products

For many of the animal products received at the premises, the store operator is unlikely to know their characteristics, including their composition, how they were processed and the hazards which are reasonably likely to occur in them. This, and the huge number of product types handled by the stores make it unreasonable to expect that specific hazard identification can be done for each type of product received.

To simplify hazard identification, a conservative approach has been taken in this HACCP application. It is assumed that the animal products contain pathogenic microorganisms that are capable of growing to unacceptable levels if storage conditions (i.e. temperature, time, humidity) are not adequately controlled.

It is also assumed, based on the results of national residue monitoring programmes and the New Zealand Total Diet Survey, that certain animal products will contain chemical hazards (e.g. chemical residues), but these are likely to be present within acceptable limits. Certain animal products may also contain physical hazards such as metal and glass.

Refrigerated or dry storage is unlikely to have any impact on any existing chemical or physical hazards in any animal product, particularly those that are received already packed

and sealed. Therefore, only microbiological hazards will be considered further in the hazard analysis in the following section.

2.4.2 Identification of process step hazards and CCP determination

A simplified approach to hazard analysis and CCP determination is presented in Table 4. This differs from the usual approach used by the NZFSA in published Generic HACCP applications or Generic RMPs for the processing of animal products. The usual approach involves a step-by-step analysis of the process, following the sequence of steps in the generic process flow. The analysis considers hazards from all inputs to the process, and it assesses the cumulative or sequential effects of the process steps on hazards. This approach was not considered as appropriate to the storage of animal products in cold or dry stores for reasons explained earlier in section 2.4.1.

It has been considered more appropriate and practical to focus on identifying the impact of individual process steps on microbiological hazards which may occur in the products, and to determine the control measures which can be applied by the store operator.

The different process steps that are commonly undertaken in cold or dry store are listed in column 1 of Table 4. They are not presented sequentially for a particular process flow. Each process step was analysed to identify any potential impact on existing hazards (e.g. growth of existing microorganisms) and/or the potential for new hazards to be introduced or transferred to the product (e.g. contamination of damaged products). The potential impact of the different process steps are summarised in column 2.

Column 3 gives the control measure(s) necessary for addressing each of the identified process step hazards. It was then determined whether or not the particular control measure was a Critical Control Point (CCP). A CCP is a step at which control can be applied and is essential to prevent or eliminate a food safety hazard or reduce it to an acceptable level. As shown in column 4, none of the control measures was identified as a CCP.

Generally, freezing and refrigerated storage of animal products are considered as preservation steps. They are not intended to eliminate or reduce microbiological hazards to an acceptable level. Thus, they have not been identified as CCPs. The control of hazards at key steps is expected to be adequately addressed by GOP.

Since no CCP has been identified, the other HACCP principles that relate to a CCP (i.e. identification of critical limits, CCP monitoring, CCP corrective action) have not been applied to the processes covered in this hazard analysis.

Verification, documentation and record keeping for the GOP control measures will still need to be undertaken by the operator.

Note:

a) When freezing is applied for the purpose of eliminating a particular hazard, this step may be identified by the operator as a CCP. When a CCP is identified, the other HACCP principles that relate to a CCP (i.e. identification of critical limits, CCP monitoring, CCP corrective action) must be applied to the process.

b) Although freezing at -18°C for 24 h will inactivate the Anisakid parasite that may present in certain types of New Zealand fish, the primary purpose for freezing fish is to preserve it. The destruction of the parasite only occurs as a consequence of the preservation step. Fish can be sold chilled which indicates that the destruction of the parasite by freezing is not considered essential for food safety. Thus, the NZ seafood industry does not consider the freezing of fish as a CCP.

c) Freezing will destroy parasites, such as Taenia saginata and Toxoplasma gondii that may be present in certain types of red meat. The primary purpose for freezing meat is to preserve it. The destruction of the parasite only occurs as a consequence of the preservation step. Meat can be sold chilled which indicates that the destruction of the parasite by freezing is not considered essential for food safety. Thus, the NZ meat industry does not consider the freezing of meat as a CCP.

d) Comb honey and bee pollen are frozen to destroy wax moth and pollen mites. These organisms are not considered as hazards to human health. Thus, freezing of comb honey and bee pollen is not considered a CCP.

Table 4. Hazard analysis for individual process steps, and CCP determination

Process step	Potential impact of step on hazards	Control measure	Is the control measure a CCP?
Receiving	Microbiological growth in chilled products due to delays in refrigerating products	GOP - Procedures for receiving and timely transfer of products to refrigerated storage Refer to Part 2, Section 9	No
		GOP - Training of workers Refer to Part 2, Section 5	No
Transfer and handling of products	Microbiological and physical contamination of products due to damage to packaging as a result of improper handling and/or forklift operation	GOP - Procedures for proper handling of products, and operation of forklifts and other conveyances Refer to Part 2, Section 9	No
		GOP - Training of workers Refer to Part 2, Section 5	No
Blast chilling or freezing	Microbiological growth due to refrigeration failure, and/or non-compliance with established refrigeration parameters (e.g. loading capacity)	GOP- Proper design and construction of refrigeration facilities Refer to Part 2, Section 2	No
		GOP – Refrigeration procedures Refer to Part 2, Section 9	No
Chilled storage	Microbiological growth due to refrigeration failure, and/or non-compliance with established refrigeration parameters (e.g. loading capacity, temperature of incoming product)	GOP- Proper design and construction of refrigeration facilities. Refer to Part 2, Section 2	No
		GOP – Refrigeration procedures Refer to Part 2, Section 9	No

Process step	Potential impact of step on hazards	Control measure	Is the control measure a CCP?
	Increase in microbiological levels above established limits due to non-compliance with agreed storage life	GOP - Procedures for ensuring agreed storage periods are met GOP - Inventory control Refer to Part 2, Section 11	No
Frozen storage	None		
Dry storage	Microbiological growth (e.g. moulds) due to increase in moisture content of dry products	GOP - Maintenance programme for facilities (e.g. leaking roofs) Refer to Part 2, Section 2	No
		GOP - Procedures for handling and storage to prevent damage to packages, and protection of products from spillages/leaks Refer to Part 2, Section 9	No
		GOP - Training of workers Refer to Part 2, Section 5	No
	Microbiological contamination from pests	GOP - Pest control procedures Refer to Part 2, Section 7	No
Dispatch	Microbiological growth in refrigerated products due to prolonged periods under unrefrigerated conditions	GOP - Procedures for loading out of refrigerated products Refer to Part 2, Section 9	No
Transport of dairy products	Microbiological, chemical or physical contamination from improperly cleaned container, vehicle or conveyance, or from other products that are transported at the same time	GOP – Cleaning and maintenance of containers, vehicles and other conveyances GOP – Separation of other products which may contaminate dairy products Refer to Part 2, Section 14	No
	Microbiological growth in refrigerated products due to refrigeration failure	GOP – Design and construction of refrigerated vehicles or conveyances	No

Process step	Potential impact of step on hazards	Control measure	Is the control measure a CCP?
		GOP – Refrigeration procedures, and temperature control Refer to Part 2, Section 14	
	Microbiological and physical contamination of products due to damage to packaging as a result of improper handling and/or forklift operation	GOP - Procedures for proper handling of products, and operation of forklifts and other conveyances. Refer to Part 2, Section 14	No

3 Identification and Control of Risk Factors related to Wholesomeness and Labelling of Products

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3.1 Wholesomeness

An animal product is considered wholesome when it does not contain or have attached to it, enclosed with it, or in contact with it; anything that is offensive, or unexpected or unusual in product of that description (e.g. foreign matter that are not food safety hazards).

The RMP must identify the risk factors that are reasonably likely to occur and have a negative impact on the wholesomeness of products covered by the RMP. It must also identify the control measures for addressing the risk factors. The control measures must be documented in supporting systems, including procedures for monitoring, corrective action and verification, and records.

Table 5: Summary of identified risk factors and controls related to wholesomeness of animal products

Risk factor	Source or cause of risk factor	Control measure
Spoilage	Microbiological growth due to improper time/temperature control	Time/temperature control, proper refrigeration Refer to Part 2, Section 9
Foreign objects that are not hazards (e.g. dirt, grease, plastic, carton)	Damage to the packaging due to improper handling and/or forklift damage	Procedures for proper handling of products, and operation of forklifts and other conveyances Refer to Part 2, Section 9
		Training of workers Refer to Part 2, Section 5

3.2 Labelling

Animal products intended for the New Zealand market must meet all relevant legislative requirements related to labelling including:

- The Animal Product Regulations 2000, regulations 8 and 19;
- Part 7 of the current Animal Products (Specifications for Products For Human Consumption) Notice;
- Standards in Part 1 of the Australia New Zealand Food Standards Code applicable to New Zealand; and
- Part 1 of the Food (Safety) Regulations 2002; and where applicable;
- Part 3 of the current Animal Products (Specifications for Products For Animal Consumption) Notice.
- Agricultural Compounds and Veterinary Medicines Regulations 2001

The RMP must identify the risk factors, related to false or misleading labelling that are reasonably likely to occur for each product. It must also identify the control measures for addressing the risk factors. The control measures must be documented, including procedures for monitoring, corrective action and verification, and records.

Table 6: Summary of identified risk factors and controls related to false or misleading labelling

Risk factor	**Source or cause of risk factor**	**Control measure(s)**
Incorrect details on label or transportation outers, e.g. • type of product • product description • lot id • storage directions	Wrong label or information put on product	Procedures for labelling Refer to Part 2, Section 9 Training of workers Refer to Part 2, Section 5