



SA Health

Food Safety Guidelines For Food Service To Vulnerable Persons

A Guidance Document for Businesses captured by
Standard 3.3.1 (Food Standards Code) -
Food Safety Programs for Food Service to
Vulnerable Persons

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Contents

Definitions	4
Introduction	7
Part 1 - Management Responsibilities.....	8
1.1 Notification Requirements	8
1.2 Implementation of a Food Safety Program.....	8
1.3 Monitoring	8
1.4 Food Safety Program Review (Validation)	9
1.5 Verification and Internal Audit.....	10
1.6 Corrective Action	10
Part 2 – Hazards that Present a Higher Risk to Vulnerable People.....	11
2.1 Menu Design.....	11
2.2 Control Measures for Higher Risk Foods	11
Table 1 - Recommended Control Measures for Higher Risk Foods.....	11
2.3 Modified Diets	12
2.4 Allergens and Intolerances	12
Table 2: Allergens that must be identified and controlled under the Food Standards Code	13
Part 3 – Process Control	13
3.1 Receiving Food.....	13
3.2 Food Storage	14
3.3 Thawing Food.....	14
3.4 Preparation	15
3.5 Cooking.....	15
3.6 Cooling of Cooked Potentially Hazardous Foods.....	16
3.7 Cook Chill Foods	17
3.8 Reheating (Hot Holding) and Warming	18
3.9 Preparation of Texture Modified and Puréed Food	18
3.10 Plating and Serving Food	20
3.11 Transporting Food	20
Part 4 – Support Programs.....	21
4.1 Approved Supplier Program	21
4.2 Food Donations	21
4.3 Food Brought in From Home/Relatives	21
4.4 Food Disposal.....	21
4.5 Food Recall Program.....	22
4.6 Product Identification/Labelling/Traceability	22
4.7 Health and Hygiene of Food Handlers	23
4.8 Cleaning and Sanitising Program.....	24
4.9 Skills and Knowledge	25

4.10	Calibration Program.....	25
4.11	Maintenance Programs	26
4.12	Pest Control Program	26
Part 5. References and Further Reading		27
1 –	Management Responsibilities	27
2 –	Process Control	27
Appendix 1 – Process Limits Guideline.....		30
Appendix 2 - Cooking Temperatures for Cook Serve Foods		35
Appendix 3 - Cooking Times and Temperatures for Cook Chill Foods.....		36
Appendix 4 - Guideline for the Control of Listeria in Food Service to Vulnerable Persons.....		38

Definitions

2hr/4hr rule is recognised as an alternative method of temperature control, the rule and how it is applied is explained in Safe Food Australia (3rd Edition 2016). The rule provides options for what can be safely done with ready-to-eat potentially hazardous food brought out of refrigeration, depending on how long it has been at temperatures above 5°C. If the total time is:

- > Less than 2 hours, the food may be used, or refrigerated for later use;
- > Between 2 and 4 hours, the food may still be used;
- > 4 hours or longer, the food needs to be thrown out.

Food Safety Standard 3.2.2 states food may be maintained at 'another temperature' - if the food business demonstrates that maintenance of the food at this temperature for the period of time for which it will be so maintained, will not adversely affect the microbiological safety of the food.

Allergen means a naturally occurring substance within a food that might induce an abnormal immune response in a susceptible person.

Allergy means the symptoms produced by reaction to an allergen. Allergic reactions to foods vary greatly from mild gastrointestinal discomfort to skin rashes and potentially life threatening asthma and anaphylaxis.

Cleaning involves using a process to remove visible contamination such as food waste, dirt and grease from a surface. This process is usually achieved by the use of warm water and detergent, which will remove microorganisms; however, the cleaning process is not designed to destroy microorganisms.

Cook Chill - Extended Shelf Life (ESL) / Heat Treated Refrigerated Food (HTRF) is a 6D heat process for non-proteolytic *Clostridium botulinum*. The food is given a heat process during cooking of 90°C for 10 minutes (or equivalent), allowing for refrigerated foods with an extended shelf life of >10 days.

Cook Chill - Short Shelf Life (SSL) is a 6D heat process for *Listeria monocytogenes*. The food is given a heat process during cooking of 70°C for 2 minutes or cooking to 75°C, allowing for refrigerated food with a short shelf life of <10 days at ≤ 5°C including the days of production and consumption. ([Refer to Appendix 3 – Cooking times and temperatures for cook chill foods](#)).

Cooling of cooked potentially hazardous food is a requirement (Standard 3.2.2 Clause 7(3)) for food businesses where food is cooled:

- > within two hours – from 60°C to 21°C; and
- > within a further four hours – from 21°C to 5°C.

Food includes:

- > any substance or thing of a kind used, or represented as being for use, for human consumption (whether it is live, raw, prepared or partly prepared); or
- > any substance or thing of a kind used, or represented as being for use, as an ingredient or additive in a substance or thing referred to in paragraph (a); or
- > any substance used in preparing a substance or thing referred to in paragraph (a) (other than a substance used in preparing a living thing) if it comes into direct contact with the substance or thing referred to in that paragraph, such as a processing aid; or
- > chewing gum or an ingredient or additive in chewing gum, or any substance used in preparing chewing gum; or
- > any other substance or thing declared to be food under a declaration in force under section 3B of the Australian New Zealand Food Authority Act 1991 of the Commonwealth and prescribed by the regulations for the purposes of this paragraph, whether or not the substance, thing or chewing gum is in a condition fit for human consumption; or
- > food does not include a therapeutic good within the meaning of the Therapeutic Goods Act 1989 of the Commonwealth; or

> to avoid doubt, food may include live animals and plants.

Food Business Notification (FBN) is a process by which food businesses are required to notify their enforcement agency (e.g. local council) of their business details before commencement of any food handling operations.

Food Handling Operation is any activity involving the handling of food. This includes, but is not limited to, delivery, storage, preparation, cooking, chilling, reheating, serving, display and transportation.

Food Safety Program (FSP) consists of a documented system to manage food safety hazards associated with the preparation and handling of food for vulnerable populations in compliance with Standards 3.2.1 and 3.3.1.

Food Standards Code means the Australia New Zealand Food Standards Code—the requirements that control the composition, level of contaminants and labelling of the food supply.

Hazard is defined as a biological, chemical or physical agent in, or condition of, food that has the potential to cause an adverse health effect in humans (e.g. microbiological, chemical/allergen or physical hazards).

Infant is a person under the age of 12 months.

Infant Formula is an infant formula product represented as a breast milk substitute for infants and which satisfies the nutritional requirements of infants aged up to four to six months.

Monitoring includes measurements or observations conducted at or near the time of activity in order to determine whether established critical limits have been maintained. The aim of monitoring is to assess whether the control chosen to manage a hazard is occurring in practice.

Point of microbial concern refers to the point in the food at which the microorganisms of concern are located and therefore the area of the food that must achieve the critical control limits to ensure food safety. (E.g., core temperature for chicken and minced/rolled meat, surface temperature of whole muscle red meat).

Potentially Hazardous Food (PHF) means food that has to be kept at certain temperatures to minimise the growth of any pathogenic microorganisms that may be present in the food or prevent the formation of toxins in the food. Some examples are:

- > raw and cooked meats (including poultry meat), or foods containing raw or cooked meat such as casseroles and curries;
- > lasagne and meat pies;
- > dairy products and foods containing dairy products (e.g. custard and dairy-based desserts);
- > seafood and foods containing seafood;
- > processed fruits and vegetables (e.g. salads, chopped & sliced fruit & vegetables);
- > cooked rice and pasta;
- > foods containing eggs, beans or other protein-rich foods (e.g. quiche);
- > foods that contain any of the above (e.g. sandwiches).

Process in relation to food, means an activity conducted to prepare food for sale including chopping, cooking, drying, fermenting, heating, pasteurising, thawing and washing, or a combination of these activities.

Ready-To-Eat (RTE) means food that is ready for consumption without further preparation, but includes food that may be reheated, portioned or garnished or food that undergoes similar finishing prior to service.

Records are evidence documented to demonstrate compliance with critical control points and other food safety requirements. Records can consist of completed forms, reports, video and/or audio recordings.

Sanitise involves a process (conducted either during or immediately after cleaning) that reduces the numbers of microorganisms present on a surface to acceptable numbers (not necessarily eliminated - that is sterilisation). Sanitising is usually achieved with a commercially available food-grade sanitiser chemical and/or the application of heat.

Shelf Life in the context of this document means the length of time food stored under specified conditions will remain safe and suitable for consumption and is commonly referred to as its 'use-by' date. Perishable foods with a 'best before' date is used to describe a date of the unopened product that if stored, as per label instructions, will retain a level of acceptable quality.

Shelf Stable means non-perishable food with a shelf life of months to years, and refers to unopened canned, bottled or packaged food products that can be stored before opening at room temperature.

These foods may use a 'best before' date to inform consumers that while safe to consume it may not retain certain quality characteristics. These foods may require refrigeration after opening.

Slowest Heating Point refers to the area of the food that will take the longest to heat up and will depend on the shape and consistency of the food.

Template means a Food Safety Program document provided as a guide for food businesses who prepare and serve food to vulnerable persons. The template can be populated to describe how the business will comply with its food safety obligations.

Validation is the process to establish scientific or technical evidence to prove the validity of critical limits that ensure effective control of identified food safety hazards. Validation may be accomplished by providing reference to regulation, standards, scientific literature or in house tests to establish that critical limits will be effective in maintaining the provision of safe food.

Vulnerable Person means a person who is in care in a facility listed in Standard 3.3.1 or a client of a delivered meals organisation.

Vulnerable Persons Business means a food business that processes or serves potentially hazardous food to six or more vulnerable persons in facilities such as:

- > Acute care hospitals;
- > Psychiatric hospitals;
- > Nursing homes for the aged;
- > Hospices;
- > Same day establishments for chemotherapy and renal dialysis services;
- > Respite care establishments for the aged;
- > Same day aged care establishments;
- > Low care aged care establishments;
- > Delivered meals organisations;
- > Childcare centres.

Introduction

SA Health has prepared this guideline to establish a consistent state-wide approach to managing food safety for vulnerable persons and assist food businesses with compliance of the Australia New Zealand Food Standards Code (Food Standards Code) - Standard 3.3.1 Food Safety Programs for Food Service to Vulnerable Persons.

The guideline intends to provide sufficient detail to assist development and maintenance of a suitable food safety program as detailed in Food Standards Code, Standard 3.2.1. Food Safety Programs. Further information is provided to explain SA Health policies in relation to control of hazards associated with menu design.

In addition the guideline details the elements of a food safety program that will be looked at and assessed during a regulatory audit, and identifies control measures that you may use to demonstrate compliance.

A business may choose to use an alternative method of compliance instead of the recommended control measures in the guideline, but must be able to demonstrate an equivalent food safety outcome.

For further information, contact:

Food Safety and Audit
Food and Controlled Drugs Branch
Health Protection and Licensing Services
Health Regulation and Protection
SA Health

Ph: 08 8226 7100

Email: HealthFoodAudit@sa.gov.au

Part 1 - Management Responsibilities

1.1 Notification Requirements

Businesses serving food to vulnerable persons must give written notice, by providing information specified in the Food Standards Code, to the appropriate enforcement agency before conducting business under the South Australian *Food Act 2001*.

1.2 Implementation of a Food Safety Program

A food business serving to vulnerable persons must comply with the Food Standards Code including:

- > Standard 3.3.1 – Food safety programs for food service to vulnerable persons.
This standard requires businesses that serve food to six or more vulnerable persons (as defined in the Standard) to implement a documented food safety program that effectively controls the hazards.
- > Chapter 3 of the Food Standards Code, including:
 - 3.1.1 – Interpretation and Application
This standard sets out the interpretation provisions that apply to the other food safety standards, including relevant definitions.
 - 3.2.1 – Food Safety Programs (FSP)
Refer to the 3.2.1 guide
<http://www.foodstandards.gov.au/code/userguide/pages/foodsafetyprogramsag4567.aspx>
The food safety program must comply with the requirements of Standard 3.2.1 of the Food Standards Code. It must:
 - a) systematically identify the potential hazards that may be reasonably expected to occur in all food handling operations of the food business;
 - b) identify where, in a food handling operation, each identified hazard can be controlled, and the means of control;
 - c) provide for the systematic monitoring of those controls;
 - d) provide for appropriate corrective action when that hazard, or each of those hazards, is found not to be under control;
 - e) provide for the regular review of the program by the food business to ensure its adequacy; and
 - f) provide for appropriate records to be made and kept by the food business demonstrating action taken in relation to, or in compliance with, the food safety program.
 - 3.2.2 – Food Safety Practices and General Requirements
This standard sets out specific food handling controls and requirements (e.g. food receipt, storage, processing, skills and knowledge).
 - 3.2.3 – Food Premises and Equipment
This standard sets out the requirements for food premises, fixtures, fittings, equipment and food transport vehicles.

1.3 Monitoring

Monitoring is undertaken to ensure that control measures (established in your Food Safety Program) are checked at pre-determined intervals to confirm that your food handling and preparation practices are within the critical limits set to ensure that the food you prepare and serve is safe.

For all controls, the food safety program must describe:

- > How each control measure will be monitored (e.g. by inspecting, measuring, checking or observing), and for each monitoring action, it must indicate:
- > What monitoring is to be done;
- > Who will do the monitoring;

- > When the monitoring is to be done (e.g. every batch, twice daily, weekly). Monitoring must be scheduled in a manner that will provide sufficient time to prevent consumption of unsafe food when critical limits are not met.

In order to be accepted as credible, monitoring must be recorded at the time of being conducted.

1.4 Food Safety Program Review (Validation)

There are two parts to a review: validation (annual and ongoing review) and verification (internal auditing activities).

A review is necessary because the activities of food businesses are not static; they change over time. These factors may mean that the food safety program no longer controls the hazards that were identified by the business when the program was first developed. It may also mean that there are new hazards that need to be controlled to make sure the food is safe.

The review ensures the controls in place are effective, is what we say in our FSP correct/safe. Some controls for food safety hazards are specified in legislation, guides or templates for developing food safety programs. These controls recognised by the relevant enforcement agency are not required to be validated by the business. If the business put into place their own controls to meet these hazards, then the controls must be validated by the business to ensure they are effective. Once controls have been validated to confirm that the control measures are effective in controlling hazards, they may need to be re-validated if there are any changes to the food business's operations that could affect a control that is in place.

The review of the food safety program needs to be performed before implementation and at a minimum, on an annual basis as defined in the food safety program. Regardless of the review date, a review (or partial review) shall be conducted in the following circumstances:

Internal factors:

- > an internal audit finds non-conformances;
- > new or different types of equipment are used to process foods;
- > changes made to chemicals used for cleaning and sanitising;
- > changes made to ingredients or menu items;
- > results of microbiological testing indicates that controls may not be adequate;
- > customers complain of illness, which may indicate that handling operations including processing are inadequate or ineffective;
- > food recalls involving the business's products.

External factors:

- > new information on hazards or control measures;
- > changes to legislation, templates or other food safety guidance material;
- > audits by enforcement agencies find non-conformances;
- > reports of illness outbreaks in the media.

The review must document when the review took place, what was reviewed (entire program or certain parts), the outcome and any action taken as a result of the review.

1.5 Verification and Internal Audit

1.5.1 Verification

Verification processes aim to determine whether the FSP, and associated documentation is being implemented and maintained i.e. the practices and procedures in the FSP are happening.

Verification may include:

- > internal audits;
- > external audits;
- > record review;
- > microbiological food testing;
- > environmental swabbing;
- > team meetings.

Verification must be conducted on a regular basis to make sure the business is performing the activities as described in the food safety program. It includes checking that control measures (including support programs), monitoring activities, corrective actions and record keeping are actually happening in practice.

These activities and frequencies need to be defined in the FSP and are often in the form of a verification schedule. The people responsible for conducting verification activities should be independent of those that have performed the work or completed the records.

1.5.2 Internal Audits

Internal audits consist of an independent assessment of the food safety program to establish if the program is accurate and is being implemented and monitored as the program says. (Are we doing what the program says we will do?).

Internal audits should include performing visual assessment as well as confirming the record review process is effective. They must be planned to be conducted at varying frequencies sufficient to ensure the FSP is being effectively implemented.

1.5.3 Record Review

All completed records, including monitoring records should be checked and signed (verified) to enable the timely identification of sporadic or systemic deviations from specified control limits or support program requirements.

1.6 Corrective Action

Corrective action is the actions taken in the event of a breakdown or failure identified with the products or food safety program including when the results of monitoring indicate loss of control or deviation from an established limit or process.

The FSP must prescribe the actions that will be taken when:

- > critical limits are not met (possibly resulting in unsafe food);
- > non-conforming supporting programs (e.g. cleaning & sanitising procedures have not been followed);
- > non-conforming products;
- > customer complaints;
- > non-conformances identified through internal or external audits.

A corrective action generally consists of two stages:

- > immediate action to be taken for any food that may be unsafe because the hazard is not under control;

- > an investigation into the cause of the 'loss of control' of the hazard so that steps can be taken to make sure this does not happen again.

Part 2 – Hazards that Present a Higher Risk to Vulnerable People

2.1 Menu Design

Certain foods present a higher risk to vulnerable people due to increased potential for these foods to cause food poisoning, with increased severity of outcomes. When developing your menu, you will need to consider the additional hazards (as required by Food Standards Code, Standard 3.3.1 and 3.2.1) in this section to ensure that safe food is served to all vulnerable people.

These foods will require specific control measures to be implemented and monitored to minimise the potential risks (refer Table 1).

Those most at-risk for Listeria infection include pregnant women and their unborn babies, newborn babies, the elderly, people of all ages with immune systems weakened by disease or illness, and anyone on medication that can suppress the immune system. Listeria is not considered a specific hazard to be controlled by childcare businesses.

2.2 Control Measures for Higher Risk Foods

Table 1 provides specific control measures to eliminate or minimise potential risks associated with higher risk foods. For control measures related to Listeria, please refer to [Appendix 4 Guideline for the Control of Listeria in Food Service to Vulnerable Persons](#)

Table 1 - Recommended Control Measures for Higher Risk Foods

Food type	Pathogen	Control measures – options for controlling hazards
Ready to Eat Meat & Poultry > Vacuum/ Modified Atmosphere Packaged > Fermented and/or Dry Cured Seafood Dairy Pâté, Pastes and Dips Fruit, vegetables, herbs and salads Pre-prepared sandwiches, wraps and sushi	<i>Listeria</i>	> Refer to Appendix 4 - Guideline for the control of Listeria in Food Service to Vulnerable Persons

Food type	Pathogen	Control measures – options for controlling hazards
Eggs	<i>Salmonella</i> <i>Campylobacter</i>	<ul style="list-style-type: none"> > Do not use cracked or dirty eggs. > Ensure that whole eggs are cooked until the white is firm and yolk begins to thicken. > Lightly cooked egg products such as custards, scrambled eggs etc. should be cooked to a minimum of 75°C or equivalent time/temperature (refer to Appendix 2). > Eggs from chickens kept on-site must be used in fully cooked food products only. > Use pasteurised egg in foods that will not be fully cooked. > Use commercially made products (e.g. commercial mayonnaise or aioli). > Purchase eggs from an accredited egg supplier.
Fruit, vegetables, herbs and products containing these foods e.g. <ul style="list-style-type: none"> > Salads > Sandwiches > Juices 	<i>Salmonella</i> <i>E.coli</i>	<ul style="list-style-type: none"> > Do not use seed sprouts or fresh produce that will be eaten raw and cannot be effectively washed (e.g. curly leaf lettuce and fresh curly leaf parsley). > Fruit, vegetables and fresh herbs may be used if: <ul style="list-style-type: none"> ○ Purchased from approved suppliers. ○ Inspected prior to use and all dirty, cut, mouldy and bruised stock removed. ○ Washed under running, potable water prior to use ¹. > Use pasteurised juices > Freshly squeezed juices may be used if: <ul style="list-style-type: none"> ○ Above controls are followed and ○ Juice is served immediately after on-site preparation.

¹ Fruit and vegetables that will not be cooked can be sanitised in a chemical appropriate for fresh produce as an additional control measure.

2.3 Modified Diets

Where modified diets may be required, clinicians should be consulted on any dietary recommendations. The International Dysphagia Diet Standardisation Initiative (IDDSI) framework outlines standardised names and descriptions of food and drink used in medical and community settings to reduce choking risk.

For highly susceptible patients or residents such as neutropenic patients (patients with blood neutrophil counts <1,000 cells/μL) a low microbial diet may be considered.

Refer to section 3.9 for food safety controls for texture-modified foods and to Part 5. References and Further Reading for menu suggestions and IDDSI framework information.

2.4 Allergens and Intolerances

Food businesses have a responsibility to ensure food served to customers is safe and suitable.

Certain foods (refer table 2) can cause some people to have an allergic reaction which can vary in severity from mild upsets to severe anaphylactic reactions. Allergenic hazards should be managed through the implementation of control measures. Control measures should also consider cross contact that can occur when an allergen is transferred from a food containing an allergen to a food that does not contain the allergen.

Businesses must be able to identify and declare the presence of allergens in their products either on the label (if the food is packaged) or in another way such as on a menu or verbally upon request if providing allergen free meals.

Table 2: Allergens that must be identified and controlled under the Food Standards Code

Cereals and their products, containing gluten, namely, wheat, rye, barley, oats and spelt and their hybridised strains other than:
<ul style="list-style-type: none"> > where these substances are present in beer and spirits > glucose syrups that are made from wheat starch and that: <ul style="list-style-type: none"> ○ have been subject to a refining process that has removed gluten protein content to the lowest level that is reasonably achievable; ○ have a gluten protein content that does not exceed 20 mg/kg. > alcohol distilled from wheat
Crustacea and their products
Fish and fish products except for isinglass derived from swim bladders and used as a clarifying agent in beer or wine
Egg and egg products
Added sulphites in concentrations of 10 mg/kg or more
Peanuts and their products
Tree nuts and their products , other than coconut from the fruit of the palm <i>Cocos nucifera</i>
Sesame seeds
Soybeans and their products, other than:
<ul style="list-style-type: none"> > soybean oil that has been degummed, neutralised, bleached and deodorised; or > soybean derivatives that are a tocopherol or a phytosterol
Milk and milk products , other than alcohol distilled from whey
Lupin

Adapted from the Food Standards Code –Standard 1.2.3 Mandatory Warning and Advisory Statements and Declarations for the most recent version.

Part 3 – Process Control

3.1 Receiving Food

The requirements for the food handling controls of food receipt are set out under Food Standards Code, *Standard 3.2.2 clause 5 - Food receipt*.

The business must prescribe in the food safety program, the methods it uses for food receipt to ensure it only accepts food and packaging that is:

- > protected from contamination to ensure that products received are in good physical condition and not showing signs of deterioration, odours or chemical taints e.g. bruised produce, broken or damaged packaging that will impact on shelf life;
- > within the use-by / best before date (or batch dated for traceability);
- > clearly identified and labelled with the name and business address, in Australia, of the vendor, manufacturer, packer or importer for traceability purposes;

- > received where required, under temperature control i.e. potentially hazardous food is only accepted at the below temperatures (unless the supplier can demonstrate the food safety has not been adversely affected).
 - cold food 5°C or below;
 - hot food 60°C or above;
 - frozen food must be hard frozen.

Some of these control measures may be in the form of a Standard Operating Procedure/s (SOP) and must include:

- > measures to prevent food contamination during food receipt;
- > measures to ensure adequate food labelling and traceability;
- > measures to ensure potentially hazardous food is only accepted at the correct temperatures.

Suppliers must be able to identify and declare the presence of allergens in their products either on the label (if the food is packaged) or in another way such as on a specification or verbally upon request when required for allergen control.

3.2 Food Storage

The requirements for the food handling controls of food storage are set out under Food Standards Code, *Standard 3.2.2 clause 6 - Food storage*.

The business must prescribe in the food safety program, the control measures it uses to ensure food is protected from the likelihood of contamination during storage. These control measures may be in the form of a Standard Operating Procedure/s (SOP) and must include:

- > how food, dry ingredients & packaging is stored to ensure it is protected from contamination;
- > date labelling and stock rotation;
- > suitability of food packaging materials;
- > how these will be monitored to ensure procedures are being followed.

Potentially hazardous foods

You must monitor, at least daily, that potentially hazardous food are stored under temperature control in equipment (e.g. fridges/hot boxes/freezers) capable of maintaining the product temperature as follows;

- > cold food 5°C or below;
- > hot food 60°C or above;
- > frozen food kept hard frozen, or
- > a time and temperature that will not affect the safety and suitability of the food.

In circumstances where more stringent temperature controls are required by the food manufacturer, alternative methods of compliance must be documented in the food safety program (E.g. some ready to heat meals or similar products may require a storage temperature of $\leq 3^{\circ}\text{C}$).

3.3 Thawing Food

The business must prescribe in the food safety program, the methods and controls it uses for thawing food to ensure it only processes safe and suitable food. Some generally accepted safe methods for thawing potentially hazardous food include:

- > in a refrigerator maintained at a maximum of 5°C (this is monitored by the food storage step);
- > in a microwave (for immediate use).

Alternative methods for thawing PHF, which require monitoring of the time/temperature include:

- > in running water (not allowing product temperature to rise above 5°C);
- > at room temperature (not allowing product temperature to rise above 5°C).

Control measures for thawing maybe documented in the form of a Standard Operating Procedure (SOP) and must include:

- > measures to prevent food contamination during thawing;
- > measures to control the time and temperature of potentially hazardous food that is not undergoing a pathogen control step;
- > measures to identify when the product commenced thawing;
- > shelf life of the thawed product (ideally used within 48 hours if thawed under refrigeration).

3.4 Preparation

The requirements for the food handling controls of food processing are set out under Food Standards Code, *Standard 3.2.2 clause 7 - Food processing*.

The business must prescribe in the food safety program, the methods it uses for the preparation of food to ensure it only processes safe and suitable food. These control measures may be in the form of a Standard Operating Procedure (SOP) and must include:

- > measures to prevent food contamination during preparation, including cross contamination;
- > measures to control the time and temperature that potentially hazardous food is out of temperature control (e.g. 2hr 4hr rule);
- > specific controls should be considered for RTE food that will not undergo a pathogen control step (e.g. cooking).

3.5 Cooking

The requirements for the food handling controls of food processing are set out under Food Standards Code, *Standard 3.2.2 clause 7 - Food processing*.

The business must prescribe in the food safety program, the methods it uses for the cooking of food to ensure it only processes safe and suitable food. These control measures may be in the form of a Standard Operating Procedure/s (SOP) and must consider critical limits as below:

- > potentially hazardous foods should be cooked to a minimum core temperature of 75°C or equivalent validated process, unless the business can demonstrate that, the cooking process used will not adversely affect the safety of the food;
- > foods that are cooked with the intention of service within 48 hrs may be cooked to alternative temperatures (refer to Appendix 2);
- > if an equivalent time/temperature critical limit is used for cooking (refer Appendix 3), the time and temperature must be monitored and recorded;
- > foods that are boiled or non-potentially hazardous foods do not require monitoring (e.g. bread, scones, cake, stewed fruit).

3.5.1 Standard Validated Procedures

The business can validate its methods of cooking by documenting the process and recording evidence that cooking times and temperatures have been met. The documentation should consider:

- > the method of cooking (e.g. steaming, boiling etc.);
- > the specific controls for different types of food (e.g. the density, volume and point of microbial concern of food can alter the cooking rate and it would be expected that there is separate validation for each food type);
- > the specific controls for equipment used to cook (e.g. oven, bratt pan etc.) If adequate standard validated procedures are adopted then daily monitoring of cooking for specific methods of cooking may not be required, however verification of the procedure should be undertaken at regular

specified intervals. If there are any changes to the business operations (e.g. new equipment, new menus etc.) then the method and procedure would need to be revalidated.

Alternate cooking methods

New cooking technologies are becoming increasingly popular in the food service sector including aged care and food safety must be adequately validated and managed if new techniques are used (e.g. Sous vide, slow cooking, overnight cooking). Refer to [Part 5 References and Further reading for sous vide information](#).

Sous vide refers to a process of cooking 'under vacuum' in sealed pouches, at precise temperatures (sometimes low) and often for a long time. Sous vide can be used to prepare foods with qualities that cannot be achieved when using traditional cooking techniques.

Sous vide cooking requires precise time and temperature combinations to effectively manage the food safety risks. The cooking process must heat the point of microbial concern of the food to a sufficient temperature and cook it for a sufficient time to kill potentially hazardous bacteria, to prevent their growth in the food. If the cooking process does not meet the minimum time and temperature requirements, the food may be unsafe to eat. Food must not be cooked below 55°C as this will not kill potentially hazardous bacteria that may be present. Food cooked between 55°C and 60°C must not exceed a total heating up and cooking time of longer than 6 hours. After this period of time Clostridium perfringens bacterial spores are able to grow and can produce toxin that may cause food poisoning. Potentially hazardous bacterial spores can survive the sous vide cooking process, so food must be cooled quickly to minimise the time the food is spent at temperatures at which these spores can grow and potentially produce food poisoning toxins.

It is important to calculate thermal processes on a "worst case" or least lethality basis, which means that all factors likely to slow the rate of heat transfer to the slowest heating point are considered. The slowest heating point of the food should be determined when using this type of standard procedure (e.g. in the core or thickest part of the food in the coolest part of the equipment).

3.6 Cooling of Cooked Potentially Hazardous Foods

The requirements for the food handling controls of food processing are set out under Food Standards Code, Standard 3.2.2 clause 7 - Food processing.

The business must prescribe in the food safety program, the methods it uses for the cooling of food to ensure it only processes safe and suitable food. These control measures may be in the form of a Standard Operating Procedure/s (SOP) and must consider critical limits as below:

- > Where PHF are cooled after cooking, they must be cooled
 - within two hours—from 60°C to 21°C, and
 - within a further four hours—from 21°C to 5°C.

(Unless the business can demonstrate that, the cooling process used will not adversely affect the safety of the food.)

3.6.1 Standard Validated Procedures

The business can validate its method of cooling by documenting the process and recording evidence that cooling times and temperatures have been met. The documentation should consider:

- > the specific controls for different types of food (the density of food can alter its cooling rate and it would be expected that there is separate validation for each food type);
- > any additional handling (e.g. portioning, stirring etc.);
- > the specific controls for equipment used to cool.

If adequate standard validated procedures are adopted then daily monitoring of cooling may not be required, however verification of the procedure should be undertaken at regular specified intervals. If

there are any changes to the business operations (e.g. new equipment, new menus etc.) then the method and procedure would need to be revalidated.

It is important to calculate cooling processes on a “worst case” basis, which means that all factors likely to slow the rate of heat transfer of the product are considered. It is important that the point of microbial concern of the food is not in the temperature danger zone for longer than the required control limits.

3.7 Cook Chill Foods

Cook chill applies to foods that are specifically prepared for storage and use after a period that is greater than 5 days.

Two categories of cook chill foods are explained in this guideline:

1. Short shelf life cook chill (up to 10 days shelf life);
2. Extended shelf life cook chill (more than 10 days shelf life).

Cook chill foods require special processing to ensure they are safe from pathogenic bacteria such as *Listeria monocytogenes* and *Clostridium botulinum*. Time and temperature control during cooling, storage and handling are critical to the cook chill system because bacteria can grow in the extended time between food production and consumption.

Many factors will influence the safety of cook chill products such as cooking times and temperatures, size or amount of food you are heating, storage temperature, aseptic packaging, acidity, composition, consistency, moisture content and chilling process.

Due to the critical steps required in this process, it is strongly recommended that you seek expert advice to determine cooking process, storage temperatures and shelf life of cook chill foods.

3.7.1 General Requirements for Cook Chill Foods

All cook chill foods must:

- > be cooked to a time and temperature that complies with Appendix 3;
- > be cooled to comply with Food Standards Code, Standard 3.2.2 Clause 7;
- > have a ‘use-by’ date to indicate the end of shelf life, not a ‘best before’ date;
- > be consumed within the stated shelf life (including both the day of cooking and the day of consumption);
- > each batch should be clearly marked to identify the date of production and the ‘use-by’ date;
- > all cook chill foods that have not been consumed after reheating and serving must be discarded.

3.7.2 Short Shelf Life Cook Chill (up to 10 days shelf life)

- > short shelf life cook chill foods must receive a heat treatment to deliver a minimum 6-log reduction in *Listeria monocytogenes* (e.g. 75°C or equivalent - see Appendix 3a);
- > short shelf life cook chill foods should be protected from contamination after cooking;
- > short shelf life cook chill foods may have a shelf life up to 10 days, although 5 days is more typical, including the day of production. However, for a shelf life greater than 5 days, validated evidence to support this shelf life should be available (e.g. microbial testing at the end of shelf life);
- > short shelf life cook chill foods must be stored at 5°C or less for the duration of the shelf life.

3.7.3 Extended Shelf Life Cook Chill (more than 10 days shelf life)

- > extended shelf life cook chill foods must receive a heat treatment to deliver a minimum 6 log reduction in non-proteolytic *Clostridium botulinum* (e.g. 90°C for 10 minutes or equivalent—see Appendix 3b) and be packaged aseptically (does not mean sterile filling, but where contamination is reduced to a minimum);

- > alternatively, extended shelf life cook chill foods could receive a heat treatment to deliver a minimum 6-log reduction in *Listeria monocytogenes* (e.g. 75°C or equivalent - see Appendix 3a) but must be chilled to 3°C and stored at 3°C for the duration of the shelf life;
- > the shelf life of extended shelf life cook chill products must be validated;
- > to achieve an extended shelf life, rapid chilling methods can be used such as tumble chilling or blast chilling or a combination.

3.8 Reheating (Hot Holding) and Warming

The requirements for the food handling controls of food processing are set out under Food Standards Code, *Standard 3.2.2 clause 7 - Food processing*.

The business must prescribe in the food safety program, the methods it uses when reheating previously cooked and cooled potentially hazardous food to hold it hot, to ensure it only processes safe and suitable food. These control measures may be in the form of a Standard Operating Procedure (SOP) and must consider critical limits as below:

- > foods to be held hot should be rapidly (no greater than 2 hours) reheated to 60°C or above;
- > where foods are held hot for greater than 2 hours, temperatures should be monitored at 2 hour intervals;
- > any leftover reheated food should be discarded.

Foods that are reheated / warmed for immediate service (food not hot held) do not require heating to a specific temperature, the purpose being to heat them to a comfortable temperature for immediate consumption.

3.9 Preparation of Texture Modified and Puréed Food

Texture modified meals are provided for residents or patients that have difficulty swallowing/chewing and may be thickened, minced or puréed. For more information relating the IDDSI framework, refer to [Part 5. References and Further Reading](#). Good hygienic practice is required during the preparation of texture modified and puréed foods because the extra handling increases the potential for cross contamination.

Contamination of blenders and mixers has been identified during audits as a potential problem area because they are difficult to clean. Poor maintenance, cleaning and sanitation of this equipment has led to outbreaks of foodborne illness in the past and close attention should be paid to this area.

In facilities where texture modified and puréed foods are prepared, the food safety program must include a procedure or set of work instructions for how this is done, including the dismantling, cleaning and sanitising of equipment.

Texture modified foods should be prepared according to the directions for use of the thickening agent or the recipe. In some cases, a blender might be required to achieve an adequate mix.

3.9.1 Modified or Puréed Food without Cooking

For food that is modified or puréed and not intended to be cooked (e.g. puréed fruit & milkshakes):

- > where practical use equipment dedicated to uncooked ready-to-eat foods only; or
- > ensure all equipment is clean and sanitised prior to modifying/puréeing; or
- > ensure these foods are processed before other foods that need to be cooked, or else the equipment is cleaned and sanitised in between uses.

3.9.2 Modified or Puréed Food before Cooking

- > minimise the amount of time between texture modification and cooking e.g. scrambled egg mix;
- > thoroughly cook food to temperatures of at least 75°C or use an equivalent heat treatment (refer to Appendix 3).

3.9.3 Modified or Puréed Food after Cooking

- > Ensure all foods used for texture modifying are thoroughly cooked to 75°C (or use an equivalent process, refer Appendix 3).
- > Texture modifying can be undertaken using the following:
 - processing immediately after cooking and serving within 2hrs, or hot holding above 60°C where food will not be consumed within 2 hrs;
 - processing after cooling (in compliance with Food Standards Code requirements).
- > To limit the risk of contaminating foods that are thickened, puréed or cut up after cooking,
 - ensure all equipment has been dismantled, cleaned and sanitised before use;
 - processing is done in an area away from raw meats and other foods requiring further preparation using equipment dedicated to ready-to-eat foods only.
- > During modification the food may be exposed to contamination so it is recommended that time and temperature controls are strictly monitored by:
 - minimise the amount of time it takes to texture modify the food before chilling commences (e.g. place in cool room as soon as possible);
 - minimise the amount of time texture modified/puréed food is stored between cooking and reheating/consumption (e.g. should be limited to 48 hours at refrigerated storage at 5°C or below). Where foods are frozen, they should be used within 48 hours of being thawed.

3.9.4 Nutritional Supplements and Milkshakes

The preparation of nutritional supplements and milkshakes requires special attention. For more information relating the IDDSI framework refer to [Part 5. References and Further Reading](#). These items are able to support the rapid growth of pathogenic bacteria. The following steps need to be taken to ensure you reconstitute, prepare and handle these items safely. Staff hygiene, in particular, hand washing is extremely important in ensuring the safety of in-house prepared nutritional supplements and milkshakes. The guideline also applies to commercial shelf-stable reconstituted products once they have been opened.

The following steps should be followed to prepare nutritional supplements and milkshakes safely:

- > wash hands thoroughly with soap and warm water and dry thoroughly. Clean gloves may be used as an additional barrier;
- > where practical, it is recommended to prepare nutritional supplements and milkshakes in an area away from raw meats, and other foods that require additional preparation on equipment dedicated to these foods;
- > minimise the time that prepared items are left on the bench during preparation and dispensing (e.g. serve immediately or place in cool room as soon as possible); and
- > never save any hydrated unfinished items—discard them.

Where nutritional supplements are produced in batches, ensure they are refrigerated at 5°C or below and used within 48 hours.

3.9.5 Preparation of Infant Formula

Staff hygiene and storage temperature of prepared formula are the two main elements to ensure the safety of infant formula from pathogenic bacteria such as *Salmonella* and *Cronobacter sakazakii*.

- > where nutritionally appropriate sterile infant formulas are available, they should be used.

In facilities where infant formula needs to be rehydrated and prepared, the food safety program should include a procedure or set of work instructions for how this is done including the sterilising of equipment and water used in rehydrating the formula.

The procedure should include the following to ensure infant formula is prepared safely:

- > wash hands thoroughly with soap and warm water and dry thoroughly—clean gloves may be used as an additional barrier;
- > good hygienic practice is required during preparation. Make infant formula in an area dedicated to preparation;
- > prepare infant formula according to the manufacturer's instructions and ensure all equipment is cleaned and sanitised prior to use:
 - a) add the formula powder to sterile water (e.g. pre-boiled cooled water), and
 - b) use sterilised bottles, teats and other utensils.

Hot water urns may not produce water at a temperature suitable to sterilise bottles or to produce boiled water:

- > as much as possible, avoid storing prepared formula by preparing formula as needed and using promptly, especially after warming;
- > when infant formula needs to be stored after preparation, it should be kept at a temperature of 5°C or less for no longer than 24 hours;
- > discard any unfinished feeds.

3.10 Plating and Serving Food

The requirements for the food handling controls of food processing are set out under Food Standards Code, *Standard 3.2.2 clause 7 - Food processing*.

The business must prescribe in the food safety program, the methods it uses when plating and serving food, to ensure it only processes safe and suitable food. These control measures may be in the form of a Standard Operating Procedure (SOP) and must include:

- > measures to prevent food contamination during plating and serving;
- > measures to keep food above 60°C or below 5°C or control the time and temperature that potentially hazardous food is out of temperature control (e.g. 2hr 4hr rule);
- > controls for any leftover food.

3.11 Transporting Food

The requirements for the food handling controls of food processing are set out under Food Standards Code, *Standard 3.2.2 clause 10 - Food Transportation*.

This section includes requirements for:

- > transport of food from one facility to another and
- > transport of food to a resident or patient using a vehicle/trolley/insulated container where food is maintained under temperature control or managed with time.

The business must prescribe in the food safety program, the methods it uses for the transport of food to ensure it only provides safe and suitable food. These control measures may be in the form of a Standard Operating Procedure/s (SOP) and must consider critical limits as below:

- > Potentially hazardous foods must be transported under temperature control as follows:
 - a) cold food $\leq 5^{\circ}\text{C}$;
 - b) hot food $\geq 60^{\circ}\text{C}$;
 - c) frozen food kept hard frozen;
 - d) where the 2hr/4hr rule is applied, that the time is not exceeded.
- > Ensure all foods are protected from the likelihood of contamination during transport;
- > Where food transport vehicles/trolleys/insulated containers are used, they must be maintained in a clean and sound condition so that food does not become contaminated;

- > Where refrigerated, frozen or hot food is transported in vehicles/trolleys/insulated containers, the units should be serviced regularly to ensure the vehicle will maintain food at the appropriate temperature. Records of maintenance activities should be kept.

Part 4 – Support Programs

4.1 Approved Supplier Program

An Approved Supplier Program should be implemented to control the quality and safety of food provided by suppliers.

All food must be received through a supplier who has been approved by the business. Types of approvals may include:

- > accredited/licensed with a relevant authority (e.g. DairySafe, Primary Industries and Regions SA (PIRSA) or equivalent interstate regulators);
- > where a supplier is notified to a local enforcement agency, provision of a food business notification number and or a recent inspection report may be accepted;
- > the business has a food safety system (HACCP/SQF etc) and is certified with a third party certification body;
- > for appropriate high-risk Listeria products, a supplier with a Listeria management program (refer Table 1 and Appendix 4 for further information);
- > large retail supermarkets who have a history of providing safe and suitable food.

A list of approved suppliers should be kept and regularly reviewed by the business and food should only be purchased from suppliers nominated on the Approved Suppliers List. The list should include their name, address, and contact details and what food products the business receives from the approved supplier.

If food, commonly horticulture/eggs, is produced on-site, appropriate control measures must be implemented by the facility before being provided for consumption to persons in care.

4.2 Food Donations

The business should include a policy on how to manage food donations as part of their approved supplier program.

The facility may only accept donations of potentially hazardous foods from commercial suppliers that are on the approved supplier list.

Infrequent donations of non-potentially hazardous or commercially packaged shelf stable products may be accepted from non-commercial sources subject to visual inspection for damage, contamination and where appropriate, compliance with use-by / best before dates. If this becomes a regular donation, the supplier should be added to the approved supplier list.

4.3 Food Brought in From Home/Relatives

Foods that are brought in from friends or relatives can be a potential risk to vulnerable persons as the foods may be higher-risk foods and there is no way of knowing the foods' history or safety.

Facilities should have a policy to manage food brought in from home by friends and relatives.

4.4 Food Disposal

The requirements for the food handling controls of food processing are set out under Food Standards Code, *Standard 3.2.2 clause 11 Food Disposal*.

- > Food may need to be disposed of because:
 - a) of a product recall;
 - b) the product is past the 'use-by' date or has become unsuitable; or

- c) the product does not comply with the requirements of the facility's food safety program.
- > Disposal should occur in such a manner that it cannot be consumed after disposal;
- > If food is to be disposed of but cannot be discarded immediately, it is marked clearly with 'ON HOLD' (or similar wording) for disposal, and separated from other food;

4.5 Food Recall Program

Most facilities captured by Food Standards Code, Standard 3.3.1 will not require a food recall plan as they do not engage in the wholesale supply or manufacture of food, e.g. facilities producing extended shelf life cook chill.

If the facility does engage in this activity, the Food Standards Australia New Zealand (FSANZ) website provides information on how to plan for, and how to conduct a food recall. Refer to the Food Industry Recall Protocol and Template to develop your food recall plan. If required, a food recall plan should be developed as a standalone document, or attachment to your FSP.

There must be a documented recall procedure that:

- a) outlines how the business traces its products and/or the ingredients used to make those products;
- b) details what actions the business will take to identify the affected products and recall them from the customer or client;
- c) notifies Food and Controlled Drugs Branch of SA Health as soon as possible in the event of a recall being required.
- > Documentation in the food recall program should include a:
 - a) list of all customers, clients, and records of where product is being distributed;
 - b) list of government food recall officers at Food Standards Australia New Zealand (available at www.foodstandards.gov.au);
 - c) copy of the Food Industry Recall Protocol issued by Food Standards Australia New Zealand (available at www.foodstandards.gov.au);
 - d) record of the batch codes or date mark applied to its products as well as the volumes produced (where applicable).

4.6 Product Identification/Labelling/Traceability

The food safety program should state exactly how product is identified throughout all stages of the production process.

Examples of identification systems include labelling:

- > at receipt
 - o 'Use-by' date (as supplied by the manufacturer);
 - o 'Best before' date (as supplied by the manufacturer).
- > during storage
 - o 'Use-by' date (as supplied by the manufacturer);
 - o 'Best before' date (as supplied by the manufacturer);
 - o 'Manufactured on' date (as supplied by the manufacturer);
 - o 'Opened on' date (for product removed from original packaging);
 - o Colour code to indicate as appropriate.
- > during frozen storage
 - o 'Date frozen' whilst retaining the manufacturer's original 'use-by'.
- > date / 'best before' date

Where a product cannot be identified, it should be discarded.

4.7 Health and Hygiene of Food Handlers

Employees and volunteers who engage in the handling of food, or who handle surfaces likely to come in contact with food are 'food handlers'. Food businesses and food handlers have legal obligations under Food Standards Code, *Standard 3.2.2 Division 4*.

4.7.1 Health of Food Handlers

Food businesses must:

- > develop a procedure to ensure that a person who is a carrier of or is known to be suffering from a food-borne disease, does not engage in the handling of food where there is a reasonable likelihood of food contamination. A food business may permit a person to resume food-handling activities after receiving medical advice from a medical practitioner.

Food handlers must:

- > advise their supervisor if they are suffering from, are a carrier of, or have symptoms of food-borne illness. Common symptoms include vomiting, diarrhoea, abdominal cramps, nausea and fever;
- > take all reasonable measures to handle food and food contact surfaces and equipment in a way that will not compromise the safety and suitability of food;
- > wash their hands with soap and warm running water in hand washing facilities whenever hands are likely to be a source of contamination of food and specifically:
 - before commencing and recommencing handling food;
 - after using the toilet or changing nappies;
 - immediately before handling ready-to-eat food;
 - immediately after smoking, coughing, sneezing, using a handkerchief or tissue, eating, drinking, touching hair, scalp or a body opening.

4.7.2 Hygiene of Food Handlers

Food businesses must:

- > provide an adequate number of suitable hand wash basins in accessible and appropriate areas with an adequate supply of warm water, liquid soap, paper towels and waste bins for their food handlers.

Food handlers must:

- > prior to preparation and at any time when hands may become contaminated, wash hands thoroughly with soap and warm water and dry thoroughly. Clean gloves may be used as an additional barrier but must be changed in the same manner as hands if they become soiled or contaminated;
- > keep fingernails short and clean; do not wear nail polish or nail decorations or artificial fingernails;
- > wear minimal jewellery (for example, plain wedding rings, and sleepers) especially on hands and wrists. Do not wear loose jewellery, especially earrings;
- > wear gloves over jewellery on hands, if they are in direct contact with food;
- > tie back or cover long hair;
- > wear outer clothing that will not contaminate food or food contact surfaces and has a level of cleanliness appropriate for the handling of food that is undertaken;
- > wear a clean apron or similar and remove when going to the toilet, on a break or away from food handling duties;
- > cover cuts or sores with a bandage (for example, bandaid). If exposed (for example, on hands) cover with gloves or other waterproof covering to prevent seepage and to stop the dressing from accidentally falling into the food being handled;
- > not eat over unprotected food (that will be served to others) or food contact surfaces;
- > store personal belongings not required for food handling in allocated staff areas.

4.8 Cleaning and Sanitising Program

The requirements for cleaning & sanitising are set out under Food Standards Code, *Standard 3.2.2 clause 19 Cleaning & Sanitising*.

Cleaning means using a process to remove visible contamination such as food waste, dirt and grease from a surface. This process is usually achieved by the use of water and detergent. During the cleaning process, microorganisms will be removed but the cleaning process is not designed to destroy microorganisms.

Sanitise means a process (conducted either during or immediately after cleaning) that reduces the numbers of microorganisms present on a surface to acceptable numbers (not necessarily completely eliminated - that is sterilisation). Sanitising is usually achieved through the use of a chemical (commercial sanitiser) and/or the application of heat.

Cleaning and sanitising are two different processes that are used to achieve different outcomes.

- > Food premises must be cleaned regularly to ensure the facility does not pose a risk of contamination to food (e.g. waste, dirt, grease);
- > Food contact surfaces and equipment must be cleaned and sanitised through the use of heat, chemicals or a combination of the two.

Cleaning and sanitising procedures and schedules must be carefully considered to ensure that all areas receive consistent attention.

The FSP should have a schedule that identifies all fixtures, fittings, equipment and areas of the production facility that require cleaning and/or sanitation (e.g. utensils, chopping boards, benches, sinks, light fittings, ventilation ducts, refrigerators, bain marie units, trolleys, cooking equipment, mincers, puree machines, dishwashers, floors, walls, ceilings, processing areas, storeroom, waste bins, amenities and washrooms etc.). The schedule should specify the frequency of cleaning and sanitation required, strength of chemicals to be used, contact times, temperature for use, and the suitability of chemicals for use in a food facility.

Cleaning equipment that may cause cross contamination, such as high-pressure spray cleaning equipment is discouraged, but should not be used to clean drains or other surfaces without being followed by a sanitising step of the whole area. Such cleaning must not be conducted during food preparation periods.

The washing up of equipment, utensils, crockery and cutlery, should be performed in locations especially designated for the purpose or other suitable areas.

Where possible, separate utensils such as knives, chopping boards or other equipment should be used for raw and ready-to-eat products. Otherwise, all equipment and utensils used for raw foods should be thoroughly washed and sanitised before they are used for cooked and pre-cooked prepared foods.

All equipment should only be used for its intended purpose, and must be kept clean and well maintained.

4.8.1 Dishwashers

Where equipment and utensils are cleaned and sanitised in a dishwasher, the manufacturer's operating instructions should be followed. To ensure the dishwasher is working correctly the following should also be undertaken:

- a) The dishwasher is regularly maintained and serviced according to manufacturer's instructions;
- b) A detergent and/or sanitiser appropriate for the equipment is used in the dishwasher;
- c) The dishwasher is operated using the hottest water rinse cycle available (ideally the economy/glass cycle should not be used, as this is generally not designed to provide a high enough temperature for the time needed to sanitise);
- d) A visual check of equipment and utensils when removed from the dishwasher to ensure they are clean;

- e) Rinse temperatures (where available e.g. commercial equipment) must be monitored and recorded and corrective action taken when limits not achieved;
- f) The dishwasher is cleaned so that there is no accumulation of food residues.

4.8.2 Monitoring and Verification of Cleaning and Sanitising

An inspection should still be undertaken even if a cleaning signoff sheet is used, as this record is usually only confirmation that planned cleaning was undertaken. The facility should be inspected to confirm that cleaning was effective and where appropriate ensure that corrective action is taken if required.

All high-risk equipment (e.g. food processors, blenders and meat slicers), particularly those used on cooked or ready-to-eat foods should be well maintained and ideally able to be fully dismantled for cleaning, sanitation and inspection.

4.8.3 Validation of Sanitisers

The business has a responsibility to demonstrate the effectiveness of the sanitiser with regard to the requirements stated in Food Standards Code, *Standard 3.2.2 clause 20*.

The majority of businesses use food grade commercial chemicals, with active ingredients such as Chlorine, QUAT or Peracetic Acid that are intended for use on food contact surfaces and do not require the business to provide any other validation. However, where the active ingredient differs to those listed above, the business is responsible for demonstrating that the product is effective in achieving the requirements stated in *Standard 3.2.2 clause 20*.

Where heat is used, such as in a dishwasher, the business must demonstrate that it is operating in compliance with the manufacturer's instructions for sanitising or other known temperature or time/temperature combination (e.g. refer to Safe Food Australia Appendix 6) to ensure effective sanitising.

4.9 Skills and Knowledge

Staff engaged in food handling or supervision of food handlers are required have appropriate skills and knowledge in food safety and food hygiene commensurate with their duties.

A documented training program should be in place with records of any food safety training undertaken by staff. This program should deliver the minimum skills and knowledge requirements for food handlers. Where staff are engaged in activities including preparation and handling of food, training should include monitoring of critical control points, good manufacturing and good hygiene practices.

Skills and knowledge may be acquired through formal or informal training and may consist of:

- a) in-house or on-the-job training;
- b) external/online courses.

The training program must consider training at induction to ensure food handlers have the appropriate skills and knowledge before they commence food handling. The program should also include ongoing training and development of food handlers. Training and food handler skills and knowledge should be assessed as a component of the internal audit.

4.10 Calibration Program

Food Standards Code, *Standard 3.2.2 Clause 22* requires food businesses that handle potentially hazardous food to have a temperature measuring device capable of measuring the temperature to +/- 1°C.

- > All measuring devices and equipment that are used to monitor critical control points in your food safety program must be included in a calibration program. The program should:
 - a) Identify all pieces of equipment used by the business that require calibration and are necessary for ensuring food safety (e.g. hand held thermometers, fridge, freezer and coolroom thermometers and dishwashers);
 - b) Identify how the business ensures new equipment (that requires calibration) is calibrated before use (e.g. purchase equipment with calibration certificates);
 - c) Document the frequency (minimum annually) and responsibility for calibration (e.g. 6 or 12 monthly by an external contractor);
 - d) Specify the temperature ranges of calibration as relevant (e.g. if equipment is used for measuring both hot and cold temperatures, calibration at both should be performed);
 - e) Document the acceptable margin of error and appropriate corrective action for non-compliance with this tolerance (e.g. discard or re-calibrate), and
 - f) Maintain calibration records.

4.11 Maintenance Programs

Food Standards Code, *Standard 3.2.2 Clause 21* requires food businesses to maintain food premises and all fixtures, fittings and equipment, including vehicles that are used to transport food and equipment, so that food safety and suitability are not compromised. This can be managed using a preventative maintenance schedule. The schedule should include:

- > Items requiring preventative maintenance (e.g. cool rooms, fridges, bain marie units, stoves, dishwashers, stab blenders, commercial mixers) should be identified;
- > Who is responsible for preventative maintenance, frequency of maintenance required, and retention of service reports;
- > All high risk equipment (e.g. food processors, stab mixers and blenders), particularly those used on cooked or ready-to-eat foods and should be maintained in accordance with the manufacturer's instructions to ensure their suitability for use;
- > Routine inspections to identify maintenance issues that are undertaken, and corresponding records kept. These routine inspections should look at the condition of all aspects of the premises including fittings, fixtures, equipment and utensils. Any identified issues should go onto a corrective action program with appropriate rectification dates. Some issues may require urgent action to effect timely rectification.

4.12 Pest Control Program

- > A documented pest control program, either in house or by a licenced contractor, should be in place, with records of any pest control undertaken retained. It should demonstrate the following:
 - a) Entry points are pest proofed (e.g. windows have fly screens, doors have weather strips);
 - b) The premises are maintained in good repair (e.g. free of holes, cracks and crevices and any access or harbourage for pests);
 - c) The premises are maintained in a clean condition with all foods covered to prevent the entry of pests into the food;
 - d) Chemicals used for controlling pests must be suitable for use within the facility;
 - e) There are reports of activities that detail:
 - i. routine activities undertaken;
 - ii. type, location and size of any pest activity found (including if there was no activity found);
 - iii. what actions were taken to control identified activity (including what type of chemicals used);
 - iv. what preventative measures the facility has undertaken to control any identified pest activity.

Part 5. References and Further Reading

1 – Management Responsibilities

<http://www.sahealth.sa.gov.au/wps/wcm/connect/public+content/sa+health+internet/protecting+public+health/food+standards/starting+a+food+business>

FSANZ (2007) Food Safety Programs. A guide to Standard 3.2.1 Food Safety Programs. Available at:

<http://www.foodstandards.gov.au/code/userguide/pages/foodsafetyprogramsag4567.aspx>

FSANZ (2008). Food Safety Programs for Food Service to Vulnerable Persons A guide to Standard 3.3.1 – Food Safety Programs for Food Service to Vulnerable Persons. Food Standards Australia New Zealand Available at: <http://www.foodstandards.gov.au/industry/safetystandards/service/pages/default.aspx>

FSANZ (2001). Safe Food Australia: A guide to the Food Safety Standards Chapter 3 of the Australia New Zealand Food Standards Code (Australia only). Food Standards Australia New Zealand Available at: <https://www.foodstandards.gov.au/publications/Pages/safefoodaustralia3rd16.aspx>

Food safety training <http://dofoodsafely.health.vic.gov.au/>

All about allergens - Allergen training for food service: <https://foodallergytraining.org.au/>

2 – Process Control

Menu Design

The Compendium of Microbiological Criteria for Food is a compilation of process hygiene criteria that have been established for specific food commodities. Available at:

<http://www.foodstandards.gov.au/publications/Pages/Compendium-of-Microbiological-Criteria-for-Food.aspx>

<http://www.foodstandards.gov.au/publications/Pages/listeriabrochuretext.aspx>

FSANZ Listeria and Food – advice for people at risk

Food Safety Information Council (2004). Fact sheet: Protecting tiny tummies and sensitive systems. Available at: <http://www.bmcc.nsw.gov.au/files/foodtinytummies.pdf>

Low Microbial Diet and Modified Diets

NSW Agency for Clinical Innovation (2010). Draft Therapeutic Diet Specifications – for consultation and comment. Draft Therapeutic Diet Specifications. Available at:

<http://www.aci.health.nsw.gov.au/?a=160557>

Food Brought in From Home

Food Safety Information Council (2004). Fact sheet: Do you cook and bring food to an elderly relative or friend in an aged care facility? Available at: <http://www.foodsafety.asn.au/resources/aged-care-facilities-and-food-safety-when-taking-food-for-residents/>

Allergen Control

Allergy & Anaphylaxis Australia: <https://allergyfacts.org.au/>

<https://allergyfacts.org.au/images/pdf/be-prepared.pdf>

National Allergy Strategy: <https://nationalallergystrategy.org.au/>

- > All about allergens - Allergen training for food service: <https://foodallergytraining.org.au/>
- > All about allergens brochure:
https://nationalallergystrategy.org.au/images/doc/All_about_Allergens_Brochure_FA.pdf

FSANZ allergen portal:

<https://www.foodstandards.gov.au/consumer/foodallergies/foodallergenportal/Pages/default.aspx>

NSWFA: <http://www.foodauthority.nsw.gov.au/search/resources-alpha>

- > Allergies: Allergy Aware Checklist (A3 poster)
http://www.foodauthority.nsw.gov.au/Documents/retail/allergy_aware_checklist.pdf
- > Allergies: Be prepared. Be Allergy Aware (brochure)
http://www.foodauthority.nsw.gov.au/Documents/retail/be_prepared_be_allergy_aware.pdf

NSW Agency for Clinical Innovation (2010). Draft Therapeutic Diet Specifications – for consultation and comment. Draft Allergy Diet specifications. Available at:
http://www.dementiaresearch.org.au/images/dcrc/output-files/253-cc-hcg-06_07_thickened+fluids++report+final+30_3_09.pdf

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FSANZ (2002). Food Safety: Temperature control of potentially hazardous foods. Guidance on the temperature control requirements of Standard 3.2.2 Food Safety Practices and General Requirements. Food Standards Australia New Zealand. Available at:
http://www.foodstandards.gov.au/publications/documents/FSTemp_control_Edition_for_printing.pdf

CSIRO (2010). Make it safe: a guide to food safety. CSIRO Food and Nutritional Sciences. CSIRO Publishing, Collingwood Victoria.

Preparation of Texture Modified and Puréed Food

Dementia Collaborative Research Centre (2008). Thickened fluids for people with dementia in Residential Aged Care Facilities. Available at:
http://www.dementiaresearch.org.au/images/dcrc/output-files/253-cc-hcg-06_07_thickened+fluids++report+final+30_3_09.pdf

IDDSI – International Dysphagia Diet Standardisation Initiative

The IDDSI framework provides a common terminology to describe food textures and drink thickness and consists of a continuum of 8 levels (0-7), where drinks are measured from Levels 0 – 4, while foods are measured from Levels 3 – 7. The IDDSI framework outlines standardised names and descriptions of food and drink used in medical and community settings to reduce choking risk.

<https://iddsi.org/framework/>

Preparation of Infant Formula

World Health Organization (2007). Safe preparation, storage and handling of powdered infant formula. Guidelines. World Health Organization in collaboration with Food and Agriculture Organization of the United Nations. Available at: http://www.who.int/foodsafety/publications/micro/pif_guidelines.pdf

SA Health – Feeding Babies Fact Sheet

<https://www.sahealth.sa.gov.au/wps/wcm/connect/5514158047d940a7ac79adfc651ee2b2/Feeding+babies+and+food+safety+Fact+Sheet.pdf?MOD=AJPERES>

Cook Serve Foods

CSIRO (2010). Make it safe: a guide to food safety. CSIRO Food and Nutritional Sciences. CSIRO Publishing, Collingwood Victoria.

Cook Chill

Cox, B. & Bauler, M. (2008). Cook chill for foodservice and manufacturing: Guidelines for safe production, storage and distribution. Australian Institute of Food Science and Technology (AIFST), Sydney.

The safety and shelf-life of vacuum and modified atmosphere packed chilled foods with respect to nonproteolytic *Clostridium botulinum* June 2017

<https://www.foodstandards.gov.scot/downloads/vacpacguide.pdf>

Sous Vide

NSW Food Authority - Sous vide Food Safety Precautions for Restaurants

www.foodauthority.nsw.gov.au/aboutus/science/food-risk-studies/sous-vide

Vic DHHS Food safety program template Supplementary practices section – Sous Vide

www.health.vic.gov.au/foodsafety and

<https://www2.health.vic.gov.au/public-health/food-safety/food-businesses/food-safety-program/food-safety-program-templates/food-safety-program-template-class-2>

Appendix 1 – Process Limits Guideline

Process	Control Measure	Critical Limit	Target Organism	Benefit	Vegetative	Comment
Chilling	Temperature Control retards micro growth	60°C - 21°C in 2hrs 21°C - 5°C in 4hrs	Salmonella, other vegetative pathogens, inc toxin producers, the vegetative state of toxin producing spore formers	Increased Shelf life	Short Shelf life	Often the most difficult control step for business to achieve e.g. fridge capacity, size of containers etc.
Cooking	Temperature Control reduces micro load to safe level	> 75°C Or equivalent time and temperature combination	Salmonella, Listeria monocytogenes & other vegetative pathogens	Kill Step	Re-contaminant	Whole muscle red meat can be exempt from this
Cook / Chill	Temperature Control reduces micro load to safe level	Shelf life dependant on cook/chill process and target organism (75 °C or >90°C for 10 mins) and chill temperature of 5°C or 3°C Refer Section 5 References & further reading for process controls	Salmonella, other vegetative pathogens, inc toxin producers. The vegetative state of toxin producing spore formers e.g. Clostridium botulinum	Kills step & control step	If either step is not correct, the possibility of micro growth increases	Particular significance for vulnerable populations or for catering businesses

Process	Control Measure	Critical Limit	Target Organism	Benefit	Vegetative	Comment
Freezing	Temperature Control suspends micro growth	Hard Frozen	Vegetative pathogens, spoilage organisms	Extended Shelf life	Freezer burn	May not destroy pathogens present - need to thaw/ cook/ temperature control correctly
Refrigerated Storage	Temperature Control retards micro growth	< 5°C	Salmonella, E coli, inc toxin producers, the vegetative state of toxin producing spore formers	Increased Shelf life	Short Shelf life	Listeria can grow slowly at refrigerated temperatures
Acid Addition <i>(not applicable to raw egg products as not suitable for VP)</i>	Acidification	pH <4.6	Vegetative pathogens	Shelf Stable Long shelf life	pH must be correct. Different acids will have different effects	Sushi rice has specific requirements - check that vine.g.ar is not being added for flavour
Sous Vide	Time & temp	Refer Section 5 References & further reading for process controls Min temp validated 55°C	All vegetative pathogens	Kill Step	Time temperature specific	New' cooking technique - operator must demonstrate they understand the food safety requirements
Vac & MAP Packing	Removal of oxygen	Will depend on the application - specifications will need to be set	Aerobic bacteria	Extended shelf life	Requires refrigeration and low oxygen transmission packaging	Pathogens such as Listeria, Salmonella & E coli are facultative anaerobes.

Process	Control Measure	Critical Limit	Target Organism	Benefit	Vegetative	Comment
Pasteurising	Temperature Control 6 log reduction	72°C 15 s	All vegetative pathogens	Kill Step Ext Shelf life	Not shelf stable	Spoilage organisms can still survive
Canning Low acid food	Temperature Control 12 log reduction	121°C for 2.52 mins Check validated procedure due to onsite product/process variables	C. Botulinum	Shelf Stable	Relies on seam integrity	Home canning/ preserving has been the main source of botulinum cases
Bottling	Pasteurisation	72°C 15 s	All vegetative pathogens	Shelf Stable Preserves in season crops	Texture changes	Spoilage organisms can still survive
Sugar	Water binding	$a_w < 0.85$	Vegetative pathogens (will not grow)	Long shelf life Shelf stable	Sweet product limited market	Osmophilic yeasts & moulds can grow
Drying	Dehydration	$a_w < 0.85$	Vegetative pathogens (will not grow)	Long shelf life Shelf stable	Maillard browning	Not all pathogens killed - Salmonella can survive very low A_w . Spores will survive

Process	Control Measure	Critical Limit	Target Organism	Benefit	Vegetative	Comment
Other low A_w	Use of fats/ oils	$a_w < 0.85$	Vegetative pathogens (will not grow)	Long shelf life Shelf stable	Salmonella can be 'protected' by the fat content	Peanut butter & chocolate are examples of low A_w foods associated with Salmonella outbreaks
General a_w limits for GROWTH	Various	$a_w < 0.93$ $a_w < 0.92$ $a_w < 0.85$ $0.61 > a_w < 0.85$	C. botulinum, C. perfringens, Salmonella, E coli, B cereus Listeria monocytogenes Staph aureus (growth) Yeasts & moulds	Product dependant	Product dependant	Water activity must always be used as a guide in conjunction with other hurdles or the type of product. E.g. bread is $A_w = 0.95$, but is baked & forms a 'protective' crust
Smoking	Usually in association with Salt &/or Drying	Different applications Hot or cold smoking	Not quantified	Known to inhibit micro growth but not quantified	Limited product range & appeal	Can use a 'liquid' smoke or natural smoke
Salt Curing	Dehydration	$a_w < 0.93$ $a_w < 0.92$	Salmonella, E. coli Listeria monocytogenes	Shelf Stable Long shelf life	For very specific products e.g. smallgoods	Must be done correctly to achieve food safety outcomes.

Process	Control Measure	Critical Limit	Target Organism	Benefit	Vegetative	Comment
Pickling	Dehydration & Acidification	$a_w < 0.93$ pH < 4.6	Salmonella, other vegetative pathogens, inc toxin producers, the vegetative state of toxin producing spore formers	Shelf Stable Long shelf life	pH must be correct	Must be done correctly to achieve food safety outcomes.
Fermenting	Dehydration & Acidification	$a_w < 0.93$ pH < 4.6	vegetative pathogens inc toxin producers, the vegetative state of toxin producing spore formers	Shelf Stable Long shelf life	pH drop must be achieved quickly	Specific starters are required for different applications
Artificial and Natural Preservatives	Chemical inhibitors	Various	Various target organisms	Too numerous to specify	May be limited by Food Standards Code	Must know what preservative will work best for what product.

NOTE: This is a guideline only. The nature of the food, other preservation techniques and other processing methods must be taken into consideration.

Appendix 2 - Cooking Temperatures for Cook Serve Foods

Products	Internal temperature (°C)
Eggs	Cook until white is firm and yolk begins to thicken
Dishes containing eggs (e.g. sauces, custards)	75°C
Poultry (chicken and turkey, whole or parts)	75°C
Fish (whole fillet)	63°C
Meat (beef, veal, lamb) whole muscle steaks and roasts only - medium rare	63°C
Meat (beef, veal, lamb) and pork - medium	71°C
Meat (beef, veal, lamb) and pork - well done	75°C
Minced meat (beef, veal, lamb, pork hamburgers, sausages)	75°C
Minced poultry (chicken and turkey hamburgers, sausages)	75°C
Sauces using raw meat, poultry or fish	Bring to the boil

Foods cooked to temperatures less than 75°C must be served within 48 hours.

Alternatively, a facility may choose to cook products to an approved time/temperature equivalent (refer to Appendix 3).

Appendix 3 - Cooking Times and Temperatures for Cook Chill Foods

Appendix 3a

Inactivation of <i>Listeria monocytogenes</i>		
Internal product temperature (°C)	Time for 6 log reduction (mins and secs)	
60	43 mins	34 secs
61	32 mins	3 secs
62	23 mins	34 secs
63	17 mins	21 secs
64	12 mins	45 secs
65	9 mins	23 secs
66	6 mins	54 secs
67	5 mins	5 secs
68	3 mins	44 secs
69	2 mins	45 secs
70	2 mins	1 secs
71	1 mins	29 secs
72	1 mins	6 secs
73	0 mins	48 secs
74	0 mins	36 secs
75	0 mins	26 secs
76	0 mins	19 secs
77	0 mins	14 secs
78	0 mins	10 secs
79	0 mins	8 secs
80	0 mins	6 secs
81	0 mins	4 secs
82	0 mins	3 secs
83	0 mins	2 secs
84	0 mins	2 secs
85	0 mins	1 secs

Note: z value = 7.5°C from Gaze et al (1989)

Appendix 3b

Inactivation of non-proteolytic <i>Clostridium botulinum</i> type B		
Internal product temperature (°C)	Time for 6 log reduction (mins and secs)	
75	465 mins	45 secs
76	360 mins	37 secs
77	279 mins	13 secs
78	216 mins	11 secs
79	167 mins	23 secs
80	129 mins	36 secs
81	100 mins	21 secs
82	77 mins	42 secs
83	60 mins	9secs
84	46 mins	35 secs
85	36 mins	4 secs
86	27 mins	55 secs
87	21 mins	37 secs
88	16 mins	44 secs
89	12 mins	58 secs
90	10 mins	2 secs
Note: z value = 9.0°C from Betts (1996)		

Time and temperature must be recorded.



Appendix 4

Guideline for the Control of Listeria in Food Service to Vulnerable Persons

November 2019



Government
of South Australia

SA Health

Contents

Purpose	3
1. Listeria Overview	3
2. Symptoms	4
3. Growth and Survival Characteristics	4
4. Control Measures	4
Implementation of menu controls for high risk foods	5
Table 1 - Recommended Control Measures for Higher Listeria Risk Foods	6
Implementation of safe food handling and preparation controls	9
Control of people entering the food handling environment	9
Environmental control through cleaning and sanitising programs	9
Maintenance of facilities and equipment	10
Implementation of use-by dates	10
Monitoring and verification	10
Training	10
5. References	11
6. Glossary	12
Appendix 1 - Limiting Shelf Life as a Control Measure for Listeria Monocytogenes.	15

Purpose

Listeria is one of many risks to be considered by a business captured by Standard 3.3.1 or businesses that supply to these businesses. This guideline forms part of the SA Health - Food Safety Guidelines for Food Service to Vulnerable Persons, and the two guidelines should be read in conjunction with each other. As *Listeria monocytogenes* can cause serious health complications or be life threatening to vulnerable persons, businesses that prepare and/or serve food to be consumed by this population should implement specific control measures to prevent foodborne illness caused by this organism.

Food businesses that are captured by Food Safety Standard (FSS) 3.3.1 or businesses that supply to these businesses will benefit from this guideline in assisting them to develop and implement their own site-specific Listeria Management Program (LMP). For those businesses captured by FSS 3.3.1 (E.g. hospitals, aged care centres and organisations that prepare and deliver food to vulnerable persons), their LMP forms part of their Food Safety Program (FSP) which states how they will control identified food safety hazards associated with the food handling activities of their business.

Listeria is not considered a hazard for healthy children, as healthy children are no more susceptible than the general public in regard to the effects of this organism; therefore childcare centres are not required to implement specific control measures for Listeria.

1. Listeria Overview

Listeria monocytogenes is a bacterium that causes an uncommon but potentially life threatening infection called listeriosis and mainly affects certain vulnerable groups. This is caused by eating food contaminated with the bacteria.

Those most at risk are:

- > pregnant women, their unborn and newborn children;
- > older people (generally considered to be persons over 65 years);
- > people of all ages whose immune systems have been weakened by disease or illness (for example, cancer, leukaemia, HIV infection, diabetes & liver or kidney disease); and
- > anyone on medication that can suppress the immune system.

Organism Description

Listeria monocytogenes belongs to the genus Listeria along with over 10 other species, however this pathogenic species is most widely known in the food industry.

Other common non-pathogenic species include *L. innocua*, *L. welshimeri* and *L. seeligeri*, and detection of these should still be treated as serious as it identifies favourable conditions for survival of Listeria in the environment or product.

Listeria can also be found throughout the environment. It has been isolated from domestic and wild animals, birds, soil, vegetation, fodder, water and from floors, drains and wet areas of food processing facilities.

Please note, unless otherwise specified, all future references to 'Listeria' in this document is referring to the pathogenic organism Listeria monocytogenes.

2. Symptoms

Healthy people may be frequently exposed to *Listeria* without apparent symptoms or may only have a mild illness with an incubation period (time between infection and the symptoms) of usually 1 day (range 6 hours to 10 days).

Symptoms of listeriosis include:

- > sudden onset of fever;
- > headache;
- > muscle aches;
- > nausea, vomiting;
- > neck stiffness; and
- > gradual onset of confusion, decreased alertness.

For at risk populations, these symptoms may progress to more serious forms of the illness (invasive listeriosis), such as meningitis (brain infection), septicaemia (blood poisoning) and possible death. Infection during pregnancy can lead to miscarriage, infection of the newborn and stillbirth. After eating contaminated food the incubation period of invasive listeriosis can be anywhere between 3 to 70 days.

3. Growth and Survival Characteristics

Understanding the unique factors that enable *Listeria* to survive and multiply in food and in the food processing environment is essential for the effective management of *Listeria*. In food these include temperature, pH, water activity, salt concentration, absence of oxygen and the presence of preservatives. Under particular conditions, *Listeria* in food can rapidly grow to unsafe levels.

An important characteristic of *Listeria* is its ability to continue to multiply at cold temperatures and survive in frozen foods. Any ready to eat food that is contaminated with *Listeria* may eventually develop enough bacteria to be dangerous, even if refrigerated correctly at or below 5°C.

Listeria can multiply at temperatures as low as -1°C and as high as 45°C. *Listeria* is also able to survive for some time in low water activity environments (e.g. dry foods) and may survive drying processes. *Listeria* is not particularly heat resistant and is killed by cooking to at least 75°C (or equivalent time/temperature).

Listeria appears to be relatively tolerant to acidic conditions with a pH value less than 4.4 required to not support the growth. As a facultative anaerobe, *Listeria* can also grow in low oxygen environments such as vacuum or modified atmosphere packaging.

Listeria can prove difficult to control on food contact surfaces such as stainless steel because the bacteria can form persistent biofilms. Biofilms result in the bacteria being more resistant to physical and chemical agents intended to kill the bacteria and allow them to survive for extended periods with minimal nutrient supply. Biofilms in locations which are difficult to identify and clean can act as a persistent source of food contamination through the ongoing presence of *Listeria*. It finds harbourage in damp, cool places and as a result, will readily multiply on damp surfaces, on food processing equipment, in cracks, crevices, cool room door seals, drains and refrigeration equipment.

4. Control Measures

Listeria can be controlled but it is a continuous process where any failure to ensure that the controls are being implemented can have major consequences. The most important control measure for a food service facility is to prevent *Listeria* from entering the food handling area. Where preventing entry is not achievable, then minimising the impact of *Listeria* that is present is crucial.

Listeria may pose different levels of risk depending on the activities undertaken by a business.

Food businesses captured by Food Safety Standard 3.3.1 will need to:

- > identify the nature of the activities and services they provide,
- > consider any associated food safety risks; and
- > implement control measures.

The control of *Listeria* in food service facilities requires commitment at different levels. The challenges for controlling *Listeria* are considerable given its ubiquitous nature, salt and acidic pH tolerances, ability to grow well in low oxygen environments and arguably most importantly, its ability to grow and survive at or below normal refrigeration temperatures.

It should be understood that any surface or material which comes into contact with food is a potential source of contamination. *Listeria* poses a particular challenge as it is a common environmental pathogen that can become established in a food handling environment and continually contaminate work surfaces and food products. Due to frequent handling involved during processing and packing, and the fact there are no further process barriers i.e. cooking prior to consumption, ready to eat foods pose the greatest risk. In addition, *Listeria* growth can occur in many long shelf-life, refrigerated food products during storage and distribution.

Typical controls include:

- > implementation of menu controls for high risk foods;
- > implementation of safe food handling and preparation controls;
- > control of people entering the food handling environment;
- > environmental control through cleaning and sanitising programs;
- > maintenance of facilities and equipment;
- > implementation of use-by dates;
- > monitoring and verification; and
- > training.

Implementation of menu controls for high risk foods

Certain foods present a higher risk to vulnerable people due to increased potential for these foods to cause listeriosis. (Further detail can be found in the [FSANZ Compendium of Microbiological Criteria for Food](#)).

The principal factors that influence the risk to vulnerable people are whether:

- > the food supports the growth of *Listeria*;
- > the food is ready to eat (RTE);
- > the food will have an extended shelf life;
- > the food undergoes a processing step to kill *Listeria*;
- > there is a risk of post-process contamination; and
- > the product formulation supports the growth of *Listeria*.

Any of the above factors can influence the potential risk to vulnerable people and the factors are cumulative, meaning the more of these factors that are present, the greater the risk for vulnerable people.

Raw materials and ingredients should be purchased from reputable suppliers, as per the business' approved supplier program and include *Listeria* Management programs if higher risk foods are purchased.

Food items which are known to be of higher risk to Listeria contamination should be avoided and a safer alternative used (refer Table 1).

Table 1 identifies:

- > foods that businesses must take into consideration when designing menus for vulnerable groups;
- > foods that must be avoided (e.g. should not serve) because of the inherent Listeria risk;
- > foods where caution must be exercised (e.g. requires hazard controls, validation and or verification); and
- > possible safer food alternatives (e.g. safest option to serve).

Table 1 - Recommended Control Measures for Higher Listeria Risk Foods

Food type	Action	Control measures – options for controlling hazards
Vacuum Packaged (VP) or Modified Atmosphere (MAP) Packaged Cooked Ready-to-Eat Meat and Poultry	Avoid	> Pre-sliced meats from service delicatessens packaged or unpackaged.
	Caution	<ul style="list-style-type: none"> > Purchase from a licensed/accredited manufacturer with a Listeria Management Program (also applies to frozen, cooked RTE meats⁵); > Pre-packaged, whole portions of unsliced ready-to-eat meats and poultry and slice in-house: <ul style="list-style-type: none"> o Limit shelf life of whole portions to 7 days¹ from opening o Limit shelf life of sliced and repackaged (VP or MAP) RTE meat and poultry to 7 days (if sliced from whole portion on opening)² o Ensure the above dates do not exceed the labelled shelf life or manufacturer’s instructions; > Pre-packaged, pre-sliced ready-to-eat meats and poultry: <ul style="list-style-type: none"> o Limit shelf life to 7 days from date of packaging¹ from manufacturer or o Product in which the process, formulation or ingredients are designed to not support the growth of Listeria for the shelf life of the product³.
	Safer Option	<ul style="list-style-type: none"> > Cook meats in house; > Meats cooked in bag or post pack pasteurised (e.g. high pressure processed (HPP)); > Canned or shelf stable meats.
Fermented and/or Dry Cured Ready-to-Eat Meat⁶	Avoid	> Pre-sliced cooked or uncooked fermented and/or dry cured meats from service delicatessens packaged or unpackaged.
	Caution	<ul style="list-style-type: none"> > Purchase uncooked fermented meats from a licensed/accredited manufacturer with a Listeria Management Program; > Purchase uncooked fermented and/or dry cured meats in which the process, formulation or ingredients are designed to not support the growth of Listeria for the shelf life of the product³.
	Safer Option	<ul style="list-style-type: none"> > Purchase cooked fermented meats; > Cook uncooked fermented and/or dry cured meats before service (e.g. pizza).

Food type	Action	Control measures – options for controlling hazards
Fruits, Vegetables, Herbs and Salads	Avoid	<ul style="list-style-type: none"> > Fresh produce that will be eaten raw and cannot be effectively washed e.g. seed sprouts, mushrooms, curly leaf lettuce and garnishes such as fresh curly leaf parsley; > Rockmelon, whole and cut.
	Caution	<ul style="list-style-type: none"> > Packaged & processed/pre-cut fruit, vegetables, herbs and salads, intended to be eaten raw, with a shelf life limited to 7 days from date of packaging^{1,3}; > Pre-packaged ready-to-eat salads with commercial dressing³; > Uncooked frozen vegetables⁵.
	Safer Option	<ul style="list-style-type: none"> > Cook fresh produce that cannot be effectively washed (e.g. seed sprouts, mushrooms and garnishes, such as curly leaf parsley); > Process whole, fresh fruit and vegetables intended to be eaten raw, in-house^{3,4}; > Canned or shelf stable pre-packaged fruit or vegetables.
Dairy	Avoid	<ul style="list-style-type: none"> > Dairy products from service delicatessens; > Unpasteurised dairy products; > Surface ripened soft cheeses such as brie and camembert; > Soft serve ice cream.
	Caution	<ul style="list-style-type: none"> > Soft cheeses such as feta, cottage, ricotta and bocconcini and other dairy foods that support the growth of <i>L.monocytogenes</i>: <ul style="list-style-type: none"> o Limit shelf life to 7 days from date of packaging^{1,3} o Purchase from a licensed/accredited manufacturer with a Listeria Management Program.
	Safer Option	<ul style="list-style-type: none"> > Cook soft cheeses before service (e.g. quiches, spinach and ricotta tarts etc.); > Hard cheeses (e.g. cheddar).
Seafood	Avoid	<ul style="list-style-type: none"> > Seafood from service delicatessens; > Raw fish, in particular raw bivalve molluscs (e.g. oysters, mussels etc.) and sashimi; > Frozen, cooked RTE seafood.
	Caution	<ul style="list-style-type: none"> > Pre-packaged cold-smoked and cooked ready-to-eat seafood with shelf life limited to 7 days from date of packaging^{1,3}.
	Safer Option	<ul style="list-style-type: none"> > Cook seafood before service; > Canned seafood or shelf stable seafood.
Pâté, Pastes and Dips	Avoid	<ul style="list-style-type: none"> > Pâté, pastes and dips from service delicatessens.
	Caution	<ul style="list-style-type: none"> > Commercially made pâté, pastes and dips with a shelf life limited to no more than 7 days from date of packaging^{1,3}.
	Safer Option	<ul style="list-style-type: none"> > Pâté, pastes and dips that have been processed and cooked in-house; > Shelf stable pâté, pastes and dips (e.g. canned).

Food type	Action	Control measures – options for controlling hazards
Pre-prepared sandwiches, wraps and sushi	Avoid	> Any pre-prepared sandwiches, wraps or sushi purchased in retail.
	Caution	> Purchase pre-prepared sandwiches wraps or sushi that contain any high risk fillings (mentioned in Table 1) from approved supplier with documented listeria controls consistent with this table.
	Safer Option	> Make sandwiches, wraps or sushi in house; > Purchase pre-prepared sandwiches, wraps or sushi with lower risk fillings ³ e.g. canned tuna, cheddar cheese.

Alternative control measures can be used where it can be demonstrated during an audit that the measures adequately control the hazard, such as:

- > **evidence of the formulation of the product to not support the growth of *L. monocytogenes* (e.g. predictive microbiological modelling, listericidal treatment or component);**
- > **evidence of the process used on the product to not support the growth of *L. monocytogenes* (e.g. cook in bag or high pressure process); and**
- > **certificate of analysis from the manufacturer/other validation to demonstrate item 3 below.**

1. Food with a refrigerated shelf life limited to 7 days – refer Appendix 1.
2. If you are slicing and vacuum packing or modified atmosphere packing ready-to-eat meat or poultry that supports the growth of *Listeria* (defined in 3 below), and you do not wish to be captured by Standard 4.2.2 or 4.2.3 of the Food Standards Code, then apply a shelf life of no more than 5 days to the product.
3. Applies to ready-to-eat products that will support the growth of *Listeria monocytogenes* (defined as an increase of 0.5 log cfu/g or more during the shelf life of the food) – extracted from Standard 1.6.1 of the Food Standards Code.

Foods that **do not** support the growth of *L. monocytogenes* include:

- > food with a pH value less than 4.4 (regardless of water activity);
 - > food with a water activity value less than 0.92 (regardless of pH);
 - > food with a combination of factors (e.g. pH < 5.0 and water activity < 0.94);
 - > frozen foods;
 - > food with a refrigerated shelf life of less than 5 days; and
 - > food that has been validated to demonstrate that the level of *L. monocytogenes* will not increase by greater than 0.5 log cfu/g over the food's stated shelf life.
4. Fruit and vegetables should be inspected prior to use and dirty, cut, moldy or bruised stock should be removed before washing under running potable water.
Fruit and vegetables that will not be cooked can be sanitised in a chemical appropriate for fresh produce as an additional control measure.
 5. Frozen High-Risk *Listeria* Foods
Although frozen foods do not support the growth of *Listeria* (as stated in point 3 above), *L. monocytogenes* has been detected in frozen seafood, vegetables and RTE meats. Therefore, there is potential for *Listeria* growth once products are thawed. The following advice is to be considered if purchasing frozen high-risk *Listeria* products:
 - > frozen vegetables must be cooked to $\geq 75^{\circ}\text{C}$ (or equivalent) prior to consumption (or in accordance with the directions on the manufacturer's packaging); and
 - > frozen RTE meats (intended to be eaten as ready-to-eat products/without further cooking) – purchase from a manufacturer with a *Listeria* Management Program that can demonstrate *Listeria* control measures during manufacture.
 6. Fermented and/or dry cured meat protocols are designed to not support the growth of *Listeria*, but due to variation in processes, evidence of the controls is specified in Table 1.

Implementation of safe food handling and preparation controls

Control measures should be documented to include detailed instructions of food processing controls for all steps occurring onsite. Listeria food processing controls include:

- > storing food under temperature control (cold food <5°C & frozen food hard frozen);
- > storing and preparing raw products and unwashed and unpeeled fruit and vegetables separately from ready- to-eat food;
- > storing packaging and single-use items in a way that prevents environmental contamination;
- > applying strict shelf life policies for high risk, Listeria prone-foods;
- > using food within best-before or use-by dates;
- > cooking food thoroughly to a core temperature of 75°C (or equivalent time/temp); and
- > ensure surfaces are clean and sanitised before use for food processing.

Control of people entering the food handling environment

People entering a facility can be a significant factor in enabling Listeria to contaminate the food handling and preparation environment.

The movement of food handlers, management, support staff, delivery drivers, contractors and visitors plays a very important part in bringing Listeria into a facility.

Food businesses do need to assess the food safety risks associated with people entering food handling facilities while wearing clothing and footwear that has been worn outside of the facility. Consideration should be given to implementation of dress codes that includes:

- > clean and protective clothing worn daily or when excessively soiled;
- > ideally, clean and protective clothing should be put on after arrival to work;
- > areas of access for staff and visitors to be defined; and
- > all people to wash hands upon entry to food handling areas and when hands become soiled.

Environmental control through cleaning and sanitising programs

Once the organism has entered a kitchen, it can grow in hard-to-access niches and can form biofilms that enhance resistance to cleaning. It readily survives in moist and cool environments and in food processing equipment. If not controlled by systematic and diligent cleaning and sanitising practices, Listeria will ultimately result in contamination of foods after processing.

Cleaning and sanitising procedures and schedules must include specific measures to control Listeria in the environment including kitchen, storage areas (cool room, freezer and dry goods), staff access areas and raw materials receipt and dispatch areas where appropriate. Particular attention must be given to cleaning and sanitising of food contact surfaces, drains, air conditioning/refrigeration units and waste control areas.

Controls to prevent Listeria survival on processing surfaces include:

- > development of specific cleaning procedures for areas of your facility, e.g.
 - o kitchen, cool rooms, waste storage etc.
 - o individual items of equipment that may need specialised attention, e.g. utensils, mechanical equipment (e.g. slicers, texture modified food equipment such as blenders and mixers,) or storage containers, lids etc.;
- > regularly cleaning and sanitising of all food contact surfaces;
- > cleaning surfaces thoroughly before the application of a food-grade sanitiser;
- > using appropriate validated food-grade chemicals; and
- > consider review of the type of food-grade sanitiser used (rotating chemicals may reduce the likelihood of resistance to cleaning and sanitising procedures).

Maintenance of facilities and equipment

To prevent *Listeria* from finding niche spots to harbour and multiply, it is important that a program of routine maintenance is developed to support cleaning and sanitising programs. The procedure should include maintenance of:

- > walls, floors and ceilings to repair cracks or broken surfaces where moisture might gather;
- > drains, sumps and grease traps;
- > defrost water collection and drainage systems from refrigeration and air-conditioning units;
- > ventilation systems to prevent condensation of steam; and
- > cool room door seals, self-closing doors and plastic curtains.

Implementation of use-by dates

Food businesses must develop a system to ensure that the shelf life of food is limited to prevent *Listeria* from becoming a hazard. This can be managed by:

- > strict adherence to use-by dates declared by manufacturers, unless additional/more stringent on-site controls are required to manage the *Listeria* hazard e.g. reduction of, or short shelf life being applied to foods identified in Table 1;
- > procedures to inform staff of limits to be applied to shelf life for foods after preparation and/or opening as per Table 1; and
- > procedures to label all food returned to storage for re-use with the date of preparation and or use-by.

Monitoring and verification

Microbiological testing of product and the environment to verify the effectiveness of their *Listeria* controls may be considered by some food businesses. Each food business would need to identify if and how they monitor and verify their controls are effective.

Training

Employees involved in the production and handling of ready to eat food should have appropriate training. This includes:

- > principal factors that influence the risk to consumers and foods which are characteristically associated with *Listeria*;
- > the nature of *Listeria*, its harbourage sites and its resistance to various environmental conditions; and
- > control measures for reducing the risk of *Listeria* associated with ready to eat food (during receipt, processing, handling, storage, distribution and use).

5. References

[FSANZ Compendium of Microbiological Criteria for Food](http://www.foodstandards.gov.au/publications/pages/compendium-of-microbiological-criteria-for-food.aspx)

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[FSANZ – Listeria and food - advice for people at risk](http://www.foodstandards.gov.au/publications/Pages/listeriabrochuretext.aspx)

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[FSANZ - Listeria](http://www.foodstandards.gov.au/consumer/safety/listeria/Pages/default.aspx)

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[FSANZ - Guidance on the application of microbiological criteria for Listeria monocytogenes in RTE food](https://www.foodstandards.gov.au/publications/Documents/Guidance%20on%20the%20application%20of%20limits%20for%20Listeria%20monocytogenes%20FINAL.pdf)

<https://www.foodstandards.gov.au/publications/Documents/Guidance%20on%20the%20application%20of%20limits%20for%20Listeria%20monocytogenes%20FINAL.pdf>

[NSW Food Authority Guidelines For Food Service To Vulnerable Persons \(July 2018\)](http://www.foodauthority.nsw.gov.au/_Documents/industry/guidelines_vulnerable_persons.pdf)

http://www.foodauthority.nsw.gov.au/_Documents/industry/guidelines_vulnerable_persons.pdf

[FSANZ Primary Production and Processing \(PPP\) Standards \(Chapter 4\)](https://www.foodstandards.gov.au/foodsafety/standards/Pages/Primary-Production-and-Processing-(PPP)-Standards-(Chapter-4).aspx)

[https://www.foodstandards.gov.au/foodsafety/standards/Pages/Primary-Production-and-Processing-\(PPP\)-Standards-\(Chapter-4\).aspx](https://www.foodstandards.gov.au/foodsafety/standards/Pages/Primary-Production-and-Processing-(PPP)-Standards-(Chapter-4).aspx)

[The Department of Health Listeria Fact Sheet \(July 2018\)](https://www1.health.gov.au/internet/main/publishing.nsf/Content/ohp-listeria-fs.htm)

<https://www1.health.gov.au/internet/main/publishing.nsf/Content/ohp-listeria-fs.htm>

[Guidelines on the Application of General Principles of Food Hygiene on the Control of Listeria monocytogenes in Foods \(CAC/GL 61 - 2007\). Codex Alimentarius Commission.](http://www.fao.org/fao-who-codexalimentarius/codex-texts/guidelines/en/)

<http://www.fao.org/fao-who-codexalimentarius/codex-texts/guidelines/en/>

[FSANZ – Micro limits for foods \(Standard 1.6.1\)](https://www.foodstandards.gov.au/foodsafety/standards/Pages/Microbiological-limits-for-food-(Standard-1.6.1).aspx)

[https://www.foodstandards.gov.au/foodsafety/standards/Pages/Microbiological-limits-for-food-\(Standard-1.6.1\).aspx](https://www.foodstandards.gov.au/foodsafety/standards/Pages/Microbiological-limits-for-food-(Standard-1.6.1).aspx)

[Meat and Livestock Australia, Practical Control of Listeria monocytogenes in Smallgoods](https://www.mla.com.au/research-and-development/search-rd-reports/final-report-details/Product-Integrity/Practical-control-of-Listeria-monocytogenes-in-smallgoods/2332)

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6. Glossary

TERM	DEFINITION
Approved Supplier	A person or company whom has been approved and listed by an organisation to provide products and services. Approval would generally require demonstration that the supplier meets with particular specifications or standards, including any legal requirements relating to the service or product they provide. Approved food suppliers include suppliers of food ingredients, prepared foods or ready to eat foods, who meet the specifications outlined by the purchasing organisation.
Bacteria	Microorganisms that are found in or on food, people, surfaces, untreated water, dirt, faeces, soil, plants, animals and pests.
Biofilm	A mass of bacteria which forms sticky and adhesive substances to protect it from the environment. Biofilms are difficult to remove from surfaces.
cfu/g	Colony forming units per gram.
Clean	Means clean to touch and free of extraneous visible matter and objectionable odour.
Contamination	The introduction or occurrence of a contaminant in food. Usually the transfer of the contaminant from a contaminated source to the food or food-contact surface.
Control measure	Any action or activity that can be used to prevent, eliminate or reduce a food safety hazard to an acceptable level.
Core Temperature	The temperature measured in the internal part of the food which heats more slowly or cools less quickly (usually the centre of the food).
Critical Control Point (CCP)	A point, step or procedure at which control can be applied and a food safety hazard can be prevented, eliminated or reduced to acceptable levels and where loss of control may lead to a food safety problem which could harm the consumer.
Facultative anaerobe	A microorganism that can grow in the presence or absence of oxygen.
Foodborne disease	A disease that is likely to be transmitted through consumption of contaminated food.
Food business	A business, enterprise or activity (other than primary food production) that involves: (a) the handling of food intended for sale, or (b) the sale of food, regardless of whether the business, enterprise or activity concerned is of a commercial, charitable or community nature or whether it involves the handling or sale of food on one occasion only.
Food handler	A person who directly engages in the handling of food, or who handles surfaces likely to come into contact with food, for a food business. The definition covers people who prepare food and/or handle surfaces likely to come into contact with food, for example a person cleaning eating and drinking utensils. Food handlers must comply with the health and hygiene requirements in Standard 3.2.2.
Food process step	A point, procedure, operation or stage in the production of food from receipt of raw foods to service of meals.
Food safety program (FSP)	A written document retained at the food premises that systematically identify food safety hazards, control measures, means of monitoring controls and corrective actions. Records demonstrate program compliance. Refer Australia New Zealand Food Standards Code, Standard 3.2.1 Food Safety Programs.

Food Safety Standards	Standards contained in Chapter 3 of the FSANZ Food Standards Code.
Food Standards Code	Means the Australia New Zealand Food Standards Code—the requirements that control the composition, level of contaminants, labelling of the food supply and standards governing the safe production for foods.
FSANZ	‘Food Standards Australia New Zealand’ is the authority that develops and coordinates Food Safety legislation.
Hazard	A biological, chemical or physical agent in, or condition of, food that has the potential to cause an adverse health effect in humans.
High risk food	Refer Potentially Hazardous Foods (PHF).
Listeria Management Program (LMP)	A Listeria Management Plan (LMP) is a component of a business’s Food Safety Program. The Plan must ensure Listeria as a food safety hazard can be managed collectively using two key indicators: <ol style="list-style-type: none"> 1. Environmental Monitoring. 2. Product Testing.
Listericidal step	A process step capable of reducing the amount of <i>L. monocytogenes</i> that may be present in food to a safe level.
Monitoring procedures	A procedure of scheduled checking (observations & measurements) to assess whether a CCP is under control and is accurately recorded for verification purposes.
Pathogen	Any microorganism (bacteria, viruses, moulds & parasites) that is able to cause disease in humans.
pH	A figure expressing the acidity or alkalinity of a solution on a logarithmic scale on which 7 is neutral, lower values are more acid and higher values more alkaline.
Potentially Hazardous Food (PHF)	Means food that has to be kept at certain temperatures to minimise the growth of any pathogenic microorganisms that may be present in the food or to prevent the formation of toxins in the food. This definition clarifies that the only food that must comply with certain temperature requirements specified in Standard 3.2.2 is food that needs temperature control to minimise the growth of foodborne pathogens or the production of toxins.
Predictive microbiological modelling	A method of assessing the food safety risks during processing, transport & storage. Mathematical models are used to define growth characteristics of microorganisms and predict their behaviour over a range of conditions.
Process	In relation to food, means an activity conducted to prepare food for sale including chopping, cooking, drying, fermenting, heating, pasteurising, thawing and washing, or a combination of these activities.
Process validation	Obtaining documented evidence that demonstrates that a specific process will consistently provide safe food. (e.g. published scientific findings or in-house trials).

Ready-to-eat food (RTE)	Food that is ordinarily consumed in the same state as that in which it is sold and does not include nuts in the shell and whole, raw fruits and vegetables that are intended for hulling, peeling or washing by the consumer. RTE food is food that can be eaten without having anything further done to it; for example, it includes raw foods prepared for consumption such as cut fruit and salads. Foods that might be just heated before serving are still considered RTE.
Sanitise	to apply heat or chemicals, heat and chemicals, or other processes, to a surface so that the number of micro-organisms on the surface is reduced to a level that: (a) does not compromise the safety of food with which it may come into contact; and (b) does not permit the transmission of infectious disease. (Standard 3.2.3).
Shelf Life	in the context of this document means the length of time food stored under prescribed conditions will remain safe and suitable for consumption and is commonly referred to as it's 'use-by' date.
Use-by date	A 'use-by' date indicates the last date on which the food may be consumed safely.
Validation	The action taken by the business to confirm that the control measures are effective in controlling the hazards (that is, they prevent, eliminate or reduce a food safety hazard to an acceptable level). Where businesses put in place controls specified in the food safety standards, food safety program guides or templates recognised by the relevant enforcement agency, businesses are not required to validate these controls. (also refer to 'Process validation').
Verification	The action taken by the business to confirm that the practices and procedures in the food safety program are happening, including reviewing, inspecting, testing & checking.
Vulnerable Person	A person who is in care, in a facility listed in Standard 3.3.1 or a client of a delivered meals organisation.
>	Greater than.
<	Less than.

Appendix 1 - Limiting Shelf Life as a Control Measure for *Listeria Monocytogenes*.

(excerpt from NSW Food Authority Guidelines for food service to vulnerable persons, July 2018)

Table 1 of this guideline lists recommended control measures for higher risk foods including limiting the shelf life of some foods to a maximum of 7 days from packaging.

Most foods that are contaminated with *Listeria monocytogenes* typically have very low levels of the organism, and some growth is required in order to produce illness, even in the susceptible populations. Risk assessment data has consistently shown that the risk of Listeriosis is increased in ready-to-eat (RTE) foods which support the growth of *L.monocytogenes* and have extended shelf lives, and that cases of Listeriosis result from high levels of *L.monocytogenes* (> 100 cfu/g) in the food.

Under European Union regulations (EC 2073/2005), a RTE food or ingredient with a shelf life of less than 5 days is considered to be unable to support the growth of *L.monocytogenes*. In addition, Health Canada has a revised policy on *L.monocytogenes* in RTE foods which includes a 'Category 2A RTE foods'. This category includes RTE refrigerated foods with a shelf-life of under 5 days. The policy states that this time period would not allow sufficient time, under reasonably foreseeable conditions of distribution, storage and use, for *L.monocytogenes* to grow to levels above 100 cfu/g by the end of the stated shelf-life (Health Canada, 2010).

The FDA/UDA risk assessment in 2003 examined several 'what-if' scenarios including estimating the effect of shelf life on the predicted number of listeriosis cases. The scenarios tested included maximum storage times for deli meats of 4, 7, 10, 14, 17, 21, and 28 days. Shortening the shelf life to 10 days was found to reduce the estimated number of cases in the elderly sub-population by 32.5%. Further reducing the shelf life to 7 days resulted in approximately a 60% reduction in the number of listeriosis cases from deli meats (FDA/USDA, 2003).

Another study by Carrasco et al. (2010) examined the effect of shortening the shelf life of RTE lettuce salads on the high-risk population of Spain, with reduction of the shelf life to 7 days resulting in a 24% reduction in predicted number of listeriosis cases. A further reduction to a 5 day shelf life resulted in a 62% reduction. Along with storage temperature and serving size, shelf life was the third most important factor in determining the number of listeriosis cases.

The intent of the Authority in recommending limiting the shelf life of foods that support the growth of *L.monocytogenes* to 7 days is to reduce the risk of listeriosis compared to product that is distributed for retail sale— for example, pre-packaged RTE deli meats may have a 6-7 week shelf life which may allow the organism to grow up to infective dose levels.

References

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For more information

SA Health
Health Protection and Licensing Services
11 Hindmarsh Square
Adelaide
(08) 8226 7100
www.sahealth.sa.gov.au



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