



Name of business:

# Food Control Plan

## Food Service and Food Retail

### Template – March 2017

### Specialist Retail – Butchery Safe

For retail businesses that process and handle meat and meat products.

Add to the food service and retail *Basics Pack*.



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# Food additives in meat products

## Goal

- Food must be safe and suitable.

## Why?

- Herbs, spices and other ingredients may be contaminated with harmful microorganisms.
- Using a validated and tried and tested recipe helps make a safe product.
- The Australia New Zealand Food Standards Code (the Code) prescribes certain food additives and their amounts that can be added to meat, poultry, game and other products.
- If a non-permitted additive is in a food, or the amount of a permitted food additive exceeds the limit prescribed in the Code the food may be unsafe.

## How this is done

*Food composition – general* <https://www.comlaw.gov.au/Series/F2015L00396> *Guidance: Food additives* [www.foodstandards.govt.nz](http://www.foodstandards.govt.nz) *Checking food additives*

- Nitrates/Nitrites
  - must be calculated to ensure that the final product has less than the maximum level specified in the Code.
  - To ensure that nitrite/nitrate is not mistaken for salt, sugar or other ingredients it must be stored separately from other ingredients.
  - Nitrite/nitrate must only be added either [identify how added]:
- Sulphur dioxide
  - Sulphur dioxide or sulphite must not be used on raw meat.
  - The amount of sulphur dioxide added to processed meat must be calculated to ensure that the final product has less than the maximum permitted level (500mg/kg).
- Casings
  - Casings must be checked that they are of food grade.

## What if there is a problem?

## Write it down

Keep a record of your calculations of food additives to confirm that your products meet requirements of the Code – either in the Diary or with your recipes.

You must write down (e.g. in the Diary) what you did to deal with a problem, what you did with the food and what action you took to prevent this happening again.

# Food additives

The information on this page is provided to help with meeting food additive requirements of the Code.

## Permitted food additives in meat and meat products

Standard 1.3.1 is extensive and examples include:

### Nitrites/Nitrates

- The total of nitrates and nitrites (calculated as sodium nitrite) permitted in cured meat, dried meat, slow dried cured meat, processed comminuted meat and poultry and game products must not exceed 125 mg/kg (parts per million) in the finished product.
- The total of nitrates and nitrites (calculated as sodium nitrite) permitted in fermented, uncooked processed comminuted meat products must not exceed 500 mg/kg (parts per million) in the finished product.

See *Brining and pickling meat* for an example of calculating nitrite in finished product.

### Sulphur dioxide

Sausage and sausage meat, and processed comminuted meat, poultry and game products must contain less than 500mg/kg (parts per million) sulphur dioxide and sodium and potassium sulphites (calculated as sulphur dioxide).

Sulphur dioxide and sulphites are not permitted to be applied to raw, unprocessed meat.

### Other permitted food additives

The Code places limits on the amount of other food additives that can be in products, such as sorbic acid and sorbates.

All ingredients and additives used must be permitted for use by, and comply with, the Code – see also *Food composition - general*.

# Limits for harmful microbes in meat

## Goal

To ensure that meat products accurately describe their ingredients and content.

Act requirements:

- Food must be safe and suitable.

The Australia New Zealand Food Standards Code (the Code) sets levels for the maximum permissible number of harmful microbes that may be present in meat products.

## Why?

- Meat products where levels aren't set in the Code may still contain harmful organisms if they aren't adequately processed and handled.

## How this is done

### Microbiological requirements of meat and meat products

Meat products that are not included in Standard 1.6.1 may also support the growth of harmful organisms. Processing must ensure that they are not in the final product or when the product is nearing the end of its shelf-life.

Guidance on microbiological levels for meat products such as uncooked corned, cured, pickled or salted meats, meat paste or spread, pâté, and hot smoked meat products is at:

[http://www.foodsafety.govt.nz/elibrary/industry/Microbiological\\_Reference-Guide\\_Assess.pdf](http://www.foodsafety.govt.nz/elibrary/industry/Microbiological_Reference-Guide_Assess.pdf)

See *Testing finished products* for information on how you can confirm that your process makes a safe products.

A check is made that meat and meat products comply with the microbiological requirements of the Code:

<http://www.foodstandards.govt.nz/code/Pages/Food-Standards-Code-from-1-March-2016.aspx>

Examples of limits for harmful microbes in meat are provided on the next page.

## What if there is a problem?

A product that doesn't meet microbiological limits must not be used. It may be thrown away, returned to the supplier or reworked using a process shown to make the product safe to use.

Review practices to identify how this happened and take action to prevent it happening again.

## Write it down

You must write down (e.g. in the Diary) what you did to deal with a problem, what you did with the food and what action you took to prevent this happening again.

Keep a record to show how your products meet microbiological requirements, (e.g. process validations, test results).

# Limits for harmful microbes in meat products

## Levels of harmful microbes in meat and meat products

If meat products are tested Standard 1.6.1 of the Code sets maximum permissible levels of harmful organisms that may be present in certain meat products from a minimum of five sample units from one lot of the product:

Food	Microbiological limit
Packaged cooked cured/salted meat	<p><b><i>Coagulase-positive staphylococci/g</i></b> up to 100 organisms is acceptable in any sample; 100-1000 organisms is acceptable in one sample only. If in more than one sample the lot is rejected; More than 1000 organisms in one sample and the lot is rejected.</p> <p><b><i>Salmonella/25g</i></b> nil present in 5 samples from the lot.</p>
Packaged heat treated meat paste and packaged heat treated pâté	<p><b><i>Salmonella/25g</i></b> nil present in 5 samples from the lot.</p>
Comminuted fermented meat which has not been cooked during the production process	<p><b><i>Coagulase-positive staphylococci/g</i></b> up to 1000 organisms is acceptable in any sample; 1000-10000 organisms is acceptable in one sample only. If in more than one sample the lot is rejected; More than 10000 organisms in one sample and the lot is rejected.</p> <p><b><i>Escherichia coli/g</i></b> up to 3.6 organisms acceptable in any sample; 3.6 to 9.2 organisms is acceptable in one sample only. More than 9.2 organisms in one sample and the lot is rejected.</p> <p><b><i>Salmonella/25g</i></b> nil present in 5 samples from the lot.</p>
Ready-to-eat food in which growth of <i>Listeria monocytogenes</i> can occur	<p><b><i>Listeria monocytogenes/25g</i></b> nil present in 5 samples from lot.</p>
Ready-to-eat food in which growth of <i>Listeria monocytogenes</i> will not occur	<p><b><i>Listeria monocytogenes/g</i></b> Up to 100 colony forming units is acceptable in any sample (5 samples from lot).</p>

## Herbs, Spices and Premixes

Herbs and spices such as paprika, cinnamon and pepper can contain harmful organisms. Guidance on microbiological levels for harmful organisms that may be found in herbs and spices is at:

[http://www.foodsafety.govt.nz/elibrary/industry/Microbiological\\_Reference-Guide\\_Assess.pdf](http://www.foodsafety.govt.nz/elibrary/industry/Microbiological_Reference-Guide_Assess.pdf)

For example, in five samples taken from a lot there should be no *Salmonella* in 25g.



# Composition of meat products

## Goal

To ensure that meat and meat products meet compositional requirements.

Act requirements:

- Food must be safe and suitable.

## Why?

- The Australia and New Zealand Food Standards Code (the Code) applies definitions, composition and labelling requirements to meat and meat products.

## How this is done

### Composition of meat and meat products

A check must be made that meat and meat products sold comply with compositional requirements of the Code (e.g. there is the correct amount of meat in a meat pie).

Check the Code Standard 2.2.1 for the requirements for the products that you make or sell at:

<http://www.foodstandards.govt.nz/code/Pages/Food-Standards-Code-from-1-March-2016.aspx>

Examples of composition requirements for meat and meat products are on the next page.

## What if there is a problem?

Products that don't meet compositional requirements but which are safe to eat may be reworked using a process shown to make the product safe to use.

Review practices to identify how this happened and take action to prevent it happening again.

## Write it down

You must write down (e.g. in the Diary) what you did to deal with a problem, what you did with the food and what action you took to prevent this happening again.

Keep a record of your calculations to confirm that your products meet compositional requirements of the Code - either in the Diary or with your recipes.

Do I need to have a recipe written down?

Writing down and following a tried and tested recipe is a way to make a consistently safe product that meets compositional and other requirements each time it is made. The recipe can also be used to check what should have been added to each batch, against the batch records showing what was actually added.

Following a recipe and keeping a record of what went into each batch can also help you to show how you consistently meet requirements in the Act and the Code.

If you change anything in a tried and tested recipe you may affect safety and composition of the end product. You will need to check - validate - that any change to the recipe, ingredients or process continues to make a safe and suitable food.

# Composition

The information on this page is provided to help with meeting food compositional requirements.

## Composition of meat and meat products

The Code Standard 2.2.1 includes definitions, compositional and specific labelling requirements for meat and meat products, including:

- A pie must contain at least 250 g/kg of meat flesh to be called a meat pie.
- Sausage must contain no less than 500g/kg of fat-free meat flesh; and the proportion of fat in sausage must be no more than 500g/kg of the fat-free meat flesh content;
- The presence of brain, heart, kidney, liver, tongue or tripe in a food must be declared either by its specific name (e.g. “liver”, “kidney”) or by the class name “offal.”
- The presence of other offal in a food - blood, pancreas, spleen, thymus - must be declared by its specific name (e.g. “thymus”).
- It is important to note that in either case above, even if a product containing offal is exempt from being fully labelled, the purchaser must be informed proactively, either verbally or in writing.
- Where reference is made/implied about the fat content of minced meat, information about the maximum proportion of fat must be expressed in g/100g.
- A declaration must be made to purchasers where raw meat is re-formed or joined or resembles a meat cut using a binding system that doesn't involve heat.
- There are prescribed names that must be used when labelling processed and manufactured comminuted fermented meat. For example, a fermented comminuted manufactured meat which has not been heat treated must be described as “fermented manufactured meat – not heat treated”.
- Other than above, labelling on a pack of fermented comminuted processed meat must not refer to any heating process unless it is a cooking instruction for consumers.

# Defrosting meat

## Goal

To ensure that the temperature of meat during defrosting does not allow the growth of harmful organisms.

To ensure that previously frozen food is not refrozen.

Act requirements:

- Food must be processed and handled in ways that minimise the contamination or deterioration of food and prevent food containing substances that are unexpected or unreasonable.
- There must be procedures for controlling hazards at each production and processing and handling step where it is essential to eliminate or reduce a hazard to an acceptable level.

## Why?

Harmful organisms can grow and some harmful organisms form toxins if products are not thawed at safe temperatures and times. Frozen meat is to be thawed at temperatures below 7°C.

Tempering helps:

- to prevent fat from softening and smearing during grinding or chopping;
- to prevent temperature during grinding or chopping from rising above 5°C. Thawing food under temperature control helps prevent harmful organisms growing

Toxins from harmful organisms can form in thawed products that are not processed further before they are refrozen.

## How this is done

Surfaces and equipment must be in sound condition and clean before use – see *Cleaning, Equipment, packaging and other items in contact with food* and *Maintenance and Food allergens*.

Good hand hygiene and personal hygiene practices must be followed when handling food - see *Hand Hygiene and Personal hygiene*.

### Defrosting frozen meat

Frozen meat being defrosted must be [identify which applies]:

- kept in a chiller to thaw below 7°C; or
- defrosted outside a chiller if it is for immediate use, or if its temperature is under 7°C;
- thawed in a way that has been demonstrated as minimising the growth of harmful microbes. This is done by: (state process)

Meat must be:

- used as soon as possible once it has defrosted or its tempered temperature is reached; or
- stored chilled until ready to use within its date code; and
- stored when defrosted so that drips cannot contaminate other foods or surfaces – for example:
  - in a dish or container to contain drips;
  - away from other foods;
  - never defrosted above ready-to-eat food;
- checked before use for any trapped packaging or plastic; wrapping/carton liner.

Once thawed, meat is not re-frozen.

## What if there is a problem?

If thawing meat is not fully defrosted, continue to thaw it until the product is completely thawed or until the required temperature is reached.

If thawing meat is too warm:

- defrost in chiller at under 7°C.

## Write it down

You must write down (eg in the Diary) any problems arising during defrosting and what you did to resolve them.

If you regularly thaw a particular size of product, write down (e.g. in the Diary) the chiller temperature setting and the time taken to consistently temper it.



Meat must be defrosted in ways that keep it suitable for use. Ambient or room temperature defrosting is not recommended for meat that is to be processed – the surface will thaw and soften while the centre remains frozen.

It is best to defrost meat in a chiller. Plan ahead and allow enough time. If possible, use a chiller set at a temperature just above the temperature desired for the defrosted meat. This helps ensure that temperature throughout the meat remains uniform. Regularly check the chiller temperature to make sure that the meat thaws evenly. Blocks of frozen meat from cartons may take several days to reach the right temperature.

If you note the chiller temperature setting of the chiller and how long it takes a particular lot size or portion to reach the desired temperature it will be useful when you want to thaw the same size of product in future. For example, you may identify that a 10kg block of frozen meat takes 3 days in the chiller operating at 5°C to reach 2°C.



# Preparing raw meat & poultry

## Goal

To prevent cross-contamination between meat, poultry, other foods and surfaces in contact with food.

To hygienically prepare food and prevent microbes that may be present in food from multiplying to harmful numbers.

Act requirements:

- Food must be processed and handled in ways that minimise the contamination or deterioration of food and prevent substances that are unexpected or unreasonable.
- There must be procedures for controlling hazards at each production and processing and handling step where it is essential to prevent or reduce a hazard to an acceptable level.

## Why?

- Some meat types are more likely to carry harmful microbes.
- Harmful microbes that can cause foodborne illnesses will grow and some can form toxins at temperatures between 5°C to 60°C (the temperature danger zone).
- Harmful microbes on dirty hands, dirty equipment and utensils can contaminate food.
- Food contaminated by chemicals can make people ill.
- Objects can fall into uncovered food affecting its suitability and/or safety.

## How this is done

Situations where cross-contamination could occur between ready-to-eat (RTE) foods and raw foods such as meat, poultry, fish and vegetables must be identified at the business – see *Preventing cross-contamination, Food allergens*.

Where possible, surfaces, equipment and places used for preparing raw foods are different to those used for RTE food – see *Potentially hazardous foods* and *Chilled and frozen food storage*.

Surfaces and equipment used for preparing food must be in sound condition and clean before use. Surfaces in contact with RTE foods must be sanitised before use – see *Cleaning and Equipment, packaging and other items in contact with food*.

Good hand hygiene and personal hygiene practices must be followed – see *Hand hygiene* and *Personal hygiene*.

### Preparing raw meat and poultry

Raw poultry must be prepared and/or packaged (identify which applies):

in a defined area that is separate from other raw meats; or

in the same area but processing and handling is at a different time to other raw meat and with thorough cleaning and sanitising in between. (poultry preparation should be after other meats).

Raw meat and poultry must be prepared and/or packaged (identify which applies):

in a defined area that is separate from cooked or RTE food; or

in the same area but processing and handling is at a different time to cooked or ready-to-eat food with thorough cleaning and sanitising in between (raw food preparation should be after cooked or RTE food). See *Cleaning schedule*.

## How this is done

Equipment used in preparing and/or packaging raw poultry (e.g. knives, slicers, racking, packaging machinery) must be (identify which applies):

dedicated to raw poultry; or

shared with the preparation of other foods and with thorough cleaning and sanitising in between.

People who prepare raw meat and poultry (identify which applies):

only work with raw meat or poultry;

work with other foods as well and follow good personal hygiene and hand hygiene practices before handling other foods.

See *Cleaning*.

### Boning, cutting, mincing, packaging

- thawed or tempered meat must be checked and any visible contamination removed;
- meat must be kept chilled whenever it is not being processed or handled;
- casings (e.g. for sausages) if pre-soaked, must be soaked in clean water;
- meat and poultry packaging must be carried out hygienically and in ways that prevent contamination of other products and surfaces.

## What if there is a problem?

Where separation procedures between raw and RTE food are not followed, throw away RTE food that may have become contaminated.

Damaged equipment is repaired before use, or is replaced.

Where equipment to be used with RTE food is dirty, it must be cleaned and sanitised before use.

Identify why this happened, review the cleaning schedule and retrain staff where necessary.

## Write it down

You must write down (e.g. in the Diary) what action you took if meat was not prepared correctly.

Keep a record of information, such as sampling and laboratory records, that was used to determine that a RTE food was safe to sell.

Keep a record of information provided by suppliers confirming the accurate labelling and composition of products.

You must write down in the Cleaning schedule the surfaces to be cleaned, and equipment used to clean them, when they need to be cleaned (and sanitised); how this is done, and by whom.



# Marinades and coatings

## Goal

To prevent cross-contamination when making and using marinades and coatings.

To ensure that only permitted food additives are used in marinades and coatings.

Act requirements:

- Food must be processed and handled in ways that minimise the contamination or deterioration of food and prevent food containing substances that are unexpected or unreasonable.
- There must be procedures for controlling hazards at each production and processing and handling step where it is essential to eliminate or reduce a hazard to an acceptable level.

## Why?

- Marinades and coatings can contain allergens that can be passed to meat and other food.
- Raw foods dipped into marinades and coatings can leave harmful microbes behind, that can cross contaminate other foods.
- The Food Standards Code Standard 1.3.1 only permits certain food additives to be added to meat, poultry, game and fish products.
- If more of a food additive is used than is permitted, safe limits may be exceeded.

## How this is done

Ingredients must be suitable for any products made – see *Purchasing and receiving food*.

Surfaces and equipment used for preparing food must be in sound condition and clean before use. Surfaces in contact with ready-to-eat foods must be sanitised before use - see *Cleaning and Equipment, packaging and other items in contact with food*.

Potential for cross-contamination between marinades and coatings and other foods must be identified – see also *Food allergens*.

Recipes must accurately calculate any prescribed food additives in meat products to meet the Code requirements – see *Food Additives in meat products, Food Composition – general and Food Composition of meat products, Food allergens, Food labelling*.

Good hand hygiene and personal hygiene practices must be followed when marinating or coating meat – see *Hand hygiene and Personal hygiene*.

### Meat marinades and coatings

- Marinades must be made-up and used either following manufacturers' instructions, or to own tried and tested recipes.
- Food additives that are only permitted in limited amounts must be added in quantities that ensure those limits are not exceeded in the final product.
- Made-up/bulk marinades must either be stored chilled and covered until use, or stored following manufacturer's instructions.
- Marinades and coatings must be applied hygienically and food stored chilled until it is either processed further or sold.
- Marinades and coatings left over from processing are thrown away at the end of the processing day.
- Marinades and coatings containing allergens are applied in ways that prevent contamination of foods that don't contain allergens.

## What if there is a problem?

If:

- own recipes are not followed, or manufacturers' instructions are ignored;
- marinades and coatings are not stored properly or are not discarded at the end of each day; and/or
- allergenic ingredients are allowed to cross-contaminate other products or are not identified in ingredients.

Then:

Identify what caused the problem, change practices and train/retrain staff to prevent a recurrence.

## Write it down

You must write down in the *Cleaning schedule* the surfaces to be cleaned and equipment used to clean them, when they need to be cleaned (and sanitised), how this is done, and by whom.

You must write down (e.g. in the *Diary*) what action you have taken if marinating or coating has not been carried out correctly.

Keep a copy of the recipe and method for each marinade and coating. This will help ensure consistency of ingredients each time it is made-up and accuracy of the formulation. This can be found (state where recipe kept):

Identify in the recipe and be able to tell customers, whether ingredients contain allergens.





# Brining and pickling meat

## Goal

To brine and pickle meats in ways that prevent cross-contamination, the growth of harmful microbes and physical contamination.

Act requirements:

- Food must be processed and handled in ways that minimise the contamination or deterioration of food and prevent food containing substances that are unexpected or unreasonable.
- There must be procedures for controlling hazards at each production and processing and handling step where it is essential to eliminate or reduce a hazard to an acceptable level.

## Why?

- Re-using brining and pickling preparations can cross-contaminate new batches of meat with harmful organisms.
- Dirty equipment such as brine injectors can contaminate food.
- Damaged or broken equipment (e.g. broken brine injector needles) can contaminate food.
- The Australia New Zealand Food Standards Code (the Code) only allows certain food additives in particular amounts in cured meats.

## How this is done

Surfaces, containers and equipment used for brining and pickling must be corrosion resistant, in sound condition and clean before use – see *Cleaning and Equipment, packaging and other items in contact with food, Maintenance and Food allergens*.

Good hand hygiene and personal hygiene practices must be followed when handling food – see *Hand hygiene and Personal hygiene*.

### Brining and pickling

- Preparations must be made-up and used following manufacturers' instructions, or to own tried and tested recipes.
- The concentration of food additives such as nitrite and salt necessary to achieve brining and pickling must not be diluted.
- Preparations must be stored chilled at 5°C or below and covered until use or otherwise stored following manufacturers' instructions.
- Brining and pickling must take place at 5°C or below;
- Recirculated or re-used preparations, and preparations that may become contaminated, such as those used in injecting, must be thrown away at the end of each batch or day's operation.
- During immersion brining, meat must be fully immersed in the brine during curing.
- Curing tanks must be emptied and cleaned regularly.
- Injection equipment must be checked before and after each use for any broken or missing parts.

## How this is done

### Additives permitted at certain levels by the Food Standards Code

Food additives used in brining and pickling must be permitted by, and comply with Standard 1.3.1 of the Code – see *Food additives in meat products*.

### Nitrites

Sodium and potassium nitrite must only be used in controlled amounts as nitrite can be toxic at excessive levels. The Code specifies the total amount of nitrite that must not be exceeded.

#### Calculating Sodium Nitrite level (mg/kg)

Example: 5 grams of sodium nitrite\* is added to a total raw meat batch weight of 20 kg

$$\frac{5\text{g}}{20\text{kg}} = \frac{(5 \times 1000\text{mg})}{20\text{kg}} = \frac{5000\text{mg}}{20\text{kg}} = 250 \text{ mg/kg (parts per million the original mix)}$$

In this example, during processing the product loses 25% of its original weight, so the concentration of nitrite increases by this amount in the final product. 20kg original weight is now 25% less (5 kg) and now weighs 15kg.

$$\frac{250 \times 20 \text{ (wet weight)}}{15 \text{ (dry weight)}} = 333 \text{ mg/kg (parts per million)}$$

sodium nitrite in the final product. This is less than 500 mg/kg (parts per million) maximum allowed by the Code.

\* The weight of sodium nitrite may need to be corrected if pure nitrite is not used.

### Other permitted additives

The Code places limits on the amount of other food additives, such as nisin, in whole cuts of processed meats. More information on Standard 1.3.1 can be found at: <https://www.comlaw.gov.au/Series/F2015L00396>

Schedule 15: substances that may be used as food additives: <https://www.comlaw.gov.au/Series/F2015L00439>

Schedule 16: type of substances that may be used as food additives <https://www.comlaw.gov.au/Series/F2015L00442>

### What if there is a problem?

If:

- own recipes are not followed, or manufacturers' instructions are ignored; or
- brining, pickling mixes preparations or equipment are not used properly.

Identify what happened and take action to prevent it from happening again. Retrain staff where necessary.

If

- injection needles break in product

Stop process and recover all missing parts.

### Write it down

- You must write down (e.g. in the Diary) what action you have taken if brining and pickling has not been carried out correctly.
- You must write down in the Cleaning schedule the surfaces to be cleaned and equipment used to clean them, when they need to be cleaned (and sanitised); how this is done, and by whom.
- Keep a copy of the recipe and method for each brine and cure preparation including preservative calculations. This can be found (state where recipe kept)  
\_\_\_\_\_.
- Identify on the recipe any ingredients containing allergens.

# Cooking meat and poultry

## Goal

To ensure that meat and poultry, (e.g. a roast joint, a ham, a rotisserie chicken, and products such as a pie, a pattie) is thoroughly cooked at the centre of the thickest part.

Act requirements:

- Food must be processed and handled in ways that minimise the contamination or deterioration of food and prevent food containing substances that are unexpected or unreasonable.
- There must be procedures for controlling hazards at each production and processing and handling step where it is essential to eliminate or reduce a hazard to an acceptable level.

## Why?

- If meat, and especially poultry, is not cooked thoroughly all the way through to kill harmful microbes people could be made ill.

## How this is done

Meat and poultry must be prepared hygienically - see *Preventing cross-contamination, Preparing raw meat, poultry & fish* and *Defrosting frozen food*.

Surfaces and equipment must be in sound condition and clean before use. Surfaces in contact with ready-to-eat foods must be sanitised before use - see *Cleaning, Equipment, packaging and other items in contact with food*, and *Maintenance and Allergens*.

Good hand hygiene and personal hygiene practices must be followed when handling food – see *Hand hygiene* and *Personal hygiene*.

Poultry must always be cooked thoroughly and never sold medium or rare. Meat – unless it is to customer order for immediate consumption – must be cooked-through thoroughly using this procedure.

When using a thermometer the procedure *Checking temperatures* and *Calibrating a thermometer* are followed.

### Cooking meat and poultry

- Manufacturer's instructions must be followed to programme cooking equipment.
- Cooking equipment (e.g. oven) must be pre-heated before cooking starts.
- Meat and poultry must be cooked so that the centre of the thickest part either exceeds 75°C or reaches one of the temperature/time combinations below:

### Temperature and timings for cooking meat and poultry

Internal temperature	Time
60°C	For 92 minutes
63°C	For 31 minutes
65°C	For 15 minutes
68°C	For 5 minutes
70°C	For 3 minutes
73°C	For 1 minute
75°C	For 30 seconds

If you want to use different temperatures and times to cook meat and poultry you must have your process validated and your FCP evaluated.

## How this is done

### Checking meat or poultry is cooked

Any cold spot in the cooking chamber must be taken into account when cooking products.

A thermometer (probe) must be used to check that the thickest part of the meat (the center of a meat joint, breast or innermost part of the thigh of poultry) has reached a temperature of at least 75°C or one of the time/temperature combinations on the table *Temperature and time for cooking meat and poultry*. This must be done in one of the following ways, either:

- each time a meat or poultry item is cooked the temperature is measured; or
- each time a batch of the same items is cooked, the temperature of the biggest item in the batch is measured at the cold spot (this should be the biggest item at a cold spot in the cooking chamber – if there is a cold spot); or
- when a proven cooking procedure is followed, one cooked item is checked periodically, to confirm that the necessary temperature has been reached for the required time – see *Validating a cooking process* and *Checking meat and poultry is cooked*.

It is not necessary to temperature probe diced or thinly sliced meat and poultry because smaller pieces are more likely to cook through to the middle easily. It's also hard to take an accurate reading.

## What if there is a problem?

If meat or poultry does not reach a high enough temperature, keep cooking until it does.

When meat or poultry being cooked using a standard time/temperature setting is found not to have been cooked properly, find out why.

- Was the procedure followed correctly?
- Was there a cold spot or does the equipment (e.g. oven) need repairing?
- Was a different size of food (e.g. meat joint or bird) used?

Identify what needs to be done to prevent this happening again.

Retrain staff if necessary.

## Write it down

You must keep a record of the temperatures that meat and poultry items are cooked to.

Write down in the 'Checking meat and poultry is cooked' procedure each item cooked and identify which option will be used to check that it is cooked thoroughly.

### 1. For meat and poultry cooked using a time/temperature setting from the table Temperature and time for cooking meat and poultry

You must:

- Write down the checks that have been made to validate that the time/temperature combination will either cook the thickest part of the food to at least 75°C or to one of the time/temperature combinations in the table - see Validating a cooking process.
- Write down (e.g. in the Diary) the temperatures of meat or poultry that is checked regularly (e.g. weekly or every fifth batch) to ensure that the cooking process still works as intended.

### 2. If you haven't validated a cooking process for meat and poultry

Every time the food is cooked, you must write down the temperature of each item, or the one item from a batch, checked in the Cooking temperature record.

In addition, you must:

- Write down (e.g. in the Diary) the action taken if food didn't reach a safe temperature.
- Write down in the Cleaning schedule the surfaces and equipment used and how/when they are cleaned (and sanitised), and by whom.

## Validating a meat and poultry cooking process

This is what you can do if you regularly cook a meat or poultry item - such as rotisserie-cooking a chicken, roasting a joint, cooking a meat pie, boiling a ham or hot-smoking sausages – and you don't want to check its temperature each time you cook it.

You must use the same equipment and the same standard ingredients (the same size or weight of the same type of food) each time you cook the product. The following process will enable you to prove (i.e. validate) that a standard cooking procedure will properly cook the food. If you want to validate your cooking process you must follow the steps in this procedure.

1. Cook using a standard cooking process (e.g. a temperature setting for a set time).
2. At the end of the set time, check the temperature of the centre of the thickest part of the food item with a probe thermometer to measure if it has either exceeded 75°C or met one of the time/temperature combinations from the table below. If there is a known cold spot in the cooker, check product temperature there.

Internal temperature	Time	Internal temperature	Time
60°C	For 92 minutes	68°C	For 5 minutes
63°C	For 31 minutes	70°C	For 3 minutes
65°C	For 15 minutes	73°C	For 1 minute

3. Write down the result of your time/temperature checks in the table below.
4. Repeat the standard cooking process in steps 1 and 2 on at least three separate occasions until confident a safe temperature will be consistently reached for the time required.

If the food does not reach a safe temperature on three occasions increase the cooking time and/or cooking temperature and repeat steps 1-3 above.

When you are confident that the standard procedure ensures that the food is cooked, regularly check with a probe thermometer (e.g. once-a-week, or every fifth batch) that the cooking method continues to work as planned.

<b>Food item and description (recipe, size/weight, thickness):</b>							
<b>Select the temperature the meat or poultry item will be cooked to:</b> [tick as appropriate]							
Cooked to higher than 75°C				Cooked at _____ °C for _____ minutes			
<b>Cooking details</b>							
Date	Method (How was the food cooked?) What equipment was used? What cooker temperature setting was used? Where was	Time started cooking	1st probe*		2nd probe		Initials
			time	temp	time	temp	
1st							
2nd							
3rd							

\*if the temperature is higher than 75°C it isn't necessary to probe a second time

<b>Food item and description (recipe, size/weight, thickness):</b>							
<b>Select the temperature the meat or poultry item will be cooked to:</b> [tick as appropriate]							
<input type="checkbox"/> Cooked to higher than 75°C				<input type="checkbox"/> Cooked at _____ °C for _____ minutes			
<b>Cooking details</b>							
Date	Method (How was the food cooked?) What equipment was used? What cooker temperature setting was used? Where was	Time started cooking	1st probe*		2nd probe		Initials
			time	temp	time	temp	
1st							
2nd							
3rd							

\*if the temperature is higher than 75°C it isn't necessary to probe a second time





# Checking meat and poultry items are cooked

Meat, poultry and foods containing raw meat and poultry that are cooked on-site must be thoroughly cooked. The table below enables you to identify the process followed for each meat or poultry item to ensure that it is properly cooked.

## Write it down

Use the table below to identify and record which checks are done to make sure that meat and poultry items are properly cooked.

**Step 1 – In column A write down all the meat and poultry items that need checking.**

**Step 2 – In column E tick the box to show that either the item will be cooked to more than 75°C, or identify the time/temperature that has been validated as thoroughly cooking the item (a proven time/temperature setting).**

**Step 3 – In columns B to D identify how you check that each item is properly cooked.**

- If you temperature probe each item every time it's cooked tick the box in column B. Each time you cook this item write the temperature it has been cooked to on the *Cooking temperature record*.
- If you cook a number of the same items together and temperature probe one item in each batch, tick the box in column C. Each time you cook a batch of this item write the temperature of the probed item on the *Cooking temperature record*.
- If you have a proven time/temperature setting for the item (because you have completed the *Validating a cooking process* for that item) tick the box in column D. Then regularly – such as once a week, or every fifth time that the item is cooked – measure the temperature when cooking the item to confirm that the time/temperature still cooks it.
- Write this temperature in the Diary.

Internal temperature	Time	Internal temperature	Time
60°C	For 92 minutes	68°C	For 5 minutes
63°C	For 30 minutes	70°C	For 3 minutes
65°C	For 15 minutes	73°C	For 1 minute

A Meat or poultry item (list each type of food)	Temperature probe (tick as appropriate)			E Temperature item must reach in thickest part (tick as appropriate)
	B Every item, every time	C One item in every batch	D One item regularly, e.g. once a week or every 5th batch	
				<input type="checkbox"/> 75°C+ or <input type="checkbox"/> _____ °C for _____ mins
				<input type="checkbox"/> 75°C+ or <input type="checkbox"/> _____ °C for _____ mins
				<input type="checkbox"/> 75°C+ or <input type="checkbox"/> _____ °C for _____ mins
				<input type="checkbox"/> 75°C+ or <input type="checkbox"/> _____ °C for _____ mins
				<input type="checkbox"/> 75°C+ or <input type="checkbox"/> _____ °C for _____ mins
				<input type="checkbox"/> 75°C+ or <input type="checkbox"/> _____ °C for _____ mins
				<input type="checkbox"/> 75°C+ or <input type="checkbox"/> _____ °C for _____ mins
				<input type="checkbox"/> 75°C+ or <input type="checkbox"/> _____ °C for _____ mins





# Cooking other foods

## Goal

To ensure food other than meat and poultry is properly cooked.

Act requirements:

- Food must be processed and handled in ways that minimise the contamination or deterioration of food and prevent food containing substances that are unexpected or unreasonable.
- There must be procedures for controlling hazards at each production and processing and handling step where it is essential to eliminate or reduce a hazard to an acceptable level.

## Why?

- Harmful microbes are present in many foods. Cooking (and reheating) can kill harmful microbes.

## How this is done

Surfaces and equipment must be in sound condition and clean before use. Surfaces in contact with ready-to-eat foods must be sanitised before use – see *Cleaning, Equipment, packaging and other items in contact with food, Maintenance* and *Food Allergens*.

Food must be prepared hygienically - see *Preventing cross-contamination, Preparing raw meat, poultry & fish* and *Defrosting frozen food*.

Cooking equipment must be checked for cold spots – see *Maintenance*.

Good hand hygiene and personal hygiene practices must be followed when cooking food - see *Hand Hygiene* and *Personal hygiene*.

When using a thermometer the procedure *Checking temperatures* and *Calibrating thermometers* is followed.

### Liquids (e.g. sauces, pie filling)

- Cold spots are avoided (e.g. by stirring frequently) so that an even temperature is reached.
- Liquids are brought to a simmer.

### Eggs

- Whole eggs must be clean and free from cracks and used within their “Best-Before” date.
- egg-pulp must be pasteurised when being used in uncooked or lightly-cooked foods and used in accordance with its date mark.

### Fish and Shellfish

Fish and shellfish must be checked for thorough cooking. Look for a change in colour and texture when cooked – for fish this will depend on the species. Prawns will turn from blue-grey to pink and scallops become milky white and firm when cooked.

Before cooking, any mussel or clam with a damaged shell or an open shell that won't close when tapped must be thrown away as it may not be safe to eat.

To check that a mussel or clam is cooked, make sure the shell is open and that the mussel or clam has shrunk inside the shell. If the shell has not opened during cooking, throw it away.

## How this is done

### Frozen products

- Products that need to be thawed before cooking must be thoroughly defrosted – see *Defrosting frozen food*.
- Manufacturer's instructions must be followed especially when cooking products designed to be cooked from frozen.
- Cooked food must be checked that it has been cooked thoroughly.

### Bakery products (e.g. pre-made frozen or chilled doughs, powder pre-mixes)

- Manufacturer's instructions must be followed especially when handling, cooking or re-heating manufactured products.
- Doughs, batters, mixes and pre-made foods must be cooked thoroughly.

## What if there is a problem?

If food is undercooked, cook it for longer.

If this happens frequently, check recipes and change cooking times and/or temperatures, or divide food into smaller quantities or use different equipment.

Retrain staff as necessary.

## Write it down

If food does not cook properly when following set recipes and procedures you must record (e.g. in the Diary) what you did with the food and what action you took to prevent this happening again.



# Making dried meat products

## Goal

To ensure that products preserved by drying are processed and handled in ways that destroy harmful organisms and prevent them from growing.

The Act requires:

- Food must be processed and handled in ways that minimise the contamination or deterioration of food and prevent food containing substances that are unexpected or unreasonable.
- There must be procedures for controlling hazards at each production and processing and handling step where it is essential to eliminate or reduce a hazard to an acceptable level.

## Why?

- The drying process may need to inactivate harmful organisms.
- Drying takes away moisture that harmful organisms need to grow.
- If moisture is added (rehydration) to dried products harmful organisms may grow.
- Processed meat and meat products need to meet standards set out in the Australia New Zealand Food Standards Code (the Code).

## How this is done



Control of *Listeria monocytogenes* is an important part of this process (see also *Listeria* in the management section).

Surfaces and equipment must be in sound condition and clean before use. Surfaces in contact with ready-to-eat foods must be sanitised before use – see *Cleaning, Equipment, packaging and other items in contact with food, Maintenance* and *Food Allergens*.

Good hand hygiene and personal hygiene practices must be followed when handling food – see *Hand Hygiene* and *Personal hygiene*

Dried products must meet the Code requirements for limits of harmful microbes. If the product isn't covered by microbiological limits under the Code the operator must still ensure that any harmful microbes that may be present (e.g. in the raw ingredients) are destroyed to make the product safe for the duration of its intended shelf-life.

A product that is preserved only by drying must have a water activity of 0.85 or less to prevent the growth of harmful organisms. If water activity is higher than 0.85, the product must either be:

- stored chilled at 5°C or below until it is used; or
- subject to other valid preservation means, such as reducing pH (increasing acidity).

### Things that must be considered when drying meat products

The rate of drying is affected by a number of factors that you must take into account when you first set up your drying process:

#### 1. Product size

Small pieces dry faster than thick pieces – the size and thickness of pieces should be similar throughout each batch for consistent drying.

#### 2. Drying place

Use a room/space (e.g. cabinet, oven) where you can control temperature, air velocity and humidity to produce consistency in drying products.

## How this is done

### 3. Control of humidity and air flow

The rate at which moisture evaporates from the surface of the product is important. If evaporation exceeds the rate at which moisture migrates from the center of the product, the outer part of the product will harden ('case hardening') and prevent the centre of the product from drying-out. The rate of evaporation will depend on the type of product (e.g. how thick it is). Evaporation can be controlled by adjusting the relative humidity of the surrounding air (e.g. by adding or removing moisture), air speed (e.g. by using fans), and flow of air around product (e.g. by allowing a clear space between drying products). The rate of drying can also impact on the inactivation of harmful micro-organisms. Drying can impart a protective effect to them which means they may survive the drying process.

### Control of temperature

Drying temperature and time will vary and will depend on the drying method used, type and size of product, the required water activity, and the amount of harmful microbes that need to be destroyed to meet any microbiological Standard or make a safe product. Regularly checking drying room temperature will help achieve batch consistency.

### Preparation

Meat must be hygienically prepared for drying in accordance with the Plan – see *Preparing meat and poultry*.

### Drying meat

Drying equipment (e.g. heating, fans, humidifiers) must be regularly checked and maintained so that they work as required to dry products.

Drying takes place [identify which applies]:

- in a temperature controlled space (e.g. room, cabinet)
- at ambient (room or changeable) air temperatures

Dried products made by the business are [identify which applies]:

- cooked by the business before sale – see *Cooking meat and poultry* and *Validating a cooking process*
- cooked by the consumer after purchase
- uncooked, ready-to-eat (RTE) and refrigerated
- uncooked, RTE and unrefrigerated (shelf-stable).

### How this is done

\*if preserved only by drying, product water activity must be 0.85 or less. If you want to sell dried product with a water activity higher than 0.85 you must show your verifier how your process keeps your product safe.

### Checking microbiological limits are met

Sending samples to a laboratory to test for the presence of harmful organisms, or that the level of a preservation means is being met (e.g. water activity, pH), will help you identify that your process meets requirements for safe and suitable food – see *Testing finished product*.

### What if there is a problem?

If the required level of water activity is not met, continue to dry the product until it is. Consider looking at whether the air temperature during drying is high enough, or whether air flow is sufficient.

## Write it down

You must keep the results of laboratory tests for water activity.

If you use product weight loss to confirm a level of water activity, you must write down in the Drying products batch record the weight loss and calculations for each batch of product and confirm that products meet the desired water activity.

If you use other preservation means in addition to drying, and the product has a water activity of more than 0.85, you will need to show how these preservation methods help to make the product safe.

Write down (e.g. in the Diary):

- the cooking time/temperature of cooked, dried product; and
- if anything went wrong during drying, what you did to put it right.



*Helpful stuff: Marinating – e.g. in a vinegar-based marinade – can help to prevent the growth of harmful organisms, – see Marinades and coatings.*



- The purpose of drying is to make less water available for organisms to grow.
- Drying to a water activity of 0.80 and vacuum packing, or drying and maintaining water activity at or below 0.70 will prevent the growth of moulds and yeast.
- The bacterium *Staphylococcus aureus* can grow and produce enterotoxins in food with a water activity of 0.84.
- Cooking products destroys harmful organisms..
- Adding salt, vinegar or sugar, or smoking helps inhibit the growth of harmful organisms.

# Hot smoking products

## Goal

To ensure that food is smoked hygienically, using materials that won't impart toxic substances to food, and in ways that prevent the growth of harmful organisms.

Act requirements:

- Food must be produced or processed and handled in ways that minimise the contamination or deterioration of food and prevent food containing substances that are unexpected or unreasonable.
- There must be procedures for controlling hazards at each production and processing and handling step where it is essential to eliminate or reduce a hazard to an acceptable level.

## How this is done



Control of *Listeria monocytogenes* is an important part of this process (see also *Listeria* in the management section).

**This procedure applies to hot smoking a meat or seafood product that is or will be cooked.**

**Making a cold-smoked ready-to-eat (RTE) product that is not cooked is not covered by this plan. You must speak to your verifier first.**

Surfaces and equipment must be in sound condition and clean before use. Surfaces in contact with RTE foods must be sanitised before use – see *Cleaning and Equipment, packaging and other items in contact with food, Maintenance and Food allergens*.

Food must be prepared hygienically – see *Preventing cross-contamination, Preparing raw meat and poultry, Defrosting frozen food*.

Good hand hygiene and personal hygiene practices must be followed when handling food – see *Hand Hygiene and Personal hygiene*.

Cooked products are cooked according to the times and temperatures identified in the plan – see *Cooking meat and poultry*.

Smoke flavours are food additives and must meet the requirements of the Code, Standard 1.3.1 – see *Food composition and Composition of meat products*.

Wood chips must be stored dry and free from fungus and microbial growth when used.

Smoking must be carried out in ways that don't allow harmful organisms to grow.

Smoking is best done in a temperature controlled space (e.g. a room or in monitored equipment). This produces more consistent product than using a smoke house where temperature is managed manually.

Consumers must be informed if they need to cook a product to make it safe to eat – see *Food labelling*.

## Why?

- Smoke flavours need to meet requirements of the Australia New Zealand Food Standards Code (the Code).
- Smoking materials that have been impregnated with chemicals could make people ill.
- Smoking moist food in the temperature danger zone (5°C to 60°C) may allow harmful microbes to grow.

## How this is done

### Smoking products

Smoke equipment must be checked as operating properly (e.g. heating, air circulation) before loading product.

Smoked products made by the business are: [identify which applies]:

cooked by the business before sale – see *Cooking meat and poultry* and *Validating a cooking process*;

cooked by the consumer after purchase;

uncooked and RTE and refrigerated\*;

uncooked and RTE and un-refrigerated (shelf-stable)\*.

\*You will need to identify in your plan how you make a safe and suitable product. Speak with your verifier before you make these products about what you must do.

Smoking is carried out [identify which applies]:

in a temperature-controlled space; or

the smoking temperature is manually controlled – see *Cooking meat and poultry*.

The smoking process must ensure that:

- product is spaced evenly to help air circulation and even smoking of product;
- only untreated wood that is free from toxic substances (e.g. paint, chemical preservative) is used to make the smoke, or
- liquid smoke is used in accordance with manufacturers' instructions.

### After smoking

When it has been smoked, RTE food must be stored at or below 5°C and must be either [identify which applies]:

marked with the date and time it was smoked, and then either used, or sold to be consumed, within 5 days of processing; or

given a "use-by" date using information identified through technical assessment. Assessments are found at:

See also *Establishing shelf life*.



### What if there is a problem?

If smoking is part of a cooking process, and product is not cooked at the end of smoking, it could mean that there has been equipment malfunction and product will need to be thrown away.

Check that smoke house equipment (e.g. heating, air circulation) is operating properly.

Product that has been exposed for an unknown time to temperatures in the danger zone must be thrown away.

If a smoked product that needs cooking can be mistaken for RTE food make sure that it is clearly labelled that it needs cooking.

Find out what went wrong and take steps to prevent it happening again.

Retrain staff if necessary. See also *Recalling food*.

## Write it down

You must write down on the 'Hot smoking record' for each batch:

Where smoking is part of the cooking process:

- the smoke house air temperature;
- the smoking start time;
- the smoking finish time;
- the core temperature of the food at the end of the cooking period; and
- whether additional smoking/cooking time was needed.

You must write down (e.g. in the Diary):

- where smoking is at a low temperature smoking to impart flavor only:
  - the smoke house air temperature; and
  - the length of time of the smoking process
- anything that went wrong during smoking, and what you did to put it right and ensure that it doesn't happen again.

Do I have to do this every time?

If you can validate that the time and temperature settings you use always cook the product, you may not need to measure product temperature each time - see *Cooking meat and poultry* and *Validating a cooking process*.



Smoking produces chemicals that can help to inhibit the growth of some microorganisms. It also imparts flavour and colour to products. It is important to know what type of product is produced at the end of hot or cold smoking because this will determine how it needs to be handled:

- Will it be ready-to-eat (RTE) when it leaves the smoker?
- Will it become RTE from further processing by the business/another business?
- Will it need to be cooked by the consumer to make it safe to eat?

Smoking may be used with other preservation methods – see *Making dried meat products* and *Brining and pickling meat*.

# Making fermented meat products

## Goal

To make uncooked comminuted fermented meat (UCFM) products (such as a fermented salami) in ways that reduce the presence of harmful organisms and preventing cross-contamination.

Act requirements:

- Food must be processed and handled in ways that minimise the contamination or deterioration of food and prevent food containing unexpected or unreasonable substances.
- There must be procedures for controlling hazards at each processing and handling step where it is essential to eliminate or reduce a hazard to an acceptable level.

## Why?

- UCFM products must:
  - meet the Food (Uncooked Comminuted Fermented Meat) Standard 2008 (the UCFM Standard);
  - meet the microbiological limits set by the Australia and New Zealand Food Standards Code (The Code);
- UCFM products need special care as:
  - they are not cooked to kill any harmful microbes that may be present;
  - their composition has to ensure that harmful microbes can't grow after processing.

## How this is done

**If you make UCFM products you must either:**

1. Obtain a copy of the guidance template for small manufacturers at: [www.mpi.govt.nz](http://www.mpi.govt.nz). and follow it. You will need to show your verifier that you are doing this; or
2. Validate your UCFM process and have your FCP evaluated. You will have to register your FCP with MPI.

**Using the UCFM guidance template with this Plan**

Making UCFM products is outside the scope of the template on which you have based your Plan. However, if you make your products following the processes in the MPI UCFM guidance template you will be able to add it to this Plan.

**Speak to your verifier to confirm what you need to do.**

The UCFM Standard is at: <http://www.foodsafety.govt.nz/elibrary/industry/guidelines-production-uncooked-guide/food-standards2008.pdf>





# Validating water activity

## Goal

To ensure that the processing of dried products meets expected levels of water activity.

Act requirements:

- Food must be produced or processed and handled in ways that minimise the contamination or deterioration of food and prevent food containing substances that are unexpected or unreasonable.
- There must be procedures for controlling hazards at each production and processing and handling step where it is essential to eliminate or reduce a hazard to an acceptable level.

## Why?

- Dried ready-to-eat (RTE) foods that are intended to be stored at ambient temperatures must meet a lowered level of water activity to make them safe to eat.
- If a required water activity is exceeded and the product is stored in the temperature danger zone (5°C to 60°C) harmful microbes may grow rapidly.

## How this is done

Water activity levels of dried products that are intended to be shelf-stable must be checked by either using a water activity meter, or sending samples to a laboratory, or calculating water activity following procedures in the Plan.

Information obtained from product testing will confirm the effectiveness of your processing.

Validation will show that your process can consistently make product to the water activity level required.

If you operate a validated process you will not need to test samples from every batch you make.

See *Dry-curing and RTE dry-cured meats, Drying products*.

An example of a validation process is provided in the *Guidance: Validating water activity* on the following page.

## What if there is a problem?

If water activity meter tests show the final product has a water activity that is higher than the limit required then, provided the product has been handled hygienically and stored outside the temperature danger zone (5°C to 60°C), it must be stored and sold under refrigeration.

Review recipe and process to identify the cause and determine new times/temperatures for drying/smoking/processing product. Make the product to this revised recipe and send a sample of the new "worst case" finished product to the laboratory to validate the new time(s)/temperature(s).

Food that is not safe to eat must be thrown away.

## Write it down

Where a particular water activity level must be achieved for the safety of a product you must write down on the 'Batch record sheet' the water activity result obtained from any laboratory water activity testing, and the size of the product the test relates to.

# Validating water activity

## How to validate a process for desired water activity - see also *Testing finished product*

At the end of processing, select product with the lowest percentage weight loss and either:

- check the water activity using a calibrated water activity meter; or
- send a number of representative samples to a laboratory to test the water activity level. (If you also carry out microbiological testing this could be the same sample).

Check with the laboratory beforehand:

- that it is able to test product for water activity – not all laboratories can do this test;
- how samples need to be taken.

Sending a number of samples from the batch will cover the possibility that the 'worst case' sample is found to have a water activity greater than the desired level. Sending samples from more than one batch will cover any batch variation that may occur and to provide greater assurance that your product will be safe.

The results from either the water activity monitor or the laboratory provide information about the % weight loss of product that achieves a desired level of water activity.

To confirm that your process consistently produces product meeting the desired water activity level, test samples from the next two batches of product.

The results from the laboratory will identify the lowest percentage weight loss of product that will meet the desired water activity level. It should also show that the greater the percentage weight loss, the more likely it is that product would exceed the desired water activity level.

After this, provided the checks have confirmed (validated) that your process consistently produces product at the desired level of water activity, you can use the information gained about % weight loss to check water activity in future batches of the same product. You will not need to test every batch (unless you want to).

You can verify your process continues to work by testing one in a number of future batches, for example, one in every five. Over time, and with continued good results, the frequency of verification checks can decrease, for example to one in every ten batches, one in every 20 etc.

## Example of using weight loss to verify water activity after validating a process – see also *Drying products*

You make a batch of cured hams to be stored unrefrigerated. You want to make sure that the target water activity for your product is 0.85 or less.

At the end of processing you calculate the % weight loss from each of the hams. For example:

2.535 kg (weight before drying) - 1.995 kg (weight after drying) = 0.54 kg difference (i.e weight lost)

0.54kg (weight lost)

$2.535\text{kg (weight before drying)} \times 100 = 21.3\% \text{ Weight loss.}$

You calculate that other hams in the batch have % weight loss of: 20.0%, 19.5%, 21.2%, 23.0%, 18.5% and 19.3%.

The least % weight loss is 18.5%. You send a sample of this product to the laboratory as it represents the 'worst case' from the batch. You also send samples from other hams and other batches – this will help identify alternative % weight loss against water activity if the 'worst case' sample exceeds the desired level of 0.85 (e.g. it has a water activity of 0.86 or higher).

The results from the laboratory show the water activity of the 18.5% weight loss sample = 0.84.

This means that:

- it may be assumed that hams in the batch with a greater percentage weight loss will also have a water activity of less than 0.85;
- when making the same-sized hams following the same recipe, and using the same equipment, achieving a % weight loss of a ham in excess of 18.5%, will be likely to achieve the desired level of water activity of 0.85 or less.

If the water activity from tested product is greater than 0.85, (e.g. in the range 0.86 – 1.00) the recipe must be reviewed and the activity/weight loss exercise repeated. Until product meets the desired level of water activity for ambient storage, product must be stored and sold chilled for the duration of its shelf-life.

# Testing finished product

## Goal

- Food must be safe and suitable.

## Why?

- The Australia New Zealand Food Standards Code (the Code) sets microbiological limits for certain products.
- Microbiological testing will show whether harmful microorganisms are present in the finished product.
- Microbiological testing will help to validate that the recipe, if followed, will consistently produce safe product.

## How this is done

### What testing do I need to do?

Limits for harmful organisms in meat products [http://www.foodsafety.govt.nz/elibrary/industry/Microbiological\\_Reference-Guide\\_Assess.pdf](http://www.foodsafety.govt.nz/elibrary/industry/Microbiological_Reference-Guide_Assess.pdf) Guidance on testing finished product

## What if there is a problem?

If a product doesn't meet microbiological limits it must be thrown away unless it may be reworked using a process shown to make the product safe to use.

Any product that doesn't meet microbiological limits which has been sent for sale elsewhere (e.g. by another business) must be traced and recalled – see *Recalling food*.

Contact your verifier for advice.

Review practices to identify how this happened and take action to prevent it happening again.

Any products made since the final product tests were submitted can be stored but must not be sold. A review of how the product was made must be undertaken by a specialist before it can be sold.

Contact your verifier for advice.

## Write it down

You must write down (e.g. in the Diary) the reference for any sample of food sent for testing so that results can be traced to the correct product/batch.

Complete the submission form provided by the laboratory to clearly identify your product so that it can be traced to the batch.

File your laboratory test results/report with the relevant 'Batch record sheet'.

Write down any corrective actions taken.

# Testing finished product

**Cooked cured/salted meat; packaged heat treated meat paste and packaged heat treated pate; and uncooked comminuted fermented meat products.**

Microbiological testing can be used to confirm that your products meet the Code requirements and to validate that the manufacturing process produces a safe product. It can be used to test:

- the finished product;
- when validating a new recipe/process;
- on an ongoing basis to ensure there are no harmful microorganisms present.

## Validation sampling & testing of products

The first 3 batches of any new process, recipe or group of products should be tested.

Five samples are taken from a batch and tested for the harmful microbes that are either specified for the product by section 1.6.1 of the Code, or are detailed in the microbiological reference guidelines for your product. Harmful microbes vary with the product but include *E. coli*, coagulase positive *staphylococcus*, *Listeria monocytogenes* and *Salmonella*. Information on sampling is at:

<https://www.comlaw.gov.au/Series/F2015L00411>

Five samples of product are needed because harmful microorganisms may not be spread evenly through a batch. Information in the Code identifies satisfactory test results for products.

## Routine sampling and testing of the validated process

Testing does not need to be carried out on every batch and the frequency can be set by the operator based on factors such as the level of production and number of different types of products. A guide is to start by testing every 5th batch but this can become less frequent if test results are consistently satisfactory.

## Other testing

Product water activity, pH and levels of nitrite can also be confirmed by a laboratory.

Example of a routine microbiological sampling & testing programme:

- ☐ every 5th batch is sampled; or
- ☐ shaded area for writing (state your sampling plan);
- ☐ the testing laboratory is

Decide on your sample type:

- ☐ 5 Pre-packed samples (e.g. sliced) ready for sale from the same batch that are traceable to each of 5 different products; or
- ☐ 5 different products from the same batch ready for sale from which a sample is cut off and sent to the laboratory.

**Record**

Name of business:

## **Specialist retail – butchery Records**

**Place this page in your Plan Contents section**

### **Specialist butchery records**

Staff training – specialist butchery

Cooking temperature checks

Once-a-week meat and poultry temperature checks

Drying products – batch record

Hot smoking products – batch record

Transported food temperature checks



# Staff training – specialist butchery

Name:	Telephone:
Position:	Start date:
Address:	

Topic	Relevant	Employee signed*	Supervisor signed†	Date
<b>Essential training</b>				
See also Staff member record for the Basics training	<input checked="" type="checkbox"/>			
<b>Training as needed</b>				
Calculating shelf life				
Food additives in meat products				
Limits for harmful microbes in meat products				
Composition of meat products				
Defrosting frozen food				
Preparing raw meat and poultry				
Marinades and coatings				
Brining and pickling				
Cooking meat and poultry				
Validating a meat and poultry cooking process				
Checking meat and poultry is cooked				
Cooking other foods				
Cooling hot food and freezing food				
Making dried meat products				
Hot smoking products				
Making fermented meat products				
Validating water activity				
Testing finished product				
Other				

\* I acknowledge that I have received training in the procedure and agree to follow it.

† The employee has been trained and has demonstrated a good understanding of the procedure and has been observed consistently following it.

## Other training

Date	Details
Notes:	





## Cooking temperature checks

Meat, poultry, fish and bakery products containing meat, poultry, or fish that are **not** cooked using a standard time/temperature setting must be checked each time with a probe thermometer to ensure that they reach at least 75°C. If the temperature does not reach at least 75°C, cook the product for longer until it does.

[illegible]

\*If temperature is more than 75°C on first probing, further probing will not be necessary.



# Once-a-week meat and poultry temperature checks

## Cooking meat and poultry to at least 75°C

Select one product that you cook using a standard time/temperature to reach at least 75°C. Cook it and check it to confirm that it reaches at least 75°C.

If you cook more than one product this way select a different one each week. Use the following to record your check:

Day	Product	Cooking method and standard time/ Temperature used	Final core temperature	Action taken if Temperature not reached

## Cooking below 75°C

Select a product that you cook using a standard time/temperature to a temperature below 75°C (for examples see table below). Cook it and check that the centre of the thickest part of the product has stayed at the required temperature for the correct length of time.

Enter time and temperature used	Date	Time started cooking	1st probe*		2nd probe	
			Time	Temp	Time	Temp
cooked at      °C for      secs/mins						

\*second probe not required if core temperature has reached at least 75°C

Use the following to record your check:

Internal temperature	Time	Internal temperature	Time
60°C	For 92 minutes	68°C	For 5 minutes
63°C	For 31 minutes	70°C	For 3 minutes
65°C	For 15 minutes	73°C	For 1 minute

## Reheating meat and poultry

Select one product that is reheated and check it reaches 75°C. Use the following to record your check:

Day	Product	Reheating method	Final core temperature**	Action taken if Temperature not reached

\*\* The core temperature of the product must be 75°C or above. If the food has not reached this temperature keep reheating until it does.

## Cooling meat and poultry (only required if food has been cooked or heated and then cooled)

Select one hot product and check whether it cools within the time frame required in the Plan. If you cook and cool more than one meat or poultry product select a different item each week.

Use the following to record your check:

Day	Poultry item	Cooling method	Time started cooling	Temp at 2hrs***	Temp after total 6 hr***	Action taken If temp not reached

\*\*\* Products must be cooled from 60°C to 21°C in two hours and 21°C to 4°C within a further four hours. See *Cooling hot food* and *Freezing food*



# Drying products – batch record

## Weight loss and Water Activity

Food Type

Water activity required for product:

 $A_w$ 

Date

Drying time: From

To

Temperature

Humidity

Additional drying time needed? From

To

Weight loss % =   $A_w$ 

Food type/ reference	Weight before drying	Weight after drying	Weight loss	% Weight loss	Meets Criteria ✓/✗





# Hot smoking products – batch record

Smoked products that are cooked.

Product/Food type	Food core temp/ time needed	Time batch started in smoker	Time batch finished	Food core temp. met    ✓/✗	Further time needed?Y/N	If Y, what was done to ensure food was cooked?	Signed



## Transported food temperature checks

Record transported food temperatures here.

[illegible]

