IN-PACK PASTEURISATION FOR REDUCING THE RISK OF *LISTERIA* CONTAMINATION ON READY-TO-EAT (RTE) MEATS

FOOD SAFETY SCHEMES MANUAL
APPENDIX 5

NSW GOVERNMENT Food Authority

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AUGUST 2019

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The *Regulatory guidelines for the control of Listeria* (Meat Standards Committee, 2008) requires businesses manufacturing packaged ready-to-eat (RTE) meats for sale to do swabbing of the processing environment and test finished product for the presence of *Listeria monocytogenes*.

However, businesses that apply a post-cooking lethality treatment to the product, such as in-pack pasteurisation, may be exempted from some of the testing requirements. Applying heat, such as immersing packaged cooked meat in hot water can destroy any *Listeria* that may have contaminated the product.

Possible disadvantages to in-pack pasteurisation

- Heating might change the meat (colour, texture, excess fluid etc), making it unattractive to consumers,
- The process is not simple for many businesses to do and is time consuming,
- It can be difficult to heat all surfaces of the meat evenly (might get hot spots and cold spots),
- It is not suitable for sliced packaged product,
- Might adversely affect packaging (not all packaging can withstand high temperatures), and
- Heating for too long might begin to heat the core of the product (which will make it difficult to cool).

Appropriate process times and temperatures are needed

While in-pack pasteurisation can provide a very effective control measure for *Listeria*, the most difficult part is to find the time and temperature that will kill *Listeria* without changing the look and taste of the packaged product. There are many variables which can affect the rate of heating and how effective the process is (see Table A5.1) which is why the NSW Food Authority advises that in-pack pasteurisation is only suitable for packaged whole primal pieces such as hams and silversides where only the surface has to be heated to destroy *Listeria*.

Table A5.1 Possible sources of variation for in-pack pasteurisation

Product shape	The size, shape and thickness of the product will affect the evenness of heating, as will overlapping or touching products, which could create cold spots where the heat will take longer to penetrate
Product surface	Meat coated with spices, skin on poultry could take longer to heat
Product composition	Injected/pumped/pickled products or presence of nitrite
Packaging	The type of packaging (film composition and thickness)
Type of meat	Lean vs fat; beef vs poultry
Hot water tank	Capacity and ability to heat and hold temperature

The goal of pasteurisation is to heat the surface of the meat to at least 72°C. Businesses are encouraged to get expert help and must validate any process they intend to use.

Table A5.2 shows the times and temperatures required to give a 6D reduction in *Listeria* on the surface of RTE meats. The temperature of the water will need to be hotter than this, and there will be variation between different meat products.

Table A5.2 Process times and temperature to deliver a 6D reduction of *Listeria monocytogenes*

Meat surface temperature (°C)	Immersion time (minutes)
60	44
61	33
62	24
63	18
64	13
65	10
66	7
67	6
68	4
69	3
70 – 72	2
73 – 75	1
76 or hotter	<1

A 6D process reduces the number of bacteria from 1,000,000 to one.

An indication of the meat's surface temperature can be measured using an infra-red thermometer (e.g. Raytek) immediately after removing the product from the hot water or by measuring the water temperature to ensure the time/temperature parameters in Table A5.2 are met. Once heated, the product must also be chilled quickly (e.g. by immersion in iced water or blast freezing straight after heating), as this also helps to destroy *Listeria*.

Approval to use in-pack pasteurisation

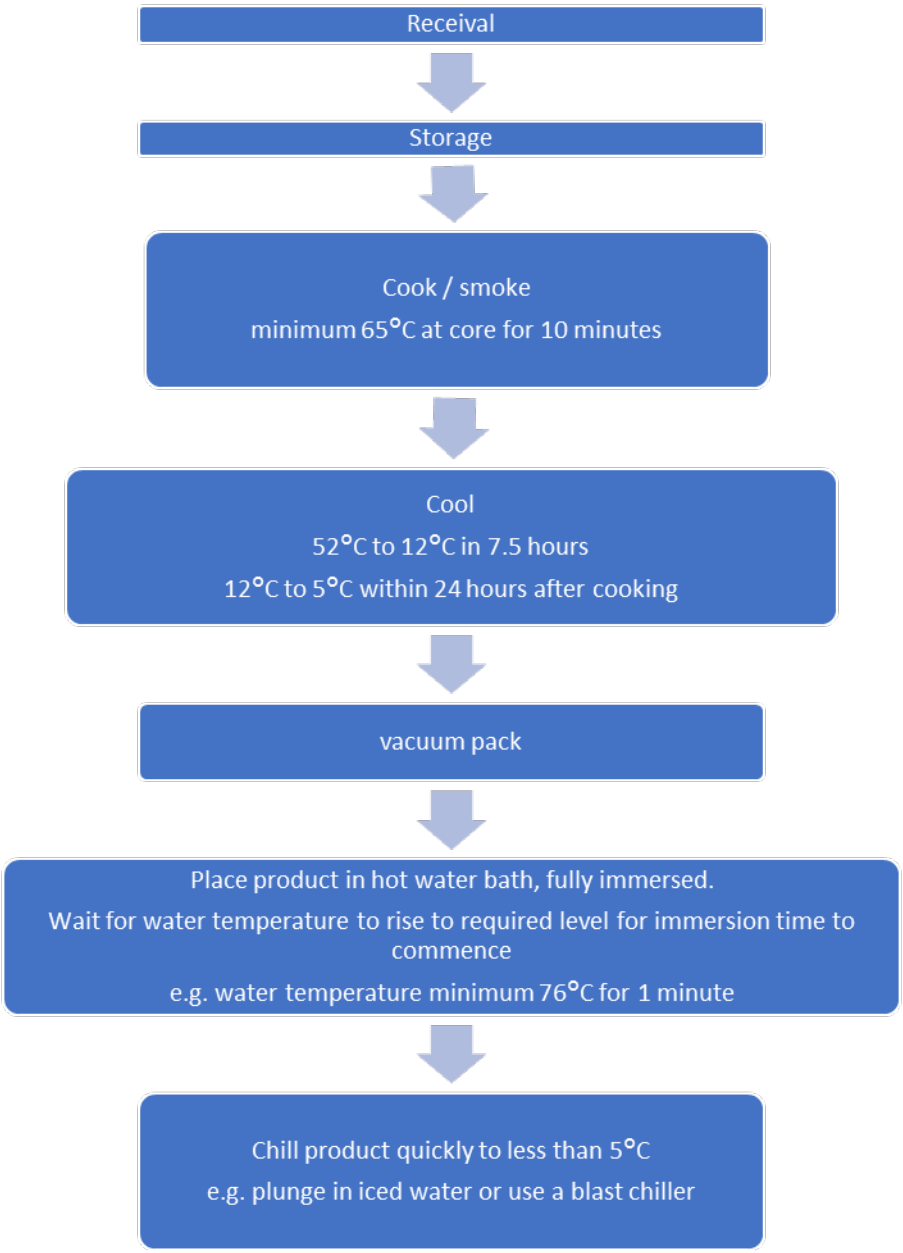
To qualify for approval to use in-pack pasteurisation, the following must be applied:

- A fixed calibrated temperature probe must be in place to make sure that the process reaches the correct temperature, and for the correct time.
- If the product is pasteurised in the pack, the package cannot be re-opened or re-packaged before it is sold.
- It is only suitable for packaged whole primal pieces (hams, silversides) or halves where the area of concern is the external meat surface only, not packaged sliced product.
- The procedure must be approved by the NSW Food Authority and documented in the food safety program.
- The process must be verified by submitting a packaged product sample for testing for the presence *Listeria* every three months.

If you have an approved process for post-pasteurisation you do not need to conduct environmental swabbing of work surfaces.

Example work instruction for post-pasteurisation process

This is an example work instruction for hams using post-pasteurisation as part of the packaging process.



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August 2019
FI353/1908