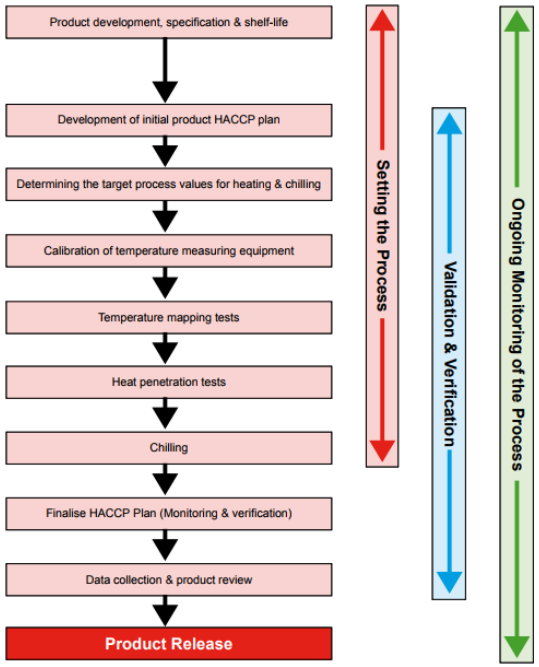
Ministry for Primary Industries
Manatū Ahu Matua

Analysis of submissions on the proposed Heat Treatment Part of the Further Processing Guidance Document (Chapter 3 Good Operating Practice, Part 1).

MPI received 4 submissions on the proposed Heat Treatment Part of the Further Processing Guidance Document. The submissions have been analysed in the following table. As a result of the consultation process, and in accordance with the analysis below, amendments have been made to the Part.

MPI values the feedback received and would like to thank those parties who took the opportunity to comment on the proposed Part.

Questions MPI would like feedback on			MPI Response
1.	Is the level of detail?	No comments received	
2.	Are the technical aspects correct?	No comments received	
3.	Are the procedures practical and achievable for the red meat sector?	No comments received	
4.	Are there any areas that need more guidance?	Some of the "Additional information" boxes seem more like main document information, rather than additional information. Some of these additional information boxes should have titles/topics and stand out more. For example: "What is a temperature distribution study?", "Can I use alternative parameters?", "*Clostridium botulinum hazard*", "Cooling water disinfection" It would be good to link as much of the references as possible (either to the appendix or other docs) particularly the RMP spec, and HC spec. Some more examples of products, and processes would be good.	The additional information boxes have been reviewed and where appropriate information has been moved out of the boxes. Titles have been added in some cases to help with readability. Additional information has been added about non-proteolytic (psychrotrophic) *C. botulinum* and cooling mediums. Links to the Notices are at the front of the Part.

Questions MPI would like feedback on			MPI Response
		Would be good to have an initial flow diagram for the scope. Such as the FSAI one –  	Extra examples have been added. A flow diagram to describe the scope and layout of the Part has been added.

Section Ref	Comment	Suggested Improvements	MPI Response
General comments	In the document you have mentioned "Temperature Distribution Studies" and "Heat Penetration Tests".	Add these definitions to section three. "	Definitions added as suggested.
	Section 4 - "Additional Information - Suitability skilled people	If possible, include a list of people or organisations that could provide the services of suitably skilled people e.g. AsureQuality.	It is difficult to recommend suitably skilled people who can carry out thermal process validation work. A recommendation to use MPIs' registers and lists to search for potential consultants has been added.
		Italicise "D" throughout the document. Use a_w	Both changed.
	"RMP spec 7 & 11"- what exactly is this referencing? .	May be good to link to document.	This is the approach used throughout the document to identify the legal requirements in the Animal Products Notice: Specifications for Products Intended for Human Consumption and the Animal Products (Risk Management Programme Specifications) Notice 2008. The full title will be included in this Part with a hyperlink to the Notices.
	Fig 5.1 below outlines a flow diagram for shelf-life.	Would some kind of flow diagram, similar to Fig 5.1 above (it would be different from above as Fig 5.1 is about shelf-life) could help the reader understand what's required for their product?	Table 1 has been replaced with a new table giving examples of the pH and Aw growth parameters for key microbial pathogens. This should assist operators in determining which pathogens are of concern when determining appropriate pasteurisation parameters to apply.

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	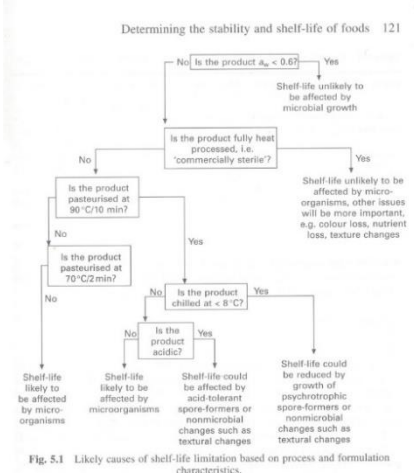 Fig 5.1 – Taken from "Food Spoilage Microorganisms" edited by Clive Blackburn (2006)		
1 Purpose			
	Continuous pasteurisers – does this definition cover ovens where the product is continuously conveyed through one of more heating zones? In my experience they may have the same issues as fixed ovens with establishing "cool spots" though it is more difficult in this type of equipment. It is not unusual for one side, or the centre, of the conveyor, to have a slightly different heating or cooling profile.		The guidance is applicable to continuous ovens as described in the submission. It is agreed that there could be issues with temperature uniformity in this type of equipment and operators need to ensure that this is considered when developing their processes. The guidance is not intended to cover continuous liquid pasteurisers and the wording has been changed so that this exclusion is clearer.

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2nd bullet	Inactivation implies elimination, which for heat processes (particularly pasteurisation) may not be the case.	Perhaps add "...inactivation or reduction of microbiological hazards to an acceptable level..."	Agreed. The terms “eliminated” or “reduced to acceptable levels” will be used.
2nd to last paragraph	Wouldn't retorting and water immersion also be applicable?		Yes these activities are covered when applied for the purpose of non-lethal heat treatments or pasteurisation. The wording has been amended to include these examples.
3. Definitions			
		It might be easier to have a section in the Appendix for these. Specific words in the main document could be anchored or linked to the appendix.	The location of the definitions are standardised at the front of the guidance documents. The defined words where used in the document will be linked to the definitions sections to help with interpretation.
Decimal reduction time	Although the units are frequently in minutes they need not be. For example, for non-spore forming bacteria the units are often seconds		Wording changed to reflect that *D* values are is not always expressed in minutes.
Pasteurise	“Pasteurise has a corresponding meaning” –	Redundant comment?	Agree this wording is not necessary for a guidance document. Wording deleted.
Suitably skilled person	It is unrealistic to expect the Operator of a small processing operation to understand the criteria that he/she could use to appoint a suitably skilled person. MPI should consider listing and licensing (so that the license could be withdrawn for poor performance) people for this role.		It is agreed that it is difficult for some operators to identify suitably skilled people. To provide assistance, information has been provided about the type of skills and knowledge needed. It is also important that people taking on this role only do so if they are competent. MPI continues to investigate ways that competencies can be demonstrated, but currently there is no simple

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			assessment process or recommended courses that MPI is aware of that could fill this gap. No change proposed.
4.1 General requirements			
Suitably skilled people (box)	Is there anything out in industry at the moment you could use as training examples, or potential providers of information?		See previous response. If this situation changes, examples of training courses or service providers could be added.
4.1(1)	It may be understood in the greater context of this document but when I see 'operator' I think of the term referring to personnel actually working on the processing line. In this context though is operator synonymous with manufacturer?		Under the Animal Products Act, and therefore within the guidance material, "operator" means the person with the overall responsibility for producing safe and suitable food. This is how the term is used in all guidance documents. No changes made.
4.3 Pasteurisation			
4.3 (box)	Typo: **Pasteurisation** *products are can be pasteurised.*		Wording amended.
4.3	A temperature range that defines pasteurisation is not mentioned. I wonder if ex-dairy people may only think of pasteurisation of 72°C/15 seconds.	Is it worth stating that pasteurisation is considered to occur at temperatures below 100°C?	Wording in the purpose section amended to include common temperature ranges for pasteurisation processes (65-90°C).

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4.3.1. Outcome of Pasteurisation	Is it your intention to include the control of *C. botulinum, C. perfringens* and *B. cereus* spores as well as vegetative cells?		No this is not the intention. Guidance has been provided only about the thermal processing of product in which the spores of non-proteolytic (psychrotrophic) *C. botulinum* is to be controlled. The spores (if present) are able to germinate and the cells can grow at chilled temperatures, with severe consequences. A heat treatment of 90°C for 10 minutes is often the recommended for certain cook chill products in other countries, to eliminate the spores of non-proteolytic (psychrotrophic) *C. botulinum*. If the spores are not eliminated by the heat treatment process, additional control measures would be needed to ensure that the spores cannot germinate and grow. Additional guidance has been added.
4.3.2 Development of pasteurisation process		Although mentioned later in the document, I think it may be useful to mention the nature (particularly if particulates are involved) of the product at this stage.	This is sufficiently covered by new sections 3.3.2. and 3.3.4.2. No changes made.
4.3.2 (2) Development of pasteurisation process		(2) "When deciding on the pasteurisation parameters, the operator should consider the:"	The information outside of the "Additional information" boxes carry more weight and so is better placed in its current position. It is agreed that these are key considerations and so have

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		The points below this comment should be highlighted or own box, as this forms a key consideration of the process.	been moved up to the first clause under this heading.
4.3.2 (2)h) Development of pasteurisation process		I would include "storage" here.	Suggested words added.
4.3.3.1 Temperature distribution studies in pasteurisation equipment	Could you combine the temperature distribution sections for heating and cooling into one as they are very similar, and this would shorten the document? Also, some diagrams displaying this and or examples (water baths, kettles etc.) might be useful.		Initially this had been drafted as a single section but feedback indicated that they would be better separated. This guidance is focused on what should be considered, rather than how the validation work should be carried out and so diagrams have not been added.
	"They are designed to determine if there is even temperature distribution"	Suggest you add "and identify cold spots (or hot spots for cooling)"	Wording amended.
	"This is usually the cold spot(s), but would need to be confirmed)". What are some other considerations / reason for this comment?		Usually the cold spot would be the location that would give the least thermal process. However, this may not always be the case, for example if the product is dried as it is thermally processed and the reduction in moisture content increases thermal resistance of the pathogen. Further clarification has been added.
4.3.3.1 (box 1)		Para 2: Suggest the following	Amended as suggested.

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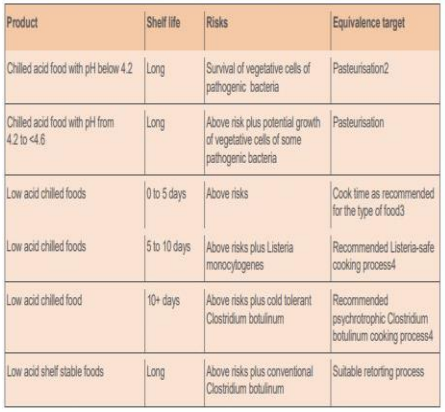
Temperature distribution studies in pasteurisation equipment		...may affect the temperature distribution throughout and cool spot within the processing equipment Para 3: Suggest the following 'Once the temperature distribution throughout the equipment has been determined appropriate processes can then be developed which will ensure that the product will receive adequate heating.'	
4.3.4 (Table1) Suggested pasteurisation parameters	Do we need all this info or could it be worded concisely?	Could we add a bit more information and lay out similar to this NSW FA table? But add/adjust for us based on equivalence target Table 1: Food safety risks associated with food types 	Table 1 has been replaced (see earlier comment).

Product	Shelf life	Risks	Equivalence target
Chilled acid food with pH below 4.2	Long	Survival of vegetative cells of pathogenic bacteria	Pasteurisation2
Chilled acid food with pH from 4.2 to <4.6	Long	Above risk plus potential growth of vegetative cells of some pathogenic bacteria	Pasteurisation
Low acid chilled foods	0 to 5 days	Above risks	Cook time as recommended for the type of food3
Low acid chilled foods	5 to 10 days	Above risks plus Listeria monocytogenes	Recommended Listeria-safe cooking process4
Low acid chilled food	10+ days	Above risks plus cold tolerant Clostridium botulinum	Recommended psychrotrophic Clostridium botulinum cooking process4
Low acid shelf stable foods	Long	Above risks plus conventional Clostridium botulinum	Suitable retorting process

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4.3.4. Table 1 last row, first column Suggested pasteurisation parameters	Non-proteolytic *C. botulinum*.	Need to add "chilled"	Table 1 replaced.
4.3.4.1 Inactivation of *Listeria monocytogenes*	"Pasteurisation used to control pathogens in RTE with a 5 day shelf life or more…." This is already mentioned in Table 1 in the doc.		Agreed, Table 1 replaced.
4.3.4.3 Inactivation of non-proteolytic *C. botulinum*	"Currently for NZ sourced ingredients"…	This should be in its own highlighted box.	It is agreed that this is important information, but it is sufficiently captured in the existing box. Further guidance has been added.
4.3.4.3 Inactivation of non-proteolytic *C. botulinum*	We should be wary of including non-proteolytic *Clostridium botulinum* in this document (it suggests that it is a hazard reasonably likely to occur) for the following reasons: • The 3 types of toxin producing strains (B, E, F) for the non-proteolytic organism have not been isolated in foods, in foodborne outbreaks or in the environment in New Zealand (NZFSA *Clostridium botulinum* – ESR 2010) • Even in Europe, where these types are ubiquitous in the environment, over 90% of isolations and outbreaks are Type E –		It is agreed that these strains are not considered reasonably likely to occur in raw materials of New Zealand origin. However, they could be present in imported raw materials and so the operator needs to be aware of this, particularly if manufacturing products in which non-proteolytic *Clostridium botulinum* could be present. The Food Standards Agency UK guidance document "The safety and shelf life of vacuum and modified atmosphere packed chilled foods with respect to non-proteolytic *Clostridium botulinum*" will be referenced in the "Additional information" box for those who need further information.

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	marine products are the vehicle. Isolations in non-dairy and non-marine products are very rare. Therefore a remote hazard for meat and poultry products. • Although the "guidance table – Additional Information on page 16 states that *C. botulinum* type II is not considered as a hazard reasonably likely to occur in NZ sources, this should be stated much more prominently and become more targeted – "**Imported ingredients and raw materials should be evaluated for the potential presence of type II *Clostridium botulinum***". Perhaps some assistance on control measures that could be applied to these ingredients before purchase could be provided in a guidance box (irradiation, ethylene oxide, hydrogen peroxide vapour etc.) • The recently published (June 2017) UKFSA document – *The safety and shelf life of vacuum and modified atmosphere packed chilled foods with respect to non-proteolytic Clostridium botulinum* – paragraph 8 – *The guidance is applicable to both ready-to-eat and raw foods, including raw meat.* This document also contains guidance on the use of modelling		An example has been added to give greater focus to fish products.

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	programmes – perhaps this type of guidance could be included in this chapter.		
4.3.4.3(1)	It may be useful to include the term "psychrotrophic".		Amended as suggested.
4.4 Post-Heat Treatment Handling			
4.4.2 Hot holding	"product should be held minimum of 60°C". 60°C would be for microbiological safety not spoilage.		The intent of hot holding temperature is to ensure that the product is held above the maximum growth temperatures for the pathogens of concern. Further clarification has been provided in an "Additional information" box.