



P O Box 10800 Market Harborough LE16 0HU  
T: +44 (0)1858 565166 [cfa@chilledfood.org](mailto:cfa@chilledfood.org) [www.chilledfood.org](http://www.chilledfood.org)

4 November 2020

Mary McGlinchey  
Food Standards Agency

Dear Mary,

**GUIDANCE ON THE SAFETY AND SHELF-LIFE OF VACUUM AND MAP CHILLED FOODS WITH RESPECT TO NON-PROTEOLYTIC *CLOSTRIDIUM BOTULINUM***

The Chilled Food Association (CFA) represents producers of chilled prepared foods primarily supplying the UK's *ca.* £13bn retail market. Chilled prepared foods range from prepared fresh produce, composite products such as sandwiches and other food to go, protein salads, recipe dishes (ready meals), meal accompaniments, fresh pizza, fresh soups. Many of these foods contain VP ingredients such as fresh meat, and some of the final products are sold in MAP.

Thank you for inviting our comment on this important consultation on the latest manifestation of this uniquely British guidance, in which we have been involved since 1990 including on all of the previous review Working Groups, and on which we have carried out extensive research, best practice and guidance development over the last 30 years.

The original ACMSF report<sup>1</sup> was published in 1992, and in the intervening 28 years the UK chilled food market has developed significantly both in terms of product variety and volume, as has quantitative food safety. We agree that there is a need for a review of the original risk assessment reflecting volumes of foods safely consumed in the UK and internationally. Much extensive work has already been done on determining levels of safety protection, showing it to be equivalent to that of canning. See para 4 of our response below.

**Consultation Point A: The shelf-life of Vacuum and Modified Atmosphere Packed chilled fresh beef, lamb and pork in respect of *C. botulinum***

1. No other country anywhere in the world limits shelf life of VP/MAP foods with respect to non-proteolytic *Clostridium botulinum* for chilled foods including fresh meat as the safety of these foods is recognised to be addressed by standard hygiene legislation and production practices.
2. Neither of the shelf lives referred to in the consultation regarding fresh meat (10, 13 days) have a clear scientific nor risk basis, both reflecting the 2017 FSA guidance, and not previously long-established shelf lives either in the UK or internationally.
3. The 2017 FSA Guidance, and specifically the first explicit inclusion of a 10-day shelf life for VP/MAP fresh meat, puts the UK at competitive disadvantage, creates technical barriers to trade, creates unnecessary waste and raises moral issues regarding assigning arbitrary rules for the usage of sentient beings' meat. WRAP estimates a food waste reduction potential of a 1 day increase in fresh meat/poultry shelf life being c.10k te/year<sup>2</sup>, and a 1 day increase across the board resulting in reduction of *ca.*250k te/year<sup>3</sup>.

---

<sup>1</sup> ACMSF (1992). **Report on Vacuum Packaging and Associated Processes.**

[https://acmsf.food.gov.uk/sites/default/files/acm\\_1282\\_vacpac.pdf](https://acmsf.food.gov.uk/sites/default/files/acm_1282_vacpac.pdf)

<sup>2</sup> WRAP (30/9/20). **Meat in a Net Zero World. Options to influence reduction of household food waste.** "0.4 million tonnes of meat is wasted each year, mostly at home", equivalent to 4 million tonnes avoided GHG emissions or ~2 million cars on the road). 10kte could be avoided by average 1-day extension of fresh meat/poultry shelf life, equivalent to 100kte avoided GHG emissions or ~500k cars on the road)

<sup>3</sup> WRAP (2015). <http://www.wrap.org.uk/content/reducing-food-waste-extending-product-life>

4. FSA project B13006<sup>4</sup> (2005-6) established the level of safety protection as 10<sup>9.8</sup> across all chilled foods including fresh meat<sup>5</sup>, and the MLA/BMPA 2019 study<sup>6</sup> determined the figure to be 10<sup>10.8</sup> for fresh red meat in the UK over the period 1999-2005 and 2007-2017, and internationally in 2017 it was 10<sup>11.87</sup>. Note that the currently specified heat process to achieve a long shelf life (90°C/10 minutes) delivers a protection level of 10<sup>6</sup>.
5. Peer-reviewed UK Government/industry-funded research (the CFA's first SUSSLE (Sustainable Shelf Life Extension) project AFM266<sup>8</sup>) included a full Quantitative Microbiological Risk Assessment (QMRA) for non-proteolytic *Clostridium botulinum*, results of which were published after peer review in January 2016<sup>9</sup> and notified to FSA at the time. It showed that fresh meat has the lowest spore loading of any food material, and quantified loadings for all food components.
6. Option 3 of Consultation Point A would therefore be most appropriate, but there is no need for additional guidance for fresh meat. All the work (e.g. FSA chilled VP/MAP food project B13006 (2005-6), MLA/BMPA (2019)) has shown this to be the case since it is covered in, for example:
  - a. CODEX, hygiene legislation, basic hygiene requirements, and industry and retailer standards
  - b. CFA/QIB/LFR/MLA/BRC 2018 International "Guidelines for Setting Shelf life of Chilled Foods in relation to non-proteolytic *Clostridium botulinum*"<sup>10</sup>. This also covers the role and approach to use of challenge testing, if used, and alternative approaches, particularly exposure/risk assessment and the role of predictive modelling
  - c. BRC Global Standards 2018 guidance on "Shelf Life of MAP and VP Raw Meat Products in Relation to non-proteolytic *Clostridium botulinum*"<sup>11</sup>

### **Consultation point B: Amendments to the guidance recommended by the ACMSF subgroup on *C. botulinum***

#### **• Challenge testing**

**Research shows that toxin can be produced before detection of growth.** It is therefore vital that detection of toxin is a minimum requirement for challenge testing as the presence of toxin, and not simply detectable growth, is the actual hazard.

However, in the guidance in general emphasis on challenge testing should be reduced. Challenge testing is not proportionate to risk particularly where products with a long-established safety record are concerned. Using high challenge test inocula are neither representative of reality<sup>9</sup>, and not cost-effective given the need to test each food formulation at significant expense (£10k+ per food), which is unlikely to be affordable by smaller businesses in particular, and which may lack internal technical resource. More appropriate alternative approaches than challenge testing should be included in the Guidance, such as exposure/risk assessment (e.g. number of packs or portions sold safely), which is an approach already used by ACMSF, process risk

<sup>4</sup> [https://www.qibextra.co.uk/getattachment/bbddaf0a-6eba-476b-936f-20f6d1aac37f/P-PSH-1033\\_Final\\_Report.pdf](https://www.qibextra.co.uk/getattachment/bbddaf0a-6eba-476b-936f-20f6d1aac37f/P-PSH-1033_Final_Report.pdf)

<sup>5</sup> Peck *et al* (2008). **Assessment of the potential for growth and neurotoxin formation by non-proteolytic *Clostridium botulinum* in short shelf-life commercial foods designed to be stored chilled.** <https://doi.org/10.1016/j.tifs.2007.12.006>

<sup>6</sup> <https://www.mla.com.au/research-and-development/search-rd-reports/final-report-details/Risk-Assessment-of-Botulism-from-Chilled-VP-MAP-Vacuum-Packed-Modified-Atmosphere-Packed-Fresh-Meat-held-at-3C-to-8C/3929>

<sup>7</sup> Peck *et al* (2008). **Assessment of the risk of botulism from chilled, vacuum/modified atmosphere packed fresh beef, lamb and pork held at 3°C–8°C.** <https://doi.org/10.1016/j.fm.2020.103544>

<sup>8</sup> <https://tinyurl.com/SUSSLEAFM266>

<sup>9</sup> Barker *et al* (2016). **Quantification of Nonproteolytic *Clostridium botulinum* Spore Loads in Food Materials** <https://aem.asm.org/content/82/6/1675>

<sup>10</sup> CFA/QIB/LFR/MLA/BRC (2018). **Guidelines for Setting Shelf Life of Chilled Foods in Relation to Non-proteolytic *Clostridium botulinum*.** <https://www.chilledfood.org/wp-content/uploads/2018/07/Non-proteolytic-Clostridium-botulinum-shelf-life-guidance-FINAL-1st-Ed-9-7-18.pdf>

<sup>11</sup> BRC Global Standards (2018). **Shelf life of Modified Atmosphere Packed (MAP) & Vacuum Packed (VP) 'Raw Meat Products' with respect to non-proteolytic *Clostridium botulinum*.** <https://www.chilledfood.org/wp-content/uploads/2020/10/BRCGS-MAP-VP-Justification-2018-Final-Jul18.pdf>

modelling, QMRA (e.g. as carried out in the SUSSLE projects) and predictive modelling. It should be noted that ComBase does not use heated spores, so is failsafe. The Guidance must state that if challenge testing is done it must be designed appropriately<sup>10</sup> and include toxin testing as that is the hazard and toxin can be produced prior to growth being detectable by plating out methods, and give clarity on what is considered a representative sample, e.g. a test of a product with worst case parameters being able to be used to provide a safe shelf life for other equivalent foods. See 2018 CFA/QIB/LFR/MLA/BRC guidance<sup>10</sup>.

- **Upper shelf-life limit for foods with controlling factors in place**

Work carried out on lysozyme in relation to thermal processes to control non-proteolytic *C. botulinum* has only used high inoculua (e.g.  $\sim 10^6$  spores/food sample, and  $5 \times 10^4$  spores/g in the case of the single research paper referring to 42 days). This does not reflect the concentrations of spores found in real foods. See Barker *et al*, reference 9, for actual spore levels.

We would reiterate that the safety of chilled prepared foods with respect to non-proteolytic *Clostridium botulinum* has been established to be of an order equivalent to canned foods, this being achieved by production according to standard GMP/GHP/HACCP requirements, and that internationally there are no stipulated limits to shelf life, instead the FBO being required to assure safety.

- **Controlling factors wording**

We concur with the proposed change of the wording to read “*a combination of controlling factors which can be shown consistently to prevent growth and toxin production by non-proteolytic C. botulinum*” as heat is not a necessary controlling factor in all cases e.g. fresh meat.

### **Consultation point C: Update of EU related references**

References should be updated to transposed EU law coming directly into effect in the UK at the end of the Transition Period. We are not yet aware of the details of such legislation however.

### **Consultation point D: Accessibility of the guidance for users.**

This is welcomed.

### **Additional points relevant to the Guidance review**

1. We have previously highlighted that the lethal rate table in the 2017 and previous version of the guidance is unsafe below 90°C. Not only is it unsafe but it is not in line with long-established industry requirements (e.g. CFA<sup>12</sup>, European Chilled Food Federation<sup>13</sup>), as borne out by the FSA-funded PhD by Wachnicka<sup>14</sup> and CFA’s first SUSSLE project AFM266. This was recognised by the ACMSF sub-group’s January 2020 report, but not mentioned in the consultation. The z value of 7 below 90°C, as has been referred to in industry technical documentation for some 25 years should be used in the guidance.
2. The Guidance should make clear that raw VP/MAP chilled products for consumer sale cannot be re-packed to extend the shelf life beyond that of the raw material without a kill step being used.
3. The Guidance document should be general guidance on the control of non-proteolytic *Clostridium botulinum*. However, separate clear guidance is needed on the requirement to control pH to assure safe production of herbs and other produce in oil stored at ambient.

---

<sup>12</sup> CFA (2006). **Best Practice Guidelines for the Production of Chilled Food**, 4<sup>th</sup> edition. [www.tsoshop.co.uk/chilledfoods](http://www.tsoshop.co.uk/chilledfoods)

<sup>13</sup> ECFF (2006). **Recommendations for the Production of Prepackaged Chilled Food**. [www.ecff.net](http://www.ecff.net)

<sup>14</sup> Wachnicka et al (2016). **Systematic Assessment of Nonproteolytic *Clostridium botulinum* Spores for Heat Resistance**. <http://aem.asm.org/content/early/2016/07/25/AEM.01737-16.abstract>

We look forward to continuing to work with FSA and ACMSF to arrive at scientifically sound yet straightforward information necessary to assist FBOs to carry out HACCP-based controls to assure food safety.

A handwritten signature in black ink, appearing to read "K. Goodburn", followed by a horizontal line.

**KARIN GOODBURN MBE**  
*Director General*