

ADVISORY COMMITTEE ON THE MICROBIOLOGICAL SAFETY OF FOOD

Update of Activity for the ACMSF Ad Hoc Group on Toxin producing clostridia in Food

1. The subgroup was set up following a discussion item at the meeting of the ACMSF in April 2021 ([ACM/1351](#)) and in light of recommendations from the ACMSF Ad Hoc group on non-proteolytic *Clostridium botulinum* and Vacuum or Modified Atmosphere Packed Foods ([ACM/1322](#)).
2. The objective of the subgroup is to produce a report, for consideration by ACMSF, which updates and builds on a previous ACMSF report on “Vacuum Packaging and Associated Processes” that was produced in 1992. The 1992 report has formed the basis for subsequent FSA guidance on safety of Vacuum Packed and Modified Atmosphere Packed chilled foods. Part of the FSA guidance is commonly known as the “ten day rule” for chilled product shelf life.
3. To date the subgroup has met twice, using MS Teams, in June and September 2021. The group includes 5 members of ACMSF, 3 co-opted members as well as representatives from Food Standards Scotland, FSA Policy group and the ACMSF secretariat. The group intends to include one additional member with appropriate expertise in aspects of human botulism and hopes to hear evidence from subject experts and stakeholders in relevant areas. The group intends to have approximately 6 meetings and aims to report to the ACMSF within 18 months.
4. The group has been supported by extensive documentation prepared by the scientific secretariat. Documents include the draft terms of reference and identification of expected outputs, a structured review of the scientific literature relating to *Clostridium botulinum* and to vacuum and modified atmosphere packing of chilled foods. The scientific secretariat has also prepared and annotated an organized list of reported outbreaks of foodborne botulism.
5. The group has agreed a final statement for its terms of reference that emphasises consideration of the risk of botulism and is not dominated by vacuum or modified atmosphere packaging or other processes. The agreed terms of reference are;
 - Review the risk posed by botulinum toxin producing Clostridia in foods stored at $\leq 8^{\circ}\text{C}$ that support growth or toxin production

- A preliminary assessment of the risk posed by botulinum toxin producing Clostridia in food designed to be stored at ambient temperature that support growth or toxin production
 - Where appropriate consider other risk related evidence relevant to toxin producing Clostridia during the lifetime of the group
6. The group agreed boundaries for the scope of its considerations. Some food groups, where strong evidence is already available (e.g. low acid canned foods, honey and foods subject to a proscribed botulinum cook), were excluded from consideration. Additionally the group will not repeat a consideration of [Vacuum Packed and Modified Atmosphere Packed fresh beef, pork and lamb](#) that was recently considered by another ACMSF subgroup that reported in February 2020. The group decided that foods which contain sodium nitrite (or other preservatives) should be within the scope of the consideration. The subgroup consideration is restricted to situations that do not include abuse conditions.
 7. The second meeting of the group was organised around the possible structure for a report, the appropriate scientific and technical content and the identification of important sources for evidence and views. The meeting also made plans for delivery. The subgroup will include a small element of background material within their report in order to establish strong continuity with the 1992 publication. The report will be structured under headings that may include Epidemiology, Taxonomy and Genomics, Detection, Growth and Survival of *Clostridium botulinum*, Packaging and Risk Assessment.
 8. Where possible the report will emphasise recent developments and trends and will include recommendations for consideration by ACMSF and the FSA.
 9. During September, in response to an emergent situation, the FSA asked the subgroup for a rapid view on the significance of a shortage of gaseous Carbon Dioxide used in packaging of food, including the impacts on microbiological safety and setting shelf life. Members of the group gave responses individually, separately from the primary activity of the group, and these were collated by the Secretariat of ACMSF and passed to the Microbiological Risk Assessment team of the FSA.
 10. Members of the subgroup highlighted the use of CO₂ atmospheres to restrict the growth of aerobic spoilage bacteria, and to slow the growth of many moulds and yeasts (and other post process contamination that causes food spoilage), in large sectors of fresh and cooked foods. In many cases it would be difficult for a Food Business to estimate, rapidly, the changes in shelf life, for established products, that would be driven by absence of a CO₂ atmosphere. Members of the subgroup indicated that, in most cases, carbon dioxide in pack contributes to a precautionary approach to food safety (rather than being an

established food safety factor) and is potentially coupled to other hurdles established by lower pH or competitive flora. This coupling is not fully quantified in current predictive microbial models and may be removed by incorporation of alternative atmospheres. The role of modified atmosphere is strongly affected by the detailed nature of the packaging materials and this is an area of significant uncertainty in understanding the impact of CO₂ on particular food products.

11. The next meeting of the group is planned for December 2021.

Secretariat
October 2021