

# Vacuum packed chilled foods: Reducing the risk of *Clostridium botulinum*



FOOD  
STANDARDS  
AGENCY

## Who should read this?

- If you make, re-pack or sell vacuum and modified atmosphere packed (VP/MAP) chilled foods, and want to set a shelf-life of more than 10 days, you should follow the recommendations in this factsheet.
- The factsheet will help you stop the growth of *Clostridium botulinum* and help show what you do to make food safely and comply with food hygiene regulations.

## What food safety risks are associated with VP and MAP foods?

- Although VP/MAP techniques generally increase the shelf-life of chilled foods by removing air, certain bacteria, including *C. botulinum*, may still be able to grow.
- *C. botulinum* can produce a very harmful toxin that can cause a fatal form of food poisoning. It is commonly found in the environment as spores and could be in food. Removing air from food packaging can allow these spores to grow and produce toxins.
- VP/MAP chilled foods must have controls in place, throughout the shelf-life of the product, to minimise the risk of this bacterium growing and producing toxin.
- Remember to consider other risks, such as *Listeria monocytogenes*, when setting a shelf-life for VP/MAP foods.

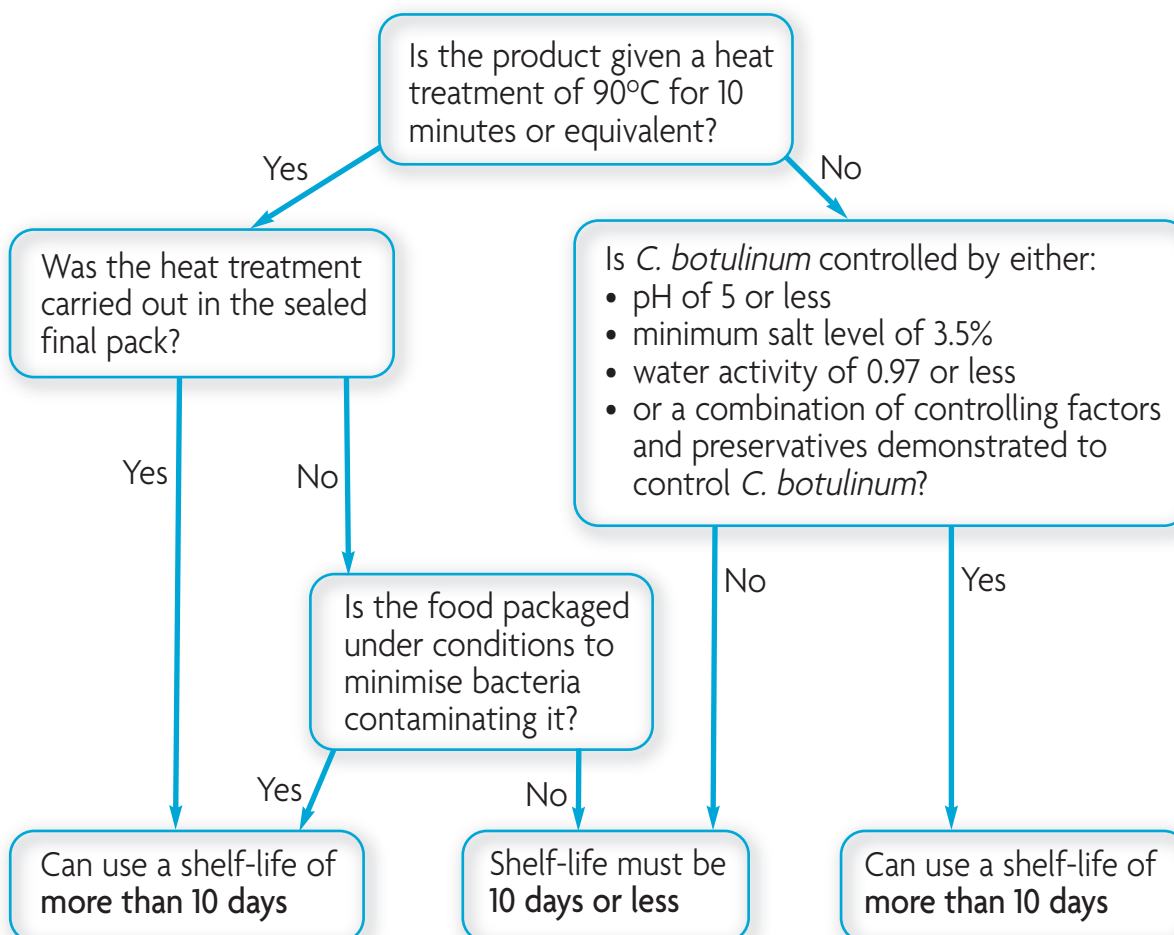
## How can the risk from *Clostridium botulinum* be minimised?

- Below 3°C harmful bacteria, such as *C. botulinum*, will not grow.
- A maximum 10 day shelf-life is recommended for VP/MAP foods stored at 3-8°C, if other controls are not used.
- For a shelf-life of more than 10 days, in addition to chill temperatures, the following controls should be used, either on their own or in combination:

- ◆ **heat treatment of 90°C for 10 minutes**, or a time and temperature combination sufficient to kill *C. botulinum* spores. This must be reached in the part that takes the longest time to heat up, e.g. in the centre of the food
- ◆ **pH of 5 or less** in all parts of the food. Foods containing meat or fats are very difficult to acidify uniformly and extra care should be taken
- ◆ **minimum salt level of 3.5%** in the water phase throughout all parts of the food
- ◆ **water activity of 0.97 or less** in all components of the food
- ◆ **combination of the controlling factors** can be used at lower levels or with other preservative factors, such as nitrite. But, these must be shown to be safe using expert scientific advice.

These methods can be difficult to achieve and it is recommended that you seek expert advice from, for example, a food research association. Speak to your local authority for more information.

## Shelf-life of VP/MAP chilled foods: reducing the risk of *C. botulinum*



### Can the shelf-life be extended after further processing?

**Rewrapping VP/MAP foods:** If a VP/MAP product is unwrapped for slicing or portioning and then rewrapped as a VP/MAP product, the shelf-life should not be extended beyond the shelf-life of the original VP/MAP product.

**VP/MAP foods as ingredients:** When VP/MAP foods are used as ingredients in other products, the shelf-life should not be extended beyond the shelf-life of the original ingredients, unless it has received a treatment that is sufficient to kill or stop the growth of harmful bacteria.

### Further Information

- Guidance on the safety and shelf-life of vacuum and modified atmosphere packed chilled foods with respect to non-proteolytic *C. botulinum*. *Technical guidance on VP/MAP foods*. [food.gov.uk/foodindustry/guidancenotes/foodguid/vacpac](http://food.gov.uk/foodindustry/guidancenotes/foodguid/vacpac)
- Food hygiene – a guide for businesses. *A general guide to the food hygiene regulations*. [food.gov.uk/aboutus/publications/safetyandhygiene](http://food.gov.uk/aboutus/publications/safetyandhygiene)
- Food safety management packs. *Practical guides to food safety management systems*. [food.gov.uk/foodindustry/regulation/hygleg/hyglegresources](http://food.gov.uk/foodindustry/regulation/hygleg/hyglegresources)