Scientific and technical assistance on the evaluation of the temperature to be applied to pre-packed fishery products at retail level

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BACKGROUND

- Point A of Chapter III of Section VIII of Annex III to Regulation 853/2004 states:

  - 'Where *chilled, unpackaged products not distributed, dispatched, prepared or processed immediately after reaching an establishment on land, they must be stored under ice in appropriate facilities*

  - *Packaged fresh fishery products must be chilled to a temperature approaching that of melting ice*'.

BACKGROUND

- The main problem for implementing that rule by Member States competent authorities is related to the storage of pre-packed fishery products (entire fish or parts of them) in supermarkets, where they are normally not maintained under ice and where Regulation 853/2004 does not apply.

TERMS OF REFERENCE

- *To assess, in the light of the current EU and international rules, which temperature conditions, including a possible tolerance, could be applied for storage and transport of pre-packed fresh fishery products, gutted or entire, including some parts of them, at retail level where icing is not possible.*
- The TORs were subsequently modified by the EC to include:
  a) fresh fishery products,
  b) thawed unprocessed fishery products, and
  c) cooked and chilled products from crustaceans and molluscs.

INTERPRETATION OF TOR

- Fishery products that have been packaged, i.e. any packaging operation that prevents contact with the surface of the fishery product
- Excluded were processed fishery products, such as smoked fish or canned fish, live bivalve molluscs
- Frozen fishery products were excluded but thawed unprocessed fishery products derived from previously frozen fishery products were included

APPROACH

1. Identify most relevant hazards
2. Effect of temperature on hazards during transport and storage was assessed quantitatively using predictive models
3. Baseline temperature was set as 0° C representing "temperature of melting ice" which was compared with alternative temperature scenarios at different storage times.
4. Modified atmosphere conditions were evaluated

HAZARD IDENTIFICATION

- Main hazards to be addressed are biogenic amines, specifically histamine, for fresh fishery products.
- Hazards capable of growth in seafood at refrigeration temperatures include histamine producing bacteria (e.g. *Morganella* spp. and/or *Photobacterium* spp.), *Clostridium botulinum*, *Listeria monocytogenes* and *Yersinia enterocolitica*, and were included in the model.
- Viruses and parasites do not reproduce outside of their hosts and phycotoxins are not influenced by post-harvest storage temperatures. These were excluded.

CONCLUSIONS 1

- The results from the modelling showed that pre-packed fresh fishery products can be stored at refrigeration temperatures above **0 ° C (e.g. 3–5 ° C) and be compliant with the current EU and international rules**. Examples of combinations of product durability (maximum shelf-life) and packaging atmosphere that should enable compliance with the safety criteria for various storage temperatures at retail are provided in the report.

CONCLUSIONS 2 - HISTAMINE

- For a fishery product subject to the current requirement, histamine formation would be 100 ppm (lower limit m of the safety criterion in Regulation (EC) No 2073/2005) at the end of its shelf-life.
- Thus, an equivalent condition to this baseline scenario is any combination of storage temperature, shelf-life and CO_2 concentration that leads to histamine formation of 100 ppm at the end of shelf-life.
- For example, for a retail temperature of 3 ° C, 100 ppm would be reached under the following conditions:
  - shelf-life of 6 days and 0 % CO_2 in the packaging headspace
  - shelf-life of 7 days and 20 % CO_2 in the packaging headspace
  - shelf-life of 8 days and 40 % CO_2 in the packaging headspace.

CONCLUSIONS 3 - LISTERIA

- For *L. monocytogenes* EU Regulation (EC) No 2073/2005 sets a limit of 100 CFU/g in RTE products at the end of shelf-life.
- FBO can ensure compliance with such limit for products stored in retail at temperatures above 0 ° C by adjusting the product durability (maximum shelf-life) and/or by modifying the packaging atmosphere
- For example, for a retail temperature of 3 ° C, this limit would be respected with:
  - shelf-life of 11 days and 0 % CO_2 in the packaging headspace
  - shelf-life of 14 days and 20 % CO_2 in the packaging headspace
  - shelf-life of 18 days and 40 % CO_2 in the packaging headspace.

CONCLUSIONS 4 - *Y. ENTEROCOLITICA*

- For *Y. enterocolitica*, the conditions that lead to equivalent growth to that at 0 ° C are, for example, the following combinations:
  - shelf-life of 10 days at 2 ° C
  - shelf-life of 7 days at 4 ° C
  - shelf-life of 5 days at 6 ° C.

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