Shelf life extension of marinated fish products by organic acids

Identification

Key words  organic acid, shelf life extension, marinated fish product
Latest version  2012/03/27
Completed by  FRIP

How does it work?

Primary objective  Prolongation of the shelf life of marinated fish products by organic acids.
Working principle  Organic acids can lower the pH of marinated fish or meat products. A decrease in pH limits the growth of a number of microorganisms of the microbial spectrum (spoilage microorganisms and pathogens) of the fish or meat products and limits germination of spores of Cl. botulinum and other spore forming microorganisms. Marinated fish are fish products preserved by the combined action of salt and organic acids [1] if stored at chilled temperatures. The main type of the organic acid used is the acetic acid or the vinegar.

Images

Additional effects  Antioxidative action, acid taste production. A decrease of the protein content and the increase of the acidity and the free amino-acid content during the marinating process give the marinated fillets a characteristic texture and aroma [1]. Lactic acid bacteria (LAB) isolated from fish products (fresh fish, smoked and marinated fish, fish intestinal tract) are discussed by Pilet et al. (1995) [5]. LABs were screened for bacteriocin production and immunity in conditions eliminating the effects of organic acids and hydrogen peroxide. When the cultures were maintained at pH 6.5, bacteriocin production was significantly increased.

Important process parameters  time, temperature, vacuum packaging
Important product parameters  fish composition, composition of marinade (salt vs. acetic acid doses)

What can it be used for?

Products  Fish products, Pacific saury (Cololabis saira) [2], [3], sardine marinades [4].
Operations  Fish product formulation, storage time in marinade solution.
Solutions for short comings  Important parameters are the duration of the marination process of the fish meat and the composition of the marinade in terms of microbial decontamination. The main industrial need is the shelf life of the marinated fish product. The shelf life is function of the antibacterial activity of the marinade.
What can it NOT be used for?

**Products**
Solid foods that cannot be marinated such as bakery products, dairy products etc.

**Operations**
Separation of marinade from the fish meat causing the low contacting time.

**Other limitations**
Composition of marinade, e.g. content of the organic acids and other antibacterial components.

**Risks or hazards**
Increase of temperature. Wrong composition of marinade solution that causes low antimicrobial activity.

Implementation

**Maturity**
This technology is currently applied in the fish industry.

**Modularity /Implementation**
Production of acid marinated fish products with longer shelf life and lower microbial contamination. The technology can be easily implemented in industrial conditions.

**Consumer aspects**
Longer shelf life of fish and their products is attractive.

**Legal aspects**
No limitation. Only local standards for microbial content in acid fish products.

**Environmental aspects**
Not applicable.

Facilities that might be interesting for you

<table>
<thead>
<tr>
<th>Title</th>
<th>Institute/company</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auditorium IRTA</td>
<td>IRTA</td>
</tr>
<tr>
<td>Clean room – Histocell</td>
<td>Noray</td>
</tr>
<tr>
<td>Video observation system for market research and product development tasks - Keki</td>
<td>NAIK EKI</td>
</tr>
</tbody>
</table>

Further Information

**Institutes**
Ege University, ENITIAA, Université de Caen, INRA

**Companies**

**References**


