

Aquatic food production – safety and quality

Effect of processing and storage on proteins and lipids in fish

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30 credits

Background:

Consumption of fatty fish such as herring and mackerel provides numerous important nutrients linked both to their lipids, proteins and water soluble compounds. Herring and mackerel are fatty fish species with lipid contents varying between 8 and 20% (herring) and 17 and 35% (mackerel). The lipids of these species are rich in omega-3 fatty acids with documented preventive effects against cardiovascular disease (CDV), positive effects on early neurodevelopment, central nervous system disorders etc. Therefore, increased consumption of these fish species could help to cover the recommended daily intake of omega-3 fatty acids. However, the healthy omega-3 fatty acids are highly susceptible to oxidation resulting in rapid quality loss. During lipid oxidation, endogenous antioxidants are consumed and various primary and secondary oxidation compounds are formed, the latter which reduce the sensory quality (undesirable taste and flavour) and may lead to significant losses of protein functionality through cross reactions with proteins. Herring is used for marinated products whereas mackerel is used also for canned products.

Goal:

The aim of the work is to establish an improved understanding of the relationship between raw material properties (fresh/frozen, seasonal variations) and the chemical and physiochemical processes taking place during the different processing steps (storage, thawing, salting/marinating and heating).

Thesis work:

The raw material properties will be characterized with regard to lipid and protein content as well as determination of physiochemical properties (water holding/texture..). The leaching of water soluble proteins, peptides and amino acids into thawing drip, salt brines and marinades will also be determined.

The master thesis is related to a research project on preserving the positive health effects of pelagic fish with the participation from several research and industrial partner