Editorial Board Member

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Biography

- Dr. Sabine Sampels, PhD studied Food Chemistry at Rheinische Friedrich Wilhlems Universität, Bonn, Germany and received her PhD at the Department of Food Science, Swedish University of Agricultural Sciences. After her Dissertation she worked at different Institutes in Sweden and Norway with quality of fish and fish products and the effect of dietary fatty acid composition on human health. Currently she has a position as a researcher at the University of South Bohemia in Ceske Budejovice, Faculty of Fisheries and Protection of Waters, Institute of Aquaculture focused on the quality safety and shelf life of fish and fish products, novel ingredients in fish products to increase nutritional value and effects of fish consumption on human health.

Research Interests

- Aquaculture and effects of consumption of fish on human health.
- Effect of animal nutrition on fish and meat compsoition.
- Fish and fish products assessment .
- Lipids and lipid metabolism in animal products and human nutrion.
- Shelf life, oxidation and antioxidants in fish and meat.

Publications

Sampels S., Zajíc T., Mráz J., 2014, Effect of frying fat and preparation on carp (Cyprinus carpio) fillet lipid composition and oxidation. Czech Journal of Food Sciences, ISSN: 1212-1800.

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Aquaculture

- Aquaculture is the farming of aquatic organisms such as fish, prawns, molluscs, and aquatic plants related directly or indirectly to human consumption.
- Over recent years, world seafood consumption has risen and overall production has increased. However,wild-caught production has remained stable, Aquaculture has therefore become increasingly important in meeting local and global demand for seafood.

- Stock restoration or "enhancement" is a form of aquaculture in which hatchery fish and shellfish are released into the wild to rebuild wild populations or coastal habitats such as oyster reefs
- Aquaculture also includes the production of ornamental fish for the aquarium trade, and growing plant species used in a range of food, pharmaceutical, nutritional, and biotechnology products.

Marine Aquaculture

- **Marine aquaculture** refers to the culturing of species that live in the ocean
- U.S. marine aquaculture primarily produces oysters, clams, mussels, shrimp, and salmon as well as lesser amounts of cod, moi, yellowtail, barramundi, seabass, and seabream.
- Marine aquaculture can take place in the ocean (that is, in cages, on the seafloor, or suspended in the water column) or in on-land, manmade systems such as ponds or tanks.

Freshwater Aquaculture

- **Freshwater aquaculture** produces species that are native to rivers, lakes, and streams.
- U.S. freshwater aquaculture is dominated by catfish but also produces trout, tilapia, and bass.
- Freshwater aquaculture takes place primarily in ponds and in on-land, manmade systems such as recirculating aquaculture systems

Production

Where are the best places to put an aquaculture farm?

- There are specific criteria that must be considered when investigating a potential site for aquaculture. These include water access, topography, climate, soil type, and proximity to markets, support and infrastructure.

Agriculture Planning Process

STAGE ONE: Preparation and Submission of Application

- In the initial instance the developer will approach the Local Planning Authority
- The LPA will advise the developer to consult with relevant parties, this is not a legal requirement but it is a requirement of industry protocol

STAGE TWO: Consultation, Consideration and Determination

- The Planning Authority may provide a planning permission, which will allow it to assess some of the impacts of the development before considering whether to grant permanent permission.

STAGE THREE: Appeal

- The applicant has the right to appeal any decision for refusal, or any conditions attached to an approval.
- The Decision is usually made under delegated powers by a local planning officer. If a statutory consultee has objected, the application will be determined by the council committee instead of being delegated to a planning officer, this has a bearing on the route of appeal by the applicant

Aquaculture Feed

- The main operating cost of intensive aquaculture ventures feed, and many ventures fail due to excessive spending on this input. Larger, warm water projects are now carefully scrutinizing feed costs.
- It is generally accepted that feed constitutes 40% to 60% of all recurring expenses in a re-circulating aquaculture system (RAS). This is a very high figure, so wastage cannot be tolerated.

Controlling diseases in aquaculture systems

Species-specific : Many fish diseases are species-specific and are brought on by different conditions. For example, poor quality water affects trout and tilapia in different ways.

- Parasitic infections such as Ichthyophthirius multifiliis (ich) and costia (white spot diseases) are often opportunistic and attack weakened fish.

Fungal infections and sensitivity Fungus may also develop on tilapia exposed to low temperatures. It is of little use to treat the fungus, as it is a secondary affliction – the water must be warmed. Some fish strains are more sensitive than others

Algae control : Ultraviolet (UV) sterilization is a useful tool in RAS disease control, both to eliminate pathogens and for uni-cellular algae control.

- If a system is carrying a high nitrate load, green water will almost certainly be a problem, resulting in fish and algae competing for oxygen.
- UV lamps of sufficiently high output and used for extended periods can control algae very effectively. These are fitted in the filtration system behind the pumps, before the water is returned to the fish tanks. These UV lamps result in clear, pathogen-free water

Fish breeding do's & don'ts

- If you breed two genetically closely-related individuals of the same species, you automatically lose genetic variability but the golden rule is to breed livestock to improve their attributes for aquaculture, and not breed inbred, low quality runts.
- The frequent inbreeding of siblings (brother/sister or father/daughter) usually has two results. Certain traits become more fixed (be they good or bad) and the general health of the fish deteriorates.

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•If all the fish in a particular population (thousands of individuals) are fast-growing, with deep body shape and a late onset of maturity, this may be an indicator of high-quality stock for aquaculture.

• But that can only be ascertained by an intensive scientific examination of their life history.

•Only once that has been documented can one say that a particular population, or ‘strain’, is of high quality, and even then these attributes may not be as well expressed under aquaculture conditions as in the wild.

Fish Farming Methods

- The first method is the **cage system** which use cages that are placed in lakes, ponds and oceans that contain the fish. This method is also widely referred to as off-shore cultivation. Fish are kept in the cage like structures and are “artificially fed” and harvested.
- The second method is **irrigation ditch or pond systems** for raising fish. This basic requirement for this method is to have a ditch or a pond that holds water. This is a unique system because at a small level, fish are artificially fed and the waste produced from the fish is then used to fertilize farmers’ fields.

- The third method of fish farming is called **composite fish culture** which is a type of fish farming that allows both local fish species and imported fish species to coexist in the same pond. The number of species depends, but it is sometimes upwards of six fish species in a single pond.
- The fourth method of fish farming is called **integrated recycling systems** which is considered the largest scale method of “pure” fish farming. This approach uses large plastic tanks that are placed inside a greenhouse
- The last type of fish farming method is called **classic fry farming** this method is also known as “flow through system”. This is when sport fish species are raised from eggs and are put in streams and released.

Thank You..!