

# Turning Waste into Profit

Gain knowledge about marine ingredients produced from by-products from fish, crustaceans, molluscs, etc. and increase your profits



## Value your waste

**Do not waste your waste! Gain more insight into the marine ingredients industry that utilizes by-products from fish, crustaceans, molluscs, etc. Inocap can be your assistant and advisor.**

In Norway in 2007 15% of all by-products from fish counted for 50% of all revenues from by-products. A Norwegian industry organization estimates that the value of by-products may fivefold if more of the by-products are being processed into food for humans and ingredients in foodstuff, health foods, nutraceuticals, pharmaceuticals, cosmetics, etc

Successful utilization of by-products is a matter of combining knowledge about **technology and markets**. Even with the very best technology it is a question of identifying and gaining access to attractive markets that makes the difference. The clue is to work with professionals that are market oriented on behalf of their clients.

**Fish meal** is not fish meal. Applying the right expertise and technology you may improve the quality making it possible to enter more profitable market segments. Studies say that fish meal with high ash level is preferred in cod and eel feed.

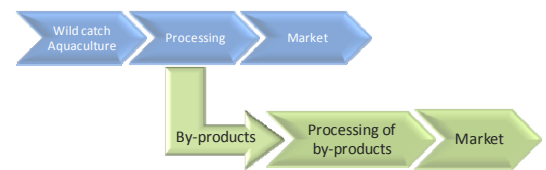
**Gelatin** produced from warm water fish such as tilapia has unique characteristics, making it an attractive substitute to gelatin produced from terrestrial animals. The global gelatin market is estimated to about USD 2,2 billion and about USD 6,75/kg.

The gills in fish might have a promising future as raw material for production of one of the world's most widely used **pharmaceuticals** in surgeries with a global market of USD 5,0 billion and growing more than 10% a year.

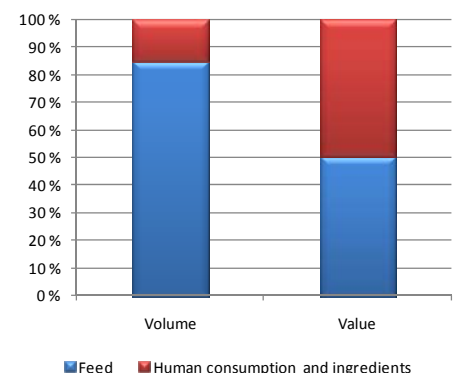
**Peptides** (a "customized" protein) from fish are used in sports drinks used by top world athletes, and tilapia might be a preferred source because of mild taste.

**Freshness and large volumes** are important factors impacting the value and competitive position of marine by-products.

Access to **low cost labor** can be a competitive advantage as it can make it economical to remove selected parts for further processing. A project in Africa made it financially attractive to produce a particular fatty acid found in eyes of shark fish.



**Utilized by-products by volume and value in Norway 2007**



| By-products - alternative applications and markets   |   |   |
|--|---|---|
| Human consumption  | Ingredients   | Feed  |
| <ul style="list-style-type: none"> <li>• Heads</li> <li>• Belly flaps</li> <li>• Dried cod fish heads</li> <li>• Cod Cheeks</li> <li>• Toungees</li> <li>• Roe</li> <li>• Liver</li> <li>• Milt</li> <li>• Stomachs</li> <li>• Swim bladder</li> <li>• Back bones</li> </ul> | <ul style="list-style-type: none"> <li>• Cod liver oil</li> <li>• Salmon oil</li> <li>• Oil from pelagic fish</li> <li>• Phospholipids</li> <li>• Protein hydrolysate</li> <li>• DNA</li> <li>• Gelatin</li> <li>• Calcium</li> <li>• Glucosamine</li> <li>• Chitosan</li> <li>• Flavors</li> <li>• Extracts</li> <li>• Amino acids</li> <li>• Enzymes</li> <li>• Peptides</li> </ul> | <ul style="list-style-type: none"> <li>• Fish meal</li> <li>• Fish oil</li> <li>• Silage oil</li> <li>• Silage concentrate</li> <li>• Attractant</li> <li>• Protein hydrolysate</li> <li>• Calcium</li> </ul> |
| Markets  | Markets   | Markets   |
| <ul style="list-style-type: none"> <li>• Consumer market</li> </ul>  | <ul style="list-style-type: none"> <li>• Food industry</li> <li>• Nutraceuticals</li> <li>• Cosmetics</li> <li>• Pharmacy</li> <li>• Biotechnology</li> <li>• Industrial applications</li> </ul>  | <ul style="list-style-type: none"> <li>• Feed</li> <li>• Feed additives</li> <li>• Pet Food</li> </ul>  |

## Gain knowledge and increase your profits

**Inocap can assist you in gaining access to knowledge and technology that may increase your profits from by-products from fish, crustaceans and molluscs, etc.**

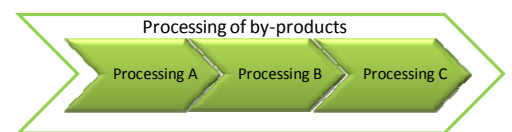
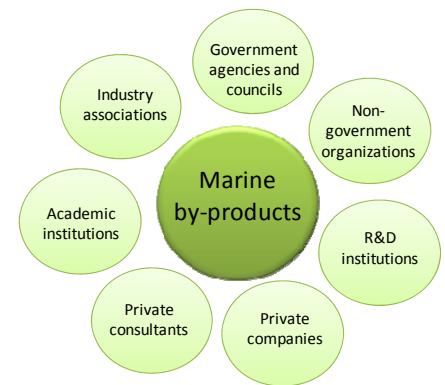
Norway has since 1992 had an industry association dedicated to push developments in utilization of by-products from fisheries and aquaculture.

Norway has about 65 private companies involved with marine ingredients. In addition comes numerous R&D institutions, out of which several have “world class” expertise in their fields.

Iceland has several private companies in the marine ingredient industry, as well as R&D institution and universities with professional expertise in the field.

Inocap has also knowledge about the marine ingredient industry in other European countries.

Inocap is an **independent advisor** ready to give you independent advice.



## About Inocap

**Inocap is an independent analyst and consulting company serving the industries; aquaculture, marine life science and biotechnology, as well as the financial community financing these industries.**

Inocap has its core competence within business development and finance.

Inocap assist companies in exploring new business opportunities and enter into new business constellations and relations.

Inocap is based in Oslo, Norway but has an international network and work experience.

Inocap is a company of great integrity, dedicated to offering great service, and working to the very highest ethical standards.

More about Inocap at [www.inocap.no](http://www.inocap.no)



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