Icelandic fisheries have evolved strategies and techniques to make money out of many by-products. In most parts of the world the "other products" of the fish are still treated as waste. Studies by the Iceland Ocean Cluster have indicated Iceland is using over 80% of each fish while most fisheries nations use around 50%. Leading fisheries in Iceland have announced their aim is to utilize 100% of the fish. Can we inspire others to use more of each fish?

The 100% Fish Project's mission is to inspire the seafood industry and seafood communities to utilize more of each fish, increase the value of each fish landed, support new business opportunities, increase employment and decrease waste. Iceland is a great example of what can be achieved with more fish utilization; The use of more byproducts in the Icelandic fisheries which (which increased by around 3000% in the last 25 years) has led to an independent industry creating at least around 6-700 direct jobs and a annual value which exceeds USD 500 million. Many of these jobs are in rural areas - coastal towns.

The unique role which the Iceland Ocean Cluster has played in the Icelandic fishing industry is to take a bottom up approach; nurture startups! By operating the Ocean Cluster House (ocean accelerator) – which has over 70 companies in the facility– we now have a large group of entrepreneurs starting new companies in this field. We are seeing a massive number of new startups in Iceland being created in the seafood industry. Here, the Iceland Ocean Cluster has played a role as we have brought more investors into this field and invested ourselves in startups.
The Ocean Cluster Network, initiated by the Iceland Ocean Cluster, consists of ocean cluster organizations in the US, Iceland and Norway which aim is to strengthen innovation in seafood and full utilization of seafood products. As of now various projects which aim to use more of whitefish, salmon and shellfish are underway within the Ocean Cluster Network, ranging from creating skin care products from whitefish skins to deriving protein from lobster shells.

There is no single explanation for the huge difference in utilization between countries. Partly it may be explained by the fact that unlike the year-round long fishery in Iceland, many fishing nations have short fishing seasons with massive amounts landed over few months, making it difficult to process such raw material efficiently. Secondly, the integration between fishing and processing in Iceland through common ownership is not usually the case with many other fishing nations. Finally, the fact that unlike the Icelandic fleet, many vessels need a long steam to the fishing zones placing them in a position in which they need to store as much frozen fillets (or headed and gutted fish) as possible and therefore they have less opportunity to keep the remaining raw material on board. In Norway for instance many trawlers steam over 700 miles to Barents Sea fishing grounds.

It is only a matter of time when fisheries will stop value discarding. The 100% Fish Project can hopefully enhance the speed of this change. Looking back 20 years, the liver was the only part of the rest of the raw material that had some “value.” The rest of the fish was mostly treated as waste with no value. Over these 20 years, new markets and companies capable of handling by-products have been developed in various areas. A good example of a company is Copalis at Boulogne-sur-Mer in northern France. The original aim of Copalis was to add value to by-products generated by fisheries. What began as a smelly by-product reduction plant has become a world class by-product producer for one of Europe’s leading fish processing ports. Another example is Haustak in Iceland, a leading fish drying plant that uses geothermal heat. In collaboration with the Iceland Ocean Cluster, Haustak established Codland, a company which aim is to create more value from each fish.

The picture on the next page depicts the future of the 100% Fish. Every part of the fish is used for various proteins or other valuable products. All the technology necessary to use all parts of the fish already exists. The work ahead is to inspire fisheries and seafood communities to become a part of the full utilization movement.
Most development has been in the liver and omega sectors where companies in countries such as Norway and Iceland have become key players in the field. The success of the liver business does not necessarily indicate that liver is in the long run the most valuable part of the rest of the fish; liver was just first in line of a great many opportunities and has already been developed over a longer time than other by-products. Next in line are enzymes, collagen, proteins and calcium, to name a few. In Iceland, many small plants are processing cod by-products for fish leather plant, enzymes, protein, omega, canning and an upcoming fish collagen plant.

The pioneering plants in fish meal, drying, liver etc. have all experienced a significant change in the market for by-products in their areas. The price of by-products has increased steadily, but never as significantly as it has in the last five years. The price for liver has doubled in the last five years and new niche markets are on the rise, such as cutlets/mince (for animal feed), dried bones, enzymes etc.

As more companies join the by-product market and the market develops further, the prices will continue to increase and the incentives for fisheries to get value from their by-products are also set to increase. The biggest threshold for increased utilization is probably the supply chain. Some fishermen I have spoken with, both in the US and Scandinavia, have been interested in utilizing more of the fish but there is often a complete lack of an efficient supply chain. One fisherman told me that even though he would like to keep the heads on
board his longliner there is no one at the other end of the chain picking them up, drying them and selling the product. The small number of existing plants also demonstrates the volume of waste material from fishing villages that are too small or have limited or over-complex logistics to make the business efficient.

To respond to this, it is crucial to study carefully every link in the value chain to determine how to strengthen it. One important part is lack of suitable technology for smaller fishing villages to be able to process their own by-products. Now, new technology is being introduced by Icelandic fish technology firms which may open doors for smaller fishing towns to start more fish utilization on a local basis. The new technology includes new modular drying plants and fish oil plants. Such development would also ease the logistics issue as processed products consume less space and higher value products would be transported to the market.

Icelandic seafood startups are making new products from seafood byproducts. The economy behind it is clear. Let's take the fish skin as an example: Fish skin can be made into fish leather. This fish leather is worth wholesale around USD 8 per skin. The skin can also be developed into fish collagen which is a protein good for skin and joints. A kilo of fish collagen is USD 14 in bulk. If the fish collagen is sold in retail packaging, the kilo is worth much more. A new fish collagen plant which is being designed in Iceland is owned by four of the large fisheries in Iceland. Finally, the fish skin can be developed as wound care. Bound into dressings for human wounds, the fish skin acts as a structure around which healthy cells can grow. The company Kerecis in Iceland are already global leaders in this field. This product has shown to have some superior qualities for wound care – and successfully used where traditional methods of wound care have been inadequate.

The technological evolution in the seafood industry means a much stronger and competitive industry in the years to come. But the need for the superb natural seafood proteins can make the industry not only more competitive but also the next generation of fishermen may become pharmacists or skin care manufacturers! This is the core message of the 100% Fish Project.

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