

Aquaculture: It's not all about Atlantic Salmon

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Let's be blunt aquaculture has had a bad press in the western world with recent headlines such as "Frankenfish" moves closer to your dinner plate"; "Fish Farms Drive Wild Salmon Toward Local Extinction" and "Sea lice killing 'large numbers' of salmon". With headlines like this it is not surprising that the perception of aquaculture in most western countries is poor. In the West aquaculture is seen as a problem rather than a solution, yet the West's appetite for seafood remains undiminished. The USA consumes around \$19 billion worth of seafood a year, 95% of it is imported and of that \$18 billion 54% is aquacultured. The reason for this is clear, many of the wild stocks of fish, invertebrates and marine algae are over exploited and near collapse to fulfill consumer demand and aquaculture has stepped in to fill the gaps. So why is aquaculture a dirty word in the west yet widely embraced elsewhere?

The social ecosystem that has developed in western culture has concentrated on criticizing the aquaculture industry rather than looking at the huge advances that have been made in improving sustainability over the last 30 years. It is not uncommon to see 30 year old data on antibiotic use in Atlantic salmon farms being used today in poorly researched articles to highlight low levels of welfare and potential for antibiotic residues to occur in the food chain. When in reality antibiotic use in Atlantic salmon farms has fallen by 99.99% since the development of effective bacterial vaccines in the 1990's.

Ah I hear you say what about all the problems with environmental degradation? Yes it's true every farm has a carbon footprint, even the best organic farm in the world has changed the environment from the wildwood to a rolling pastoral scene reverberating to the sounds of Vaughan Williams. Western aquaculture has made mistakes when it concerns the environmental impact of aquaculture. Are these any worse than those made by traditional agriculture? No. However, the agricultural revolution that occurred in terrestrial farming over several centuries only to be replaced by the "green revolution" of the last 50 decades has been repeated in aquaculture in 30 years rather than 250.

Today aquaculture in the west stands at a crossroads; integrated multitrophic aquaculture (IMTA) has the potential to recover much of the carbon, nitrogen and phosphorous input in open aqua farms. Not only reducing the carbon footprint of aquaculture, but also improving the farm's economic by diversify the products and opening new markets. Onshore aquaculture farms have even more potential to reduce the environmental impact further becoming carbon neutral in real terms.

The consumption of Ω -three fatty acids is widely recommended by the medical profession to improve human health; yet the wild sources of these lipids has collapsed and the price to the consumer has increased significantly, often putting them out of the reach of the underprivileged. More and more we see them being produced from aquaculture sources such as marine algae to fulfill the demand for human consumption.

So this brings us back to our first question why does aquaculture have such a poor perception in the west? To us the answer is clear; the public is poorly educated about aquaculture and we, the educators and scientists, need to work to improve the acceptance of this technology. Even as we write this the "horsemeat in beef" scandal is full swing in Europe. A scandal that occurred because governments and the food industry lost control of the supply chain. Yet the USA consumes over \$9 billion worth of imported seafood every year produced in countries where the standards of public health may be very different from those in the home market. Are we staring down the barrel of another food safety scandal when we find out that expensive snapper is actually bleached tilapia produced in a developing country where there are no food standards agencies to ensure a level playing field? If those dollars were reinvested in aquaculture in the USA then we would see a vibrant aquaculture industry. Which would have regenerated our working waterfront, prevented our coastal communities becoming museums, full of summer people yet empty in the winter? Better still the seafood deficit would have all but disappeared with our coastal communities benefitting from the expansion of the blue economy.

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