

Risks versus benefits of farmed seafood

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Good nutrition involves the consumption of a variety of foods, including meat, carbohydrates, fruits and vegetables. Seafood, which belongs to the meat category, is a good source of protein, lipids and iodine. In order to increase the production of seafood for public consumption, seafood has been cultured in fish farms, which are then harvested and distributed to the markets and groceries. Consequently, the risks and benefits of using farmed seafood have been examined in detail and compared to that of fish caught in the wild.

This paper will discuss consumer-related aspects of farmed seafood that have been gathered from scientific investigations. Review of Literature
Proper nutrition requires the incorporation of different food groups into an individual's daily diet in order to maintain good health and prevent illnesses. Food suppliers have given tremendous effort in providing the best choices of food in the grocery, including meat, vegetables and fruits. Seafood is good source of protein, vitamin D, selenium and iodine (Daviglius, 2002).

It is also rich in long chain omega-3 fatty acids eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA), which prevent cardiovascular problems and mental disorders, as well as facilitate brain development in developing fetuses and infants (Harper and Jacobson, 2001). It has been observed that increased seafood consumption may promote a healthier body by decreasing the amount of consumption of saturated fats. It has been recommended that at least two meals of seafood be taken every week in order get the minimum nutritional value of seafood.

Seafood production is based on two routes—by farming or by catching from the wild. Currently, large-scale seafood farming serves as a better option for seafood production because it efficiently provides sufficient amounts equivalent to the global market demand for seafood for human consumption. For salmon alone, there has been an annual increase in global production from 27, 000 to > 1 million metric tons in the last 20 years (FAO, 2004). Types of seafood that are utilized in huge amount include tuna, shrimp, salmon, tilapia, cod, flounder and tilapia (Nesheim and Yaktine, 2007).

In Southeast Asia, integrated fish farming through the use of livestock manure as fish feed are employed, as this mode of administration provides a direct mode for the transfer of nutrients to the farmed fish, as well as less need for providing supplementary feed. The livestock are strategically positioned above the water so that droppings from the livestock would reach the farmed fish that are confined in cage units underwater. To ensure that the livestock are clean and healthy, antimicrobial treatments are administered to the livestock at regular intervals.

In the light of increased production of seafood by fish farming, the concept of food safety has been added to the requirements of dietary guidelines, wherein it is strongly promoted that not only should a consumer's nutrition be considered when choosing and buying food, but more importantly— the consumer's food safety upon consumption of different types of food. Information on the cause and symptoms of food-borne illnesses have been presented to the public, as well as the other long-term disorders or diseases that these may cause.

Food-borne illnesses are preventable if the consumer is given proper knowledge on how to keep food safe for consumption. Assessment for contaminants in farmed seafood have brought up health risks that may arise from their consumption (Torpy et al. , 2006). It has been determined that farmed seafood may contain analogues of methylmercury (MeHg), a heavy metal that could cause disorders in the nervous system of infants.

Methylmercury is deposited in seafood meat, and its amounts are usually greater in huge seafood such as swordfishes and sharks.

In addition, persistent organic pollutants such as dioxins and polychlorinated biphenyls (PCBs) may have accumulated in fatty tissues of farmed seafood. As for integrated fish farming systems, there is a growing concern the drug-resistant bacteria may infect fish ponds through the livestock manure. Two bacterial species, *Acinetobacter* spp. And *Enterococcus* spp. have been identified as indicator species that may confirm any case of drug-resistance in different aquatic environments.

These bacteria are usually found in water-associated environments and have caused healthcare-related or nosocomial infections in healthcare facilities, mostly due to their capability of carry resistance genes that transform them into untreatable pathogens. Other farmed seafood is specific areas such as Chile has been observed to carry *Piscirickettsia salmonis*, a bacterial pathogen that infect the salmon species. The same pathogen has lately been identified to occur in salmon harvest from the waters of North America (Brocklebank et al. , 1992).

Ingestion of such moribund fish can cause septicemia or bacterial infection in the bloodstream. The risk of transmission of these bacteria are greater when seafood is eaten raw, as in Japanese dishes such as sashimi or oysters. There are a number of studies that have shown that farmed seafood contain significantly higher concentrations of dioxins and PCBs, as well as pesticides such as toxaphene and dieldrin (Hites et al. , 2004; Foran et al. , 2005).

These contaminants have also been detected in wild seafood, but at lower concentrations (Foran et al. 2005). It may be possible that the containment during growth of these farmed seafood facilitates the accumulation of contaminants because the seafood and water are both hindered from movement to other bodies of water. Nevertheless, there is no difference in consumption of farmed from wild seafood, since both types of seafood can be availed at its freshest condition and reasonable price. Fish consumption advisories based on risk assessment of contaminants in farmed seafood have been established in almost every country around the world.

It provides the current levels of contamination as well as the possible risks once the seafood is consumed at specific amounts and through specific preparations (Arnold et al. , 2005). Sadly, such safety warnings do not include the benefits of seafood consumption, hence these efforts have discourages the general public from eating seafood. Also, consumers have resorted to using alternative food sources which are, unfortunately, less nutritious than what seafood can provide. It would be beneficial if such advice were more specific, indicating what seafood species from which farm origin, is unsafe for public health consumption (Woteki et al. 2001).

Dissemination of general advisories that fish is unsafe does not benefit the public at all, because it removes a nutritious item from their food source list, and eventually results in substandard nourishment levels in the society. In order to balance the benefits and risks derived from farmed seafood, it is important to understand the reasons behind seafood consumption. Human nature shows that a consumer does not immediately follow dietary suggestions that an individual should consume more seafood than other meat sources unless it tantamount to recuperation from a grave illness such as a stroke or myocardial infarction.

The choice to eat seafood is mainly based on the consumer's taste, price, availability, beliefs and culture. Our society is composed of different races, hence there are certain smaller groups of people that would have a different perception on the presented benefits and risks of farmed seafood. Hence, consumer information should be well disseminated to facilitate a better understanding and allow consumers to decide what is best for them.

Summary and Conclusions The benefits of seafood consumption is far greater than its potential risks, given that safety guidelines to seafood farming and handling are currently being implemented.

Chemical and bacterial risks may still persist in farmed seafood, yet it is important to keep in mind that all types of food have their own inherent risks as well as benefits. Hence, it is imperative to monitor the amount of seafood eaten, as well as maintain a variety of food for daily consumption. There is still a need for further investigations on the effects of the other contents of seafood, such as selenium. More so, the amount of contaminants in seafood

is positively correlated to the size, number, origin and age of the farmed seafood.