ATTACHMENT 12

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CONCERNING ORGANIC CERTIFICATION

OF AQUACULTURE PRODUCTS

PRESENTED TO THE

NATIONAL ORGANIC STANDARDS BOARD

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Thank you for the opportunity to present remarks concerning organic standards for aquaculture. I wish to comment on two of the unresolved issues before the National Organic Standards Board (NOSB). Before I do that, however, I want to state my strong support for the development of organic standards for aquaculture. Aquaculture is a rapidly growing industry in the United States and worldwide and now supplies close to a third of all fish (both finfish and shellfish) consumed by humans. (The remainder comes from capture fisheries.) Given that the NOSB is developing organic standards for meat and poultry production, the NOSB should not ignore production of farmed fish. Both farmers and consumers would benefit considerably from the development of organic standards for fish farming.

The NOSB should restrict or ban the use of fishmeal in feeds for farmed fish and other animals

Aquaculture is often promoted as a means to produce more fish. However, in practice the opposite is often true. Aquaculture often results in a net loss of fish protein in large part because fishmeal, and sometimes fish oil, are major components of aquaculture feeds. Many forms of aquaculture require two to five pounds of wild caught fish, in the form of fishmeal and fish oil, to produce one pound of wild caught fish.

For example, fishmeal and fish oil are a necessary component of feeds for carnivorous farmed fish such as salmon, which typically consume feeds containing 45% fishmeal and 25% fish oil (Tacon, 1997). These two ingredients supply essential amino acids (e.g. lysine and methionine) that are deficient in plant-proteins and fatty acids (eicosapentanoic acid (EPA) and decosahexanoic acid (DHA)) that are not present in vegetable oils (De Silva and Anderson, 1996). Fishmeal and fish oil are also an important energy source, since fish in general are poor at using carbohydrates for energy (De Silva and Anderson, 1996).

Herbivorous, omnivorous, and carnivorous finfish all require about the same quantity of dietary protein per unit weight or protein gain. However, herbivorous and omnivorous freshwater finfish such as tilapia are much better able to utilize plant-based proteins and oils than carnivorous finfish such as salmon, and require only small quantities of fishmeal to supply essential amino acids (De Silva & Anderson, 1996). Nevertheless, compounds feeds for herbivorous fish such as tilapia often contain about fifteen percent fishmeal – more than is needed for rapid growth. Manufacturers over-formulate feeds as nutritionally complete diets, because there is insufficient information on the dietary requirements of these species.

Aquaculture now uses about a quarter of the world's annual fishmeal production, and use of fishmeal by aquaculture is increasing every year as the aquaculture industry grows and intensifies. Most of the rest of the world's fishmeal production is used in animal feeds, especially for poultry and swine. However, there are important differences between the use of fishmeal to feed farmed fish and terrestrial animals. While many farmed fish require fishmeal in their diets and many aquaculture feeds contain 30-50%

fishmeal, swine and poultry do not require fishmeal in their diets and swine and poultry feeds typically contain only a couple percent fishmeal.

Fishmeal and fish oil for animal feeds is made from small pelagic fish, such as pilchards, anchoveta, herring, and jack mackerel (see Table 1), with the by far the largest harvests coming from Chile and Peru. Close to one third of the world's total fish catch each year – roughly 30 million metric tons of fish -- is now used for the production of fishmeal and fish oil. Harvests from most of the fisheries used to produce fishmeal and fish oil cannot continue to grow, as the fisheries are considered fully exploited or in some cases depleted or overfished.

Although the impact of the huge removal of small fish from the ocean to make fishmeal and fish oil has been little studied, it is reasonable to believe that it results in less food being available for more marine predators, including valuable predatory fish that comprise most fisheries directed at human consumption. For example, in Europe, overfishing is blamed for crashes of North Sea capelin and herring fisheries, and may have resulted in the loss of other wild fish stocks, such as cod, as well as in starvation of seals and seabird chicks. It is reasonable to conclude that continued rapid growth of the aquaculture industry will likely come at a major cost to marine biodiversity – at least if the aquaculture industry is built upon the farming of those fish species that have high levels of fishmeal and fish oil in their diets.

Organic agriculture is supposed to be a production system that promotes biodiversity and biological cycles, and minimizes the use of off farm inputs. Farming fish that depend on diets largely composed of fish caught halfway round the world, and sometimes form overexploited stocks, does not appear to me to fit the definition of organic agriculture. While it may be justifiable to allow low levels of fish products in animal diets as a nutritional supplement – at least if the fishmeal and fish oil are derived from processing wastes -- it certainly does not make sense for the NOSB to sanction a from of agriculture based on heavy use of wild caught fish. I urge that the NOSB greatly restrict the use of fish products in the diets of farmed fish and other animals. Alternatively, the NOSB could entirely ban use of fishmeal and fish oil in animal diets, because the NOSB decides that wild caught fish cannot be considered organic.

The NOSB should only allow netcages for fish farming if netcage operators institute nutrient management plans that recycle nutrients

Virtually all farmed salmon and in some places other fish are now raised in netcages – literally nets placed directly into bodies of water and stocked with fish. Wastes and uneaten feed from the cages flow directly into surrounding bodies of water. The major approach to managing nutrient pollution from netcages is to site the cages in areas with strong currents. In other words, netcage managers typically take a very old-fashioned and now discredited approach to management of pollutants – that dilution is the solution. As a result, many environmentalists in salmon farming countries are fighting the expansion of netcage aquaculture.

Defenders of netcages sometimes compare them to raising grazing animals in pastures. Afterall, if it is acceptable for an animal to defecate on land, why shouldn't it be acceptable for finfish to defecate in the water? However, there are important differences between netcage farming and raising animals in pastures. For one thing, dilution of wastes is much less effective in a pasture than in strong ocean currents. Thus, compared to fish in netcages, animal densities in pastures are more self-limiting. Moreover, finfish raised in netcages generally depend entirely on introduced feeds, while animals in pastures typically depend on plants growing in the pasture for much of their nutrition. Thus, animals grazing in pastures largely recycle local nutrients, while finfish in netcages excrete nutrients imported to the area.

Given the emphasis of organic agriculture in maintaining natural balances, organic farmers should only be able to farm finfish in netcages if they take responsibility for removing the quantity of nutrients that they introduce. This can be accomplished by farming seaweeds or filter-feeding mollusks near netcages – although there are few, if any, commercial farms that now employ such practices. I urge that organic certification for netcage farms be limited to those with credible plans for recycling and removing the nutrients that they introduce.

References:

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Table 1. Catches of major species used for fishmeal and fish oil production and their state of exploitation.

Stock	Main fishing countries	Catches – 1000's metric tons					State of exploitation
		1990	1991	1992	1993	1994	
Anchoveta	Peru, Chile	3772	4017	5489	8300	11897	F-O
Sardina (pilchard)	Peru, Chile	4254	4190	3042	1624	1793	F-O
Jack Mackerel	Chile	3828	3954	3372	3348	4255	M-F
Atlantic herring	Norway, Denmark, Sweden, *Finland, *UK,*Iceland, *Netherlands	1222	1122	1266	1327	1643	F-D
Sandeels	Denmark, Norway, UK, Scotland, *Faroe Is	754	1021	1066	745	1037	F
Capelin	Iceland, Norway, Faroe Is, Greenland*, Russian Fed*	796	1206	2083	1693	882	F-D
Blue whiting	Norway, Russian Fed, *Faroe Is Spain, Denmark, *Lithuania	575	433	465	538	487	M-F
Atlantic horse mackerel	Netherlands ,Norway, Ireland, Denmark, *Spain	435	402	456	535	464	M
Norway pout	Norway, Denmark, Faeroe Is.	296	303	453	324	291	M-F
Sprat	Denmark, Sweden, Poland	191	254	269	367	562	M
Gulf Menhaden	USA	520	551	433	552	767	F

M = moderately utilized , F = fully utilized; O = overexploited; D = depleted; R = recovering from overexploitation
All data from FAO Circular 920 (1997) except * data from IFOMA 1998