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Soy products and aquaculture are a winning combination

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A market for over six million metric tons of soybean meal has been successfully created over the past 15 years through the development, field testing, and demonstration of all-plant protein, soymeal-based feeds to fish farmers in China. Opening this market to alternative feeds has helped boost China's freshwater aquaculture production from less than five million metric tons to more than 20 million metric tons (5.5 to 22.0 million US tons) by alleviating the necessity for traditional animal protein sources, such as fish meal, in most freshwater fish diets. In the process, it has helped the Chinese aquaculture industry advance from traditional manure-fertilized to modern, feed-based production of the majority of carp, tilapia, catfish and other freshwater fish species farmed in China. This new approach to feed has provided domestic and international consumers with ready access to higher quality farmed

seafood from China at reasonable prices, while providing a growing market for US grown soybean products.

Soy products can make up 50 percent or more of the feeds for the carp and tilapia species that comprise nearly two-thirds of the freshwater aquaculture production in China. As an example, a recent pond feeding trial conducted by the American Soybean Association International Marketing program from 2006 through 2008, demonstrated that a 60 percent soy product, all-plant protein feed for grass carp yielded up to 65 percent higher production and up to 500 percent greater profit when compared head to head with a traditional Chinese polyculture system that used a combination of feed and grass. A 55 percent soy diet for tilapia not only grows tilapia quickly and with a high feed conversion efficiency, but it provides a healthy 2:1 ratio of omega 6 to omega 3 fatty acids. Other studies have demonstrated that the typical 20 percent fish meal inclusion in fingerling feeds for carp and tilapia can be fully replaced with soy protein concentrate, further alleviating the demand on limited fish meal stocks. The soy-based feeds additionally blend soy and fish oils to reduce dependence on fish oil stocks.

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Marine fish and shrimp producers worldwide are also gaining knowledge from research conducted by the US soybean industry. Currently, research is underway to boost soy product inclusion in the diets of key marine fish and shrimp cultured in Asia, Europe, the Middle East, Latin America, and the U.S. A recent study in which soybean meal and soy protein concentrate replaced all but 10 percent of the fish meal in a test diet was successfully demonstrated with pompano

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farmed in open ocean cages in southern China. Studies in Spain have demonstrated that the protein contribution from fish meal can be reduced to as low as 15 percent in the diet of gilthead sea bream with properly formulated soy feeds, and to 40 percent with European sea bass. A high omega-3 fatty acid soy oil is being tested as a fish oil replacement for yellowtail cultured in open ocean cages in Hawaii. New soy-based diets for white shrimp also have been developed and are being demonstrated throughout Latin America and Asia.

Collectively these studies are reducing the requirement for fish meal and fish oil in aquaculture feeds and helping to reduce aquaculture's environmental impact, and increase industry sustainability. For additional information on soy use in aquaculture, see www.soyaqua.org.

Pompano Trachinotus blochii (photo below) grew from 25g to 610g in 146 days on a diet in which soybean meal and soy protein concentrate were the primary protein sources, and in which fishmeal inclusion was reduced to 10 percent of the diet (ASA-IM feeding trial, Hainan Island, China 2007).



Pangasius (photo right) catfish grew from 0.1g to 880g in 181 days on soy-based, all-plant protein feeds with an feed conversion ratio (FCR) of 1.2kg feed to 1.0kg fish gain.

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A three-year pond feeding trial (2006-2008) in China demonstrated that a 60 percent soy product, all-plant protein feed for grass carp yielded up to 65 percent higher production and up to 500 percent greater profit when compared head-to-head with a traditional Chinese polyculture system that used a combination of feed and grass, while simultaneously reducing the environmental impact by 50 percent or more.