

## Soy in Aquaculture Efforts Increase Sustainability and Profitability of Fastest Growing Animal Ag Sector

Commodity Exported: Soybean meal, Soybeans, Soy Protein Concentrate  
Region/Country: China, Latin America, Asia, Europe  
Program year in which success was achieved: 2008  
Export volume: 5 million metric tons

The U.S. soybean check-off program helped create a market for over 180 million bushels of soybean meal over the past decade and a half through the development, field testing and demonstration of all-plant protein, soybean-based feeds to fish farmers in China. This helped boost China freshwater aquaculture production from less than 5 metric tons (mmt) to more than 20 mmt by alleviating the necessity for traditional animal protein sources, such as fishmeal, in most freshwater fish diets. In the process, it helped the China aquaculture industry advance from traditional manure-based to modern, feed-based production of the majority of carp, tilapia, catfish and other freshwater fish species. This provided both domestic and international consumers with ready access to higher quality aquatic products at reasonable prices, while providing a growing market for soybean products.

Soy products can make up 50% or more of the feeds for the carp and tilapia species that comprise nearly two-thirds of the freshwater aquaculture production in China. A recent three-year pond feeding trial (2006-2008) conducted by ASA-IM and FAS, together with Chinese partner institutions, demonstrated that a 60% soy product, all-plant protein feed for grass carp yielded up to 65% higher production and up to 500% 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% or more. Other ASA-IM China feeding trials demonstrated that a 55% 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 and omega 3 fatty acids. Another series of feeding trials conducted during 2006 to 2008 demonstrated that the typical 20% fishmeal inclusion in fingerling feeds for carp and tilapia can be fully replaced with soy protein concentrate (SPC), further alleviating the demand on limited fishmeal stocks. The soy-based feeds additionally blend soy and fish oils to reduce dependence on distressed fish oil stocks.

Marine fish and shrimp producers worldwide are gaining from research conducted by the U.S. soybean industry. 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 diet in which soybean meal and soy protein concentrate replaced all but 10% of the fishmeal was successfully demonstrated with pompano in offshore ocean cages in southern China in 2006 to 2008. Studies in Spain in 2007 and 2008 demonstrated that the protein contribution from fishmeal can be reduced to as low as 15% in the diet of gilthead sea bream with properly formulated soy feeds, and to 40% with European sea bass. A high omega-3 fatty acid soy oil is currently being tested as a fish oil replacement for yellowtail cultured in offshore cages in Hawaii. New soy-based diets for white shrimp 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 improve food safety for consumers, reduce aquaculture's environmental impact, and increase industry sustainability. For additional information on soy use in aquaculture, see [www.soyaqu.org](http://www.soyaqu.org).

