

SHARING AQUACULTURE SUCCESS

With the highly successful program that began in China, efforts have been expanded to growing aquaculture industries in India, Vietnam, Indonesia, the Philippines, Latin America and the Middle East. By offering aquafeed mills and local fish farmers a wide range of support and technical assistance, incorporation of high-quality and nutritionally balanced soy-based feeds are being rapidly adopted in these regions. In India, for example, rohu carp that were fed diets of 46 percent to 52 percent soymeal in their rations produced more than three times the yield achieved by using traditional methods. In Vietnam, red drum cultured in soy-fed cages had an 85 percent better growth rate than red drum fed trash fish.

LOOKING FORWARD

Soybean farmers can look forward to increased demand of soybean meal inclusion through aquaculture. With the worldwide population expected to grow by 2 billion people by 2025 and continued emphasis on the nutritional benefits of consuming fish, the aquaculture industry is going to need a protein source that is renewable and one that can make them profitable. Soybean products are proving a powerful solution to those challenges.

UNITED STATES AQUACULTURE SOLUTIONS

Currently, the aquaculture industry in the United States has restrictions on fish culture in open ocean waters and the American Soybean Association is supporting legislation to establish a regulatory framework for offshore ocean aquaculture in the United States.

- ❑ The U.S. is the world's third largest consumer of seafood with over 70 percent imported. This has created the largest U.S. trade deficit of any agricultural commodity.
- ❑ Soy-based aquaculture may not erase the seafood trade deficit anytime soon, but some timely answers to U.S. aquaculture challenges can be found in U.S. soybean fields.



LEARN MORE

For more information about U.S. soybeans in global aquaculture, please visit www.soyaqua.org or contact us at:

U.S. Soybean Export Council

12125 Woodcrest Executive Drive, Ste. 140

St. Louis, MO 63141 USA

314-985-0988 / 800-408-4993

www.ussoyexports.org

The activities of the U.S. Soybean Export Council to expand international markets for U.S. soybeans and soy products are made possible by producer checkoff dollars invested by the United Soybean Board and various State Soybean Councils, support from cooperating industry, and through the American Soybean Association's investment of cost-share funding provided by USDA's Foreign Agricultural Service.



U.S. SOY INDUSTRY EMPOWERS GLOBAL **AQUACULTURE** Trends

WORLD SEAFOOD DEMAND INCREASING

“Fish and soy” is a phrase not as common to our vocabulary as “fish and chips,” but that may soon change thanks to a global aquaculture research and marketing program spearheaded by the U.S. soybean industry.

Health conscious consumers and a growing global population are driving up demand for fish and seafood products.

These products are getting increased recognition for their healthy dietary qualities and consumption is expected to increase by nearly 50 percent by 2050 as a result.

However, because the oceans now meet only about 60 percent of the global demand for fish products, aquaculture is being called upon to close the gap between wild caught supplies and increasing demand. That results in unexpected pressure on ocean habitats and dramatic increases in cultured fish farming.





U.S.-led research and feeding demonstrations are under way to learn the most efficient and effective inclusion rates of soy protein in fish diets.

AQUACULTURE BRINGS “ECO” CHALLENGES

Traditional methods of feeding cultured fish often deliver sub-optimal output and are not always environmentally friendly. This presents an interesting combination of ecological and economic challenges.

Ecological challenges are a serious concern with some types of aquaculture production.

- ❑ For example, “trash fish”—small ocean fish not used for human consumption—are a common food in the culture of several popular fish species in certain countries.
- ❑ Removing those small fish from the ocean food chain is not well-researched in terms of impact, but the practice is raising questions among environmental groups. Most marine fish species can be easily converted from trash fish to aquafeeds.

While nutritional requirements of most domestic livestock species are well understood and easy to link to economic output, with aquaculture there is relatively little dietary knowledge to help optimize production.

In some world areas, producers routinely use manure to produce natural food organisms that cultured fish can eat, which is cheap but not environmentally friendly or optimized for maximum output. Also, “manure-produced” fish doesn’t have nearly the same sort of down-stream consumer appeal as “corn-fed” or “grass-fed” beef.

As a result of these and other challenges, the aquaculture industry is looking for ways to meet the demand for high protein diets. Soybeans are an excellent solution to nutritional challenges of aquaculture production and are resulting in numerous success stories, but application of new soy-based feed technologies is still an emerging science.

Because many aquaculture fish species have large differences in nutritional requirements, extensive U.S.-led research and feeding demonstrations are under way to learn the most efficient and effective inclusion rates of soy protein in fish diets. Freshwater carp feeds, for example, can have soy meal inclusion rates of 50 percent or more, but salmon, with higher protein and lipid requirements, are presently restricted to an average 10 percent soy meal inclusion rate.

More than 175 feeding demonstrations have been conducted under U.S. soybean industry international marketing programs on numerous fish species since research and feeding trials began in the early 1990's. But with many more species yet to be studied, progress has only begun on the growing opportunity to use soy products in fish diets.

U.S. SOY MARKETING AND RESEARCH DELIVERS AQUACULTURE ADVANCES

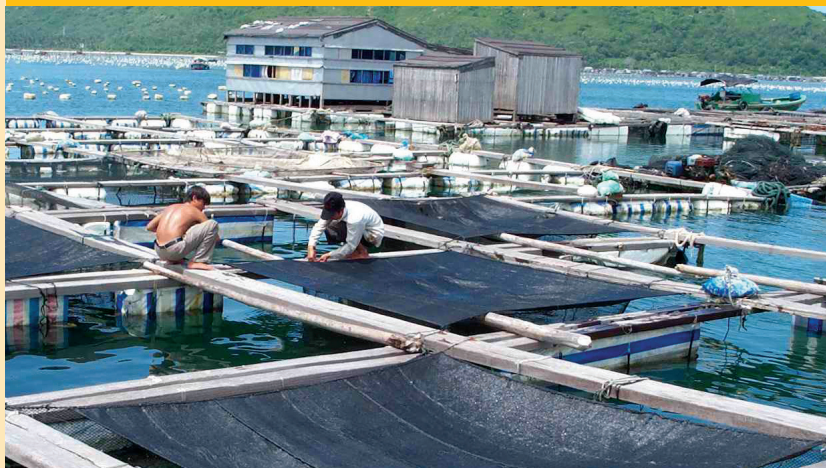
Ever since 1992 when feeding demonstrations and studies on soy-based fish feed first started in China, the U.S. soybean industry has been making great strides in researching the most effective and efficient way to introduce soy feeds into the global aquaculture industry. **There is a long list of reasons why soy-based feeds are a sustainable solution to the growing need for more protein in fish diets, but quality and availability are two reasons that top the list.**

- ❑ Soybean meal can be considerably less expensive and more consistent in quality than feeds made from traditionally used fish meal.
- ❑ The amino acid complex of soybean meal meets the nutritional needs for the majority of freshwater fish species, is highly digestible, and promotes rapid fish growth with high feed conversion efficiency.
- ❑ A renewable plant protein ingredient, abundant soybean meal supplies are a renewable resource that can be tailored to demand, including being processed to a protein concentrate that shows significant promise for use in high value marine fish diets.



Soybean meal is an excellent solution to aquaculture nutrition needs.

AQUACULTURE INNOVATION IN CHINA



Technologies focusing on pond and cage production of fish were rapidly adopted in China after earning support from the government.

Fifteen years ago when the U.S. soybean industry first began intensive research on incorporating soy in fish diets, China was an ideal place to start. China not only has the largest population with over 1.2 billion people, but also produces over 70 percent of the world's aquaculture products. At the time research on soy-based feed began in China, there was very little feed use by the aquaculture industry and no soybean meal use at all. **Today, China's aquaculture industry consumes over 185 million bushels of soybeans a year for use in fish diets.**

This immense growth in soy-based feeds in the aquaculture industry was the result of U.S. soybean farmers, working through the combined efforts of the American Soybean Association, the U.S. Soybean Export Council, the USDA Foreign Agricultural Service and the soybean checkoff, forging new frontiers for their products. Technical experts developed new aquaculture technologies that would enhance and encourage the use of soy-based feeds for fish production in both freshwater and ocean waters.

Examples of these technologies include the 80:20 Pond Technology; the Low-Volume, High-Density (LVHD) Cage Technology; and the Ocean Cage Aquaculture Technology (OCAT).

The technology showing the most potential for expansion is the Ocean Cage Aquaculture Technology. These cages, which are placed 2.5 miles off the coast of China, are designed to allow fish production offshore in clean waters unaffected by industrial pollution and excessive numbers of fish farms. A new prototype cage design has been developed to withstand ocean storm conditions and presents an exciting new opportunity for the aquaculture industry.