Introduction

Tilapia are produced in developing countries by some of the world’s poorest farmers. This fish is a key contributor to global food security as an international trade standard 31% crude protein diet can produce a significant cost savings in feeds with no appreciable effect on growth performance and yield of tilapia raised in ponds. The ability to produce pelleted fishmeal-free aquafeeds can not only promote an additional cost savings in feed manufacturing held in two regions of Central Luzon, Philippines. Participants were highly receptive to this mode of disseminating information, which included podcasts translated into the local language.

Feeding Strategies

One way to reduce total feed costs for tilapia is by decreasing the amount of feed used for grow-out of marketable fish. AquaFish researchers in the Philippines tested the growout performance of tilapia fed at varying fractions of a normal daily ration (100% daily): 67% daily feeding; 50% daily feeding and 100% alternate day feeding. Six separate farms found that feeding at 50% sub-saturation was as effective at producing tilapia of similar gross yield as fish grown on full ration (100% daily) feedings. Furthermore, a combined feed reduction strategy that incorporates elements of two or more of the different rations proved to be less effective than the 67% feeding rate used alone. Despite similar growth rates, the survivorship of fish and final yield was reduced when using combined feed reduction strategies.

Alternative Feeds

In a pond trial in the Philippines, AquaFish researchers demonstrated that eliminating fishmeal from a standard 31% crude protein diet can produce a significant cost savings in feeds with no appreciable effect on growth performance and yield of tilapia raised in ponds. A cost-return analysis shows that incorporation of a fishmeal-free diet resulted in an 8% feed-cost savings (almost US$100) per hectare, above the > 50% savings seen with an alternate day feeding protocol. The ability to produce pelleted fishmeal-free aquafeeds that are of comparable performance as extruded feeds can not only promote an additional cost savings in feed of 3-7%, but would allow manufacturers who lack costly extruders to expand to production of aquafeeds.

Smallholder Impacts

The outcomes of these investigations have been disseminated to stakeholders using a variety of outreach methods including workshops, symposia, and internet-based podcasts focused on improving local capacity for farming tilapia. Efforts to utilize accessible, low-cost innovative technologies in outreach have been received positively by end users. Combining these technological advances with a proven capacity building strategy, AquaFish has provided a means for farmers to more effectively grow tilapia, ultimately improving nutrition for consumers and generating income for a pathway out of poverty.

Supply Chain Assesment

AquaFish researchers from Central Luzon State University in the Philippines partnered with researchers from North Carolina State University to profile the supply chain for tilapia markets and address concerns of members in the supply chain. They provided the following recommendations:

1. Establish nurseries with high quality brood stock and increase technology transfer to farmers for better health management of tilapia;
2. Conduct market promotion activities highlighting the various niche opportunities for tilapia growers;
3. Motivate small farmers to participate in supply chains by setting up an incentive scheme;
4. Create an accreditation program for feed manufacturers, hatcheries and processors to improve quality assurance;
5. Provide capital to improve facilities and reduce logistics/transaction costs.

Outreach

Podcasting is an internet-based communication method that is increasing in popularity. Podcasts can be distributed at practically no cost to end users worldwide, and applications of this technology as a means of communication are growing. In 2009, the AquaFish CRSP produced and uploaded the first Tilapia Podcast at North Carolina State University (NCSU). Interest in the podcast has been excellent with 285 downloads and 444 hits on the NCSU iTunes server over a 2-month period, indicating they are an effective tool for disseminating tilapia culture technologies worldwide.

Acknowledgements

The authors would like to acknowledge and thank the following for their contributions to this project:

- USAID-funded Feed the Future Innovation Lab for Collaborative Research on Aquaculture & Fisheries (formerly the Aquaculture & Fisheries Collaborative Research Support Program) - AquaFish (CRSP) is funded under USAID Leader with Associates Cooperative Agreement No. 2012-560000713.44 and by the participating USA and Host Country partners.