

17TH INTERNATIONAL SYMPOSIUM ON FISH NUTRITION AND FEEDING

The 17th International Symposium on Fish Nutrition and Feeding (ISFNF), hosted by the University of Idaho, was held 6-10 June 2016 at the Sun Valley Resort in Ketchum, Idaho. The biannual conference attracted over 340 scientists and industry experts from 35 countries and has only been held in the USA once before, in College Station, Texas, in 1996. Previous symposia were held in Australia (2014), Norway (2012), China (2010), Brazil (2008) and France (2006). The ISFNF conferences are overseen by an international scientific committee, currently chaired by Dr. Marisol Izquierdo from Gran Canaria, Spain (see photo), with an *ad hoc* local organizing committee responsible for each individual conference.

Fish nutrition research is dominated by the need to develop low fishmeal and fish oil feeds for commercial production. As is well known, demand for seafood is expected to double by 2030 and this demand can only be filled by increased aquaculture production. This requires a doubling of fish feed production at a time when annual global production of the primary ingredients in fish feeds (fishmeal and fish oil) has declined, resulting in sustained high prices for both ingredients. Global supplies of fishmeal and fish oil are already fully utilized, mainly by the fish feed industry. Alternate sources of protein and oil have long been used in fish feeds, but the challenge now is to increase their levels in feeds well beyond historical inclusion levels while maintaining fish growth and health, producing healthy products for consumers and limiting the effects of aquaculture production on aquatic environments.

Researchers have defined the nutritional requirements for some species, notably salmonids and catfish, and sufficient information on the effects of ingredient substitution on fish performance is available to formulate commercial feeds with low fishmeal and fish oil levels. However, for many other farmed fish species, notably marine species, nutritional requirements have not yet been established. Reducing fishmeal and oil in feeds for these species reduces fish growth performance and leads to increased disease losses and elevated feed conversion ratios, similar to past challenges faced by the salmon, trout and catfish industries. Investment in research is needed to overcome these challenges, and the marine aquaculture industry is benefiting from the pioneering fish nutrition research conducted by scientists working with salmonids and catfish.



A lighter moment at the 17th ISFNF.

The ISFNF is the leading international conference that brings together scientists and industry to exchange new research findings and stimulate new research to solve the issues facing the international fish feed industry. The symposium schedule was structured to provide ample opportunities for interactions between researchers and industry during breaks and events at the resort,

and in the nearby colorful town after hours.

During the event-filled, week-long conference, attendees heard 85 oral presentations and reviewed 125 poster presentations. International experts were invited to give lectures on future research priorities, from perspectives of the research community (Dr. Sachi Kaushik, INRA), from the fish feed industry (Jose Villalon, Skretting) and from a practicing fish nutritionist (Tim O'Keefe, United Soybean Board).

Duke University Professor John Rawls, an expert on fish gut microbiota, presented an invited lecture on recent findings from medical and animal research that demonstrate the crucial role of gut microbiota in the physiology, nutrition and health of animals, including fish. This research area has exploded with the development of high-throughput technologies that have replaced traditional culture techniques used for the past century to identify microorganisms in the gut and to explore how they interact with the host intestine to promote nutrient absorption, inhibit pathogens and drive metabolism of humans, animals, and now fish.

The conference was organized into several topic areas, including Feed Resources, Nutritional Modeling, Nutrition and Health, Nutrition and Product Quality, Nutritional Requirements, Nutrigenomics, Nutritional Physiology and Practical Applications of Nutritional Research. It is difficult to summarize the numerous research findings presented at the conference, but the topic sessions with the greatest number of submissions were Feed Resources and Nutrition and Health, reflecting their importance to the aquaculture industry.

A surprising number of presentations were made on the effects of feed additives on fish performance and intestinal health, suggesting a growing realization that gut health is the key to fish performance. This is not a new idea. Over 2500 years ago, Hippocrates stated that "all disease starts in the gut." He also stated

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that “Our food should be our medicine and our medicine should be our food.” It is becoming evident that substituting alternate protein ingredients for fishmeal affects more than the amino acid profile of the feed.

Presentations at the conference demonstrated that researchers are identifying other effects of ingredient substitution, the first step in developing high-performance feeds containing lower levels of fishmeal and oil. Conference presentations demonstrated that the path forward to sustainable fish feeds involves a convergence of scientific disciplines as well as application of high-throughput technologies that can identify changes in global gene expression, gut microbiota and metabolomics associated with use of alternative feed ingredients and targeted feed supplements.

The Sun Valley Resort proved to be a perfect venue for the ISFNF. Located in Idaho’s Rocky Mountains, the Sun Valley Resort was the first destination ski resort in the USA. Now it is a year-round resort offering an array of outdoor activities, including hiking, horseback or bicycle riding, and whitewater rafting. ISFNF attendees were given one afternoon off during the conference for recreation, followed by an outdoor cowboy barbecue. The excellent facilities combined with spectacular weather enabled attendees to experience the natural beauty and grandeur of the Mountain West of the USA.

— Ron Hardy, Director,
Aquaculture Research Institute, University of Idaho

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