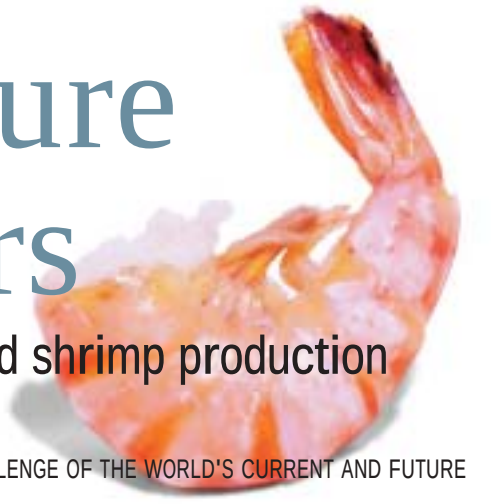
World aquaculture without frontiers

Development of feeding and nutrition in fish and shrimp production



AQUACULTURE IS THE SECTOR MOST LIKELY TO MEET THE CHALLENGE OF THE WORLD'S CURRENT AND FUTURE FOOD NEEDS. SUCCESS IN FEEDING THE WORLD NEEDS SUCCESSFUL FEEDING STRATEGIES. CHRISTIAN LÜCKSTÄDT EXPLORES SOME OF THE SOLUTIONS PRESENTED AT THIS YEAR'S WORLD AQUACULTURE SOCIETY'S ANNUAL MEETING HELD IN BALI.

Dr. Christian Lückstädt's background in fisheries and aquaculture stem from his upbringing in the fishing town of Rostock on the Baltic coast of Germany and continued right through to his PhD on the feed intake and utilisation of commercially raised juvenile milkfish in the Philippines, which he completed in 2004. Since 2003, Biomin Deutschland GmbH have benefited from his wealth of knowledge and experience, when joined as product manager.

The current situation of the world's food supply calls for supreme efforts to secure the increasing requirements of a growing world population for staple diets and high-quality food and to bridge the widening gap between food demand and supply, especially in developing areas. Setbacks in any food production sector place greater pressure on the other sectors to satisfy the needs of increasing urban and rural populations, particularly in less developed countries.

ASIAN AQUACULTURE BUOYANT

Around one billion people are dependent on fish as their main protein resource and this number is likely to increase further (Becker and Focken, 1998), since the world's population is increasing with an estimated annual growth rate of 2%. Aquaculture now provides more than 22% of consumable aquatic products (Guillaume *et al.*, 2001). Most of this aquaculture production occurs in developing countries, mainly in Asia. About 90% of finfish produced through aquaculture comes from tropical regions and fish has made larger percentage gains in human diets than other foods over the last four decades (Williams, 1997). During the last 20 years the share of farmed fish on total fish supply has increased tremendously. Between 1987 and 1996, aquaculture production of food fish increased by 148% (Tomasso and New, 1999), while livestock meat and fisheries have grown yearly only by 3% and 1.6% respectively. Fish farming or aquaculture is at present the only growing sector within the fishing industry and is moreover also reputed as the fastest growing food production sector in the world. Yearly growth rates of around 10% since the early 1980s were reported for the aquaculture sector, but it has increased much more rapidly in the developing world, due to the development in Asia. Because of this situation, global production of farmed fish and shellfish has more than doubled in volume and value in the past 15 years (Naylor et al., 2000) and the per capita fish supply increased, for instance in Asia, from 10.6 kg in 1984 to 17.9 kg in 1997 (Pedini, 2000).

Since Asia is the thriving region for aquaculture development, the World Aquaculture 2005 conference was held for the 4th time in the region, in Bali during a week in early May. More than 2000 scientists, farmers, feed millers and decision makers came together to discuss topics covering a wide range of subjects, ranging from marine finfish to freshwater prawns, from nutrition to health, from environmental concerns to product quality, and from producers to the work of NGO's in developing countries.

FEEDING FOCUS

A main focus was given to finfish and shrimp feeding and nutrition. Topics such as feeding frequency, feed intake, replacement of fish meal and fish oil as well as the use of feed additives were covered. Feed additives were again a major focus of the simultaneous trade show.

Against an often-assumed fact, Seo *et al.* (2005) showed for juvenile rockfish that feed efficiency decreased with increasing feeding frequency. On the other hand, Lückstädt *et al.* (2005) demonstrated using stomach content models, that feed is often not directly taken in by fish and therefore large amounts of feed are wasted – therefore it is necessary to monitor very carefully the feed intake of fish and adjust the feeding management accordingly.

A wide diversity of papers was delivered on the replace-

Most of the papers presented at the meeting will be made available on the website of the World Aquaculture Society: www.was.org

ment of fish meal (Allan and Booth, 2005) and fish oil in complete diets. Suontama and Olsen (2005) used krill and copepod oil in salmon diets and found that these zooplankton species can be used as alternative marine feed ingredients in carnivore aquaculture. Rapeseed oil also showed beneficial effects in Atlantic salmon culture, especially where low protein diets were used (Karalazos *et al*., 2005).

Feed additives were also discussed. Here, the use of acidifiers has proved beneficial in fish production. De Wet (2005) showed that a well balanced acidifier can be used at levels between 5–15 kg / t as replacement for antibiotic growth promoters in trout production, while Ramli *et al*. (2005) showed that organic acid salts can be an efficient tool to control bacterial infections in tilapia. In shrimp grow-out Massam (2005) found direct fed probiotics an effective tool to boost survival. Probiotics for shrimp were one of the main topics during the trade show, as well as the discussion on maintaining post-larval quality in shrimp aquaculture. <-

References are available from the author on request.