Deutscher Tropentag, October 9-11, 2002, Witzenhausen

"Challenges to Organic Farming and Sustainable Land Use in the Tropics and Subtropics"

Response of Dietary Phosphorus Concentration and Phytase Supplementation on Weight Gain and Phosphorus Utilisation in Gilthead Seabream (*Saprus aurata*)

Karen Güthler[1], Ingrid Lupatsch[2], George W. Kissil[2], Ernst Pfeffer[1]

[1] *University of Bonn, Department of Animal Nutrition, Germany*
[2] *National Center for Mariculture, Israel Oceanography & Limnological Research, Israel*

Abstract

In order to determine methods for maximizing growth in gilthead seabream and minimizing waste output of nutrients into the water at the same time, a series of growth experiments was carried out. Since phosphorus is largely responsible for water pollution, main targets in this study were the adjustment of dietary phosphorus and improving availability of phosphorus of plant origin by supplementing the diet with microbial phytase.

In two growth experiments with gilthead seabream the response to different levels of dietary phosphorus was examined. Each trial contained seven diets based on wheat gluten. Phosphorus sources were Dicalciumphosphate (DCP) in the first and Monocalciumphosphate (MCP) in the second trial.

Each diet was fed two times a day to triplicate groups of seabream containing 27 and 26 fish respectively. In the DCP experiment fish were fed to satiation and in the MCP experiment feed was restricted. This restriction took into account that fish fed to satiation consume less of a P-deficient diet than of diets sufficient in P. The restriction achieved that feeding intensity was the same in all groups referring to their body weights. After reaching three times the initial weight, fish were killed, homogenized and analysed.

Maximum phosphorus concentration in gain required 12.3 g DCP and 10.4 g MCP per kg diet. For maximum weight gain a concentration of 10.2 g DCP per kg diet was sufficient.

Utilization efficiency was determined at 67 % for DCP and 83 % for MCP.

To examine the possibility of improving phosphorus digestibility in seabream at diet based on rapeseed oilmeal was used. The diet comprised about 80 % rapeseed meal being the only phosphorus source in the diet. Phosphorus concentration was about 11 g per kg diet. This diet was fed with and without supplementation of 2000 FTU microbial phytase per kg diet to duplicate groups of seabream each. Digestibility was calculated using cromic oxide as a marker. Phosphorus digestibility of the control diet was determined to 50 %. With phytase supplementation phosphorus digestibility could improved up to 85 %.

Contact Address: Ernst Pfeffer, University of Bonn, Institute of Animal Nutrition, Bonn, Germany, e-mail: epfe@itz.uni-bonn.de