

The effect of vitamin-enriched rotifers on newly hatched and 15-d-old gilthead sea bream larvae (*Sparus aurata*)

M. M. Gonzalez, M. S. Izquierdo, M. Salh, C. M. Hernandez-Cruz, and H. Fernandez-Palacios

There is little information available about the vitamin requirements of marine larvae. The objective of this study was to examine the effect of vitamin-enriched rotifers on the growth performance and biochemical composition of gilthead sea bream larvae. Two trials were carried out respectively with 3 and 15-d-old larvae. Fish were fed with four batches of rotifers enriched with: (1) a mixture of fat-soluble vitamins, (2) a binder of water-soluble vitamins, (3) both fat and water soluble vitamins, and (4) control (enrichment). All the rotifers were given an oil emulsion to provide the necessary levels of essential fatty acids for the larvae. At both ages,

larval growth was significantly affected by the vitamin enrichment. Larvae fed with rotifers enriched with water-soluble vitamins had the best growth rate ($p < 0.05$); those fed with rotifers enriched with both kinds of vitamins had the poorest growth.

M. M. Gonzalez, M. S. Izquierdo, and M. Salh: Universidad de Las Palmas de Gran Canaria, Dpto. Biología, Tafira Baja, 35017, Las Palmas de G.C. (Las Palmas), Spain. C. M. Hernandez-Cruz and H. Fernandez-Palacios: Cabildo Insular de Gran Canaria, Instituto Canario de Ciencias Marinas, Apdo. 56, S-35200 Telde (Las Palmas), Spain.

Growth of (*Hippoglossus hippoglossus* L.) related to temperature, light period, and feeding regime

H. Hallaråker, A. Folkvord, K. Pittman, and S. O. Stefansson

We examined the growth potential of 0+ halibut at 7, 10, 13, and 16°C and the effects of continuous light versus natural photoperiod. The effects of two different feeding regimes were investigated and we also examined whether the smallest size grade had the same growth potential as the largest size grade (20 g initial weight). This experiment was used as a pseudoreplicate of the first temperature experiment. A total of 270 of the 320 juveniles in the temperature experiment were individually PIT tagged. In the light period and feeding regime experiments we used the smallest size grade (2.5 g initial

weight). The halibut grew best at 13°C and slowest at 7°C. The juveniles also grew better at 10°C than at 16°C. Daily growth rates over 3% were observed in the 13°C group. No significant differences in growth of survival were found in the light period or feeding regime experiments.

H. Hallaråker, A. Folkvord, K. Pittman, and S. O. Stefansson: Department of Fisheries and Marine Biology, University of Bergen, Bergen High Technology Centre, 5020 Bergen, Norway.

Diurnal variations in feeding incidence of halibut larvae (*Hippoglossus hippoglossus*)

T. Harboe and I. Huse

Halibut larvae at three different ages (0, 44, and 77 day degrees after first-feeding) were examined for feeding

incidence every second hour over a 32-h period. The larvae were reared in an outdoor system (natural light

*biochemical composition (FAA, protein, lipids), accurate energy budgets can be established. This communication describes quantitative metabolic conditions for developing eggs and larvae of gilthead sea bream (*Sparus aurata*) and sea bass (*Dicentrarchus labrax*). Moreover, the indicated energy substrates at the onset of first-feeding are discussed in relation to requirement*

at first-feeding. The study was supported by Norwegian Fisheries Research Council (NFFR) project V.110-011.

I. Rønnestad and H. J. Fyhn: Zoological Laboratory, University of Bergen, Allégt. 412, N-5007 Bergen, Norway. A. Tandler, M. Harel, and B. Koven: National Centre for Mariculture, Israel Oceanographic and Limnological Research, PO Box 1212, Eilat, 88112, Israel.