Survey on the use of natural food and supplemental feed in commercial milkfish farms on Panay, Philippines

Christian Lückstädt[1], Ulfert Focken[1], Relicardo Coloso[2] & Klaus Becker[1]
[1]Institute for Animal Production in the Tropics and Subtropics
Department of Animal Nutrition and Aquaculture
University of Hohenheim, 70593 Stuttgart, Germany
[2]Southeast Asian Fisheries Development Center
Aquaculture Department
5021 Tigbauan, Iloilo, Philippines
e-mail: wfish@uni-hohenheim.de; Fax: 0711-459 3702

The milkfish (*Chanos chanos* Forsskål) is the most important cultured fish species in the Philippines. In 1998, more than 156,000 t were produced here, mainly in brackishwater ponds. A significant part of this production is done semi-intensively in commercial fish farms of 1-30 ha total pond area. A culturing system is defined as semi-intensive if the natural food from the pond is enhanced by fertilization and/or supplemental feed is given. Local researchers from the Philippines suggest daily rates of supplemental feeding of up to 4% BME (body mass equivalent). However, investigations on the intake of supplemental feed and natural food by milkfish in experimental ponds showed that only a part of the supplemental feed was taken in directly by the fish. The present study aimed to find out the utilization of natural food and supplemental feed in commercial milkfish ponds.

Several pond monitorings were conducted on Panay Island, Philippines, in commercial milkfish farms using different culture methods, between 1996 and 1998. The individual size of the ponds ranged between 1.0 ha and 9.0 ha. Pond depth varied between 0.3 m and 0.7 m. Pelleted feeds were given only on a small-scale fish farm in Dumangas (1 ha pond area), where it was given in three equal rations at a total daily rate of 3.75% BME. No fertilizer was applied here. The other farm in Banate used a method involving regular transfer of fish (every 8 weeks) to larger ponds with well-developed natural food, as well as stocking of fish of

different sizes (total pond area 30 ha). This farm used fertilizer for the ponds prior to stocking the fish to enhance the growth of natural food. About 2,000 kg ha^{-1} chicken manure and 2,000 kg ha^{-1} pig manure were applied per production cycle (two cycles per year). The estimated production figures ranged from 1.2 t/ha/y in the small scale farm to 1.5 t/ha/y in the semi-intensively managed milkfish farm. Milkfish typically reach commercial size after 120 days.

To evaluate the actual feed intake, fish samples of up to five fish per hour were collected at regular intervals with a cast net over two to five days, after which period all hours of the day had been covered. The daily feed intake was estimated by microscopic and gravimetric analyses of stomach contents followed by non-linear regressions with the aid of the fish feeding model MAXIMS.
The MAXIMS analysis suggested that in the case of the small, intensive farm only around 22% of the feed given was taken in directly by the fish (0.82% BME), leading to a wastage of high quality fish feed and an apparently poor food conversion ratio of the compound feed (FCR=6.8 assuming 100% ingestion). Furthermore, the growth rate reached only 1.73 g/d. Faster growth of fish can be achieved even without supplemental feed; in the fertilized system, a growth rate of 2.36 g/d was calculated for fish feeding mainly on *lablab*, a cyanobacterial mat also containing diatoms and invertebrates.

In conclusion, these results may suggest a heavy reduction in or even the abandonment of the use of supplemental feed for milkfish, since growth rates of milkfish in ponds without any feeding are comparable to those of fed fish. Semi-intensive systems may achieve this aim; they are most likely also more economically efficient. Nevertheless, systems involving the shifting of stocks between ponds in the grow-out phase in order to use natural food more efficiently require greater land area and management skills and are therefore unsuitable for small-scale farmers.

KEYWORDS: milkfish, semi-intensive aquaculture, commercial fish ponds, feed intake