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The Use of Self-Feeders in Carp (*Cyprinus carpio*) Cultured Production

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SUMMARY

In aquaculture there is a need to better understand feeding rhythms in order to facilitate a good match between the timing of feed distribution and fish biological rhythms. Further, feeding the fish at the appropriate time may reduce feed wastage in aquaculture systems.

The aim of the present paper is to evaluate the use of self-feeders in carp culture production. The basic idea with self-feeders is that the fish themselves control the feeding level, which is thereby set by their feeding motivation. To determine the limitations of the technique this work has focused on characterizing: (1) how self-feeding activity is related to food demand and (2) how the self-service food supply is related to growth and feed conversion ratios.

For the feeding system to function correctly, carp must first learn how to operate it. Carp reared in cage in groups of 100 individuals require about 12 days reaching a stable level of self-feeding. Under large-scale rearing conditions (e.g. in cages with group sizes of 1000-2000 fish), however, learning seems to be of minor importance for the ability of fish to operate the system. When reared in small tanks in groups of up to about 300 fish, self-feeding activity in carp is strongly influenced by the development of dominance hierarchies. Under such situations, a small number of fish will dominate the activation of the trigger and thereby have a disproportionately greater influence on the food supply of the group as a whole.

Carp fed using the demand feeding technique and restricted rations had the best-feed conversion, with a mean value of 1.08 during the experiment (feed conversion=kg food supplied/kg weight gain). The feeding of carp using the unrestricted demand feeding technique resulted in a feed conversion of 1.29 and using restricted timer-controlled feeding it was 1.16.

The reward level (amount of food received in response to one trigger actuation) is the single most important factor requiring proper adjustment in order to optimize growth and feed conversion ratios when using self-feeding systems. High-density conditions reduce the self-feeding activity of carp, and the recommended maximum rearing density is about 30 kg m^{-3}. An evaluation of growth and feed conversion data indicates that self-feeders have the potential to function well with carp under commercial rearing conditions.

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