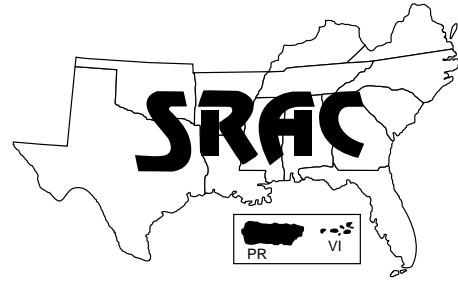


Southern Regional Aquaculture Center



March 1998

Feeding Practices for Baitfish

In the past, baitfish were primarily cultured by extensive or semi-intensive methods relying heavily on naturally occurring foods for nourishment. However, land and water resources are now more limited and intensification of baitfish production has become an economic necessity. The resultant high fish densities effectively reduce the availability of natural foods for individual fish. Thus, intensively cultured fish are generally fed prepared feeds to support maximum growth. In addition to serving as a direct food source for the fish, prepared feed may also act as a fertilizer to stimulate the growth of the pond's natural food (biota).

Naturally occurring foods

Phytoplankton and zooplankton are natural foods that are important sources of nourishment for baitfish. Adding organic and/or inorganic fertilizer leads to blooms of phytoplankton or zooplankton, thus enhancing the supply of natural food. Plankton also shades out aquatic weeds in the pond.

A pond can be seeded with plankton by pumping water from a nearby pond with a suitable bloom. However, the water must be carefully screened to prevent the transfer of fish, and water should not be transferred if fish in

The Southern Regional Aquaculture Center has supported a regional research project, "Improving Production Efficiency of Warm Water Aquaculture Species Through Nutrition," to investigate nutritional aspects that are most limiting in the production of baitfish. This publication was compiled by Wendy M. Sealey, James T. Davis, and Delbert M. Gailin III, based on research conducted by Auburn University and Texas A&M University.

the adjoining pond are infected with disease or parasites. The bloom should be abundant enough that a Secchi disk can be faintly seen at a depth of 10 inches. If the water begins to clear, more fertilizer should be added to the pond. Establishing and maintaining a bloom can sometimes be difficult as aquatic weeds use the nutrients in the pond and may prevent a bloom from developing. Blooms may also die off following cold or cloudy weather. Under these circumstances, fish become more dependent on prepared feeds for nourishment.

Prepared feeds

The use of prepared feeds can double the production of baitfish ponds, and fed fish have fewer parasitic infestations. The standard practice is to feed baitfish once daily. Golden shiners con-

sume just under 3 percent of their body weight per feeding when fed once daily. However, more frequent feedings will result in increased intake and potentially more rapid growth. Lower feeding rates may be used when fish are being maintained at a given size. It has been reported that golden shiners continue to consume large quantities of natural foods even when fed complete feeds.

Only recently have some of the nutritional requirements of the different baitfish species been established. Baitfish feeds in the past have been similar in composition to catfish feeds, and may not have supplied the necessary nutrients or may have supplied nutrients already provided by natural foods.



Figure 1. Golden shiners derive nourishment from natural foods as well as prepared foods.

Contribution of natural foods and prepared feeds

The relative contribution of natural foods and prepared feeds to the nutrition of intensively raised golden shiners was determined at the University of Arkansas, Pine Bluff (UAPB). Golden shiners obtained at least 40 percent of their nutrition from natural foods even when offered nutritionally complete diets. The consumption of natural foods by golden shiners was inversely related to the assimilation of the prepared feeds. When the feeds contained ingredients that were poorly utilized by the fish, natural foods supplied up to 83 percent of the fish's nourishment. Similar results were seen in a concurrent golden shiner study at UAPB and Texas A&M University (TAMU) which assessed the effects of stocking density on the relative contribution of natural and prepared foods. In that study there were large differences in natural food between sites, and fish with access to less natural food ate more of the prepared feed. These results suggest that it may be most economical to use a supplemental diet for baitfish.

Supplemental diets are not formulated to meet all of the nutritional requirements of the fish. These feeds typically contain lower levels of protein, vitamins, and other nutrients and are less expensive than complete feeds. The fish's nutritional needs are met through a combination of the supplemental feed and natural foods. Adding a vitamin/mineral supplement to an otherwise balanced feed does not improve the growth of golden shiners. Single feedstuffs such as cottonseed meal or rice bran also do not enhance the growth of baitfish in ponds as much as balanced feeds.

The protein and lipid dietary requirements of golden shiners and goldfish have recently been established along with the protein:energy ratio. By determining the nutrient and energy content of the natural foods and comparing this information with the fish's nutritional requirements, it should be possible to formulate properly balanced supplemental diets for baitfish. These feeds will adequately supplement the nutrients supplied by the natural foods and make maximum production possible.

Conclusions

The decision to feed baitfish supplemental or complete feeds must include a consideration of the quality and quantity of natural food available both seasonally and among ponds. The composition and abundance of plankton in the pond affects the fish's dependence on prepared feeds. In ponds that do not develop or maintain good plankton blooms during the production season, natural foods may not provide sufficient nourishment for the fish, making nutritionally complete feeds preferable to supplemental feeds. Supplemental or complete feeds may be used in a mixed feeding strategy according to the availability of natural food in the pond. However, this requires the skill to quickly and accurately assess the quality and quantity of natural foods available in the pond and to select the appropriate feed for the conditions of the pond.



Figure 2. Plankton blooms should be abundant enough that a Secchi disk can be faintly seen at a depth of 10 inches.

References

- Gray, D.L. 1988. Baitfish: feeds and feeding practices. Southern Regional Aquaculture Center publication, November 1988.
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