The Progressive Fish-Culturist 52:203–204, 1990

A Comparison of Second-Year Growth of Blue Catfish and Channel Catfish in Kentucky

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Abstract.—Second-year growths of blue catfish (*Ictalurus furcatus*) and channel catfish (*I. punctatus*) were compared in north-central Kentucky. Percent weight gain was significantly higher ($P < 0.05$) for blue catfish than for channel catfish. There were no significant differences ($P > 0.05$) in feed conversion or survival. Blue catfish showed more consistent growth and were easier to seine than were channel catfish. Blue catfish should be evaluated further in temperate regions.

Several attributes may make the blue catfish (*Ictalurus furcatus*) an attractive alternative to channel catfish (*I. punctatus*) for commercial culture as food fish in certain regions of the country. Optimum growing temperature for blue catfish is reported to be about 24°C, compared to 30°C for channel catfish (Collins 1988). Such moderate temperature requirements could extend the growing season of blue catfish in cooler regions of the USA (Huner 1988). Also, blue catfish have a higher dress-out percentage and are easier to seine than channel catfish (Chappell 1979). The aggressive nature of the blue catfish might be highly desirable in areas with large fee-fishing markets (such as Kentucky).

The blue catfish may be inferior to the channel catfish as a cultured species due to slower growth at sizes less than 1 lb and less efficient feed conversion (Huner and Dupree 1984). Several producers, however, have reported that blue catfish grow faster than channel catfish in the first year (Collins 1988). Chappell (1979) indicated that growth of the two species is similar in the first 2 years and that channel catfish perform slightly better. Dunham (1979) found that third-year blue catfish and channel catfish grew at the same rate during the winter. However, these studies were conducted in the Deep South (Alabama). Production of the two species has not been compared in cooler climates, such as Kentucky.

The objective of this study was to compare growth and feed conversion in blue catfish and channel catfish during the second growing season (fingerling to harvest size) in north-central Kentucky.

On 4 May 1987, blue catfish and channel catfish were stocked at a density of 6,175 fish/hectare into triplicate 0.04-hectare earthen ponds (six ponds total; Table 1). Ponds were about 1.5 m deep and supplied with water from a reservoir filled by runoff; water levels were maintained by periodic additions to replace evaporation. Water temperature and dissolved oxygen (DO; model 54A oxygen meter, Yellow Springs Instruments Co.) were monitored twice daily at a depth of 0.5 m. Ponds were aerated if DO levels were predicted to reach 3.0 mg/L or less during the night. Fish were fed in midafternoon with a commercial floating feed (32% crude protein) at 3% of body weight daily. Feed amounts were adjusted every 2 weeks based upon an assumed feed conversion (amount fed/weight gain) of 1.5. Periodic fish samples were not taken because blue catfish do not tolerate handling and harvest well (Collins 1988), especially at high temperatures, and sampling causes channel catfish to stop feeding (Lovell 1989). Fish were harvested on 9 October 1987 (culture period, 156 d). All fish were counted and total harvest weights were recorded for each pond.

Student's t-tests ($P = 0.05$) were used for two-mean comparisons of stocking weight, harvest weight, percent weight gain, weight of feed offered, feed conversion, and percent survival (Dowdy and Wearden 1983). Percentage data were transformed (arcsine) before analysis (Steel and Torrie 1980).

Morning DO averaged 6.7 mg/L, and afternoon DO 8.2 mg/L. Average monthly afternoon water temperatures ranged from a high of 26°C in July to a low of 20°C in October. The overall mean for the culture period was 24°C, the temperature reported to be optimum for blue catfish (Collins 1988).

There was a significant difference ($P < 0.05$) in stocking weight for the two species (Table 1), but no significant difference ($P > 0.05$) in harvest weight, feed conversion, or survival. Survival was low (75%) in one channel catfish replicate due to

TABLE 1.—Performance of blue catfish and channel catfish cultured for 156 d during second-year growth. Values are means (SEs) for three replicate ponds. An asterisk indicates that the two means within a column are significantly different (Student's t-test, $P \leq 0.05$).

Species	Stocking weight (g)	Harvest weight (g)	Weight gain[a] (%)	Feed conversion[b]	Survival (%)
Blue catfish	85.8 (0.3)*	594.6 (5.2)	593.3 (4.7)*	1.3 (0.1)	99.3 (1.2)
Channel catfish	98.8 (3.2)	577.5 (55.5)	485.8 (74.3)	1.7 (0.5)	89.7 (13.5)

[a] Percent increase from stocking to harvest.
[b] Feed conversion = amount fed/weight gain of fish.

an infestation of *Ambiphrya* sp. (which explains the large SE for survival in Table 1). The elevated feed conversion for channel catfish (1.7) may have resulted from overfeeding in this pond. Feed conversion for blue catfish (1.3) was somewhat better than the 1.5 reported by Chappell (1979). Percent weight gain was significantly greater for blue catfish than for channel catfish ($P < 0.05$). Blue catfish averaged a 593.3% gain, whereas channel catfish averaged 485.8%. Chappell (1979) reported larger weight gains, but stocked smaller fingerlings and cultured fish for 208 d.

Growth of blue catfish in replicate ponds was consistent compared to that of channel catfish, as demonstrated by the low SEs for ponds containing blue catfish (Table 1). Blue catfish were also more easily seined, as observed by Chappell (1979). The three ponds of blue catfish in this study yielded 100%, 100%, and 99% of the fish on the first seine haul.

Chappell (1979) found that blue catfish and channel catfish demonstrated similar second-year growth in Alabama and that channel catfish were slightly larger at harvest. Our study in Kentucky found significantly faster second-year growth of blue catfish. The overall mean temperature during the study period (24°C) was the reported optimum for blue catfish (Collins 1988). Chappell (1979) did not report mean water temperatures for comparison, but did remark that water temperatures were unusually high at the July sampling, suggesting that temperatures were closer to the optimum for channel catfish.

The blue catfish warrants further examination as a cultured species, especially in regions with temperate climates, large pay markets, and single-season production systems, for which size consistency is important.

Acknowledgments.—We thank Julia Clark, Keith Crabtree, Richard Knaub, Eddie Reed, Jr., Karla Richardson, and Danny Yancey for assistance. This investigation was supported by a grant from the U.S. Department of Agriculture, Cooperative State Research Service, to Kentucky State University under agreement KYX-1283000009.

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