

A COMPARISON OF THE FOOD INTAKE OF MALE AND FEMALE CHANNEL CATFISH (*ICTALURUS PUNCTATUS*)

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ABSTRACT.—A study was conducted to determine the relationship between food intake and sex of yearling channel catfish. The work was conducted in cages and involved the evaluation of the response of 494 fish. No significant difference was found to exist between the amount of food consumed and the sex of the fish.

A problem associated with the intense culture of fish is variation in growth. This has been partly attributed to sexual differences (Albaugh, 1969 and Heidinger, 1970). Beaver et al. (1966) attributed greater growth of male channel catfish, as compared to females, to a sex-linked genetic characteristic that gave males an advantage either through aggressive feeding behavior or through efficiency of food conversion. To date, the relationship between ration consumed and sex of channel catfish had not been investigated.

MATERIALS AND METHODS

To investigate the feeding response of male and female channel catfish an experiment, utilizing cage culture techniques, was initiated during the summer of 1970. Yearling channel catfish, with a mean weight of 29.3 g, were utilized in the study. The experiment was conducted in an earthen pond of the Cooperative Fisheries Research Laboratory located at Southern Illinois University. This research pond has an area of 0.06 ha and a depth of 1.25 m. The pond received a flush of approximately 75 liters of water per minute obtained from a 32 ha city reservoir.

Nine cages of a cylindrical design were used in the study. Cages were 0.61 m in diameter and 1.22 m in depth and were constructed of 16-gauge welded wire with a mesh size

of 1.27 x 2.54 cm; they were treated with a tar compound to avoid zinc toxicity. A 25.4 cm strip of aluminum screen wire was installed at water line to prevent food from floating out of the cages. Tops and bottoms of the cages consisted of exterior plywood 1.9 cm thick. When floated by styrofoam blocks, each cage contained approximately 0.27 m³ of water.

Nine cages were stocked with channel catfish on June 19 at a rate of 222.2 fish per m³. The suggested rate of stocking for channel catfish is 196.2-261.6 fish per m³ (Lewis, 1969). Fish were cultured in cages from June 19 to July 14, 1970, a period of 26 days. This time was necessary to acclimate the fish to cage conditions and to establish the feeding response of the catfish. Food used in the study was a floating food for trout (Purina Trout Chow) containing a crude protein content of not less than 40.0 per cent and measuring 6.0 mm in size. The ration for fish in each cage was weighed and transferred to labeled containers for distribution to the respective cages. Fish were fed daily at twilight an amount of food equal to three per cent of their body weight.

After a 20 minute feeding period on the final day of the experiment, the fish were killed and removed from the cages, sealed in airtight containers and immediately frozen.

The length of storage prior to laboratory analysis was two weeks.

Fish were thawed for analysis, weighed to the nearest gram, and sexed. The contents of the gut anterior to the pyloric sphincter were removed, and the fish weighed again. Food was placed in pre-weighed dishes and oven-dried at 100°C for 24 hours or until a constant weight was obtained. Contents were then weighed to the nearest 0.0001 g. Per cent body weight was then calculated using dry weight of food and wet weight of fish.

Data were programmed using the multiple regression approach (Kelly et al., 1969) and were submitted to the Southern Illinois University Data Processing and Computer Center for analysis. Statistical procedures used in the study followed Edwards (1960).

RESULTS AND DISCUSSION

A total of 494 fish were examined; of these, 53.8 per cent were males compared to 46.2 per cent females. The greatest ration consumed by a fish was equivalent to 4.1 per cent

of its body weight. Only three fish examined contained no measurable amount of food.

The mean food intakes of male and female channel catfish within the nine experimental cages were compared (Table 1). No significant difference ($P=.05$) was found to exist between the rations consumed by males compared to females. Beaver et al. (1966) concluded that a sex-linked genetic characteristic gave male channel catfish an advantage either through efficiency of food conversion or through aggressive feeding behavior. Data gathered from the current study showed that, at least for yearling channel catfish, sexual difference had no relationship to ration consumed. In comparing the food intake of male and female bluegill sunfish (*Lepomis macrochirus*) Heidinger (1970) found no significant difference in per cent stomach contents between sexes. Differences in growth were attributed to quality of food or to a decrease in efficiency in digestion or assimilation of food by female sunfish.

TABLE 1. Comparison of mean food intakes, expressed as per cent of body weight, of yearling male and female channel catfish cultured in cages.¹

Cage	Male			Female			t-value for Males vs. Females
	Number of Individuals	Mean	SD	Number of Individuals	Mean	SD	
1	27	0.8	0.59	19	0.7	0.42	0.620 n.s. ²
2	30	1.3	0.68	25	1.0	0.73	1.547 n.s.
3	28	1.5	0.68	27	1.6	0.66	-0.543 n.s.
4	32	0.6	0.38	24	0.7	0.38	-0.957 n.s.
5	30	0.5	0.39	24	0.6	0.49	0.820 n.s.
6	32	1.3	0.60	25	1.6	0.77	-1.623 n.s.
7	33	1.6	0.83	24	1.5	0.77	0.455 n.s.
8	24	2.0	0.76	34	2.2	0.68	1.032 n.s.
9	30	2.3	0.86	26	1.9	0.86	1.635 n.s.

¹Food intakes based on dry weight of food divided by wet weight of fish and multiplied by 100.

²n.s. = no significant difference at the .05 level of probability.

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