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ALL-MALE POPULATION OF CHANNEL CATFISH WAS PRODUCED AFTER FEEDING HORMONE

The culture of all-male channel catfish (*Ictalurus punctatus*) populations could have a significant effect on commercial operations. In ponds stocked with mixed sexes, male channel catfish grow faster than females. Average weights of channel catfish in all-male ponds are 10% higher than in mixed sex ponds and 15% higher than in all-female ponds.

The use of steroid hormones to produce monosex populations has proven to be an effective method for increasing yield in several other species of fish. Administration of sex steroids to fry overrides the natural sex determining mechanism. Generally in fish, androgens produce males and estrogens produce females. However, production of all-male channel catfish populations by treatment with steroid hormones has been unsuccessful until now. Recent research at the Southeastern Fish Cultural Laboratory has shown that channel catfish fry fed a diet containing trenbolone acetate (Finaplix, Hoechst-Roussel Agri-Vet Co.) for 60 days produces all phenotypic males. Trenbolone acetate is a synthetic anabolic androgenic steroid hormone approved by the U.S. Food and Drug Administration for use as a growth promoter in beef cattle.

Channel catfish were stocked in 100-L tanks at a density of 300 sac fry per experimental unit and fed either 0, 50, 100 or 150 mg of trenbolone acetate/kg of feed for 60 days. Swim-up fry in three replicates for each treatment were fed to satiation four times per day. After 60 days, fish were fed a

control diet twice a day until they reached 15 to 20 cm in total length. At this time fish were weighed, measured, and sexed.

Treatment of sexually undifferentiated channel catfish fry with 50, 100, or 150 mg of trenbolone acetate/kg of feed for 60 days produced 100% males (Table 1). No differences ($P > 0.05$) from the expected sex ratio of 1:1 were found for the control diet. The mean weight and survival of fish treated with 50 mg of trenbolone acetate did not differ from the control (Table 2). Fish that received doses of 100 or 150 mg of trenbolone acetate had significantly lower total weight of fish per tank than the control or 50 mg diets. Average weight and survival of the fish fed the higher doses was lower but not statistically different from that of the control.

All-male populations of channel catfish can be produced by feeding diets with at least 50 mg of trenbolone acetate per kg of diet. Current research is evaluating how long to feed the diets and the effective dose of trenbolone acetate. Additional research is needed to determine the mechanism of gonadal differentiation in channel catfish.

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Table 1. Number and percentage of male and female channel catfish (*Ictalurus punctatus*) fingerlings produced in diets containing 0, 50, 100 or 150 mg of trenbolone acetate (TBA) per kg.

Treatment	Males (average %)	Females (average %)
Control	45.1	54.9
TBA-50	100 ^{**}	0
TBA-100	100 ^{**}	0
TBA-150	100 ^{**}	0

^{**}Significant different ($P < 0.01$) from a 1:1 sex ratio.

Table 2. Mean ($\pm$ standard deviation) weight, total weight, and percent survival of channel catfish (*Ictalurus punctatus*) swim-up fry fed trenbolone acetate (TBA) at 0, 50, 100 or 150 mg/kg of diet for 60 days. Means in a column not sharing a letter are significantly different ($P < 0.05$).

Treatment	Weight (g)	Total Weight (g)	Survival (%)
Control	7.25 $\pm$ 0.53 a	2037.1 $\pm$ 185.8 a	91.7 $\pm$ 6.6 a
TBA-50	7.35 $\pm$ 0.69 a	2039.9 $\pm$ 34.7 a	90.3 $\pm$ 7.0 a
TBA-100	5.92 $\pm$ 1.06 a	1594.2 $\pm$ 214.3 b	85.3 $\pm$ 12.7 a
TBA-150	5.53 $\pm$ 1.40 a	1336.0 $\pm$ 116.5 b	75.7 $\pm$ 11.2 a