AQUACULTURE

FEEDING MANAGEMENT FOR MARKET-SIZE HYBRID CATFISH

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HARVEST DELAYS OFTEN OCCUR WHEN THERE IS OFF-FLAVOR, OVER-SUPPLY OF FISH IN THE MARKET, OR LOW FISH PRICES. HARVEST DELAYS CAN BECOME A SERIOUS ISSUE FOR HYBRID CATFISH, SINCE THEY FEED MORE AGGRESSIVELY AND GROW FASTER THAN CHANNEL CATFISH.

Circumstances such as off-flavor, oversupply of fish in the market, or low fish prices, can cause delays in harvesting market-size fish in catfish production. Harvest delays increase the risk of fish losses and restricts cash flow resulting in diminished production efficiency. In addition, large fish exceeding optimal harvest size begin to convert feed less efficiently and, more importantly will decrease in value if they exceed a specified size limit. Harvest delays can become a serious issue, especially for hybrid catfish, since they feed more aggressively and grow faster than channel catfish. Proper feeding management to maintain fish size is needed to minimize economic losses associated with harvest delays. A preliminary study conducted at DREC/NWAC shows the weight of market-size hybrid catfish can be held relatively constant by feeding to satiation once weekly. However, the effects of complete feed restriction and the effects of re-feeding after feed restriction on hybrid production and processing characteristics are not known. As a continuation of this work, a pond study was conducted to evaluate effects of no feeding, maintenance feeding, and refeeding on weight gain and processing yield of market-size hybrid catfish.

Market-size hybrid catfish (average weight = 1.42 lb) were stocked into 20 experimental ponds (0.1 ac) at 8,520 lb/ac (approximately 6,000 fish per ac). Fish were not fed or fed once weekly to satiation to simulate a long-term harvest delay, which were compared with fish fed daily to satiation. A commercial 28% protein feed was used. After two months, half the ponds in each feed restriction treatment were harvested, and fish in the remaining ponds were fed daily for one month and then harvested. After two months, weight gain, percent visceral fat, carcass yield and fillet yield were compared. Fish not fed for two months lost 14.3% body weight, compared to a 6.7% weight gain for fish fed weekly. Fish not fed or fed once weekly had reduced visceral fat and fillet yield compared with fish fed daily. There were no statistical differences in percent visceral fat and fillet yield between fish not fed or fed once weekly. The unfed fish had statistically higher carcass yield than fish fed daily or once a week. This is likely caused by the metabolism of energy reserves during starvation which initially results in a loss of visceral fat and liver followed by a loss in muscle. Since head, bones, and skin remain relatively constant during the initial stages of starvation, there is little change in carcass yield.

At the end of three months (after all fish were fed daily for one month), the average fish size in each

Feeding regimen	Feed fed (lb/ac)	Net yield (lb/ac)	Weight gain (%)	Feed conversion	Carcass yield (%)	Fillet yield (%)	Visceral fat (%)
Not fed for 2 mos	–	-1,297 b	-14.3 b	–	67.9 a	31.8 b	3.3 b
1×/wk for 2 mos	1,433 b	439 a	6.7 a	2.70	66.6 b	31.1 b	3.6 b
7×/wk for 2 mos	8,455 a	NH[2]	NH	–	67.1 b	33.3 a	6.1 a
Not fed for 2 mos + 7×/wk for 1 mo	8,194 z	3,215 z	38.9 z	2.51 yz	67.2	33.3	4.6 z
1×/wk for 2 mos + 7×/wk for 1 mo	9,230 z	3,253 z	40.0 z	2.71 y	66.7	33.1	4.6 z
7×/wk for 3 mos	14,296 y	5,811 y	70.4 y	2.38 z	66.9	33.8	6.2 y

[1]Initial weight was 1.42 lb/fish; carcass yield, fillet yield, and visceral fat of initial samples were 68.5%, 33.4%, and 3.8%, respectively.
[2]Not harvested.

Table 1: *Production and processing characteristics of hybrid catfish[1] on various feeding schedules. Means in each column and each section followed by different letter were significantly differerent. ($P \leq 0.05$)*

treatment was 2.42 lb for fish fed daily, 1.99 lb for fish fed once weekly, and 1.97 lb for fish withheld from feed for the first two months. There were no statistical differences in weight gain, net yield, carcass yield, fillet yield, or percent visceral fat whether fish were previously not fed or fed once weekly. Fish fed daily for three months had statistically higher weight gain, visceral fat, and marginally higher fillet yield ($P = 0.08$). Feeding once weekly for two months followed by one-month full feeding resulted in statistically higher feed conversion ratio (FCR) than fish fed daily for three months. No feeding for two months followed by one-month full feeding led to an intermediate FCR, which was not significantly different from the other two feeding regimens. The higher FCR observed may be due to a relatively higher proportion of the ingested feed being used for maintenance during the first two months and for tissue recovery during refeeding. There were no statistical differences in observed mortalities among feeding regimens.

Results from this study show feeding once weekly can generally maintain fish body weight. No feeding or feeding once weekly for two months does not affect survival but significantly reduces fillet yield. After one month of full feeding there were no differences in production and processing characteristics whether fish were previously not fed or fed once weekly. One month of full feeding following no feeding or maintenance feeding improves fillet yield relative to values before refeeding.