

Channel Catfish Fry to Fingerling Growth Performance in Anhui with Soymeal-Based Feeds

Results of ASA/China 2000 Feeding Trial 35-00-109

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ABSTRACT

A feeding demonstration trial was conducted at the Jiao Gang Hu Fish Farm in Huainan, Anhui Province, to demonstrate fry to fingerling growth performance of channel catfish using the ASA 80:20 pond production model and soymeal-based fry and fingerling feeds. Fish were stocked in three, 3-mu ponds at a densities of 8,000 channel catfish fry and 1,000 silver carp fry per mu. Channel catfish grew from 1.6 g to an average of 49.3 g per fish in 101 days of feeding. Gross production averaged 353.5 kg/mu for channel catfish and 50.1 kg/mu for silver carp. Average survival rates for channel catfish and silver carp were 89.4% and 81.5%, respectively. Channel catfish FCR for the combination of ASA 41/11 fry and 36/7 fingerling feeds was 0.93:1. Average net economic return was RMB 5,665/mu per mu, and average ROI was 110.7%. Channel catfish exhibited good growth, feed conversion, survival and economic return with the ASA 80:20 pond technology and soymeal-based feeds. Compared to normal production of channel catfish at the Jiao Gang Hu Fish Farm, fish survival was reported to have increased by 25-30%, FCR was reduced by 100%, and ROI was increased by >60% with the ASA technologies and feeds.

INTRODUCTION

The American Soybean Association (ASA), in cooperation with the China National Fisheries Extension Center (NEC), the Anhui Provincial Fisheries Extension Center, and the Jiao Gang Hu Fish Farm in Huainan, conducted a 3.4-month demonstration feeding trial with channel catfish. The objective of the trial was to demonstrate channel catfish growth and economic performance from fry to fingerling stages with soymeal-based aquafeeds and the ASA 80:20 pond production model.

MATERIALS AND METHODS

Three ponds of size 3.0-mu each at the Jiao Gang Hu Fish Farm in Huainan, Anhui Province, were used for the feeding trial. Pond water depth averaged approximately 1.5 m. All ponds were equipped with water exchange and stand-by aeration.

Fish were advanced fry stage channel catfish and “summer flower” stage silver carp produced by the Jiao Gang Hu Fish Farm. Advanced stage channel catfish fry were cultured at the Jiao Gang Hu farm using ASAS hatchery production techniques and the ASA 52/16 high protein starter feed. Fish were stocked in the three trial ponds in July 2000 at densities of 8,000 channel catfish fry per mu and 1,000 silver carp fry per mu. Fish were in good health and of uniform size and age at stocking.

Channel catfish fry were fed the ASA 41/11 fry feed in crumble form from pond stocking to fish size 1.5-2.0 g (Table 1). At size 1.5-2.0 g, channel catfish were weaned to the ASA 36/7 fingerling feed in extruded, floating pellet form (Table 1). Fish feeding rate and frequency varied with fish size and water temperature following ASA guidelines.

Trial management was based on the ASA 80:20 pond production model. Fish in all ponds were sampled once per month on the same date each month. At the conclusion of the trial, all ponds were drained and the channel catfish and silver carp in each pond counted and weighed to determine average fish weight, gross and net production, feed conversion ratio (FCR) and survival. Production input costs were monitored throughout the trial and used to calculate net income and ROI at the end of the trial.

RESULTS

Channel catfish were fed a total of 101 days between 15 July and 23 October 2000. The catfish grew from 1.67 g to an average weight of 49.3 g during this feeding period (Figure 1; Table 2). Gross production averaged 353.5 kg/mu for channel catfish and 50.1 kg/mu for silver carp (Table 2). Net production averaged 340.2 kg/mu for channel catfish and 49.3 kg/mu for silver carp (Table 2). The ratio of fed channel catfish to filtering silver carp at harvest was 87:13. Average channel catfish and silver carp survival rates were 89.4% and 81.5%, respectively. Average FCR with the combination of ASA 41/11 fry and 36/7 fingerling feeds was 0.93:1.

Net economic return for the demonstration trial was RMB 5,665 per mu at market prices of RMB 30/kg for channel catfish and RMB 3.60/kg for silver carp (Table 2). ROI averaged 110.7% for the three trial ponds (Table 2).

SUMMARY AND CONCLUSIONS

Channel catfish exhibited good growth, FCR, survival and economic return when cultured using the ASA 80:20 pond production model and the soymeal-based ASA feeds. Compared to normal production of channel catfish at the Jiao Gang Hu Fish Farm, fish survival was reported to have increased by 25-30%, FCR was reduced by 100%, and ROI was increased by >60%.

The 87:13 ratio of fed channel catfish to filtering silver carp at harvest indicated a low level of natural productivity for silver carp foraging in the trial ponds. Trial data records also indicate a high level of pond water flushing in all months of the trial. It is recommended that the management of Jiao Gang Hu Farm significantly reduce the amount of water flushing and take

advantage of the nutrient inputs from feed and fish wastes to produce additional silver carp biomass.

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Chinese Currency and Production Unit Conversions:

RMB 8.26 = US\$1.00

15 mu = 1.0 hectare (ha)

kg/mu x 15 = kg/ha

1.0 kg = 2.2 lb

6 mu = 1.0 acre (ac)

kg/mu x 13.2 = lb/ac

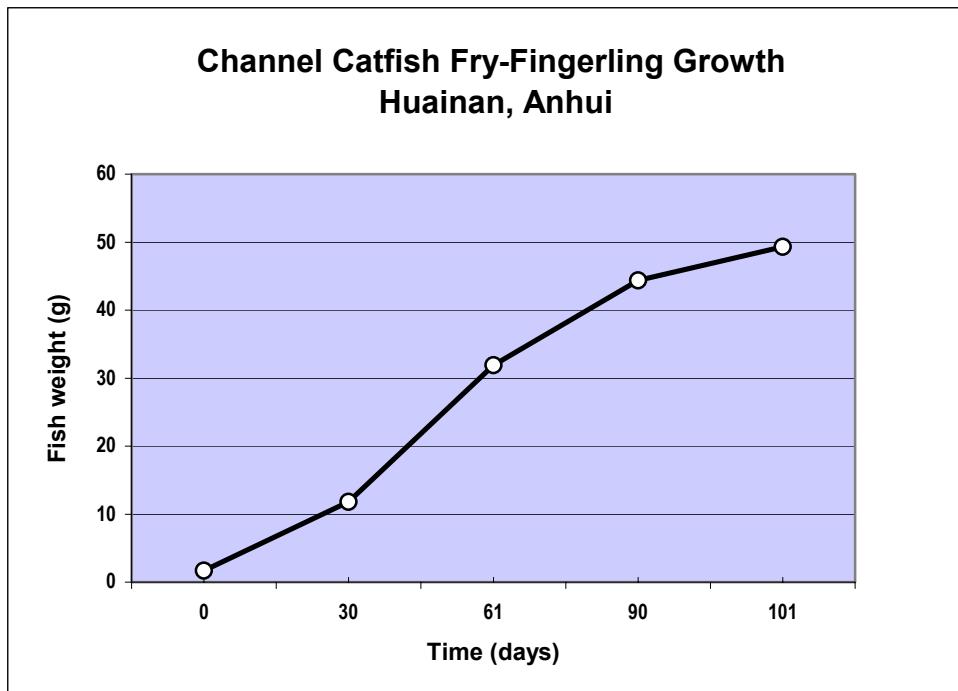


FIGURE 1. Growth curve for channel catfish from fry to fingerling stages for the 80:20 feeding demonstration trial conducted at Huainan, Anhui Province. Channel catfish grew from 1.7 g to 49.3 g in 101 days, with an FCR of 0.93:1, on a combination of soymeal-based ASA 41/11 fry and 36/7 fingerling feeds.

Table 1. Formulations for the soymeal-based ASA 41/11 fry and 36/7 fingerling feeds used in the 2000 channel catfish feeding demonstration trial conducted at the Jiao Gang Hu Fish Farm in Huainan, Anhui Province, China.¹

Ingredient	41/11 Fry Feed	36/7 Fingerling Feed
Soybean meal 47.5	46.30	46.30
Wheat, SWW	13.00	19.00
Wheat middlings	-----	8.00
Corn gluten meal 60%	15.00	10.00
Fishmeal, Anchovy 65/10	14.00	8.00
Fish oil	4.03	4.58
Soy oil	4.00	-----
Soy lecithin	1.50	1.50
Ca phosphate mono	1.70	2.20
Vit PMX Roche 2118	0.20	0.15
Min PMX F-1	0.25	0.25
Ethoxyquin	0.02	0.02
Total	100.00	100.00

¹The numerical component of the feed description refers to the percentage of protein and fat, respectively, in the ration, i.e. 32/6 indicates 32% crude protein and 6% crude fat.

TABLE 2. Results of the 2000 ASA aquaculture trial at the Jiao Gang Hu Fish Farm in Huainan, Anhui Province, that demonstrated fry to fingerling growth and economic performance of channel catfish using the ASA 80:20 production model and soymeal-based fry and fingerling feeds.

Pond No.	ChC ¹ stocking size (g)	Stocking rate (fish/mu)	No. days fed	Harvest wt. (g) ChC SiC ²	P _G ³ (kg/mu) ChC SiC	P _N ⁴ (kg/mu) ChC SiC	Survival (%) ChC SiC	FCR	Net (RMB/mu)	ROI (%)
1	1.67	8,000	101	54.6 35.2	399.3 46.7	386.0 45.9	91.4 83.0	0.81	7039.84	137.8
2	1.67	8,000	101	43.5 41.5	287.0 52.7	273.7 51.9	82.5 79.4	1.11	3664.37	71.4
3	1.67	8,000	101	49.7 38.7	374.3 50.9	361.0 50.1	94.2 82.1	0.97	6289.89	122.8
Mean	1.67	8,000	101	49.3 38.5	353.5 50.1	340.2 49.3	89.4 81.5	0.93	5664.70	110.7

¹ChC = Channel catfish

²SiC = Silver carp

³P_G = Gross Production

⁴P_N = Net Production