

Production of Longnose Catfish (*Leiocassis longirostris*) Fingerlings in Beijing Using the ASA 80:20 Pond Model and Soymeal-Based Feeds

Results of ASA/China 2001 Feeding Trial 35-01-108

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ABSTRACT

A feeding trial was conducted at the Xu Xing Zhuang Fish Culture Farm in Beijing to demonstrate fry to fingerling growth performance of longnose catfish (*Leiocassis longirostris*) using the ASA 80:20 pond production model and soymeal-based fry and fingerling feeds. Fish were stocked in three ponds of size 5.0-mu each at a density of 5,000 longnose catfish and 1,000 silver carp fry per mu. Catfish were fed a combination of soymeal-based 41/11 fry and 36/7 fingerling feeds. Longnose catfish grew from 0.8 g to an average weight of 45 g per fish in 110 days of feeding. Gross production averaged 186 kg/mu for longnose catfish and 70 kg/mu for silver carp. Average survival rates for longnose catfish and silver carp were 83% and 100%, respectively. Longnose catfish fed the combination of ASA soy-based feeds yielded an average FCR of 1.18:1. Average net economic return was RMB 1,921 per mu. Return on investment (ROI) averaged 33.6%. Longnose catfish exhibited good growth performance, FCR, survival and economic return in this trial, and are a promising pond culture species in feed-based production systems for the China freshwater aquaculture industry.

INTRODUCTION

The American Soybean Association (ASA), in cooperation with the Xu Xing Zhuang Fish Culture Farm, the Beijing Municipal Fisheries Extension Center and the China National Fisheries Extension Center (NEC), conducted a four-month feeding trial with longnose catfish (*Leiocassis longirostris*), a riverine catfish species native to China. The objective of the trial was to demonstrate longnose catfish growth and economic performance from fry to fingerling stages with soymeal-based fry and fingerling feeds and the ASA 80:20 pond production model.

MATERIALS AND METHODS

Three ponds of size 5.0-mu each at the Xu Xing Zhuang Fish Culture Farm in Beijing were used for the feeding trial. Water was supplied to the ponds from a deep well. Water depth in the ponds averaged approximately 1.2 m. All ponds were equipped with water exchange and stand-by aeration.

Fish were 0.8-g longnose catfish purchased by the Beijing Xu Xing Zhuang Fish Culture Farm. Catfish were stocked in the three trial ponds in June 2001 at a density of 5,000 fish per mu, together with 1,000 silver carp fry per mu. Fish in all three trial ponds were of uniform size and age at stocking.

Longnose catfish were fed a 41% crude protein, 11% crude fat (41/11) aquafeed in crumble form from the time of fish stocking in ponds until fish size 2.0 g (Table 1). At fish size >2.0 g, the catfish were fed the ASA 36% crude protein and 7% crude fat (36/7) fingerling feed in extruded, floating pellet form (Table 2). Both feeds were formulated by ASA and produced by Fwusow Group in their aquafeed mill in Xiamen, Fujian Province. Catfish were fed using the satiation feeding methodology, in which the 100% satiation rate was determined every 10 days and the feeding rate maintained at that rate for the following 10 days. Fish were fed twice daily, with the catfish in the three trial ponds being fed identically at each feeding.

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 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 recorded throughout the trial and net income and ROI were calculated at the end of the trial.

RESULTS

Longnose catfish were fed a total of 110 days between 25 June and 14 October 2001. Catfish grew from 0.8 g to an average weight of 45 g during this feeding period (Figure 1; Table 3). Gross production averaged 186.5 kg/mu (2,798 kg/ha) for longnose catfish and 69.6 kg/mu (1,044 kg/ha) for silver carp (Table 3). Average longnose catfish and silver carp survival rates were 83% and >100%, respectively. Average FCR for longnose catfish was 1.18:1.

Net economic return was RMB 1,921 per mu at a market price of RMB 40/kg for longnose catfish and RMB 2.5/kg for silver carp (Table 3). ROI averaged 33.6% for the three trial ponds (Table 3).

SUMMARY AND CONCLUSIONS

Longnose catfish exhibited good growth, FCR, survival and economic return in this demonstration feeding trial. The stocking density of 5,000 catfish per mu yielded gross production of less than 200 kg/mu, indicating that stocking density can be significantly increased without negatively impacting fish growth or pond water quality. It is recommended that follow-on trials evaluate longnose catfish growth and economic performance at stocking densities up to 10,000 fish per mu.

The trial cooperator reported that longnose catfish fry were difficult to establish on feed after stocking in ponds due to the high natural fertility of the ponds. While it is generally desirable to take advantage of the natural fertility of ponds as a means to reduce FCR and production costs, it is recommended that longnose catfish fry be trained on feed in hatchery tanks prior to stocking in ponds. This should improve overall fish performance and survival, as well as establish the fish

on commercial feed, before they are stocked in ponds. This, in turn, will simplify production management for this species.

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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

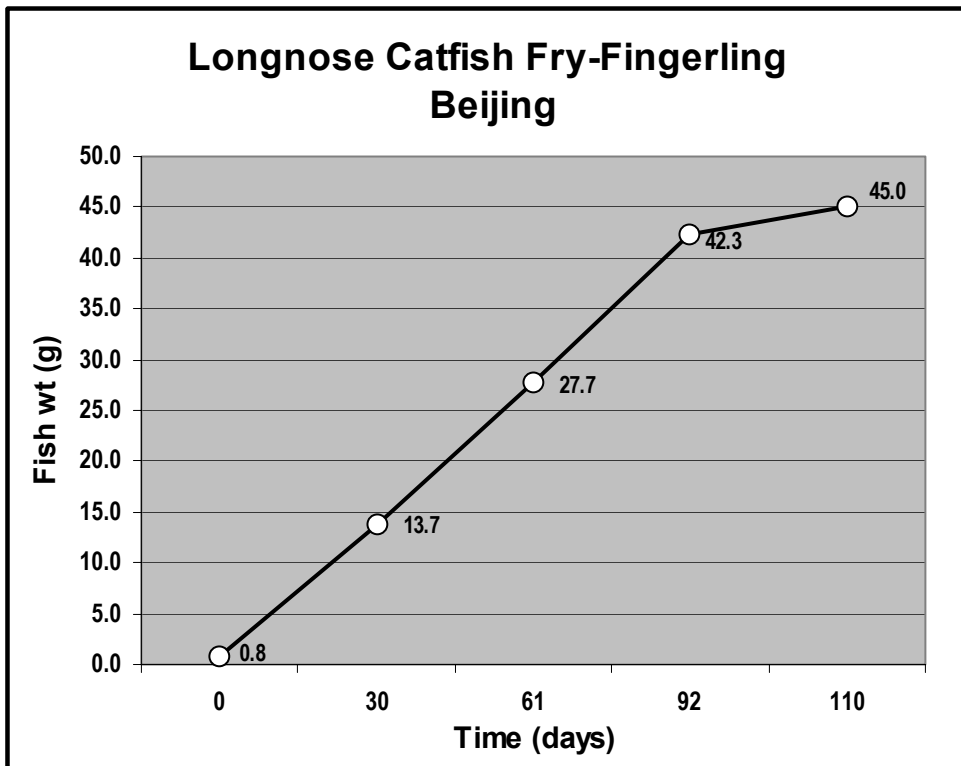


FIGURE 1. Growth curve for longnose catfish produced in Beijing in a 2001 fry to fingerling production trial using the ASA 80:20 pond production model and soy-based fry and fingerling feeds. Longnose catfish grew from 0.8 g to 45 g in 110 days, and show good promise as a pond culture species in feed-based production systems.

Table 1. Formula for the ASA 41/11, soymeal-based fry feed used in the 2001 longnose catfish demonstration feeding trial at the Xu Xing Zhuang Fish Culture Farm in Beijing, China. The feed was fed in crumble form to catfish from size 0.8 g to 2.0 g.

Ingredient	41/11 Fry Feed ¹
Soybean meal 47.5	46.3
Corn gluten meal 60%	15.0
Fishmeal, Anchovy 65/10	14.0
Wheat, SWW	13.0
Fish oil	4.03
Soy oil	4.00
Soy lecithin	1.50
Ca phosphate mono	1.70
Vit PMX Roche 2118	0.20
Min PMX F-1	0.25
Ethoxyquin	0.02
Total	100.00

¹The numerical component of the feed description refers to the percentage of protein and fat, respectively, in the ration, i.e. 41/11 indicates 41% crude protein and 11% crude fat.

Table 2. Formula for the ASA 36/7, soymeal-based fingerling feed used in the 2001 longnose catfish demonstration feeding trial at the Xu Xing Zhuang Fish Culture Farm in Beijing, China. The feed was fed in extruded, floating pellet form to fish 2.0 g and larger.

Ingredient	36/7 Fingerling Feed ¹
Soybean meal 47.5	46.3
Wheat, SWW	19.0
Corn gluten meal 60%	10.0
Fishmeal, Anchovy 65/10	8.0
Wheat midds 15%	8.0
Fish oil	4.58
Soy lecithin	1.50
Ca phosphate mono	2.20
Vit PMX Roche 2118	0.15
Min PMX F-1	0.25
Ethoxyquin	0.02
Total	100.00

¹The numerical component of the feed description refers to the percentage of protein and fat, respectively, in the ration, i.e. 36/7 indicates 36% crude protein and 7% crude fat.

TABLE 3. Results of the 2001 ASA aquaculture trial at the Xu Xing Zhuang Fish Culture Farm in Beijing that demonstrated fry to fingerling growth performance of longnose catfish using the ASA 80:20 pond production model and soymeal-based fry and fingerling aquafeeds.

Pond No.	LnC ¹ stocking size (g)	Stocking rate (fish/mu)	No. days fed	Harvest wt. (g)		P _G ³ (kg/mu)		Survival (%)		FCR	Net (RMB/mu)	ROI (%)
				LnC	SiC ²	LnC	SiC	LnC	SiC			
4	0.8	5,000	110	46	65	186.4	71.5	81	110	1.18	1,923	33.7
5	0.8	5,000	110	47	65	192.8	70.2	82	108	1.14	2,176	38.1
6	0.8	5,000	110	42	70	180.2	67.2	86	96	1.22	1,664	29.1
Mean	0.8	5,000	110	45	66.7	186.5	69.6	83	100+	1.18	1,921	33.6

¹LnC = Longnose Catfish

²SiC = Silver Carp

³P_G = Gross Production