

Channel Catfish Fingerling Production in Ponds with Soy-Based Feeds and 80:20 Pond Technology: Jiangxi Province

Results of ASA/China 2003 Feeding Trial 35-04-88

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ABSTRACT

A feeding demonstration was conducted in Anjie City, Jiangxi Province, to demonstrate fingerling production of channel catfish using the ASA 80:20 pond production model and ASA soymeal-based fry and fingerling feeds. Catfish were stocked in three, 2.0-mu ponds at a density of 8,000 channel catfish per mu (120,000/ha) and 1,000 silver carp per mu (15,000/ha). Channel catfish grew from 1 g to an average weight of 39 g per fish in 109 days of feeding. Gross production averaged 269 kg/mu (4,038 kg/ha) for channel catfish and 50 kg/mu (750 kg/ha) for silver carp. Average survival rates for channel catfish and silver carp were 86.8% and 76.4%, respectively. Channel catfish FCR with the soymeal-based fry and fingerling feeds averaged 0.96:1. Average net economic return was RMB 1,646 per mu, for an average return on investment of 62.3%. Channel catfish exhibited good growth, feeding behavior and FCR with the ASA soymeal-based feed and 80:20 production technology.

INTRODUCTION

The American Soybean Association (ASA), in cooperation with the Xiajiang County Fish Farm in Anjie City, Jiangxi, the Jiangxi Provincial Fisheries Extension Center, and the China National Fisheries Extension Center (NEC), conducted a pond feeding demonstration with channel catfish. The objective was to demonstrate channel catfish growth and economic performance from fry to fingerling stages with soy-maximized feeds and the ASA 80:20 pond production model.

MATERIALS AND METHODS

Three earthen ponds of size 2.0-mu each at the Xiajiang County Fish Farm in Anjie City, Jiangxi Province, were used for the feeding demonstration. Pond water depth averaged approximately 1.5 m. All ponds were equipped with water exchange and stand-by aeration.

Fish were 1-g channel produced at the Xiajiang County Fish Farm. Channel catfish were stocked in the three trial ponds at a density of 8,000 fish per mu (120,000/ha), together with 1,000 silver carp per mu (15,000/ha). Fish in all three trial ponds were of uniform size and age at stocking. Target fingerling size for the channel catfish was 50 g per fish.

Channel catfish were fed the ASA 41/11 soymeal-based fry feed in crumble form from fish size 1 g to an average fish size of 2-3 g (Table 1). At 2-3 g, the fish were weaned to the ASA 36/7 soymeal-maximized fingerling feed (Table 2). This feed was fed in extruded, floating pellet form. Channel catfish were weaned to the extruded 36/7 feed over a five-day period. Initial extruded feed pellet size was 1.5 mm. Feed pellet size was increased as the fish grew, with pellet size maintained at approximately one-half the full open mouth size of the fish. Fish were fed to satiation twice daily, with fish in the three replicate ponds receiving an identical amount of feed at each feeding. The feeds were formulated by ASA and produced by the Fwusow feed mill in Xiamen, Fujian Province

Trial management was based on the ASA 80:20 pond production model. Fish in all ponds were sampled once per month on approximately the same date each month. At the conclusion of the trial, all ponds were drained and the fish in each pond were 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 return on investment (ROI) were calculated at the end of the trial.

RESULTS

Channel catfish were fed a total of 109 days between 30 June and 16 October 2004. Channel catfish grew from 1 g to an average weight of 38.8 g during this feeding period (Table 3). Gross production averaged 269.2 kg/mu (4,038 kg/ha)¹ for channel catfish and 50 kg/mu (750 kg/ha) for silver carp (Table 3). Average channel catfish and silver carp

¹ Kg/mu x 15 = kg/ha

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survival rates were 86.8% and 76.4%, respectively. Average FCR for channel catfish with the soy-maximized fry and fingerling feeds was 0.96:1 (Table 3).

Net economic return averaged RMB 1,646 per mu (\$2,989/ha) at a market price of RMB 15/kg (\$1.81/kg)² for channel catfish fingerlings and RMB 5.0/kg (\$0.60/kg) for silver carp fingerlings (Table 3). ROI averaged 62.3% for the three trial ponds (Table 3).

SUMMARY AND CONCLUSIONS

Channel catfish fed aggressively and exhibited rapid growth and good feed conversion with the soymeal-maximized fry and fingerling feeds. Results indicate that stocking density in channel catfish fingerling ponds can be increased approximately 50% over the 8,000 fish per mu rate demonstrated in this feeding trial. Increasing stocking density should further improve economic return, while optimizing pond utilization. High local market value for channel catfish fingerlings yielded a high net income and high return on investment in this demonstration trial.

Channel catfish did not reach the producer's target size of 50 g. Producers will need to improve channel catfish spawning performance and have 1-g fish ready for stocking in fingerling production ponds by early June to produce 50-g fingerlings. The 39-g fingerlings produced in this trial should attain a market size of 600 g or more in 2005 with good quality feed and management.

ACKNOWLEDGEMENTS

ASA gratefully acknowledges the Xiajiang County Fish Farm, the Jiangxi Provincial Fisheries Extension Center, and the China National Fisheries Extension Center (NEC) for their assistance and support for this aquaculture trial.

² RMB 8.26 = \$1.00

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Table 1. Formula for the ASA 41/11¹, soymeal-based fry feed used in the 2004 channel catfish fry to fingerling feeding trial in Anjie City, Jiangxi Province, China. Fwusow/Xiamen feed mill produced the feed in crumble form.

Ingredient	Percent of total
Soybean Meal 47.5	46.3
Wheat, SWW	13.0
Corn Gluten Meal 60%	15.0
Fishmeal, Anchovy 65/10	13.5
Fish Oil, Unspec.	3.93
Soy Oil	4.0
Soy lecithin	1.5
Ca Phosphate Mono	1.7
Vit PMX F-2	0.75
Min PMX F-1	0.25
Stay C-35%	0.05
Ethoxyquin	0.02
TOTAL	100.00

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

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Table 2. Formula for the ASA 36/7¹, soymeal-based fingerling feed used in the 2004 channel catfish fry to fingerling feeding trial in Anjie City, Jiangxi Province, China. Fwusow/Xiamen feed mill produced the feed in extruded, floating pellet form.

Ingredient	Percent of total
Soybean Meal 47.5	46.0
Wheat, SWW	19.0
Corn Gluten Meal 60%	10.0
Wheat middlings	8.0
Fishmeal, Anchovy 65/10	8.0
Fish Oil, Unspec.	4.0
Ca Phosphate Mono	2.2
Soy lecithin	1.75
Vit PMX-F2	0.75
Min PMX F-1	0.25
Stay C-35%	0.03
Ethoxyquin	0.02
TOTAL	100.00

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

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Table 2. Results of the 2004 ASA aquaculture feeding demonstration in Jiangxi Province that demonstrated fry to fingerling pond growth 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)		P _G ³ (kg/mu)		Survival (%)		FCR	Net income (RMB/mu)	ROI (%)
				ChC	SiC ²	ChC	SiC	ChC	SiC			
1	1	8,000	109	38.9	72.5	279.6	55.1	89.8	76.0	0.93	1,814	68.3
2	1	8,000	109	37.5	54.2	263.1	47.4	87.8	87.5	1.00	1,522	57.2
3	1	8,000	109	40.0	72.2	265.0	47.5	82.7	65.8	0.95	1,602	61.4
Mean	1	8,000	109	38.8	66.3	269.2	50.0	86.8	76.4	0.96	1,646	62.3

¹ChC = Channel Catfish

²SiC = Silver Carp

³P_G = Gross Production