

Tilapia Production in Ponds with Soy-Based Feed

Results of ASA/China 2002 Feeding Trial 35-02-107

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ABSTRACT

A feeding trial was conducted in Taixing, Jiangsu Province, to demonstrate fingerling to market growth performance of GIFT tilapia using the ASA 80:20 pond production model and the ASA all-plant protein, soymeal-based growout feed. Fish were stocked in three, 5-mu ponds at a density of 1,000 tilapia and 100 silver carp per mu. Tilapia grew from 28 g to an average weight of 525 g per fish in 131 days of feeding. Gross production averaged 509 kg/mu for tilapia and 75 kg/mu for silver carp. Average survival rates for tilapia and silver carp were 97.5% and 98%, respectively. Average FCR for tilapia with the soy-based feed was 1.19:1. Feed cost per kilogram of fish weight gain was RMB 3.63. Net economic return was RMB 1,200 per mu. Average return on investment (ROI) was 36.4%. Tilapia demonstrated excellent growth performance, feed conversion efficiency and economic return with the ASA extruded, soymeal-based feed and 80:20 production technology in this trial.

INTRODUCTION

The American Soybean Association (ASA), in cooperation with Taixing Fish Stock Farm in Taixing, the Jiangsu Provincial Fisheries Extension Center, and the China National Fisheries Extension Center (NEC), conducted a pond feeding trial with hybrid tilapia. The objective of the trial was to demonstrate tilapia growth and economic performance from fingerling to market stages with the ASA 32/6 soymeal-based growout feed and the ASA 80:20 pond production model.

MATERIALS AND METHODS

Three ponds of average size 5.0-mu at the Taixing Fish Stock Farm in Taixing, Jiangsu 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 27.8-g GIFT (Philippine Genetically Improved Farmed Tilapia) hybrid tilapia fingerlings produced by the Taixing Fish Stock Farm. Tilapia were stocked in the three trial ponds in early June at a density of 1,000 per mu, together with 100 silver carp fingerlings per mu. Fish in all three trial ponds were of uniform size and age at stocking. Target market size for tilapia was 500 g per fish.

Tilapia were fed the ASA 32/6 soymeal-based growout feed in extruded, floating pellet form (Table 1). The feed was formulated by ASA and produced by Cargill in Jiangsu Province. Fish were fed to satiation twice daily, with fish in all three ponds 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 approximately the same date each month. At the conclusion of the trial, all ponds were drained and the tilapia 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

Tilapia were fed a total of 131 days between 4 June and 13 October 2002. Tilapia grew from 27.8 g to an average weight of 524.7 g during this feeding period (Figure 1; Table 2). Gross production averaged 508.7 kg/mu (7,630 kg/ha) for tilapia and 75 kg/mu (1,125 kg/ha) for silver carp (Table 2). Average tilapia and silver carp survival rates were 97.5% and 98%, respectively. Average FCR for tilapia with the 32/6 soymeal-based feed was 1.19:1. Average feed cost per kilogram of fish growth was RMB 3.63.

Net economic return averaged RMB 1,200.42 per mu at a market price of RMB 8.4/kg for tilapia and RMB 3.0/kg for silver carp (Table 2). ROI averaged 36.4% for the three trial ponds (Table 2).

SUMMARY AND CONCLUSIONS

Hybrid GIFT tilapia exhibited excellent growth (500 g net gain in 131 days) and FCR (1.19:1) with the ASA extruded, soy-based feed and 80:20 pond technology. The ASA feed maintained good water quality, and no pond water flushing was required. A low feed cost of RMB 3.63 per kilogram of fish growth with the ASA feed yielded a high economic return in this trial. The Taixing Fish Stock Farm reported that, through several years of aquaculture feeding trials with ASA, it has fully recognized the advantages of extruded, soy-based feeds for maintaining a high quality fish culture environment and yielding good economic return.

ACKNOWLEDGEMENTS

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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

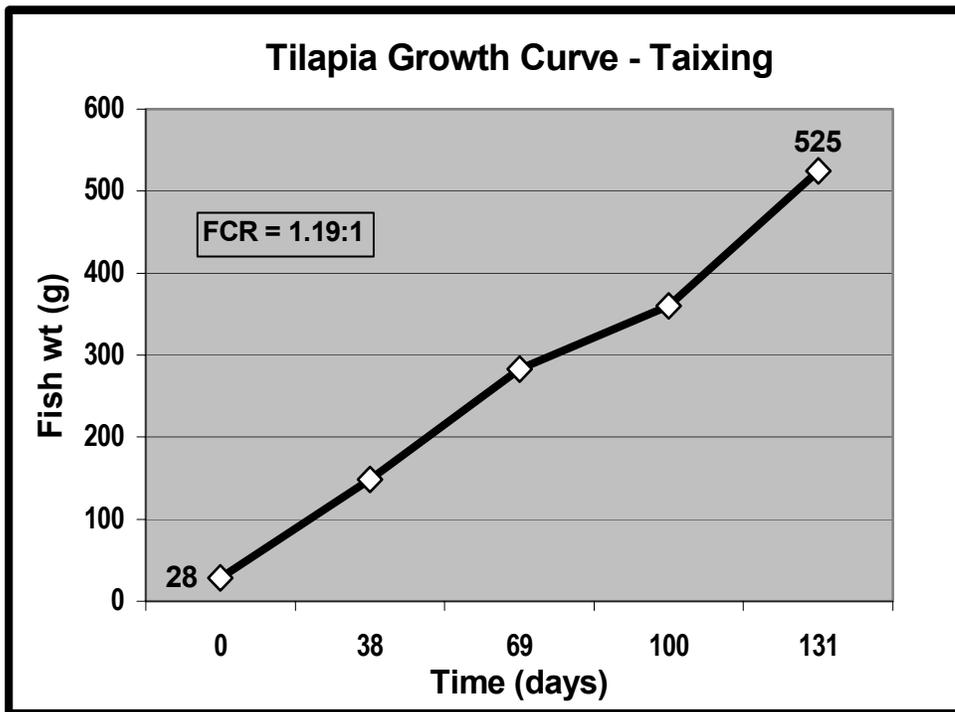


FIGURE 1. Growth curve for tilapia produced in ponds with an extruded, soymeal-based aquafeed. Tilapia grew from 28 g to 525 g in 131 days with an average feed conversion ratio of 1.19:1. Feed cost per kilogram of fish growth with the soy-based, extruded feed was RMB 3.63.

Table 1. Formula for the ASA 32/6, soymeal-based growout feed used in the 2002 tilapia demonstration feeding trial in Taixing, Jiangsu Province, China. Cargill feed mill produced the feed in extruded, floating pellet form.

Ingredient	32/6 Growout Feed ¹
Soybean meal 47.5	52.8
Wheat, SWW	23.6
Wheat middlings	10.0
Corn gluten meal 60%	6.0
Fish oil	3.53
Soy lecithin	1.00
Ca phosphate mono	2.70
Vit PMX Roche 2118	0.10
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 lipid, respectively, in the ration, i.e. 32/6 indicates 32% crude protein and 6% crude lipid.

Table 2. Results of the 2002 ASA aquaculture trial in Taixing that demonstrated fingerling to market pond growth performance of GIFT tilapia using the ASA 80:20 production model and soymeal-based growout feed.

Pond No.	NiT 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 (%)
				NiT	SiC ²	NiT	SiC	NiT	SiC			
1	27.8	1,000	131	522.7	694.3	504.1	68.3	96.4	98.4	1.20	1,141.7	34.6
2	27.8	1,000	131	543.3	849.9	520.9	84.1	97.5	99.0	1.16	1,330.2	40.3
3	27.8	1,000	131	508.1	751.8	501.1	72.6	98.6	96.6	1.21	1,129.4	34.2
Mean	27.8	1,000	131	524.7	765.3	508.7	75.0	97.5	98.0	1.19	1,200.4	36.4

¹NiT = Tilapia

²SiC = Silver carp

³P_G = Gross Production