

Fingerling to Market Growth Performance of Second Generation Texas Select Channel Catfish on Soy-Based Feed

Results of ASA/China 2001 Feeding Trials 35-01-110

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ABSTRACT

Growth performance of second generation Texas Select channel catfish was demonstrated from fingerling to market stages in an ASA 80:20 pond technology trial using an all-plant protein, soy-based growout feed. Texas Select catfish were the offspring of genetically select catfish imported from the United States to the Tai Xing Fish Stock Farm in Jiangsu Province in 1997. Channel catfish in the three replicate trial ponds were fed to satiation twice daily with the ASA 32/6 soy-based feed in extruded, floating pellet form. Texas Select catfish grew from 48 g to 776 in 189 days of feeding, with an average FCR of 1.56:1. Fish survival averaged 95.3%, and production averaged 447 kg per mu for catfish and 60 kg/mu for silver carp. Net economic return averaged RMB 1,766 per mu at an average market price of RMB 15/kg for catfish and RMB 4/kg for silver carp. Return to investment averaged 34.1% for the nine mu of trial ponds. The results of the trial demonstrated that second generation Texas Select channel catfish continue to exhibit good growth performance and production efficiency, and that the select strain stock remained a high performance line. The Tai Xing Fish Stock Farm is cautioned, however, that they must broaden the genetic pool of the small number of brood fish that have been retained on the farm.

INTRODUCTION

The American Soybean Association (ASA), in cooperation with Tai Xing Fish Stock Farm in Tai Xing, Jiangsu Province, conducted a feeding trial in 2001 to assess growth performance from fingerling to market size of second generation Texas Select channel catfish. This was the fifth and final year of ASA trials conducted with this catfish strain at the Tai Xing farm since the importation of the Texas Select catfish strain from the United States as sac-fry in 1997. This trial was conducted using the ASA 80:20 pond production model and ASA 32/6, soy-based growout feed.

MATERIALS AND METHODS

Three ponds of size 3.0 mu each at the Tai Xing Fish Stock Farm were used for the trial. Pond water was supplied from a canal adjacent to the farm to an average pond water depth of 1.5 m. All ponds were equipped with water exchange and stand-by aeration.

Fish were 48-g, second generation Texas Select channel catfish fingerlings produced in ponds in a year 2000 ASA trial at the Tai Xing farm. The fingerlings were stocked in the three trial ponds at a density of 600 fish per mu (9,000 fish/ha), together with 100 silver carp fingerlings per mu (1,500 fish/ha)

Catfish were fed the ASA 32/6 growout feed in extruded, floating pellet form (Table 1). Fish were fed to satiation twice daily, with fish in all ponds fed the same amount at each feeding.

Catfish in all ponds were sampled once per month on the same date each month to monitor growth performance. At the conclusion of the trial, the 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 recorded throughout the trial and net income and ROI calculated at the end of the trial.

RESULTS

Channel catfish were fed a total of 189 days between 26 April and 1 November 2001. Catfish grew from 48 g to 776 g with an FCR of 1.56:1 (Figure 1; Table 2). Average survival for channel catfish was 95.3%.

Gross production averaged 446.8 kg/mu (6,702 kg/ha) for channel catfish and 60 kg/mu (900 kg/ha) for silver carp (Table 2). The ratio of fed catfish to filter feeding silver carp at harvest was 88:12.

Net economic return averaged RMB 1,776.43 per mu for the nine mu of trial ponds. Return on investment (ROI) was 34.1% at market prices of RMB 15/kg for channel catfish and 4/kg for silver carp (Table 2). Feed cost per kilogram of fish growth was RMB 4.99 at a FOB feed cost of RMB 3.20/kg.

SUMMARY AND CONCLUSIONS

The series of ASA catfish culture trials conducted at the Tai Xing Fish Stock Farm over the past five years have demonstrated that the Texas Select strain is a superior performing strain when cultured using the ASA 80:20 production model and ASA starter, fry, fingerling and growout feeds. The five-year ASA trial series included fry to fingerling production of imported sac-fry of Texas Select strain catfish in 1997, fingerling to market production of these fish in 1998, production of brood stock in 1999, breeding and fry to fingerling production of second generation fish in 2000, and fingerling to market production of second generation fish in 2001. The results of the 2001 trial indicated that second generation Texas Select channel catfish continued to exhibit good growth performance and production efficiency, and that the select strain stock remained a high performance line for the China catfish industry. The Tai Xing Fish Stock Farm is cautioned, however, that they must import additional high quality stock in order to broaden the genetic pool of the small number of brood fish that have been retained on the farm. This will be critical if the Tai Xing farm is to establish itself as a breeding center of high quality catfish stock for the lower Yangzte River aquaculture region.

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

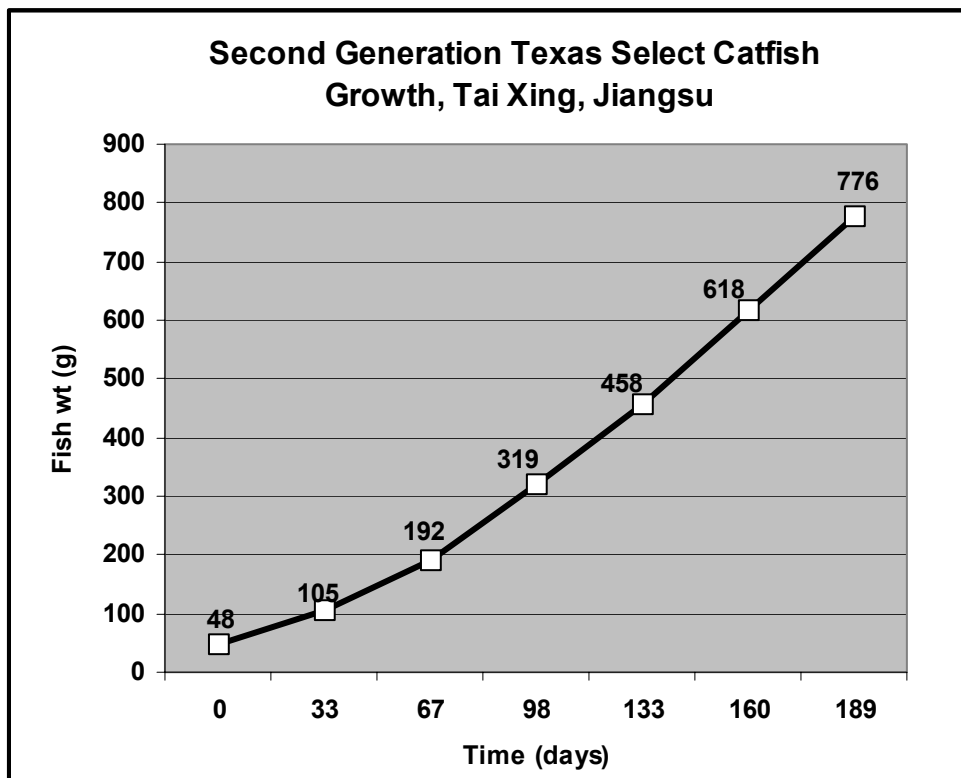


Figure 1. Growth curve for second generation Texas Select channel catfish produced in ponds in the 2001 ASA feeding trial at Tai Xing using the ASA 80:20 pond production model and 32/6 soy-based growout feed. Catfish grew from 48 g to 776 g in 189 days when fed to satiation twice daily with the ASA 32/6 feed in extruded, floating pellet form. Channel catfish were cultured at a stocking density of 600 fish per mu, together with 100 silver carp per mu.

Table 1. Formulation for the ASA 32/6, soy-based growout feed used in the 2001 Texas Select strain channel catfish fingerling to market production trial at Tai Xing, Jiangsu Province, China.¹ The feed was fed 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 fat, respectively, in the ration, i.e. 32/6 indicates 32% crude protein and 6% crude fat.

TABLE 2. Results of the 2001 ASA aquaculture trial at the Tai Xing Fish Stock Farm in Tai Xing, Jiangsu Province, that demonstrated fingerling to market growth performance of second generation Texas Select strain channel catfish using the ASA LVHD cage production model and soymeal-based growout aquafeed.

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 (RMB/mu)	ROI (%)
				ChC	SiC ²	ChC	SiC	ChC	SiC			
1	48	600	189	753	651	431.8	62.7	95.0	96.3	1.62	1553	30.0
2	48	600	189	767	623	443.3	61.3	96.3	98.3	1.57	1720	33.2
3	48	600	189	809	568	465.3	55.5	94.5	97.7	1.49	2026	39.2
Mean	48	600	189	776	614	446.8	76.6	95.3	97.4	1.56	1766	34.1

¹ChC = Channel Catfish

²SiC = Silver Carp

³P_G = Gross Production