

Pond Production of Common Carp in Shenyang with Soy-Based Feed

Results of ASA/China 2002 Feeding Trial 35-02-103

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ABSTRACT

A feeding trial was conducted in Shenyang, Liaoning Province, to demonstrate fingerling to market growth performance of common carp using the ASA 80:20 pond production model and the ASA all-plant protein, soymeal-based growout feed. Fish were stocked in three, 2.4-mu ponds at a density of 700 common carp and 100 silver carp per mu. Common carp grew from 80 g to an average weight of 668 g per fish in 99 days of feeding. Gross production averaged 466 kg/mu for common carp and 79 kg/mu for silver carp. Average survival rates for common carp and silver carp were 99.6% and 100%, respectively. Common carp FCR with the soymeal-based feeds averaged 1.46:1. Average net economic return was RMB 371 per mu, for an average return on investment (ROI) of 15.4%. Results of the feeding demonstration showed that common carp exhibited good growth performance and FCR with the ASA soymeal-based feed and 80:20 production technology. Common carp reached the target market size in just 99 days and had good quality and market acceptance. The use of extruded, floating feed significantly reduced labor costs, lowered fish FCR, improved water quality, and allowed production of healthy and disease-free fish without the use of drugs or chemicals.

INTRODUCTION

The American Soybean Association (ASA), in cooperation with the Shenyang Municipal Fishery Research Institute and its Experimental Fish Farm, and the China National Fisheries Extension Center (NEC), conducted a three-month pond feeding trial with common carp. The objective of the trial was to demonstrate common carp 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 earthen ponds of size 2.4-mu, 2.4-mu and 2.3-mu at the Shenyang Municipal Fishery Research Institute Experimental Fish Farm in Shenyang, Liaoning 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 80-g common carp fingerlings produced at the Shenyang Municipal Fishery Research Institute Experimental Fish Farm in 2001. Common carp were stocked in the three trial ponds in

mid-May at a density of 700 fish 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 the common carp was 650 g per fish.

Common carp were fed the ASA 32/6 all-plant protein 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 common 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

Common carp were fed a total of 99 days between 18 May and 22 August 2002. Common carp grew from 80 g to an average weight of 668 g during this feeding period (Figure 1; Table 2). Gross production averaged 465.7 kg/mu (6,986 kg/ha) for common carp and 79 kg/mu (1,185 kg/ha) for silver carp (Table 2). Average common and silver carp survival rates were 99.6% and 100%, respectively. Average FCR for common carp with the 32/6 soymeal-based feed was 1.46:1.

Net economic return averaged RMB 371 per mu at a market price of RMB 5.6/kg for mirror carp and RMB 2.2/kg for silver carp (Table 2). ROI averaged 15.4% for the three trial ponds (Table 2).

SUMMARY AND CONCLUSIONS

Common carp exhibited excellent growth and feed conversion efficiency using the ASA 80:20 pond production model and the soy-based 32/6 growout feed. Average growth to 668 g in 99 days was excellent for the northeastern region of China, where average daily water temperatures in June and July were only 20°C and 23.5°C, respectively. Shenyang is located at approximately 42° N. latitude.

The extruded, soy-based feed yielded lower FCR (1.46) than local sinking feeds (≥ 1.9), and resulted in lower feed cost per kilogram of fish produced. Pond and fish management was improved using the floating feed because the manager was able to monitor fish health and feeding performance at each feeding. Water quality was reported as being much better than normal using the ASA feed, and resulted in energy cost savings from reduced aeration and water exchange. Labor costs were also reduced, and farm efficiency increased. In addition, no disease problems occurred and no drugs or chemicals were required during the trial. This yielded a high quality “green” product, free of contamination for consumers. Despite the low market price of RMB 5.6/kg for common carp in 2002, the ASA feed and 80:20 technology netted the cooperator a 15.4% profit on investment.

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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

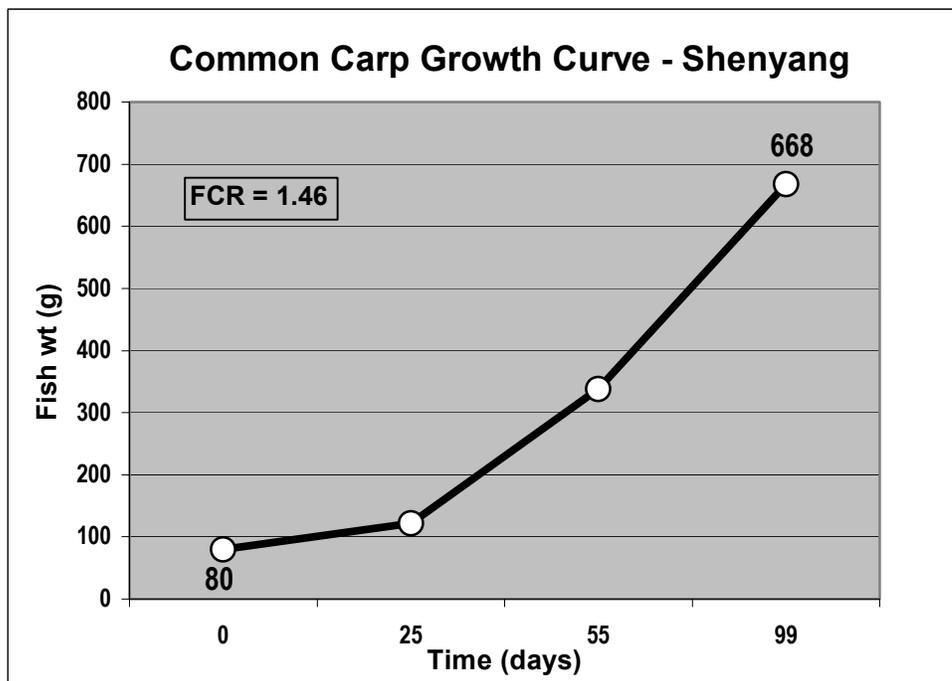


FIGURE 1. Growth curve for common carp produced in Shenyang, northeastern China, with an all-plant protein, soymeal-based aquafeed. Common carp grew from 80 g to 668 g in 99 days with an average feed conversion ratio of 1.46:1.

Table 1. Formula for the ASA 32/6, soymeal-based growout feed used in the 2002 common carp demonstration feeding trial in Shenyang, Liaoning 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 Shenyang that demonstrated fingerling to market pond growth performance of common carp using the ASA 80:20 production model and soymeal-based growout feed.

Pond No.	CoC 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 (%)
				CoC	SiC ²	CoC	SiC	CoC	SiC			
1	80	700	99	673	840	470	84	99.7	100	1.45	380	15.6
2	80	700	99	680	822	473	82	99.4	100	1.43	432	18.0
3	80	700	99	651	710	545	71	99.7	100	1.49	301	12.6
Mean	80	700	99	668	791	466	79	99.6	100	1.46	371	15.4

¹CoC = Common carp

²SiC = Silver carp

³P_G = Gross Production