

Bigmouth Buffalo Fingerling to Market Growth Performance in Ponds in Harbin on a Soymeal-Based Feed

Results of ASA/China 2000 Feeding Trial 35-00-099

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ABSTRACT

A feeding trial was conducted at the Harbin West Suburb Fish Farm in Heilongjiang Province to demonstrate the fingerling to market growth performance of bigmouth buffalo fish using the ASA 80:20 pond production model and a soymeal-based growout feed. Fish were stocked in two, 7-mu ponds at densities of 800 bigmouth buffalo and 100 silver carp fingerlings per mu. Bigmouth buffalo grew from 60 g to an average weight of 464 g per fish in 120 days of feeding. Gross production averaged 337 kg/mu for bigmouth buffalo and 82 kg/mu for silver carp. Average survival rates for bigmouth buffalo and silver carp were 90.7% and 93.5%, respectively. Bigmouth buffalo FCR with the all-plant protein, soymeal-based feed was 0.99:1. Average net economic return was RMB 2,514/mu per mu at market prices of RMB 16.2/kg for bigmouth buffalo and RMB 2.4/kg for silver carp. Average ROI per mu was 80.2%. Results of the feeding demonstration showed that bigmouth buffalo fed well on the extruded, floating feed, and exhibited good growth performance, FCR, survival and economic return with the ASA soymeal-based feed and 80:20 production technology. Bigmouth buffalo appeared to have been underfed in the trial, and it is recommended to increase the feeding rate if larger fish are required for the market.

INTRODUCTION

The American Soybean Association (ASA), in cooperation with the China National Fisheries Extension Center (NEC), the Heilongjiang Provincial Fisheries Extension Center, and the Harbin West Suburb Fish Farm, conducted a 4-month feeding trial with bigmouth buffalo fish. The objective of the trial was to demonstrate bigmouth buffalo growth and economic performance from fingerling to market stages with a soymeal-based, extruded feed and the ASA 80:20 pond production model.

MATERIALS AND METHODS

Two earthen ponds of size 7.0-mu at the Harbin West Suburb Fish Farm in Heilongjiang 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 60-g bigmouth buffalo fingerlings produced in an ASA fry to fingerling feeding trial in 1999 at the Harbin West Suburb Fish Farm and over-wintered in ponds at the farm. Bigmouth buffalo were stocked in the two trial ponds in May 2000 at a density of 800 fish per mu, together with 100 silver carp fingerlings per mu. Fish were of uniform size and age at stocking.

Bigmouth buffalo were fed a 32% crude protein, 6% crude fat aquafeed formulated by ASA and produced by Shanghai Fwusow aquafeed mill. The feed was an all-plant protein ration formulated

with dehulled soybean meal as the primary protein source (Table 1). The feed was fed in extruded, floating pellet form. Fish feeding rate and frequency varied with fish size and water temperature following ASA guidelines.

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 bigmouth buffalo and silver carp in each pond counted and weighed to determine average fish weight, gross and net production, feed conversion ratio (FCR) and survival.

RESULTS

Bigmouth buffalo were fed a total of 120 days between May and September 2000. Bigmouth buffalo grew from 60 g to an average weight of 464 g during this feeding period (Figure 1; Table 2). The average daily growth rate for bigmouth buffalo was 3.36 grams. Gross production averaged 336.5 kg/mu (5,048 kg/ha) for bigmouth buffalo and 81.5 kg/mu (1,223 kg/ha) for silver carp (Table 2). Net production averaged 288.5 kg/mu (4,327.5 kg/ha) for bigmouth buffalo and 69.5 kg/mu (1,043 kg/ha) for silver carp (Table 2). The ratio of fed bigmouth buffalo to filtering silver carp at harvest was 80:20.

Average bigmouth buffalo and silver carp survival rates were 90.7% and 93.5%, respectively. Average FCR for bigmouth buffalo fed the soymeal-based feed was 0.99:1.

Net economic return for the demonstration trial was RMB 2,514 per mu at a market price of RMB 16.20/kg for bigmouth buffalo and RMB 2.40/kg for silver carp (Table 2). ROI averaged 80.2% for the trial (Table 2).

SUMMARY AND CONCLUSIONS

Bigmouth buffalo exhibited good FCR, survival and economic return, but a slower than expected growth rate, when cultured using the ASA 80:20 pond production model and a 32/6 growout feed formulated with dehulled soybean meal as the primary protein source. FCR was particularly low at 0.99:1. The low FCR and average growth rate of 3.36 grams per day indicated that the fish were underfed and that the bigmouth buffalo partially relied on natural organisms for food. If larger fish are required for the market, it is recommended that the feeding rate for bigmouth buffalo be increased.

ACKNOWLEDGEMENTS

ASA gratefully acknowledges the Harbin West Suburb Fish Farm, the Heilongjiang Fisheries Extension Center, and the Director and staff of the National Fisheries Extension Center for their assistance and support for this aquaculture trial.

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

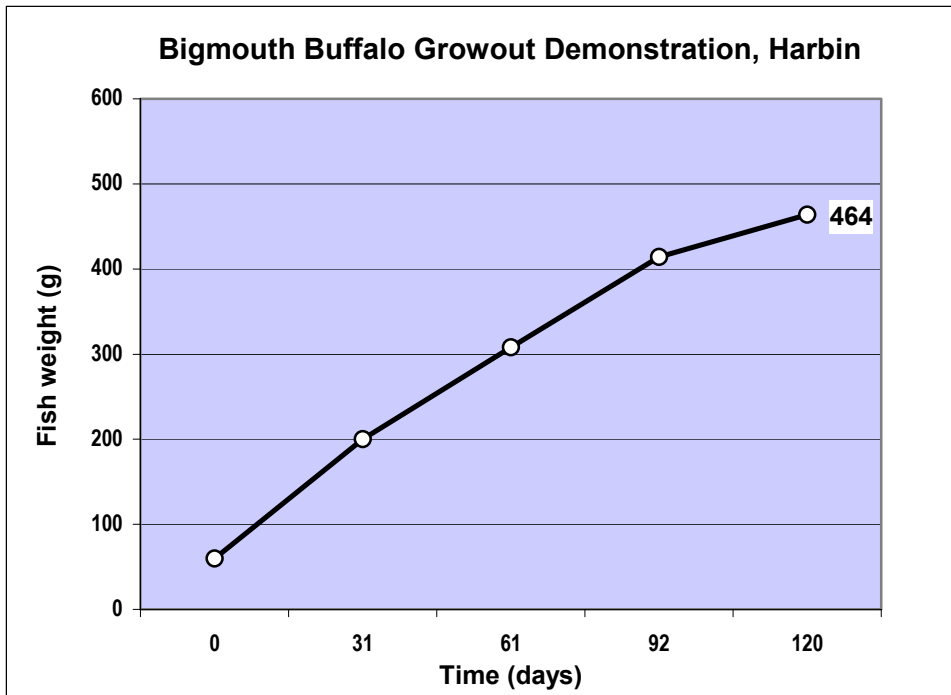


FIGURE 1. Growth curve for bigmouth buffalo produced in Harbin, northeastern China, with a soymeal-based aquafeed formulated to contain 32% crude protein and 6% fat and fed in extruded, floating pellet form. Bigmouth buffalo grew an average of 3.36 grams per day over the 120-day feeding period with an average FCR of 0.99:1.

Table 1. Formula for the ASA 32/6, soymeal-based growout feed used in the 2000 bigmouth buffalo demonstration feeding trial at the Harbin West Suburb Fish Farm in Heilongjiang Province, China.

Ingredient	32/6 Growout Feed ¹
Soybean meal 47.5	52.80
Wheat, SWW	23.60
Wheat middlings	10.00
Corn gluten meal 60%	6.00
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 2000 ASA aquaculture trial at the Harbin West Suburb Fish Farm that demonstrated fingerling to market pond growth performance of bigmouth buffalo using the ASA 80:20 production model and an extruded, soymeal-based aquafeed.

Pond No.	BuF ¹ stocking size (g)	Stocking rate (fish/mu)	No. days fed	Harvest wt. (g)		P _G ³ (kg/mu)		P _N ⁴ (kg/mu)		Survival (%)		FCR	Net (RMB/mu)	ROI (%)
				BuF	SiC ²	BuF	SiC	BuF	SiC	BuF	SiC			
1	60	800	120	472	882	344	83	296	71	91.1	94	0.98	2,618	83.0
2	60	800	120	456	860	329	80	281	68	90.2	93	1.00	2,410	77.4
Mean	60	800	120	464	871	336.5	81.5	288.5	69.5	90.7	93.5	0.99	2,514	80.2

¹BuF = Bigmouth buffalo fish

²SiC = Silver carp

³P_G = Gross Production

⁴P_N = Net Production