

Results of a Bigmouth Buffalo Fry to Fingerling Feeding Demonstration in Harbin

Results of ASA/China 1999 Feeding Trial 35-99-71

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ABSTRACT

A feeding demonstration was conducted in Harbin in 1999 to demonstrate the advantages of ASA's 80:20 pond technology and soy-based diets for producing bigmouth buffalo fingerlings. Bigmouth buffalo fry with an average weight of 0.5 g were stocked in two 7-mu ponds in Harbin in May and fed soy-based feeds for 106 days between June and September. The fry grew from 0.5 g to 60 g during this period, with an average FCR of 0.93:1. Net production averaged 244 kg/mu of bigmouth buffalo fingerlings and 62 kg/mu of silver carp fingerlings. Average survival for bigmouth buffalo was 83%. Net economic return was RMB 4,108/mu, with a 114% return to investment. The trial successfully demonstrated the value of the 80:20 technology and both the production and economic advantages of soy-based aquafeeds.

INTRODUCTION

The American Soybean Association (ASA), in cooperation with the Harbin Xi Jiao Fish Farm, the Heilongjiang Provincial Fisheries Extension Center, and the National Fisheries Extension Center (NEC), conducted a field trial in 1999 to demonstrate bigmouth buffalo fry to fingerling growth performance with 80:20 pond technology and soy-based aquafeeds. Results of the feeding demonstration are reported below.

MATERIALS AND METHODS

Fish for the trial were 0.5-g bigmouth buffalo fry obtained from Wuhan. The bigmouth buffalo fry were stocked in two 7.0-mu ponds at the Xi Jiao Fish Farm in Harbin, Heilongjiang Province, on 23 May 1999. Bigmouth buffalo fry were stocked at a density of 4,800 fish per mu together with 1,000 silver carp fry per mu. Pond water depth averaged approximately 1.5 m during the production season. Ponds were equipped with water exchange and stand-by aeration.

Bigmouth buffalo were fed a crumble fry starter feed from 0.5 g to approximately 10 g average fish weight. The fry feed was formulated to contain 41% protein and 11% fat (Table 1). Initial feed crumble size was 0.5 mm. At size 10 g, the fish were weaned to a 1.5-mm extruded (floating) feed formulated to contain 36% protein and 7% fat (Table 1). Dehulled soybean meal (47.5% crude protein) was the primary protein source in both the fry and fingerling feeds. The

feeds were formulated by ASA and produced by Shanghai Fwuso aquafeed mill. Feeding rate and frequency varied with fish size and water temperature following ASA guidelines.

Fish in the two ponds were sampled once per month on approximately the same date each month. At the conclusion of the trial, the 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

Fish were fed a total of 106 days, with feeding commencing on 17 June and ending on 30 September 1999. Bigmouth buffalo fry grew from 0.5 g to 60 g during this period (Table 2). Net production of bigmouth buffalo fingerlings averaged 244 kg/mu, together with 62 kg/mu of silver carp. Average FCR for the combination of 41/11 fry and 36/7 fingerling feeds was 0.93:1. Average fish survival in the 14 mu of demonstration ponds was 83%.

Net economic return and return on investment (ROI) averaged RMB 4,108/mu and 114%, respectively, for the two demonstration ponds (Table 2).

SUMMARY AND CONCLUSIONS

Feed-based production of bigmouth buffalo fingerlings using the ASA 80:20 pond production model and aquafeeds formulated with dehulled soybean meal as the primary protein source was demonstrated to be both technically and economically feasible in Harbin. Bigmouth buffalo fingerlings averaging 60 g were produced in 106 days of feeding, with a feed conversion efficiency of 0.93. Use of the extruded, floating form of the fingerling feed allowed the Harbin Xi Jiao farm manager to closely monitor fish feeding performance and fish health and prevented over-feeding of fish and wasting of feed.

ACKNOWLEDGEMENTS

ASA gratefully acknowledges the Harbin Xi Jiao farm staff, Heilongjiang aquaculture extension personnel, 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

TABLE 1. Aquafeed formulations for the ASA soy-based 41% protein and 11% fat fry ration, and the 36% protein and 7% fat fingerling ration fed in the 1999 grass carp fry to fingerling demonstration trial at the Xi Jiao Fish Farm in Harbin, Heilongjiang Province, China.

Ingredient	41/11 Fry diet	36/7 Fingerling diet
Dehulled soybean meal (47.5%)	46.3	46.3
Corn gluten meal (60%)	15.0	10.0
Fishmeal, anchovy 65/10	14.0	8.0
Wheat, SWW	13.0	19.0
Wheat middlings	-----	8.0
Fish oil	4.03	4.58
Soy oil	4.0	-----
Ca phosphate mono	1.7	2.2
Soy lecithin	1.5	1.5
Mineral premix	0.25	0.25
Vitamin premix Roche 2118	0.20	0.15
Ethoxyquin	0.02	0.02
TOTAL	100.00	100.00

TABLE 2. Results of the 1999 ASA aquaculture trial at the Harbin Xi Jiao Fish Farm that demonstrated grass carp fry to fingerling pond growth performance using the ASA 80:20 production model and soy-based aquafeeds.

Fry stocking size (g)	Stocking rate (fish/mu)		No. days fed	BuF harvest weight (g)	Net production (kg/mu)		Survival (%)	FCR	Net return (RMB)	ROI (%)
	BuF ¹	SiC ²			BuF	SiC				
0.5	5,000	1,000	106	60	244	62	83	0.93	4,108	114

¹BuF = bigmouth buffalo fish

²SiC = silver carp