

Pond Production of Wuchang Bream Fingerlings with Soy-Based Feeds

Results of ASA/China 2002 Feeding Trial 35-02-117

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ABSTRACT

A feeding trial was conducted in Changzhou, Jiangsu Province, to demonstrate fry to fingerling performance of wuchang bream using the ASA 80:20 pond production model and ASA soymeal-based fry and fingerling feeds. Fish were stocked in three, 5.0-mu ponds at a density of 9,000 wuchang bream and 1,000 silver carp per mu. Wuchang bream grew from 0.1 g to an average weight of 50.8 g per fish in 137 days of feeding. Gross production averaged 306 kg/mu for wuchang bream and 62 kg/mu for silver carp. Average survival rates for wuchang bream and silver carp were 67% and 43%, respectively. Low survival rates were the result of under-stocking. Wuchang bream FCR with the soymeal-based feeds averaged 0.93:1. Average net economic return was RMB 652 per mu, for an average return on investment (ROI) of 33.6%. Results of the feeding demonstration showed that wuchang bream exhibited good growth, feeding behavior and FCR with the ASA soymeal-based feeds and 80:20 production technology during the fry to fingerling phase. In addition, the soy-based extruded feeds yielded good water quality, lower labor costs, 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 Jiangsu Ge Hu Wuchang Breeding Stock Farm, the Jiangsu Provincial Fisheries Extension Center, and the China National Fisheries Extension Center (NEC), conducted a six-month pond feeding trial with wuchang bream. The objective of the trial was to demonstrate wuchang bream growth and economic performance from fry to fingerling stages with the ASA soy-based fry and fingerling feeds and the ASA 80:20 pond production model.

MATERIALS AND METHODS

Three earthen ponds of size 5.0-mu each at the Jiangsu Ge Hu Wuchang Breeding Stock Farm in Changzhou, 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 0.1-g wuchang bream fry produced at the Jiangsu Ge Hu Wuchang Breeding Stock Farm. Wuchang bream were stocked in the three trial ponds on 20 June at a density of 9,000 fish per mu, together with 1,000 silver carp fry per mu. Fish in all three trial ponds were of uniform size and age at stocking. Target fingerling size for the wuchang bream was 50 g per fish.

Wuchang bream were fed the ASA 41/11, soy-based fry feed in crumble form from the time of stocking to fish size 3.0 g (Table 1). At fish size 3.0 g the wuchang bream were weaned to the ASA 36/7 fingerling feed in extruded, floating pellet form (Table 2). Initial floating pellet size was 1.5 mm. Pellet size was increased as the fish grew, with pellet size maintained at approximately one-half the full open mouth size of the fish. Fish were fed to satiation twice daily, with fish in the three replicate ponds receiving an identical amount of feed at each feeding. The feeds were formulated by ASA and produced by Cargill in Jiangsu Province.

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 wuchang bream 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

Wuchang bream were fed a total of 137 days between 20 June and 5 November 2002. Wuchang bream grew from 0.1 g to an average weight of 50.8 g during this feeding period (Figure 1; Table 3). Gross production averaged 305.8 kg/mu (4,587 kg/ha) for wuchang bream and 61.8 kg/mu (927 kg/ha) for silver carp (Table 3). Average wuchang bream and silver carp survival rates were 66.9% and 42.8%, respectively. Average FCR for wuchang bream with the ASA soymeal-based feeds was 0.93:1.

Net economic return averaged RMB 652 per mu at a market price of RMB 8.0/kg for wuchang bream and RMB 2.4/kg for silver carp (Table 3). ROI averaged 33.6% for the three trial ponds (Table 3).

SUMMARY AND CONCLUSIONS

Wuchang bream exhibited good growth and feed conversion efficiency using the ASA 80:20 pond production model and the combination of soy-based 41/11 fry and 36/7 fingerling feeds. The soy-based extruded feeds yielded good water quality, reduced disease, lower labor costs and high economic return. Fish survival was low for both wuchang bream (67%) and silver carp (43%). The low survival rates were reported to be the result of under-stocking. Fish stocking was by weight, rather than number, and initial average fish weight was under estimated.

The cooperator was pleased with the trial results and recommended applying the ASA technology and feeds to pen culture of wuchang bream in an adjacent lake. Pen culture of wuchang bream comprises a large segment of the wuchang bream industry in the Changzhou region.

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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

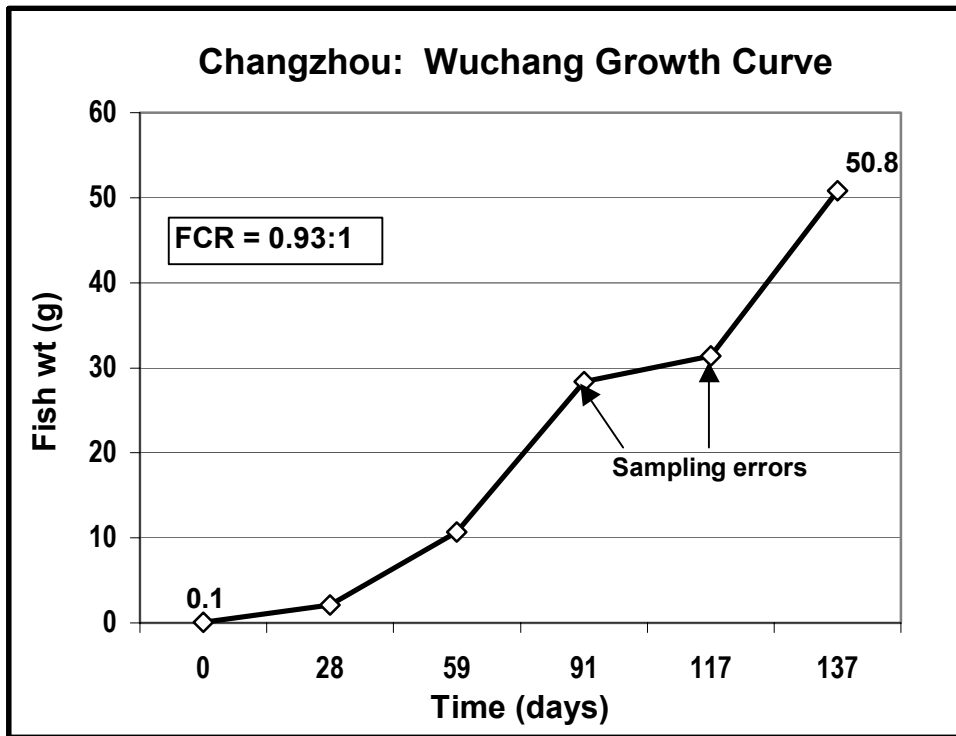


FIGURE 1. Growth curve for wuchang bream produced in Changzhou, Jiangsu Province, with soymeal-based fry and fingerling feeds. Wuchang bream grew from 0.1 g to 50.8 g in 137 days with an average feed conversion ratio of 0.93:1.

Table 1. Formula for the ASA 41/11, soymeal-based fry feed used in the 2002 wuchang bream demonstration feeding trial in Changzhou, Jiangsu Province, China. The feed was fed in crumble form to fish from size 0.1-g to 3.0-g.

Ingredient	41/11 Fry Feed ¹
Soybean meal 47.5	46.3
Corn gluten meal 60%	15.0
Fishmeal, Anchovy 65/10	14.0
Wheat, SWW	13.0
Fish oil	4.03
Soy oil	4.00
Soy lecithin	1.50
Ca phosphate mono	1.70
Vit PMX Roche 2118	0.20
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. 41/11 indicates 41% crude protein and 11% crude fat.

Table 2. Formula for the ASA 36/7, soymeal-based fingerling feed used in the 2002 wuchang bream demonstration feeding trial in Changzhou, Jiangsu Province, China. The feed was fed in extruded, floating pellet form to fish from size 3.0-g.

Ingredient	36/7 Fingerling Feed ¹
Soybean meal 47.5	46.3
Wheat, SWW	19.0
Corn gluten meal 60%	10.0
Fishmeal, Anchovy 65/10	8.0
Wheat midds 15%	8.0
Fish oil	4.58
Soy lecithin	1.50
Ca phosphate mono	2.20
Vit PMX Roche 2118	0.15
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. 36/7 indicates 36% crude protein and 7% crude fat.

Table 3. Results of the 2002 ASA aquaculture trial in Changzhou that demonstrated fingerling to market pond growth performance of wuchang bream using the ASA 80:20 production model and soymeal-based fry and fingerling feeds.

Pond No.	WuC ¹ stocking size (g)	Stocking rate (fish/mu)	No. days fed	Harvest wt. (g)		P _G ³ (kg/mu)		Survival (%)		FCR	Net income (RMB/mu)	ROI (%)
				WuC	SiC ²	WuC	SiC	WuC	SiC			
1	0.1	9,000	137	51.0	133	308.2	58.4	67.7	43.9	0.93	663	34.1
2	0.1	9,000	137	48.4	147	298.9	65.8	68.7	44.8	0.96	606	31.2
3	0.1	9,000	137	53.2	154	310.4	61.3	64.9	39.8	0.92	687	35.4
Mean	0.1	9,000	137	50.8	145	305.8	61.8	66.9	42.8	0.93	652	33.6

¹WuC = Wuchang Bream

²SiC = Silver Carp

³P_G = Gross Production