

Wuchang Bream Production with Soy-Based Feed and 80:20 Pond Technology: Shenyang

Results of ASA/China 2003 Feeding Trial 35-03-116

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ABSTRACT

A feeding demonstration was conducted in Shenyang, Liaoning Province, to demonstrate fingerling to market growth performance of wuchang bream using the ASA 80:20 pond production model and ASA soymeal-based growout feed. Fish were stocked in three, 2.2-mu ponds at a density of 1,000 wuchang bream and 100 silver carp per mu. Wuchang bream grew from 65 g to an average weight of 480 g per fish in 128 days of feeding. Gross production averaged 480 kg/mu for wuchang bream and 68 kg/mu for silver carp. Average survival rates for wuchang bream and silver carp were 99.9% and 100%, respectively. Wuchang bream FCR with the all-plant protein, soymeal-based feed averaged 1.10:1. Average net economic return was RMB 488 per mu at market prices of RMB 6/kg for wuchang bream and RMB 2/kg for silver carp. Return on investment (ROI) for the three demonstration ponds averaged 19.3%. Wuchang bream exhibited rapid growth, aggressive feeding behavior and efficient FCR with the ASA soymeal-based feed and 80:20 production technology.

INTRODUCTION

The American Soybean Association (ASA), in cooperation with the Shenyang Municipal Fishery Research Institute (SMFRI), conducted a four-month pond feeding trial with wuchang bream. The objective of the trial was to demonstrate wuchang bream growth and economic performance from fingerling to market stages with the ASA soy-based growout feed and the ASA 80:20 pond production model.

MATERIALS AND METHODS

Three earthen ponds of size 2.2-mu (0.15-ha) each at the SMFRI 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.

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Fish were 65-g wuchang bream produced at the SMFRI Experimental Fish Farm. Wuchang bream were stocked in the three trial ponds at a density of 1,000 fish per mu (15,000/ha), together with 100 silver carp per mu (1,500/ha). Fish in all three trial ponds were of uniform size and age at stocking. Target market size for the wuchang bream was 450 g per fish.

Wuchang bream were fed the ASA all-plant protein, soymeal-based growout feed containing 32% crude protein and 6% crude lipid (Table 1). The feed was fed in extruded, floating pellet form. Feed 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 were 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 128 days between 13 May and 16 September 2003. Wuchang bream grew from 65 g to an average weight of 480 g during this feeding period (Table 2). Gross production averaged 480 kg/mu (7,200 kg/ha) for wuchang bream and 68.3 kg/mu (1,025 kg/ha) for silver carp (Table 2). Average wuchang bream and silver carp survival rates were 99.9% and 100%, respectively. Average FCR for wuchang bream with the ASA soymeal-based feed was 1.10:1 (Table 2).

Net economic return for the three demonstration ponds averaged RMB 488 per mu (\$886/ha) at a market price of RMB 6.0/kg (\$0.72/kg) for wuchang bream and RMB 2.0/kg (\$0.24/kg) for silver carp (Table 2). ROI averaged 19.3% for the three trial ponds (Table 2).

SUMMARY AND CONCLUSIONS

Wuchang bream exhibited excellent growth performance with the ASA diet, growing to the target market size of ≥ 450 g in only 128 days. The 1.10:1 FCR indicated excellent feed conversion efficiency with the all-plant protein, soymeal based feed. Wuchang bream in this trial exhibited the best growth to date of the ASA feeding demonstrations with this species. Wuchang bream in other ponds at the SMFRI farm that were fed a

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local 32% protein sinking feed grew to 380 g (100 g smaller) and had a much higher FCR than fish fed the ASA feed (reported by SMFRI farm manager).

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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

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Table 1. Formula for the ASA 32/6¹, all-plant protein, soymeal-based feed used in the 2003 wuchang bream demonstration feeding trial in Shenyang, Liaoning Province, China. The feed was fed in extruded, floating pellet form.

Ingredient	Percent of total
Soybean meal 47.5	52.8
Wheat, SWW	23.2
Wheat middlings	10.0
Corn gluten meal 60%	6.0
Fish oil	3.5
Soy lecithin	1.00
Ca phosphate mono	2.70
Vit PMX F-2	0.50
Min PMX F-1	0.25
Stay C-35%	0.03
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.

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Table 2. Results of the 2003 ASA aquaculture trial in Shenyang that demonstrated fingerling to market pond growth performance of wuchang bream using the ASA 80:20 production model and soymeal-based, extruded feed.

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	65	1,000	128	494	750	494	75	99.9	100	1.08	587	23.2
2	65	1,000	128	486	700	486	70	100.0	100	1.11	528	20.9
3	65	1,000	128	461	600	461	60	99.9	100	1.18	349	13.8
Mean	65	1,000	128	480	683	480	68.3	99.9	100	1.10	488	19.3

¹WuC = Wuchang Bream

²SiC = Silver Carp

³P_G = Gross Production