

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

Results of ASA/China 2003 Feeding Trial 35-03-106

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ABSTRACT

A feeding trial was conducted in Changzhou, Jiangsu Province, to evaluate 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, 5.0-mu ponds at a density of 800 wuchang bream and 100 silver carp per mu. Wuchang bream grew from 50 g to an average weight of 462 g per fish in 188 days of feeding. Gross production averaged 387 kg/mu for wuchang bream and 113 kg/mu for silver carp. Average survival rates for wuchang bream and silver carp were 100+% and 95%, respectively. Wuchang bream FCR with the all-plant protein, soymeal-based feed averaged 1.22:1. Average net economic return was RMB 705 per mu, for an average return on investment (ROI) of 34.5%. Wuchang bream exhibited good growth, feeding behavior and FCR with the ASA soymeal-based feed and 80:20 production technology.

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 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 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.

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Fish were 50-g wuchang bream produced at the Jiangsu Ge Hu Wuchang Breeding Stock Farm in the ASA 2002 feeding trial. Wuchang bream were stocked in the three trial ponds at a density of 800 fish per mu, together with 100 silver carp per mu. 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 188 days between 16 April and 20 October 2003. Wuchang bream grew from 50 g to an average weight of 462 g during this feeding period (Table 2). Gross production averaged 386.9 kg/mu (5,803 kg/ha) for wuchang bream and 113 kg/mu (1,695 kg/ha) for silver carp (Table 2). Average wuchang bream and silver carp survival rates were 104% and 95%, respectively. Average FCR for wuchang bream with the ASA soymeal-based feed was 1.22:1 (Table 2).

Net economic return averaged RMB 705 per mu at a market price of RMB 6.4/kg for wuchang bream and RMB 2.4/kg for silver carp (Table 2). ROI averaged 34.5% for the three trial ponds (Table 2).

SUMMARY AND CONCLUSIONS

Wuchang bream grew to the target market size of ≥ 450 g in 188 days on the ASA 32% all-plant protein, soymeal-based feed. Bream exhibited good feed conversion efficiency with ASA diet. The soy-based extruded feed yielded good water quality, no disease, and good economic return. The greater than 100% survival rate for wuchang bream was the result of stocking by weight, rather than number, which resulted in overstocking of fish.

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Farmer concern that wuchang bream would require a higher protein feed than the ASA diet was not indicated by the results of this evaluation trial. Wuchang bream yielded a low FCR of 1.22:1 with the 32% crude protein ASA feed and indicated that the protein level in the test diet was sufficient for this species. Wuchang bream growth performance in this trial was among the best to date of the ASA feeding trials with this species.

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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 Changzhou, Jiangsu 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 Changzhou 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	50	800	188	462	1,190	387.9	113.4	105	95	1.22	712	34.8
2	50	800	188	457	1,200	385.4	112.2	105	93	1.23	693	33.9
3	50	800	188	466	1,180	387.4	113.8	104	96	1.22	710	34.8
Mean	50	800	188	462	1,190	386.9	113.1	105	94.7	1.22	705	34.5

¹WuC = Wuchang Bream

²SiC = Silver Carp

³P_G = Gross Production