

# **Fingerling to Market Growth Performance of Wuchang Bream on Two Soy-Based Aquafeeds**

## **Results of ASA/China 2001 Feeding Trials 35-01-111**

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### **ABSTRACT**

Growth performance of wuchang bream was compared from fingerling to market stages in an ASA 80:20 pond technology trial using two ASA soy-based aquafeeds. This was the second year of a two-year wuchang bream evaluation trial conducted at the Tai Xing Fish Stock Farm in Jiangsu Province. Wuchang in six replicate trial ponds were fed to satiation twice daily with the ASA feeds. Wuchang in three of the ponds were fed with the standard ASA 32/6 carp growout feed. Wuchang in the other three ponds were fed with the ASA 32/3 grass carp feed. Both feeds were fed in extruded, floating pellet form. Wuchang fed the 32/6 feed grew from 36 g to 329 g in 188 days of feeding, with an average FCR of 1.78:1. Fish fed the 32/3 grass carp feed grew from 36 g to 313 g in 188 days of feeding, with an average FCR of 1.83:1. Wuchang survival averaged 93.1% and 95.5%, respectively, for fish fed the 32/6 and 32/3 feeds. Gross production averaged 245 kg per mu for wuchang bream and 67 kg/mu for silver carp in the three ponds receiving the 32/6 feed. In ponds receiving the 32/3 feed, gross production was 239 kg per mu for wuchang bream and 90 kg per mu for silver carp. Net economic return averaged RMB 328 per mu and RMB 655 per mu for fish fed the 32/6 and 32/3 feeds, respectively. Return on investment was significantly higher for fish fed the 32/3 feed because of the lower cost of the feed.

### **INTRODUCTION**

The American Soybean Association (ASA), in cooperation with Tai Xing Fish Stock Farm in Tai Xing, Jiangsu Province, conducted a feeding trial in 2001 to assess growth performance from fingerling to market size of wuchang bream. This was the second year of a two-year trial to assess wuchang bream performance using the ASA 80:20 pond production model and soy-based aquafeeds. Fish performance in the 2001 trial was compared using the standard ASA 32/6 carp growout feed and the ASA 32/3 grass carp feed.

### **MATERIALS AND METHODS**

Six ponds of size 2.0 mu each at the Tai Xing Fish Stock Farm were used for the trial. Pond water was supplied from a canal to an average pond water depth of 1.5 m. All ponds were equipped with water exchange and stand-by aeration.

Fish were 36-g wuchang bream fingerlings produced in a year 2000 ASA trial at the Tai Xing farm. The fingerlings were stocked in the six trial ponds at a density of 800 fish per mu (12,000 fish/ha), together with 100 silver carp fingerlings per mu (1,500 fish/ha)

Wuchang bream in three of the trial ponds were fed the ASA 32/6 carp growout feed in extruded, floating pellet form (Table 1). Wuchang bream in the other three ponds were fed the ASA 32/3 grass carp feed (Table 1). Fish in all ponds were fed to satiation twice daily, with fish in the three replicate ponds of each feed treatment fed the same amount at each feeding.

Wuchang bream in all ponds were sampled once per month on the same date each month to monitor growth performance. At the conclusion of the trial, the ponds were drained and the wuchang 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 calculated at the end of the trial.

## **RESULTS**

Wuchang bream were fed a total of 188 days between 26 April and 31 October 2001. Wuchang bream fed the ASA 32/6 feed grew from 36 g to 329 g with an FCR of 1.78:1 (Table 2). Fish fed the ASA 32/3 feed grew from 36 g to 313 g with an FCR of 1.83:1. Average survival for wuchang bream was 93.1% for fish fed the 32/6 feed and 95.5% for fish fed the 32/3 feed (Table 2).

Gross production averaged 245.3 kg/mu (3,680 kg/ha) for wuchang bream and 67 kg/mu (1,005 kg/ha) for silver carp in ponds receiving the 32/6 feed (Table 2). Gross production of wuchang and silver carp in ponds receiving the 32/3 feed was 239.1 kg/mu and 90 kg/mu, respectively (Table 2). The ratios of fed wuchang bream to filter feeding silver carp at harvest were 79:21 and 73:27, respectively, for the 32/6 and 32/3 feed pond units.

Net economic return averaged RMB 328.5 per mu for the six mu of trial ponds where wuchang bream were fed the 32/6 feed. Return on investment (ROI) averaged 13.7%, with most of the return being from silver carp. ROI for the fed wuchang bream only in these ponds averaged 2.5%. Net economic return for the six mu of trial ponds where wuchang bream were fed the 32/3 feed averaged RMB 655.6 per mu. ROI averaged 31.3%. ROI from the wuchang bream in these ponds averaged 14.1%, and was 5.6 times higher than for wuchang fed the 32/6 feed because of the lower cost of the 32/3 feed.

## **SUMMARY AND CONCLUSIONS**

Wuchang bream did not attain the 400-g per fish target size with either of the feed treatments tested in this ASA trial. Hot weather and high water temperatures were reported to have significantly impacted normal growth performance of wuchang bream. While the 31.3% ROI for fish fed the 32/3 grass carp feed was high, fish growth performance was judged to be marginal and the FCR of 1.83:1 was significantly higher than feed conversion efficiencies typically obtained with ASA soy-based feeds fed to common, crucian, black and grass carp species. ASA recommends repeating this trial to verify the results under different environmental conditions.

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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

Table 1. Formulation for the ASA 32/6 soy-based carp growout and 32/3 soy-based grass carp feeds used in the 2001 wuchang bream fingerling to market production trial at Tai Xing, Jiangsu Province, China.<sup>1</sup> The feeds were fed in extruded, floating pellet form.

Ingredient	32/6 Growout Feed <sup>1</sup>	32/3 Grass Carp Feed <sup>1</sup>
Soybean meal 47.5	52.8	-----
Soybean meal 44	-----	50.0
Wheat, SWW	23.6	21.0
Soy hulls	-----	16.0
Wheat middlings	10.0	-----
Corn gluten meal 60%	6.0	8.9
Fish oil	3.53	1.3
Soy lecithin	1.00	-----
Ca phosphate mono	2.70	2.43
Vit PMX Roche 2118	0.10	0.10
Min PMX F-1	0.25	0.25
Ethoxyquin	0.02	0.02
Total	100.00	100.00

<sup>1</sup>The 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, and 32/3 indicates 32% crude protein and 3% crude fat.

TABLE 2. Results of the 2001 ASA aquaculture trial at the Tai Xing Fish Stock Farm in Tai Xing, Jiangsu Province, that demonstrated fingerling to market growth performance of wuchang bream using the ASA 80:20 pond production model and ASA 32/6 standard carp growout and ASA 32/3 grass carp aquafeeds.

Feed	WuC <sup>1</sup> stocking size (g)	Stocking rate (fish/mu)	No. days fed	Harvest wt. (g)		P <sub>G</sub> <sup>3</sup> (kg/mu)		Survival (%)		FCR	Net (RMB/mu)	ROI (%)
				WuC	SiC <sup>2</sup>	WuC	SiC	WuC	SiC			
32/6	36	800	188	331	74	249.5	69.0	94.3	93.3	1.75	379	15.8
32/6	36	800	188	334	66	249.9	62.0	93.4	94.2	1.74	354	14.8
32/6	36	800	188	322	75	236.4	70.3	91.6	93.8	1.86	252	10.6
Mean (32/6)	36	800	188	329	72	245.2	67.1	93.1	93.8	1.78	328	13.7
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32/3	36	800	188	309	147	236.3	140.8	95.5	95.8	1.86	830	39.6
32/3	36	800	188	313	63	241.3	57.8	96.5	92.1	1.81	548	26.2
32/3	36	800	188	317	76	239.9	71.2	94.6	93.1	1.83	588	28.1
Mean (32/3)	36	800	188	313	95	239.1	89.9	95.5	93.7	1.83	655	31.3

<sup>1</sup>WuC = Wuchang Bream

<sup>2</sup>SiC = Silver Carp

<sup>3</sup>P<sub>G</sub> = Gross Production