

Cage Production of Japanese Sea Bass Weaned From Trash Fish to Extruded Feed at Sub-Market Size

Results of ASA/China Feeding Trial 35-01-128

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ABSTRACT

Weaning of 74-g Japanese sea bass (*Lateolabrax japonicus*) from trash fish to extruded feed, followed by growout to market size on extruded feed, was demonstrated in a cage feeding trial at Longmen Town, Qingzhou City, Guangxi Province, China. Sea bass that had only been fed with trash fish were stocked in three, 6.4-m³ cages at a density of 156 fish per m³ and weaned from trash fish to extruded feed over a period of one week. After weaning to extruded feed, the sea bass were fed to satiation twice daily with a 43/12 extruded, floating marine fish feed formulated by ASA. Dehulled soybean meal was used as a partial replacement for fishmeal in the 43/12 feed. Sea bass grew from 74 g to 505 g in 144 days on the ASA feed, with an average FCR of 1.31:1. Average fish carrying capacity at harvest was 72 kg/m³ of cage. The average fish survival rate was 91.1%. Net economic return and return on investment for the trial were RMB 714/m³ and 82.2%, respectively. Sea bass weaned from trash fish to extruded feed without difficulty and exhibited good production performance on the extruded feed following weaning. Feed conversion efficiency with the ASA 43/12 feed, which contained 35% dehulled soybean meal by weight, was significantly lower than that obtained with trash fish. Feed cost per kilogram of fish growth with the ASA extruded feed was RMB 6.29, which was substantially below the cost of producing sea bass with trash fish. Sea bass demonstrated a high degree of tolerance for low salinity water conditions that prevailed at the Longmen site throughout the duration of the feeding trial.

INTRODUCTION

The American Soybean Association (ASA), in cooperation with the Xiou San Cage Fish Farm and the Guangxi Aquaculture Technology Extension Center, Guangxi Province, conducted a cage feeding trial with Japanese sea bass in 2001 at Longmen Town, Qingzhou City. The objective of the trial was to demonstrate the feasibility of weaning sub-market size Japanese sea bass from trash fish to extruded aquafeed and completing the culture of the sea bass to market size with the extruded feed.

MATERIALS AND METHODS

Three, 6.4-m³ cages (2 m x 2 m x 1.6 m) at the Xiou San cage fish farm at Longmen Town, Qingzhou City, Guangxi Province, were used for the trial. Cages were constructed of nylon mesh netting with a rigid top frame, opaque cover and feed enclosure to contain extruded, floating feed pellets. The three cages were positioned in a single row on the outside edge of the farm, with a minimum of one cage width between and on all sides of each cage to allow good water exchange.

The three trial cages were stocked in May with 75-g Japanese sea bass (*Lateolabrax japonicus*) at a density of 156 fish per m³. The sub-market size sea bass had previously only been fed trash fish. The sea bass were weaned over a one-week period from trash fish to the ASA 43/12 (43% crude protein and 12% crude fat) marine fish growout feed in extruded, floating pellet form (Table 1). The ASA 43/12 feed is formulated with 35% soybean meal to reduce feed cost. Shanghai DaJiang aquafeed mill produced the feed. Weaning was accomplished by replacing a portion of the trash fish each day with extruded feed until the sea bass were consuming 100% extruded feed. The trial was started after weaning to extruded feed was completed. During the trial the sea bass in all trial cages were fed to satiation twice daily with the extruded feed. Fish in all trial cages were fed identically at each feeding.

Trial management was based on the ASA LVHD cage production model. Fish in all cages were sampled once per month on the same date each month. All cages were harvested at the conclusion of the trial to determine average fish weight, gross and net production, feed conversion ratio (FCR) and survival. Production costs were recorded throughout the trial to permit calculation of net economic return and return to investment (ROI) at the end of the trial.

RESULTS

Sea bass were fed for 144 days between 1 June and 23 October 2001. On 5 July it was found that nearly all of the fish in cage #2 had escaped through a hole in the cage netting. Cage #2 was subsequently withdrawn from the trial. Sea bass in the remaining two replicate cages grew from 73.5 g to an average weight of 505 g during the 144-day feeding period (Figure 1; Table 2). Average FCR with the ASA 43/12 feed was 1.31:1. Average fish carrying capacity at harvest was 71.9 kg/m³. The average fish survival rate was 91.1% (Table 2).

Feed cost per kilogram of fish growth with the ASA extruded feed was RMB 6.29. Average market price for Japanese sea bass was RMB 22/kg. Net economic return and return on investment (ROI) for the two trial cages averaged RMB 714/m³ and 82.2%, respectively (Table 2).

SUMMARY AND CONCLUSIONS

Sea bass were weaned from trash fish to extruded feed without difficulty and exhibited good production performance on the extruded feed from a starting size of 74 g to a market size of 500 g. Feed conversion efficiency with the ASA 43/12 feed, which was formulated with 35% soybean meal to reduce cost, was significantly lower than that obtained with trash fish. Feed cost per kilogram of fish growth with the ASA extruded feed was RMB 6.29, which was substantially below the cost of producing sea bass with trash fish.

Environmental conditions at the Longmen trial site were below optimum, with low salinity prevailing throughout the 144-day trial period. Salinity ranged from 0 ppt to 14 ppt during the trial. Sea bass demonstrated a high degree of tolerance for the low salinity water conditions that prevailed at the trial site.

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Chinese Currency and Production Unit Conversions:

RMB 8.26 = US\$1.00

1.0 kg = 2.2 lb

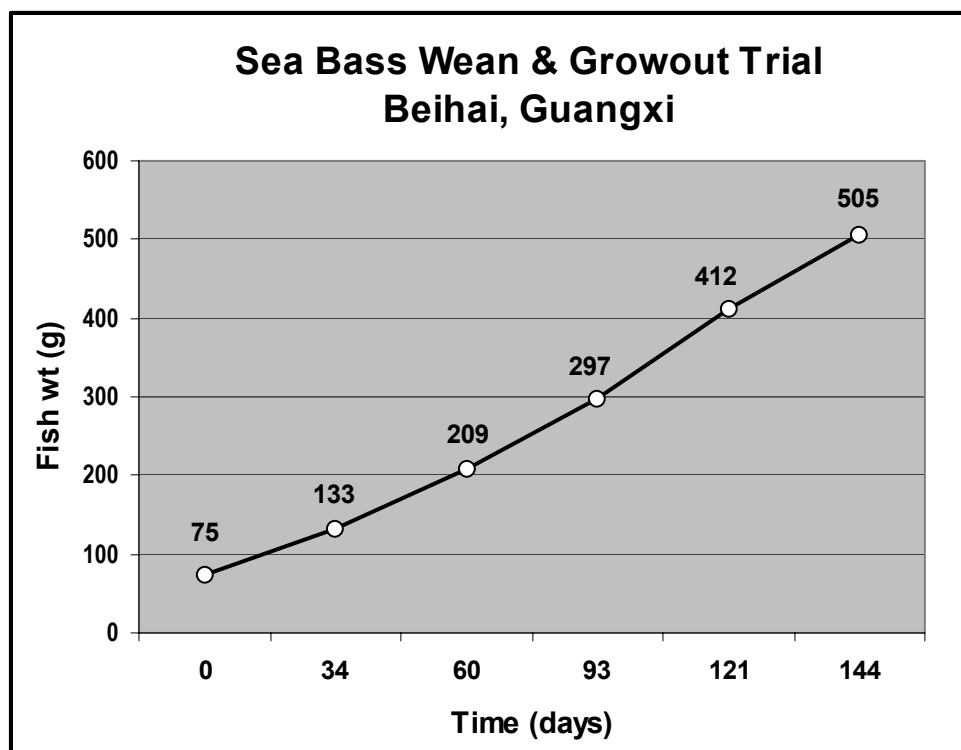


FIGURE 1. Growth curve for Japanese sea bass cultured with extruded aquafeed following weaning from trash fish. Sea bass grew from 74 g to 505 g in 144 days on the ASA 43/12 extruded aquafeed, with an average FCR of 1.31:1. The ASA feed was formulated with 35% soybean meal to reduce cost, and yielded significantly lower FCR and feed cost per unit of fish growth than trash fish. Average feed cost per kilogram of sea bass growth with the 43/12 extruded feed was RMB 6.29.

Table 1. Formula for the ASA 43/12 marine fish growout feed used in the 2001 sea bass trial conducted at Longmen Town, Qingzhou City, Guangxi Province, China.

Ingredient	Percentage of feed
Soybean Meal 43	35.00
Fishmeal, anchovy 63/6.5	37.00
Wheat Flour 10	14.20
Wheat Gluten	4.60
Fish Oil, Unspec.	8.40
Vit PMX	0.50
Min PMX	0.25
Stable Vitamin C35	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. 43/12 indicates 43% crude protein and 12% crude fat.

Table 2. Results of the 2001 ASA aquaculture trial at Longmen, Guangxi Province, that demonstrated weaning of Japanese sea bass from trash fish to extruded feed, followed by growout to market size in 6.4-m³ cages using the ASA LVHD cage production model and ASA extruded aquafeed.

Cage No.	Feeds	Stocking rate (fish/m ³)	Initial fish weight (g)	No. days fed	Fish harvest weight (g)	Survival (%)	P _G ¹ (kg/m ³)	FCR	Net income (RMB/m ³)	ROI (%)
1	43/12	156	73.0	144	505	92.9	73.3	1.27:1	745	85.8
3	43/12	156	74.0	144	505	89.3	70.5	1.34:1	682	78.6
Mean	43/12	156	73.5	144	505	91.1	71.9	1.31:1	714	82.2

¹ P_G = Gross Production, expressed as fish weight per cubic meter of cage