

# **Production of Goldenfin Pompano in 6.4-m<sup>3</sup> Cages In Coastal Waters in Zhuhai, China**

## **Results of ASA/China 2004 Feeding Trial 35-04-104**

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### **ABSTRACT**

A feeding trial was conducted in Zhuhai, Guangdong Province, China to demonstrate growth performance of goldenfin pompano in near-shore coastal cages with a high soybean meal inclusion feed. Pompano were stocked in three, 6.4-m<sup>3</sup> cages at a density of 1,600 fish per cage. Pompano were fed a 43% crude protein, 12% crude lipid diet formulated with soybean meal at a 32% inclusion rate as partial substitution for fish meal.

Pompano grew from 5 g to an average weight of 346 g per fish in 137 days of feeding. Gross production averaged 56.9 kg/m<sup>3</sup> (364 kg per cage) in the three trial cages. The average survival rate for fish in the three cages was 65.6%. Average FCR was 2.3:1. Average net economic return was RMB 2,501 (\$303) per cage, yielding a 34.2% return on investment.

Fluctuating salinity and turbidity caused chronic water quality problems that impacted pompano performance. Poor water quality was estimated to have increased FCR by approximately 15% and reduced survival by approximately 25%. Results of the trial indicate that Guishang Island is not a good site for pompano culture due to the severity of water quality fluctuations.

## INTRODUCTION

The American Soybean Association (ASA), in cooperation with Guangdong Provincial Fisheries Extension Center and the China National Fisheries Extension Center (NEC), conducted a cage feeding trial with goldenfin pompano (*Trachinotus ovatus*). The objective of the trial was to demonstrate pompano growth and economic performance in low volume high density (LVHD), near-shore ocean cages with a high soybean meal inclusion feed.

## MATERIALS AND METHODS

Three cages of average size 6.4-m<sup>3</sup> (underwater volume) at Guishang Island near Zhuhai, Guangdong Province were used for the feeding trial. Two cage designs were used for culturing pompano. Suspended nylon nets, weighted at the lower corners, were used to culture pompano from size 5 g to 50 g. At fish size 50 g, the pompano were transferred rigid frame cages in which nylon netting was stretched over a rigid steel cage frame. All cages were individually fitted with an opaque cover and a feed enclosure to contain extruded, floating feed pellets. Cage placement was at the perimeter of the cage farm, with a minimum spacing of two meters between and on all sides of each cage.

Fish were 5.5-g goldenfin pompano purchased from local hatcheries and cultured by the cooperator to the trial size. Pompano were stocked in the three trial cages on 21 May at a density of 250 fish/m<sup>3</sup> (1,600 fish per cage). Fish in all three trial cages were of uniform size and age at stocking. Target fish size was the maximum the fish would grow to within the 2004 culture season.

Pompano were fed a modified form of the ASA 43/12 marine growout feed in extruded, floating pellet form (Table 1). The feed was modified from the standard ASA 43/12 formula to use regular, 44% crude protein soybean meal instead of dehulled, 47.5% crude protein soybean meal. Dehulled soybean meal was not available in the China market due to high soybean meal prices prevalent in 2004. The modified feed was formulated with soybean meal at a 32% inclusion rate as partial replacement for fishmeal. Fish were fed to satiation twice daily, with fish in all three cages fed identically at every feeding. Feed pellet size was increased as the fish grew so that the maximum size pellet that all fish could consume was being fed.

Trial management was based on the ASA LVHD cage production model. Fish in all cages were sampled once per month on approximately the same date each month. At the conclusion of the trial, all cages were emptied and the fish in each cage 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 return on investment (ROI) were calculated at the end of the trial.

## **RESULTS**

Pompano were fed a total of 137 days between 23 May and 5 October 2004. Pompano grew from 5.5 g to an average weight of 346.3 g during this feeding period (Table 2). Gross production averaged 56.9 kg/ m<sup>3</sup>, or 364 kg per cage (Table 2). Average pompano survival rate was 65.6%. Average FCR for pompano with the high soy-inclusion feed was 2.3:1.

Average feed cost per kilogram of fish growth was RMB 14.65 (\$1.77/kg)<sup>1</sup>. Net economic return for the 137-day production cycle averaged RMB 2,501 per cage (\$303) at a pompano market price of RMB 27/kg (\$3.27/kg) (Table 2). Return on investment averaged 34.2% for the three trial cages (Table 2).

## **SUMMARY AND CONCLUSIONS**

Pompano exhibited reasonable growth and feed conversion efficiency in this coastal cage trial. Fish performance, however, was compromised by water quality conditions at the trial site. Poor water quality was estimated to have increased FCR by approximately 15% and reduced survival by approximately 25%. Salinity fluctuation was a chronic problem, due to the trial site's location near the estuary of the Pearl River (Figure 1). Salinity was found to drop significantly and turbidity increase significantly following periods of rainfall over nearby land masses. Water quality was particularly poor during the last half of the trial, during the months of August to October. Results of the trial indicate that Guishang Island is not a good site for marine fish culture due to the severity of water quality fluctuations.

## **ACKNOWLEDGEMENTS**

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<sup>1</sup> RMB 8.26 = \$1.00

**ASA FY04 Zhuhai Pompano Trial**

Table 2. Formula for the 43/12,, high soy-inclusion marine fish feed used in the 2004 pompano trial conducted at Guishang Island near Zhuhai, Guangdong Province, China.<sup>1</sup>

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Ingredient	Percentage of feed
Fishmeal 68/10	40.00
Soybean Meal 44	32.00
Wheat Flour	17.25
Fish Oil, Unspec.	6.95
Corn Gluten Meal	2.00
Soy Lecitin	1.00
Vit PMX F-2	0.50
Min PMX F-1	0.25
Stay C 35	0.03
Ethoxyquin	0.02
TOTAL	100.00

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<sup>1</sup>The 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.

**ASA FY04 Zhuhai Pompano Trial**

Table 2. Results of the 2004 ASA aquaculture trial at Guishang Island, Zhuhai, that demonstrated goldenfin pompano growth performance in 6.4-m<sup>3</sup> coastal cages with a high soy-inclusion feed.

Cage No.	Fish stocking size (g)	Stocking rate (fish/cage)	No. days fed	Fish harvest wt. (g)	Fish production kg/cage	Fish production kg/m <sup>3</sup>	Survival (%)	FCR	Net (RMB/cage)	ROI (%)
1	6.5	1,600	137	352.5	399	62.3	70.7	2.09	3,440	47.0
2	5.1	1,600	137	348.9	351	54.8	62.8	2.37	2,144	29.3
3	4.9	1,600	137	337.4	342	53.5	63.4	2.42	1,919	26.2
Mean	5.5	1,600	137	346.3	364	56.9	65.6	2.30	2,501	34.2

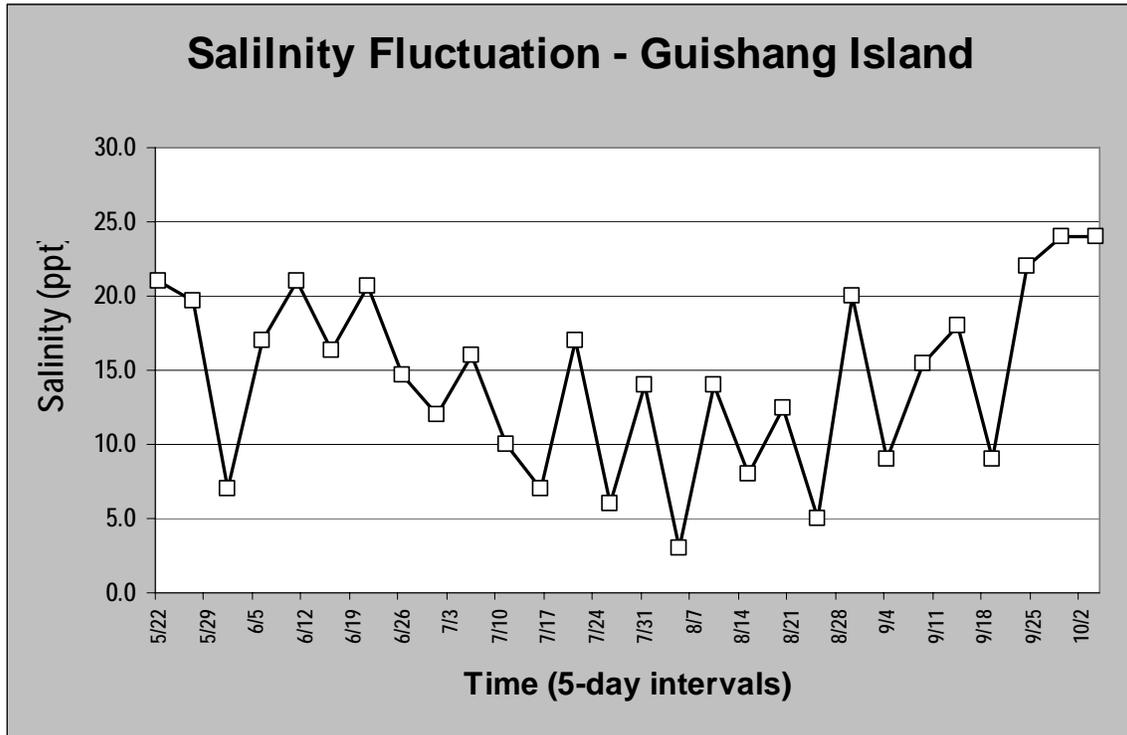


Figure 1. Salinity fluctuation at Guishang Island, Zhuhai, Guangdong Province, China during the 2004 ASA pompano coastal cage culture trial. Salinity and turbidity fluctuation at the trial site significantly affected fish performance. Significant water quality fluctuations make the Guishang Island area a high risk site for culturing marine fish.