

Pacu Fingerling Production with Soy-Based Feeds: Nanjing

Results of ASA/China 2003 Feeding Trial 35-03-109

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ABSTRACT

A feeding trial was conducted near Nanjing, Jiangsu Province, to demonstrate fry to fingerling growth of pacu using the ASA 80:20 pond production model and ASA soymeal-based feeds. Juvenile fish were stocked in three, 4.0-mu (0.27-ha) ponds at a density of 7,000 pacu and 1,000 silver carp per mu (105,000 pacu and 15,000 silver carp per hectare). Pacu grew from 1.6 g to an average weight of 22 g per fish in 59 days of feeding, with an average FCR of 0.50:1.

INTRODUCTION

The American Soybean Association (ASA), in cooperation with Jiangsu Provincial Fishery Extension Center, the Jiangpu County Fish Stock and Breeding Farm, and the China National Fisheries Extension Center (NEC), conducted a 2-month pond feeding demonstration with pacu. The objective of the trial was to demonstrate pacu growth and economic efficiency from juvenile to fingerling size using ASA soymeal-based feeds and the ASA 80:20 pond production model.

MATERIALS AND METHODS

Three ponds of average size 4.0-mu at the Jiangpu County Fish Stock and Breeding Farm near Nanjing, 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.

Fish were 1.6-g pacu *Piractus branchyomum* purchased by Jiangpu County Fish Stock and Breeding Center. Pacu were stocked in the three demonstration ponds in June 2003 at a density of 7,000 fish per mu (105,000 fish per hectare), together with 1,000 silver carp fry per mu (15,000 fish per hectare).¹ Fish in all three trial ponds were of uniform size and age at stocking.

¹ 15 mu = 1 hectare

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Fish all the three demonstration ponds were lost to flooding. A second stock of pacu were obtained in August and the demonstration was restarted on August 11.

Pacu were fed the ASA 41/11 fry feed in crumble form from fish size 0.1-g to fish size 3-g (Table 1). At size 3-g, the pacu were weaned to the ASA 36/7, soymeal-based fingerling feed in extruded, floating pellet form (Table 2). All feeds were formulated by ASA and produced by Cargill in Jiangsu Province. Fish were fed to satiation twice daily, with fish in all three ponds fed identically at each feeding.

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 each stage of the trial, all ponds were drained and the pacu 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.

RESULTS

Pacu were fed a total of 59 days between 12 August and 9 October 2003. Pacu grew from 1.6 g to an average weight of 22.3 g in 59 days (Table 3). Gross production averaged 126.7 kg/mu (1,900 kg/ha) for pacu and 30.6 kg/mu (459 kg/ha) for silver carp (Table 3).² Average pacu and silver carp survival rates were 82.4% and 50.3%, respectively. Average FCR for pacu with the ASA soymeal-based feeds was 0.50:1.

SUMMARY AND CONCLUSIONS

Flooding resulted in the loss of the initial stocks of fish in the three demonstration ponds. Additional stocks of fish were obtained and the ponds were restocked and the demonstration restarted on August 11. The August starting date limited the demonstration feeding period to 59 days, which was insufficient for the pacu to grow to the target fingerling size of 75 g.

Pacu exhibited excellent growth and feed conversion efficiency with the soymeal-based fry and fingerling feeds during the 59-day feeding demonstration. FCR values of 0.43:1 to 0.58:1 indicated significant nutrition was also likely obtained from natural pond organisms. The farm manager reported that profit in the ASA demonstration was 35% to 40% higher than with traditional culture practices.

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² kg/mu x 15 = kg/ha

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Table 1. Formula for the ASA 41/11¹, soymeal-based fry feed used in the 2003 pacu demonstration feeding trial in Nanjing, Jiangsu Province, China. Cargill feed mill produced the feed in extruded, floating pellet form.

Ingredient	% of total
Soybean Meal 47.5	46.3
Wheat, SWW	13.0
Corn Gluten Meal 60%	15.0
Fishmeal, Anchovy 65/10	13.5
Fish Oil, Unspec.	3.93
Soy Oil	4.0
Soy lecithin	1.5
Ca Phosphate Mono	1.7
Vit PMX F-2	0.75
Min PMX F-1	0.25
Stay C-35%	0.05
Ethoxyquin	0.02
TOTAL	100.00

¹The numerical component of the feed description refers to the percentage of protein and lipid, respectively, in the ration, i.e. 41/11 indicates 41% crude protein and 11% crude lipid.

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Table 2. Formula for the ASA 36/7¹, soymeal-based fingerling feed used in the 2003 pacu demonstration feeding trial in Nanjing, Jiangsu Province, China. Cargill feed mill produced the feed in extruded, floating pellet form.

Ingredient	Percent of total
Soybean Meal 47.5	46.0
Wheat, SWW	19.0
Corn Gluten Meal 60%	10.0
Wheat middlings	8.0
Fishmeal, Anchovy 65/10	8.0
Fish Oil, Unspec.	4.0
Ca Phosphate Mono	2.2
Soy lecithin	1.75
Vit PMX-F2	0.75
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 lipid, respectively, in the ration, i.e. 36/7 indicates 36% crude protein and 7% crude lipid.

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Table 3. Results of the 2003 ASA aquaculture trial in Nanjing that demonstrated fry to fingerling growth performance of pacu in ponds using the ASA 80:20 production model and soymeal-based fry and fingerling feeds.

Pond No.	Pacu stocking size (g)	Stocking rate (fish/mu)	No. days fed	Harvest wt. (g)		P _G ² (kg/mu)		Survival (%)		FCR	Net (RMB/mu)	ROI (%)
				Pacu	SiC ¹	Pacu	SiC	Pacuj	SiC			
1	1.6	7,000	59	27.0	150	129.0	14.4	68.3	96	0.48	725	111.2
2	1.6	7,000	59	20.5	148	142.5	14.4	99.5	97	0.43	881	135.2
3	1.6	7,000	59	19.5	136	108.7	12.9	79.5	95	0.58	516	79.2
Mean	1.6	73,000	59	22.3	145	126.7	9.5	82.4	96	0.50	707	108.5

¹SiC = Silver Carp

²P_G = Gross Production