SUPPLEMENTAL FEEDING OF NILE TILAPIA (*OREOCHROMIS NILOTICUS* L.) IN FERTILIZED PONDS USING COMBINED FEED REDUCTION STRATEGIES

9th International Symposium on Tilapia in Aquaculture

Shanghai Ocean University, Shanghai, China

April 21-25, 2011

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INTRODUCTION

- Grow-out culture of tilapia has been modified with several technologies including feeding option that promotes cost-saving strategies

- Reduction of food costs without a reduction in fish yield can be a result of more efficient food consumption (i.e. lack of waste), better food utilization (increased food conversion ratio) or both

- Feed is the most costly component of growing tilapia
- It constitutes 60-70% of the total variable costs for producing tilapia

Typical Farm Budget for Tilapia Pond Culture		
Gross Income		643,854
Less: Cash costs		
Fingerlings	37,801	
Feed	262,400 ←	63%
Fertilizer	5,417	
Diesel	42,652	
Hired labor	19,718	
Non-cash cost	49,088	
Total Costs		417,076
Net Income		226,778
Price/kg of tilapia	40	
Production cost/kg of tilapia	26	
Profit margin	35%	

INTRODUCTION

- Previous Aquafish CRSP studies introduced different feeding strategies with the aim of reducing the total cost of tilapia production that can increase the profit of the farmers while limiting the degradation of the environment with lesser nutrient load given to the fish

AquaFish CRSP Feeding Strategies

- Delayed feeding
- Sub-satiation feeding (Brown *et al.*, 2004)
- Alternate-day feeding (Bolivar *et al.*, 2010)
- Combined feed reduction strategies (Borski *et al.*, 2010)

Objective of the Study

To determine the effect of using combined feed reduction strategies on the grow-out culture of Nile tilapia in fertilized earthen ponds

Place and Duration of the Study

Freshwater Aquaculture Center, Central Luzon State University, Science City of Munoz, Nueva Ecija, Philippines

July – September 2010

MATERIALS AND METHODS

- Experimental Units
  - Nine (9) 500 m^2 earthen ponds
- Stocking Density
  - 4 pcs./m^2 (Average Weight = 0.36g)
- There were 3 replicates per treatment
- Fish were all fed with Commercial Feeds
  - First Month – Pre-starter Feeds with 34% CP
  - Second Month – Starter Feeds with 34% CP
  - Third Month until Harvest – Grower Feeds with 31% CP

MATERIALS AND METHODS

- Individual length and weight of fish samples were measured on the initial and final sampling

- Fish sampling measuring bulk weight was done every two weeks

MATERIALS AND METHODS

- Feeding adjustment was done biweekly based on a feeding rate from 20% down to 2% of the average body weight

MATERIALS AND METHODS

- Water quality parameters were measured weekly such as water temperature, dissolved oxygen, pH, Secchi disc visibility depth (SDVD) and total ammonia nitrogen

MATERIALS AND METHODS

- Weekly fertilization of the experimental ponds was adjusted based on the SDVD
- Inorganic Fertilizers (Urea and Ammonium Phosphate) were used at the rate of 28 kg N and 5.6 kg P per hectare per week

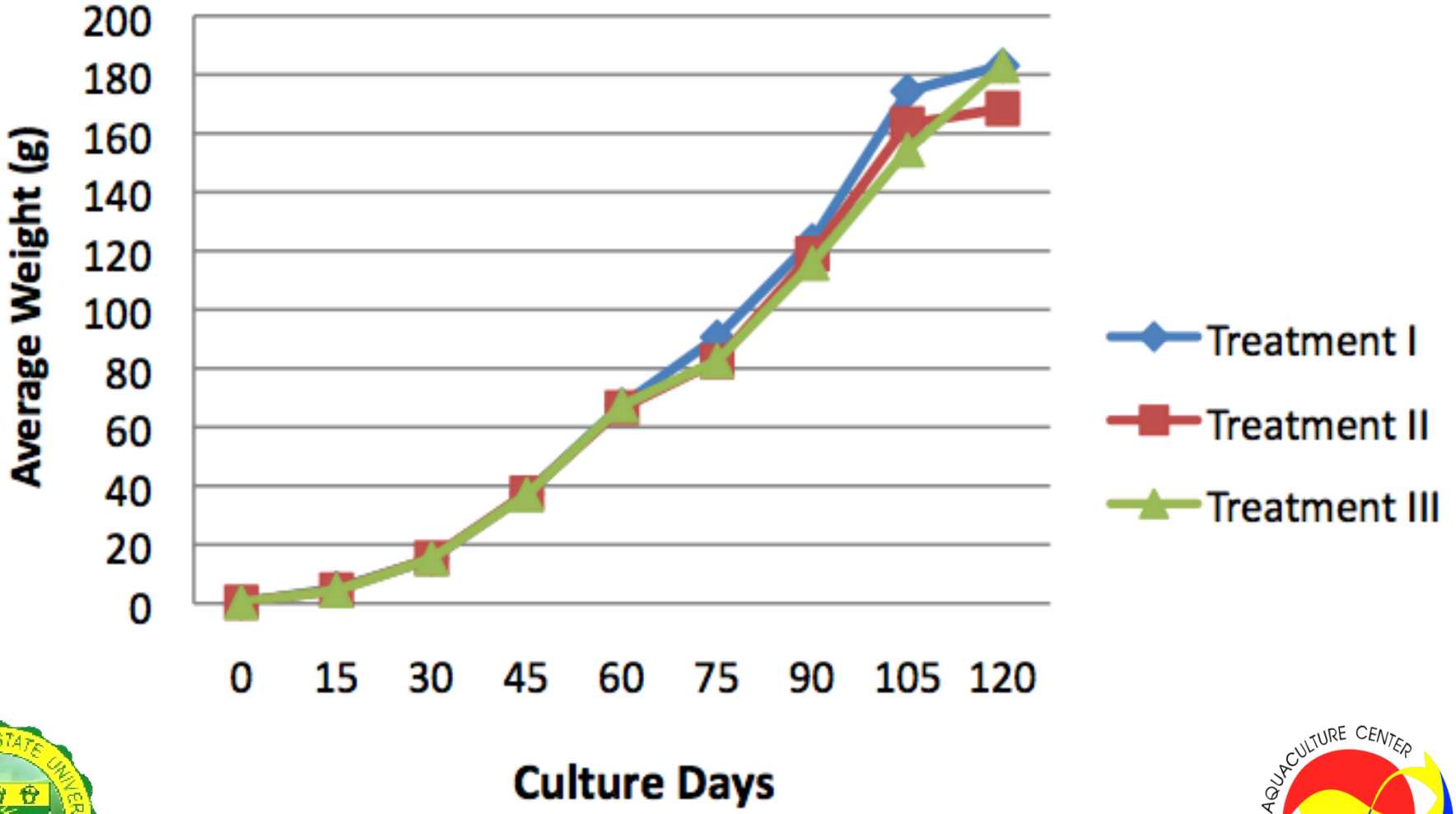
MATERIALS AND METHODS

- Treatments
  - Treatment I – 67% Daily Feeding until harvest
  - Treatment II – 67% Daily Feeding for 60 days, 50% daily feeding until harvest
  - Treatment III – 67% daily feeding for 60 days, 100% alternate-day feeding until harvest
- Statistical Analysis

  Data analysis was done using Analysis of Variance (ANOVA) and Duncan's Multiple Range Test (DMRT) for the comparison of treatment means.

RESULTS AND DISCUSSION

Growth pattern of fish stock



Growth performance of fish stock

Treatment	Final Average Weight (g)	Final Average Length (cm)
I	183.1 ± 77.1^{a}	20.1 ± 2.9^{a}
II	168.5 ± 39.9^{a}	19.9 ± 1.4^{a}
III	183.1 ± 16.0^{a}	20.5 ± 0.6^{a}

Means with the same letter superscipt within a column are not significantly different ($P<0.05$)

Growth performance of fish stock

Treatment	Feed Conversion Ratio	Yield per Hectare (kg/ha)	Feed Consumed per Hectare (kg/ha)	Percent Survival (%)
I	1.8 ± 0.3^{a}	2968.7 ± 439.6^{a}	5201.1 ± 1238^{a}	46.9 ± 24.1^{a}
II	2.0 ± 0.1^{a}	1980.7 ± 541.8^{b}	3965.2 ± 1037^{a}	29.3 ± 4.7^{a}
III	2.0 ± 0.2^{a}	2024.7 ± 329.0^{b}	4045.3 ± 1104^{a}	27.7 ± 4.1^{a}

Means with the same letter superscipt within a column are not significantly different ($P<0.05$)

Water Quality Readings

Parameters	Treatment I	Treatment II	Treatment III
	Min – Max	Min – Max	Min – Max
Dissolved Oxygen (mg/l)	0.98 – 12.87	1.20 – 11.41	1.39 – 6.64
Water Temperature (°C)	28.43 – 36.37	28.53 – 36.27	28.50 – 37.50
pH level	7.07 – 8.37	6.97 – 8.20	6.93 – 8.27
Total Ammonia Nitrogen (mg/l)	0.017 – 1.090	0.018 – 1.456	0.022 – 0.942
Nitrite-Nitrogen (mg/l)	0.067 – 0.075	0.067 – 0.075	0.075 – 0.075
Secchi Disc Visibility Depth (cm)	23.3 – 72.7	22.3 – 78.3	24.3 – 57.7

SUMMARY

- Results of this study showed that there were no significant differences observed on the growth performance and survival of Nile tilapia after 120 days of culture period
- Significant difference was observed on the fish yield with Treatment I having the highest yield among treatments

CONCLUSION

- The combined feed reduction strategies did not significantly affect the growth performance of the fish
- It reduced the cost of grow-out production of tilapia due to the reduction of feed

Funding for this research was provided by the

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COLLABORATIVE RESEARCH SUPPORT PROGRAM

USAID FROM THE AMERICAN PEOPLE

OSU Oregon State University

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The AquaFish CRSP is funded in part by United States Agency for International Development (USAID) Cooperative Agreement No. EPP-A-00-06-00012-00 and by US and Host Country partners.

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THANK YOU!