THE GROWTH AND SURVIVAL RATE OF {PRIVATE }OREOCHROMIS NILOTICUS FINGERLINGS FED WITH VARYING PERCENTAGES OFLEUCAENA LEUCOCEPHALA LEAF MEAL BASED DIETS

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ABSTRACT

A-ten-week feeding trial was carried out to evaluate the growth and survival rate of *Oreochromis noloticus* fed with varying percentage levels of *Leucaena leucocephala* leaf meal for groundnut cake in the various diets were 0% - Diet 1, 25 & - Diet 2, 50& - Diet 3 and 75% - Diet 4.

Ten fingerlings with an average weight of 0.44g were stocked at the rate of 10 fish per bowl and fed at 5% body weight.

Diet 1 with 0% inclusion of leucaena leaf meal gave a significant difference (P>0.05) in growth and survival rate compared with diets 2, 3 and 4.

The water quality parameters recorded were appropriate for fist culture.

INTRODUCTION

The incessant soaring costs of conventional fish feed ingredients in Nigeria is a major cause of increase in the production cost and reduction in the profit margin of commercial aquaculturists. Niamat and Jafti (1984) reported that between 40 - 60 percent of the variable costs in expended on feeding in an intensive fish culture system. Agricultural by-products and unconventional feed stuffs can be used as alternative to the very expensive conventional feed stuff in fish feed (Falaye, 1992). Falaye (1988) stressed the need to consider the nutrient composition, relative cheapness and availability of the feedstuff to be selected in fish feed.

Leucaena Leucocephala is a vigorous and drought resistant leguminous tree whose high-protein leaves have been widely used in animal feeds, particularly for ruminants in the tropics. Nuwanyaka (1986) reported 20 percent crude protein level in the leaves of 3 years old stands of leucaena. Ekpenyong (1984) recorded 25.05 and 23.33 crude protein levels in the fresh and dry leaves of leucaena respectively. However, caution should be taken in the use of unconventional dietary ingredients in fish feed due to the presence of some toxic anti-nutritional factors as well as their deficiencies in certain amino acids.

This study aimed at assessing the growth and survival rate of O niloticus fed with varying percentages of L. Leucocephala leaf meal based diets.

MATERIALS AND METHOD

The feeding trialwas conducted for 10 weeksin experimental plastic bowls with a flow-through system. Oreochromis niliticus fingerlings with average weight of 0.44g were stocked at the rate of 10 fish per bowl.

The leucaena leaves collected from University of Ibadan research fkarm were processed bu soaking inwater for 48 hours and sundrying for about 24 hours. The dried leaves were ground and incorporated into the formulated experimental diets at 0% (diet 1), 25% (diet 2), 50% (diet 3) and 75% (diet 4) replacement levels for groundnut cake.

Moisture, protein, lipid, fibre and ash content of experimental diets and experimental fish (at the start and end of the feeding trial) were determined using A.O.A.C. (1990) methods.

Water temperature, pH and dissolved oxygen concentration were monitored and analyzed throughout the period of the experiment according to the techniques of Boy (1980) to maintain desirable level for freshwater fish. The fish were weighed every week and the feed offered was adjusted accordingly.

Computations at the end of the feeding trial were made for the following:

Mean wet weight gain (g) = Initial mean wet weight (g) - final mean wet weight (g)

Total percentage weight gain (%) = Total wet weight gain (g) x 100/Initial wet weight.

specific growth rate (%/day) = 100 [In (final wet weight) - In (Initial wet weight)]/time in days.

Protein efficiency ratio =Net wet weight gain(g) **x 100 /Protein intake (g).**

Food conversion ratio = Food intage (g)/wet weight gain (g).

Net Protein Utilization = 100 (body protein at the end of the feeding trial) - (body protein at the start of feeding trial / (amount of protein consumed).

Incidence of cost = Cost of feed (N) /kg of fish produced.

Profit index = value of fish crop (N) / cost of feed (N).

Results from all calculations were subjected to analyses of variance (ANOVA) and ducan's multiple test as described by steel and Torrie (1960).

RESULTS AND DISCUSSION

The results of proximate analysis of leucaena leat meal are presented in Table 1. While Table 2 shows the growth performance, nutrient utilizaiton and survival rate of *O. niloticus* fed increasinglevels of leucaena leaf meal based diets.

Table 1: Proximate composition of L. leucocephala

{PRIVATE }Parameter	% Dry weight
Moisture	7.50
Ash	11.00
Fat	2.05
Crude protein	24.05
Crude fibre	20.20

Table 2: Growth performance, nutrient utilization and survival rate of *O. niloticus* fed increasing dietary levels of *L. leucocephala* leaf meal.

Treatments				Prameters	
1	2	3		4	Numer of fish
stocked 10	10	10		10	Survival rate %
90a	80a	40c	60b		Initial mean wet weight (g)
0.47a 0.53a	0.42	0.42a	Final mean wet weight (g)		
3.55A 2.62b	2.03b	2.05b	Mean wet weight gain (g)		
3.08a 2.09b	1.61b	1.63b	Total percentage weight gain (%)		
65.53a 39.43b	38.33b	38.81b	Specific growth rate		
1.25a 0.95b	0.98b	0.98b	Feed conversion ratio		
2.44a 3.41b	3.42b	3.41b	Protein efficiency		
ration 1.21a	0.83b	0.73b	0.82b		

Figures in the same row with different superscripts are significantly different (p>).05).

Leucaena has spectacularly increase in popularity over the last ten years among agonomists, forresters and animal nutritionists. its usefulness lies in its availability during the drought, high crude protein (CP) content and digestibility. The proximate analysis of leucaena leaf meal in this study gives 24.05 cp level.

Diet 1 with 0% inclusion of leucaena leaf meal gave the best growth performanceand survivalrate followed closely by diet 2 (25% replacement of GNC) while lowest value was recorded for diet 3 (50% replacement of GNC). Observation fromthis study indicates that substitution of leucaena leaf meal for GNC in this diet of O. niloticus leads to reduction in growth performance and nutrient utilization without significant difference (P>0.05). W and Wang (1987) ina similar trial using O. niloticus and subnstituting leucaena for fish meal stated that is is possible to include soaked leaf meal up to 25% of the dietary crude protein levl with no adverse effects onthe growth. The significant difference (P>0.05) in the survival

Rate of fish in treatments 1,2,3 and 4 is probably due to effect of anti-nutritional factors. The presence of mimosine in L. leucocephala has been a majore factor that limits its usefulness in fish nutrition. The level of anti-nutritional factor can be brought to minimallevelusing appropriate method of treatmentsuch as soaking in water, sundrying and heating.

Growth of fish does not depend on nutrition only but also on suitable enviromental variable like temperature, dissolved oxygen and pH. Failure tomaintain optimum water quality parameters in ponds may result in poor growth or death of fish. However, the mean dissolved oxygen concentration (6.9 mg/l), pH (7.3) and temperature (28^0c) appeared suitable for fish culture as recommended by Boyd (1980).

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