

DEVELOPMENT OF FARM MADE FLOATING FEED FOR AQUACULTURE SPECIES

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Abstract

High cost of extruded floating fish feed necessitated the research into the development of on-farm made floating fish feed using locally available floating agents. Six feeds were formulated to evaluate the effect of catalyst on the buoyancy of the feed (pellets and flakes). The feeds were formulated using yeast and baking powder as catalysts at 5% and 10%, respectively. The results showed significant differences ($P < 0.05$). The 10% catalyst based diets gave the highest percentage of floatation (70%) at 60 minutes of buoyancy test, while the soybean based feed did not float at all. The result showed that, locally developed floating feeds can substitute for the extruded feed.

Key words: floating catalysts, feeds, pellet, flake.

INTRODUCTION

Fish feed accounts for 60-80% of management costs (Olomola, 1990). Local feeds which are sinking pellets are prone to leaching of nutrients (Lopez-Alverado *et al.*, 1994; Falayi *et al.*, 2003). In Nigeria, there are limited numbers of feed producing company that has Extrusion Technology. Therefore, the need for developing floating fish feeds using available local ingredients.

MATERIALS AND METHODS

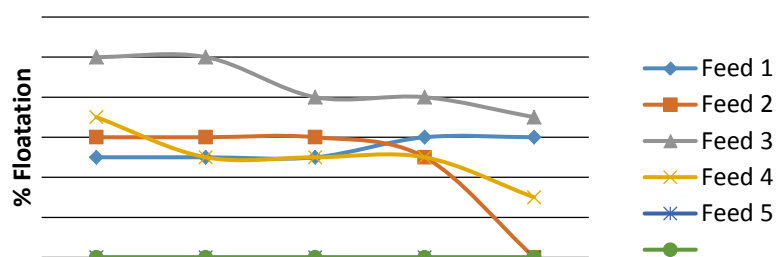
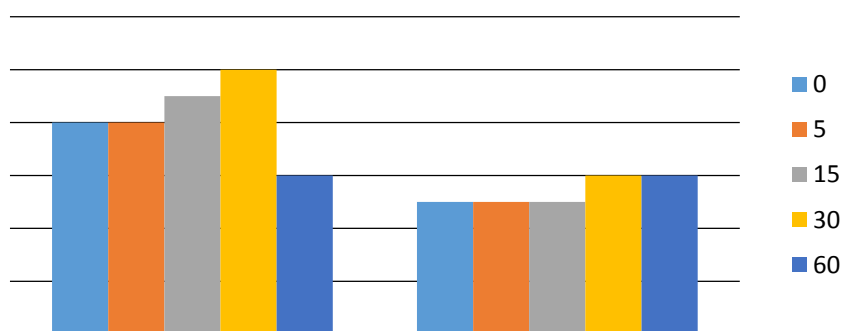
The research was carried out in the Department of Water, Aquaculture and Fisheries Technology of the Federal University of Technology Minna. The feedstuffs used were fish meal, wheat meal, soyabeans meal, yeast, and baking powder obtained at Bosso market in Minna, Niger state, Nigeria. Formulation of the feeds were done using Pearson square method and the feedstuffs were measured with a sensitive weighing balance (CITIZEN 300), mixed together in powdered form and then compounded using warm water at 150ml for every 500g of the compounded feed to form a dough. The compounded feedstuffs were then pelleted with 2mm die pelleting machine. Pelleted feeds were then put in a plastic container for warmth for about 45 minutes for activation of yeast in the dough. The expanded dough were then sun dried for a period of 6 hours and stored in a refrigerator at 4°C. The feeds were evaluated for buoyancy by putting 10 pellets of regular size (5cm) in a 250 ml beaker containing water. The floatation duration was captured by stop watch for a maximum of 60 minutes. Six feeds were produced designated as feed 1 and 2 which are wheatmeal with catalysts at 5 and 10% as control feeds, feed 3 and 4 contained wheat meal, fishmeal and catalysts at 5 and 10% inclusion levels while feed 5 and 6 contained soybean meal with catalysts at 5 and 10% respectively.

RESULTS

The feeds showed significant differences ($P < 0.05$) in the buoyancy analysis. Wheat meal catalyst based feeds 1 and 2 the control feeds floated with significant difference ($P < 0.05$). Feed 3 and 4 also exhibited floatation while soybean-wheat meal based diet (Feed 5 and 6) did not float at all. Furthermore, the fishmeal-wheat meal based feeds with 5% inclusion level had a higher floating rate 70% pellets floated for 60 minutes than the feed with 10% floating catalyst (30%) of same constituents (Table 1, figures 1, 2 and 3).

Table 1: Assessment of Pellets Buoyancy

Feed	0 Minute	5 Minutes	15 Minutes	30 Minutes	60 Minutes
1	50	50	50	60	60
2	60	60	60	50	0
3	100	100	80	80	70
4	70	50	50	50	30
5	0	0	0	0	0
6	0	0	0	0	0

**Fig. 1: Floating time of pellets six feeds****Fig. 3: Floating ability of wheatflour based diet with floating catalyst at 5%**

DISCUSSION

The catalyst aided feeds floatation as observed in both the control diets and the formulated balanced feeds. However, the choice of ingredients played a significant role as it was evident from the results which indicated that, feeds containing ingredients with high molecular weight did not float as in the case of soybean based feeds despite the presence of catalysts. Thus, the disparity in buoyancy observed could be attributed to the ability of feed ingredients to expand at the appropriate inclusion of catalysts (Mbogwu and Adeniji, 1988). The sinking feeds like that of soybean based feeds generate negative nutrient retention in water with serious loss of essential vitamins like A, D, E and K (Lopez-Alverado *et al.*, 1984). However, benthic fishes like catfish may still benefits from the sinking feed (Falayi, *et al.*, 2005)

CONCLUSION

Right selection of feedstuffs and appropriate inclusion level of locally available floating catalysts will achieve positive buoyancy in feeds. This makes the technology adoptable by local farmers compared with hi-tech and expensive extrusion machine.

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