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DEVELOPMENT OF FARM MADE FLOATING FEED FOR AQUACULTURE SPECIES

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ABSTRACT

Six feeds were formulated to evaluate the effect of catalyst on the buoyancy of the feed (pellets and flakes). The feed were formulated using yeast and baking powder as the catalyst at 5% and 10%, respectively. The research result shows that feed formulated at 5% and 10% fishmeal based feed of 5% and 10% catalyst gave the highest floatation while the soyabean based feed with both percentage of catalyst did not float at all. . The objective of this study is to explore the buoyancy potential of locally available floating catalysts to develop floating fish feed on-farm.

KEY WORDS: floating catalysts, feeds, pellet, and flake.

INTRODUCTION

Fish feed cost is a major factor militating against fish culture in Nigeria in that it accounts for about 60-80% of management costs (Olomola, 1990). Pelleted fish feed are prone to leaching of nutrient in pond waters due poor water stability, poor nutrient retention and immediate sinking and disintegration to the bottom of ponds at feeding. This is a big loss in aquaculture input management (Holm and Walther, 1988; Lopez-Alverado et al., 1994; Falayi et al., 2003). Extruded floating feed cost is a significant disadvantage over locally produced dried and moist pellets (Lovell, 1988). The actual extruding machine for floating feed such as Insta PRO 2000 is very expensive and all efforts to procure the machine by the National Agricultural research Project (NARP) during the World Bank Project in 1900's proved abortive in that less effective (Insta PRO 600) extruder, made solely to process soybean for African countries were brought to Nigeria (Falayi, 2009). This has made Nigeria permanent buyer of expanded floating feeds at high cost from United State of America and other western countries. The Nigeria economy policy should not support such outrageous wastage of our foreign exchange. Therefore, it is imperative that emphasis should be geared towards the technology of developing buoyant (floating) fish feeds without adverse effect on the quality of compounded nutrients. Such feed must be very stable and afloat in water for a period of time before it sinks Kearns, 1989; Hilton et al., 1981). The objective of this study is to explore the buoyancy potential of locally available floating catalysts to develop floating fish feed on-farm.

MATERIALS AND METHODS

The research was carried out in Water, Aquaculture and Fisheries Technology Department Laboratory of the Federal University of Technology Minna, Niger state.

Source of feedstuffs

The feedstuffs used in this study included research are: fish meal, wheat meal, soyabeans meal, yeast, and baking powder.

Feeds formulation

Equational method or Algebra method ($x_1+y_1= z$ (eqn 1); $x_2+y_2=p$ (eqn 2); where x_1 and y_1 denote unknown values for wheat meal and catalysts while x_2 and y_2 represent nutritional values for wheatmeal and catalysts respectively and while z and p denote ration target and nutrient level of feed formulation (Falayi, 2009) was adopted for feed 1 and 2 since there was no target crude protein level. Feed 1 and 2 served as control to establish the bouyancy potential of the catalysts. Pearson square method was used for formulating feeds 3, 4, 5 and 6. The other feeds were formulated at 20% crude protein fixing yeast and baking powder at 5% and 10% using the following feedstuffs (Table 1).

Buoyancy Test

The floating ability of pellets and flakes wheat-flour based feed with floating catalyst at 5% and 10% were evaluated for 1hour. 10 pellets /flakes samples were randomly selected. They were put in a 250 ml beaker with 150 ml of freshwater. With the aid of a stop watch degree of floatation was recorded wwithin the time frame of 1 hour. The trial was replicated with their means statistically analyzed. The Density of feed s were calculated [(Mass/Volume (g/cm^3)] as well as the Relative density (Mass of feed/Mass of equal volume of water) were also evaluated to establish the floating level of the feeds as against the mass of water.

Statistical Analysis

Data were subjected to one way analysis of variance to test their significant levels at 5% probability. The means were separated using Turkey's method using Minitab Release 14 while the graphs were drawn using the Microsoft excel window 2007.