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Elaboration and Physicochemical Characterization of Phytonutrients for Tilapia Nilotica (*Oreochromis niloticus).*

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Research Article

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ABSTRACT

Alvins of *Oreochromis niloticus* (1.2 ± 0.04 g) were fed with four test diets. (F1, F2 and F3) formulated using vegetable proteins derived primarily from agricultural by-products and crop residues. The fourth formula contains animal protein in addition to agricultural by-product. After 120 days of experience fry are fed with another test diets (F) with the percentages of protein satisfied *Tilapia* requirements. The results show that among the forms prepared formula (F4) protein-based animal and plant has a better growth rate and the second nutrient (F) balanced greatly reduce the time`s farm.

INTRODUCTION

Tilapia are currently known as 'aquatic chicken' due to their high growth rates, adaptability to a wide range of environmental conditions and ability to grow and reproduce in captivity and feed on low trophic levels. It is thus no surprise that these fish have become an excellent candidate for aquaculture, especially in tropical and subtropical environments [1].

The major constraint to the emergence of fish farming in the country development is the cost of food .For them, the use of fishmeal as the main source of protein in feed for aquaculture is causing the cost consideration of these foods [2].

Tilapia nilotica is an omnivore vegetarian trend. For the composition of feeding Tilapias, sources of nutrients consist mostly of industrial by-products and agricultural. Among these products, some as: fruit dregs, scrap dates are currently available in the area south west of Algeria and are good sources of carbohydrates. Animal offal is a source of protein and fat .wheat bran and barley are source of vegetable protein.

The test formulations of appropriate food for rearing T. nilotica have followed the following main principles:

- Increasing the calories of carbohydrates and lipids in order to save protein needs.
- Introduction of substances rich in vitamins and minerals in foods to determine the lack of vitamins in foods
- Economies point of view, the substitution of ingredients used in certain nutrition aquaculture by fresh local to reduce the cost of the food.

MATERIALS AND METHODS

The Alvins of nile Tilapia, Oreochromis niloticus were obtained from ain sekhouna Saida , Algeria a total of 199 alvins were distributed in 3 aquariums. The experiment was carried out in glass aquariums of 70 x 45 x 45 cm (L x B x H) with water volume maintained at 50 cm level. These fishes were allowed to acclimate and fed with the control.

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Formulation of food by the random choice

Four diets test (F1, F2, F3 and F4) was formulated using agricultural by-product and a commercial in the fourth formula we introduce animal offal (chicken liver) to cover the needs of tilapia in animal protein. The test diets were prepared with random choice. The choice of ingredients is based on their availability in the region of south west Algerian, their nutritional content elements and their prices on the local market. The agricultural by-products are components of energy, fruit meal rich in vitamin C and carbohydrates and chicken liver as a source of animal protein

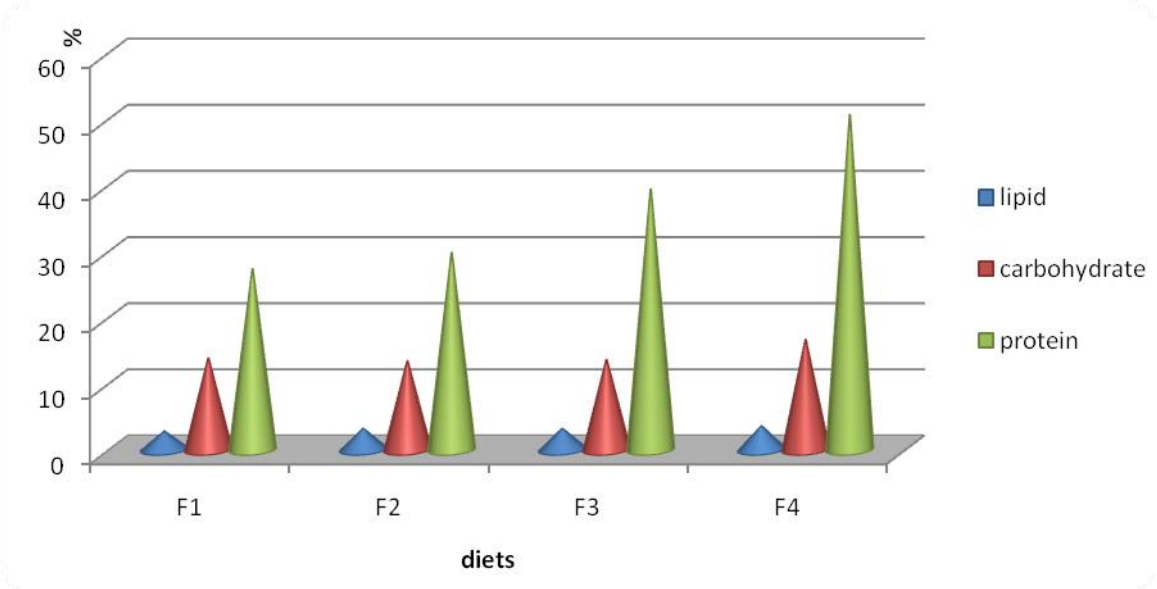


Figure 1: Biochemical composition of diets

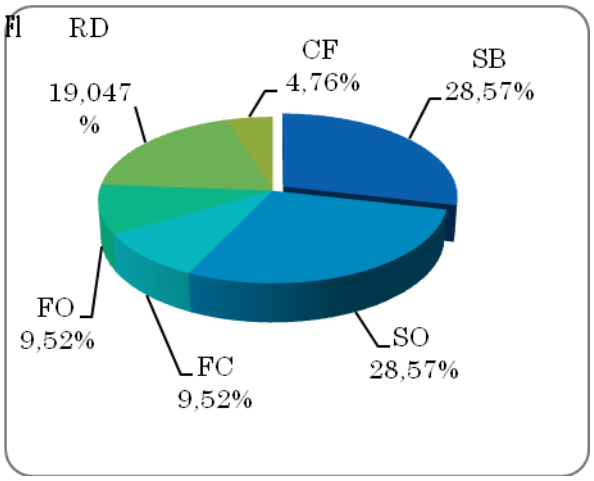
Feed formulation and preparation

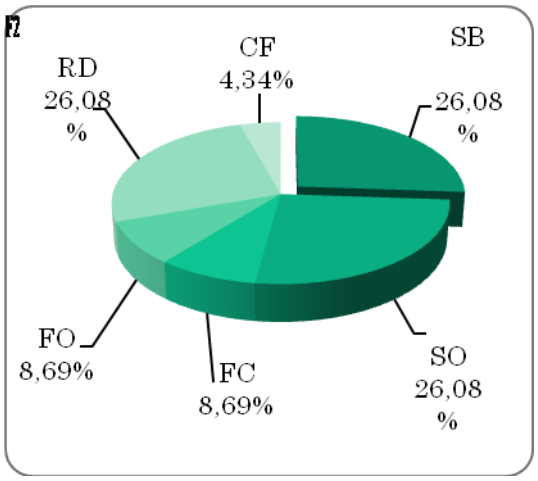
The raw materials have been dried for 48 h in dry areas to remove humidity, each ingredient was pulverized. The different ingredients weighed beforehand is educed meal uses grinder.

The mixture was homogenate to ensure the contribution of any ingredients in definite proportions. Finally the mixture will be granulated using water.

Feedings

Alvins fed third between 8.00-9.00am and 12.00-13.00 between 16.00-17.00 pm daily at 11% [3] body weight for 15t weeks (197 days). The daily ration was divided into three equal feedings. Fish were weighed weekly and the daily ration was adjusted accordingly, the fish were weighed. Growth measured by the percentage of body weight gain, feed conversion ratio _FCR





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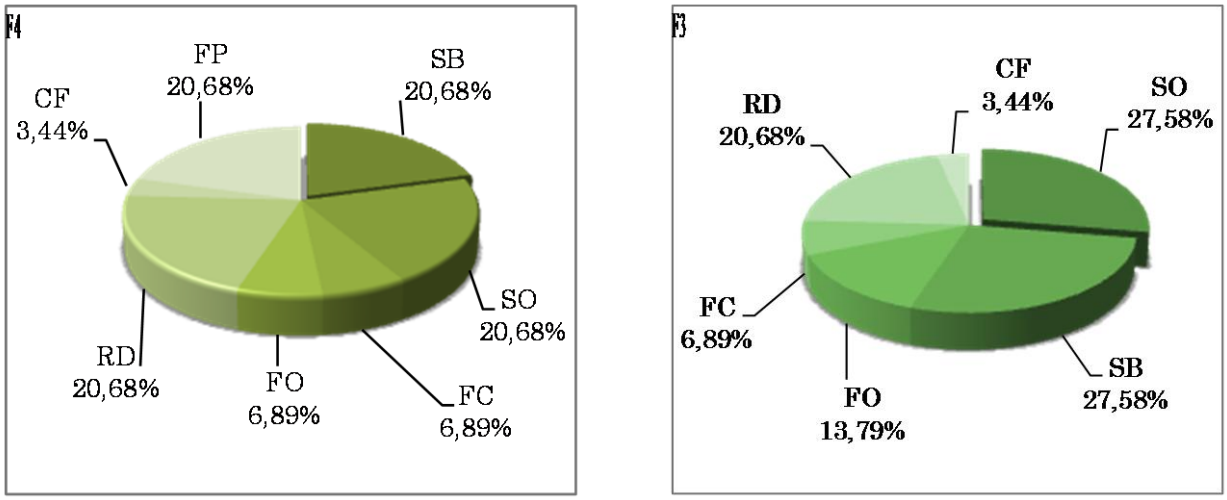

SO: Barley bran , SB: Wheat bran , RD: Garbage date, FO :Flour orange , FC :Flour lemon , CF: Egg shell , FP: Chicken liver

Figure 2: composition of experimental diets for O*reochromis niloticus.*

Feed formulation with Pearson square method

The test diet was formulated for 35% crude protein using Pearson square method. The diet with crude protein levels of 30% were formulated using the trial and error method based on the composition of ingredients inTable1.

Table 1: Analysis of feed component (% dry weight).

Ingredient	SB	SO	FO	R D	FP
Protein (%)	11.5	4.1	9.39	3.5	16.9
Carbohydrate (%)	9.2	8.45	15.30	18.84	-
Lipid (%)	2.6	0.8	2.8	1.5	-

RESULTS AND DISCUSSION

The results obtained with the formula (F1) showed that high energy content in the food saves the need for protein in Tilapia nilotica. The formula (F3) gave interesting results. The increase in the percentage of flour fruit slightly improved fish growth and yield of food.

The increase of protein from animal sources can reduce the time required to raise tilapia to market size [4]. This is important for a more effective performance of livestock.

Tilapia fingerlings are accepted and the nutrient was consumed in a few moments of its distribution. The formula has made based on agricultural products and crop residues (vegetable protein) and even proteins whose animal protein needs of tilapia has have been well adapted procured better growth performance compared with formulas made with nutrient percentages which randomly puts weight gain exceeds the 1g/week suitable test for the formula. And also a better daily growth rate 1g /week.

We present in the (Figure V.3) our results on the growth of fry during the breeding and growth indices by gains in weight. Thus we note that the formulas F3, F4 record the maximum weight gains at the end of the test period of four forms.

Increasing it assumed proportional to body mass, this ratio allows a better comparison of the rate of growth of individuals, because it varies little.

The best daily growth indices obtained for the four nutritional formulas tested in descending order as follows:

ICJ F3> ICJ F2> F1 and the ICJ if histogram above represents these results.

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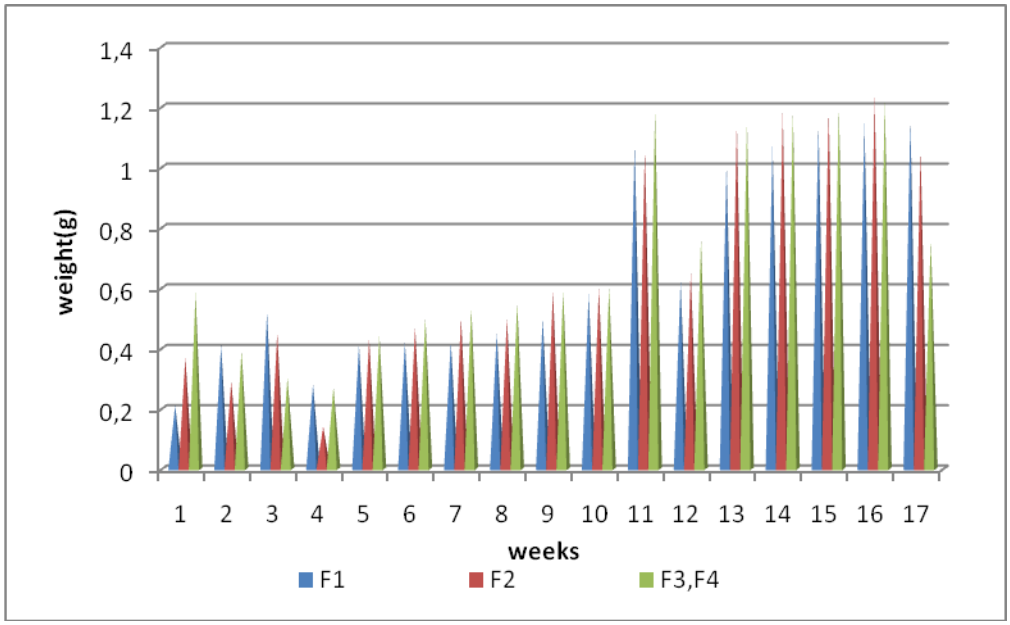

Figure 3: Weekly weight gain (g) of *O. niloticus* fed with 4 test diets

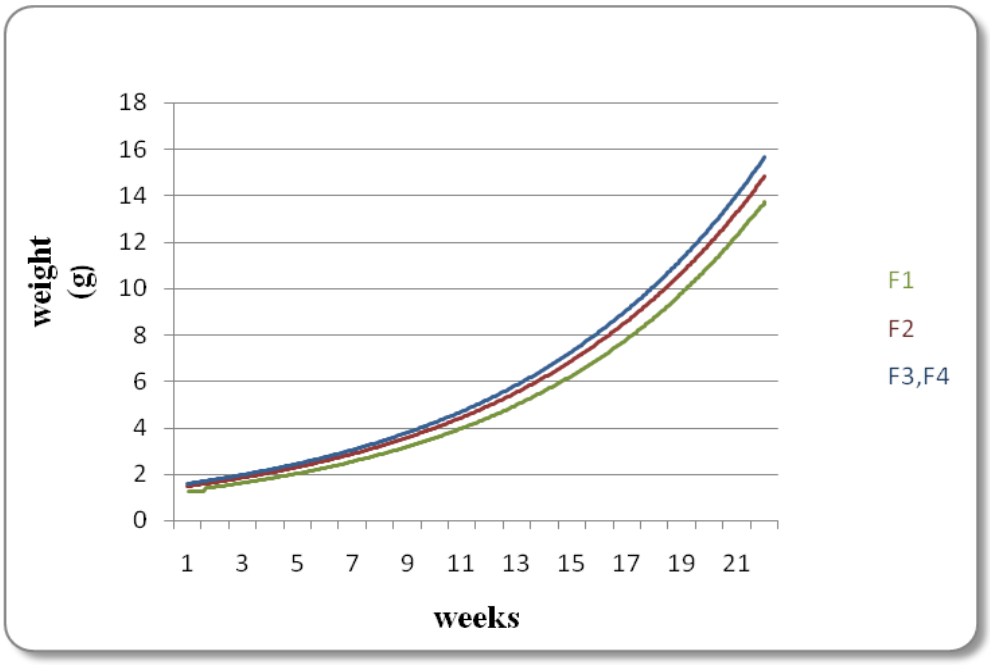

Figure 4: Weekly weight (g) of *O. niloticus* fed with 4 test diets

In interpreting the nutritional values for feed formulations being tested, one should take into account the seasons and a bioticconditions, water temperature and pH of the medium affects the growth rate and thus gain weight.

The formula (F4) has yielded interesting results, due to increase in the percentage of animal protein (animal offal) improved fish growth and yield of food. The giblets are ingredients rich in essential amino acids [5]. The increase in protein from animal sources can reduce the time needed to raise tilapia [4]. This is important for a more effective performance of livestock. A protein of about 30% gives a better performance, and a diet composed entirely of plant products has been successful in breeding [6].

However, we can conclude that the substitution of offal is fish meal is possible what actually has greatly reduced the price of food

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CONCLUSION

The food for the tilapia high may contain a high percentage of carbohydrates for energy, it is recommended that the protein content is increased. For several species of fish, containing approximately 40% crude protein gave the best growth [7]. However, given the price of protein sources, the percentage of protein is often less than optimum for growth.

From an economic perspective, most proteins should come from plant sources. However, a certain percentage of protein should come from animal sources rich in essential amino acids and essential fatty acids. This protein from animal sources is also the most expensive ingredient.

The current composition of the food can vary with availability of ingredients. The resources available for the treatment of these ingredients (drying, milling, storage etc...) to convert them into pellets can also be limited to the choice of ingredients [8].

In the end, the food must contain Tilapia 30-40% protein and a portion of animal [9]. The rest of the food ingredients composed mostly of carbohydrates. The choice of these energy sources depends on the availability, price and means of treatment available.

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