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Test of the Different Proportions of Moringa oléifera fluor on the Growth of COBB500 Chicks in Vivo in Kinshasa (DR Congo) Bay

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Abstract:

In Kinshasa, to understand the influence of different proportions of Moringa incorporated into the feeding of chicks, a study was carried out on the COBB 500 chicks. 40 chicks with an average weight of 41 ± 4.71 g for the control and 42 ± 4.06 for the test batch were tested in an experimental system duplicated with foods containing 25% crude protein where diets were supplemented with 5%, 10%, and 15% of the Moringa flour for 21 days. After analysis of the results, we noted the following: It was found that the chicks triplet weight during the experiment in the following order: 152 ± 55.96 g for R1, 181 ± 57, 48 g for R2, 185 ± 46.36 g for R3 and 157.5 ± 27.88 g for feed R0. A non-significant difference (>0.05) was found in the STUDENT t-test, between the body weight gain of chicks fed R0 diet and those fed R1, R2, and R3. SGR (specific growth rate) was significantly correlated with the R3 regimen. Weekly consumption was not constant, and with significant increase during the experimental period. The results of mortality rates obtained during this experiment did not seem to be directly linked to the different regimes but rather to diseases, poor zootechnical construction conditions, and untimely shutdown of electricity in livestock premises. Regarding food Conversion Efficiency (ACE), it is found that diets containing 15% of Moringa show better feed conversion efficiency, with 0% diets showing a decrease in diet as the proportion in Moringa decreases. As regards the quantity of the food consumed, it should be noted that R1 was the most consumed during the experiment.

Keywords:
Kinshasa; chicks; Moringa oléifera; growth

I. Introduction

Poverty in almost all areas of developing countries and spaces is lacking for livestock farming especially in areas of population density. This is how the development of small breeding seems more and more as an essential solution for the fight against protein malnutrition. Today, poultry represents nearly 50 % of the total imports of frozen carnas products in the Democratic Republic of Congo, Gabon, Congo in particular.

The Democratic Republic of Congo it is, on the other hand, via the port of Matadi, to feed Kinshasa (and its periphery, low Congo included): 120 000 tonnes of frozen fish and 50 000 tonnes of chicken and frozen ablaps (Anonymous, 2008).

In major urban centers like the city of Kinshasa, the small breeding is in full expansion. Domhuffers are breaking in the raising of poultry, small ruminants, rabbits and pigs and are confronted with the problem of food and animal health (Wasewa, 2002).

However, it is possible to assist the breeders with a minimum of supervision that includes:

- Acces to quality chicks;
- Vaccination against psudo-baked (Newcastle);
- Facilitating access to food and ingredients at reasonable prices, which ultimately assigns the raising of corn culture fist (soybean in suite);
- Helps improvement of storage infrastructure and the formulation of more or less balanced rations with local ingredients;
- Zootechnical control of the main farming parameters: housing, cabinet;
- Capacity to calculate a cost price of their activity.

Subsequently, it will be necessary to organize a correct slaughtering and marketing circuit. In addition, it is appropriate to diversify the types of breeding and promote the duration of the duck, already very popular by the congolese population.

On the other hand, we rarely find specific powder foods such as ducks, throttle and spinstones (Bernard. S ,1988). Hence the need to make an approprate food ration respecting the nutritional needs of these poultry to save small farms and small breeders.

However, any process of domestication of a poultry species necessarily transmits by the control of the massive production of quality chicks and by the formulation of food specific to this species.

Therefore, it becomes indispensable on the one hand, to undertake more research on the reproduction of the household chicken and on the breedinding strategies of their chickes in the controlled circles and others, to conduct studies to detemine the specific food needs of chicks at different stages of growth (Bertin ,2016).

It is with this in mind that this study was initiated to determine the proportion of Moringa oleifera flour that would give better growth over time in cobb 500 chicks in Kinshasa.

II. Review of Literature

2.1 Middle

The study was conducted in the province of Kinshasa, within the university of CEPROMAD, Kinshasa, Democratic Republic of the Congo.

Kinshasa is located in the westen part of the Democratic Republic of Congo, on the southern bank of the Congo River. On the other side of the shore, opposite her, is Brazzaville, the capital of Congo.

The geographical coordinates of the city of Kinshasa are as follows:

- 4° 19’ South latitude,
- 15° 14 ‘East longitude,
- 280 à 350 m altitude (BWALA K; 2016)

Figure 1. Map of the City Province of Kinshasa (Anonyme, 2010)

III. Material and Methods

3.1 Biological Materiel

The chickes used in this study were one day old, coming from India via a local seller, Mr. MOSENGO in the town of Djili.

Figure 2. *Starage of Chickes Before Experimentation*
(Source: personal picture)

3.2 Research Methods

This study was initiated to determine the proportion of Moringa oleifera flour that would give better growth over time in cobb 500 chicks in Kinshasa.

40 chicks were selected and distributed at the rate of 5 chicks’ batch. The initial average biomass was 166,5±0,94 and the average individual weight was 41,5 ±4,26 g.

These chicks were transported to the experimental cages installed at the University of CEPROMAD in Kinshasa (Petro-congo), in the commune of Masina by land, in a rectangular cardboard box of 60 cm x 30 cm x30 cm, at a desity of about 40 chichs.

As soon as they arrived, they were stored in a previously controlled room, for their stabilization, without artificial food, only water with the antibiotic to fight against infections.

The duration of the summer experience of 21 days, this was determined by the duplication of weight of the chicks. Wooden breeding cages with grid, rectangular and utility of use 30 centimeters, useful length 60 centimeters and width useful 55 centimeters, which was installed in a constructed room chosen in the CEPROMAD University.

These cages were illuminated by 70-watt bulbs to warm the chicks during the night. Che cage also contained the supply devices (feeders) and a novel. A small, layer of at least 1 centimete of the woodworking panels inside to absorb the moisture of the chicken fistenses.

The cleaning of feeders and waterings is done after a meal, as it can stress the chicks and prevent them from eating in the following minutes. During this experience, chicks were subjected to natural photoperiod during the day and artificial photoperiod at night. The temperature measurements were taken daily with a thermometer, 2 times a day, 8 :00 and evenig at 16: 00. The chicks were raised at an average temerature of 28 degress during the experimental period.

The chickes were fed ad libitum in a passage, twice a day. The ration distributed daily at well under conmeduration. The optimal rationation rate formule is as follows:

R = 9,291 x P-0,324
, with R as a percentage and P in grams

The weight control weighing to get all the 7 days and the dead were uncompt, removed and weigh for their respective biomasses.

Figure 3. *Pick-up Cages*
(Source: Personal Picture)

3.3 Experimental Foods

We had 4 compatible iso-energit regimes, having a single protein concentation, but differ in proportion to Moringa oleifera flour. Everything was tested at a diet without moringa oleifera flour.

- R0 : Diet without merdingal oleifero ;
- R1,R2 and R3 : Regimes containing 25 % of raw protein (see table 1).

These plans have been used in duplicate for reasons for the statistical results of the results.

Table 1. Composition of 4 Expérimental Schemes (Quantity in Gram for 1000 grams of Food)

	Food (gram food protei/kilogram of food)			
Ingrédients	**250**	**250**	**250**	**250**
Fish flour	204	204	204	204
Palmist cucks	102	102	102	102
Soya flour	200	190	160	200
Moringa oleifera sheets flour	**50**	**100**	**150**	
Bran	200	180	170	220
Mais waste	200	180	170	220
Limestone powder	30	30	30	30
Palm oil	5	5	5	5
Sodium	9	9	9	9
Water	Has a willbe	Has a will be	Has a will be	Has a will be
PB (%)	**25**	**25**	**25**	**25**
TOTAL	1000	1000	1000	1000
Energy released in kilocalori(Kcal)	**3,9447**	**3,9247**	**3, 9733**	**3,98873**

Food manufacturing took place within the University of CEPROMAD. Food powder was mixed by hand in a plastic bucket, which is then adding palm oil, iodzed salt, vitamin, then turn to obtain a homogeneous mixture.

The foods made were stored in the brick and buckets of mini plastic seats permanently to avoid contamination by bacteria.

Figure 4. *Preservation of Foods Made*
(Source: personal picture)

5 chickes were placed by cage. The feed had lasted 21 days and the chicks were daily. Since chicks are animals with a jabot and a guy, which therefore knows satiety.

3.4 Evaluation of the Growth and Use of Food

From the results obtained, several parameters were calculated to evaluate growth and feed efficiency. These parameters are:

- The specific growth rate (TCS);
- Weight gain (GP) in%;
- Food Efficiency (CEA);

a. Mass Gain (G), calculates the following formula:

$$G (\%) = \frac{100 \times (Pf - Pi)}{Pi}$$

Pf = final mode weight (g)
Pi = initial average weight (g)

b. Specific Growth Rate (TCS)

The individual weights taken and, in a beginning, of experience, allowed us to estimate the Specific Growth Rate (TCS) in percentage.

$$SGR (\%.j^{-1}) = \frac{(Ln\ Pf - Ln\ Pi) \times 100}{\Lambda t}$$

Pf = final mode weight (g)
Pi = initial average weight (g)

c. Mortality rate (M)

Calculates according to the following formula:

$$M (\%) = \frac{100 \times (Ni - Nf)}{Ni}$$

Ni = initial number of chicks,
Nf = final number of chicks.

3.2 Statistical Data Processing

Raw date was entered into Excel software. Statistical analysis was performed manually by student's t test. A significant probability threshold of 5 % was uded.

IV. Discussion

First of all, remember that three plans have been tested under this work on COBB 500 chicks.

The 90- based merway, ovelerae fiber regime, and a witness and 25 % of raw protein, containing different proportions of Moringa oleifera flour, which aimed at avaluating its influences on the zootechnical performance of the chicks. The values shown in table 2, represent the means a comments made for each diet. To this, we calculated the deviations – types for each value by specifying the existing variation within the same regime and the coefficient of variation.

Table 2. Influence of Food Diets Tested on the Main Zootechnical Parameters of the Breeding of Inland Vice Voices

Settings	Scheme(R) 0	Scheme(R) 1	Scheme (R) 2	Scheme(R) 3
initial number of chicks	10	10	10	10
final number of chicks	6	5	5	5
Mortality **(%)**	40	50	50	50
Initial biomass (g)	41	41	41.5	43
Final biomass (g)	314.99	343.75	428.75	318.33
Final biomass + dead (g)	399 ,99	441,75	538,75	424,33
Initial average weight (g)	41 ± 4,71	41 ± 3,94	41.5± 3,37	43.5±4,74
Final average weight (g)	157.5±27,88	152±55,96	181±57,48	185±46,36
Quantity of food distributing (g)	1077,99	2039 ,04	1269,11	1800,8
G (% jour^{-1})	2.84	2.70	3.36	3.25
SGR (%.jour^{-1})	6,38	6,23	7	6,90
CEA(%)	0,001	0,01	0,01	0,02
%CV(Pi)	0,11	0,09	0,08	0,10
%CV (Pf)	0,17	0,36	0,31	0,25

Legends: G = weight gain, SGR = specific growth rate, M = mortality rate, EA = feed efficiency, CV = Coefficient de variance.

3.3 Growth and Mortality

The biomasses as well as the average weight of the chicks were heterogeneous from the experience. It turned out that chickes have quadruple weight during experimentation in the following order: **152 ± 55,96 g** for Scheme **1**, **181± 57,48 g** for Scheme **2**, **185± 46,36 g** for Scheme **3** et **157.5 ± 27,88 g** for Scheme **0**.

A non-significant difference ($p<0,05$) could be highlighted, according to the student « t » of the study between the body mass of gods fed with the RO regime and the nourished with the (**R1, R2, R3**). It is the R3 regime that showed the best performance, chicks from an average initial weight of 43,5g has 185g in 21 days.

With regard to the gain of body mass, the specific growth rate, has significantly correlated to R2 regime, (7% in 21 days).

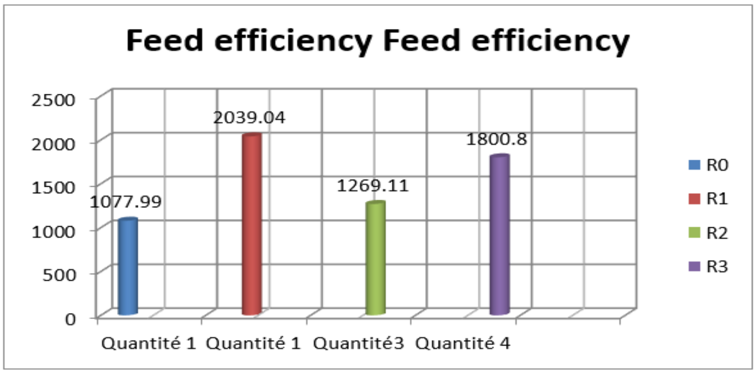

Figure 5. *Influence of the Different Diets on the Drop of Mass Bodily of Chickes*

This figure shows clearly that weekly consumption was not constant and without increasing over tim. However, in general, the difference between the plans have shown large developments between the beginning and the end of the experimentation. The same is true for the 10 % diet of moringa Oleifera flour, which was emerged from the other from the first week with regard to the body weight. The gap was dug betxeen the- cl and the 5 % and 15 % doll of ontimera flour. Variabilyity marked between the diet as shown in figure 5. The pic observer corresponds to the second week of experimentation and is the average weight of the chicks.

The results of the mortality obtained during this experience do not seem to be attributed to be attributed to the diffent diets, but rather to infectious diseases, predatory attacks in the room.

Deceased chickeys were cheese. Mortality was observed from the first week of feeding.

3.4 Food conversion efficiencies

Food conversion efficiencies (ECA) is the opposite of the rate of conversion (FCR). It is spring from Figure 6 that the scheme containing 15 % of Moringa olelelera flour, represents a better food conversion efficiency. On the other hand, the scheme at 0 % show a decline in the one as the proportion of Moringa Olelera flour decreases.

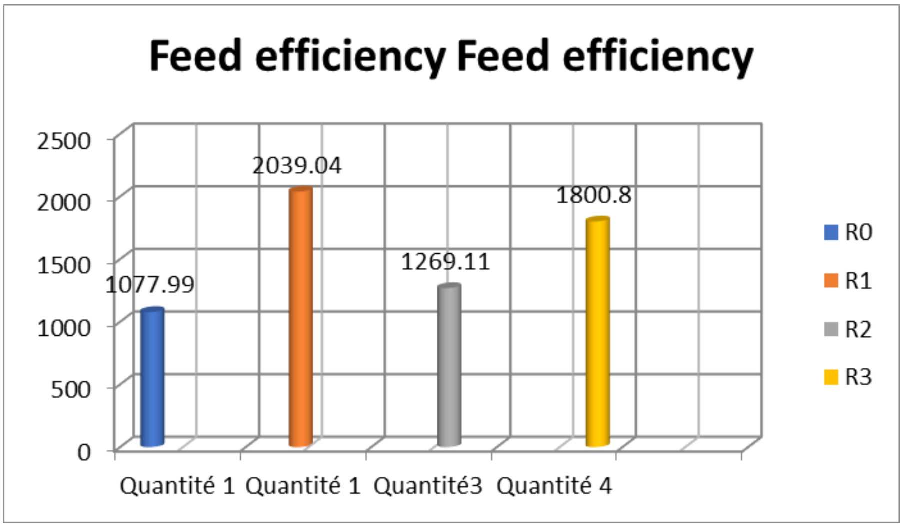

Figure 6. *Food Conversion Efficiencies*

With regard to the amount of the food consumed, note that it is the R1 regime that was most consumed during the experimentation (Figure 7).

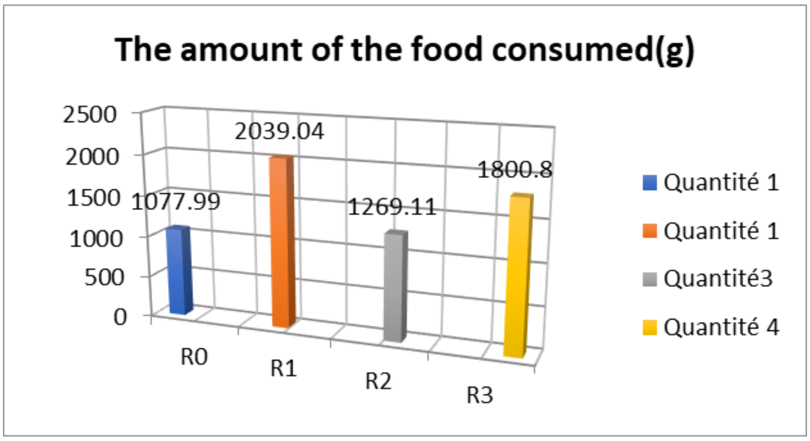

Figure 7. The Amount of the Food Consumed

V. Conclusion

During the 21 days of our experiment, rearing conditions were maintained more or less optimal for the growth of chickes in vivo. Mortality was observed in almost all groups regardless of treatment. Diets with different proportions of Moringa Oléifera meal differently influence Chick growth, as well as feed conversion efficiency.

According to our results, the influence of the diets on the growth of the chicks is even higher in the diet containing proportions of Moringa Oléifera flour close to 15 %. Thus, it can be assumed that better results will be obtained with the diet containing less than 15 %. Moreover, from an economic point of view, it is more advantageous to use as little protein of animal origin as possible by substituting it with Moringa Oleifera flour, which would cost the breeder less.

Note, however, that growth could be limited by factors onther than protein content, at least in this case. In addition, it has been observed that the concention in proportion of Moringa Oleifera flour in the food has a direct effet on its own palatability. Indeed, for diets with a low concentration of Moringa Oleifera flour, it is clearly observed tha the chicks do not show a good appetite for the latter.

Feed efficiency (ECA) represents the body weight gain obtained per unit weight of food. Since it is mainly proteins tha are used for tissue growth, feed efficiency increases with the protein content of diets.

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