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Performance Of Weaner Rabbits Fed Different Levels Of Dried Maize Wet-Milling By-Product

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Abstract.

This experiment was conducted to determine the performance of weaner rabbits fed different dietary levels of dried maize wet-milling by-product (DMWB). Thirty weaner rabbits (New Zealand White and California White) were used. They were randomly assigned to five dietary treatments at 0%, 25%, 50%, 75% and 100% levels of dried wet-milling by-products with three replicates of 2 rabbits each. Palm oil was added to enhance the metabolizable energy. The experiment lasted for eight weeks. The results show that the average daily feed intake for rabbits placed on 75% (30.71g) was slightly higher than those placed on 0% (29.47g), 25% (29.65g), 50% (30.35g) and 100% (29.35g). However, there was no significant difference ($p>0.05$) among each other. The average daily weight gain was highest for rabbits placed on 75% ((13.12g/day) followed by those on 50% (12.58g/day), 25% (12.48g/day), 0% (12.35g/day) and 100% (11.98g/day. There was no significant difference ($p>0.05$) among the diets. On the feed conversion ratio, rabbits placed on 75% had lowest value (2.34), followed by 0% (2.38), 25% (2.38), 50% (2.41) and 100% (2.45). There was also no significant difference ($p>0.05$) among the diets. The cost of production per rabbit was lowest with 100% maize wet-milling by-product (₦2,600), followed by 75% (₦2,605), 50% (₦ 2,825), 25% (₦2,950) and 0% (₦3,040) which was the highest.

Key Words: Rabbits ,performance, Maize wet-milling by-product

1.0 Introduction

The increasing demand for animal protein coupled with more stringent economic conditions have encouraged greater interest in fast growing animals with short generation interval. Poultry and pigs are the first choice but their production is more demanding because of the high cost of production and competition with man for feedstuffs (Sandford 1979).[1]. One of the cheapest producers of meat that can easily fit into the wider segment of the population which has been neglected in developing Nations is the rabbit. The rabbit has the ability to convert feedstuff such as forages, most agricultural by-productions, kitchen waste etc, that human being cannot consume directly into highly nutritious meat. Rabbits are highly prolific, cheap to feed because they can utilize roughage feeds. They have rapid growth rate, high dressing percentage, short gestation period and low purchasing price (Lukefahr, 1990).[2.] Maize has been playing a major role as one of the major sources of energy in rabbit diets and because it is one of the major staple food as well as its use for various industrial raw materials, its demand is more than its supply. This has led to increase in its price, high cost of rabbit feed production and animal product. Sandford (1979)[1] reported that, there is a wide range of feedstuff on which rabbits can live on. Alternative feed sources such as maize wet-milling by-product could be used as one of such feedstuff to replace maize in rabbit feed. This product is an agro-industrial waste product

2.4 Acclimatization

Before the arrival of the rabbit, the rabbitry was prepared using the following procedures. One to two weeks before the arrival, the house was swept, washed, disinfected using the disinfectant (izal) and the cobweb was also removed. The drinkers, feeders and other equipments were washed, disinfected and dried. The rabbitry was allowed to dry and was kept for some days. The hutch which was constructed by a carpenter was brought into the rabbitry and the surrounding was kept tidy.

On the arrival of the rabbit, they were off-loaded, initial weight was taken and they were taken into the hutch. They were fed with commercial feed for 2 days and water was given to replace the energy loss during transportation. Drugs and other medications were given at appropriate time.

2.5 Feed Ingredients

The feed ingredient used in diets for the experiment are;

Yellow maize, soybean Meal (SBM), brewers dried grain, fish meal, dried maize wet-milling by-product, bone meal, palm oil, vitamin and mineral premix, methionine, lysine and common salt.

2.6 Experimental Diets

The maize wet-milling by-product was prepared by pressing out water from the by-product using hydraulic press and drying it consistently for seven (7) days under a very high temperature before including in the ration formulation. Five (5) experimental diets were formulated. Diet one treatment which served as the control had maize as its main energy source while treatments two (2) to four (4) contained a combination of maize and dried maize wet-milling by-product as the main energy source. Treatment five (5) had dried maize wet-milling by-product as its main energy source.

2.7 Feeding

The thirty (30) experimental animals were fed with the five (5) experimental diets.

The nutrient composition of the ingredients used in the diets are shown in table 2.1, while the composition of the experimental diet is shown in table 2.2.

Table 2.1 Nutrient composition of dried maize wet-milling by-product (DMWB) as compared to maize, soybean meal (SBM), brewers dried grain (BDG) and fish meal used in the diet

Nutrient	Maize	DMWB	SBM	BDG	Fish Meal
Crude protein	9.0	12.6	44.0	22.0	60.O
Crude fibre	2.2	11.93	6.7	16.3	0.6
Ether extract	3.8	2.83	16.0	5.6	9.8
Ash	1.5	1.68	5.8	3.8	19.0
\ M. E (kcal/kg)	3.2	1.37	3.20	2.08`	2.80
Calcium	0.03	0.20	0.32	0.29	5.97
Phosphorus	0.35	0.65	0.65	0.54	3.05
Methionine	0.20	0.60	0.50	0.60	1.8
Lysine	0.24	0.60	2.40	0.90	4.83
Cystine	0.20	0.30	0.60	0.40	0.6

Sources: National Research Council (NRC) (2003)[9], Cullison (1982)[10]

Table 2.2 The Composition of Experimental Diets

INGREDIENTS	T1 (0%)	T2 (25%)	T3 (50%)	T4 (75%)	T5 (100%)
Maize	54.0	37.9	24	11.6	_
DMWB	_	11.6	24	37.9	54.0
Soybean	11.4	11.4	11.4	11.4	11.4
BDG	22.6	22.6	22.6	22.6	22.6
Molasses	3	3	3	3	3
Fish meal	5.6	5.6	5.6	5.6	5.6
Bone meal	3	3	3	3	3
Salt	0.5	0.5	0.5	0.5	0.5
Vit./min. Premix	0.5	0.5	0.5	0.5	0.5
Methionine	0. 25	0. 25	0. 25	0. 25	0. 25
Lysine	0. 25	0. 25	0. 25	0. 25	0. 25
Total	100	100	100	100	100
Crude protein	18	18	18	18	18
M. E (kcal/kg)	2,829.	2,843	.2,731.	2,633.03	2,731.38
Crude fibre	5.6	6.9	8.2	9.2	7.3

2.8 Data Collection

Records on daily feed intake were taken every morning by subtracting the quantity of feed remaining from the feed fed to the animal the previous day. The rabbits were weighted at the commencement of the experiment. Subsequent weights were taken weekly.

2.9 Data Analysis

The data collected were subjected to analysis of variance using statistical package for social sciences (SPSS).

2.10 Proximate Analysis of Nutrients

The proximate analysis of the dried maize wet-milling by-product and maize were carried out in the University of Uyo as shown in Table 2.3.

Table 2.3 Proximate Analysis of Dried Maize Wet-Milling By-Products and Maize

Nutrients	Maize Wet-Milling By-Product (MWB)	Maize
Crude protein (%)	12.50	9.5
Crude fibre (%)	11.90	2.2
Ether extract (%)	2.80	3.8
Ash (%)	1.68	1.3

3.0 Results and Discussion

Table 3:1 Growth Performance of Weaner Rabbit

Parameters	Maize Based Diet	Maize Wet-Milling By-Product Based Diet				
	0%	25%	50%	75%	100%	SEM
No. of animals	6	6	6	6	6	
Average initial weight (g)	468[a]	466[a]	468[a]	465[a]	469[a]	67.1
Average final weight (g)	1160[a]	1165[a]	1173[a]	1365[a]	1140[a]	87.0
Average weight gain(g)	692[b]	699[b]	705[ab]	705[ab]	671[b]	98.5
Average daily gain (g/day)	12.35[a]	12.48[a]	12.58[a]	13.12[a]	11.98[a]	2.3
Average feed intake (g)	1650.7[b]	1660.5[b]	1701[ab]	1720	1643.6[b a]	105.5
Average daily intake (g/day)	29.47[a]	29.65[a]	30.37[a]	30.71[a]	29.35[a]	3.4
Feed conversion ratio (g.feed/g.gai	2.38[a]	2.38[a]	2.41[a]	2.34[a]	2.45[a]	0.25
Cost of production (₦)	3,040[b]	2,950[b]	2 ,825[ab]	2,665[a]	2,600[a]	61.0

ab: means in the same row not subscripted by the same letters are significantly different from one another

Feed intake

he experimental results of the rabbits placed on the five diets, 0%, 25%, 50%, 75% and 100% levels of maize wet-milling by-product are shown in table 3.1. The results show that the average daily feed intake was slightly higher for rabbits placed on 75% dietary level (30.71g/day) followed by those on 50% (30.37g/day); 25% (29.65g/day); 0% (29.47g/day) and 100% (29.35 g/day) which is the lowest. However, there was no significant difference ($p>0.05$) among the diets. The trend on feed intake result shows that the higher the level of the maize wet-milling by-product the more the feed intake up to 75% with a slight drop in 100%. This could be as a result of increase in fibre content with increase in the wet-milling by-product which is more fibrous than maize (table 2.1). This is in agreement with other findings where it has been shown that fibrous feeds are deficient in available carbohydrate with low metabolizable energy and are consumed in higher amount to overcome the energy stress (Stock *et al.,* 2010)[11]. This result of rabbits consuming progressively higher feed as the level of the maize wet-milling by-product increased is in line with the work of Uko *et al.* (1999)[12]. Their work showed that rabbits on maize wet-milling by-product based diet consumed more feed compared to those on the maize-based diet. They reported that this could be as a result of the low energy content per unit weight of wet-milling by-product of maize. This result is equally in line with the work of Longe and Olonilua (1997)[4] which showed that maize wet-milling by-product has low metabolizable energy content (1.375kcal/kg) compared to maize (3.435kcal/kg), thus the rabbit has to increase their intake of maize wet-milling by-product diet to compensate for a low concentration of available energy. This agrees with the work of Schlolaut (1985)[13] which reported that a lesser content of digestible or convertible energy in the feed of rabbits can be compensated within relatively broad limit by a corresponding increase in intake. The slight drop in feed-intake by 100% dietary level could be as a result of the marshy texture of the fibrous feed, dustiness (though reduced by the addition of palm oil) and palatability.

Weight gain

There was slight difference on the average daily weight gain of the rabbits placed on the five diets with 75% dietary level showing the highest (13.12g/day) followed by 50% (12.58g/day) then 25% (12.48g/day); 0% (12.35g/day) and 100% (11.98g/day). There was no significant difference ($P>0.05$) among all the diet levels. However, the highest weight gain occurred on the rabbits placed on the 75% level despite its low energy content. This could be attributed to the high fibre content of the diet. This agrees with the

findings of Longe and Olonilua (1997)[4] which showed that rabbits need to be fed some fibrous feeds such as grass or root crops. The fibre content of these foods is important for the normal passage of food though the digestive system. Moreover, high fibre content of the food has an effect on the rate of coprophagy which equally affects utilization. Arrington and Ammermann (1963[14]) showed that coprophagy renders the rabbit totally or partially independent of an external vitamin B supply. In addition, the digestion of crude fibre and protein is improved, potassium and sodium are better utilized. Apart from the high crude fibre content of the feed, the highest weight gain recorded in 75% level could equally be as a result of the high concentration of the protein in the wet-milling by-product of maize (12.6%) over maize (9.0%) (Cullison, 1982).[10] A slight drop in average daily weight gain for 100% could be attributed to lower feed intake due to marshy texture of fibrous feed and palatability.

Feed conversion ratio

On feed conversion ratio, rabbits placed on 75% dietary level showed slightly lower ratio (2.34) than 0% and 25% (2.38) respectively. 50% (2.41) and 100 (2.45). There is no significant difference among the diets. There was progressive slight increase from 0% dietary level to 50% as fibre content increased but at 75% it dropped and 100% had highest figure. This could be as a result of decrease in energy as maize wet-milling by-product increases. This progressive increase from 0% ,25% to 50% is in agreement with the work of Tee (1991)[15] in poultry which showed that maize based diet has lower figure than maize wet-milling by-products except for 75% this experiment which could be attributed to its best performance both in feed intake and weight gain among all the diets. The results of this experiment also agrees with the work of Ogundu *et al.(2018)16[* with broiler which showed 75% maize wet-milling by-product performing best in weight gain, feed intake and feed conversion ratio

Cost Efficiency

The cost of production in table 3:1 shows that rabbits placed on 100% was cheapest (₦ 2,600) followed by 75% (₦ 2,665), 50% (₦ 2,825) 25% (₦ 2,950) then 0% (₦3,040) which was the highest. This shows that the more the maize wet-milling by-product in the diet, the lower the cost of production. This could be as a result of the low price of maize wet-milling by-product which is an industrial waste in maize milling

4. Conclusion and Recommendation

The results of this study have shown that increasing levels of maize wet-milling by-product in the diets of weaner rabbits resulted in corresponding increase in body weight up to 75% level. It could be concluded that maize wet-milling by-product can replace maize up to 75% without depressing the performance of the weaner rabbits. One hundred (100%) replacement could also be possible and feasible because of its lowest cost of production which could compensate its lower performance. This experiment has shown that with the best performance of rabbits at 75% level of maize wet-milling by-product and the decreasing cost of production as wet-milling by-product increases up to 100%, maize wet-milling by-product could be recommended for rabbit feed to reduce the cost of rabbit production and make meat available for people especially in developing world to meet the human protein requirement.

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