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THE PERFORMANCE OF RABBITS FED FAT-FREE DIET

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Target Audience: Animal Nutritionists, Livestock farmers and Research Scientists.

ABSTRACT

The effect of fat on the growth performance of weaning rabbits was studied. The eight weeks trial involving sixteen six-weeks old male and female New-zealand white rabbits weighting 410-470g in a completely randomised design were feed two diets, one containing fat and the second one was fat-free.

The body weight gain, feed intake, feed efficincy and protein efficiency ratio were determined at the end of eight weeks. The body weight gain, feed efficiency and protein efficiency ratio of the rabbits fed with control diet increased, though they were not signifiacantly (P>0.01) different from those rabbits fed fat-free diet. However the inclusion of fat in rabbit diet had no significant effect on fat digestibility. There was no incidence of enteritis or mortality among the treatment groups.

Key words: Performance, fat-free diet, rabbits

DESCRIPTION OF PROBLEM

Fats are important sources of stored energy and are characterized by high energy values. Fats are esters composed of fatty acids and glucerol and make up about 98% of the lipid present in most feed stuff. HTe quality and quantity of fat laid down in a farm animal can be partially regulated by altering the nutrition of the animal.

When rats were fed fat-free diets, their growth rate were markedly reduced (1,2,3). Addition of essential fatty-acid containing oils to fat-free diets, however fed to increased growth rate of rats (3).

Various workers have shown that digestion of fat is not affected by raw-oil seed meal, and that depression in overall fat absorption caused by raw oils seed meal is not due to an effect on the digestion process itself (4).

The dietary fat requirement of rabbits has been st at 2% (5). Santoma, et al. (6) found a positive relationship between degree of unsaturation of fats and digestibility similar to pig and poultry. They also found a negative relationship in dietary fat level and digestibilty of the non-fat components of the diet when fat is added at level 3%. From comparison with poultry this effect would be at lower fat level. The objective of this study was to examine the effect of fat-free diet on the growth performance and fat digestibility of weaner rabbits.

MATERIALS AND METHODS.

The Feed Ingredients And Petroleum Ether (60°c) Were Purchased From Elis Oye Nigeria Limited, Abeokuta Nigeria.

Two diets consisting of undefatted rabbit diet (control) and defatted rabbit diet, the diet was defatted using petroleum ether (60° C) and Soxhlet apparatus, were formulated as shown in Table 1. The diets were all pelleted and made to be isonitrogenous.

Table 1: Percentage Composition of Experimental Diets.

Components	Undefatted (Control) diet	Defatted diet
Yellow corn	53.29	53.29
Groundnut cake	13.00	13.00
Blood meal	3.01	3.01
Wheat offal	30.00	30.00
Oyster shell	2.00	2.00
Bone meal	1.00	1.00
Methionine	0.10	0.10
Lysine	0.10	0.10
Vit/Mineral Premix	0.25	0.25
Salt	0.25	0.25
Total	100.00	100.00
Calculated Analyses		
Protein (%)	16.27	16.27
M.E. (KJ/gm)	13.66	6.90
Calcium (%)	1.09	1.09
Fibre (%)	15.00	15.00
Methionine (%)	0.25	0.25
Lysine (%)	0.87	0.87

Sixteen six weeks old male and female New-Zealand weighing 410-470g were were obtained from University Teaching and Research Farm. The animals were divided into two groups of 8 each with an average weight of 440g for each group. Each group was further sub divided into two, such that duplicate groups of four rabbits were fed the pelleted feed daily at 8.30 a.m. with water *ad libitum*. The trial was conducted for eight weeks.

Records of body weight gain, feed intake, faecal output, feed efficeincy, protein efficiency ratio and apparent fat digestibility were calculated weekly.

Digestibilities of the fats in diets were carried out at the sixth week of experiment, and lasted for seven days. The first four days were for adaptation of the animals to the new environment environment and the last three days were used for

data collection for the apparent digestibilities of fats. Two rabbits were used per replicate for the digestibility. Records of the daily feed intake and the daily faeces output were kept, faeces collected were dried in an oven at about 80°C for 24-48 hours.

Analytical Techniques

The diets were analysed for their proximate constituents using the methods of the (7).

Statistical Analysis

Performance records of the animals were subjected to one way analysis of variance (8) and (9) was then used to determine significant differences between means.

RESULTS AND DISCUSSION

The crude protein protein, crude fibre, ash and nitrogen free extract of fat-free diet nwere significantly higher than those found in the control diet (Table 2). The levels of fat were 4. 84% for the control diet and 0. 26% foe the fat-free diet. N.R.C. (5) reported that the usefulness of fat as source oif energy and to facilitate the supply and absorption of fat soluble vitamins is limited.

Table 2: Chemical Composition of experimental diets (%) Dry Matter Basis.

Components (%)	Undefatted (Control) diet	Defatted diet
Moisture	4.00	2.42
Crude Protein	20.45	22.42
Crude fibre	18.60	20.42
Ether Extract	4.64	0.26
Ash	10.05	12.42
Nitrogen free extract	41.36	41.24
Minerals		
Potassium (%)	0.16	0.26
Sodium (%)	0.06	0.08
Phosphorus (%)	0.16	0.18
Magnesium (%)	0.20	0.18
Calcium (%)	0.10	0.10
Zinc (ppm)	264	234
Manganese (ppm)	284	262

The requirement of dietary fat by rabbit had been set at 2% (5) while 6-10% is optimal. Although the fat inthese diets varied from 0.2-4.84% with no ill effect, and this agrees with the work of (10) that fat in the diet of rabbits can be varied

from 0.1-10% mwith no ill effect.

The effect of dietary treatments on growth and feed efficiency is shown in Table 3. Presents results showing that rabbits fed the defatted diet had the lower body weight gain agrees with the findings of (2)

Table 3: Effect of experimental diets on growth performance of rabbits

Performance	Undefatted (Control) diet	Defatted diet	SEM**
Number of Rabbits	8	8	
Initial Body Weight (g)	439.36[a]	439.36[a]	6.54
Final Body Weight (g)	1096.98[a]	1093.46[a]	18.42
Daily Weight gain (g/day)	11.74[a]	11.68[a]	0.48
Feed efficiency ratio	0.23[a]	0.22[a]	0.04
Protein efficiency ratio (PER)	1.12[a]	1.10[a]	0.08
Apparent fat digestibility (%)	64.42[a]	64.00[a]	9.24
Mortality	0	0	0

*Means along the same row with different superscripts are significantly different ($P<0.01$).

that rats fed a fat-free diet grew more slowly and reached a weight plateau very early in life. The feed efficiency and protein efficiency ratio of the rabbits fed the undefatted diet increased though they were not significantly ($P>0.01$) different from those of rabbits with the fat-free diet. The rabbits fed control diet had a slightly higher apparent fat digestibility and this is not significantly ($P>0.01$) diiferent when compared with those rabbits fed with fat-free diet. There is little information on fat digestion in rabbits, however the present digestibility results indicate that, it is probably similar to other monogastric animals. Maertens, et al (11) found a positive relationship between degree of unsaturation of fats and their digestibility which is very similar to those of pigs and poultry. These authors also found a negative relationship in dietary fat level and digestibility for saturated fats. The low fat digestibility recordede in this study with rabbits fed with control diet agrees with the work of (12) that fat digestibility decreases when fat content of diets increases.

CONCLUSION AND APPLICATIONS

(1). The results from this study of performance of rabbits fed fat-free diet, suggest that the inclusion of fat in the diet of rabbits had no significant effect on growth, feed utilization and fat digestibility.

(2). It can then be suggested that the rabbit meat has little or not fat.

(3). It can also be suggested that hte rabbit meat can be recommended for patients with high blood pressure problems.

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