Greener Journal of Agricultural Sciences
ISSN: 2276-7770; ICV: 6.15
Vol. 2(6), pp. 237-245, October, 2012

http://gjournals.org/GJAS

Research Article

Effect of Varying Levels of Brewer's Dried Grain on the Growth Performance of Weaner Rabbits (*Oryctolagus Cuniculus*)

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ARTICLE INFO

Article No.: *08271254*
DOI: *10.15580/GJAS.2012.6.08271254*

Submitted: *27/08/2012*
Accepted: *30/08/2012*
Published: *30/10/2012*

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Keywords:
Rabbit, Brewer's Dry Grain, Palm kernel Cake, Sweet potato, Nutrient digestibility

ABSTRACT

Rabbit production in Cameroon like other countries in the Central African Region is timid and is partly caused by inadequate knowledge of feed ingredients as well as feeding and other management techniques. This study evaluates the effect of partial substitution of sun-dried brewer's grain (SDBG) with palm kernel cake (PKC) on the growth performance and digestibility in weaner rabbits. The substitution levels were: 0% SDBG, 25% SDBG, 50% SDBG and 75% SDBG respectively representing T_1, T_2, T_3 and T_4. Twenty weaner rabbits (*Oryctolagus cuniculus*) were used for the study. After balancing for weight, the animals were randomly and equally assigned to four dietary treatments. Each dietary treatment had five rabbits. The rabbits for each treatment were housed together. The animals were fed for 9 weeks on the test diets and supplemented with potato (*Ipomea balatas*) vines. The test diets and water were given ad libitum. During the seventh week, faecal samples were collected for three days and sun-dried. AOAC 1990 version was used for the proximate analyses while SPSS was used for the statistical analysis. Nutrient digestibility was calculated using percentage nutrient in the ingredients and the results from proximate analyses of the diets and faecal samples. No mortality was recorded. Feed intake, feed conversion ratio and cost of the diets increased with increase levels of SDBG but weight gain, growth rate and feed efficiency were the reverse. There was a significant difference ($P<0.05$) in feed intake, weight gain, daily growth rate, feed conversion ratio and feed efficiency between the different treatments. Excluding the control (T_1), T_2 (25% SDBG and 75 % PKC) showed the best performance and the highest TDN (6.99%). The results indicate that SDBG meal could replace 25% of PKC meal in the diet of weaner rabbits.

Introduction

Rabbit production in Cameroon is practiced mainly in the rural areas under traditional management systems, with native forage-based diets as the principal feed source (Mbanya *et al*., 2005). These Tropical grasses are unsuitable as the sole feed for rabbits, due to their low digestibility (less than 10%) (Mbanya *et al*., 2005). In order to intensify rabbit production, the problems with regard to feeding the animals have to be solved (Teguia *et al.,* 2004). The poor and unbalanced quality of grasses is a major constraint, which limits the successful production of rabbits. Availability and affordability of rabbit meat in Cameroon, as in other countries south of the Sahara, depends principally on the costs and quality of feed stuffs (Fotso *et al.,* 2000). Rabbit production is, however, constrained by a number of factors, prominent among which is high cost of feed and management. The conventional feedstuffs, which constitute a major component of rabbit diet, are scarce, competitive and exorbitant. This has generated concern to rabbit farmers and has consequently opened research interest in the use of non-conventional protein sources for rabbit production (Ahamefule *et al*., 2007). In spite of the high production cost of livestock, resulting from the cost of feed, coprophagy (pseudo-rumination) practiced by rabbits increases the chances of better utilization of feed, thus reducing cost. Coprophagy serves an important nutritional function by supplying the animal with intestinally synthesized vitamin B and protein. The stability of normal micro flora depends somehow on normal coprophagy (Clarence *et al.,* 1986) and when sufficient forage is provided increases feed utilization (Geoffrey *et al.,* 1988).

The rapid increase in the world's population and acute protein shortage, particularly in developing countries such as Cameroon, have necessitated the urgent need for a means to increase food production, especially cheap and good sources of proteins (Oloyede *et al*., 2007. One of such sources which could fill the gap in shortages in animal source protein is the rabbit which is richer in protein (20.8%) and lower in fat (10.2%) than other meat species (Akinmutimi and Anakebe, 2008). Rabbit which is an important micro-livestock, has simple biological characteristics: short breeding cycle, high prolificacy and better food conversion efficiency (Hasanat *et al.,* 2006). Recently, small scale rabbit projects are gaining attention day by day as a means of alleviating poverty threat. Agro-climatic conditions, religious point of view, social practices and technological aspects support the prospects and potentials of raising rabbit. To make rabbit rearing more viable as a small-scale business, Ahamefule *et al*. (2005), advocated the development of alternative materials that will be relatively cheap when compared with commercial feeds or conventional feedstuffs. Rabbits have the potential of utilizing such unconventional feedstuffs.

Brewer's grain is a byproduct of high availability in Cameroon with 128.000tons of wet grains being produced annually by local breweries (Meffeja *et al.,* 2003). Since brewer's grain is not consumed by Cameroonians, and the breweries are searching for means of it disposal, sun-dried brewer's grain can be used as a feed ingredient. Substituting it for other high cost crude fibre feed ingredient, such as palm kernel cake, will reduce the cost of rabbit production by reducing the cost of feed. This will be so because brewer's grain can be obtained free of charge and the process through which it passes to become an animal feed ingredient may demand very little cost.

Studies (Mafeni and Fombad, 2001; Boateng *et al*., 2008) reveal that brewer's dried grain is higher in amino acids than palm kernel cake. It was against this background that this present study was conducted to determine the performance of weaner rabbits fed varying levels of sun-dried brewer's grain as substitute for palm kernel cake. Sun-dried brewer's grain and palm kernel cake were analyzed. The diets formulated using sun-dried grain as substitute for palm kernel cake were fed to weaner rabbits to evaluate their effects on the feed intake (FI), weight gain (WG), feed conversion ratio (FCR), growth rate (GR), feed efficiency (FE), nutrient digestibility (ND) and survival rate (SR) of the rabbits.

Materials and Methods

2.1 Study Site

The experiment was carried out at the rabbitry of the Institute of Agricultural Research for Development Ekona. It is located some 15 kilometers from Buea, along the Buea-Kumba highway, in Muyuka Subdivision, Fako Division, South West Region of Cameroon. It is located at an altitude of about 400m above sea level, with an average annual rainfall of 2284mm and a mean temperature of 24.4ºC during the dry season and 23.7ºC in the rainy season. It has an average annual relative humidity of about 90%.and a humid tropical climate characterized by high temperatures and rainfall. The rainy season is usually from mid March to mid November while the dry season is from mid November to mid March. The area has a rich volcanic soil.

2.2 Dietary Treatments and Processing Of Brewer's Grain

In the diets palm kernel cake (PKC) was replaced by sun-dried brewer's grain (SDBG) according to the following dietary groups:

T_1= 0% sun-dried brewer's grain (SDBG) and 100% palm kernel cake (PKC).
T_2= 25% sun-dried brewer's grain (SDBG) and 75% palm kernel cake (PKC brewer's).

T_3= 50% sun-dried brewer's grain (SDBG) and 50% palm kernel cake (PKC).
T_4= 75% sun-dried brewer's grain (SDBD) and 25% palm kernel cake (PKC).
Wilted forage; sweet potato (*Ipomea balatas)* vine, was the basal diet. The dietary treatments and fresh water were offered *ad libitum*.

Wet brewer's grains were collected in clean fertilizer bags from the brewery in Douala. The fresh feedstuff was spread on a large polythene sheet outside on a concrete floor in a thin layer and sun-dried for four days to minimum moisture content. Three times a day, the feedstuff was turned to improve the drying process and to avoid fermentation which could result in lowering the nutritive value. Before evening each day, it was gathered together and covered with the polythene sheet. Sun-dried brewer's grain (SDBG) and the other bought ingredients (Table 1) were

mixed in their calculated proportions following the treatments, ground in a mill, spread on a large fertilizer bag and allowed to cool for 24 hours to avoid condensation of water vapor that could enhance moulding. After cooling, each treatment feed was put in a polythene bag protected by a fertilizer bag, to avoid entry of crawling arthropods, contamination by rats and entry of air.

Table 1: Proximate composition of the experimental ingredients and experimental diets.

Sample	DM (%)	Ash (%DM)	Lipids (%DM)	CF (%DM)	CP (%DM)	GE (kcal/kg DM)	ME (kcal/kg DM)
PKC	89.63	2.11	13.63	27.66	13.72	5210.96	2150.98
SDBG	89.01	4.48	5.28	16.03	21.23	4671.59	2633.24
T_1	86.66	3.90	7.04	13.45	15.51	4681.68	2981.65
T_2	89.01	7.96	7.86	11.64	15.41	4525.58	3020.81
T_3	86.61	7.95	3.81	11.66	17.14	4339.11	2799.22
T_4	87.81	8.87	4.89	11.81	18.99	4383.85	2807.29

DM=Dry matter, CF=crude fibre, CP=Crude protein, GE=Gross energy, ME=Metabolisable energy, PKC=Palm kernel cake, SDBG= Sun dried brewer's grain.

2.4 Housing and Equipment

The rabbitry was a wooden house with a concrete floor having corrugated aluminum sheets for the roof. It was well ventilated with four large windows covered with wire mesh. A long wooden hutch of about 616cm was built on one of the walls without windows. This was to prevent direct wind (draught) from blowing on the rabbits (rabbits are susceptible to airborne diseases such as snuffles). The long wooden hutch was suspended at a height of 70cm from the floor level. The hutch was partitioned into four cages. Each cage had a size of 30cm x 78cm x 60cm so as to provide a space of about 0.47m^2 per rabbit, a hinged door of about 39cm x 29cm covered with wire mesh, the sides covered with plywood, the floor and roof having planks of 4cm thick, with the floor planks spaced at a distance of 1.5cm to allow for the easy passing of faecal droppings. The drinkers were made out of cement mould with a size of 10cm x 10cm x 5cm and volume of 500cm^3. The feeders were large empty "ovaltine" cups bent in the middle having a volume of 785cm^3.

2.5 Rabbits and Management

Twenty weaner rabbits (*Oryctolagus cuniculus)* of age six to eight weeks (42-56 days) were used. Three days before the arrival of the rabbits, the rabbitry was disinfected with "Izal" and petrol spread round the building to scare snakes. The equipment (feeders and drinkers) were thoroughly washed and the environment cleaned. During the course of the experiments, the rabbitry and the hutches were cleaned daily to avoid accumulation of ammonia which is toxic to the rabbits. The drinkers were also washed daily and fresh water provided. Two hours before the arrival of the rabbits, feed and water were put in place. On arrival of the rabbits, their body weights were measured using a top scale balance. The rabbits were identified using ear tags. They were allotted to the four dietary treatments (T_1, T_2, T_3 and T_4) in a randomized complete block design, thus five replicates per treatment. An anti stress [vitamin (amine total)] was administered to the animals. The test diets (T_1, T_2, T_3 and T_4) Table 1 were offered to the respective treatments for the first two weeks such that animals became adapted to their respective dietary treatments. Then after, feed intake and body weights were measured on a weekly basis until the end of the experiment.

2.6 Faecal Collection

Washed dried cleaned fertilizer bags separated to sheets were perforated in the middle to allow urine passage, were hung below each cage to collect faeces. Faeces (T_1, T_2, T_3 and T_4) void of fur and urine was collected for 72 hours and sun-dried to minimum moisture content. Sun-dried faeces was then put in polythene bag and protected in a fertilizer bag and preserved for chemical analysis.

2.7 Data Collection and Analysis

Weekly records were kept on Feed intake, growth rate for each treatment, morbidity, mortality and clinical disease symptoms. The animals were weighed using a top scale balance before feeding. The average weight gain for each treatment was computed by taking the average of weight gains of all replicates of the said treatment. The weekly weight gain was determined by subtracting each weight measured at weekly interval from the previous week's weight. The weekly growth rate was calculated by dividing monthly weight gain (∑ weight gain for four weeks) by four. The daily growth rate was calculated by dividing weekly weight gain by seven. The weekly feed conversion ratio was determined by dividing weekly feed intake (**FI**) by weekly weight gain. The weekly feed efficiency was determined by calculating the inverse of feed conversion ratio.

Representative samples of experimental ingredients (palm kernel cake and sun-dried brewer's grain) and experimental diets were analyzed using the standard methods of the Association of official Analytical chemist (1990) version 15th edition.

2.8 Nutrient digestibility

Nutrient digestibility was calculated using information from percentage nutrient in ingredients, calculated percentage nutrient in diets, proximate analyses of diets and faecal samples.

a) Percentage digestion coefficient (%DC) of nutrient was calculated using information from the proximate analyses of the experimental diets and sun- dried faecal samples.

$$\%DC = \frac{\%\text{ nutrient in analyzed diet} - \%\text{ nutrient in analyzed faeces}}{\%\text{ nutrient in analvzed diet}} \times 100$$

b) Percentage digestion coefficient (%DC) of metabolisible energy (ME) of nutrient was calculated using the information from the proximate analyses of the experimental diets (Table 3) and sun- dried faecal samples (Table 4).

$$\%DC\text{ of }ME = \frac{\%ME\text{ in analyzed diet} - \%\ ME\text{ in analyzed faeces}}{\%\ ME\text{ in analyszed diet}} \times 100$$

c) Percentage digestion of nutrient (%DN)

i) % nutrient from ingredient in the feed = % nutrient in ingredient x calculated % nutrient in the feed.
ii) % nutrient in the feed = % nutrient from all ingredients in the feed = ∑ % nutrient from ingredients in the feed.

$$\%DN = \frac{\%\text{ nutrient in the diet} \times \%DC\text{ of nutrient}}{100}$$

d) Percentage digestion of metabolisable energy (% DME) of nutrient.

i) % ME of nutrient from ingredient to the feed = % ME of nutrient in ingredient x calculated % ME of nutrient in the feed.
ii) % ME of nutrient in the feed = % ME of nutrient from all ingredients in the feed = ∑ % ME of nutrient from ingredients in the feed

$$\%\ DME = \frac{\%\ ME\text{ of nutrient in the diet} \times \%DC\text{ of }ME}{100}$$

e) Total digestible nutrient (TDN) in feed and total digestible metabolisible energy (TDME) in feed.

These were calculated as follow:

TDN = [% DN of EE x 2.25] + % DN of CF + %DN of CP
TDME = %DME of EE + %DME of CF + %DME of CP

2.9 STATISCAL ANALYSES

The data from the feeding trial were analyzed using the software package SPSS (Statistical Page for Social Science) 2010 version. Kolmogorov-Smirnov and Shapiro-Wilk tests were used to compare feed intake, feed efficiency and weight gain of the different treatments.

Parametric tests used for the analyses were the following: 1) Independent sample T-test, to compare two independent treatments for significant difference; 2) ANOVA test, to compare three or more independent treatments for significant difference; 3) Paired sample T-test, to compare two related treatments (treatments within the same week) for significant difference; and 4) Friedman test, to compare three or more related treatments (treatments within the same week) for significant difference. All analyses were considered significant at 95% (P=0.05) level.

3.1 RESULTS AND DISCUSSION

The chemical composition of the experimental ingredients and diets are presented in Table 1.The crude proteincontent (21.23%) of sun-dried brewer's grain was lower than reported earlier by Maertens and Salifou (1997) (23.6%), Siddarammana *et al.* (2009) (28%), Jovanka *et al.* (2010) (30%) and Luu *et al.* (2008) (32%). It was higher than the 20% reported by Mafeni and Fombad (2001). The crude fibre content of sun-dried brewers' grain was16.03%, lower than 18% reported by Siddarammana *et al.* (2009) and higher than 15% reported by Mafeni and Fombad (2001). The reasons for these differences could be: the processing method used for the brewer's grain, the method of chemical analysis used, the types of grains (barely, corn, wheat and rice etc) used, the type of brewery that produced the brewer's grain, the duration of fermentation of the grains before brewer's grain production, and the type of fermentation to which the brewer's grain was subjected. The crude protein in the diets increased with increase in sun-dried brewer's grain inclusion. This was because sun-dried brewer's grain had a higher content of crude protein (21.23%) than palm kernel cake (13.72%).

Morbidity and mortality during the experimental period was 0%, far below that reported by Maertens and Salifou (1997) (15.6%), Nfi and Ndoping (1996) (20-25%) and Fomunyam *et al.*(2000) (30-60%), The reasons for the absence of any morbidity and mortality could be due to the high hygienic measures taken during the preparation and storage of the diets, the feeding and management of the animals that prevented contamination, the absence of transportation stress since the transportation distances of the animals were not far from the experimental site, and the high crude fibre content of the feed (greater than 11%, which was within the expected level of 13.00% in the diets for optimum growth and performance). All these prevented diarrhoea and dysentery which are usually the main causes of death in rabbits (Maertens and Salifou; 1997, Fomunyam *et al.* (2000).

There was a significant difference in the average weekly feed intake between treatments and within treatments at $P<0.05$. (Table 2 & Figure 1). The lowest average weekly feed intake was recorded in T1 (0.539±0.004kg) and the highest in T4 (0.606±0.003kg). The results showed that there was an increase in feed intake with increase in sundried brewer's grain inclusion (T1<T2<T3<T4) and a decrease in the crude fibre content and metabolisable energy. This was also observed by Siddarammana *et al*. (2009) in an experiment with New Zealand White rabbits. This could probably be due to an increase in palatability with increase in sun-dried brewer's grain in the diet, and the shorter time taken for the low crude fibre diets to pass through the intestine being compensated by frequent feed intake. Lower metabolisable energy also increases feed intake to meet the energy requirement Akinmutimi and Anakebe (2008).

There was no significant difference in the average daily growth rate among treatments at $P>0.05$. The highest average daily growth rate (0.023±0.003kg) was recorded in T1 that also had the lowest average weekly feed intake (0.539±0.004kg) (Table 2 & Figure 2). Maertens and Salifou (1987) had a growth rate of 0.003kg±0.001 per day far below that observed in this experiment. This could be due to the high crude fibre content (13.45%) found in T1 that reduced bowel content movement but increased bowel content absorption. This might have also vincreased amino acid absorption and metabolisable energy used in edification of cells. The lowest average daily growth rate (0.021±0.003kg) was recorded in T3 that had the lowest crude fibre (11.64%) but the highest metabolisable energy (3020.81kcal/kg). The high energy content in T3 probably was not made available for anabolism.

Table 2: Performance of growing weaner rabbits fed varying levels of SDBG as substitute for palm kernel cake.

Parameters	T_1 (mean± SEM)	T_2 (mean± SEM)	T_3 (mean± SEM)	T_4 (mean± SEM)	ANOVA
Average Initial weight (kg)	0.950±0.157	0.984±0.177	1.034 ± 0.148	0.960 ± 0.142	F=0.090 P=0.965
Average weight gain (kg)	1.448±0.216	1.410±0.165	1.294 ± 0.167	1.364 ± 0.110	F=0.154 P=0.925
Average Weekly weight gain (kg)	0.161±0.024	0.157 ± 0.018	0.144 ± 0.019	0.152 ± 0.012	F=0.154 P=0.925
Average feed intake (kg)	4.850^{abc} ± 0.035	5.088^{ad} ± 0.047	5.222^{be} ± 0.040	5.458^{cde} ± 0.024	F=46.294 P<0.001
Average Weekly feed intake (kg)	0.539^{abc} ± 0.004	0.565^{ad} ± 0.005	0.580^{be} ± 0.004	0.606^{cde} ± 0.003	F=46.294 P<0.001
Average final weight (kg)	2.398 ± 0.317	2.394 ± 0.249	2.328 ± 0.248	2.290 ± 0.218	F=0.041 P=0.989
Average feed conversion ratio	6.643 ± 1.040	4.467± 0.514	6.350 ±1.135	6.739 ± 1.142	F=1.160 P=0.356
Average feed efficiency	0.300 ± 0.045	0.282 ± 0.036	0.247± 0.034	0.252 ± 0.022	F=0.524 P=0.672

^{a,b,c,d,e,f} : pairs with the same letters within rows are significantly different at the P = 0.05 level.
a, b, c, ……Treatment means with different superscripts are significantly different at (P≤ 0.05)

Table 3: Proximate analyses of the experimental diets (T_1, T_2, T_3 and T_4)

Sample	DM (%)	Ash (%DM)	Lipids (%DM)	CF (%DM)	CP (%DM)	GE (kcal/kg DM)	ME (kcal/kg DM)
T_1	86.66	3.90	7.04	13.45	15.51	4681.68	2981.65
T_2	89.01	7.96	7.86	11.64	15.41	4525.58	3020.81
T_3	86.61	7.95	3.81	11.66	17.14	4339.11	2799.22
T_4	87.81	8.87	4.89	11.81	18.99	4383.85	2807.29

DM=Dry matter, CF=crude fibre, CP=Crude protein, GE=Gross energy, ME=Metabolisable energy.

Table 4: Proximate analyses of Sun - Dried Faecal Samples of Weaner rabbits fed varying levels of sun-dried brewer's grain as substitute for palm kernel cake.

Samples	DM (%)	Ash (%DM)	Lipids (%DM)	CF (%DM)	CP (%DM)	GE (kcal/kg DM)	ME (kcal/kg DM)
T_1	92.20	16.68	1.19	20.58	13.43	3840.62	1509.29
T_2	93.91	15.41	1.92	18.18	13.11	3908.76	1813.93
T_3	91.61	16.23	1.53	19.62	14.51	3885.76	1631.30
T_4	90.52	16.07	1.98	19.64	13.03	3894.64	1660.63

DM=Dry matter, CF=Crude fibre, CP=Crude protein, GE=Gross energy, ME=Metabolisable energy.

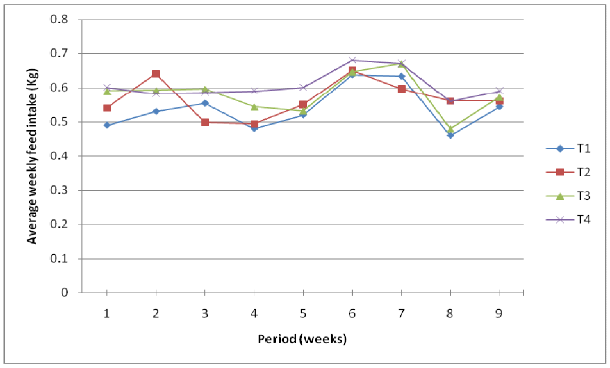


Figure 1 Average weekly feed intake of Weaner rabbits fed varying levels of SDBG as substitute for PKC.

There was a significant difference in the average daily growth rate within treatments at P<0.001, P<0.002, P<0.002 and P<0.001 for treatment 1, 2, 3 and 4 respectively. The lowest average growth rate (0.007±0.002kg, 0.007±0.003kg, 0.007±0.004kg, 0.011±0.004kg) was recorded in week 8, 9, 9 and 8 for treatment 1, 3 2, and 4 respectively. This could be attributed to the fact that the animals were approaching adulthood, a period when more protein is used for other physiological activities than edification. Moreover, rabbits generally require high maintenance energy because of their high surface to body weight ratio (Ahamefule *et al.,* 2007), which increases with age.

There was a significant difference in the average weekly feed conversion ratio within treatments and between weeks.

The results showed that feed conversion ratio increased with increase in feed intake and sun-dried brewer's grain inclusion. This might have been as a result of the crude protein in the sun-dried brewer's grain not being made available for convertibility into tissue due to the low metabolisable energy. There was no significant difference in weekly feed conversion ratio within weeks and across treatments at P>0.05. The lowest average weekly feed conversion ratio (4.421±0.236) was recorded in treatment 1 while the highest average weekly feed conversion ratio (4.838±0.421) was recorded in treatment 3 that had the lowest average weekly feed intake. Akinmutimi and Anakebe (2008) observed that lower feed conversion ratio of a diet indicated superiority of the diet.

There was no significant difference in weekly feed efficiency among treatments at P>0.05 but there was a significant difference in weekly feed efficiency within treatments at P<0.001, P<0.003, P<0.006 and P<0.001 for treatment 1, 2, 3 and 4 respectively (Figure 3). The results showed that feed efficiency was decreasing with decreased in the fibre content of the diets. This observation was also reported by Siddarammana et al. (2009), that the major importance of fibre in rabbit diet is to regulate the transit time due to it low digestibility. The most efficient diet was T1 that had the highest fibre content (13.45%) and almost the lowest crude protein (15.51%), but showed the highest average weekly weight gain and the lowest average weekly feed intake. The high fibre content might have been having a delaying effect on digestive passage Maertens and Salifou (1987), thus permitting complete utilization of metabolisable energy (2981.65 kcal/kg) and proper nutrient absorption as compared to other diets like T4 with low fibre content (11.8%), high crude protein (18.99%) but low energy (2807.29 kcal/kg). The highest feed efficiency was record in the early stage of the experiment while the lowest was at the late stage. The reason for this could be the decrease in the ability of feed convertibility with age. There was a strong but insignificant correlation between the average total feed intake and the average total weight gain at P=0.340. This correlation revealed that the least consumed feed fed better (Figure 4 & 5).

Calculated digestible nutrient (DN) of ether extract (lipid), crude fibre and crude protein were decreasing (T1>T2>T3>T4) with increasing sun-dried brewer's grain inclusion in the diet. This could have been due to the fact that digestible energy was not enough for digestion since the calculated digestible energy was decreasing from T1 to T4. T1 had the highest total digestible nutrients (8.08) with the lowest digestible crude protein (2.41) but the most efficient diet. This could be explained by the fact that it had the highest digestible energy (1359.04kcal/kg).

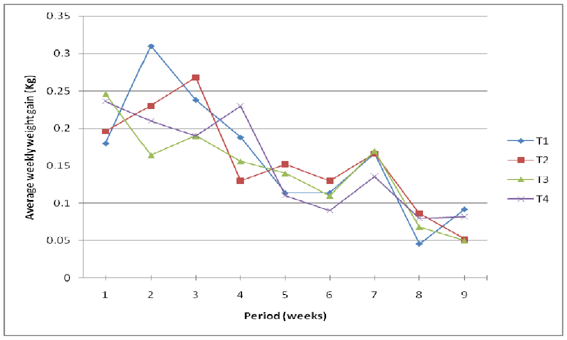


Figure 2: Average weekly weight gain of Weaner rabbits fed varying levels of SDBG as substitute for PKC.

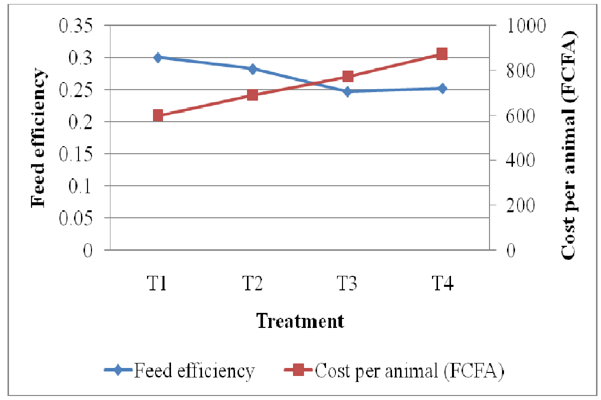


Figure 5: Association between feed efficiency of Weaner rabbits fed varying levels of SDBG as substitute for PKC and cost of ingredients per treatment

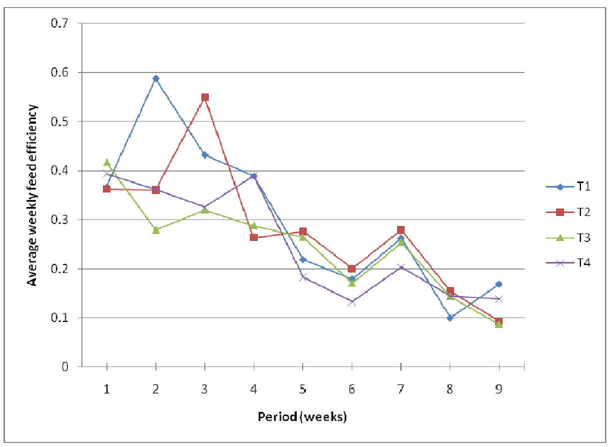
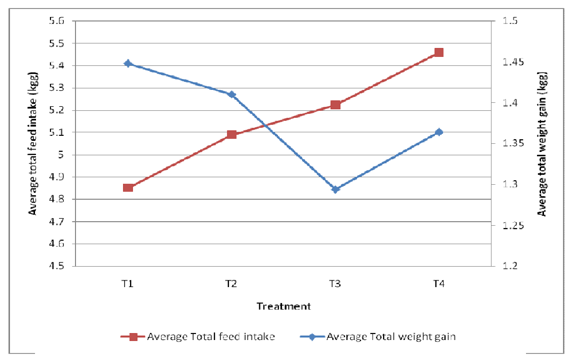


Figure 3: Weekly feed efficiency of Weaner rabbits Fed varying levels of SDBG as substitute for PKC.



Pearson correlation test: R=-0.660; P=0.340

Figure 4: Correlation between average total feed intake and average total weight gain of Weaner rabbits fed varying levels of SDBG as substitute for PKC.

3.2 CONCLUSION

From the results of this study, it is clear that excluding diet 1 which had 0% sun-dried brewer's grain, diet 2 (25% SDBG) had the best performance since it recorded the highest average weight, was the least consumed but the most efficient. The weight gain decreased as the percentage of sun-dried brewer's grain inclusion increased in the diet. Therefore, it can be concluded that sun-dried brewer's grain meal could replace up to 25% of palm kernel cake in the diet of Weaner rabbits.

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Cite this Article: K.A. Etchu, M.E. Humbu, K.J.N. Ndamukong and E.B. Agbor (2012). Effect of Varying Levels of Brewer's Dried Grain on the Growth Performance of Weaner Rabbits (*Oryctolagus Cuniculus*)**.** Greener Journal of Agricultural Sciences, 2(6): 237-245, http://doi.org/10.15580/GJAS.2012.4.07261204**.**