ACCEPTABILITY AND PERFORMANCE CHARACTERISTICS OF WEST AFRICAN DWARF SHEEP FED DIETS MIXED WITH SOYA BEAN AND PALM KERNEL OILS

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ABSTRACT

This study was conducted to investigate the acceptability and performance characteristic of West African Dwarf sheep fed diets mixed palm kernel oil (PKO) and soyabean oil (SBO). Sixteen (16) West African Dwarf sheep of average weight 12.50±0.5kg were allotted to four dietary treatments in a completely randomized design. The sheep were fed with the experimental diets mixed with palm kernel oil and soyabean oil with inclusion level of 0:0g/day, 10:5g/day, and 7.5:7.5g/day, 5:10 g/day of SBO: PKO as treatment 1, 2, 3 and 4 respectively for 16 weeks. Free choice intake was determined by cafeteria method using two indices; Coefficient of preference (CoP) and percentage preference (Pp) while for growth performance study, animal were randomly allotted to the four dietary treatment where feed intake, weight gain and feed conversion ratio were determined. The results revealed that the free choice intake of the diet (493.75-560.68g/day) was significantly ($p<0.05$) influenced by the dietary treatments. The highest percent preference (27.03%) was recorded with rams fed diets mixed with 5:10g/day PKO: SBO and was ranked 1st.Rams fed diet mixed with 5:10g/day PKO: SBO also recorded the highest daily weight gain (54.14 g/day) which was significant ($p<0.05$) across the treatments. The metabolic weight gain (1.93-3.09 $W^{0.75}$ g/day) were significantly ($p<0.05$) different among the treatments. It was therefore concluded that diets mixed with palm kernel oil and soyabean oil at 5:10g/day is best accepted, preferred and exhibited the best feed conversion ratio without any adverse effect on the West African Dwarf sheep

Keywords: Acceptability, Preference, Oil, Soyabean oil, Growth

INTRODUCTION

The world population is ever increasing most especially in the developing countries, this increase in population practically erodes increase in food production leaving no hope for ever having surplus gain to compound economically viable livestock feeds (Onimis, 2005). Current research efforts in most developing countries are therefore aimed at identifying potential feed for feeding ruminant with better feed utilization. The high energy value of soybean oil is attributed to its high percentage of Poly unsaturated fatty acids, which are well absorbed and utilized as a source of energy by the animal (Huyghebaert *et al*., 1988). Also, the high polyunsaturated fatty acids (PUFA) in soybean oil appears to have an energy independent effect on improving reproduction in dairy cattle (Kerley and Allee, 2003) and this has been attributed to the role of linoleic acid in reproduction.Palm oil and palm kernel oil are edible plant oils derived from the fruits of palm trees. Palm oil is extracted from the pulp of the fruit of oil palm (*Elaeis guineensis*); palm kernel oil is derived from the kernel seed of the oil palm (Poku, 2002).

MATERIALS AND METHODS

The experiment was conducted at Southern farm, Small Ruminant Unit of Federal College of Animal Health and Production Technology, Moor Plantation Ibadan. The unit was located in South Western part of Nigeria. The area lies within longitude and latitude 7-27^{0}N and 3-25^{0}E respectively. Altitude 200-300m above sea level with an average rainfall of about 1250mm-1300mm, the temperature and relative humidity ranges from 30°C-35°C and 76-78% respectively.

A total number of sixteen (16) West African Dwarf sheep were used for the experiment.At the end of one week adjustment period, the palm kernel and soybean oil were thoroughly mixed with the diet compounded for the animals at different ratio: T_1 (0:0g/day), T_2 (10:5g/day), T_3 (7.5:7.5g/day), T_4 (5:10g/day) respectively which was later fed to the experimental animals as shown in the Table 1 below.The quantity of the daily feed provided and the remnant of the previous days feed was weighed to determine the feed intake on a daily basis. Weekly weight gain was also determined.

A cafeteria trial was carried out at the beginning of the experiment to determine the acceptability of the feed; it was determined by two ingesta indices; Coefficient of Preference (CoP) and Percentage Preference (Pp). 4kg of each diet was replicated into 12 different troughs representing 3 troughs per treatment; it was then placed at different locations and repeated for 7 consecutive days. The animals were then allowed on free choice to feed on those diets for 2hours and the left over were weighed to determine the accepted feed intake.

TABLE 1: GROSS (%) COMPOSITION OF THE EXPERIMENTAL DIET

FEED INGREDIENT (%)	Treatments			
	T_1(g/day) PKO : SBO 0 : 0	T_2(g/day) PKO : SBO 10 : 5	T_3 (g/day) PKO : SBO 7.5 : 7.5	T_4 (g/day) PKO : SBO 5: 10
Dried Cassava Peel	37.00	37.00	37.00	37.00
Groundnut Haulms	20.00	20.00	20.00	20.00
Cowpea Haulms	10.00	10.00	10.00	10.00
Soybean Husk	10.00	10.00	10.00	10.00
Corn Bran	12.00	12.00	12.00	12.00
Palm kernel cake	10.00	10.00	10.00	10.00
Premix	0.50	0.50	0.50	0.50
Salt	0.50	0.50	0.50	0.50
Total	100.00	100.00	100.00	100.00
Calculated Analysis (%)				
Crude Protein (%)	12.90	12.90	12.90	12.90
Crude Fibre (%)	17.50	17.50	17.50	17.50
Metabolizable Energy (MJ/Kg)	12.05	12.45	12.45	12.46

PKO- Palmkernel Oil SBO- Soybean Oil

RESULTS AND DISCUSSION

Table 2 shows the Acceptability of diets mixed with Palm kernel oil and Soyabean oil. The preference assessment otherwise called acceptability is a fast and cheap means of assessing diets or fodder plants in a short period of time (Scandoval-castrol *et al.,*2005). The free choice intake ranged between 493.75 and 560.68g/day which was in line with the 520.48-570.75 g/day reported by Ososanya and Olorunisomo, (2015) who fed West African Dwarf sheep with wet brewer's dry grain ensiled with maize cob. Diet is prepared to be relatively acceptable when crop is equal to or greater than unity Babayemi and Bamikole, (2006). The Coefficient of Preference (CoP) recorded in this study ranged from 0.95 -1.08, within the range reported by Ososanya and Olorunnisomo (2015) of CoP 0.84 -1.33. It was also within the range reported by Ibhaze *et al*., (2016) who gave the CoP of 0.49 -2.30.When the coefficient of Preference (CoP) is equal to or greater than 1 the diet is considered to be acceptable and when CoP is less than 1,the diet is assumed to be less or unacceptable to the livestock. Olorunisomo and Fayomi, (2012) noted that Coefficient of Preference (CoP) may not be a realistic measures of acceptability of diets by ruminants since it does not take into consideration the previous experience of the animals or the relative importance of changing the dietary preference of livestock. Abegunde, *et al.,* (2017) also reported CoP of (0.37-1.44) for West African Dwarf goats fed mombin leaves fruit silage; the percent preference reported as (9.18-35.26 %) which was within the range (23.81-27.03%) recorded in this study. Animal tends to consume diets more if found more pleasant or palatable irrespective of the nutrient value. Ibeawuchi, *et al.,* (2002) opined that beyond nutritional compositions of diets, animal tend to consume more of palatable diets. Quedrago, *et al.,* (1996) indicate that several factor influenced the acceptability of feed in terms of texture, coarseness or odour. The inclusion level of palm kernel and soybean oil in the sheep diets significantly ($p<0.05$) influence the weight gain, final weight gain, average daily feed intake. The average weight gain was significantly ($p<0.05$) higher in sheep fed diets mixed with PKO:SBO (5:10g/day)as shown in Table 3and lower in T2 inclusion level. This may be attributed to the level of the voluntary intake of the diet.Forbes (1995) observed that if voluntary intake of feed by animal is too low, rate of production will be depressed. This factor has thus been described as one of the factors for production in small ruminant (Do Thi Than, 2006). The daily was also in agreement with the findings of (Jinadu *et al.,* 2018) who reported an average daily weight gain of (29.35-41.43g/day) for West African Dwarf sheep fed diets containing varying levels of sugarcane waste silage.

Table 2: Acceptability of diets mixed with Palm kernel and soyabean oil by West African Dwarf sheep

Parameters	T1(g/day) PKO: SBO	T2 (g/day) PKO: SBO	T3(g/day) PKO: SBO	T4(g/day) PKO: SBO	SEM
	0:0	10:5 7.5:7.5	5:10		
Free choice intake (# g/day)	520.15 ^{b}	493.75^{c}	499.35^{c}	560.68^{a}	7.08
Coefficient of preference	1.00	0.95	0.96	1.08	0.01
Percentage preference (%)	25.08	23.81	24.08	27.03	0.10
Ranking	2nd	4th	3rd	1st	

Table 3:Performance characteristics of West African dwarf sheep fed diet mixed with palm kernel and soyabean oil

Parameters	T1(g/day) PKO: SBO	T2 (g/day) PKO: SBO	T3(g/day) PKO: SBO	T4(g/day) PKO: SBO	SEM
	0:0	10:5	7.5:7.5	5:10	
Initial body weight (kg)	13.35	13.64	13.67	13.62	0.44
Final body weight (kg)	16.95^{ab}	16.04^{b}	16.38^{ab}	18.17^{a}	0.47
Weight gain (kg)	3.60^{ab}	2.40^{b}	2.72^{ab}	4.55^{a}	0.45
Daily weight gain (kg)	42.80^{ab}	28.57^{b}	32.35^{ab}	54.14^{a}	0.26
Metabolic weight gain ($W^{0.75}$ g/day)	2.59^{ab}	1.93^{b}	2.01^{ab}	3.09^{a}	5.39
Total feed intake (kg)	45.83	42.15	44.80	46.39	2.22
Daily feed intake (g/day)	545.63	501.82	533.30	552.23	26.44
Feed conversion ratio	12.73	17.56	16.47	10.20	5.15

^{a,b,c} means along the same row with different superscripts are significantly different

CONCLUSION:

It can be concluded from the study that the diets mixed with palm kernel oil and Soybean oil at 5:10 g/day is best preferred and exhibited the best daily weight gain without any adverse effect on the West African Dwarf sheep.

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