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THE EFFECTS OF CONCENTRATE FEED SUPPLEMENTATION ON THE THE VISCERAL ORGAN WEIGHTS OF GRASSCUTTERS FED ELEPHANT GRASS AS BASAL FEED

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ABSTRACT:
A 24 week feeding trial was used to study the effect of different levels of concentrate feeding regimes on the visceral organs weights of the grasscutter fed Elephant grass as basal feed. Twenty grasscutters of age 3 months were randomly assigned in equal numbers to five concentrate supplementary feeding regimes fed at their percentage weekly body live weight of 1, 3, 5, 7 and 9% for T_1, T_2, T_3, T_4, and T_5 respectively, using a Completely Randomized Design (CRD). The data collected were subjected to analysis of variance and significant difference separated where observed. The weights, of the liver, kidneys, heart, spleen and gall bladders did not differ significantly ($P>0.05$) but the lungs and pancreas were significantly ($P<0.05$) different. It was concluded that, since all the organs were not damaged, no mortality and no any sign of distress among the grasscutters, it implies that, the feeding regimes of up to 9% did not have adverse effect on them. It is therefore recommended that, the concentrate feeding regimes should be used in feeding grasscutters.

Key words: Grasscutter, concentrate feed Supplement, Elephant grass, Organs' weights

INTRODUCTION

The small size of micro or mini-livestock animals means a small amount of input per unit, which in turn means more flexible production. Backyard food production such as mini-livestock can be a major contributors to a more balanced diet for both rural and urban people. The attributes of mini-livestock gives it the potential of contributing significantly to food security and meeting up the recommended dietary animal protein intake. Its small indigenous and flexible nature makes it a suitable livestock production that can be handled by women and children (Hardouin *et al.*, 2003). In recent times, raising of micro livestock by rural household is becoming popular due to the fact, that the households have realized the need to diversify their source of income, thereby reducing the risk involved in depending on crop production as the main source of income. Farmed 'bush-meat' is still highly ranked in terms of taste and preference, and there is no doubt that a market exist, if necessary intensive management techniques, including domestication can be developed (Leake, 2000). Major hindrances to the development of the captive grasscutter include lack of improved breeding stock, lack of technical know-how, poor management practices, poor housing and lack of start-up capital.

Poku *et al.* (2013) and many other researchers have studied the effect of protein supplementations and varied energy requirements on growth, reproduction and carcass characteristics of grasscutters from birth to maturity. However, the need to study the effect of concentrate supplementation feeding regimes on the visceral organs cannot be over emphasized considering the fact that, animal species apart from having their nutrient requirements, they also have a particular feeding regime based on their physiological stage that may affect their organs and grasscutter is still under study in these regards.

Materials and Methods

The study was carried out in Obubra, Cross River State. This is located between longitude 8^0-9^0E and Latitude 6^0-7^0N of the equator with mean annual rainfall of the area ranges from 500 to 1070 mm, with a warm weather and ambient temperature of about 20^{0c}-30^{0c} (Mfam, 2000.

A total of twenty (20) weaned grasscutters between the ages of 3-4 months were used for the study. The grasscutters were randomly assigned to five treatments feeding regimes in a completely randomized

design. There were four replicates of each treatment with an animal serving as a replicate. The animals were given elephant grass as basal feed *ad libitum* and formulated concentrate supplemented at a feeding regime of 1, 3, 5, 7, and 9% for T_1, T_2, T_3, T_4 and T_5 respectively, of their weekly live body weight throughout the period of study.

The grasscutters were individually housed in clearly and properly-labelled concrete cells measuring 90 x 75 x 40 cm (length x width x height). Each cell was provided with a feeder and a drinker. On introduction into the cells, the animals were provided with the necessary preventive medications. Elephant grass (*Pennisetum purpureum*), were cut and wilted for about 12 hours, weighed and fed daily as basal diet. Water and elephant grass were supplied *ad libitum*. The animals were weighed weekly throughout the period of 24 weeks of the study. All the sanitation measures were adhered.

Experimental diet

A concentrate supplement diet was formulated to contain approximately 18% crude protein and a Metabolizable energy of 2961.47 kcal/kg (Table 1) which was used at different feeding regimes of 1, 3, 5, 7 and 9% of their weekly body live weight and fed with wilted Elephant grass as basal feed (Table 1).

Table 1: Composition of concentrate supplement feed

Ingredients	%
Maize	58.41
Soybean meal	27.59
Rice offal	10.00
Bone meal	3.00
Vitamin-min-premix*	0.50
Common salt	0.50
Total	100.00
Calculated nutrients composition.	
Crude Protein	18.00
Metabolizable Energy (/kcal/kg)	2961.47
Crude fibre (%)	6.97

* Each 1kg of vitamin/mineral premix manufactured by BEAUTS Co. Inc. Man, U.S.A., contains Vitamin A 220,000, Vitamin D 66,000, Vitamin E 44, 014; Vitamin K 88 mg; Vitamin B 12; 0.76 mg; Niacin 1122 mg, Calcium 27%, Phosphorus 10%, Iron 0.6%, Zinc 0.35%, manganese 0.25%, Copper 0.06%; Iodine 0.002%, Cobalt 26 ppm, Selenium 4 pp. ME = Metabolizable Energy

Data collection

Organ evaluations.

At the end of the 24th week of the feeding trial two grasscutters from each treatment groups with live weight approximate their treatment mean live weight were selected for slaughter and their carcasses' organs were evaluated. Prior to slaughtering, the animals were deprived of feed overnight but had access to water. Each grasscutter was weighed and then slaughtered by severing transversely across the trachea, oesophagus, large carotid arteries and jugular veins with a sharp knife (at the neck region), then there were suspended head down and allowed to bleed to death completely under gravity. After slaughtered, the carcasses were eviscerated and weighed.

Organ weights

The weight of the liver, kidneys, heart, lungs+ trachea, spleen, pancreas and gall bladder expressed as percentage of the live weight were obtained.

Statistical analysis

Data collected was subjected to analysis of variance (ANOVA) using mini-tab statistical software (2014), and means separated were significant using least significant difference according to the procedures contained in the software.

Results and Discussion

Effect of the concentrate feeding regimes in the visceral organ weights

The weights of the liver, kidney, heart, spleen and gall bladders expressed as percentages of live body weight were similar (P>0.05) whereas that of the lungs and pancreas were significantly (P<0.05) different. The weight of the liver obtained 1.19-1.63% is in line with 1.42-1.47% (Henry *et al.*, 2012) but slightly less than 1.7-1.8% (Olomu *et al.,* 2003). The kidney weights 0.25-0.34% are in harmony with 0.28%-0.33% (Olomu *et al.,* 2003) but less than 0.38-0.49% (Henry *et al.,* 2012). The values of weight of the lungs 0.52 to 0.87% are comparable to 0.56-0.69% (Henry *et al*., 2012) and 0.62 to 0.67% (Olomu *et al.*, 2003). The heart weights recorded 0.39% - 0.48% are in line with 0.44-0.501% (Olomu *et al.*, 2003), but less than 0.56 to 0.67% (Henry *et al.,* 2012).

The Pancreas weight which ranged in this study from 0.03-0.045 was significantly different (P<0.05). The spleen weights 0.08-0.155% are less than 0.27-0.34% (Olomu *et al.,* 2003). The weight of the gall bladder obtained 0.04-0.065% were not significantly influence by the feeding regimes. These results implies that none of the visceral organs in the experimental grasscutters, were damaged by the feeding regimes since most organs were comparable to other researchers and some, the feeding regimes did not have effect on them. It is known that these organs help to ascertain the health status of farm animals. It was observed in this study that, this feeding regimes up to 9% of their weekly body live weight did not compromise the health status of the grasscutters. There was no record of loss of any grasscutters in any treatment neither was there any sign of distress among the grasscutters.

Table 2: Effect of concentrate supplement feeding regime on the visceral organs weight expressed as percentage live weight (%LW)

Visceral Indices	T1	T3	T5	T7	T9	SEM
Liver	1.275	1.190	1.625	1.245	1.300	0.14^{ns}
Paired Kidney	0.335	0.320	0.250	0.310	0.330	0.02^{ns}
Lungs	0.520c	0.540^{bc}	0.690^{abc}	0.870^{a}	0.835^{ab}	0,09*
Heart	0.390	0.420	0.405	0.425	0.485	0.06^{ns}
Pancreas	0.045^{a}	0.045^{a}	0.030^{b}	0.030	0.040^{ab}	0.003*
Spleen	0.110	0.140	0.110	0.080	0.155	0.03^{ns}
Gall bladder	0.045	0.065	0.030	0.045	0.040	0.01^{ns}

a, b, and c means within rows with similar superscripts are not significantly different (p>0.05), SEM= Standard Error of mean, * = significant level (0.05), ns = Non-significant (p 0>05)

CONCLUSION AND RECOMMENDATION

Based on the results obtained in this study, since all the organs in the experimental grasscutters, were not damaged by the feeding regimes, it implies that the feeding regimes did not have adverse effect on them, since the organs help to ascertain the health status of farm animals. This is an indication that, these

concentrate feeding regimes of up to 9% of their weekly body live weight did not compromise their health. There was also no record of mortality of any grasscutters in any treatment neither was there any sign of distress among the grasscutters. It is therefore recommended for feeding grasscutters.

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