GROWTH PERFORMANCE OF GROWING YANKASA RAMS FED CONCENTRATE WITH VARYING INCLUSION OF GINGER

Adeniji, S.A. and Ososanya, T.O.
Department of Animal science, University of Ibadan, Ibadan

Abstract
Ginger rhizome is a spice and may be beneficial in ruminant nutrition due to its inherent composition such as essential oils and its quality anti-microbial factor. The use of herbs and spices has been employed so as to bypass the use of antibiotics which has raised a number of public health concerns globally. The examinations were carried out on the effect of ginger rhizome powder on the growth performance. In a completely randomized design, ground raw dry Zingiber officinale Roscoe (ginger) rhizome was added to the feed of growing Yankasa rams aged 6-8 months. The supplementation with different levels of ginger powder at 0, 5, 10, 15 and 20g/kg of the diets were indicated as G1, G2, G3, G4, and G5 respectively. A total of 25 Yankasa rams were allotted to 5 treatments, with each ram kept in individual pen with access to feed and water. Weight gain (WG, (g)) and Feed conversion ratio (FCR) were assessed. Data obtained were subjected to analysis of variance, of Statistical analysis systems (SAS). The result showed that WG of rams on G3 (5.30) diet is higher than in the other treatments G1, G2, G4 and G5 (2.00, 4.00, 3.00 and 2.70). The FCR of G3 (7.39) is lower than in other treatments G1, G2, G4 and G5 (30.73, 15.79, 13.06 and 19.18). Summarily, dried ginger rhizome powder can be said to improve the performance of Yankasa rams at 10g/kg inclusion level.

Introduction

Herbs and spices or their products are often indicated to improve the flavor and palatability of feed, thus helping the animal to achieve a better performance. Livestock farmers are generally confronted with the problem of improving livestock performance in order to ensure more net returns (Pervez, 1992). A lot of research and production strategies have been employed, including the use of antibiotics to achieve this aim (Kehinde *et al*., 2010). Although antibiotics achieved good performance, their potential side effects became a real public health concern globally (Donoghue, 2003) and eventually led to the ban of the products especially in the western world (Nweze and Nwankwagu, 2010). This triggered an explosion of interest in the use of herbs and spices and their products as supplements in animal rations (Bunyapraphatsra, 2007; Owen, 2011; Anyanwu, 2010).

Some of the useful herbs and spices indigenous to Africa have been reported to enhance the performance of livestock animals (Muhmmad *et al*., 2009). This class of feed additives is increasingly gaining popularity in livestock production. Hence, this study tests the use of ginger as an alternative growth promoter.

Materials and Methods

The experiments were conducted at the Teaching and Research Farm of the University of Ibadan. The location is within the derived savannah zone of Nigeria. A total of 25 ram-lambs of ages between 15-18 weeks, weighing 11-13kg were used for this experiment. The ginger rhizome was added on top of the concentrate diet at 0, 5, 10, 15 and 20g/kg respectively with each inclusion level serving as experimental treatment. The concentrate composition is as shown Dry Cassava Peel 35%, Brewers Dry Grain 40 %, Palm kernel cake 12 %, Rice husk 8 %, Salt 3 %, Limestone 2 %, and Calculated Crude Protein 11.47%. The animals were fed *Panicum maximum* as the basal diet alongside the experimental diet. Each of the animals was weighed weekly for a period of 105days. The experimental design was a complete randomized design, while data were subjected to analysis of variance.

Animal Feeding

The rams were divided into 5 groups of five animals per treatment based on body weight and were randomly allocated to the experimental diets in a completely randomized design. The dietary treatments were offered at 8.00h at 2% body weight per animals and at 10.00h Guinea grass were offered to each of the animal at 3% of their body weight. The feeds offered the animals were carefully weighed using a top loading scale while all the feeds not consumed was also weighed in the same manner and recorded before being discarded. This is done so as to determine the actual voluntary feed intake by difference.

Feed and water troughs were cleaned daily while cool, fresh and clean water was offered them daily *ad-libitum*. The animals were weighed weekly before morning feed to ascertain weight change throughout the period of the trial.

The gross composition of the experimental concentrate diet with no ginger included cassava peel (30%), wheat offal (15%), corn bran (10%),

brewers' dry grain (25%), palm kernel cake (8%), rice husk (7%), salt (3%) and limestone (2%).

Table 1 shows the chemical composition of the experimental diet. The crude protein (CP) and crude fibre (CF) values ranged between 12.23-12.90 and 21.03-21.93 respectively. The CP content obtained for all the treatments is slightly above the ARC (1980) minimum protein requirement of 10-12% recommended for ruminants and was higher than the critical value of 7.7% or 70g/kg recommended by NRC (1981) for small ruminants.

There were no significant differences observed in the values obtained for the various parameters tested. The neutral detergent fibre (NDF), Acid detergent fibre (ADF) and the nitrogen free extract (NFE) had values ranging between 30.13- 40.73; 44.07- 45.07 and 31.53- 36.64 respectively.

The intake and weight changes observed in the Yankasa rams fed ginger rhizome powder are shown in table 2. The initial weight range of the experimental rams is 10.4-10.6kg, while the weight gain in (g/d) is observed to be between 19.05 in the unsupplemented diet and 50.48 in the diet containing 10g/kg of ginger i.e. G3. The optimum weight gain was observed in treatment G3 which reflected in the feed conversion ratio as well. The FCR observed for G3 showed that it has the highest potential amongst all the treatments. The trend showed that the FCR reduced in the control (30.73) to G2 (13.06) to G3 (7.39) and increased to G4 (15.76) to G5 (19.18). The result obtained in this study is in line with the numerous reports on improved feed intake through the use of phytogenic feed additives in swine (Windisch et al., 2007).

Herbs and spices or their products are often indicated to improve the flavor and palatability of feed, thus helping the animal to achieve a better performance. Thus, the result of this study indicated that this claim may be true and it is in line with the study that stated that flavor could affect feed intake (Deyoe *et al.*, 1962). In table 3, there is significant difference in t he weight gain per day and the total weight gain. However, no definite conclusion can be drawn from the present study because the table 3 does not show the daily dry matter intake having a definite trend to support the claim.

References

Anyanwu, M. (2010), Evaluation of the feed preservative potentials of Ocimum gratissimum L. B.Sc. project Dept. Anim. Sci. Fed. Unvi.of Tech., Owerri.

ARC 1980. The Nutrient Requirements of Ruminant Livestock. Commonwealth Agricultural Bureaux, Slough, England. 351p.

Bunyapraphatsara, N. (2007), Utilization of medicinal plants in animal production.11th International Congress.Leiden, Netherlands, Phytopharmcology

Deyoe, C.W., Davies, R.E., Krishnan, R., Khaund, R. and Couch, J.R. (1962), Studies on the taste preference of the chick. Poult. Sci., 41, 781-784

Donoghue, D. J. (2003), Antibiotic residues in poultry tissue and eggs. Human health concerns. Poult. Sci. 83(4): 618-622.

Kehinde, A. S., Omole, A. J., Bobadoye, A.O. and Obun, C.O. (2010), Growth performances and nutrients digestibility of cockerel chicks fed diets containing graded levels of Ginger (Zingiberofficinale). Proc. 35th Conf. Nig. Soc. for Anim. Prod. 14 -17th March, 2010, Univ. Of Ibadan, Nigeria, Pp. 356.

Muhammad Javed, Fazil-Raziq Durrani, Abdul Hafeez, Rifatullah khan and Ijaz Ahmad (2009), Effects of aqeous extract of plant mixture on carcass quality of broiler chicks. Research Publishing Netwok (ARPN) Journal of Agricultural and Biological Sciences 4(1), 37-40.

National Research Council, 1981. Nutrient Requirements of Goats. Nat. Academy Press Washington, D.C.

Nweze, B.O. and Nwankwagu, A.E. (2010), Effects of Tetrapleura tetraptera under different feeding regimes on growth performance and gut microbes of broiler chicken. Proc. 35th Conf. Nig. Soc. Anim. Prod. 14-17 March, 2010. Univ. of Ibadan, Nigeria, 299

Odoemelam, V.U., Nwaogu, K.O., Ukachukwu, S.N., Esonu, B.O., Okoli, I.C., Etuk, E.B., Ndelekwute, E.K., Etuk, I.F., Aladi, N.O. and I.P. Ogbuewu (2013), Carcass and Organoleptic assessment of Broiler fed Ocimum gratissimum Supplemented diets. Proc. 38th Conf. Nig. Soc. Anim. Prod. 17-20th March, 2013, Rivers state Univ. of Sci. and Tech., Port Harcourt, 767-770

Owen, J. (2011), Introduction of alternative antibiotic growth promoters (AAGPS) in animal production in Nigeria: A review. Proc. 36th Conf. Nig. Soc. Anim. Prod. 13-16th March, 2011 Univ. of Abuja, Nigeria.

Pervez, A. 1992. Response of broiler chicks to

different feed additives. M.Sc Thesis NWFP Agricultural University, Peshawar, Pakistan.

Windisch, W., Schedle, K., Plitzer, C. and Kroismayr, A. (2007), Use of phytogenic products as feed additives for swine and poultry. J. Anim. Sci. 86, 140-148.

Table 1: Chemical Composition of the Experimental Diet

Parameters (%)	G1	G2	G3	G4	G5	SEM
Dry Matter	86.05	85.20	84.97	84.42	84.26	0.10
Ether Extract	19.93	21.60	21.73	22.80	21.87	0.52
Crude Fibre	21.03	21.10	21.33	21.73	21.93	0.79
Crude Protein	12.23	12.47	12.58	12.83	12.90	0.32
Ash	11.00	11.17	11.08	11.00	10.96	0.32
Nitrogen Free Extract	33.63	32.57	34.87	31.53	36.64	0.94
Neutral Detergent Fibre	34.70	30.13	30.57	40.73	36.00	2.18
Acid Detergent Fibre	45.07	44.07	44.27	44.70	45.00	1.29

a, b: Means in the same row with different superscript are significantly different ($P < 0.05$)
G1 =Concentrate + 0g/Kg Ginger; G2=Concentrate + 5g/Kg Ginger; G3=Concentrate + 10g/Kg Ginger; G4=Concentrate + 15g/Kg Ginger; G5= Concentrate + 20g/Kg Ginger

Table 2: Intake and weight changes in *Yankasa* rams fed *Zingiber officinale* fortified diets

Parameters (%)	G1	G2	G3	G4	G5	SEM
Initial Weight(kg)	10.60	10.40	10.40	10.60	10.40	0.38
Final Weight(Kg)	12.60	14.40	15.70	13.60	13.10	0.52
Weight gain(g/d)	19.05^{b}	38.10^{ab}	50.48^{a}	28.57^{ab}	25.71^{ab}	0.42
Weight gain(kg)	2.00^{b}	3.00^{ab}	5.30^{a}	4.00^{ab}	2.70^{ab}	0.89
Average daily dry matter intake(g/day)	584.07	550.60	649.44	548.80	534.87	0.28
Feed Conversion Ratio	30.73	13.06	7.39	15.76	19.18	0.79

a, b: Means in the same row with different superscript are significantly different ($P < 0.05$)