

CARCASS CUTS AND ORGANOLEPTIC PROPERTIES OF RABBIT MEAT FED DIETS CONTAINING GRADED LEVELS OF ROASTED DATE PALM SEED MEAL.

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ABSTRACT

The objective of this study was to determine the carcass cuts and organoleptic properties of rabbit meat fed diets containing varying levels of roasted date palm seed meal. The roasted date palm seed meal was fed to weaner rabbits at different dietary treatment levels of 0 %, 5 %, 10 %, 15 %, and 20 % respectively. A total of 45 rabbits of mixed sexes of ages of 5-6 weeks and average initial weights of 555.67-600g were used for the experiment for a period of 12 weeks in a completely randomized design experiment. The rabbits were randomly allocated to five (5) treatments with each treatment having 9 rabbits, made up of three replicates with three (3) rabbits per replicate. Final weights of rabbits ranges between 1664g to 1738.89g. The organoleptic characteristics were generally acceptable and rated between the range of 5.30-6.50 with rabbits on 20 % inclusion of roasted date palm seed meal recording the best values in all parameters. Amongst the cut parts and organs examined, dressing percent, weight of head, intestine, neck and lumbosacral region were significantly influenced by dietary treatments.

Rabbit meat, carcass cuts, organoleptic, date palm seed

INTRODUCTION

The use of unconventional feed stuff as substitutes for grains and the search for non-conventional feedstuffs has been the most active area of animal nutrition research in the tropical world. Ikani and Adesehinwa, (2000). Most research effort in animal nutrition in Nigeria is geared towards sourcing for readily available and less competitive feed resources to replace the conventional feed. The search for cheaper source of animal protein brings rabbit in to focus. The attributes of meat quality is of great commercial importance, these attributes such as colour, texture, juiciness, and flavor require examining as consumers consider these attributes as they make cooked meat edible, attractive, appetizing and nutritious. This research work was conducted to examine the carcass characteristics of rabbits fed diets containing graded levels of roasted date palm seed meal and also to determine the organoleptic qualities of meat from rabbits fed diets containing graded levels of roasted date palm seed meal

MATERIALS AND METHODS

This experiment was conducted at the Rabbitry unit, behind Niger State Veterinary Centre, Minna, Niger State. The date palm seed used as a test ingredient is a hard coated seed and this makes the seed difficult to be processed and also makes the seed components difficult to digest. Therefore, the seeds were roasted in open frying pan with sand at bottom of the pan to reduce the hardness and antinutritional content and grounded to pass through 0.5mm wire mesh sieve so that it will bind well when pelleted. 45 weaned rabbits of 6-7 weeks of age were used for the experiment in a Complete Randomized Design (CRD). The rabbits were randomly allocated to five (5) treatments. Each treatment was replicated thrice (3) with each replicate having three (3) rabbits and nine (9) rabbits per treatment. The rabbits were fed with the diets that contained inclusion of different levels of roasted date palm seed meals. Treatment one (T1), the control, contained 0 % roasted date palm seeds meal (RDPSM). T2 5 % RDPSM, T3 10 % RDPSM, T4 15 % RDPSM and T5 20 % RDPSM. The rabbits were treated against ectoparasites, dewormed against endoparasites and given broad spectrum antibiotics against bacteria infection. Groundnut hay was fed alongside the test experimental diets, test diets were served to the rabbits in the morning and groundnut hay was served in the late afternoon. At the end of the experiment, one rabbit per replicate (three per

treatment) were randomly selected, weighed and slaughtered for carcass proportion. Muscles of the fore arm hind legs were used for organoleptic assessment (meat sensory test) was carried out with twenty (20) member of meat sensory evaluation panel (semi-trained) according to the procedures of (AMSA, 1995) were used to evaluate meat colour, tenderness, juiciness, flavour and overall acceptability of rabbit meat raised on different levels of roasted date palm seed meal. Parameters measured were carcass cuts and organoleptic characteristics. The data collected were subjected to one way analysis of Variance (ANOVA). Significant difference between treatments means were separated using Duncan's multiple range test as outlined by Lintel (2002).

Table 1: Composition of the Experimental Diets

Ingredient (%)	Dietary Levels of Roasted Date Palm Seed Meal (%)				
	0% Diet 1	5% Diet 2	10% Diet 3	15% Diet 4	20% Diet 5
Maize	51.49	48.92	46.34	43.77	41.19
RDPSM	0.00	2.57	5.15	7.72	10.30
SBM	16.39	16.39	16.39	16.39	16.39
Rice Bran	17.04	17.04	17.04	17.04	17.04
GNC	7.08	7.08	7.08	7.08	7.08
Fish Meal	3.00	3.00	3.00	3.00	3.00
Bone Meal	1.00	1.00	1.00	1.00	1.00
Limestone	0.25	0.25	0.25	0.25	0.25
Methionine	0.25	0.25	0.25	0.25	0.25
Lysine	0.25	0.25	0.25	0.25	0.25
*Premix	0.25	0.25	0.25	0.25	0.25
Salt	0.25	0.25	0.25	0.25	0.25
Total	100	100	100	100	100
Calculated Values (%)					
ME (Kcal/Kg)	2700.05	2676.96	2653.80	2630.72	2607.55
Crude protein	18.00	18.00	18.00	18.00	18.01
Crude fibre	9.66	11.07	12.49	13.90	14.32
Ether extract	6.46	6.59	6.72	6.85	6.99
Methionine	0.32	0.30	0.31	0.30	0.30
Lysine	0.85	0.88	0.90	0.91	0.94
Calcium	1.64	1.73	1.82	1.90	2.00
Phosphorus	0.93	1.13	1.33	1.55	1.75

*Premix supplied the following per kg diet: vit. A, 10000 I.U; vit. D, 2000 I.I; vit. E, 25 mg; vit. K, 2 mg; Thiamine B1, 1.8 mg; Riboflavin B2, 5 mg; Pyridoxine B6, 3.5 mg; Niacin, 28 mg; vit. B12 0.015 mg; Pantothenic acid, 7.5 mg; Folic acid, 0.75 mg; Biotin, 0.06 mg; chlorine chloride, 300 mg; Manganese, 40 mg; Zinc, 30 mg; Antioxidant 1.25mg Iron, 20 mg; Copper, 3 mg; Iodine, 1 mg; Selenium, 0.2 mg; Cobalt, 0.2 mg

RESULTS

Table 2 shows that significant differences ($P < 0.05$) were observed in all treatments. Treatment 5 (20 % RDPSM) was significantly ($P < 0.05$) better than other treatments in meat colour, tenderness, juiciness, flavour and overall acceptability of rabbit meat.

Table 3 shows the carcass cuts of rabbits fed diets containing varying levels of roasted date palm seed meal (RDPSM). Significant differences ($P < 0.05$) were observed in the live weight of rabbits fed RDPSM. T1 and T2 were significantly higher than other treatments while treatment 5 recorded the lowest value of 1610g (Table 3). Significant differences ($P < 0.05$) were also recorded in the slaughter weight where treatment 2 and 1 were statistically similar while other treatments fed RDPSM also recorded statistically similar values. The cut up parts recorded significant differences in the head, neck and lumbosacral region

The head of the rabbits fed RDPSM recorded significant differences ($p < 0.05$), treatments containing RDPSM recorded values that were statistically similar to the control experiment. The visceral organs recorded significant differences in the intestine, spleen, heart, lungs, kidney and liver. Significant difference ($P < 0.05$) were recorded in the intestine of rabbits fed RDPSM

Table 2: Organoleptic evaluation of rabbits fed diets containing graded levels of roasted date palm seed meal (RDPSM)

Parameter	Diets					LS
	Treatment 1 0%RDPSM	Treatment 2 5%RDPSM	Treatment 3 10%RDPSM	Treatment 4 15%RDPSM	Treatment 5 20%RDPSM	
Colour	4.90 ^{bc}	4.75 ^{bc}	5.60 ^{ab}	5.20 ^{ab}	5.90 ^a	*
Tenrderness	5.75 ^{ab}	5.30 ^b	5.85 ^{ab}	5.40 ^b	6.40 ^a	*
Juiciness	5.30 ^{ab}	5.20 ^{ab}	5.60 ^{ab}	5.00 ^b	5.95 ^a	*
Flavour	5.50 ^{bc}	4.95 ^{cd}	5.75 ^{ab}	4.55 ^d	6.30 ^a	*
Overall Acceptability	6.00 ^{ab}	5.40 ^{bc}	6.35 ^a	5.30 ^c	6.50 ^a	*

a, b, c = means on the same row with different superscript differ significantly ($P < 0.05$)

Discussion

The result of organoleptic evaluation of rabbit meat fed diets containing varying levels of roasted palm seed meal (RDPSM) is shown in table 3. Significant differences were observed among all treatments on the physical variables evaluated in this study. The result revealed that treatment 5 with 20 % RDPSM was generally attested to be better than other treatments in all parameters. Although there was a significant difference in the colour of the rabbit meat among treatments, treatments with RDPSM inclusion recorded significantly higher values than the control. The result showed that rabbit meat fed inclusion of RDPSM recorded values higher than the control diet. A similar report by Nasiru, *et. al.* (2011) who recorded 2.89 for colour and 2.81 for ternderness, they considered meat tenderness as the most important palatability attribute of meat and that it is a critical eating quality which determine whether consumers are repeat buyers. Significant difference was also recorded in the juiciness and flavour of the rabbit meat fed roasted date palm seed meal (RDPSM). Despite the fact that colour, tenderness, juiciness and flavour were all within the range of 5-6. The overall acceptability was rated 6.50. The panelist accessed cooked rabbit meat fed roasted date palm seed meal (RDPSM) from slightly to like moderately. Nasiru, *et al.* (2011) opined that colour is the most important criteria in meat assessment and that colour is one of the most cherished attributes of meat that attracts consumers, that juiciness of meat is made up of two similar effects, the impression of moisture released during chewing and salivation produced by flavor factors while Egena and Ocheme (2008) were of the view that increase in temperature during cooking causes shrinkage of meat tissue leading to the release of juices Significant differences were observed on the live weight of the rabbits fed RDPSM. Treatment 2 (5 % RDPSM) achieved the heaviest value (1736.67g) but statistically the same with the control while other treatments fed RDPSM were statistically the same. Non-significant differences were recorded for blood, fore limb, hind limb, gall bladder, cervicothoracic region (CTR) and abdominal fat. This showed that the dietary treatments did not influence the weights of these organs. Significant differences were obtained in the dressing percentage, the values ranged between 65.47 – 67.61 %. The dressing percentages in this study was higher than 58.32 – 63.61 % as reported by Adama and Ayanwale, (2000) and also higher than 47.8 – 49.6 % and 42.0 – 48.38 as reported by Olorunsanyan, *et. al.* (2007) and Oimage, *et. al.* (2009) respectively. Date palm seeds have showed that it

is a waste product that can be converted to wealth. It is also an indication that date palm seed that is known as a nuisance can now be regarded as a free waste product that can be used to feed livestock, especially rabbits

Table 3: Mean Carcass Cuts of Rabbits Fed Diets Containing Varying Levels of Roasted date Palm Seed Meal (RDPSM). Expressed as a Percentage of Live Weight

Dietary Treatments						
Parameters	Treatment 1	Treatment 2	Treatment 3	Treatment 4	Treatment 5	LS
	0 % RDPSM	5 % RDPSM	10% RDPSM	15% RDPSM	20 % RDPSM	
Live weight	1726.67 ^a	1736.67 ^a	1640 ^b	1616.67 ^b	1610.00 ^b	*
Slaughter weight	1663.33 ^a	1666.67 ^a	1571.67 ^b	1556.67 ^b	1556 ^b	*
Blood %	4.09	4.01	3.76	3.71	3.31	NS
Dressing %	65.47 ^b	67.14 ^{ab}	66.29 ^{ab}	66.29 ^{ab}	67.97 ^a	*
Cut up Parts						
Head %	9.72 ^{ab}	9.91 ^{ab}	9.60 ^b	10.44 ^a	9.91 ^{ab}	*
Neck %	2.28 ^{bc}	1.97 ^d	2.35 ^b	2.82 ^a	2.16 ^c	*
Fore limb %	7.2	7.37	7.59	7.55	7.46	NS
Hind limb %	11.09	11.00	10.81	9.56	9.27	NS
CTR %	9.53	11.38	10.46	10.31	11.09	NS
LSR %	16.14 ^b	17.66 ^{ab}	17.57 ^{ab}	17.85 ^{ab}	18.76 ^a	*
Viscerals						
Intestine %	20.95 ^a	17.84 ^b	17.81 ^b	17.23 ^b	17.83 ^b	*
Spleen %	0.05 ^c	0.07 ^{ab}	0.06 ^{bc}	0.05 ^{abc}	0.08 ^a	*
Gall bladder %	0.53	0.13	0.14	0.16	0.14	NS
Heart %	0.22 ^{bc}	0.21 ^{bc}	0.18 ^c	0.27 ^a	0.25 ^{ab}	*
Lung %	0.45 ^{ab}	0.38 ^b	0.50 ^a	0.46 ^{ab}	0.49 ^a	*
Kidney %	0.56 ^c	0.52 ^c	0.75 ^b	0.75 ^b	1.04 ^a	*
Liver %	1.81 ^{bc}	1.78 ^{bc}	2.08 ^{ab}	2.36 ^a	1.67 ^c	*
Abdominal fat %	1.74	1.58	1.65	1.62	1.63	NS
Offals						
Skin %	9.40 ^c	10.85 ^b	11.37 ^a	11.03 ^b	10.84 ^b	*
Fore leg %	1.41 ^{ab}	1.31 ^{ab}	1.12 ^b	1.17 ^b	1.57 ^a	*
Hind leg %	2.60 ^a	1.84 ^b	1.94 ^{ab}	2.41 ^{ab}	2.29 ^{ab}	*
Tail %	0.23 ^{bc}	0.19 ^d	0.26 ^a	0.25 ^{ab}	0.21 ^{cd}	*

CONCLUSION

1. On the organoleptic evaluation, the meats of Rabbits on 20 % RDPSM were generally attested, accepted and even better than other treatments. Non-significant differences recorded for fore limb, hind limb and cervicothoracic region (CTR), and the same statistical differences of lumbosacral region is a show that RDPSM does not have any deleterious effect on the meat of rabbits This result of visceral

organs showed that the dietary treatments did not any abnormal influence the weights of lungs, liver and intestine.

RECOMMENDATION

Inclusion of up to 20 % of RDPSM in the diet of rabbit gives better result on organoleptic evaluation. However further researches can be carried out using higher levels of inclusion and other processing technics of date palm seed and RDPSM have demonstrated a reduced unit cost of feed per kg.

REFERENCES

- Adama, T. Z., & Ayanwale, B. A. (2000). The effect of replacing maize with cocoyam (*xanthosoms sagittifolium* and *colocasia esculantun*) corms of performance of weaned rabbits. *Journal of science technology and mathematics education*. 3 (1), 170-178
- AMSA (1995). Research guide lines for cookery sensory evaluation and instrument of fresh meat. Chicago American meat science Association (AMSA) & National livestock and meat and Board
- Egena, S. S. A., & Ocheme, O. B. (2008). Effect of hydrocyanic acid intake on sensory properties of broiler meat. *Paksitan Journal of Nutrition*.,(7), pp 191-193
- Ikani, E. I. and A. O. K. Adesehinwa, (2000) promoting non-convectional feed stuff in livestock feedng. The need for extension strategy. In; Animal production iin the new millennium and option.
- Nasiru, A., Muhammad, B. F., & Abdullahi, Z. (2011). Effects of cooking time and potash concentration on organoleptic properties of red and white meat. *Journal of food technology*, Year 2011, Volume 9, Issue 4, Page No:119-12
- Olorunsanya, B., Ayoola, M. A., Fayeye, T. R., Olagunju, T. A. & Olorunsanya, E. O. (2007). Effects of replacing maize with sundried cassava waste meal on growth performance and carcass characteristic of meat type rabbit. *Livestock Research for Development*, 19 (4), 2007
- Omage, J. J., Agubosi, O. C. P., Bawa, G. S. & Onimisi, P. A. (2009). Evaluation of the Nutritive value of Quantity protein Maize on the Growth performance and carcass characteristics of weaner Rabbits. *Pakistan Journal of Nutrition*, 8 (2), 106 – 111