

EFFECTS OF MONOSODIUM GLUTAMATE ON CARCASS QUALITY TRAITS OF MONGREL RABBITS IN SEMI-ARID ZONE OF NIGERIA

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ABSTRACT

This study aimed at determining the effect of monosodium glutamate on carcass characteristics traits of mongrel rabbits in semi-arid zone of Nigeria. The research was carried out at Teaching and Research Farm of the Faculty of Agriculture, Federal University Dutse. Thirty-two (32) mongrel rabbits were used in the experiment with four (4) treatments of eight (8) animals per treatments as T₁ (0 g), T₂ (2 g), T₃ (4 g) and T₄ (6 g). Data collected on carcass quality parameters was analysed in one-way ANOVA using SAS (2000) and the means were separated using Duncan Multiple Range Test (DMRT). The results elucidated not significant ($p > 0.05$) effect of monosodium glutamate on most parameters of the carcass characteristics of the rabbits whereas rabbits placed on T₂ (2 g) were reported with significantly higher ($p < 0.05$) values on liver, loin, average weight and neck weight, respectively. It was recommended that monosodium glutamate should best be used at 2 g as the best results were recorded at that value.

Keywords: Monosodium glutamate, Rabbits, Carcass, Semi-arid, Nigeria

INTRODUCTION

Animal protein is considered as the only alternative source of protein that contains all the required essential amino acids by the human body (MOH, 2010) and so can help reduce protein deficiency. Ajala and Balogun (2004) reported rabbit production as the best way of solving the problem of protein deficiency.

Glutamate is an amino acid having multiple roles in cell metabolism and physiology (Blachier *et al.*, 2009). Manal and Al-Badr (2012) described monosodium glutamate (MSG) as the sodium salt of glutamic acid and the main component of many proteins. It has been used in human diets, for many years, as flavour enhancer to promote consumption rates of food (Parshad and Natt, 2007). Monosodium glutamate improves the palatability of foods thereby enhancing intake which promotes weight gain (Egbounu *et al.*, 2010).

Information regarding the effects of glutamate in the diets of rabbits within the semi-arid zone of Nigeria is limited. This study was therefore carried out to evaluate the effect of dietary monosodium glutamate on carcass characteristics of rabbits.

MATERIALS AND METHODS

Location of the experiment

The study was carried out in the Teaching and Research Farm of Faculty of Agriculture, Federal University Dutse, Jigawa State Nigeria. Dutse lies on latitude 11.76° North and longitude 9.341° East (Encarta 2007) the main annual temperature is about 25° but the mean ranges between 21°C or below in the coldest month and 31°C or above in the hottest month, the Total annual rainfall is about 600 mm.

The rainy season lasts from May to September with average rainfall of between 600 to 1000 mm while high temperatures are normally recorded between the months of April and September. The southern part of the state has a higher rainfall percentage than the northern part.

Management of experimental animals.

Thirty-two (32) mongrel male adult Rabbit with average body weight weighing ± 1040.25 procured from different market source, the animals were housed in cages measuring 35 × 35 × 55 cm (width × length × height). The cages were cleaned. Drinkers and feeding trough were provided in each cage. The drinkers were washed daily. Both feed and water were provided *ad-libitum* during the experimental period. All the experimental rabbits were identified and allowed two weeks pre-conditioning period to acclimatize. They were medicated against coccidiosis and mange. They were given prophylactic coccidiostat (Ampro-vitracycline) 30 g / 50 litres of drinking water for 3 days, via drinking water as recommended by the manufacturer. They were dipped with cinatic powder base on the instruction given by manufacturer. The animals were housed in 16 pens containing 2 rabbit each.

Experimental diet and source

The animals were fed with commercial pelletized growers MAXX feed with the nutritional information of crude protein 16% (Minimum), fat 5% (max), crude fibre 3% (min), calcium 1.0% (min), available phosphorus 0.40% (min) and metabolizable energy 2600 kcal/kg (min) was used for the experiment and purchased from trimade corp link Ltd.

Experimental Layout

Complete Randomized Design (CRD) was used with thirty-two (32) male adults Mongrels rabbits were divided in to four (4) treatments of eight (8) animals per treatment.

Sources, preparation and administration of monosodium Glutamate

Monosodium Glutamate was Purchased from the Shuwarin market kiyawa LGA. Monosodium glutamate (MSG) was administered orally by using a round-head syringe according to (Abd-elaziz *et al.*, 2007), T₁ (control) The control group received normal water for the duration of the experiment. T₂ = 2 mg, T₃ = 4 mg, and T₄ = 6 mg per g body weight of 40% aqueous solution of MSG every 48 hours for eight weeks using syringe, constituting the low, medium and high dose groups, respectfully.

Data analysis

Data generated was analysed using one-way ANOVA and the means were separated using Duncan Multiple Range Test (DMRT).

RESULTS AND DISCUSSION

The results on the carcass quality traits of mongrel rabbits treated with MSG is presented in Table 1 below. According to the results of the study, majority of the parameters does not show ($p > 0.05$) any significant effect across the treatments levels. The indifferences observed in carcass evaluation is in agreement with Cisa *et al.* (2019) who recorded no significant effect on carcass characteristics in broiler chickens fed at various graded levels with MSG. Rabbits on the control diet (T₁) showed a significant ($p < 0.05$) difference on dressing percentage (DRP) when compared with other treatments but statistically similar ($p > 0.05$) with those rabbits fed 4 mg MSG (T₃) and 6 mg MSG (T₄), respectfully. The variation in the value of this parameter among the treatments may have occurred due to chance, this means, even though the figures are different, they were statistically the same. The dressing percentage range (81.74 - 87.83%) recorded in this study was above the recommended range of 55 - 61% of rabbits reported by Ouhayoun (1998). This could have been attributed to the age of rabbits at slaughtering and the different diets used by researchers. This is an indication that the diets can support growth and development. However, the results obtained in this study showed that, the dietary treatments affected the rabbits on 2 mg MSG (T₂) with a significantly higher ($p < 0.05$) values on lungs, average weight, loin and neck weight in rabbits fed 2 mg MSG (T₂), respectfully. This agreed with report of Cisa *et al.* (2019) who indicated that supplementing 2 mg of MSG/kg as feed additive to broiler chickens improves growth performance.

Table 1: The carcass quality traits of mongrel rabbits treated with monosodium glutamate (MSG)

Parameters	Treatments			
	1(0g)	2 (2g)	3(4g)	4(6g)
Slaughter weight	1373.0	1798.	1243.5	1379.0
Live Weight	1402.0	1733.0	1284.5	1428.0
Dressing weight	1231.0	1496.5	1069.5	1178.50
Dressing percentage	87.83 ^a	81.74 ^b	83.23 ^{ab}	82.79 ^{ab}
Head	120.50	179.00	118.00	129.00
Stomach	77.50	80.50	72.00	84.00
Small intestine	68.00	74.50	69.50	76.00
Large intestine	150.50	157.50	128.50	158.00
Lungs	9.00 ^b	18.50 ^a	9.00 ^b	12.00 ^{ab}
Liver	43.50	53.00	44.50	44.00
Kidney	10.50	10.50	11.50	10.00
Heart	3.00	4.50	4.00	3.00
Offal	365.00 ^{ab}	409.00 ^a	336.50 ^b	391.00 ^{ab}
Thigh	131.50	198.50	134.50	144.50
Loin	174.50 ^{ab}	260.00 ^a	119.50 ^b	154.00 ^{ab}
Neck	28.50 ^b	53.50 ^a	26.00 ^b	24.50 ^b

CONCLUSION

It can be concluded that rabbit should be fed with monosodium glutamate at the rate of 2g as it yielded the best results among the treatments groups.

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