

## **EFFECT OF FEEDING COMPLETE DIETS CONTAINING RICE STRAW ON CARCASS BY-PRODUCTS AND VISCERAL ORGANS OF FATTENED YANKASA RAMS**

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### **ABSTRACT**

*The study was conducted to evaluate the carcass by-products and visceral organs of fattened Yankasa rams fed complete diets containing rice straw. Twelve (12) Yankasa sheep (rams) were used for the experiment. The animals were randomly distributed to 4 treatments with 3 animals per treatment, each ram served as a replicate and an adjustment period of a week was allowed for the animals before data collection commenced. The feeding trial lasted for a period of 70 days. A Completely Randomized Design (CRD) was used. Data collected was analyzed using Analysis of Variance (ANOVA). Results of this experiment suggests that nutrients in all diets impacted positively and similarly on carcass characteristics and visceral organs of fattened rams with the utilization of available nutrient to rams fed varying levels of rice straw. In this study, it was observed that 8.75% rice straw increased carcass weight compared with rams fed other diets. The improved carcass weight could be attributed to the effect of the laxative action of rice straw in the gut and fibre content of rice straw which supports increased carcass weight. From the study, it can be concluded that rice straw fed had no adverse effect on the carcass by-products and visceral organs characteristics of fattened rams. Therefore, it is recommended that rice straw up to 26.26 % could be included in the fattened rams' diet.*

*Key words: yankasa rams, carcass by-products, visceral organs, diets, rice straw.*

### **INTRODUCTION**

In Nigeria fattened rams play an important role in socio-cultural activities as they are of great use during cultural, religious and other festivities in Nigeria. Sheep production is one of the best ways of enhancing meat supply and also generates income to small holder farmers. Livestock contributes 6-8% of agricultural gross domestic product in Nigeria with estimates of 41.3 million sheep's population in the country (PTNP, 2017). These estimates highlight the important contribution of livestock to sustainable agricultural development. Sheep and other ruminants are essential to the livelihoods of millions of farmers and critical to human health, global food and nutritional security (FAO, 2016). There are four major breeds of sheep in Nigeria, namely: Uda, Balami, Yankasa and West African Dwarf (WAD). However, ram in Nigeria are use for fattening mostly by small holder farmers both in rural and urban areas especially by women and children as a source of investment, without some basic fattening feeding principles and the utilization of agro-industrial by-products in achieving this objective.

Rice is the second most cultivated cereal worldwide (FAO, 2013). Rice straw, a by-product of the rice grain industry, is a potential alternative feed for ruminants. Rice straw producers have generally considered straw as waste product and as such are either left on the farm or baled at their convenience after harvest. Though, several factors determine how much straw can be used in ration, including; quality of rice straw, nutritional needs of the animal, environmental conditions during feeding such as temperature, rain, snow, mud, as well as the condition of the animal and expected performance. Rice straw remain a potential alternative feed for ruminant that needs to be explore for fattening ram, hence the reason for this study.

## MATERIAL AND METHODS

### EXPERIMENTAL LOCATION

This study was conducted at the Department of Agricultural Education Teaching and Research Farm, Federal College of Education (Technical) Bichi. The farm is located within the campus of the College at about 40 km North of Kano Metropolis in Bichi Local Government Area of Kano State, Nigeria. Kano is situated in the Sahelian geographic region, South of the Sahara in the North-Western Nigeria, 481 metres (1,578 feet) above sea level within longitude: 8°31'00" E and latitude: 12°00'00" N (Wikipedia, 2018; Dateandtime.info, 2018).

### EXPERIMENTAL RAMS AND THEIR MANAGEMENT

Twelve (12) Yankasa sheep (rams) were used in this experiment and were purchased from Badume market, Dawakin Tofa local government area of Kano State. The animals were randomly distributed to 4 treatment groups of 3 animals per treatment. Each ram served as a replicate and an adjustment period of a week was allowed for the animals before data collection commenced. The feeding trial lasted for a period of 70 days. Water and salt lick were also offered *ad libitum*. The animals were quarantine in the College Farm, for two weeks, and given prophylactic treatment with Avomec® against *endo* and *exto* parasites and also treated with oxytetracycline HCl (a broad spectrum antibiotic). Prior to the experiment, the animals were managed intensively and group-fed with groundnut haulm and wheat offal.

Table 1: Composition of the Rice straw Meal Based Diets fed to Fattening Yankasa Rams

| Ingredients           | Experimental Treatments |       |       |       |
|-----------------------|-------------------------|-------|-------|-------|
|                       | A                       | B     | C     | D     |
| Rice straw            | 0                       | 8.75  | 17.5  | 26.25 |
| Wheat offal           | 35                      | 26.25 | 17.5  | 8.75  |
| Rice offal            | 10                      | 15    | 20    | 20    |
| Cotton seed cake      | 10                      | 15    | 15    | 15    |
| Groundnut haulms      | 28                      | 18    | 18    | 18    |
| Maize                 | 05                      | 05    | 05    | 05    |
| Sorghum stover        | 10                      | 10    | 05    | 05    |
| Salt                  | 1                       | 1     | 1     | 1     |
| Bone meal             | 1                       | 1     | 1     | 1     |
| Total                 | 100                     | 100   | 100   | 100   |
| Calculated values (%) |                         |       |       |       |
| Crude protein         | 14.66                   | 13.73 | 12.73 | 11.52 |
| Crude fibre           | 18.18                   | 19.02 | 16.05 | 17.63 |

CP = crude protein, CF = crude fiber

Table 2: Proximate Composition of the Rice straw Meal Based Diets fed to fattening Yankasa Rams

| Parameters    | A     | B     | C     | D     |
|---------------|-------|-------|-------|-------|
| Dry matter    | 91.37 | 92.30 | 92.48 | 93.46 |
| Crude Protein | 14.94 | 14.38 | 15.01 | 12.69 |
| Crude fibre   | 23.92 | 29.99 | 27.65 | 27.14 |
| Ether extract | 6.59  | 6.80  | 7.20  | 6.77  |
| Ash           | 10.64 | 8.58  | 10.21 | 12.80 |

### STATISTICAL ANALYSIS

In this study the data generated were subjected to Analysis of Variance (ANOVA) using Completely Randomized Design (CRD). The treatment means were separated and compared using standard error of the mean (SEM), and Duncan's Multiple Range Test (DMRT) as contained in SPSS (2013) for window 32, version 24.

## RESULTS AND DISCUSSION

As shown in Table 3, the pre-slaughter live weight of rams fed 0% rice straw was significantly ( $p<0.05$ ) higher compared with those fed other diets, while those fed 17.5% rice straw had the lowest pre-slaughter weight. However, the rams fed 8.75% had the highest carcass weight which was significantly ( $p<0.05$ ) higher compared with those fed the control and 26.25% rice straw was significantly lower. In this study, it was observed that 8.75% rice straw increased carcass weight compared with rams fed other diets. The improved carcass weight could be attributed to the effect of the laxative action of rice straw in the gut and fibre content of rice straw which supports increased carcass weight. The rams fed 17.5% rice straw had significantly ( $p<0.05$ ) higher dressing percentage than those fed 8.75% rice straw, while those fed the control diet (0%) and 26.25% rice straw were significantly ( $p>0.05$ ) similar. Dressing percentage at 17.5% level of inclusion of rice straw was highest compared with rams fed other diets. The percentage ribs and loins of rams fed 8.75% had significant differences ( $p<0.05$ ) which was higher than those fed the control, 17.5% and 26.25% respectively. The results of the present study which showed that rice straw resulted in better ribs and loins. It is known that the ram is known to be especially sensitive to dietary fibre concentration. The rams fed 17.5% rice straw had significantly ( $p<0.05$ ) higher back percent than those fed 8.75% rice straw, while those fed diet the control diet (0%) and 26.25% rice straw were significantly ( $p>0.05$ ) similar. The values for the shoulder of rams fed 17.5% and 26.25% were significantly ( $p<0.05$ ) higher than those fed 8.75% rice straw (diet B), which was higher than those fed the control diet (0%). The neck percent of the rams fed 8.75% rice straw and the control diet (0%) were significantly ( $p<0.05$ ) higher than those fed 17.5% rice straw, which was higher than those fed 26.25%. However, percent thigh were highest with rams fed 17.5% and 26.25% rice straw compared with rams fed the control diet (0%) and 8.75% rice straw which were similar ( $p>0.05$ ).

Table 3: Effect of Feeding Complete Diets Containing Rice Straw on Carcass Characteristics of fattened Yankasa Rams

| Parameters                     | Treatments         |                    |                    |                    | SEM  |
|--------------------------------|--------------------|--------------------|--------------------|--------------------|------|
|                                | A                  | B                  | C                  | D                  |      |
| Pre-slaughter Live weight (Kg) | 34.10 <sup>a</sup> | 32.20 <sup>b</sup> | 27.10 <sup>d</sup> | 28.10 <sup>c</sup> | 0.08 |
| Carcass Weight (Kg)            | 13.90 <sup>b</sup> | 14.10 <sup>a</sup> | 13.30 <sup>c</sup> | 11.50 <sup>d</sup> | 0.08 |
| Dressing Percentage (%)        | 40.51 <sup>c</sup> | 43.70 <sup>b</sup> | 45.57 <sup>a</sup> | 40.97 <sup>c</sup> | 0.21 |
| Ribs (%)                       | 7.33 <sup>b</sup>  | 8.07 <sup>a</sup>  | 7.04 <sup>c</sup>  | 6.64 <sup>d</sup>  | 0.08 |
| Loin (%)                       | 3.22 <sup>b</sup>  | 3.73 <sup>a</sup>  | 2.96 <sup>c</sup>  | 2.54 <sup>d</sup>  | 0.07 |
| Back (%)                       | 3.83 <sup>c</sup>  | 4.35 <sup>b</sup>  | 5.93 <sup>a</sup>  | 3.77 <sup>c</sup>  | 0.08 |
| Shoulder (%)                   | 8.31 <sup>c</sup>  | 9.01 <sup>b</sup>  | 10.00 <sup>a</sup> | 9.86 <sup>a</sup>  | 0.08 |
| Neck (%)                       | 4.99 <sup>ab</sup> | 5.28 <sup>a</sup>  | 4.81 <sup>b</sup>  | 2.72 <sup>c</sup>  | 0.14 |
| Thighs (%)                     | 12.32 <sup>b</sup> | 12.11 <sup>b</sup> | 14.81 <sup>a</sup> | 14.72 <sup>a</sup> | 0.15 |

SEM: standard error of mean <sup>a,b,c</sup> Means on the row with different superscripts are significantly ( $p<0.05$ ) different.

Table 4: Effect of Feeding Complete Diets Containing Rice Straw on Visceral organs of fattened Yankasa Rams.

| Parameters (%) | Treatments         |                   |                    |                    | SEM  |
|----------------|--------------------|-------------------|--------------------|--------------------|------|
|                | A                  | B                 | C                  | D                  |      |
| Head           | 7.36 <sup>c</sup>  | 8.70 <sup>a</sup> | 7.41 <sup>c</sup>  | 7.64 <sup>b</sup>  | 0.05 |
| Legs           | 2.00 <sup>b</sup>  | 1.93 <sup>c</sup> | 2.1 <sup>b</sup>   | 2.49 <sup>a</sup>  | 0.49 |
| Heart          | 0.35               | 0.46              | 0.47               | 0.37               | 1.42 |
| Lungs          | 0.39 <sup>b</sup>  | 0.40 <sup>c</sup> | 0.28 <sup>b</sup>  | 0.35 <sup>a</sup>  | 0.44 |
| Liver          | 1.54               | 1.18              | 1.54               | 1.35               | 0.23 |
| Kidney         | 1.54               | 0.60              | 0.26               | 0.35               | 0.02 |
| Spleen         | 0.27 <sup>b</sup>  | 0.32 <sup>a</sup> | 0.17 <sup>c</sup>  | 0.18 <sup>c</sup>  | 0.01 |
| Testes         | 0.90 <sup>d</sup>  | 1.32 <sup>a</sup> | 1.09 <sup>c</sup>  | 1.17 <sup>b</sup>  | 0.24 |
| Full Gut       | 23.53 <sup>b</sup> | 9.94 <sup>d</sup> | 15.56 <sup>c</sup> | 24.42 <sup>a</sup> | 0.05 |
| Empty Gut      | 2.94 <sup>b</sup>  | 1.82 <sup>d</sup> | 2.90 <sup>c</sup>  | 3.00 <sup>a</sup>  | 0.08 |
| Skin           | 5.88 <sup>c</sup>  | 8.70 <sup>a</sup> | 6.67 <sup>b</sup>  | 5.77 <sup>d</sup>  | 0.02 |

SEM: standard error of mean <sup>a,b,c</sup> Means on the row with different superscripts are significantly ( $p < 0.05$ ) different.

The visceral organs of the carcass of fattened Yankasa ram fed complete diet containing rice straw are presented in Table 4. The values for the heads of rams fed 8.75% rice straw was significantly ( $p < 0.05$ ) higher compared with those fed the control diet and those fed 17.5% rice straw, while those fed 26.25% rice straw had the lowest. The values for the legs were ( $p < 0.05$ ) higher in rams fed 26.25% rice straw compared with those fed the control diet and those fed 17.5% rice straw, while those fed 8.75% rice straw had the lowest. Hearts of the rams were not significantly ( $p > 0.05$ ) affected across the dietary treatments. The values for the lungs were ( $p < 0.05$ ) higher in rams fed 26.25% rice straw compared with those fed the control diet and those fed 17.5% rice straw, while those fed 8.75% rice straw had the lowest. The liver and kidney of the rams were not significantly ( $p > 0.05$ ) affected across the dietary treatments. Spleen was higher ( $p < 0.05$ ) for rams fed 8.75% compared with those fed the control diet, while those fed 17.5% and 26.25% were ( $p > 0.05$ ) similar. Lower values for testes was recorded in rams fed the control diet and higher in rams fed 8.75% rice straw. The full gut and empty gut were significantly ( $p < 0.05$ ) higher in rams fed 26.25% rice straw than those fed other diets. It is however lowest in rams fed 8.75% rice straw. Skin from the rams fed 8.75% rice straw were higher compared with those fed 17.5% rice straw, which was higher than those fed the control diet, while it is lowest in those fed 26.25% rice straw. The result of the present study is not consistent with those of Nader (1999; 2000) who reported poorer performance of rams when fed rice straw as a complete or only feed.

## CONCLUSION

From the present study, it can be concluded that rice straw fed had no adverse effect on the carcass by-products and visceral organs characteristics of fattening rams studied. Therefore, on the basis of the results obtained from this study, it is recommended that rice straw up to 26.26 % could be included in the fattened rams' diet.

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