

**Table 1: Effects of dietary treatments on Nutrient Digestibility of broiler chickens**

| Parameters        | Diets              |                    |                    |                     |                     |                    |                     |                     | SEM   |
|-------------------|--------------------|--------------------|--------------------|---------------------|---------------------|--------------------|---------------------|---------------------|-------|
|                   | 1                  | 2                  | 3                  | 4                   | 5                   | 6                  | 7                   | 8                   |       |
| Live weight (g)   | 2439.33            | 2477.33            | 2532.67            | 2669.33             | 2619.00             | 2464.00            | 2514.33             | 2518.67             | 33.91 |
| Dry matter (%)    | 82.38 <sup>a</sup> | 64.52 <sup>d</sup> | 73.97 <sup>c</sup> | 78.13 <sup>b</sup>  | 70.99 <sup>c</sup>  | 69.87 <sup>d</sup> | 84.59 <sup>a</sup>  | 84.02 <sup>a</sup>  | 0.81  |
| Crude Protein (%) | 87.50 <sup>a</sup> | 81.50 <sup>c</sup> | 86.50 <sup>a</sup> | 82.50 <sup>bc</sup> | 84.50 <sup>b</sup>  | 83.00 <sup>b</sup> | 83.50 <sup>b</sup>  | 82.00 <sup>c</sup>  | 0.37  |
| Crude fat (%)     | 93.50              | 92.50              | 93.50              | 93.00               | 93.50               | 93.00              | 93.00               | 94.00               | 0.08  |
| Crude fibre (%)   | 64.00 <sup>b</sup> | 60.00 <sup>c</sup> | 63.50 <sup>a</sup> | 67.50 <sup>a</sup>  | 65.50 <sup>ab</sup> | 67.50 <sup>a</sup> | 65.50 <sup>ab</sup> | 63.50 <sup>ab</sup> | 0.18  |
| Crude ash (%)     | 63.00 <sup>a</sup> | 56.00 <sup>b</sup> | 58.50 <sup>a</sup> | 56.50 <sup>b</sup>  | 64.00 <sup>a</sup>  | 57.50 <sup>b</sup> | 61.50 <sup>a</sup>  | 57.00 <sup>b</sup>  | 0.52  |

<sup>abcd</sup> Means with similar subscripts along the same row are significantly ( $P < 0.05$ ) different

**Table 2: Gross composition of Experimental diets (Starter phase)**

| Ingredients                    | Diets   |         |         |         |         |         |         |         |
|--------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|
|                                | 1       | 2       | 3       | 4       | 5       | 6       | 7       | 8       |
| Rice husk                      | --      | 10.00   | 10.00   | 10.00   | 10.00   | 10.00   | 10.00   | 10.00   |
| Wheat offal                    | 10.00   | --      | --      | --      | --      | --      | --      | --      |
| <sup>†</sup> Fixed ingredients | 13.00   | 13.00   | 13.00   | 13.00   | 13.00   | 13.00   | 13.00   | 13.00   |
| Cocci guard                    | +       | +       | +       | +       | +       | +       | +       | +       |
| AG enzyme                      | --      | --      | +       | --      | +       | --      | +       | --      |
| Maxigrain                      | --      | --      | --      | +       | --      | +       | --      | +       |
| Total                          | 100.00  | 100.00  | 100.00  | 100.00  | 100.00  | 100.00  | 100.00  | 100.00  |
| <b>Analyzed composition</b>    |         |         |         |         |         |         |         |         |
| Crude protein (%)              | 22.48   | 22.67   | 22.67   | 22.39   | 22.67   | 22.67   | 21.67   | 22.39   |
| Crude fibre (%)                | 4.64    | 6.79    | 6.79    | 6.79    | 6.79    | 6.79    | 6.79    | 6.79    |
| Ash                            | 7.13    | 7.21    | 7.21    | 7.16    | 7.21    | 7.16    | 7.21    | 7.46    |
| *ME (Kcal/kg)                  | 2859.80 | 2812.80 | 2812.80 | 2812.80 | 2812.80 | 2812.80 | 2812.80 | 2812.80 |
| Cost/kg of feed (₦)            | 119.00  | 115.76  | 115.76  | 115.76  | 115.76  | 115.76  | 115.76  | 115.76  |

<sup>†</sup>Fixed ingredients: maize 45, soyabean meal 32, Corn bran 4.50, Bone meal 3.00, Palm kernel cake 2.00, Fish meal (72%) 2.50, Methionine 0.25, Lysine 0.25, Premix 0.25, Salt 0.25

\*ME = Metabolizable energy (Calculated)

**Table 3: Gross composition of Experimental diets (Finisher phase)**

| Ingredients                    | Diets   |         |         |         |         |         |         |         |
|--------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|
|                                | 1       | 2       | 3       | 4       | 5       | 6       | 7       | 8       |
| Rice husk                      | --      | 16.00   | 16.00   | 16.00   | 16.00   | 16.00   | 16.00   | 16.00   |
| Wheat offal                    | 16.00   | --      | --      | --      | --      | --      | --      | --      |
| <sup>†</sup> Fixed ingredients | 84.00   | 84.00   | 84.00   | 84.00   | 84.00   | 84.00   | 84.00   | 84.00   |
| Cocci guard                    | +       | +       | +       | +       | +       | +       | +       | +       |
| AG enzyme                      | --      | --      | +       | --      | +       | --      | +       | --      |
| Maxigrain                      | --      | --      | --      | +       | --      | +       | --      | +       |
| Total                          | 100.00  | 100.00  | 100.00  | 100.00  | 100.00  | 100.00  | 100.00  | 100.00  |
| <b>Analyzed composition</b>    |         |         |         |         |         |         |         |         |
| Crude protein (%)              | 18.87   | 19.28   | 19.28   | 18.79   | 19.28   | 18.79   | 19.28   | 18.79   |
| Crude fibre (%)                | 4.15    | 7.59    | 7.59    | 7.59    | 7.59    | 7.59    | 7.59    | 7.59    |
| Ash                            | 5.97    | 6.08    | 6.08    | 5.89    | 6.08    | 5.89    | 6.08    | 5.89    |
| *ME (Kcal/kg)                  | 2808.46 | 2733.30 | 2733.30 | 2733.30 | 2733.30 | 2733.30 | 2733.30 | 2733.30 |
| Cost/kg of feed (₦)            | 91.50   | 85.00   | 85.00   | 85.00   | 85.00   | 85.00   | 85.00   | 85.00   |

<sup>†</sup>Fixed ingredients: Maize 49.30, soybean meal 23, Corn bran 2.00, Bone meal 3.70, Palm kernel cake 2.00, Fish meal (72%) 3.00, Methionine 0.25, Lysine 0.25, Premix 0.25, Salt 0.25, ME = \*Metabolizable energy (Calculated)

enzyme for the last four weeks of the experiment, Diet 8 – Diet 2 + maxigrain for the last four weeks of the experiment.

**Experimental Animals and Management:** Two hundred and eighty-eight (288) day old Marshall stains of broiler chicken was used for the experiment. Birds were randomly allocated to

eight dietary treatments of three replicates each. Each replicate had twelve (12) birds to make a total of thirty-six birds per treatment in complete randomized design (CRD) experiment. The birds were offered adequate feed and water on daily basis throughout the experiment which lasted for eight (8) weeks.

## Data Collection

**Digestibility study:** At the end of the experiment, three birds were taken from each treatment and transferred to metabolic cages for digestibility study. The birds were acclimatized for two (2) days after which faecal samples were collected for five (5) days, the wet as well as the dry weight of faeces were taken. The corresponding feed intake for five days was also recorded. The samples from each treatment for five days were bulked together and sub sample were taken for proximate analysis. **Laboratory analysis:** The experiment diets as well as faecal samples were analyzed for proximate composition by method of (AOAC, 2005).

**Data analysis:** All data collected were subjected to one way analysis of variance using the GLM of SAS (2003). Means Duncan's Multiple Range Test of the same package was used for comparing the means.

## Results and Discussion

The nutrient digestibility is presented in Table 1. The digestibility coefficient for all the components were significantly ( $P < 0.05$ ) different in all the dietary treatments except the live weight. The dry matter ranged ( $P < 0.05$ ) from 69.87 in diet 2 to 84.59 in diet 7. The crude protein also ranged ( $P < 0.05$ ) from 81.50 in diet 1 to 87.50 in diet 2. The crude fibre varies from 60.00 in diet 2 to 67.50 in diet 6 while the crude ash varies from 56.00 in diet 2 to 64.00 in diet 5.

The inclusion of enzyme increase the dry matter digestibility of rice husk based diet. The conventional wisdom would suggest that exogenous xylanase will have a better efficacy in the diet with high concentration of non starch polysaccharides. Nonetheless, the structure of the non starch polysaccharides from different ingredients and weather soluble or insoluble, may determine the response to specific enzymes targeting dietary fibre (Choct 1997). This agrees with the report of Piano *et al.*, (2002) and Li *et al.*, (2002) who reported that digestibility of most nutrients were higher in replacing brown rice with corn.

Rice husk based diet with enzyme supplementation in diet 8 exhibit an increased of crude fat digestibility when compared with other treatments. Danicke *et al.*, (1999) reported that the digestibility of crude fat is greatly reduced in the presence of soluble pentosans, this study suggested that crude fat digestibility was affected by rice husk based diet without enzyme supplementatation in diet 2. Crude fat digestibility was increased in diet 8 due to addition of enzyme which was not evident in diet 2.

## Conclusion

This study shows that it could be concluded that rice husk could be used as an alternative to wheat offal in formulating broiler diet at 10% in the starter phase and 16% in the finisher phase.

## References

- Agbede J.O, Ajaja, K, Aletor, V.A (2002). Influence of Roxazyme G supplementation on the utilization of sorghum dust-based diets for broiler chicks. Proceedings of the 25<sup>th</sup> Annual Conference Nigeria Society for Animal Production (NSAP), March 17-21, 2002, Federal University of Technology, Akure, Nigeria. Pp. 105-108
- Allen, V.M., Fernandez, F. and Hinton, M.H. (1997). Evaluation of the influence of supplementing diet with mannose or palm kernel meal on salmonella colonization in poultry. *British Poultry Science* 38:485-488.
- AOAC, (1990). Official method of Analysis 15<sup>th</sup> Edition. Association of Analytical Chemist, Washington D.C.
- Attia, Y.A, Qota, E.M.A, Aggoor, F.A.M and Kies, A.K, (2003). Value of rice bran, its maximal utilization and upgrading by phytase and other enzymes and diet-formulation based on available amino acid for broiler chicks. *Archiv Für Geflügelkunde* 67 (4):157-166.
- Attia,Y.A, Abd El-Rahman S.A and Kies A.K, (2001). Utilization of vegetable diets containing different levels of rice bran with or without commercial enzymes in Norfa laying hen diets. *Mansoura Journal of University Agricultural Science*, 26:3557-3577.
- Awesu, J.R, Bamgbose, A.M., Oduguwa, O.O., Fanim, A.O., Oguntola, E.B (2002). Performance and nutrient utilization of cockerel finishers fed graded levels of rice milling waste. *Nigeria Journal of Animal Production* 29:181-188.
- Choct, M. (1997). Feed non- starch polysaccharides. Chemical structures and nutritional significance. *Feed mill international*. June: 13-26
- Dafwang, I.T., and Shwarmen EBN (1996). Utilization of rice offal in practical rations for chicks. *Nigeria Journal of Animal Production* 23: 21-23.
- Danicke, S., Simon, O., Jeroch, I.I. and Bedford, M. (1999). Effect of fat source and xylanase supplementation on the

- performance and intestinal viscosity in rye-fed birds. Proceedings of the 2<sup>nd</sup> European symposium of feed enzymes. Noordwijkerhout, NL. Pp 102-107
- Hastings, W.H. (1946). Enzyme supplementation for poultry feeds. *Poultry Science* 25:584-586.
- Kung, P., and Grueling, H.T (2000). Enzyme supplementation of a poultry diet containing rye and wheat. *British Journal of Animal Nutrition*. 62:139-149.
- Li, D.F., Zhang, D.F., Diao, X.S., Han, K., Chul, J., Yang, J.B. and Lee, J.H. (2002). Effect of replacing corn with Chinese brown rice on growth performance and apparent faecal digestibility of nutrients in weaning piglets. *Asian Australian Journal of Animal Science* 15(8):1191-1197
- Njwe, R.M. (1997). Strategies for matching feed resources to small ruminants needs: A review paper, Department of Animal Science, Dschang – University Centre. B. P 222 Dschang Cameroon.
- SAS, (2003). Statistical Analysis System User's guide, SAS Institute, Incorporated Cary NC 27513