



# Tropentag Conference October 5 - 7, 2011



## Apparent ileal digestibility of crude protein and amino acids in wheat offal diets for broilers

Agboola, A. F., Lawal, T. T. and Iyayi, E. A.  
Department of Animal Science, University of Ibadan, Nigeria

### INTRODUCTION

- Broiler diet formulation based on CP and AA resulted in excess over the amount digestible in birds.
- It increases cost of rations and introduces excess nitrogen to the environment.
- Manipulation of hind gut microbes in further digesting AA is of a great concern.
- Measurement of AA at the terminal ileum is a reliable measure of digestibility.

### Materials and Methods

- ❖ Eighty day old broiler chicks were used for the study.
- ❖ Wheat offal (WO) was included in the diets at 0%, 10%, 20% and 30%.
- ❖ TiO<sub>2</sub> added as dietary marker at a level of 5g/kg.
- ❖ Digesta collection (ileo-caeco-colonic junction).

### Chemical and Statistical analyses

- Proximate composition of diets and digesta (AOAC, 2000).
- Titanium dioxide (TiO<sub>2</sub>) in samples by photometric techniques (Brandt and Allam, 1987)
- Amino acids analyses – determined by HPLC (AOAC, 2000; method 982.30).
- The data obtained were subjected to analysis of variance and treatment means were compared using Tukey's HSD test (SAS, 2006).



Wheat



Wheat offal

### RESULTS AND DISCUSSION

- AA concentrations for WO were highest in diet with 10% WO except for tryptophan.
- Least values for all the essential AAs were recorded in 20% WO diet except for valine and isoleucine in the control diet with lower values recorded.
- CP digestibility was highest in birds fed 10% WO while least value was observed in birds on 30% WO inclusion.
- The digestibility of all the essential AAs in birds fed WO based diets significantly (P<0.05) decreased as the levels of wheat offal increased across the dietary treatments.
- Threonine digestibility was lowest when compared with digestibility of other essential amino acids across the diets.

### CONCLUSION

The data from the present study showed that there were considerable differences in varying levels of WO in the digestibility of their amino acids for broiler starters. Therefore, it is imperative to consider lower level of WO inclusion, as level above 10% resulted in decreased digestibility of crude protein and amino acids.

Chart 1. Amino acid concentrations (g/100gCP) of broilers fed wheat offal-based diets

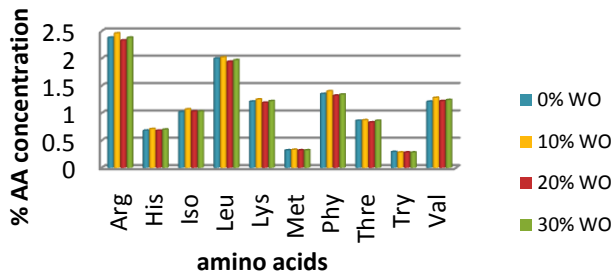
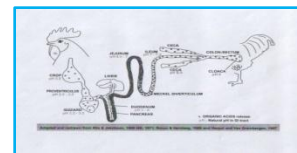


Table 1. Apparent ileal digestibility (%) of crude protein and amino acids in birds fed wheat offal diets (n= 4 replicates of 5 birds each)

Item	0% WO	10% WO	20% WO	30% WO	SEM
Dry matter	71.48 <sup>b</sup>	73.07 <sup>a</sup>	70.81 <sup>c</sup>	70.04 <sup>d</sup>	0.121
Crude protein	84.14 <sup>b</sup>	85.48 <sup>a</sup>	83.47 <sup>c</sup>	83.02 <sup>d</sup>	0.003
Arginine	96.24	96.14	95.12	95.12	0.507
Histidine	90.71 <sup>b</sup>	91.18 <sup>a</sup>	89.96 <sup>c</sup>	89.85 <sup>d</sup>	0.013
Isoleucine	90.02 <sup>b</sup>	90.63 <sup>a</sup>	89.13 <sup>c</sup>	88.20 <sup>d</sup>	0.036
Leucine	91.23 <sup>b</sup>	91.54 <sup>a</sup>	89.94 <sup>c</sup>	89.43 <sup>d</sup>	0.008
Lysine	91.01 <sup>a</sup>	90.72 <sup>b</sup>	88.88 <sup>c</sup>	88.62 <sup>d</sup>	0.006
Methionine	91.22 <sup>a</sup>	90.63 <sup>b</sup>	88.52 <sup>c</sup>	87.44 <sup>d</sup>	0.007
Phenylalanine	92.75 <sup>a</sup>	92.44 <sup>a</sup>	91.61 <sup>b</sup>	91.22 <sup>b</sup>	0.302
Threonine	86.53 <sup>b</sup>	87.80 <sup>a</sup>	85.59 <sup>c</sup>	85.33 <sup>d</sup>	0.021
Tryptophan	92.50 <sup>a</sup>	92.16 <sup>b</sup>	91.40 <sup>c</sup>	91.01 <sup>d</sup>	0.109
Valine	89.32 <sup>b</sup>	92.33 <sup>a</sup>	88.67 <sup>c</sup>	87.85 <sup>d</sup>	0.057

Means on the same row with different superscripts are significantly (P<0.05) different; SEM - standard error of mean; WO – wheat offal



ileo-caeco-colonic junction

### REFERENCES

- AOAC (2000). Official Method of Analysis, 17<sup>th</sup> Edn. Association of Official Analytical Chemists, Washington DC.
- Brandt and Allam. (1987). Analytik von TiO<sub>2</sub> in Darminhalt und kot nach kjeldahlau fcschluB. *Arch Anim Nut.* 37:453– 454.
- SAS (2006). Statistical Analysis System Proprietary Software Release 9.1. SAS Inst. Inc. Cary, NC.