



Broiler Chickens' Performance and Prebiotic-potential of Wheat Offal and Palm Kernel Cake Supplemented with Xylanase

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1. Introduction:

More emphasis is laid on digestive flora and microbial balance of animals' gut since the ban of antibiotics by European Commission. Prebiotics and probiotics are seen as viable alternatives as they protect beneficial microorganisms. Prebiotics are required to sustain the growth and proliferation of probiotics in the digestive system as they can be metabolized by probiotics. Xylanase breaks down xylans, a major components of hemicellulose and the fermentable carbohydrate obtained from xylans produces prebiotic. Hence, this study aimed at evaluating broiler chicken's performance and prebiotic potential of wheat offal (WO) and palm kernel cake (PKC) supplemented with xylanase.

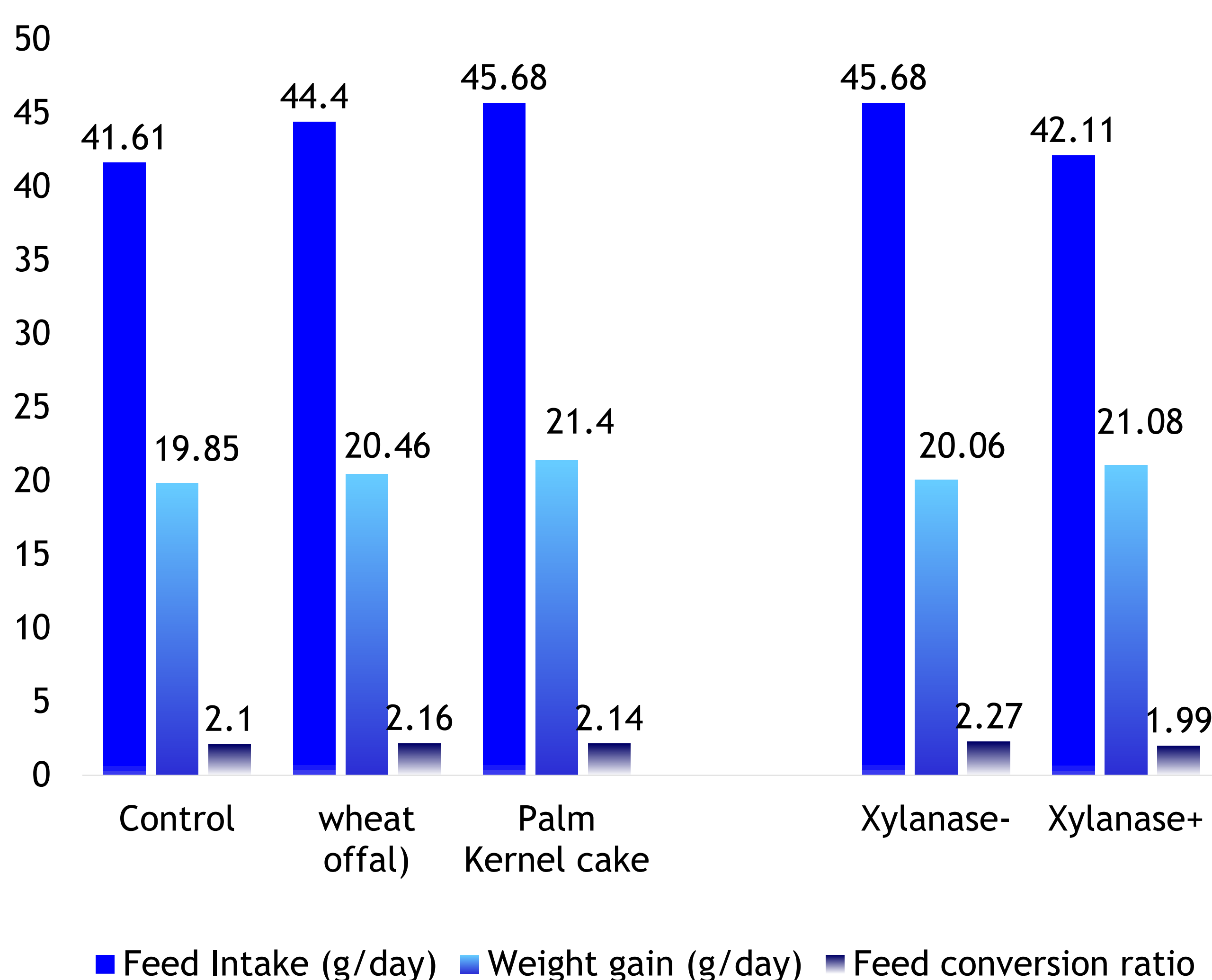
Materials and Methods

➤ A 35-day feeding trial made up of a 3x2 factorial design was conducted using 288 1-day old Marshall broiler chickens. The birds were randomly allocated to six dietary groups. Each group was further divided into 6 replicates of 8 birds each. Birds were fed control (maize: 60%), corn-wheat offal (30% each) and corn-PKC (30% each) based diets with or without xylanase supplementation. Nutrient digestibility trial was done on day 21 of the experiment using 2 birds per replicate. On day 35, 3 birds per replicate were sacrificed to determine the microbial profile assay. Their crops were aesthetically removed and placed in sterilized sample bottles (used to convey them to the laboratory for analysis). Data collected were subjected to Analysis of Variance with 5 % significance in a Factorial Design.

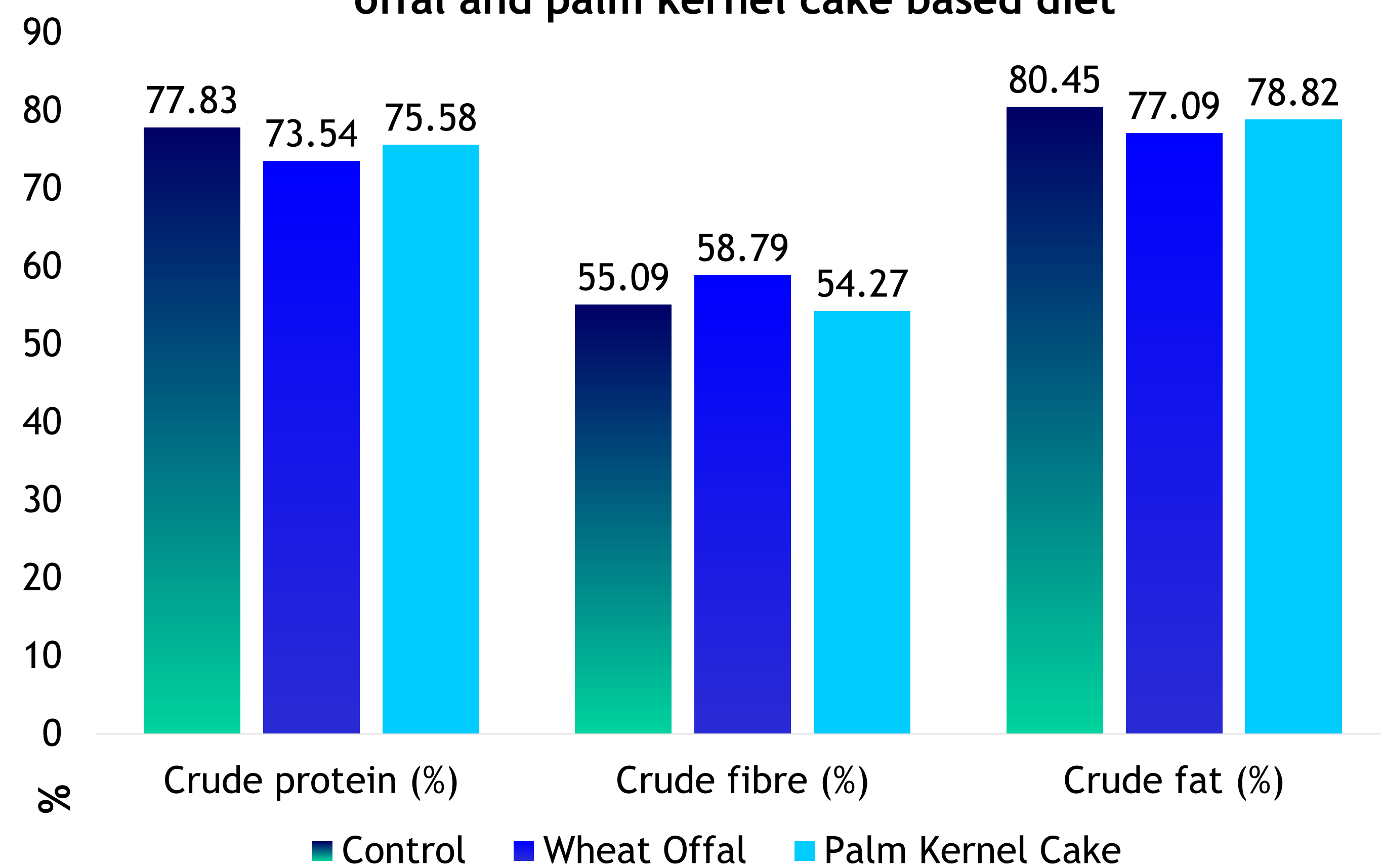
Results

➤ Feed intake (FI) increased ($p < 0.05$) with wheat offal and PKC inclusion while weight gain (WG) and feed conversion ratio (FCR) were not affected. Xylanase supplementation had no effect ($p > 0.05$) on FI and WG but significantly improved the FCR (1.99). Xylanase supplementation did not influence ($p > 0.05$) crude protein (CP) and fat (CFa) retention but improved ($p < 0.05$) crude fibre (CF) digestibility (58.79 %). Birds fed control diet recorded a higher ($p < 0.05$) CP (77.83 %) and CFa (80.45 %) digestibility while birds fed Wheat offal (WO) and Palm kernel cake (PKC) had higher CF digestibility. Total viable count (TVC) and faecal coliform count (FCC) was higher ($p < 0.05$) in the control groups as compared to groups fed WO and PKC. Xylanase supplementation and WO inclusion resulted into higher ($p < 0.05$) Lactobacillus count and lower TVC and FCC.

Performance characteristics of broiler chickens fed wheat offal and palm kernel cake supplemented with xylanase



Nutrient digestibility of broiler chickens fed wheat offal and palm kernel cake based diet



Effect of Xylanase on nutrient digestibility of broiler chickens fed wheat offal and palm kernel cake

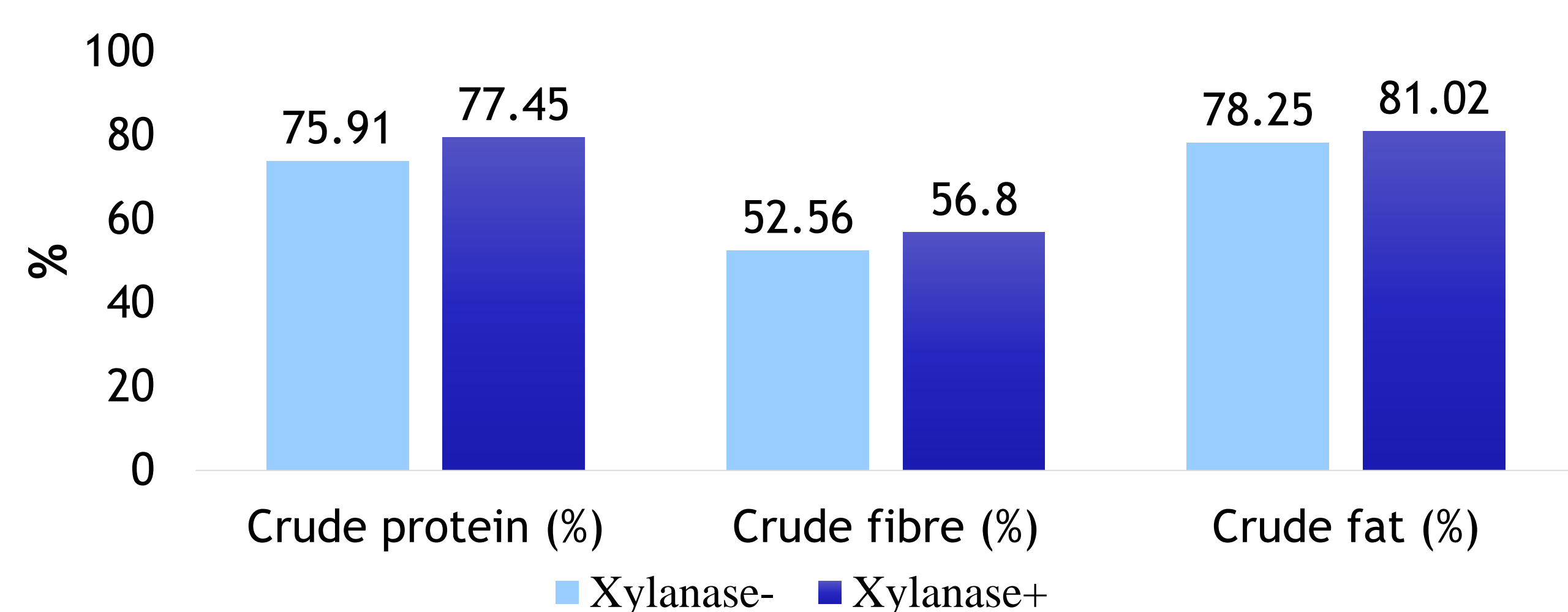


Table 1: Effect of xylanase supplementation on microbial profile of broiler chickens fed wheat offal and Palm Kernel Cake

Diets	Total Viable Count (cfu/ml)	Coliform Count (cfu/ml)	Faecal Coliform Count (cfu/ml)	Lactobacillus Count (cfu/ml)	Fungi Count (cfu/ml)
Control	7.00 ^a	4.05 ^a	1.86 ^a	1.40 ^b	1.79 ^b
WO	4.15 ^a	4.21 ^a	0.52 ^b	1.46 ^a	3.44 ^b
PKC	3.37 ^b	2.39 ^b	0.00 ^b	1.45 ^a	1.21 ^a
SEM	0.74	0.49	0.55	0.02	0.67
P Value	0.001	0.001	0.001	0.023	0.001
Enzyme Supplementation					
With	3.65 ^b	2.87 ^b	0.46 ^b	1.95 ^a	2.02
Without	6.03 ^a	4.23 ^a	1.13 ^a	0.99 ^b	2.27
SEM [±]	0.72	0.44	0.34	0.48	0.13
P value	0.001	0.001	0.003	0.022	0.018

^{ab}Means on the same row with different superscripts were significantly different ($P < 0.05$)

Conclusion

- ✓ This study concluded that xylanase supplementation enhanced FCR and CF digestibility of broiler chickens fed wheat offal and palm kernel cake.
- ✓ Xylanase supplementation enhanced the prebiotic potential of wheat offal.

Acknowledgments

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