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CARCASS CHARACTERISTICS, PRIMAL CUTS AND ORGAN WEIGHTS OF BROILER CHICKENS FED DIETS SUPPLEMENTED WITH SYNBIOTICS

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ABSTRACT
A seven(7) weekfeeding trial was conducted to determine the carcasscharacteristics, primal cutsand organ weights of broiler chickensfed synbioticssupplemented diets.Four dietary treatments comprising 0ppm (control), 100ppm, 150ppm and 200ppmsynbiotics(MaiDiasan®) respectively. One hundred and twenty (120) day-old chicks were randomly allotted tofour experimental diets, at thirty (30) birds per treatment in a completely randomized design. The parametersmeasured were live weight, bled weight, carcass weight, breast weight, thigh weight, drumstickweight, wings weight, neck weight, back weight, spleen weight, liver weight, heartweight, lungs weight. The result showedthat all theparameters were not significantly different across the treatments. Therefore, the inclusion of MaiDiasan®synbioticsup to 200 ppmin broiler chickendiets did not adversely affect the carcass and organ traitsof the birds.
Key words: Antibiotics, probiotics, prebotics, synbiotics, carcass traits.

INTRODUCTION
The use of antibiotics as a growth promoter shows that their use in broiler nutrition is extremely important to maintain the types and quantity of bacteria in the digestive tract, as well as to form adequate protection to the wall of the intestinal mucosa, thus, enabling better utilization of nutrients (Araujo *et al.*, 2019). Their use has been pointed out as one of the possible causes of the increase in bacterial resistance, intensifying discussions based on the possibility of the presence of residues of animal origin in food that could harm the consumer's health. There is also the likelihood of an increase in microbial resistance, which can lead to problems in antibiotic treatments in humans, raising the attention of research to overcome such issues (Sorum and Sunde, 2001).In view of this, the European Commission has banned the use of antibiotics as growth promoters in animal production since 2006 (EU Commission, 2003). Therefore, much attention has been given to finding alternatives to antibiotics. Synbiotics, considered an alternative, is a mix of probiotics and prebiotics. Probiotics (direct-fed microbial) are used as live microorganism feed supplement that confer health to the host by improving microbial intestinal balance (Fuller, 1989). On the other hand, prebiotics are defined as non-digestible food ingredients that beneficially affect the host by selectively stimulating the growth and/or activities of one or a limited number of beneficial bacteria (Gibson *et al*., 1995). Therefore, this study investigated the carcass and organ parameters of broiler chickens fed diets supplemented withsynbiotics.

MATERIALS AND METHODS

Experimental Site

The study was carried out at the Poultry Unit, Livestock Teaching and Research Farm of the College of Animal Science, Joseph SarwuanTarka University, Makurdi, Benue state, Nigeria.

Experimental Diets and Management of Birds

One hundred and twenty (120) day-old mixed sex Cobb 500 broiler chicks were purchased from a reputable commercial hatchery and used in a seven (7) week feeding trial. The birds were randomly assigned to four (4) dietary treatment groups with three (3) replicates of ten birds each in a completely randomized design. Treatment groups comprised 0 ppm (T_1control), 100 ppm (T_2), 150 ppm (T_3) and 200 ppm (T_4) MaiDiasan®synbioticsrespectively. Broiler starter and finisher diets were fed from 0 - 4 weeks and day 4-7 weeks respectively while feed and water were administered *ad libitum*. The starter and finisher dietswere isocaloric and isonitrogenous (Table 1). Birds were housed in deep litter pens and all necessary routine management practices were observed.At the end of the feeding trial, the birds were slaughtered, defeathered and eviscerated. Carcass characteristics weredone using the method described by Oluyemi and Robert (2013). The dressed weight, weightsof the carcass primal cuts (thighs, drumstick, breast, back, wings, and neck) and internal organs (liver, heart, lung, pancreas and spleen) were measured with the aid of laboratory electronic scale (ACCULAB). The primal cuts were expressedas percentage of dressed weight while dressing percentage was determined as follows:

$$\text{Dressing percentage} = \frac{\text{Scald Weight}}{\text{Live Weight}} \text{x } 100$$

Data Analysis

Data obtained from the experiment were analyzed using the statistical analysis of variance (ANOVA)procedure of SAS (2010) and significance was at P>0.05. The treatment means werecompared using the Duncan new multiple range test option of the same software.

RESULTS AND DISCUSSION

The results of the present study showed no significant(P>0.05) effect of synbioticsupplementation in diets of broiler chickens on dressingpercentage, breast weights, thigh weight and drum stick weights(Table 2). Similar findings were reported by Sarangie*t al.* (2016), who observed that supplementation of diets with synbiotics did not affect the dressing percentage,breast meat yield and thigh meat yield of broiler birds.Ashayerizadeh e*t al.* (2011) also reported similar non significant (P>0.05) differences in carcass yield, thigh meat yield and breast meat yield percentagesofbroiler chickens fed diets supplemented with synbiotics (Primalac and Biolex-MB®).In contrast,Abdel-Raheem e*t al.* (2012)reported that dressingpercentage, breast meat and thigh meat yieldsincreased as compared with other treatment groups.The results of the present study also showed that synbioticsupplementation in the diets of broiler chickens had no significant (P>0.05) effect on relative organ weights(Table 2). Similar resultswere reported by Yun e*t al.* (2017). These authors found that theaddition of synbiotics in the diets of broiler chickens did not affect (P>0.05) giblet relative weight percentages. On the contrary, Salma e*t al.*

(2007)reported that the inclusion of probiotics gave rise to significant (P<0.05) reductions in liverweight of chickens comparedto other broiler birdtreatments.

Table 1: Composition of Broiler Starter and Finisher Diets

	Starter Diets				Finisher Diets			
Ingredients (kg)	T_1 0 ppm	T_2 100 ppm	T_3 150 ppm	T_4 200 ppm	T_1 0 ppm	T_2 100 ppm	T_3 150 Ppm	T_4 200 ppm
Maize	41.00	40.90	40.85	40.80	52.70	52.60	52.55	52.50
Full- Fat Soya	48.50	48.50	48.50	48.50	33.80	33.80	33.80	33.80
Brewer's Dried Grain	4.00	4.00	4.00	4.00	7.00	7.00	7.00	7.00
Rice offal	2.00	2.00	2.00	2.00	2.00	7.00	2.00	2.00
Bone Ash	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
L-Lysine	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
DL-Methionine	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Salt	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
V/M Premix	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Synbiotic (ppm)	-	*100*	*150*	*200*	-	*100*	*150*	*200*
Total	100	100	100	100	100	100	100	100
***Calculated* values**								
M.E. (Kcal/kg)	2898.20	2898.20	2898.20	2898.20	2870.45	2870.45	2870.45	2870.45
C.P.	23.04	23.04	23.04	23.04	19.04	19.04	19.04	19.04
C.F.	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2

Table2: Carcass Characteristicsand Organ Weights ofBroiler Chickens Fed Diets

Supplemented with Synbiotics

	Treatments					
Parameters (kg)	T_1 0 ppm	T_2 100 ppm	T_3 150 ppm	T_4 200 ppm	**SEM**	**P-value**
Live weight (kg)	1.32	1.10	1.60	1.60	1.71	0.09
Slaughter weight (kg)	1.28	0.98	1.55	1.66	0.15	0.80
Scald weight (kg)	1.21	0.91	1.48	1.58	0.15	0.09
Dressing %	67.00	68.62	68.72	72.90	0.31	0.52
Primal cuts and organ weights (expressed as % of dressed weight)						
Back	17.71	17.41	20.23	20.83	2.79	0.17
Thigh	19.87	15.58	19.51	20.91	3.58	0.27
Drum stick	5.41	5.01	5.65	5.55	3.57	0.33
Breast	35.48	34.78	36.63	38.19	7.51	0.15
Wings	4.50	4.05	4.81	4.91	1.92	0.18
Shanks	2.56	2.32	2.58	2.59	1.38	0.61
Liver	1.40	1.10	1.25	1.37	0.28	0.30
Lungs	0.71	0.69	0.76	0.70	0.10	0.18
Kidney	0.78	0.76	0.87	0.90	0.05	0.08
Heart	0.53	0.50	0.62	0.64	0.14	0.70
Spleen	0.13	0.10	0.14	0.18	0.02	0.12

SEM = standard error of mean

CONCLUSION

Based on the result obtained, there was no significant variation across the treatments, thus,MaiDiasan®synbioticsupplementation in the diets of broiler chickens of up to 200ppmdid not have detrimentaleffect on the carcass characteristics, primal cuts and organ weights

REFERENCES

Abdel-Raheem, S.M., Abd-Allah, S.M.and Hassanein,K.M.(2012). The effects of prebiotic, probiotic and synbiotic supplementation on intestinal microbial ecologyand histomorphology of broiler chickens. *International Journal of Agronomy and Veterinary Medicine Science 6:277-289*.

Araujo, R.G., Polycarpo, G.V., Barbieri, A.I., Silva, K.M., Ventura, G.I. and Polycarpo, V.C.C. (2019). Performance and Economic Viability of Broiler Chickens Fed with Probiotic and Organic Acids in an Attempt to Replace Growth-Promoting Antibiotics. *Brazilian Journal of Poultry Science. Vol. 21 (21): 001-008*.

Ashayerizadeh, A., Dabiri, N., Mirzadeh, K.H. and Ghorbani, M.R. (2011). Effect of dietarysupplementation of probiotic and prebiotic on growth indices andserum biochemical parameters of broiler chickens. *Journal of Cell and Animal Biology; 58:152-156.*

EU Commission (2003). Regulation (EC) No. 1831/2003 of the European Parliament and of the Council of 23 September 2003 on additives for use in animal nutrition. *Official Journal of the European Union. L268:29–43.*

Fuller, R. (1989). Probiotic in man and animal. Journal of Applied Bacteriology, *66:365–378*.

Gibson,G.R., Probert,H.M., Loo,J.V., Rastall,R.A. andRoberfroid,M.B. (1995). Dietary modulation of the human colonic microbiota: updating the concept of prebiotics. *British Journal of Nutrition 17:1401–1412*.

Oluyemi, J. A. and Robert, F. A. (2013).Poultry Production in warm wet Climate. Macmillan press, London 2nd Edition Pp 692.

SAS (Statistical Analysis System). (2010). Version 9.3, SAS Institute Inc. Carry N. C. USA.

Salma, U., Miah, A.G., Maki, T., Nishimura, M., Tsujii, H. (2007). Effect of dietaryRhodobactercapsulatus on cholesterol concentration and fatty acidcomposition in broiler meat. *Poultry Science86:1920-1926*.

Sarangi, N.R., Babu, L.K., Kumar, A., Pradhan, C.R., Pati, P.K., Mishra, J.P. (2016). Effectof dietary supplementation of prebiotic, probiotic, and synbiotic ongrowth performance and carcass characteristics of broiler chickens.*Veterinary world 319-323.*

Sorum, H. andSunde, M. (2001). Resistance to antibiotics in the normal flora of animals. *Veterinary Research 32:182-188*.

Yun, W., Lee, D.H., Choi, Y.I, Kim, I.H. and Cho, J.H.(2017). Effects of supplementation ofprobiotics and prebiotics on growth performance, nutrient digestibility,organ weight, fecal microbiota, blood profile, and excreta noxiousgas emissions in broilers. *Journal of Applied Poultry Research 26:584-592*.