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Effect of Arbocel on the Fecal and Litter Moisture Content of Broilers Chicks

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Abstract
The effect of Arbocel® fine in broiler production in the tropical country of Nigeria was determined. Arbocel® fine was added to formulated broiler starter and finisher diets at 0.0, 0.6 and 0.8% inclusion levels, respectively, partially replacing wheat offal.144-day broiler chicks were divided into 3 treatment groups and assigned to the three treatment diets in a complete randomized design (CRD) experiment replicated 4 times. Starter and finisher rations were fed to the broilers during 0-28 and 29-56 days of age, respectively. Results showed reductions in both faecal and litter moisture contents. Therefore, the use of 0.6 and 0.8% Arbocel® fine in broiler diets can be incorporated in broiler diets to improve the faecal and litter moisture condition of the birds.

Keywords: Arbocel® fine, faecal moisture, litter moisture, insoluble fibre concentrate, broilers

Introduction

In Nigeria, different fibre sources are used in poultry feed formulations deliver significant amount of soluble fibre and are often contaminated with mycotoxins and consume a lot of space in formulation (Pietsch, 2012). However, using these traditional fibre sources often result in excessively wet droppings which invariably leads to wet litter. Wet litter aggravates coccidiosis by providing the proper environment for oocysts to sporulate, thereby increasing challenge levels to which birds are exposed (Bulletin, 2017).Arbocel® fine is a raw fibre concentrate used outside Nigeria in poultry dietswith a minimum crude fibre content of 65% (Pietsch, 2012). Unlike traditional fibre sources, it is free from contaminants, do not consume space in feed formulations, do not bind nutrients, stimulates the intestinal villi and increases enzyme binding capacity (Trautwein *et al*., 2012). Unlike traditional fibre products Arbocel, has a remarkable advantage due to its high hygienic level of production and has proved successful in poultry diets in terms of health status, litter, animal behavior as well as performance and economy (Pietsch, 2012).There is need to see if the positive effect of Arbocel® fine in other countries can be obtained in Nigeria.

The objectives of this study were to determine the faecal quality and litter quality of broilers fed diets containing Arbocel® fine.

Materials and Methods

The research was carried out in Owerri, Imo State, Nigeria. Arbocel® fine was made available by Dr Manfred Pietsch of J. Rettenmaier and Söhne (JRS) from Germany and was stored in a cool and dry environment. Three experimental broiler starter diets were formulated, such that the diets contained 0, 0.6 and 0.8% Arbocel®, respectively, partially replacing wheat offal in the diets (Table 1). One hundred and forty-four (144) day old broilers used for the experiment were divided into three groups and were randomly assigned to each of the three experimental diets in a complete randomized design (CRD) replicated 4 times. The experiment lasted for 56 days. Litter and faecal samples were collected from all pens at 28 and 56 days of age and analyzed for humidity according to the method described by AOAC (1999).

The data generated were statistically analyzed using analysis of variance and means were separated using the R-cranprogramme of R Core Team (2014).

Table 1: Composition of starter and finisher diets

	Starter Inclusion Levels			Finisher Inclusion Levels		
Ingredient (%)	0%	0.6%	0.8%	0%	0.6%	0.8%
Maize	50.00	50.00	50.00	58.00	58.00	58.00
Soy bean meal	15.00	15.00	15.00	16.00	16.00	16.00
Arbocel	---	0.60	0.80	---	0.60	0.80
Wheat offal	3.00	2.40	2.20	2.50	1.90	1.70
Others*	32.00	32.00	32.00	23.50	23.50	23.50
Total	100.00	100.00	100.00	100.00	100.00	100.00

*spent grain (13.00, 10.00), PKC (4.00 3.00), fish meal (8.00, 4.50), blood meal (3.00), bone meal, (2.00), oyster shell (1.00), lysine (0.25), methionine (0.25), vitamin premix (0.25), salt (0.25)

Results and Discussion

At the 28th day(Table 2), diets containing Arbocel® fine at the two levels of inclusion, caused 6.55 and 7.72% reductions in faecal moisture that were not significant when compared with the control (70.51%). At the 56th day, inclusion of Arbocel® fine in broiler finisher diets at 0.6 and 0.8% caused 6.45 and 6.24% reductions in fecal moisture, respectively (Figure I). The values were significantly ($p<0.05$) lower when compared to the control (75.82%). Litter moisture was also lower in the groups fed diets containing Arbocel® fine, but the values were not significantly different from the control (24.54%).The result agrees with the report by Pietsch (2012), who recorded a 10% reduction in litter moisture of finisher broilers fed 0.8% Arbocel diet. This tends to show that Arbocel was able to regulate the rate of digestion by increasing water and nutrient absorption, and thus minimize the rate of excretion of moisture via the feces.

Table 2: Performance of starter broilers fed diets containing Arbocel®fine

Parameter	Dietary Inclusion Levels (%) of Arbocel ® Fine			
	0.00	0.60	0.80	SEM
Faecal Moisture Content at 28th day (%)	70.51	65.89	65.07	2.86
Faecal Moisture Content at 56th day (%)	75.82[a]	70.93[b]	71.09[b]	0.84
Litter Moisture Content at 56th day (%)	24.54	23.24	21.99	1.92

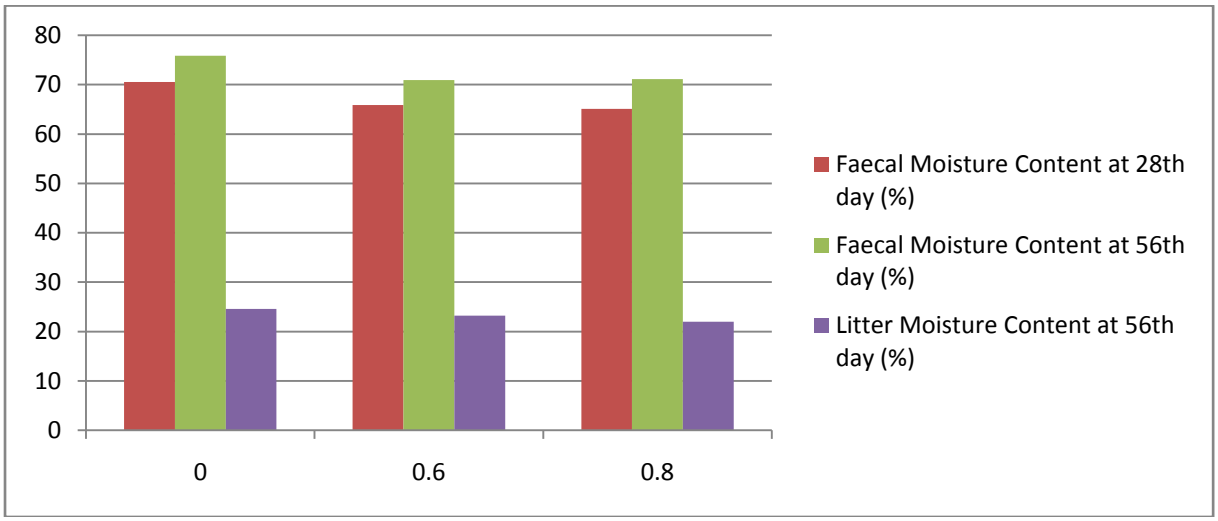

Fig. I: Fecal moisture content of broilers fed diets containing different levels of Arbocel ®fine

Conclusion

The current results on Arbocel® fine supplementation at 0.6 and 0.8% in broiler diets showed improved quality of litter.

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