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EFFECT OF YEAST AS WATER ADDITIVE IN THE MANAGEMENT OF LITTER IN THE PRODUCTION STARTER BROILER

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ABSTRACT

A total of 150 Anak broiler chicks were used to investigate effect of yeast in water on the litter management of broiler starters raised under the conventional deep litter system common in Nigeria. The study was laid out in a completely randomised design (CRD). Data were collected on the cost of yeast application on feed and water consumption, production and litter water and bacteria contents. Data collected were analysed using Association of Official Analytical Chemists (2000). Results showed that yeast application improved daily feed intake, daily protein intake and daily water intake which were all significantly (P<0.05) different. Daily live weight gain, final and total live weight were also significantly (P<0.05) different as yeast application supported these indices. Feed consumption parameters were highest in the 2.0g yeast inclusion group while live weight parameters were best in the 0.5g yeast inclusion group. Litter water content and bacterial load were also highest in the 2.0g group.

Keywords: Yeast, Litter, Management, Moisture, Bacterial load

INTRODUCTION

The demand for broiler chicken in Nigeria is progressively rising as meat consumer's interest is generally being shifted from red to white meat (Ndelekwute *et al*., 2009). However, to meet poultry products requirements of Nigerians, there is the need to expand the industry. This goal according to Babatunde and Hamzat (2005) depends to a large extent on the availability of good quality feed in sufficient quantity and affordable prices that farmers could afford. According to Okonkwo *et al.*(1998), Ibiyo and Atteh (2005), and Nsa *et al.* (2007), the cost of poultry feed has been on the increase and could constitute up to 80% of the total production cost.

The use of feed additives have been on the increased with the increased negative resultant effects of the use of antibiotics in poultry production the world over and the need to incorporate more fibrous material that man cannot consume reasonably in livestock feed. Yeast (*Saccharomyces cerevisiae*) appears potentially useful. However, there is a need to investigate the effect of the exclusive completion initiated by feed additives. Excess of microbes in droppings could as well be detrimental to man and his healthy livestock, fish and poultry. This study was designed to investigate the effect of yeast on litter management of poultry starter birds.

MATERIALS AND METHOD

This study was carried out in the Teaching and Research farm of F.C.E.(T), Omoku using 150 Anak broiler chicks of mixed sexes. Graded levels (0.5g l^{-1}, 1.0g l^{-1}, 1.5g l^{-1} and 2.0g l^{-1} of drinking water given *ad libitum* to broiler chicks except for the control group. The treatments were replicated thrice with 30 chicks per replicate. Feed and water intake were

recorded on daily basis. Litter was also collected and bacteria identification and count determined. All data were analysed using Association of Official Analytical Chemists (2000).

Nutrient agar was used for the enumeration of heterotrophic bacteria while MaConsky was used for Coliform identification.

RESULTS AND DISCUSSION

From Table 1 below, the economics of yeast application as an additive in broiler starter in water revealed that daily feed in intake was significantly ($P<0.05$) different. The best feed cost was saved in the birds that consumed 0.5g yeast that consumed N3.97 against ₦4.10 of the control group. The highest feed consumption was in the 2.0g group (₦ 4.20). Daily protein intake was highest in the 2.0g group (₦0.93). The control group had the least protein consumption (₦0.88). Initial live weight was not significantly ($P>0.05$) different. Daily feed intake was highest in the birds that received yeast inclusions in water except for those that received 0.5g yeast which was lower than the control. This implies that yeast in fed in water in broiler starter birds encouraged feed intake. This agrees with Shareef and Al-Dabbagh (2009), who reported that yeast supplementation at 1.0, 1.5 and 2.0% were all significantly different in, feed consumption, feed conversion efficiency and body weight gains. It also agrees with Paryad and Mahmoudi (2008), who also reported that 1.5% yeast supplementation in broiler ration improved body weight gain, feed intake and feed conversion ratio. Onifade *et al.(*1999), Nilson *et al.(*2004), Zang *et al.*(2005) and Angel *et al.* (2005), had also reported significant increase in feed/gain ratio. The increased feed intake resulted to increased protein intake in the birds that received yeast supplementations. Water consumption increased as feed intake increased as birds that received yeast consumed more water than those in the control. This implies that the application of yeast did add to production cost in terms of feed and water consumption.

From Table 2, the initial live weights cost was the same (₦250.00). This was the cost per chick at day-old. Daily live weight gain cost the least in the 0.5g yeast inclusion group (₦1.16). Final live weight cost in the 2.0g yeast inclusion level was ₦358.49, and least in the 0.5g group (₦343.37) and in the control (₦348.53). Total live weight cost was highest in the 2.0g yeast inclusion group (₦255.43) and least in the 0.5g yeast inclusion group (₦254.53).

Daily live weight costs less at 0.5g, 1.0g and 1.5g yeast than in the control but 2.0g yeast inclusion costs more for daily live weight cost than in the control. The cost for final live weights and total live weight was also less in the chicks that received yeast than in the control birds. These results agree with GAO Et Al. (2008), who reported that growth performance of broilers was apparent during the first phase during yeast application trial. Results also agree with Adejumo *et al*. (2005) who reported that yeast supplementation at the starter phase is more effective for promoting feed conversion and body weight gain than that applied at the finisher phase of broiler production. Yeast supplementation at week 4 to 5 improved growth performance (Zhang *et al*., 2005). Ghasemi (2006) reported significant improvement in body weight gain and feed conversion ratio in chicks fed live yeast (Sc47).

From Table 3, birds that were fed yeast voided more water in their droppings than those in the control. The gastrointestinal tract of the birds fed yeast had more heterotrophic and coliform bacteria as isolated and identified from the litter. These bacteria increased as yeast application level increased. This agrees with Shim and Choi (1997), who reported that supplementation of yeast tended to increase the total intestinal flora. The *E. coli* count was lower than those of other bacteria and agrees with Huff *et al.*(nd) who reported lowered

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percentage *E. coli* from air sac and liver of turkey poults challenged with *E. coli* that were fed yeast.

CONCLUSION AND RECOMMENDATION

The use of yeast as feed additive is beneficial in the promotion of performance parameters especially at 0.5g per litre of water. Levels above this increased feed intake without a corresponding improvement in live performance. Bacteria load also increased with increased yeast application which resulted to increased bacteria been voided in droppings and this could be detrimental to man and other animals. The increased water intake in the yeast fed groups also increased the litter water content thereby increasing management problems. This could encourage microbial growth giving other health problems, like fungal and protozoan. Again, the increased litter water content also increased cost in terms of procurement, removal and disposal of such wastes with high bacteria load.

This study recommends the use of yeast as water additive only at 0.5g inclusion level as this had the least feed consumption, the best live performance and the least bacteria load.

Table 1. Cost implication of yeast in water on broiler chicks feed and water intake

Parameters	*0.0g*	*0.5g*	*1.0g*	*1.5g*	*2.0g*	*±SEM*
Daily Feed Intake (₦)	4.01^{bc}	3.97^{c}	4.14^{ab}	4.12^{ab}	4.19^{a}	0.39
Daily Protein Intake(₦)	0.88^{c}	0.89^{c}	0.92^{a}	0.90^{a}	0.93^{a}	0.09
Daily water intake (₦)	122.01^{c}	150.70^{b}	171.46^{ab}	177.49^{ab}	180.72^{a}	20.21

^{a,b,c} Means within the same rows with the same or no superscripts are not significantly (P>0.05) different. All values are means of three birds**.**

Table 2. Cost implication of yeast in water on broiler chicks live performance

Parameters	*0.0g*	*0.5g*	*1.0g*	*1.5g*	*2.0g*	*±SEM*
Initial Liveweight (₦)	250	250	250	250	250	0.00
Daily Liveweight Gain (₦)	1.17^{b}	1.16^{a}	1.21^{ab}	1.21^{ab}	1.23^{c}	0.49
Final Liveweight (₦)	348.53^{c}	343.37^{c}	310.20^{a}	354.69^{b}	358.49^{b}	10.25
Total Liveweight (₦)	264.69^{c}	254.53^{a}	255.0^{b}	255.33^{b}	255.43^{b}	10.4

^{a,b,c} Means within the same rows with the same or no superscripts are not significantly (P>0.05) different. All values are means of three birds**.**

Table 3. Effect of yeast in water on litter management in broiler chicks production

Parameters	*0.0g*	*0.5g*	*1.0g*	*1.5g*	*2.0g*	*±SEM*
Litter moisture content	152.08^{d}	171.26^{bc}	172.79^{bc}	180.42^{b}	196.49^{a}	10.21
Nutrient agar	4.89^{d}	5.86^{c}	6.43^{c}	7.18^{b}	8.06^{a}	1.58
Maconsky	5.54^{d}	6.61^{d}	8.82^{c}	14.23^{b}	16.47^{a}	6.06

^{a,b,c} Means within the same rows with the same or no superscripts are not significantly (P>0.05) different. All values are means of three birds**.**

REFERENCES

Adejumo, D. O. Onifade, A. A., Olutunde, T. O. & Babatunde, G. M. (2005). The effects of concentration, age and duration of feeding supplemental yeast (Levucel SB) in a

higher fibre diet on the performance of broiler chickens. *J. Sus. Trop. Agric.Res.*, 13: 58-65.

Angel, (2005). instant dry yeast manufacturer, Angel yeast. Retreived 12/11/2010 from mhtml:file:\\C:\User\ONWURAH\Destop\Document\Instant Dry, Yeast Manu.

Association of Official Analytical Chemists, (2000). Official methods of analysis, 17th edition. Association of Official Analytical Chemists, Arlington, VA, USA.

Babatunde, B.B. and Hamat, R.A. (2005). Effect of feeding graded levels of kolanut husk meal on the performance of cockerels. *Nigerian Journal of Animal Production, 32* (1),61-66.

Gao et al., (2008). Effects of yeast culture in broiler diets on performance and immunomodulatory functions. *Poult. Sci.,* 87: 1377-1384.

Ghasemi et al., (2006). The effect of phytase and Sachharomyces cerevisiae (Sc47) supplementation on performance, serum parameters, phosphorous and calcium retention of broiler chickens. *International Journal of Poultry Science 5 (2)*, 162-168.

Ibiyo, L. M. & Atteh, J. U. (2005). Response of starter broilers to diets containing graded levels of rice bran with or without palm oil. *Nigerian Journal of Animal production, 32*(1), 39-45.

Ndelekwute, E.K. and Uzoegbu, H.O. (2009). Feeding of malasses through drinking water as a supplement in broiler production. A paper presented at the 34th annual conference held at University of Uyo, Marchth – 18th: 414-416.

Nilson, A. J., Peralta, M. F. & Miazzo, R. D. (2004). Use of brewer's yeast (S. cerevisiae) to replace part of the vitamin mineral premix in finisher broiler diets. *XXII World Poultry Congress*, Istanbul, Turkey.

Nsa, E. E., Okereke, C. O. & Okon, b. (2007). Effect of supplementary green feedstuffs on growth performance, *internal organ development and abdominal fat deposition in finisher broilers*. A paper presented at the 32nd annual conference of the Nigerian Society of Animal Production held March 18th-21st: 494-496.

Okonkwo, A. C., Onwurah, F. B. & Eluwa, H. C., (1998). Effect of feed restriction on the performance traits of Broiler finisher. *East African Agriculture and Forestry Journal, 61*(3), 277-282.

Onifade et al., (1999). Assessment of the effects of supplementing rabbit diets with a culture of Sachharomyces cerevisiae using growth performance, blood composition and clinical enzyme activities. *Anim. Feed Sci. Technol.77*, 25-32.

Paryard, A. & Mahmoudi, M. (2008). Effect of different levels of supplemental yeast (Saccharomyces cerevisiae) on performance, blood constituents and carcass characteristics of broiler chicks. *African Journal of Agricultural Research, 3*(12), 835-842.

Shareef, A. M. & Al-Dabbagh, A. S. A. (2009). Effect of probiotic (Sachharomyces cerevisiae) on performance of broiler chicks. Iraq *Journal of Veterinary Sciences, 23*(1), 23-29.

Zhang et al., (2005). Effects of yeast (Saccharomyces cerevisiae) cellwall components on growth performance, meat quality, and ileum mucosa development of broiler chicks. *Poultry Science, 84*, 1015-1021.