

EFFECT OF GRADED LEVELS OF YEAST FED IN WATER ON THE PERFORMANCE OF BROILER CHICKENS

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Abstract



A total of 150 Anak broiler chicks were used to investigate effect of yeast in water on the performance of broiler chickens raised under the conventional deep litter system common in Nigeria. The study was laid out in a completely randomised design (CRD). Diets were analysed using Association of Official Analytical Chemists (2000) while all data generated were analysed using SPSS . Results showed that yeast application improved daily feed intake, daily protein intake and daily feed conversion and protein efficiency ratios which were all significantly ($P<0.05$) different. Feed consumption parameters were highest in the 2.0g yeast inclusion group in the starter phase but in the 0.5g yeast group in the finisher phase while liveweight parameters were best in the 0.5g yeast inclusion group.

Key words: Yeast, Performance, Graded levels and Anak broiler.

Introduction



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 Ibiyo and Atteh (2005), the cost of poultry feed has been on the increase and could constitute up to 80% of the total production cost.

26 Yeast (*Saccharomyces cerevisiae*) appears potentially useful as it has been shown to improve feed
 27 digestibility and meat colour (Ezema, 2009). Yeast has also been reported as a feed quality
 28 enhancer as it has anti-microbial properties (National Livestock Research Institute, 2007) and
 29 may be a good alternative to antibiotic growth promoters (Shen *et al.*, 1990).

30 This study was designed to investigate the effect of yeast on the performance of broiler fed yeast
 31 in water.

32 Materials and Method

33 This study was carried out in the Teaching and Research farm of Michael Okpara University of
 34 Agriculture Umudike, Nigeria using 150 Anak broiler chicks of mixed sexes. Graded levels (0.5g
 35 l⁻¹, 1.0g l⁻¹, 1.5g l⁻¹ and 2.0g l⁻¹ of drinking water given *ad libitum* to broiler starter chicks and
 36 finishers except for the control group. The treatments were replicated thrice with 20 starter
 37 chicks/finishers per replicate. Feed and water intake were recorded on daily basis. Daily feed
 38 intake, daily weight gain, Daily protein intake, feed conversion ratio, protein efficiency ratio and
 39 mortality were taken and recorded. Diets were analysed using Association of Official Analytical
 40 Chemists (2000). All data were analysed using SPSS (2006).

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Results and Discussions

Table 1.0: Starter and fisher diets compositions

Ingredients	Broiler starter	Broiler finisher
Maize	50.00	50.00
Soybean	33.00	28.00
Palm kernel cake	14.00	18.00
Bone meal	3.00	3.00
Sodium chloride	0.25	0.25
Premix	0.20	0.20
Lysine	0.20	0.20
Total (%)	100.00	100.00
Calculated analysis		
Crude protein (%)	22.04	20.56
ME/MJ/KG	14.45	14.67

Table 2.0: Performance of starter birds fed graded level of yeast in water

Parameters	0.0g	0.5g	1.0g	1.5g	2.0g	SEM
Initial Liveweight (g)	115.33	113.00	110.33	112.67	131.33	3.59
Final Liveweight (g)	538.89 ^b	611.11 ^a	594.44 ^{ab}	583.33 ^{ab}	547.22 ^b	10.25
Daily Weight Gain (g)	20.17 ^b	23.72 ^a	23.05 ^{ab}	22.41 ^{ab}	20.60 ^b	0.49
Daily Feed Intake (g)	55.15 ^c	55.67 ^{bc}	57.56 ^{ab}	57.23 ^{ab}	58.26 ^a	0.39
Feed Conversion Ratio	2.78 ^a	2.33 ^b	2.50 ^{ab}	2.55 ^{ab}	2.86 ^a	0.07
Daily Protein Intake(g)	12.12 ^c	12.33 ^{bc}	12.75 ^{ab}	12.67 ^{ab}	12.91 ^a	0.09
Protein Efficiency Ratio	1.64 ^b	1.94 ^a	1.81 ^{ab}	1.77 ^{ab}	1.60 ^b	0.04
Mortality	0.00	0.00	0.00	0.00	0.00	0.00

a,b,c: Means within the same rows with the same superscripts are not significantly ($P>0.05$) different.

SEM = Standard error of mean.

Starter broilers fed 0.5g yeast in drinking water had significantly ($P<0.05$) higher daily weight gain and final live weight at the 4th week more than those fed 0g and 2.0g yeast in drinking water (Table 2.0). This could be attributed to positive performance effect of yeast at the other levels other than 2.0g level and the control group. This higher feed intake, lower feed conversion and increased protein intake in the 2.0g group could be attributed to hampered feed utilization due to excess intake of yeast, resulting to excess alcohol production which could denature enzymes and proteins. There could also be possible yeast clodding in the gastrointestinal tract, making yeast less functional. The 0.5g yeast was most beneficial as feed intake was the least and protein efficiency ratio the highest which resulted to better performance as indicated in the daily weight gain. This performance was similar to that of birds fed 1.0g and 1.5g yeast in drinking water. Daily feed intake and feed conversion ratio followed the same pattern with daily weight gain but with significantly ($P<0.05$) higher feed intake recorded in birds fed 2.0g yeast probably due to reduced feed energy as feed carbohydrates are rapidly converted to alcohol and carbon (IV) oxide, in water than those fed 0g and 0.5g yeast. Also, significant ($P>0.05$) difference existed between birds fed 0g, 1.0g, 1.5g and 2.0g yeast in feed conversion ratio and protein efficiency ratio. Daily protein intake was of the same pattern with daily feed intake. The overall yeast in water beneficial performance could be attributed to the beneficial effects of Mannan oligosaccharides contained in yeast which exerts significant growth promoting effect by enhancing the animal's resistance to enteric pathogens (Ferket, 2004) and yeast cellwall extract that contains 1,3-1,6D glucan and mannan-oligosaccharidases which are important growth promoters for modern livestock and poultry production. These results

agree with Ghasemi (2006) who reported significant improvement in body weight gain and feed conversion ratio in chicks fed live yeast (Sc47). These agree with Paryad and Mahmoudi (2008), who reported that 1.5% yeast supplementation in broiler improved body weight gain, feed intake and feed conversion ratio. Results also agree with Shareef and Al-Dabbagh (2009) and Oyedeji (2010), who reported that 1.0, 1.5 and 2.0% yeast supplementation levels were all significantly different in feed consumption and feed conversion efficiency and body weight gains. Results however, disagree with Gheisari and Kholeghipour (n.d), who reported that both granular and powdery forms of live yeast have no growth stimulatory effects in male broiler chicks.

Table 3.0: Performance of finisher birds fed graded level of yeast in water

Parameters	0.0g	0.5g	1.0g	1.5g	2.0g	SEM
Initial Liveweight(g)	538.89 ^b	611.11 ^a	594.44 ^{ab}	583.33 ^{ab}	547.22 ^b	10.26
Final Liveweight(g)	1957.0 ^b	2182.66 ^a	2152.33 ^a	1986.00 ^b	1906.67 ^b	33.53
Daily Weight Gain (g)	50.67 ^{abc}	56.13 ^a	55.64 ^{ab}	50.10 ^{bc}	48.55 ^c	1.04
Daily Feed Intake(g)	114.54 ^c	123.30 ^a	120.64 ^{ab}	116.00 ^{bc}	116.17 ^{bc}	1.03
Feed Conversion Ratio	2.27	2.20	2.17	2.32	2.39	0.04
Daily Protein Intake (g)	23.02 ^c	24.78 ^a	24.25 ^{ab}	23.32 ^{bc}	23.35 ^{bc}	0.21
Protein Efficiency Ratio	2.20	2.26	2.30	2.15	2.08	0.04
Mortality	0.00	0.00	0.00	0.00	0.00	0.00

a,b,c: Means within the same rows with the same superscripts are not significantly ($P>0.05$) different. SEM = Standard error of mean.

The performance of finisher broilers fed graded levels of yeast in drinking water is presented in Table 3.0. Broilers fed 0.5g yeast in water had significantly ($P<0.05$) higher daily weight gain, daily feed intake and final live weight than those fed 0g, 1.5g

and 2.0g yeast in drinking water. Excess alcohol production at the finisher phase discouraged feed intake. Increasing yeast levels appear not to favour performance of broiler chicken. Daily protein intake also followed exactly the same pattern with daily feed intake while there were significant ($P>0.05$) differences among the finisher broilers fed graded levels of yeast in feed conversion ratio (FCR) and protein efficiency ratio. This could also be attributed to the effect of oligosaccharides in yeast added at 0.5g yeast that enhances gut health with improved performance. This result agrees with Park *et al.* (2001), who reported that diets with supplemental *Saccharomyces cerevisiae* at 0.025, 0.05 and 0.1% contain beta-glucans which has growth promoting and immune-enhancing effects in broiler chickens. The improved performance of broiler finisher fed yeast could also be attributed to selenium in yeast which influences growth via thyroid hormone status in broiler (He *et al.*, 2007). Rutz *et al.* (2006) verified broiler performance improvement when fed yeast extracts and attributed the performance to the beneficial effects of the nucleotides present in yeast extract and to presence of glucans/mannan/ fructo- oligosaccharides in yeast. Results however, disagree with Shim and Choi (1997), who reported that yeast had no effect on growth, apparent digestibility and nitrogen retention.

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