J. Animal and Poultry Production, Mansoura Univ., Vol. 1 (6): 241 - 249, 2010

EFFECT OF STOCKING DENSITY AND PROBIOTIC SUPPLEMENTATION ON BROILER PERFORMANCE

Tag El- Din, T. H.[1]; Alsamra H. Abo Egla [2]; R. M. Mahmoud [3] and E. A. Abu El-Hassan[3]

1- Poultry Prod. Dept., Fac. Agric., Damietta, Mansoura Univ., Egypt

2- Poultry Prod. Dept., Fac. Agric., Mansoura Univ., Egypt

3- Anim. Prod. Res. Inst., Agric. Res. Center, Egypt.

ABSTRACT

A factorial experiment (3×3) was conducted to evaluate the response of broiler to stocking density (8, 12 and 16 bird/m2) with probiotic supplementation (Almiral plus® at 0, 1.5 and 2.5 g/l water). A total of 324 one day old unsexed Hubbard broiler chicks were used. All birds were randomly housed in twenty seven floor pens and reared under similar managerial conditions. The most important results obtained could be summarized as follows:

Decreasing stocking density to 8 birds/m2 showed the best values of live body weight, live body weight gain, feed conversion ratio, performance index, plasma globulin concentration, net revenue and economic efficiency. However, no significant differences in feed intake, protein efficiency, plasma total protein and albumin due to stocking density. Probiotic supplementation at level 2.5g/l water showed the best value of body weight, body weight gain, feed conversion ratio, protein efficiency, performance index and net revenue, economic efficiency. However, probiotic supplementation didn't have any significant effect on feed intake, plasma total protein, albumin and globulin concentration. According to the obtained results, probiotic (Almiral plus®) can be used at level of 2.5 g/l water to improve broilers growth performance and level of 8 birds/m^2 can protect birds from the reduction in their growth performance.

Keywords: Stocking density, Probiotic, broiler, performance.

INTRODUCTION

Most growth promoters act by modifying the intestinal flora, especially targeting gram-positive bacteria, which are associated with poorer health and performance of poultry. Indeed many so-called non-pathogenic bacterial species reduce feed conversion ratio and growth in chickens due to competition with the host for the nutrients in the intestinal tract, degradation of host enzymes and reduction of the absorptive surface area (Bedford, 2000). Probiotic, has been defined as a live microbial feed supplement, which beneficially affects the host animal by improving its intestinal, balance. In this respect, Tolba *et al.* (2004) found that broiler performance was improved when they added probiotic to broiler diets. Improved feeding led to faster growth rate associated with inferior feed efficiency, whereas stocking density exerted negligible effects on broiler performance. Stocking density indicated the numbers of birds being reared in a given housing area. Moderate size of bird represents the majority of broiler production. Stocking density has critical implications for the broiler industry, because higher returns can be obtained as the number of birds per unit space increases. Assigned densities have been primarily driven by cost-benefit analysis (Estevez, 2007). Numerous

studies have been conducted to characterize the effects of stocking density on broiler performance (Bolton *et al.,* 1972, Proudfoot *et al.,* 1979, Cravener *et al.,* 1992 and Estevez *et al.,* 1997). Generally, broiler chickens are reared at a considerably high stocking density. Such rearing conditions may act on the birds as a stress that causes various functional disorders. Thus, increasing stocking density would result in increased levels of stress and consequently decreased immuno-competence in the birds.

Therefore, the present study was carried out to investigate the effect of probiotic supplementation and stocking density on growth performance, carcass traits, blood plasma constituents and economic efficiency.

MATERIALS AND METHODS

The experiment was carried out at Gimmizah Poultry Research Station, Animal Production Research Institute, Ministry of Agriculture, Egypt. A total of 324 1-day old unsexed Hubbard broiler chicks were used. All birds were randomly housed in twenty seven floor pens, under similar managerial conditions. A 3×3 factorial arrangement was used, 3 stocking density (8, 12 and 16 bird/m2) with 3 levels of probiotic (Almiral plus® consisted of *Lactobacillus acidophilus*, amylase, protease and cellulose, produced by NEOLAIT SAS, France) at 0, 1.5 and 2.5 g/L drinking water. All birds were fed *ad libitum* and had free access to water throughout the experimental period. A commercial starter ration containing 22.40 % crude protein and 2950 kcal ME/kg diet was offered during the period from one day-old to 28 days of age. Thereafter, birds received a commercial finisher ration containing 18.53 % crude protein and 3150 kcal ME / kg diet from 28 to 42 days of age. The composition and chemical analysis of these rations are shown in Table (1). Body weight gain (BG), feed conversion ratio (FCR), protein efficiency ratio (PER) and performance index (PI) were calculated bi-weekly, as well as at the entire experimental period. Economic efficiency (EEP) was estimated for the whole experimental period (0 – 6 weeks). At the end of the experiment, 6 weeks of age, blood samples were collected from wing vein just before slaughter in heparinized test tubes. Blood plasma was analyzed for the concentrations of total protein, albumin, triglyceride and cholesterol, were determined in blood plasma using commercial kits. Data were analysed using multifactor analysis of variance of the general linear model procedure of the Statistical Analysis System (SAS, 1990). Significant differences among means were detected by Duncan's multiple range test (Duncan, 1955).

Table (1): Composition and calculated chemical analysis of the diet.

Ingredients	Starter	Finisher
Yellow corn	60.50	67.50
Soybean meal 48 %	30.80	22.00
Corn gluten meal 60%	4.00	3.20
Vig. oil	0	2.30
Ground limestone	1.40	1.40
DI-Calcium Phosphate	2.30	2.30
Salt	0.35	0.35
(Permix)*	0.35	0.35
DL-methionine	0.10	0.10
L-lysine	0.10	0.10
Coccidiostate	0.10	0.10
Total	100	100
Calculated chemical analysis **		
Crude protein, %	22.40	18.53
Metabolisable energy (Kal/kg)	2950	3150
Calcium, %	1.05	1.05
Available phosphorus, %	0.45	0.45
Lysine, %	1.18	1.18
Methionine, %	0.49	0.49
Meth. + Cyc., %	0.86	0.86

*** Each kg of premix contained Vit. A 1000 I.U., Vit D3 2000 I.U., Vit E 10 mg, Vit K 1 mg, Vit B_1 5mg, Vit B_2 5mg, vit B_6 1.5 mg, Vit B_{12} 0.01 mg, folic acid 0.35 mg, Biotin 0.05 mg, Pantothenic acid 10 mg, Niacin 30 mg, Choline 250 mg, Fe 30 mg, Zn 50 mg, Cu 4 mg and Se 0.1 mg.**

**** according to N.R.C. 1994.**

RESULTS AND DISCUSSION

Performance traits of broiler:

The effects of stocking density, probiotic supplementation and there interaction on performance traits of broiler are presented in Tables 2, 3 and 4. From the second week of age till the end of the experiment, live body weight was significantly ($P<0.05$) decreased by increasing stocking density from 8 to12 and 16 bird/m^2. Also, live body weight gain was significantly ($P<0.05$) decreased by increasing stocking density at experimental periods (0-2, 2-4, 4-6 weeks of age) and the entire experimental period (0-6 weeks of age). The best value ($P<0.05$) of feed conversion ratio and performance index were achieved by broiler chicks housed at 8 birds/m^2, however, no significant differences in feed intake and protein efficiency due to stocking density. These findings confirm with those reported by Feddes *et al*., (2002) and Dozier *et al*., (2006) they found that final body weight decreased by increasing stocking density, also, Proudfoot and Hulan (1985) reported that no significant effect on feed intake with numerically higher of feed conversion ratio for the broiler group reared under the highest stocking density. But, Imaeda (2000) and Heckert *et al*. (2002) reported that daily weight gain did not effect by stocking density at the same age of broiler chicks. In addition, Dozier *et al*. (2006) found that increasing the stocking density improved feed conversion ratio in broiler chicks.

Table (2): Average body weight of broiler chicks as affected by density, probiotic levels and their interaction

Treatments		Age (week)						
		day	1	2	3	4	5	6
Density (D)								
	8	48.2	140.0	329.9^{a}	569.9^{a}	828.4^{a}	1261.2^{a}	1999.6^{a}
	12	48.3	139.2	325.5^{a}	558.4^{b}	811.3^{b}	1243.1^{b}	1972.9^{b}
	16	48.1	136.5	315.3^{b}	554.9^{b}	760.7^{c}	1212.5^{c}	1860.2^{c}
SEM		0.8	2.4	4.5	5.1	5.8	8.7	9.9
Sig.		NS	NS	*	*	*	*	*
Probiotic (P)								
	0	47.8	136.6	319.7^{b}	548.6^{b}	799.8^{c}	1231.6^{b}	1840.5^{c}
	1.5	48.5	139.3	324.1^{a}	564.2^{a}	808.0^{b}	1240.5^{a}	1950.6^{b}
	2.5	48.4	139.6	326.9^{a}	570.4^{a}	814.1^{a}	1244.8^{a}	2041.5^{a}
SEM		0.4	2.8	3.9	5.2	6.4	7.0	9.4
Sig.		NS	NS	*	*	*	*	*
Interaction								
D	P							
	0	47.8	138.1	326.1	557.6	814.0	1253.9	1895.9
8	1.5	48.5	140.8	330.5	572.8	822.1	1262.8	2006.0
	2.5	48.4	141.1	333.3	579.3	828.2	1267.1	2096.9
	0	47.9	137.3	321.6	546.1	805.4	1235.8	1869.2
12	1.5	48.6	140.0	326.0	561.3	813.6	1244.7	1979.3
	2.5	48.5	140.3	328.8	567.9	819.6	1249.0	2070.2
	0	47.7	134.6	311.5	542.3	780.1	1205.1	1756.4
16	1.5	48.4	137.3	315.9	558.5	788.3	1214.0	1866.5
	2.5	48.3	137.6	318.7	564.1	794.4	1218.3	1957.4
SEM		0.7	2.1	3.3	5.0	6.5	7.1	9.1
Sig.		NS	NS	*	*	*	*	*

Means within column for each item followed by different letters are significantly different * (P<0.05), NS = no significant
SEM= Standard error of means: Sig. = Significant

At all experimental period and the entire experimental period, probiotic supplementation at level 2.5g/l water increased live body weight (except early age, 1st week) and body weight gain significantly (P<0.05), and improved feed conversion ratio and performance index compared with either low level of probiotic (1.5g/1 water) or control groups. Also, the previous level showed the best value (P<0.05) of feed intake and protein efficiency at (4-6 weeks of age); however, probiotic supplementation didn't had any significant effect on feed intake and protein efficiency at (0-2 weeks of age) and the entire experimental period (0-6 weeks of age). Most presented results is in line with the suggestion of Ali (1999) who fed broiler chicks on diets containing probiotic and observed that the chicks which fed probiotic supplementation had significantly heavier live body weight and weight gain with consumed less feed than the control group and significant improvement was observed in FCR at all periods.Broiler housed by 8 birds/m^2 with adding probiotic at 2.5 g/1 water showed the highest significant (P<0.05) value of live body weight, live body weight gain, feed conversion ratio and performance index with any significant effect on feed intake and protein efficiency in most experimental periods and the entire experimental period. The results showed also that birds housed by 12 birds/m^2 with adding probiotic of both levels (1.5 or 2.5 g/L water) recorded better feed conversion ratio and performance index as compared to groups of birds housed by 8 birds / m^2 without probiotic supplementation.

Table (3): Average body weight gain (BG), feed intake (FI), feed conversion ratio (FCR) of broiler chicks as affected by density, probiotic levels and their interaction.

Treatments		0 – 2 week			2 – 4 week			4 – 6 week			0 – 6 week		
		BG	FI	FCR	BG	FI	FCR	BG	FI	FCR	BG	FI	FCR
Density(D)													
8		281.6^{a}	540	1.91^{b}	491.4^{a}	1006	2.04^{b}	178.1^{a}	2286	1.96^{b}	951.3^{a}	3832	1.97^{b}
12		277.1^{b}	546	1.97^{b}	487.3 ^{a}	1013	2.07^{b}	159.9^{b}	2278	2.00^{b}	924.3^{b}	3837	2.01^{b}
16		267.1^{c}	548	2.07^{a}	472.2^{b}	1011	2.14^{a}	072.4^{c}	2276	2.19^{a}	811.9^{c}	3835	2.13^{a}
SEM		3.21	3.01	0.01	5.24	7.98	0.04	6.87	19.81	0.03	8.99	30.58	0.05
Sig.		*	NS	*	*	NS	*	*	NS	*	*	NS	*
Probiotic(P)													
0		271.8^{b}	546	2.01^{a}	480.0^{b}	1026^{a}	2.14^{a}	040.6^{c}	2261^{b}	2.19^{a}	792.6^{c}	3835	2.14^{a}
1.5		275.5^{b}	543	1.97^{b}	483.8^{b}	1011^{b}	2.08^{b}	142.6^{b}	2286^{a}	2.00^{b}	902.0^{b}	3841	2.01^{b}
2.5		278.4^{a}	545	1.97^{b}	487.1^{a}	993^{c}	2.03^{c}	227.4^{a}	2293^{a}	1.92^{c}	993.1^{a}	3830	1.95^{c}
SEM		3.56	2.65	0.03	5.20	8.15	0.06	6.81	18.98	0.04	8.92	29.88	0.06
Sig.		*	NS	*	*	*	*	*	*	*	*	NS	*
Interaction													
D	P												
	0	278.23	540	1.94	487.88	1020	2.09	081.93	2270	2.13	848.04	3830	2.08
8	1.5	281.92	540	1.92	491.66	1010	2.05	183.90	2290	1.94	957.47	3840	1.96
	2.5	284.87	540	1.89	494.94	990	2.00	268.71	2300	1.82	048.52	3830	1.87
	0	273.69	550	2.01	483.80	1035	2.14	063.76	2255	2.14	821.25	3840	2.12
12	1.5	277.38	540	1.92	487.58	1010	2.05	165.73	2290	1.94	930.68	3840	1.96
	2.5	280.33	550	2.00	490.86	995	2.02	250.54	2290	1.94	021.73	3830	1.97
	0	263.73	550	2.10	468.64	1025	2.19	976.29	2260	2.32	708.65	3835	2.24
16	1.5	267.42	550	2.07	472.42	1015	2.15	078.25	2280	2.12	818.08	3845	2.12
	2.5	270.36	545	2.04	475.70	995	2.09	163.07	2290	2.01	909.13	3830	2.03
SEM		3.14	2.65	0.01	5.19	8.02	0.04	6.89	19.22	0.04	9.10	29.54	0.03
Sig.		*	NS	*	*	*	*	*	*	*	*	NS	*

Means within column for each item followed by different letters are significantly different, * (P<0.05), NS= no significant, SEM= Standard error of means: Sig. = Significant

The effects of stocking density, probiotic supplementation and their interactions on biochemical traits of broiler are presented in Table 5. Plasma total protein, albumin and cholesterol concentration didn't affect by stocking density; however, decreasing stocking density to 8 birds/m^2 showed the highest value (P<0.05) of plasma globulin and triglyceride. Probiotic suppleme-ntation had no significant effect on plasma concentrations of total protein, albumin, globulin and cholesterol, however, adding probiotic at 1.5 g showed the highest value of triglyceride. In agreement, El-Ghamry *et al*. (2002) who showed that the concentration of plasma total protein, albumin and globulin were not affected by the experimental diets containing yeast culture compared with control group. However, Tolba *et al*. (2004) found significantly increased total protein, albumin, and globulin fractions when birds fed diet supplemented with probiotic compared with control group. Significant (P<0.05) level of stocking density (8 birds/m2) and probiotic supplementation (2.5g/l water) interaction was observed for Plasma total protein, albumin, globulin, cholesterol and triglyceride.

The effects of stocking density, probiotic supplementation and their interactions on economic efficiency of broiler are presented in Table 6. The results revealed that decreasing stocking density to 8 birds/m^2 showed the

highest value of net revenue, economic efficiency and relative economic efficiency. Probiotic supplementation at level 2.5g/l liter of water showed the highest value of net revenue, economic efficiency and relative economic efficiency. These results are in agreement with Ali (1999) who found that adding probiotic to broiler chick's diets gave the best net revenue and economic efficiency. The highest value of net revenue, economic efficiency and relative economic efficiency was observed for interaction between stocking density at level 8 birds/m^2 and probiotic supplementation at 2.5g/l water. Also, it was observed that level of stocking density (12 birds/m^2) and probiotic supplementation at 1.5 and 2.5 g/L water was equal to stocking density of 8 birds / m^2 with probiotic supplementation at 1.5 g/L water.

Table (4): Average protein efficiency ratio (PER) and performance index (PI) of broiler chicks as affected by density, probiotic levels and their interaction.

Treatments		0 – 2 week		2 – 4 week		4 – 6 week		0 – 6 week	
		PER	PI	PER	PI	PER	PI	PER	PI
Density									
8		2.33	17.22^a	2.17	40.10^a	2.78^b	102.75^a	2.43^b	101.47^a
12		2.27	16.48^b	2.15	39.28^b	2.75^b	97.64^b	2.39^b	98.11^b
16		2.18	15.23^c	2.09	36.75^c	2.54^a	87.09^c	2.27^a	87.32^c
SEM		0.65	0.90	0.35	0.01	0.21	0.09	0.12	0.99
Sig.		NS	*	NS	*	*	*	NS	*
Probiotic									
0		2.22	15.88^c	2.09^b	37.39^c	2.48^c	84.06^c	2.26^c	85.98^c
1.5		2.27	16.50^b	2.14^b	38.75^b	2.70^b	97.91^b	2.43^b	97.31^b
2.5		2.28	16.52^a	2.19^a	39.96^a	2.89^a	106.51^a	2.45^a	104.67^a
SEM		0.52	0..32	0.12	0.16	0.20	0.99	0.20	0.84
Sig.		NS	*	*	*	*	*	*	*
Interaction Density Probiotic									
	0	2.30	16.80	2.14	38.89	2.57	89.14	2.34	91.11
8	1.5	2.33	17.24	2.17	40.00	2.79	103.65	2.43	102.35
	2.5	2.36	17.64	2.23	41.41	2.98	115.46	2.52	112.09
	0	2.22	15.99	2.09	37.64	2.55	87.21	2.29	88.16
12	1.5	2.29	17.01	2.16	39.59	2.75	102.26	2.40	100.97
	2.5	2.28	16.44	2.20	40.55	2.95	106.47	2.48	105.08
	0	2.14	14.86	2.04	35.66	2.33	75.83	2.17	78.39
16	1.5	2.17	15.25	2.08	36.67	2.55	87.84	2.27	88.02
	2.5	2.21	15.59	2.13	37.92	2.74	97.61	2.36	96.40
SEM		0.41	0.23	0.21	011	0.21	0.15	0.99	0.41
Sig.		NS	*	*	*	*	*	*	*

Means within column for each item followed by different letters are significantly different,*(P<0.05), NS= no significant., SEM= Standard error of means,Sig. = Significant

Table (5): Plasma total protein, albumin, globulin, triglyceride and cholesterol of broiler chicks as affected by density, probiotic levels and their interaction.

Treatments		Plasma total protein	Plasma albumin	Plasma globulin	Plasma triglyceride	Plasma cholesterol
Density						
8		2.78	0.80	1.98[a]	51.02[a]	76.68
12		2.68	0.82	1.86[b]	37.80[b]	76.40
16		2.65	0.71	1.94[b]	36.01[b]	76.35
SEM		0.06	0.07	0.07	1.49	1.98
Sig.		NS	NS	*	*	NS
Probiotic						
0		2.67	0.76	1.91	35.07[b]	74.61
1.5		2.63	0.74	1.89	45.51[a]	77.11
2.5		2.81	0.83	1.96	44.24[a]	77.70
SEM		0.06	0.07	0.07	1.49	1.98
Sig.		NS	NS	NS	*	NS
Interaction						
Density	Probiotic					
	0	2.53	0.75	1.78	25.53	70.45
8	1.5	2.65	0.70	1.95	59.10	76.15
	2.5	3.18	0.95	2.23	68.43	83.45
	0	2.89	0.90	1.993	25.70	77.10
12	1.5	2.57	0.78	1.79	51.80	82.95
	2.5	2.59	0.80	1.79	35.90	69.15
	0	2.60	0.65	1.95	54.00	76.30
16	1.5	2.68	0.75	1.93	25.65	72.25
	2.5	2.65	0.75	1.90	28.40	80.50
SEM		0.12	0.01	0.01	3.51	3.43
Sig.		*	*	*	*	*

Means within column for each item followed by different letters are significantly different
*** (P<0.05), NS no significant**
SEM= Standard error of means, Sig. = Significant

Table (6): Effect of density, probiotic levels and their interaction on economic efficiency

Parameters / Treatment		price of 1 kg diet (LE)	FRC (g diet/g BW)	Feed cost/ 1 kg gain (LE)	Price kg live of BW (LE)	Economic efficiency[4]	Relative E.E.
Density (D)							
8		2.25	1.97	4.22	9	113.3	100.0
12		2.25	2.01	4.26	9	111.3	98.2
16		2.25	2.13	4.38	9	105.5	93.1
Probiotic(P)							
0		2.25	2.14	4.39	9	105.0	100.0
1.5		2.25	2.01	4.26	9	111.3	106.0
2.5		2.25	1.95	4.20	9	114.3	108.8
Interaction							
D.	P.						
	0	2.25	2.08	4.33	9	107.9	100.0
8	1.5	2.25	1.96	4.21	9	113.8	105.5
	2.5	2.25	1.87	4.12	9	118.4	109.8
	0	2.25	2.12	4.37	9	105.9	100.0
12	1.5	2.25	1.96	4.21	9	113.8	107.3
	2.5	2.25	1.97	4.22	9	113.3	106.9
	0	2.25	2.24	4.49	9	100.4	100.0
16	1.5	2.25	2.12	4.37	9	105.9	105.4
	2.5	2.25	2.03	4.28	9	110.3	109.8

Conclusion

Based on the obtained results, probiotic (Almiral plus®) can be used at level of 2.5 g/l water to improve broilers growth performance and stoking density level of 8 birds/m2 can protect birds from the reduction in their growth performance.

REFERENCES

Ali, Mervat. A. (1999). Effect of probiotics addition to broiler rations on performance and some blood constituents. Egypt. Poult. Sci., 19: 161-177.

Bedford, M. (2000). Removal of antibiotic growth promoters from poultry diets: implications and strategies to minimize subsequent problem. World's Poult. Sci. J., 56: 347-354.

Bolton, W.; W. A. Dewar and R. Morley Jones (1972). Effect of stocking density on performance of broiler chicks. Br. Poult. Sci., 13: 157-162.

Cravener, T. L., W. B. Roush and M. M. Mashaly (1992). Broiler production under varying population Densities. Poultry Science, 71: 427- 433.

Dozier W. A., J. P. Thaxton, J. L. Purswell, H. A. Olanrewaju, S. L. Branton, and W. B. Roush (2006). Stoking density effects on male broilers grown to 1.8 kilograms of body weight. Poultry Sci., 85: 344- 351.

Duncan, D.B. (1955). The multiple range and multiple F. tests. Biometrics, 11: 1-42.

EL-Ghamry, A.A., G.M. EL-Mallah, and A.T. EL-Yamny (2002). The effect of incorporating yeast culture, Nigella sativa seeds and fresh garlic in broiler diets on their performance . Egypt. Poult. Sci., 22: 445-459.

Estevez, I. (2007). Density allowances for broilers: where to set the limits? Poult Sci. Jun., 86 (6):1265-72.

Estevez, I., R. C. Newberry, and de Reyna L. A. (1997). Broiler chickens: A tolerant social system? Etologia., 5:19-29.

Feddes, J. J. R. ; E. J. Emmanuel and M. J. Zuidhof (2002). Broiler performance, body weight variance, feed and water intake and carcass quality at different stocking densities. Poultry Science, 81: 774-779.

Heckert, R. A.; I. Estevez; E. Russek- Cohen and R. Pettit-Riley (2002). Effects of density and perch availability on the immune statue of broilers. Poultry Science, 81: 451- 457.

Imaeda, N. (2000). Influence of the stocking density and rearing season on incidence of sudden death syndrome in broiler chickens. Poult. Sci., 79: 201-204.

NRC; National Research Council (1994). Nutrient Requirements of Poultry, 9th Edition, National Academy Press Washington DC., USA.

Proudfoot, F. G. and H. W. Hulan (1985). Effects of stocking density on the incidence of scabby Hip syndrome among broiler chickens. Poultry Science, 64: 2001- 2003.

Proudfoot, F. G.; H. W. Hulan and D. R. Ramey (1979). The effect of four stocking densities on broiler carcass grade, the incidence of breast blisters, and other performance traits. Poult. Sci., 58: 791-793.

SAS Institute (1990). SAS® User's Guide. Statistics version 6th Ed., SAS Intstitute Inc., NC. USA.

Tolba, A. A.; H. M. M. Sabry and S. M. M. Abuzeed (2004).Effect of micrrobial probiotics on performance of broiler chicks under normal or heat stress conditions: 1- Lactobacillus or Pediiococcus. Egypt. Poult. Sci., 24:351-367.

تأثير معدل الكثافة وإضافة المنشط الحيوي علي آداء كتاكيت التسمين

تاج الدين حسن تاج الدين[1]،السمرة حسن علي أبو عجلة[2]، رمضان مغاوري محمود[3] و السيد عبدالفتاح أبو الحسن[3]

1- قسم إنتاج الدواجن- كلية الزراعة بدمياط– جامعة المنصورة

2- قسم إنتاج الدواجن- كلية الزراعة– جامعة المنصورة

3- معهد بحوث الإنتاج الحيواني – مركز البحوث الزراعية– الدقي

أجريت تجربة عاملية (3×3) بهدف دراسة تأثير كثافة التسكين بمعدل 8 و 12 و 16 طائر/م^2 و استخدام المنشط الحيوي (Almiral plus®) بمعدل (صفر و 1.5 و 2.5 جرام/لتر من ماء الشرب) علي آداء دجاج التسمين. تم إستخدام عدد 324 كتوت عمر يوم وتم اسكانها في 27 بيت حيث قسمت إلي 9 مجموعات تجريبية بكل مجموعة 3 مكررات. تم التغذية علي (عليقة بادئ 22.40% بروتين خام 2950 كيلو كالورى لكل كيلوجرام و عليقه ناهي 18.53% بروتين خام و 3150 كيلو كالورى لكل كيلوجرام). وتم أخذ قياسات عن وزن الجسم ومعدل زيادة وزن الجسم وإستهلاك الغذاء ومعامل التحويل الغذائي والدليل الإنتاجي و معامل تحويل البروتين والكفاءة الإقتصادية ومستوى البروتين الكلي والألبيومين في بلازما الدم.

وأمكن تلخيص أهم النتائج المتحصل عليها فيما يلي

- أظهر معدل 8 طائر/م^2 تأثير أعلي قيمة لوزن الجسم و معدل زيادة وزن الجسم ومعامل التحويل الغذائي و معامل تحويل البروتين والدليل الإنتاجي ومحتوي بلازما الدم من الجلوبيولين و العائد الصافي و الكفاءة الاقتصادية بينما لم تؤثر هذه المستويات علي باقي الصفات المدروسة.
- أظهرت إضافة البروبيوتك بمستوي 2.5 جرام/لتر ماء أعلي قيمة لوزن الجسم و معدل زيادة وزن الجسم ومعامل التحويل الغذائي و الدليل الإنتاجي والعائد الصافي والكفاءة الاقتصادية بينما لم تؤثر هذه المستويات علي باقي الصفات المدروسة.
- أظهرت الطيور التي سكنت بمعدل 8 طائر/م^2 مع إضافة البروبيوتك بمستوي 2.5 جرام/لتر ماء أعلي قيمة لوزن الجسم و معدل زيادة وزن الجسم وكمية الغذاء المأكول ومعامل التحويل الغذائي وكفاء تحويل البرويتن والدليل الإنتاجي ومحتوي بلازما الدم من البروتين الكلي والجلوبيولين والألبيومين والعائد الصافي والكفاءة الاقتصادية بينما لم تؤثر هذه المستويات علي باقي الصفات المدروسة.

ونستخلص من النتائج المتحصل عليها أنه يمكن استخدام الإضافات الغذائية (Almiral plus®) عند مستوي 2.5 جرام/لتر لتحسين آداء دجاج التسمين وبمعدل كثافة تسكين 8 طائر/م^2 لحماية الطيور من أي تأثير سلبى على آدائها الإنتاجي .

قام بتحكيم البحث

أ.د / فوزى صديق عبد الفتاح اسماعيل	**كلية الزراعة – جامعة المنصورة**
أ.د / حسن صابر زويل	**كلية الزراعة – جامعة الأسكندرية**