

THE USE OF ANTIBIOTIC, PROBIOTICS OR PREBIOTIC AS GROWTH PROMOTERS IN BROILER DIETS AND ITS EFFECTS ON PERFORMANCE AND IMMUNE RESPONSE IN COMMERCIAL SCALE PRODUCTION.

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ABSTRACT

An experiment was carried out to study the effect of using antibiotic, probiotics or prebiotic, as growth promoters, in broiler diets, on their performance and immune response under commercial scale production. A total number of 18000 one-day-old broiler chicks were divided into 12 experimental groups of 1500 birds each. All birds groups were randomly distributed into 6 experimental treatments (T₁, T₂, T₃, T₄, T₅ and T₆) where each treatment had 2 replicate groups.

Six experimental diets were formulated to contain about 21.5% CP and 2960 Kcal.ME/Kg diet, during the 1st four weeks of age (starter / grower period) and 17.9% CP and 3000 Kcal.ME/Kg diet, during the finisher period (29-42 days of age). Control treatment groups (T₁) fed diets without any supplement, while treatment groups T₂, T₃, T₄, T₅ and T₆ fed the control diets supplemented with antibiotic growth promoter (AGP), probiotic (P₁), probiotic (P₂), probiotic (P₃), and prebiotic, commercial products, respectively .

No significant differences (P>0.05) were detected between treatments neither during the starter/grower period nor all over the experimental period that for body weight , feed consumption, feed conversion ratio, performance index and carcass characteristics.

The results of immune response indicated that some feed additives (prebiotic and probiotic) gave a promising effect on immune response against disease regardless to its effect on feed conversion.

It could be concluded that using of probiotics or prebiotic, as alternative growth promoters, in broiler diets, have no negative effects on their performance or immune response and may be comparable with antibiotic growth promoters (AGPs). It could be suggested also, that under commercial poultry production conditions, some of the existence many variable factors have not always been successfully controlled , however, further researches may have been needed.

INTRODUCTION

The use of antibiotic growth promoters (AGPs) in broiler's diets was reported by many investigators (Hatata *et al.*, 1990; Ibrahim *et al.*, 1993; Ghazalah *et al.*, 1994 and Noh *et al.*, 1994). The mode of action of AGPs was suggested to be due to various activities: a nutrient sparing effect, better absorption of nutrients, a change in the microflora population of the gastrointestinal tract or a metabolic effect and suppression of organisms causing signs of disease (Hay, 1978). Jamroz *et al.* (1989) and Gazalah *et al.* (1994) found that the addition of AGPs to chick's diets resulted in an increase in live

body weight. On the other hand, some investigators reported that supplementing broiler diets by AGPs had no significant improving effect upon growth performance (Plaur *et al.*, 1983, Decuypere *et al.*, 1989 and Attia *et al.*, 1997).

In 1997, the European Union (EU) banned Avoparcin as a feed additive in monogastric. In subsequent years (at the end of June, 1999), the EU has banned Virginiamycin, Bacitracin, Tylosin and Spiramycin and intends to terminate all use of antibiotics as growth promoters by 2006. The removal of these products from the market will undoubtedly increase the variability in performance resulting from inconsistencies in diet digestibility, a key factor in determining nutrient availability for bacterial overgrowth (Bedford, 2000).

There are many ways to influence the intestinal microflora population once AGPs are removed. Probiotics and prebiotics are two of several approaches that have potential to reduce enteric disease in poultry and subsequent contamination of poultry products (Patterson and Burkholder, 2003). Probiotic, which means "for life" in Greek (Gibson and Fuller, 2000), has been defined as "A live microbial feed supplement, which beneficially affects the host animal by improving its intestinal balance" (Fuller, 1989). Prebiotics are defined as "A non digestible food ingredient that beneficially affects the host by selectively stimulating the growth and / or activity of one or a limited number of bacteria in the colon" (Gibson and Roberfroid, 1995).

There are many types of probiotic products in the market; many studies have been conducted to test the efficacy of such product on animal performance. The addition of probiotics in broiler diets has produced variable results. Jernigan *et al.* (1984); El-Deeb and Makled (1993); Jin *et al.* (1998 and 2000) and Zulkifli *et al.* (2000) found performance improvement in broiler chicks fed diets supplemented with probiotics. While Yeo and Kim (1997) reported that feeding a diet containing probiotic, significantly increased average daily weight gain during the first 3 weeks but not during weeks 4-6 of growth. They pointed out that the increase was partly accounted by increased feed intake. On the other hand, Watkins and Kratzer (1984) and Maiolino *et al.* (1992) found no significant differences in final body weight or feed conversion ratio of broiler chicks fed diet supplemented with probiotic.

The dominant prebiotics are fructo-oligosaccharide products (FOS, oligofructose, inulin). However, trans-galacto-oligosaccharides, gluco-oligosaccharides, glyco-oligosaccharides, lactulose, lactitol, malto-oligosaccharides, xylo-oligosaccharides, stachyose, raffinose and sucrose thermal oligosaccharides have also been investigated (Monsan and Paul, 1995; Orban *et al.*, 1997; Patterson *et al.*, 1997; Piva, 1998 and Collins and Gibson, 1999). Oligosaccharides, which predominantly escape digestion in the upper gastrointestinal tract, are important sources of energy for bacteria in the ceca-colon which express enzymes such as α -fructosidase, α -galactosidase, xylanase or any other hydrolases to enhance nutrient utilization by bacteria. Mannose -oligosaccharides (MOS) are non-digestible for monogastric animals but can be utilized by lactic acid bacteria as an energy source (Delzenne, 2003). Hidaka *et al.* (1986 and 1991); Salminen *et al.* (1993) and Tomomatsu (1994) reported that fructo -oligosaccharides have been most extensively studied for their ability to improve animal health and performance. Also,

Ammermen *et al.* (1988 and 1989) and Treada *et al.* (1994) mentioned that studies specifically related to poultry suggest that feeding fructo-oligosaccharides may enhance performance and may be substituted for sub therapeutic levels of antibiotics. On the other hand, Eyssen and De Somer (1963) and Stutz and Lawton (1984) found that glucose, sucrose and fructose appeared to suppress growth of broiler chicks.

Thus, the objectives of this study were to evaluate the effect of probiotics or prebiotics as alternative growth promoters, comparing with antibiotics (AGPs), on the performance and immune response of broilers in commercial scale production.

MATERIALS AND METHODS

An experiment was carried out, in commercial scale, to evaluate the performance of broiler chicks fed diets supplemented with antibiotic, probiotics or prebiotic as growth promoters as follows:

- 1- Antibiotic growth promoter (AGP): is a commercial feed grade product containing Enramycin.
- 2- Probiotic-1 (P₁): is a dry product primarily composed of high strength *Saccharomyces cerevisiae*, microencapsulated *Lactobacillus acidophilus*, *Streptococcus faecium* and *Bacillus subtilis* blended with digestive enzymes, mannan-oligosaccharide, Beta 1,3-Beta 1,6 D-glucan and sweetener.
- 3- Probiotic-2 (P₂): is a natural dry product primarily composed of high strength active dry yeast culture selected from high fermenting capacity *Saccharomyces cerevisiae*. It also contains *Bacillus cereus*.
- 4- Probiotic-3 (P₃): is a fermentation product dehydrated of *Lactobacillus acidophilus*, *Lactobacillus casei*, *Bifidobacterium bifidium*, *Streptococcus faecium*, *Torua* yeast, rice mill by-product and calcium carbonate.
- 5- Prebiotic: is a dry product primarily composed of natural sugar complex of mannan-based oligosaccharide and Beta 1,3-Beta 1,6 D-glucan with various digestive enzymes.

A total number of 18000 one-day-old unsexed "Arbor Acres" broiler chicks, have nearly similar live body weight, were used. Chicks were allocated in littered floor poultry houses in an open system under the same management conditions. Water and feed were offered *ad-libitum* and artificial lighting was provided 24 hrs. / day, all over the experimental period which lasted for 6 weeks. All groups were received a routine vaccination against Newcastle disease (ND), infectious bursal disease (IBD) and infectious bronchitis (IB).

The birds were divided into 12 groups of 1500 birds each. All bird groups were randomly distributed into 6 experimental treatments (T₁, T₂, T₃,...T₆) where each treatment had 2 replicates groups. The experiment was divided into 2 periods: starting/growing period (from 0 to 28 days of age and finishing period from 29 to 42 days of age). Six experimental diets were

formulated and such experimental diets were fed to six treatment groups as follows:

Treatment group-1 (T₁): birds were fed the control diets (1) containing 21 % crude protein (CP) and 2950 Kcal ME/ Kg feed, during the starting/growing period and contained 17.5% CP and 3000 Kcal ME/ Kg feed, during the finishing period. These diets were formulated to contain no supplemental growth promoter.

Treatment group-2 (T₂): birds were fed diets (2) which contained the same nutrients content of control diets (1) and supplemented with Enramycin as AGP in inclusion rate of 150 gm/ton of feed, all over the experimental period.

Treatment group-3 (T₃): birds were fed diets (3), which contained the same nutrients content of control diets (1) and supplemented with probiotic -1 (P₁) in inclusion rate of 1 kg/ton of feed, all over the experimental period.

Treatment group-4 (T₄): birds were fed diets (4), which contained the same nutrients content of control diets (1) and supplemented with probiotic -2 (P₂) in inclusion rate of 1 kg/ton of feed, all over the experimental period.

Treatment group -5 (T₅): birds were fed diets (5), which contained the same nutrients content of control diets (1) and supplemented with probiotic -3 (P₃) in inclusion rate of 1 kg/ton and 500 gm/ton of feed during the starting/growing and finishing period, respectively.

Treatment group-6 (T₆): birds were fed diets (6), which contained the same nutrients content of control diets (1) and supplemented with prebiotic in inclusion rate of 1 kg/ton of feed, all over the experimental period.

The composition and calculated chemical analysis of the experimental diets are shown in Table (1). Data on body weight, feed intake and calculated feed conversion ratio were recorded at the end of each period, while mortality was recorded daily. Performance index (PI) was calculated according to North (1981) as follows:

$$PI = (\text{Live body weight (kg)} / \text{feed conversion}) \times 100.$$

At the end of the experiment, all birds were fasted for 12 hours, weighed and slaughtered at the slaughterhouse to determine the dressing and giblets weight. At the same time, 5 chicks from each group were sacrificed for a trial of *E.coli*, *Proteus merabiles*, *Salmonella gallinarium* and *Clostridium perfringens* reisolation from livers and intestines occurred after Cruickshank *et al.* (1975). Suspected microbial colonies were tested serologically by specific antisera. Blood samples were collected from all groups weekly to determine the antibody (Ab) titer against Newcastle disease according to the method of Reed and Muench (1938).

Data were statistically analyzed using the linear model (SX, 1992). A simple one - way classification analysis followed by least significant difference test (LSD) was used for testing the significance between means.

Table 1: Composition and calculated analysis of the experimental diets.

ingredients	Treatments											
	Starter/Grower (0-28 days)						Finisher (29-42 days)					
	T ₁	T ₂	T ₃	T ₄	T ₅	T ₆	T ₁	T ₂	T ₃	T ₄	T ₅	T ₆
Yellow Corn	60	60	60	60	60	60	71	71	71	71	71	71
Soybean meal (44%)	30	30	30	30	30	30	21	21	21	21	21	21
Corn gluten meal (62%)	5	5	5	5	5	5	4	4	4	4	4	4
DL-methionine	0.050	0.050	0.050	0.050	0.050	0.050	0.070	0.070	0.070	0.070	0.070	0.070
L-Lysine HCl	0.050	0.050	0.050	0.050	0.050	0.050	0.095	0.095	0.095	0.095	0.095	0.095
Di-calcium phosphate	1.943	1.943	1.943	1.943	1.943	1.943	1.915	1.915	1.915	1.915	1.915	1.915
Limestone	1.213	1.202	1.157	1.157	1.157	1.157	1.234	1.219	1.134	1.134	1.184	1.134
Vegetable oil	1	1	1	1	1	1	-	-	-	-	-	-
NaCl	0.444	0.440	0.400	0.400	0.400	0.400	0.386	0.386	0.386	0.386	0.386	0.386
Vit. & Min. Mixture*	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300
AGP	-	0.015	-	-	-	-	-	0.015	-	-	-	-
Probiotic 1	-	-	0.1	-	-	-	-	-	0.1	-	-	-
Probiotic 2	-	-	-	0.1	-	-	-	-	-	0.1	-	-
Probiotic 3	-	-	-	-	0.1	-	-	-	-	-	0.05	-
Prebiotic	-	-	-	-	-	0.1	-	-	-	-	-	0.1
Total	100	100	100	100	100	100	100	100	100	100	100	100
Calculated analysis: **												
Crude protein %	21.48	21.48	21.48	21.48	21.48	21.48	17.89	17.89	17.89	17.89	17.89	17.89
ME (Kcal / Kg diet)	2958	2958	2958	2958	2958	2958	3002	3002	3002	3002	3002	3002
Calcium %	0.99	0.99	0.97	0.97	0.97	0.97	0.97	0.97	0.93	0.93	0.95	0.93
Available phosphorus%	0.50	0.50	0.50	0.50	0.50	0.50	0.48	0.48	0.48	0.48	0.48	0.48
Methionine %	0.42	0.42	0.42	0.42	0.42	0.42	0.37	0.37	0.37	0.37	0.37	0.37
Methionine+Cystine %	0.78	0.78	0.78	0.78	0.78	0.78	0.70	0.70	0.70	0.70	0.70	0.70
Lysine %	1.06	1.06	1.06	1.06	1.06	1.06	0.87	0.87	0.87	0.87	0.87	0.87
Na %	0.18	0.18	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17

* Each 3kg contains: Vit.A 12 mIU; Vit D₃ 2.2 mIU; Vit.E 10g; Vit.K 2g; Vit B₁ 1g; Vit.B₂ 5g; Vit B₆ 1.5 g; Vit B₁₂ 10mg; Niacin 30g; Pantothenic acid 10g; Folic acid 1g; Biotin 50mg; Choline 300g; Iron 30g; Iodine 1g; Zinc 50g; Manganese 60g; Copper 4g; Selenium 100 mg; Cobalt 100 mg.

**According to NRC (1994).

RESULTS AND DISCUSSION

The broiler's performance results obtained in this study are shown in Table (2). Data of live body weight (BW), feed intake (FI), feed conversion ratio (FCR) and performance index (PI) indicated that feed supplemented with antibiotic (T₂) or probiotics (T₃, T₄ and T₅) or prebiotic (T₆) had no significant effect (P>0.05) neither during starter/grower period (0-28 days of age) nor all over the experimental period (0-42 days of age). These results (Table 2) are in agreement with those reported by Plaur *et al.* (1983), Wojcik and Plaur (1983), Decuypere *et al.* (1989) and Attia *et al.* (1997). They mentioned that there were no significant improving effect upon growth performance of broiler chicks fed diets supplemented with antibiotic growth promoters. While, Jamroz *et al.* (1989) and Ghazalah *et al.* (1994) found that

addition of AGPs to chick's diet resulted in improvement in growth performance. These contradictory results indicate that several factors are affecting the response to APGs, i.e., kind or level of addition, environmental conditions and physiological status of animal or bird concerned (Tomov *et al.*, 1980, Hamdy *et al.*, 1981 and Aly *et al.*, 1985). Also, Thomke and Elwinger (1998 a,b) reported that the response to such products (AGPs), however, is variable and may, to a large extent, be dependent upon the environment in which the animals are raised and the diet offered to them.

Table 2: Effect of antibiotic growth promoter (AGP), probiotics and prebiotic supplementation on broiler performance.

Item	Treatments	T ₁	AGP	Probiotic	Probiotic	Probiotic	Prebiotic	SEM	P**
	(Control)	T ₂	T ₃	T ₄	T ₅	T ₆			
0-28 days of age:									
Body weight (g/bird)	905 ^a	917.5 ^a	880 ^a	895 ^a	877.5 ^a	892.5 ^a	25.78	0.651	
Feed intake (g/bird)	1614 ^a	1640 ^a	1597 ^a	1606 ^a	1586 ^a	1607 ^a	31.32	0.650	
FCR	1.784 ^a	1.788 ^a	1.815 ^a	1.795 ^a	1.807 ^a	1.801 ^a	0.034	0.924	
Performance index (PI)	50.75 ^a	51.32 ^a	48.50 ^a	49.91 ^a	48.56 ^a	49.57 ^a	2.213	0.746	
0-42 days of age:									
Body weight (g/bird)	1495 ^a	1513 ^a	1472 ^a	1475 ^a	1464 ^a	1478 ^a	23.87	0.430	
Feed intake (g/bird)	3673 ^a	3698 ^a	3650 ^a	3638 ^a	3643 ^a	3666 ^a	43.05	0.074	
FCR	2.457 ^a	2.444 ^a	2.480 ^a	2.467 ^a	2.488 ^a	2.481 ^a	0.034	0.773	
Performance index (PI)	60.85 ^a	61.91 ^a	59.34 ^a	59.81 ^a	58.84 ^a	59.56 ^a	1.653	0.520	

a, b means with different superscript(s) in the same row are significantly different (P < 0.05).

* Standard error mean for comparison.

** Probability.

The results obtained in this study indicated also that the use of the different probiotic preparations (P₁, P₂ and P₃) in broiler diets (T₃, T₄ and T₅) had no significant effect (P>0.05) on performance parameters, during the experimental period (Table 2). These results (Table 2) are in agreement with those found by Watkins and Kratzer (1984) and Maiolino *et al.* (1992) who reported non significant improvement in growth performance of broilers fed diets supplemented with commercial probiotics. Contrarily, Jin *et al.* (1997, 1998 and 2000) concluded that the addition of probiotics to the diet has been found to improve growth performance of broilers.

El-Moniary and Kutkat (2003) obtained corresponding results to ours. They reported that the values of weight gain of birds, feed conversion ratio and performance index of birds fed diets containing either probiotics or AGPs had no significant differences as compared to control. Contradictory, results were published with respect to the comparative effects of probiotics and AGPs, Chapman (1989), McNaughton *et al.* (1992) reported comparable efficacy of microorganisms and AGPs in promoting general health and performance of broilers. Similar findings with direct microbial feed including yeast culture and lacto sacc were reported by Owings (1992), Madrigal *et al.* (1993) and Igancia and Sefton (1995). On the other hand, Attia *et al.* (1997) found that the addition of AGPs or probiotics had no significant effect on feed consumption, body weight and feed conversion ratio, during the experimental period.

The variation in the effects of probiotics on chicks may be attributed to the difference in strains and forms of bacteria used and in their concentrations of dietary supplements (Jin *et al.*, 1997). Moreover, in commercial scale poultry production, using of antibiotics in diseases treatment may be masked the positive effect of AGPs or probiotics due to the mortal effect of high doses of antibiotics on all types of bacteria either harmful or useful.

Data concerning prebiotic effect on performance (Table 2) indicated, also, that the type of the commercial prebiotic product used in this experiment (mainly mannan-based oligosaccharide) had no improvement effect on broiler's performance compared to control birds. These results are in agreement with that reported by Stutz and Lawton (1984) who suggested that fructose resulted in the greatest depression in weight gain. However, Patterson and Burkholder (2003) mentioned that although mannan oligosaccharides (MOS) have been used in the same manner as the other prebiotics, they do not selectively enrich for beneficial bacterial populations.

Data concerning dressed carcass, giblets and total edible parts which were recorded for each treatment and expressed as percentage of live body weight are shown in Table (3).

Table 3: Effect of antibiotic growth promoter (AGP), probiotics and prebiotic supplementation on carcass traits at the end of the experiment.

Treatments Item	T ₁ (Control)	AGP	Probiotic 1	Probiotic 2	Probiotic 3	Prebiotic	SEM	P**
	T ₂	T ₃	T ₄	T ₅	T ₆			
Live Body weight (g/bird)	1495 ^a	1513 ^a	1472 ^a	1475 ^a	1464 ^a	1478 ^a	23.87	0.430
Carcass weight (g/bird) *	1039 ^a	1022 ^a	991 ^a	1002 ^a	989 ^a	992 ^a	24.82	0.362
% of live body weight	69.47 ^a	67.57 ^a	67.36 ^a	67.93 ^a	67.56 ^a	67.12 ^a	1.555	0.708
Giblets weight (g/bird)**	68.5 ^{ab}	73.5 ^a	62.5 ^b	65.5 ^{ab}	64 ^b	66.5 ^{ab}	3.786	0.244
% of live body weight	4.59 ^a	4.86 ^a	4.35 ^a	4.44 ^a	4.38 ^a	4.50 ^a	0.283	0.549
Total edible parts (g//bird)	1107 ^a	1096 ^a	1055 ^a	1068 ^a	1053 ^a	1098 ^a	22.06	0.185
% of live body weight	74.06 ^a	72.42 ^a	71.71 ^a	72.37 ^a	71.94 ^a	71.61 ^a	1.431	0.591

a, b means with different superscript(s) in the same row are significantly different (P < 0.05).

* with neck and wings . ** Giblets = the heart, empty gizzard and liver.

Statistical analysis revealed no significant effect (P>0.05) of the treatments on absolute carcass weight, giblets weight, dressing percentage and giblets weight percentage. These results indicated that the average percentage values of dressing and giblets were nearly similar and there was no clear trend due to the different treatments. These results are in agreement with Izat *et al.* (1989) and Ghazalah *et al.* (1994) who found that virginiamycin did not affect dressing percentage or carcass component weight of broilers.

The ineffectiveness of antibiotics were obtained on this study confirmed those reported previously by Fayek *et al.* (1990), Ghazalah *et al.* (1994), EL-Faham *et al.* (1994), Ali (1999) and Abdel- Azeem (2002) who found that different supplementation (antibiotic or probiotic) had no beneficial effect on carcass characteristics.

Regarding to the effect of AGP, probiotics or prebiotic on bacterial isolation (Table 4) , no difference was observed between treated and non treated groups ; while *E.coli*, *Proteus merabilis* were isolated from treatments 2 to 6 , as well as , from non treated control treatment (T₁). Salmonella and clostridium organisms could not be isolated from five treated or from non treated control group. These results are not accord with the findings of Kutkat *et al.* (2002) who reported that *Lactobacillus acidophilus* completely eliminate *E.coli* and *Clostridium perfringens* when used prophylactically for 10 days before infection. The investigators found that the percent of inhibition decreased to 70% and 40% for *E.coli* and *Clostridium perfringens*, respectively, when *Lactobacillus* was added to ration for 3 days before infection.

The obtained results may be due to the continuous administration of curative antibiotics to all experimental groups.

Table (4): Effect of the tested feed additives on microbial isolation

Treatments	Results of reisolation			
	E.coli	Proteus	Salmonella	Clostridium
Control	+	+	-	-
AGP	+	+	-	-
Probiotic 1	+	+	-	-
Probiotic 2	+	+	-	-
Probiotic 3	+	+	-	-
Prebiotic	+	+	-	-

The role of AGP, probiotics or prebiotic in immune response after vaccination against Newcastle disease is represented in Table (5). The results showed that prebiotic (mannan-oligosaccharide) was superior in induction of specific Ab, against Newcastle disease when monitored after 3 weeks until 5 weeks post vaccination if compared with control and other treated groups. These results are in agreement with the reports of Savage *et al.* (1996) and Savage and Zakrzewska (1996). They showed that phosphorylated mannan-oligosaccharide elevated plasma IgG & IgA in turkey.

Table (5): Result of antibody response to dietary treatments against Newcastle disease vaccine virus (NDVV).

Treatments	Sampling after vaccination		
	1 Week	2 Weeks	3 Weeks
Control	2.90	3.60	3.70
AGP	1.95	4.40	4.80
Probiotic 1	2.20	3.00	1.50
Probiotic 2	1.90	4.70	4.23
Probiotic 3	2.43	2.50	5.30
Prebiotic	3.00	3.40	5.30

It could be concluded from the results of immune response that some feed additives (prebiotic as mannan-oligosaccharide) followed by probiotic (*Saccharomyces cerevisiae* , *Lactobacillus acidophilus*, *Lactobacillus casei*, *Bifidobacterium bifidium* ...etc.) gave a promising effect on immune response against disease regardless to its effect on feed conversion.

Finally, it could be concluded that using of probiotics or prebiotics , as alternative growth promoters, in broiler diets, have no negative effects on performance or immune response and may be comparable with antibiotic growth promoters (AGPs). It could be suggested ,also, that under commercial poultry production conditions, some of the existence many variable factors have not always been successfully controlled , however, further researches may have been needed.

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إستخدام كل من المضادات الحيوية، المنشطات الحيوية (بروبيوتك أو بريبيوتك) كمنشطات للنمو في علائق دجاج اللحم وتأثيرها على الأداء الإنتاجي والاستجابة المناعية-على مستوى الإنتاج التجاري.

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أجريت تجربة لدراسة تأثير استخدام كل من المضادات الحيوية ، المنشطات الحيوية (بروبيوتك أو بريبيوتك) كمنشطات نمو في علائق دجاج اللحم على الأداء الإنتاجي والاستجابة المناعية على مستوى الإنتاج التجاري .

أجريت التجربة على ١٨٠٠٠ كتكوت "أرورا يكرز" من عمر يوم وحتى ٤٢ يوم من العمر . قُسمت الطيور عشوائياً الي ١٢ مجموعة مكونة من ١٥٠٠ طائر ، وزعت المجموعات على ٦ معاملات غذائية حيث شملت كل معاملة غذائية على مكررين . غُذيت المعاملة الأولى (المقارنة) على علائق تحتوي على ٢١,٥% بروتين خام ، ٢٩٦٠ كيلو كالوري طاقة ممثلة / كجم خلال فترة البادي / نامي (٠ - ٢٨ يوم من العمر) كما اجتوت على ١٧,٩% بروتين خام ، ٣٠٠٠ كيلو كالوري طاقة ممثلة / كجم خلال فترة الناهي (٢٩ - ٤٢ يوم من العمر) وبن أية إضافات . غُذيت باقي المعاملات على علائق المقارنة مضافاً إليها مضاد حيوي كمنشط للنمو (T₂) أو ثلاثة أنواع تجارية من البروبيوتك (T₃, T₄, T₅) أو منشط نمو (بريبيوتك) يتكون أساساً من سكريات عديدة (T₆) .

لم تظهر فروق معنوية بين المعاملات سواء عند عمر ٢٨ يوم أو في نهاية التجربة (٤٢ يوم من العمر) وذلك لكل من وزن الجسم ، استهلاك العليقة ، معامل التحويل الغذائي وكذا دليل الأداء الإنتاجي وصفات الذبيحة .

أثبتت نتائج المناعة أن بعض الإضافات الغذائية (البريبيوتك والبروبيوتك) لها تأثير إيجابي على الإستجابة المناعية للطيور ضد الأمراض.

يمكن من نتائج هذه التجربة - استنتاج أن استخدام البروبيوتك والبريبيوتك كمنشطات نمو بديلة للمضادات الحيوية في علائق دجاج اللحم ليس لها تأثير سلبي على الأداء الإنتاجي أو الإستجابة المناعية . كما يمكن استنتاج أنه - تحت ظروف الإنتاج التجاري - هناك عوامل عديدة لا يمكن دائماً التحكم فيها ، ولذلك فإن الأمر يحتاج إلي بحوث مستقبلية تحت نفس الظروف الإنتاجية.