

EFFECT OF SOME ANTIBIOTICS INTERACTIONS WITH SOME COCCIDIOSTATS ON PERFORMANCE OF BROILER CHICKS

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SUMMARY

A factorial experiment was conducted to study the effects of feeding diets containing 37.5 or 75 lasalocid (Las) or 30 or 60 ppm salinomycin (Sal) with or without 20 ppm virginiamycin (Vir) or 10 ppm avoparcin (Avo) on broiler performance.

Four hundred and eighty, day-old Arbor Acres chicks were randomly distributed into 60 groups of 8 chicks each in battery brooders. Four replicates were used for each of the 15 dietary treatments. The diets were supplemented with the drugs from one to six weeks of age followed by a week withdrawal period.

Significant interactions were detected in body weight gain (BWG) between the tested antibiotics and coccidiostats. Virginiamycin (20 ppm) with lasalocid at the level of 37.5 ppm resulted in significantly ($P < 0.05$) more BWG than did either supplement fed alone. The combination of Las37.5 + Virg was significantly ($P < 0.05$) superior in improving the BWG than the other combinations of Virg or Avo and Sal or Las.

Virginiamycin at the level of 20 ppm was comparable to avoparcin at the level of 10 ppm in improving overall BWG means.

Lasalocid was significantly more effective in increasing the overall BWG rather than Sal. The overall BWG means showed that using lower levels of either Las or Sal was more pronounced in improving the gains of

chicks rather than using the corresponding higher levels at 6 wks of age.

This could indicate the relative potency of each drug which would help in assessing the proper level of each coccidiostat or antibiotic in commercial practice.

Keywords: Lasalocid, salinomycin, virginiamycin, avoparcin, coccidiostat, broiler

INTRODUCTION

The use of antibiotics as feed additive has shown generally an improvement in the performance of poultry. Virginiamycin is one of the new antibiotics approved for use in poultry feeds. Virginiamycin is an antibiotic mixture produced by a mutant of *Streptomyces virginiae*. Avoparcin is an antibiotic produced by fermentation using a strain *Streptomyces candidus*. It has been used as a growth promoter in poultry feed.

Salinomycin is one of the polyether ionophorous antibiotics isolated from culture of *Streptomyces albus*. Salinomycin is an effective anticoccidial drug when fed to broilers at recommended levels. Lasalocid is a broad spectrum ionophorous antibiotic. It has been shown to be an effective against major pathogenic species of *Eimeria* in chicks. Anticoccidial compounds are seldomly used as the only feed additive for broiler diets. They are generally fed in combination with one or more of growth promoters.

The objective of the present experiment was to study the effect of feeding diets containing 37.5 or 75 ppm lasalocid or 30 or 60 ppm salinomycin with or without 20 ppm virginiamycin or 10 ppm avoparcin on broiler performance.

MATERIALS AND METHODS

Four hundred and eighty, day-old Arbor Acres broiler chicks were fed on a commercial starter diet containing 22% CP and 3200 Kcal ME/kg diet for the first week of age, then fasted over night and individually weighed. The birds were randomly distributed into 60 groups of 8 chicks each in battery brooders. Four replicates were used for each of the 15 dietary treatments. The diets were supplemented with the drugs from one to six weeks

of age followed by a week withdrawal period.

The experimental treatments design could be outlined as follows:

- 1- Basal diet (Unmedicated diet) .
- 2- Basal diet + 10 ppm Avoparcin.
- 3- Basal diet +20 ppm Virginiamycin.
- 4- Basal diet+ 30 ppm Salinomycin.
- 5- Basal diet +60 ppm Salinomycin.
- 6- Basal diet + 37.5 ppm Lasalocid.
- 7- Basal diet + 75 ppm Lasalocid.
- 8- Basal diet + 30 ppm Salinomycin + 10 ppm Avoparcin.
- 9- Basal diet + 60 ppm Salinomycin + 10 ppm Avoparcin.
- 10- Basal diet + 30 ppm Salinomycin + 20 ppm Virginiamycin.
- 11- Basal diet + 60 ppm Salinomycin + 20 ppm Virginiamycin.
- 12- Basal diet + 37.5 ppm Lasalocid +10 ppm Avoparcin.
- 13- Basal diet + 75 ppm Lasalocid + 10 ppm Avoparcin.
- 14- Basal diet + 37.5 ppm Lasalocid + 20 ppm Virginiamycin.
- 15- Basal diet + 75 ppm Lasalocid +20 ppm Virginiamycin.

The basal starter-grower and finisher diets used in this experiment are shown in Table 1. Methionine, lysine and vitamin and mineral mixture were added to cover the requirements of chicks (NRC 1984). The metabolizable energy (ME) of experimental diets was calculated using the reported values of NRC (1984). The chemical analyses of the ingredients and diets were determined according to Association of Official Analytical Chemists (1980).

Diets and water were offered ad. lib. over the experimental period. Chicks were kept under similar management conditions. Artificial lighting was provided all over 24 hours daily. Weekly body weight, feed consumption and mortality rate were recorded. The feed conversion values were calculated as the amount of feed consumption per unit of body weight gain. Chicken were vaccinated against New castle disease three times, firstly with Hitchner-B₁ eye drops on the 5th day of age and twice with Lasota strain in drinking water at 18 and 35 days of age.

Data were analyzed by ANOVA using the General Linear Model Procedure of SAS^R software (SAS Institute, 1986). When significant ($P \leq 0.05$) differences were obtained, Duncan's new multiple range test (1955)

was used to separate treatment means. Arcsine transformation was applied to mortality data prior to analysis. The following model was used for chick performance.

$$Y_{ijkl} = \mu + A_i + B_j + C_k + (AB)_{ij} + E_{ijkl}$$

where:

μ = population mean; A_i = effect of i^{th} excluding growth promoters; B_j = effect of j^{th} including growth promoters; $(AB)_{ij}$ = interaction of i^{th} excluding growth promoters and j^{th} including growth promoters; C_k = effect of replication; E_{ijkl} = mean random error and assumed to be independently and normally distributed with zero mean and σ^2 i.e. NID $(0, \sigma^2)$.

Table 1. Composition of experimental basal diets.

Ingredients %	Starter-grower (1-4 wks of age)	Finisher (4-7 wks of age)
Yellow corn	63.85	73.33
Soybean meal(44%)	22.57	15.80
Corn gluten (60)	6.20	6.00
Fish meal (70%)	3.80	1.80
Lime stone	1.53	1.35
Dicalcium phosphate	1.40	1.20
Salt	0.20	0.20
Vitamin & mineral mix.*	0.25	0.25
DL-Methionine	0.13	-
L-Lysine HCl	0.07	0.07
Determined values(%)	100.00	100.00
Moisture	9.18	9.14
Ash	5.53	5.32
CP	21.70	17.65
CF	3.05	2.75
EE	3.15	3.25
NFE	57.39	61.89
Total	100.00	100.00
Calculated value		
ME Kcal/kg	3002	3093

* Each 2.5 kg of vitamin and mineral mixture (Pfizer Company) contains: Vitamin A, 12000000 I.U; Vitamin D₃, 2000000 I.U; Vitamin E, 10 g; Vitamin K, 2g; Vitamin B₁, 1 g; Vitamin B₂, 4 g; Vitamin B₁₂, 10 mg; Niacin, 20 g; Pantothenic acid, 10 g; Vitamin B₆, 1.5 g; Folic acid, 1 g; Biotin, 50 mg; Choline, 500 g; Iron, 30 g; Copper, 10 mg; Zinc, 55 g; Manganese, 55 g; Iodine, 1 g; Selenium, 100 mg; B.H.T, 125 g; D.O.T, 125 g.

* The inclusion rate was 2.5 kg / Ton of feed.

RESULTS

The results obtained for broiler performance in terms of live body weight (LBW), body weight gain (BWG), feed intake (FI) and feed conversion (FC) are summarized in Tables 2 - 5.

The birds in the present study as in most similar feeding trials were group-fed within each treatment. Therefore, actual individual feed intake is not possible to be precisely measured. It is common to assume that each bird of replicate consumes similar amount of feed. Such assumption has no biological basis when there are genetic variations and specially with unsexed birds, since feed intake is mostly related to body weight. Therefore, it is unlikely to completely rely on the data of feed consumption and consequently the feed conversion because the values of feed consumption are naturally reflected on the feed conversion. Thus, measurement of body weight gains is the most reliable values in evaluating the chick performance and is considered the target reference in such kind of studies. Therefore, for the sensitivity and accuracy of the results of this study, the analysis of variance and Duncan 's multiple range test were used to compute significances among individual values of LBW and BWG, while it was carried among replicate group for FI and FC.

For the simplicity of interpreting the results of this experiment, the following abbreviations will be used for each drug treatment.

<u>Treatment</u>	<u>Abbreviation</u>	<u>Treatment</u>	<u>Abbreviation</u>
Avopracin (10 ppm)	Avo.	Salinomycin (60 ppm)	Sal. 60
Virginiamycin (20 ppm)	Virg.	Lasalocid (37.5 ppm)	Las.37.5
Salinomycin (30 ppm)	Sal. 30	Lasalocid (75 ppm)	Las. 75

The initial LBW of one-week-old chicks for all treatments were very similar ranging from 126 to 127 g. The general health of the chicks was good throughout the experiment. No disease or other adverse events occurred that might have affected performance.

The results of BWG followed a similar trend to those recorded for LBW during the period of 1-6 weeks of age (Tables 2 & 3). Significant interactions were detected between antibiotics and coccidiostats for LBW and BWG. This indicated that the increases in LBW and BWG obtained by an antibiotic was greater in the presence of

anticoccidial drug than with others.

Table 2. Body weight (g) of broiler chicks fed diets supplemented with two levels of salinomycin or lasalocid with and without virginiamycin or avoparcin at 6 weeks of age

Dietary Treatments	No growth promoters	Avoparcin 10ppm	Virginiamycin 20ppm	Overall coccidiostat means	
				Levels	Sources
Basal	g 1518	cde 1747	bcd 1771	H 1679	
±SE	2.48	3.53	6.00	11.92	
Salinomycin 30ppm	f 1709	bc 1776	bc 1774	F 1753	
±SE	10.68	7.61	9.23	6.19	D 1736
Salinomycin 60ppm	e 1740	e 1736	f 1684	G 1720	4.63
±SE	8.99	11.29	10.69	6.48	
Lasalocid 37.5ppm	de 1745	cde 1750	a 1824	E 1773	
±SE	8.07	8.23	11.79	6.59	C 1768
Lasalocid 75ppm	e 1738	b 1786	bcde 1765	EF 1763	4.57
±SE	10.94	11.05	9.26	6.31	
Overall antibiotic means±SE	B 1690	A 1759	A 1764		
	7.90	4.17	5.58		

a-g Means without common letters are significantly different ($P < 0.05$).

A,B Overall growth promoter means without common letters are significantly different ($P < 0.05$).

C,D Overall coccidiostat source means without common letters are significantly different ($P < 0.05$).

E-H Overall coccidiostat level means without common letters are significantly different ($P < 0.05$).

Virginiamycin (20 ppm) significantly ($P < 0.05$) increased LBW and BWG in the presence of Las. 37.5 than all other medicated birds either fed in combinations or singly. Both LBW and BWG of birds fed Virg. with Las. 37.5 were significantly ($P < 0.05$) superior to that obtained with either additive fed alone.

Body weight gain (BWG)

Chicks fed rations containing antibiotics and/or coccidiostats exhibited significantly ($P < 0.05$) higher BWG compared with that of the unmedicated birds

(Table 3). The results of BWG during the period from 1 to 6 weeks of age showed that there were significant ($P < 0.05$) interactions between antibiotics and coccidiostats. This indicated that the increase in BWG obtained with an antibiotic was greater with an anticoccidial drug than with others. These results clearly showed that virginiamycin (20 ppm) significantly ($P < 0.05$) increased BWG in the presence of lasalocid at the level of 37.5 ppm than all the other seven combinations and also exhibited a significant ($P < 0.05$) increase in BWG over those obtained with either antibiotic or coccidiostat-medicated birds. This combination of Virg. with Las. 37.5 resulted in significantly ($P < 0.05$) greater gains than those obtained with either supplement fed alone. The improvements in BWG as a result of feeding the combinations of Las. 75 + Avo., Sal. 30 + Avo. and Sal. 30 + Virg. were statistically similar being significantly ($P < 0.05$) higher than those of Sal. 60 + Avo. and Sal. 60 + Virg. Gains resulted from the remaining combinations of Las. 75 + Virg. and Las. 37.5 + Avo. were intermediate among the combined treatments. Feeding the combinations of Las. 75 + Avo. and Sal. 30 + Avo. significantly ($P < 0.05$) increased BWG over that obtained with either additive fed alone. On the other hand, the combinations of Sal. 30 + Virg. led to significantly ($P < 0.05$) greater BWG than that of birds fed Sal. 30 diet alone but did not significantly differ from that of Virg. fed alone. Gains with the combinations of Las. 75 + Virg., Las. 37.5 + Avo. and Sal. 60 + Avo. treatments were not significantly ($P < 0.05$) different from either supplement fed alone, but gains with the combination of Sal. 60 + Virg. was significantly ($P < 0.05$) lower than either supplement fed alone.

Although Sal. 30 alone exhibited significantly ($P < 0.05$) lower BWG than that of Sal. 60 alone, its combinations with either Virg. or Avo., exhibited significantly higher ($P < 0.05$) BWG than the corresponding values of sal 60 with either Vir or Avo. This could indicate that the addition of Virg. or Avo. in the presence of the low level of Sal. (30 ppm) was more effective in increasing the BWG of chicks rather than with its high level of 60 ppm.

Table 3. Body weight gain (g) of broiler chicks fed diets supplemented with two levels of salinomycin or lasalocid with and without virginiamycin or avoparcin (1-6 weeks of age)

Dietary Treatments	No growth promoters	Avoparcin 10ppm	Virginiamycin 20ppm	Overall coccidiostat means	
				Levels	Sources
Basal	g 1391	de 1621	bcd 1645	H 1552	
±SE	2.61	3.56	6.03	11.99	
Salinomycin 30ppm	f 1582	bc 1650	bcd 1648	F 1627	
±SE	10.39	7.68	9.09	6.15	D 1610
Salinomycin 60ppm	e 1613	e 1610	f 1558	G 1594	4.57
±SE	8.86	11.24	10.19	6.35	
Lasalocid 37.5ppm	e 1617	cde 1624	a 1699	E 1646	
±SE	8.44	8.48	11.80	6.72	C 1641
Lasalocid 75ppm	e 1611	b 1658	bcde 1636	EF 1635	4.61
±SE	11.04	10.92	9.35	6.30	
Overall antibiotic means±SE	B 7.89	A 4.16	A 5.51		

a-g Means without common letters are significantly different ($P < 0.05$).

A,B Overall growth promoter means without common letters are significantly different ($P < 0.05$).

C,D Overall coccidiostat source means without common letters are significantly different ($P < 0.05$).

E-H Overall coccidiostat level means without common letters are significantly different ($P < 0.05$).

Although the BWG for Las. at low level of 37.5 was statistically equal to that of its high level of 75 ppm, yet its combination with Virg. (Las. 37.5 + Virg.) allowed for a significant increase in BWG than the corresponding value of its high level with Virg. (Las. 75 + Virg.). In contrast, the high level of Las. (75 ppm) in combination with Avo. (Las. 75 + Avo.) exhibited significantly ($P < 0.05$) higher BWG than that of the corresponding value of its low level with Avo. (Las. 37.5 + Avo.). This could indicate that Las. at the low level of 37.5 ppm was more effective in improving the BWG in the presence of Virg. rather than in the presence of Avo. In contrast, Las. at the high level of 75 was more effective in improving BWG in the presence

($P < 0.05$) more feed than the three treatments of Las. 37.5 + Avo., Sal. 60 + Virg. and the unmedicated group but consumed numerically more feed than the other eleven treatments. Chicks fed the combination of Virg. with Las. 37.5 consumed numerically more feed than that obtained with either supplement fed alone.

Table 4. Feed intake (g) of broiler chicks fed diets supplemented with two levels of salinomycin or lasalocid with and without virginiamycin or avoparcin (1-6 weeks of age).

Dietary Treatments	No growth promoters	Avoparcin 10ppm	Virginiamycin 20ppm	Overall coccidiostat means	
				Levels	Sources
Basal	c	ab	ab	C	
±SE	2654	3009	3060	2908	
Salinomycin 30ppm	ab	ab	ab	C	
±SE	18.14	9.80	44.78	56.42	
Lasalocid 37.5ppm	ab	ab	ab	C	
±SE	2963	3028	2979	2990	
Salinomycin 60ppm	ab	ab	b	C	B
±SE	61.73	52.18	63.51	32.10	2974
Lasalocid 75ppm	ab	ab	ab	C	26.00
±SE	3050	2962	2862	2958	
Overall antibiotic means±SE	A	A	A	C	
	73.12	36.14	55.76	41.85	
Lasalocid 37.5ppm	ab	b	a	C	
±SE	3056	2912	3147	3038	
Lasalocid 75ppm	ab	ab	ab	C	B
±SE	44.95	48.86	70.64	41.31	3029
Overall antibiotic means±SE	A	A	A	C	28.78
	74.62	60.40	89.71	3119	
	42.57	23.44	34.47	41.72	

a-c Means without common letters are significantly different ($P < 0.05$).

A No significant differences were detected among overall growth promoter means.

B No significant difference was detected between overall coccidiostat source means.

C No significant differences were detected among overall coccidiostat level means.

However the increases in FI as a result of feeding the combinations of Las. 37.5 + Virg., Las. 75 + Avo., Sal. 30 + Avo., Sal. 30 + Virg., Sal. 60 + Avo. and Las. 75+ Virg. were statistically similar being significantly more than those fed Las. 37.5 + Avo. and Sal. 60 + Virg. No significant difference in FI was detected between each combination and that obtained with either supplement fed alone.

There were no significant differences in the overall FI mean values among the Virg., Avo. and unmedicated groups. There was no significant difference in the overall FI mean values between the two sources of coccidiostats (Las.& Sal.). The coccidiostat- treated birds consumed almost similar feed intake to that of unmedicated birds. Neither significant differences were detected in the overall FI mean values between birds fed the two coccidiostats with two levels each nor with that of the unmedicated birds.

Feed conversion (FC)

Chicks fed rations containing antibiotic and/or coccidiostat gave better FC compared with the unmedicated group (Table 5).

Table 5. Feed conversion of broiler chicks fed diets supplemented with two levels of salinomycin or lasalocid with and without virginiamycin or avoparcin (1-6 weeks of age).

Dietary Treatments	No growth promoters	Avoparcin 10ppm	Virginiamycin 20ppm	Overall coccidiostat means	
				Levels	Sources
Basal	a 1.908	cde 1.860	cde 1.860	D 1.878	
±SE	0.01	0.01	0.01	0.0	
Salinomycin 30ppm	bcd 1.874	ef 1.834	fg 1.807	E 1.838	
±SE	0.01	0.01	0.01	0.01	
Salinomycin 60ppm	abc 1.890	def 1.840	ef 1.837	E 1.856	C 1.847
±SE	0.01	0.02	0.01	0.01	0.06
Lasalocid 37.5ppm	abc 1.890	g 1.793	de 1.852	E 1.845	C 1.846
±SE	0.01	0.01	0.01	0.01	0.01
Lasalocid 75ppm	ab 1.900	ef 1.831	fg 1.808	E 1.846	
±SE	0.01	0.01	0.02	0.01	
Overall antibiotic means±SE	A 1.892 0.01	B 1.831 0.01	B 1.833 0.01		

a-g Means without common letters are significantly different (P<0.05).
 A,B Overall growth promoters means without common letters are significantly different (P<0.05).
 C No significant difference was detected between overall coccidiostat source means.
 D,E Overall coccidiostat level means without common letters are significantly different (P<0.05).

All the eight combinations of antibiotics with coccidiostats exhibited significantly ($P < 0.05$) better FC than the unmedicated birds. Significant interactions in FC were detected between antibiotics and coccidiostats. This indicated that the improvement in FC obtained with an antibiotic was greater with an anticoccidial compound than with the other. Chicks fed rations containing Avo. (10 ppm) in the presence of Las. 37.5 showed either numerically or significantly ($P < 0.05$) better FC than those obtained for the other seven combinations and even more better than those obtained for either antibiotic or coccidiostat fed alone. The three combinations of Avo. + Las. 37.5, Virg. + Sal. 30 and Virg. + Las. 75 significantly ($P < 0.05$) exhibited better FC than that obtained with either supplement fed alone. The remained five combinations showed significantly better FC than those obtained with coccidiostat fed alone but numerically better than those obtained with antibiotic fed alone.

Significant improvements ($P < 0.05$) were observed in the overall antibiotic mean values for chicks fed either Virg. or Avo. when compared with those fed diet without antibiotic. No significant difference was detected in FC between the overall mean values of Virg. and Avo. There was no significant difference in the overall FC mean value between the two sources of coccidiostats (Las. & Sal.). Significant improvements in FC were obtained in the presence of each coccidiostat with its two levels rather than in their absence. There were no significant differences among the overall FC mean values of the anticoccidial drugs at their tested levels.

DISCUSSION

Under the conditions of this experiment, significant interactions were detected between antibiotics (Virg. & Avo.) and anticoccidial compounds (Las. & Sal.) for performance measurements. Virginiamycin at the level of 20 ppm significantly increased BWG in the presence of Las. 37.5 than other medicated birds fed drugs either in combinations or singly. The combination of Virg. with Las. 37.5 resulted in significantly ($P < 0.05$) superior BWG to that obtained with either additive used singly. It is unknown whether improved utilization of energy, such as has previously been reported for

virginiamycin fed alone to turkey poults (Buresh *et al.*, 1984, 1985 and Salmon and Stevens, 1990) or to broiler chicks (March *et al.*, 1978 and El-Sherbiny *et al.*, 1990), is responsible for the improved gains observed or other reasons are involved.

However, many workers (Fairley *et al.*, 1985; Waldroup *et al.*, 1986, 1988; Simon *et al.*, 1987; Salmon and Stevens, 1990; Boulos *et al.*, 1990 and Waibel *et al.*, 1991) obtained similar significant interactions between coccidiostats and antibiotics for growth response criteria. They concluded that in combination with some coccidiostats, some antibiotics significantly improved the growth performance of birds. Fairley *et al.* (1985) obtained similar significant interactions between avoparcin and the anticoccidial compounds for body weight and feed consumption of broiler chicks. Their results indicated that the increases in body weight and feed consumption obtained by avoparcin were greater with some anticoccidial compounds (lasalocid and salinomycin for body weights and lasalocid for feed consumption) than with others (monensin and narasin for body weights and monensin, narasin and salinomycin for feed consumption). Salmon and Stevens (1990) reported that the weight gains of poults from 0 to 12 weeks of age were greater when the diet was supplemented with virginiamycin alone or in combination with monensin ($P < 0.05$). However, the combination of virginiamycin with monensin resulted in superior overall feed efficiency to that obtained with either additive fed alone.

The present results showed that virginiamycin at the level of 20 ppm was comparable to avoparcin at the level of 10 ppm in improving the overall BWG of broiler chicks at 6 weeks of age. This could indicate that virginiamycin at 20 ppm has the same potency as avoparcin at 10 ppm for promoting the growth of broiler chicks. However, many investigators confirmed the superiority of using Virg. or Avo. as growth promoters for chicks, when used at subtherapeutic levels. The reports of March *et al.* (1978), Miles *et al.* (1984), Buresh *et al.* (1986) and Ibrahim *et al.* (1993) provide evidences for the enhancement of growth rates and feed conversion ratios by dietary levels of virginiamycin ranging from 10 to 22 ppm of feed. Other reports of Roth-Maier and Kirchgessner (1976), Spoerl and Kirchgessner (1978), Leeson *et al.* (1980), Pensack *et*

al.(1982), Foster and Stevenson (1983) and Ibrahim et al. (1993) clearly showed that avoparcin is an efficient antibiotic growth promoter for feeding broiler chicks. They obtained significant improvements in body weight gains and efficiency of feed utilization when avoparcin was given in broiler diets at a rate of 10 ppm.

The data presented show that lasalocid was significantly more effective in increasing BWG of broiler chicks rather than salinomycin at 6 weeks of age. However, several reports confirmed the activity of many anticoccidial compounds including lasalocid and salinomycin and have shown that the addition of such compounds to diets either singly or in combinations with growth promoters have a great effect in improving the growth performance of broiler chicks (Migaki et al., 1979; Fairley et al., 1985; Waldroup et al., 1986 and Abdellatif et al., 1993). The overall BWG mean values for the tested two coccidiostats with two levels each at 6 weeks of age showed that lasalocid at 37.5 ppm was superior to lasalocid at 75 ppm and salinomycin at 30 ppm in improving the BWG, while Sal. 60 gave the lowest BWG value. This could indicate the relative potency of each drug which would help in assessing the proper level of each coccidiostat in commercial practice. Since the effect of using lower levels of either lasalocid (37.5 ppm) or salinomycin (30 ppm) was more pronounced in improving the gains of chicks rather than using their corresponding higher levels (75 ppm and 60 ppm, respectively) at 6 weeks of age, it could be recommended using these lower levels in broiler diets as an economical advantage in saving the cost of drug.

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دراسة تأثير تداخل بعض المضادات الحيوية مع مضادات الكوكسيديا على
انتاجية كتاكيت التسمين

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الغرض من هذا البحث هو دراسة تأثير التغذية على علائق محتوية على
مضادات الكوكسيديا (٣٧,٥ أو ٧٥ ملجم لاسالوسيد / كجم عليقة أو ٣٠
أو ٦٠ ملجم سالينومايسين / كجم عليقة) مع اضافة أو عدم اضافة منشطات
النمو (١٠ ملجم افوبارسين / كجم عليقة أو ٢٠ ملجم فرجيناميسين / كجم
عليقة) على اداء كتاكيت التسمين .

استخدام فى هذه التجربة ٤٨٠ كتكوت عمر يوم من سلالة اربرايكرز وتم
توزيع الكتاكيت عشوائيا فى بطاريات على ٦٠ مجموعة كل مجموعة ٨
كتاكيت حيث استخدم ١٥ معاملة تجريبية بكل منها اربع مكررات .
تم اضافة الادوية للعلائق حتى الاسبوع السادس وبعد ذلك تم رفعها من
العلائق لمدة اسبوع .

ويمكن تلخيص النتائج والاستنتاجات المتحصل عليها فى الاتى :

- يوجد تداخل معنوى بمستوى معنوية ٥% بين المضادات الحيوية
(فرجيناميسين أو افوبارسين) ومضادات الكوكسيديا (سالينومايسين أو
لاسالوسيد) على وزن الجسم المكتسب عند عمر ٦ اسبوع.
- ادى خلط منشط النمو (فرجيناميسين) مع مضادات الكوكسيديا
(لاسالوسيد) عند المستوى المنخفض الى زيادة وزن الجسم المكتسب بمعنوية
٥% وذلك بالمقارنة باضافة اى منهما بمفرده.
- ادى خلط منشط النمو (فرجيناميسين) مع المستوى المنخفض من
اللاسالوسيد الى زيادة معنوية فى وزن الجسم المكتسب مقارنة بالخلطات
الآخري من الافوبارسين أو الفرجيناميسين مع مضادات الكوكسيديا وبناء
عليه فان خلط الفرجيناميسين يكون متوافقا مع الالاسالوسيد عند المستوى
المنخفض حيث ادى هذا المخلوط الى زيادة وزن الجسم المكتسب معنويا
مقارنة بكل المعاملات التجريبية الآخري.

- وجد ان تأثير الفرجينيامايسين عند معدل ٢٠ مجم/كيلو جرام علف يقابل تأثير الافوبارسين عند المعدل ١٠ ملجم /كيلو جرام علف فى تحسين قيم الوزن المكتسب العام للكناكيت .
- كان اللاسالوسيد اكثر فاعلية فى زيادة وزن الجسم المكتسب معنويا من السالنيومايسين .
- كان معدل استخدام المستويات المنخفضة من مضادات الكوكسيديا (لاسالوسيد أو سالنيومايسين) له اكثر وضوحا من استخدام المستويات المرتفعة من ايهما على زيادة وزن الجسم المكتسب .
- ادى استخدام المستوى المنخفض من اللاسالوسيد الى زيادة وزن الجسم المكتسب مقارنة بمستواه المرتفع ومستوى السالومايسين المنخفض بينما سجل المستوى المرتفع من السالنيومايسين اقل وزن جسم مكتسب ويدل هذا على تباين القوة الكامنة لكل دواء بالنسبة للاخر مما يكون له عظيم الفائدة فى مساعدة المربي على اختيار المستوى المناسب من كل مضاد لاستعماله فى الحياة العملية .