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(Original Article)

Effect of Synbiotic Supplementation on Growth Performance and Carcass Quality of Growing Rabbits

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Abstract

The study investigates the effect of Synbiotic levels on growing local rabbits' performance and their carcass characteristics. A total number of forty-eight weaned, growing local rabbits, mixed sex, 24 male and 24 female were obtained after weaning, they were group weighed and placed in cages in the room. Rabbits averaged body weight were 0.770±0.04 Kg and were assigned to 3 groups of 16 rabbits each. Each group included 8 replicated cages (2 rabbits / pen). The first group was the control group (G1), the second and the third groups were the treated groups (G2, G3).

The control group was fed with a basal diet only, rabbits of (G2) were fed with the basal diet supplemented with 0.25g Synbiotic/kg diet, and (G3) with the basal diet supplemented with 0.5g Synbiotic/kg diet. Synbiotic were homogeneously mixed by mixer gradually by additive basal rations larger quantities. Rabbits were supplemented with water lines supporting all pens.

Body weight and daily weight gain of rabbits non-significantly increased by supplementing Synbiotic. Also, feed conversion ratio was not significantly affected by Synbiotic supplementation, except total of feed conversion ratio was better ($P<0.0001$) in treated rabbits (groups, G2, G3).

The other carcass components were not significantly affected by Synbiotic supplementation, except slaughter weight mean was higher ($P<0.036$) of treated rabbits (G2, G3), while head percentage decreased ($p<0.016$) of treated rabbits (G2, G3) compared with (G1). Stomach full percentage increased ($p<0.062$) of (G1), while intestines full percentage was lower ($p<0.028$) in treated rabbits (G2, G3) compared with control group.

Keywords: *Synbiotic, Rabbits, Growth performance, Carcass.*

Introduction

The Synbiotic concept has been suggested to give synergistic effects of both prebiotics and probiotics and thus offer a number of health-promoting effects, stimulating growth and improving the welfare of the host (Gibson and Roberfroid, 1995; Awad *et al*., 2006). Synbiotic have both probiotic and prebiotic properties and were created in order to overcome some possible difficulties in survival of probiotics in the gastrointestinal tract. Probiotics beneficially influence the intestinal equilibrium and

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constitute a protective barrier for the alimentary tract. Prebiotics, on the other hand, supply energy and nutrients for probiotic bacteria (Markowiak and Śliżewska 2018).

Synbiotic may improve animal health through different effects. Synbiotic can modulate the gastrointestinal microbiota community in favor of beneficial intestinal and cecal microorganisms, improve immune system functions, and provide specific active molecules that can improve the digestion of feed and absorption of nutrients (Hashem *et al*., 2020). Rabbits as monogastric animals cannot hydrolyze Synbiotic by the endogenous digestive enzymes in the small intestine, but they are hydrolyzed within the caecum by the beneficial bacterial populations or probiotics, and, in turn, confer Synbiotic beneficial effects on the rabbit (Gabr *et al.,* 2023).

The aim of this study was to investigate the effects of Synbiotic supplementation on rabbits' health rather than antibiotics and their performance as a source of red meat production.

Materials and Methods

This study was conducted in the graduated youth special Poultry Farm in Arab Elawamer, Abnob, Assiut Governorate, Egypt, from November 2023 to January 2024. The aim of this research was to evaluate the effect of Synbiotic supplementation on the diets of growing rabbits on body performance and carcass quality of experimental animals.

Treatment of animals

Forty-eight weaned, growing local rabbits were used in this experiment. Rabbits averaged body weight (0.77±0.04 kg) and were assigned to 3 groups of 16 rabbits each. The first group 1 (control) was fed with a basal diet only (Table 1), The second and third groups (G2, G3) were fed with the basal diet supplemented with 0.25g Synbiotic/kg diet, and 0.5g Synbiotic/kg diet, respectively (Gabr *et al.,* 2023). Small amounts of the basal diet were first mixed with the respective amounts of Synbiotic as a small batch, and then with a larger amount until the total amount of the respective basal diets and Synbiotic were homogeneously mixed by mixer.

Table 1. Diet ingredients and chemical composition of experimental grower rations.

Ingredients	Grower diet	Chemical composition of diet	%
Alfalfa hay	28.00	**Dry matter**	89.20
Wheat bran	28.00	**Ash**	8.80
Barley	20.00	**Crude protein %**	16.18
Soybean meals 44%	12.00	**Crude fiber %**	13.30
Yellow Corn	7.00	**Crude fat%**	2.4
Molasses	3.00	**Nitrogen free extract**	57.32
Limestone	1.1	**Digestible energy (Kcal/kg)**	2620
Sodium chloride salt	0.3		
Vitamin and mineral Premix1	0.6		
Total	100		

Rabbits were supplemented with water provided by a commercial plastic water dispenser attached to an automatic water line supporting all pens. Rabbits were housed in metal battery cages (2 rabbits / cage)

Growth performance

Rabbits were individually weighed at the beginning of the experiment and then weekly throughout the experiment before morning. Daily gain and feed conversion ratios were calculated.

Slaughter and carcass measurements

At the end of the experimental period, 12 rabbits (4 male rabbits from each group) were chosen in order to represent the average final body weight of each group. Rabbits were sacrificed in the Animal Production Department, Faculty of Agriculture, Assiut University.

The dressing was done by removing the external and internal organs. Moreover, the individual weights of external organs (head, feet, tail and fur) and internal organs (liver, spleen, lunges, heart, bile and kidney) were immediately recorded. The stomach and intestine were weighed full and empty.

Moreover, dressing percentage was determined by calculating the proportion of hot carcass weight relative to both the pre-slaughter weight, as described by (Blasco, 1992). The carcass was anatomically divided into specific joints, including the breast and ribs, loin, fore legs and hind legs, as outlined by (Deltoro and López., 1986).

The loin joint was isolated, weighed, and dissected into its individual components: muscle, fat, and bone. Each component was then weighed, and its percentage was calculated relative to the total weight of the joint. The *Longissimus Dorsi* muscle was selected for both meat quality evaluation and chemical analyses.

Statistical analysis

All data were statistically analyzed as completely randomized designs by one-way ANOVA of SAS (2004) with supplemented Synbiotic as the main effect and individual animal as the statistical unit. Duncan's multiple range test (Duncan., 1955) was used to determine significant differences between treatment means (Steel and Torrie., 1980). The data was presented in mean ± S.E. The level of significance was set at $P<0.05$. Statistical model as follows:

$$Y_{ij} = \mu + \tau_i + \varepsilon_{ij}$$

Where: Y_{ij}= the observation ij, μ =the overall mean, τ_i = the effect due to treatment i., ε_{ij} = the experimental error.

Results and Discussion

The final body weight, total weight gain, and average daily gain increased as responses to the Synbiotic level in the rabbits' diet (Gabr *et al.,* 2023). As shown in (Table 2), averages of body weight and daily gain of rabbits treated with Synbiotic in the diets. Treated rabbits did not significantly influence by supplementing Synbiotic in the first 2 weeks after the start of the experiment, but body weight tended to increase of Synbiotic treated rabbits. However, body weight of rabbits in the third group (G3) increased significantly with hay ($P<0.001$) compared with the 2nd group (G2) and control group in the third week (1.315±0.039, 1.201±0.039 and 1.149±0.024 kg), respectively. The 3rd group in the fourth week tended to increase but not significantly. In the fifth week, the results showed a highly significant increase in body weight at (P<0.007). The final body weight in the 2nd and the 3rd groups was significantly higher compared with control group at (P<0.001), while the third group (G3) having the highest body weight (1.515±0.022 kg) followed by the second group (1.416±0.032 kg) and the control group having the lowest body weight (1.339±0.025 kg), which could be attributed to the beneficial effect of Synbiotic supplementation.

The results are in agreement that the use of Synbiotic drug in a dosage of 1.0g/kg of feed contributes to the growth rate in fattened young rabbits (Kurchaeva *et al.,* 2020). As well as those reported by Memon *et al.* (2024) that rabbits supplemented by synbiotic increased in final body weight as compared to the other treatments.

Table 2. Means and standard error (Mean ± S. E.) of body weight (kg)

BW of rabbits (kg)	Control (G1)	G2 (0.25)	G3 (0.5)	Probability
B W Start	0.773± 0.037	0.770 ± 0.036	0.768 ± 0.036	N. S.
B W 1	0.86 ± 0.04	0.87 ± 0.04	0.89 ± 0.05	N. S.
B W 2	0.922± 0.048	1.023 ± 0.034	1.040 ± 0.055	N. S.
B W 3	1.149± 0.024^{b}	1.201 ± 0.039^{b}	1.315 ± 0.039^{a}	0.001
B W 4	1.240± 0.034	1.225 ± 0.052	1.348 ± 0.057	N. S.
B W 5	1.318± 0.037^{b}	1.399 ± 0.032^{ab}	1.476 ±0.029^{a}	0.007
B W 6	1.339± 0.025^{c}	1.416 ± 0.032^{b}	1.515 ± 0.022^{a}	0.001

a, b, c: Means within a row containing different superscripts tended to differ (p<0.05); G1: Control group, G2: Rabbits treated with the basal diet supplemented with 0.25g Synbiotic/kg diet. G3: Rabbits treated with the basal diet supplemented with 0.5g Synbiotic/kg diet. N.S.: not significant.

The effect of Synbiotic supplementation on daily gain of rabbits is shown in Table 3. The best response of control and treated rabbits had been noticed at the third daily gain (DG3), but not significantly different between groups. Highly significant (P<0.0001) maximum daily gain (0.018±0.001 kg) was noted in the third group as compared to the second group (0.015±0.001 kg), and minimum daily gain (0.013±0.001 Kg) was recorded from the control group.

Table 3. Means and standard error (Mean ± S. E.) of daily gain (DG)

DG of rabbits (Kg)	Control(G1)	G2 (0.25)	G3 (0.5)	Probability
DG1	0.013 ± 0.004	0.014 ± 0.004	0.017 ± 0.005	N. S.
DG2	0.009 ± 0.003	0.022 ± 0.006	0.022 ± 0.006	N. S.
DG3	0.032 ± 0.006	0.025 ± 0.007	0.039 ±0.007	N. S.
DG4	0.013 ± 0.004	0.003 ± 0.004	0.005 ±0.006	N. S.
DG5	0.011 ± 0.003	0.025± 0.006	0.018 ± 0.006	N. S.
DG6	0.003 ± 0.005	0.002 ± 0.005	0.005 ±0.002	N. S.
Total DG	0.013 ± 0.001^{b}	0.015 ± 0.001^{b}	0.018 ± 0.001^{a}	0.0001

a, b: Means within a row containing different superscripts tended to differ (p<0.05); G1: Control group, G2: Rabbits treated with the basal diet supplemented with 0.25g Synbiotic/kg diet. G3: Rabbits treated with the basal diet supplemented with 0. 5g Synbiotic/kg diet. N.S.: not significant.

The significant increase in the final daily weight gain of rabbits fed Synbiotic diets was in agreement with the findings of Gabr *et al*. (2023) who reported a significant (P<0.001) increase in average daily gain (0.029±0.0011 Kg) of 0.5g Synbiotic treated rabbits, in comparison with those in the control group (0.026±0.001 Kg). In rabbits, Ewuola *et al.* (2011) showed that there were improvements in daily weight gain in rabbits receiving Synbiotic compared to those on a standard diet.

As shown in Table 4, the groups did not record any increase in feed conversion ratio compared to the control group. The feedc3 was the best one (2.791±0.347) of the third group which had the lowest feed conversion values but was not significant. However, a highly significant (P<0.0001) decrease was observed between groups in the total feed conversion ratio, with the highest rate in the control group (7.240±0.405) and the lowest rate in the third group (5.739±0.204). The decreased value of feed conversion ratios means an economical sparing effect in the amount of feed stuffs. The significant decrease in the final feed conversion ratio of rabbits fed Synbiotic diets was in agreement with the findings of Gabr *et al.* (2023) who reported a significant decrease at (P<0.001) in the average feed conversion ratio with the 0.5g Synbiotic/kg diet level (2.67g feed/g gain) compared with those of the control group (2.89g feed/g gain).

In rabbits, Memon *et al.* (2024) found that the effects of dietary Synbiotic supplementation on feed conversion ratio (FCR) of rabbits were higher compared to other groups. The use of Synbiotic has resulted in a decrease in feed conversion ratio FCR (Acharya *et al.,* 2024). As well as dietary supplementation of probiotics (Bacillus subtilis and Clostridium butyricum) during the finishing stage increased growth performance and FCR (Meng *et al.* 2010).

Table 4. Means and standard error (Mean ± S. E.) of feed conversion ratio (FC)

Feed conversion ratio	Control (G1)	G2 (0.25)	G3 (0.5)	Probability
Feedc 1	5.353 ±0.608	5.003 ± 0.527	4.069±0.506	N. S.
Feedc 2	6.038 ± 1.030	3.851 ± 0.494	3.788±0.790	N. S.
Feedc 3	3.384 ± 0.372	3.076 ±0.378	2.791±0.347	N. S.
Feedc 4	4.918 ± 1.184	6.856 ±0.717	5.467 ±0.544	N. S.
Feedc 5	6.586 ± 0.6378	5.172 ±0.893	5.177±0.901	N. S.
Feedc 6	4.027 ± 1.221	4.983 ±1.728	5.423±1.414	N. S.
Total feed	7.240±0.405^{a}	6.375±0.343^{b}	5.739±0.204^{c}	P<0.0001

a, b, c: Means within a row containing different superscripts tended to differ (p<0.05); G1: Control group, G2: Rabbits treated with the basal diet supplemented with 0.25g Synbiotic/kg diet. G3: Rabbits treated with the basal diet supplemented with 0. 5g Synbiotic/kg diet. N.S.: not significant.

Carcass components of rabbits supplemented Synbiotic showed (Table 5) that slaughter weight increased significantly in the 2nd group compared to other groups. The higher slaughter weight was recorded in the second group (1523.25±79.74 g) followed by the third group (1522.00±106.15 g). The lower slaughter weight was recorded in control group (1195.00±64.89 g) than in the treated ones at (p<0.036).

Head percentage, Stomach full %, Intestine full% and Intestine empty% showed significant differences (P<0.05) between groups where the maximum percentage in the control group (8.13±0.39, 5.99±0.13, 20.48±1.00 and 9.36±0.58 %), respectively. But minimum percentages at (P<0.05) were in the second group of previous components (6.70±0.28, 4.98±0.47, 16.32±1.41 and 7.97±0.33 %), respectively.

The decreasing values and percentages of inedible parts show that the percentages of dressing and edible portions have increased (Ali, 2023).

In rabbits, the weight proportion of the lung, heart, kidney, and small intestine as well as the carcass yield, are the same for all groups, according to Onbasilar and Yalcin (2008).

According to Gabr *et al.* (2023), the weight percentages of internal organs and fur were unaffected by varying degrees of Synbiotic dietary supplementation as compared to the control group.

Table 5. Means and standard error (Mean ± S. E.) of Carcass components of different groups

Carcass components (%)	Control (G1)	G2 (0.25)	G3 (0. 5)	Probability
Slaughter weight	1195.00 ± 64.89^{b}	1523.25 ± 79.74^{a}	1522.00 ± 106.15^{a}	0.036
Head %	8.13 ± 0.39^{a}	6.70 ± 0.28^{b}	6.90 ± 0.19^{b}	0.016
Feet %	4.48 ± 0.41	4.07 ± 0.13	4.51 ± 0.38	N.s.
fur %	9.47 ± 1.23	10.55 ± 0.45	11.21 ± 0.42	N.s.
Spleen %	0.12 ± 0.03	0.12 ± 0.02	0.08 ± 0.01	N.s.
Liver %	3.18 ± 0.22	2.96 ± 0.18	3.01 ± 0.12	N.s.
Lungs %	0.77 ± 0.08	0.84 ± 0.11	0.73 ± 0.06	N.s.
Heart %	0.28 ± 0.09	0.30 ± 0.01	0.33 ± 0.01	N.s.
Kidneys %	0.90 ± 0.07	0.80 ± 0.03	0.78 ± 0.03	N.s.
Stomach full %	5.99 ± 0.13^{a}	4.98 ± 0.47^{b}	4.99 ± 0.15^{b}	0.062
Intestine full %	20.48 ± 1.00^{a}	16.32 ± 1.41^{b}	16.50 ± 0.24^{b}	0.028
Stomach empty %	1.78 ± 0.21	1.57 ± 0.06	2.24 ± 0.51	N.s.
Intestine empty %	9.36 ± 0.58^{a}	7.97 ± 0.33^{b}	8.20 ± 0.18^{ab}	0.075
Bile %	0.08 ± 0.02	0.08 ± 0.02	0.06 ± 0.01	N.s.
Tail %	0.62 ± 0.09	0.69 ± 0.04	0.77 ± 0.10	N.s.

a, b, ab: Means within a row containing different superscripts tended to differ (p<0.05); G1: Control group, G2: Rabbits treated with the basal diet supplemented with 0.25g Synbiotic/kg diet. G3: Rabbits treated with the basal diet supplemented with 0. 5g Synbiotic/kg diet. N.S.: not significant.

Dressing out percentage is a crucial economic factor in the rabbit market. In Spain, the standard commercial criterion is to take into account a slaughter yield of between 56% and 58% when referring to chilled carcasses (Pla *et al*., 1998).

Dressing out percentage, increased not significantly, between groups (Table 6). The increased value of dressing out percentage was found in the third group (48.09 ± 1.34%). Where, the dressing percentages increased as the carcass weights and body weight increased. But the percentages of the fore side, hind side, middle part, and loin did not significantly increase when compared to the control group.

Table 6. Means and standard error (Mean ± S. E.) of carcass cuts (%)

Meat cuts	Control (G1)	G2 (0.25)	G3 (0. 5)
Slaughter weight (g)	1195.00 ± 64.89^{b}	1523.25 ± 79.74^{a}	1522.00 ± 106.15^{a}
Hot carcass (g)	552.25 ± 68.82^{b}	714.25 ± 19.01^{a}	731.25 ± 50.06^{a}
Dressing %	45.80 ± 3.35	47.16 ± 2.06	48.09 ± 1.34
Fore side %	15.38 ± 1.19	19.63 ± 4.31	16.27 ± 0.70
Hind side %	27.66 ± 2.19	26.89 ± 4.27	31.54 ± 1.97
Middle part %	19.58 ± 1.52	23.36 ± 1.58	20.92 ± 0.41
Loin %	31.92 ± 6.11	29.92 ± 1.23	26.91 ± 2.08

a, b: Means within a row containing different superscripts tended to differ (p<0.05); G1: Control group, G2: Rabbits treated with the basal diet supplemented with 0.25g Synbiotic/kg diet. G3: Rabbits treated with the basal diet supplemented with 0. 5g Synbiotic/kg diet.

These results are agreement with those of Gabr *et al.* (2023) who found that there were significant differences in the forequarter % and hindquarter %, which were significantly affected (P<0.001) between the groups. The maximum percentages of forequarter % and hindquarter % were noted in group supplemented with Synbiotic at a level 0.5 g/kg diet (34.3±0.16% and 39.8±0.15%) as compared to other groups.

Physical and chemical analysis

No significant effects of rabbits' meat supplemented with Synbiotic were found in expressible fluids and pH of Loin (Table 7). The highest expressible fluids content was observed in the (G3) followed by (G2) and the minimum value was in control group.

Cooking loss increased significantly in the second group (46.40 ±4.39) compared with the control group and the third group (G3). The highest value of cooking loss percentage in groups was found in the second group (G2), but the lowest value was found in the third group (G3). These results confirm that the cooking loss was better and more juiciness in G3 than G1 and G2 (Siemers and hanning, 1953; lawrie, 1974).

Murshed *et al*. (2014) when comparison of carcass and meat characteristics of male and female rabbits, found that not significant differences between the percentage of cooking loss values that ranged between (27.69±0.03 and 28.22±0.10).

Meat quality preservation during storage is influenced by pH levels. It controls microbial balance in the environment. pH value of the loin was recorded the lowest in 3rd group (6.03±0.09), but the 2nd and the control groups were higher. This means that the lowest values of pH indicates that meat has more juiciness which have more expressible fluids, and by cooking it will lose more weight.

In rabbits, Combes *et al.* (2007) found that pH tests on cooked longissimus lumborum (LL) muscle were unable to distinguish between groups.

Table7.Means and standard error (Mean ± S. E.) of physical analysis of rabbits meat of different groups

Physical analysis	Control(G1)	G2 (0.25)	G3 (0. 5)	Probability
Expressible fluids %	18.30 ± 2.23	19.29 ± 1.94	22.08 ± 2.08	N.s.
Cooking loss %	38.24 ± 2.28^{ab}	46.40 ±4.39^{a}	36.81 ± 1.85^{b}	0.0788
pH	6.38 ± 0.24	6.20 ± 0.12	6.03 ± 0.09	N.s.

a, b, ab: Means within a row containing different superscripts tended to differ (p<0.05); G1: Control group, G2: Rabbits treated with the basal diet supplemented with 0.25g Synbiotic/kg diet. G3: Rabbits treated with the basal diet supplemented with 0. 5g Synbiotic/kg diet. N.S.: not significant.

Results on the effects of Synbiotic supplementation on loin weight of rabbits are mentioned in Table (8). Data indicates that maximum loin weight (214.25±13.29 g) was noted in the second group (G2) as compared to third group (G3, 199.50±26.32g). Minimum loin weight (168.50±24.83g) was recorded from control group (G1).

In rabbits, Ewuola *et al.* (2011) found that, the loin weight was higher in rabbits who fed a Synbiotic diet (11.81± 0.61g) compared to those fed control diet (10.85 ± 0.61g), prebiotics diet (10.93 ± 0.61g) and probiotics diet (11.35± 0.61g).

Meat weight of loin was increased significantly in treated rabbits at (p<0.006). Higher weight was noted in G2 (112.00 ± 8.92g) followed by G3 (108.25 ± 12.69g) compared to control group (60.25 ± 5.01g).

Bone weight and bone percentage of loin were not affected by treated rabbits compared to the control group.

In rabbits, Kurchaeva *et al.* (2020) showed that the use of Synbiotic drug in a dosage of 1.0 g/kg of feed contributes to a positive effect on the nutritional value of rabbit meat.

Synbiotic supplementation contributed to a significant increase in shape index. Data indicates that the maximum value of the shape index in the second group (G2) was (1.95 ± 0.12). Minimum value of the shape index (1.42±0.06) was recorded from the control group.

Table 8. Means and standard error (Mean ± S. E.) of Loin dissection

Loin dissection	Control (G1)	G2 (0.25)	G3 (0. 5)	Probability
Weight of loin	168.50 ± 24.83	214.25 ± 13.29	199.50 ± 26.32	N.s.
Meat weight (g)	60.25 ± 5.01^{b}	112.00 ± 8.92^{a}	108.25 ± 12.69^{a}	0.006
Bone weight (g)	70.00 ± 2.94	89.25 ± 8.82	93.00 ± 14.39	N.s.
Meat %	37.85 ± 5.73^{b}	52.85 ± 4.81^{a}	54.81 ± 2.21^{a}	0.050
Bone %	43.73 ± 5.17	41.36 ± 1.88	46.04 ± 1.73	N.s.
Shape Index	1.42 ±0.06^{b}	1.95 ± 0.12^{a}	1.85 ± 0.17^{a}	0.034

a, b: Means within a row containing different superscripts tended to differ (p<0.05); G1: Control group, G2: Rabbits treated with the basal diet supplemented with 0.25g Synbiotic/kg diet. G3: Rabbits treated with the basal diet supplemented with 0. 5g Synbiotic/kg diet. N.S.: not significant.

Chemical analysis

Table 9 shows the chemical composition of the average rabbit meat sample. Synbiotic supplementation contributed to a non significant increase in the percentage of protein in muscle tissue. The highest protein percentage content was observed in the meat of rabbits of the 3rd group and amounted to (22.3650 % ± 1.1292). It seems to be the same results as reported by Kurchaeva *et al.* (2020).

Table 9. Means and standard error (Mean ± S. E.) of chemical and physical analysis of rabbit meat

Chemical analysis	Control (G1)	G2 (0.25)	G3 (0. 5)
Moisture %	76.27 ± 0.297^{a}	75.45 ± 0.286^{ab}	74.77 ± 0.304^{b}
Ash %	1.330 ± 0.119^{b}	1.245 ± 0.135^{b}	2.218 ± 0.358^{a}
Protein %	18.515 ± 1.722	22.320 ± 0.664	22.365 ± 1.129
Fat %	0.608 ± 0.014	0.615 ± 0.017	0.640 ± 0.015

a, b, ab: Means within a row containing different superscripts tended to differ (p<0.05); G1: Control group, G2: Rabbits treated with the basal diet supplemented with 0.25g Synbiotic/kg diet. G3: Rabbits treated with the basal diet supplemented with 0. 5g Synbiotic/kg diet.

Fat percentage in muscle tissue had a non significant increase as the Synbiotic level increased in the diet of rabbits.

In contrast, the moisture percentage in muscle tissue decreased significantly by increasing the Synbiotic level in the diet. In both treated rabbits in the 2nd and the 3rd groups. The moisture percentages were 75.45 and 74.77 %, respectively. They were less than in the control group by 0.82% and 1.5 %. This indicates that the dry matter is increased in treated rabbits by Synbiotic.

When Synbiotic treated rabbits, ash percentages had the highest significant value (2.218 ± 0.358 %) of the third t group compared with control and second groups. The results are in conflict with the results presented by Memon *et al*. (2024) which reported that the treated groups had lower ash percentages.

Conclusion

Supplementation of Synbiotic improved the body performance of rabbits, their carcass components, and dressing percentage without any harmful effect on rabbits.

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تأثير السينبيوتيك على أداء النمو وجودة ذبيحة الأرانب النامية

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الملخص

تبحث الدراسة في تأثير مستويات السينبيوتك على أداء الأرانب البلدي النامية وخصائص ذبائحها. تم استخدام ثمانية واربعون ارنب بلدي بعد الفطام، مختلطة الجنس 24 ذكر، 24 انثي سيتم وزنهم جميعا ووضعهم في بطاريات بالغرفة. كان متوسط وزن جسم الأرانب (770 ± 0.04 جرام) وتم توزيعهم على ثلاث مجموعات تجريبية تضم كلا منها 16 ارنباً. كل مجموعة تشمل 8 مكررات (أرنبين لكل قفص) كانت المجموعات الثانية والثالثة (G3, G2) هي المعاملات والمجموعة الأولي (G1) هي المجموعة غير المعاملة.

تم تغذية ارانب المجموعة الأولي (G1) على العليقة الأساسية فقط، بينما المعاملة الثانية (G2) تم تقديم العليقة الأساسية بالإضافة الي 0.25 جرام من السينبيوتيك لكل كجم من العلف، في المعاملة الثالثة (G3) تم تقديم العليقة الأساسية بالإضافة الي 0.5 جرام من السينبيوتيك لكل كجم من العلف. تم خلط السينبيوتيك تدريجيا بواسطة الخلاط وخلط كميات أكبر من العلف. تم تزويد الأرانب بخط ماء يدعم جميع الأقفاص.

زاد وزن الجسم ومعدل الزيادة اليومية بشكل غير معنوي عند إضافة السينبيوتيك، ومع ذلك لم يكن هناك تأثير معنوي على معدل تحويل الغذاء عند إضافة السينبيوتك عدا معدل تحويل الغذاء الكلي كان أفضل معنويا عند (P<0.0001) في المجموعات المعاملة (G3, G2).

لم تتأثر مكونات الذبيحة بشكل معنوي عند إضافة السينبيوتيك، عدا ان متوسط وزن الذبيحة كان اعلي معنويا (P<0.036) في الأرانب المعاملة بالسينبيوتيك (G3, G2). بينما انخفضت نسبة الرأس (P<0.0016) للأرانب المعاملة (G3, G2) مقارنةً بالمجموعة غير المعاملة (G1). ارتفعت نسبة امتلاء المعدة (P<0.062)في المجموعة غير المعاملة (G1)، بينما انخفضت نسبة امتلاء الأمعاء(P<0.028) في الأرانب المعاملة (المجموعتان G3، G2) مقارنة بالمجموعة غير المعاملة (G1)، ولكن نسبة الأمعاء الفارغة المئوية كانت أعلى (P<0.075، المجموعةG1) مقارنةً بالمعاملات الأخرى.

وقد ساهمت إضافة السينبيوتيك في تحسين أداء نمو الأرانب النامية ومكونات الذبيحة ونسبة التصافي دون أي تأثير ضار على الأرانب.

الكلمات المفتاحية: *ارانب، أداء الجسم، الذبيح، سينبيوتيك*