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Effect of Feed Restriction with or without Addition Saccharomyces Cerevisiae on Blood and Serum Biochemical Parameters of Arabian Lambs

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ABSTRACT

This study was conducted in the field of Animal / College of Agriculture / Wasit University for the period from 15/11/2016 to 26/2/2017. It included 20 Arab male aged 4-5 months and an average weight of 21.50 kg. The lambs were distributed equally randomly with four animals per treatment. experimental treatments were: First treatment: feed control free feed without additive yeast. The second: treatment was 80% of the control diet. The third treatment: 80% of the control diet, plus 5 g yeast / kg feed. The fourth treatment: 70% of the control diet and the fifth treatment: 70% of the control diet plus 5 g yeast / kg feed.The study found the following results: There were significant differences (P <0.05) in the number of RBC and WBC where the first, second and third treatment were had higher values (6.10, 5.65 and 5.85) and (8.67, 7.12 and 7.21) x 310 cells / mL respectively. The significant differences in values of concentration of hemoglobin and Packed cell voulum have similar traind to those of the red and white blood cells (P <0.05) for the first three treatments with the last two treatments. On other hand there were no significant differences in serum urea, total protein, cholesterol, GPT and GOT for different treatment .

Key words: *Cholesterol, Protein, Livestock, Yeast*

INTRODUCTION

Nutrition is the main factor affecting the profits of livestock projects, especially ruminants because they consume large amounts of feed compared to poultry. Therefore, the breeder seeks strategies and feeding systems to reduce the cost of nutrition and improving the performance of the animal production and health of animals. On the other hand, yeast (SC) is one of the oldest useful microorganisms. has been used as a growth promoter in ruminant diets to protect consumers from the risks of chemical growth catalysts. Yeast (SC) was used as feed additives in ruminant diets as it improved animal performance by modifying the microbial balance when feeding animals on high-energy diets. Chaucheyras- Durand *et al.*[12].

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In a study by Stanislaw and Przemysl[29] they found an increase in red blood cells and white blood cells when they used bread yeast to feed ewes. In the study of Al-Galibi[5], and Al-Ammara[2] they found an increase in hemoglobin concentrations in Arabi lambs when adding yeast to feed goat.Other studies showed a significant decrease in urea concentrations when yeast were added with rations dietary components with or without of Monensin and to lambs[13,18,19,21,25]. Gingerem and Mahmuod and Ahmed[1] showed significant differences ($P<0.05$) in total protein concentration when adding yeast to lambs rations Al-Barari and Arabi, respectively. In a study Mousa *et al.*[26] found a significant decrease in the concentration of GPT and GOT in the yeast groups compared to the control**.**

MATERIAL AND METHODS

The study was carried out in the field of animal research of the Agricultural Research Station / College of Agriculture / University Wasit. The study included two experiments. The first experiment was the experiment of growth and fattening of 90 days. It started on 15/11/2016 and ended on 26/11/2017 on 20 Arabi lambs were purchased from the local market at the age of 5-4 months. free from diseases and parasites, was divided into five nutrition groups, equal to 4 lambs for each group, provided free water throughout the experiment. While concentrated diet fed 3% of body whight in two meals a day at 8 am and 4 pm. The quantities provided were based on the new weight of the animals for every two weeks. The amount of diet provided and the residual was calculated for the feed intake The lambs were fed for a preliminary duration of one week and then weighed for primary weight stabilization and experimental treatments were as follows: First treatment: feed control free feed without additive. The second: treatment was 80% of the control diet. The third treatment: 80% of the control diet, plus 5 g yeast / kg feed. The fourth treatment: 70% of the control and the fifth treatment: 70% of the control plus 5 g yeast / kg feed.

Table 1: Components of the experimental diet (%)

ingredient	First The control	The Second 80% of control	The third 80% 0f control +yeast	The fourth control 70% of	The fifth 70% of control + yeast
Barley	61	61	61	61	61
Brian	35	35	35	35	35
Urea	1	1	1	1	1
Vitamins and minerals	2	2	2	2	2
Food salt	1	1	1	1	1
Yeast 5 g / kg feed	-	-	5	-	5

Table 2: Chemical composition of the ingredients of the experiment diet

Chemical Composition	(%)
Dry matter	88.24
Organic matter	84.20
Crude protein	14.96
Crude fiber	7.68
Ether Extract	2.27
Ash	4.07
Nitrogen free extract	62.14
ME mj/kg DM	11.56

Collection of blood and parameters measured

The blood samples were taken from the jugular vein of the lambs once a month. The samples were taken with 10 ml sterile syringes, 2 ml of which were placed in special tubes containing ethylene diamine tetra acetic acid (EDTA) and transferred to the laboratory In a vessel containing ice cubes to avoid blood decomposition to measure blood values, while the remaining blood sample (8 ml) was placed in a test tube free of any anticoagulants to facilitate the isolation of the serum after leaving the tubes containing the blood Apply a little diagonal at 4 ° C for 24 hours. The blood was then separated by placing the tubes containing the blood (8 ml) in the centrifuge and 3000 cycles / min for 15 minutes. The serum was then removed using a sterile medical syringe. The serum was placed in sterile clean tubes, Until all the biochemical components are analyzed. Calculation of red blood cell count (RBC) and pack cell volumes (PCV) : According to Hughes *et al.*[23] And Calculation of White Blood Cell Count (WBC): According to Hean[20] while Estimation of Hemoglobin (Hb): According to Schalm *et al*.[28] and Measurement of urea concentration: Using the Kit provided by the French company Biomerieux and based on the steps referred to by Tietz[31] And Measuring total protein concentration:Using the kit produced by the French company Biolabo, Tietz[30] And Measure the concentration of cholesterol:using the kit of Biolabo, Tietz[30] And Measuring the concentration of GPT and GOT :Several prepared analyzes were used by the French company Biolabo, Frankel and Reitman[17].

RESULTS AND DISCUSSION

Table (3) shows the mean number of red blood cells and white blood cells between the different treatments. There were significant differences in the number of red blood cells. the first, second and third treatment were had higher values (6.10, 5.65 and 5.85) in the red blood cell count and (8.67, 7.12 and 7.21) x 310 cells / mL in white blood cells, respectively. The last two treatments has lowers values may due to obtained (70%) of the free feeding. These results were consistent with a study by, Stanislaw and Przemysl[29] who found an increase in the number of red blood cells and white blood cells when using yeast in feeding ewes (P <0.05). While these results did not agree with what, El-Shamaa[14] and Al-Faris[6], who found no significant different of white blood cells number when adding yeast to male lambs ration.

Table 3: Mean numbers of red blood cells and white blood cells for different treatments ± standard error

Trait Treatment	Number of white blood cells X ^{3}10 cell / ml	Number of red blood cells x^{6}10 ml / ml
First ad lib the control	8.67 ± 0.86 a	6.10 ± 0.31 a
Second 80% of control	7.12 ± 0.92 a	5.65 ± 0.20 a
Third 80% of control+ yeast 5 g / kg	7.27 ± 0.70 a	5.85 ± 0.15 a
Fourth 70% of control	6.00 ± 0.41 b	5.20 ± 0.24 b
Fifth 70% of control + yeast 5 g / kg	6.15 ± 0.51 b	5.23 ± 0.33 b

Values in a column bearing different superscripts differ significantly * (P<0.05)

Table (4) shows the average concentration of hemoglobin in the blood of different treatments, which was significantly different at (P<0.05). where the concentration of hemoglobin was (10.50) g / 100 ml, in first while the values of second, third (9.73, 9.95) g

/ 100 ml, respectively. While there was a significant difference in from values of fourth and fifth treatment. while the percentage of packed cells volume had the same treined to values concentration of hemoglobin in significant differences and the values of first, second, third, fourth and fifth treatment were (34.25, 34.50, 34.75, 28.20 and 28.24)% respectively, These results were agreed with, El-Shamaa[14] and Al-Fares[6] where they found significant differences (P <0.05) in the values of hemoglobin as well as an increase in the packed cells volume when addition the yeast to diet of male lambs (0.5 Rahmani x0.5 romanove) and arabi lambs, while this result in agreement with Bugdayci, how find significant differences (P <0.05) in hemoglobin concentration and packed cells volume . On other hand our results was in agreement with Elsheikh *et al*[15] who found significant differences in hemoglobin concentration and packed cell volume between restricted and ad lib feeding groups, but Kheirnad and Ahmed[1] not found that. The differences between studies may be due to different in period, type and percent of restricted diet

Table 4: Mean packed cell volume and hemoglobin concentration for different treatments ± standard error

Trait / Treatment	Packed cell volume (%)	Hemoglobin concentration (gm / 100 ml)
First ad lib the control	34.25 ± 0.49 a	10.05 ±0.33 a
Second 80% of control	34.50 ±0.28 a	9.73 ±0.08 a
Third 80% of control+ yeast 5 g / kg	34.75 ±0.47 a	9.95 ± 0.14 a
Fourth 70% of control	28.20 ± 1.65 b	8.13 ± 0.56 b
Fifth 70% of control + yeast 5 g / kg	28.24 ± 1.10 b	8.15 ± 0.37 b

Values in a column bearing different superscripts differ significantly * (P<0.05)

Table (5) indicates that there is no significant difference in blood urea, total protein and cholestrol for the different treatment, the values ranged from (6.26-4.42), (6.01-4.84) and (63.20-53.35) respectively. This results in agreement with Kommonna, Oguz *et al.*[27] and Muhammad, and disagreement with Ghoneem and Mahmuod[18] how not found significant differences in blood urea, total protein in diet of control with treatment yeast add.

Table 5: Average blood characteristics (blood urea, total protein, and cholesterol) for different treatments ± standard error

Trait / Treatment	Total protein (gm / 100 ml)	Blood urea (mmol / L)	Cholesterol (mg/100ml)
First ad lib the contro	5.81 ±0.72	6.26±1.16	63.20±4.17
Second 80% of control	5.2 ± 0.48	5.18±0.49	63.12±13.09
Third 80% of control+ yeast 5 g/ kg	6.01±0.53	4.42±0.54	62.33±16.92
Fourth 70% of control	5.83±0.69	5.11±0.82	53.40±16.20
Fifth 70% of control + yeast 5 g / kg	4.84±0.41	5.79±1.00	53.35±11.86
Level of significance	N.S	N.S	N.S

Table (6) shows the mean GOT and GPT levels, there is no significant difference between treatment the values ranged from (56.17-51.42) and (24.68-20.13) respectively. The values of our study in the range of studies of Al-Galibi[5], Al-Harees[3] and Muhana, And disagreement with Abdou *et al.*[9] how found significant differences in the concentration of the GPT and GOT through its study in which feed mixtures were used.

Table 6: Mean GPT and GOT for Different Treatments ± Standard Error

Trait / Treatment	GOT (IU / L)	GPT (IU / L)
First ad lib the control	54.16 ± 3.38	24.68 ± 2.95
Second 80% of control	55.12 ± 4.59	93.92 ± 3.84
Third 80% of control+ yeast 5 g / kg	56.17 ± 8.13	21.87 ±3.48
Fourth 70% of control	51.42 ± 1.42	20.13 ± 2.98
Fifth 70% of control + yeast 5 g / kg	53.53 ± 4.84	21.77 ± 4.29
Level of significance	N.S	N.S

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