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Effect Of Using Different Levels Of Watermelon Seeds On Productive Performance And Some Physical And Biochemical Blood Properties In Awassi Sheep

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Abstract

The study aimed to know the effect of using different levels of crushed watermelon seeds on some blood and carcass characteristics of Awassi sheep. Sixteen Awassi sheep were used in the experiment, aged 3-4 months, with an average initial weight of 25 ± 1 kg. The sheep were divided into four groups (four sheep per group) and the treatments were distributed randomly to the groups. The first group was considered as a control group, while the second, third and fourth groups were fed on a provender containing 1.5%, 3%, and 4.5% of the crushed watermelon seeds. The experimental sheep were fed on a concentrated provender of 3% of the live animal's weight on the basis of dry matter, while the hay was provided freely, and the animals were weighed weekly to adjust the amount of feed provided according to the change in weight.

The results of this study indicated the following: No significant differences (P≤0.05) were recorded between the groups treated with watermelon seeds and the control group in the average body weight during the 106 days of the experiment, while the amount of daily weight gain increased significantly (P≤0.05) in favor of the fourth treatment during the period (71-106 days) compared to the control and experimental treatments, and the overall weight gain rate did not differ significantly (P≤0.05) compared to the rest of the treatments. The general average of feed conversion efficiency was not significantly affected (P≤0.05) during the entire period of the experiment and for all experimental treatments, as well as the average amount of the provender weekly intake did not show any significant effect (P≤0.05) between the experimental and control treatments, and this is what happened for Final weight of sheep, the experiment was not significantly affected (P≤0.05) compared to the control treatment. The physical properties of blood WBC 10^3/ml, RBC 10^6/ml, Hbg/100ml and PCV% No significant differences (P≤0.05) were recorded between the groups treated with watermelon seeds compared to the control group for the duration of the experiment. The level of thyroxine hormone T4 nmol/L decreased significantly (P≤0.05) in the fourth and third treatments on day 70 of the experiment, while on day 106 the fourth treatment recorded a significant increase (P≤0.05) in the level of TSH in mmU/L compared to other treatments. There were no significant differences (P≤0.05) between groups in the level of growth hormone GH ng/ml throughout the duration of the experiment, but the fourth and third group had an increase in urea level of g/100 ml at day 70, while no significant difference was indicated. (P≤0.05) between treatments in creatinine level mg/100ml.

Key words: watermelon seeds, growth hormone, thyroid hormones, Awassi sheep

Introduction :

Provender is the main entrance in all animal production projects, feeding systems have been developed to take advantage of all available feed resources. Traditional animal provender resources, especially in developing countries, have become expensive due to competition with humans and export of these products to earn foreign exchange, so the use of animal feed resources has become an unconventional supplement for energy and protein in the Provender of ruminant animals is essential. The availability of watermelon seeds and sheep in the same area provides a good opportunity to include these seeds in diets for the production of sheep ready for local consumption or export. and it has to include watermelon seeds within the components of the animal provender in good proportions that support the good performance of fattening them (Heddia et al., 2020). Watermelon Citrullus lanatus belongs to the Cucurbitaceae family and is known as watermelon (Hassan, 1988). Generally, cucurbit seeds are used in extracting fats because they contain a good proportion of fats. Watermelon seeds have a high nutritional value as they contain 32% fat, 27-51.4% protein, and sugars. 15% (Kamel et al., 1985) Also, 100 gm of fruit meat contains 0.5 mg of iron, 1 mg of sodium, 100 mg of potassium, 0.2 niacin, 8 mg of magnesium (Hassan, 1988), 6 mg of vitamin C, 0.05 g of riboflavin, and 590 IU of ascorbic acid (Al-Mohammadi and Jassim, 1983) Moreover, watermelon seeds have a high content of essential fatty acids. The main fatty acids in watermelon seed oil are linoleic 68.3%, oleic 13.3%, palmitic 11.4% and citric acid 7% (Moaddabdoost et al., 2010) that make watermelon seeds a potential source of protein and fat (El-Adawy and Taha, 2001).

Proteins play a large and important role in the animal body, as they represent the main parts of all structural tissues, in addition to their importance for most body functions such as antibodies, most hormones, enzymes, and genes, all of which are partial or complete protein units. The non-nitrogenous part of the protein can be metabolized to generate energy in cases And protein by its nature represents the cornerstone when making feed by exploiting common by-products and crop residues such as seeds and oil- cake after extracting oils from them to represent an important source of nutrients for livestock and a source of protein and energy (Suliman and Babiker, 2007).

The aim of the study was to know the effect of different levels of watermelon seed on some weight, physical and biochemical parameters of blood in the serum of Awassi sheep.

Research materials and methods:

The experiment was carried out on the farm of the Department of Animal Production of the College of Agriculture / Tikrit University, which included 16 Awassi sheep (all from the same farm) at the age of 3-4 months and for a period of 106 days. after an introductory period of two weeks, the sheep were weighed and distributed randomly into four fairly homogeneous groups with a general average of 25.15 ± 1.40 kg, all the sheep were placed in individual cages with dimensions of 1 x 2 m^2.

Water was available throughout the experiment, with hay freely available to the animals. After that, the sheep groups were fed in different proportions as follows: the first group (control): watermelon seeds 0%, the second group: 1.5% watermelon seeds, the third group: 3% watermelon seeds, and the fourth group: watermelon seeds 4.5% (table) 1) The animals were weighed weekly to calculate their need for the provender using an electronic scale with an accuracy of 10 g.

Table (1): The proportions of materials used in the composition of the experiment provender

T4	T3	T2	T1	Treatment / Item
52.44	**52.44**	**53.83**	**53.6**	Barley
5.6	**5.96**	**6.06**	**7.4**	soybean meal
35.46	**36.1**	**36.61**	**37**	wheat bran
4.5	**3**	**1.5**	**0**	watermelon seeds
1	**1**	**1**	**1**	salt
1	**1**	**1**	**1**	vitamins and minerals
100	**100**	**100**	**100**	Total

Table (2): Chemical Structure of Experimental Diets (Based on Dry Matter)

T4	T3	T2	T1	provender / Components
89.90	**89.90**	**89.93**	**89.93**	dry matter
95.59	**95.60**	**95.64**	**95.65**	Organic matter
14.67	**14.50**	**14.20**	**14.33**	raw protein
7.86	**7.87**	**7.84**	**7.81**	fiber
2.32	**2.36**	**2.36**	**2.38**	Fats
4.41	**4.39**	**4.36**	**4.35**	ash
70.74	**70.88**	**71.23**	**71.12**	*NFE nitrogen-free extract
1.136	**1.137**	**1.139**	**1.140**	** food assimilated metabolic energy MJ / Kg

* Nitrogen-free extract = organic matter - (Raw protein + Raw fiber + ether extract).

** Metabolic energy represented as MJ/Kg based on dry matter = Raw protein x 0.012 + ether extract x 0.031 + Raw fiber x 0.005 + nitrogen-free extract x 0.014.

**The represented energy was calculated according to (Maaf, 1975)

Blood was drawn three times over the course of the experiment on days 35, 70 and 106 from the jugular vein with a 10ml syringe divided into two tubes, one containing the anticoagulant substance EDTA to examine the blood picture, and another tube containing a Cloat activator for the purpose of blood clotting and serum isolation for biochemical tests. The number of red blood cells was calculated based on Schalm et al. (1975), and the differential count of white blood cells according to the Mckenezie method (2004), As for hemoglobin, it was calculated by Hillman and Ault (2002) method, and the packed cell volume was calculated using the Haematocrit reader according to (Dacie and Lewis, 1995). The levels of threonine, thyroxine, thyrotropin, growth hormone, urea and creatinine in the blood serum were measured by means of ready-made analyzes CORMANY SA (Kit) Made in Poland by Auto biochemistry analyzer (Model accent 200) Made in Poland.

Statistical analysis:

The study data was analyzed using a simple complete randomized design CRD to find out the effect of adding watermelon seeds at a rate of (1.5, 3 and 4.5%) on some productive traits and some blood physical and biochemical parameters in the blood serum of Awassi sheep according to the statistical

program SPSS 22 according to the mathematical model Yij= μ+ti+eij, where Yij represents the observation value j of the treatment i for each of the studied traits, μ = the overall mean, and ti = the effect of the treatments, where i=(1, 2, 3 and 4) . And eij = represents the amount of random error found in the observation j of treatments i and is normally and independently distributed, then compare the significant differences using Duncan's multiple-range test (Duncan, 1955).

Results and discussion:

Table (3) Effect of using different levels of crushed watermelon seeds on some weight characteristics, amount of provender intake and food conversion efficiency of Awassi sheep (mean ± standard error).

the treatments					
fourth	third	second	first	**Fattening period / day**	**Trait**
19.8±152.4	**11±168.6**	**7.3±172.2**	**10.7±162.2**	**35 -0**	**daily increase (gm)**
32.8±206.6	**21.2±200.2**	**10.6±188**	**13.9±211.2**	**70 - 36**	
a 30.1±278	**b 15.8±194.2**	**b 24±192**	**ab 27.9±215.8**	**106 - 71**	
19.07 ± 212	**10.69 ± 187**	**11.55±184.06**	**15.04 ± 196.4**	**المتوسط العام**	
0.21±4.60	**0.31±4.50**	**0.42± 4.63**	**0.69±4.33**	**35 -0**	**Weight gain rate (kg)**
0.65±7.05	**0.85±7.00**	**0.17±6.58**	**0.87±6.50**	**70 - 36**	
0.33±6.83	**0.61±6.80**	**0.83±6.73**	**0.52±6.85**	**106 - 71**	
0.97±18.12	**1.15±18.30**	**1.02±17.92**	**1.56±17.67**	**المجموع الكلي**	
1.73±26.80	**1.13±27.73**	**1.52±27.39**	**2.79±27.10**	**35 -0**	**Average body weight (kg)**
0.94±33.64	**1.37±33.00**	**1.42±32.45**	**3.35±32.20**	**70 - 36**	
1.22±43.25	**1.59±39.56**	**0.96±38.99**	**3.70±38.41**	**106 - 71**	
0.91±33.99	**1.35±33.42**	**1.27±32.94**	**3.09±32.73**	**المتوسط العام**	
0.34±7.78	**0.71±7.36**	**0.98±7.05**	**0.37±6.73**	**35 -0**	**feed conversion efficiency**
0.39±5.68	**0.72±5.52**	**0.13±5.28**	**0.61±5.82**	**70 - 36**	
0.41±7.46	**0.31±6.53**	**0.90±7.43**	**0.65±5.56**	**106 - 71**	
0.15±6.97	**0.34±6.47**	**0.64±6.58**	**0.35±6.03**	**المتوسط العام**	
0.36±5.63	**0.24±5.82**	**0.32±5.75**	**0.59±5.69**	**35 -0**	**Average weekly intake of provender (kg)**
0.33±6.83	**0.29±6.93**	**0.30±6.82**	**0.70±6.76**	**70 - 36**	
0.27±8.34	**0.34±8.31**	**0.20±8.19**	**0.68±8.17**	**106 - 71**	
0.31±6.93	**0.28±7.01**	**0.26±6.91**	**0.65±6.87**	**المتوسط العام**	
4.73±105.43	**4.33±106.77**	**4.06±105.08**	**9.90±104.61**	Provender total intake (kg)	
0.69±26.02	**1.05±26.35**	**1.21±26.62**	**2.45±25.57**	Starting weight (kg)	
1.22±43.25	**1.67±42.35**	**0.74±41.95**	**1.48±44.30**	Final weight (kg)	

- The absence of different letters horizontally means the absence of significant differences between the experimental treatments (P≤0.05).
- First treatment: control group 0% watermelon seeds. - The second treatment: the second group

1.5% watermelon seeds.
The third treatment: the third group 3% watermelon seeds. Fourth treatment: the third group 4.5% of the watermelon seeds.
The groups treated with different levels of watermelon seeds 0, 1.5, 3 and 4.5% did not show any significant effect in the daily weight increase for the period (0-35 days) compared to the control group, where the average increase in this period was 162.2, 172.2 and 168.6 and 152.4 g, respectively, and this was also observed in the period of (36-70 days) of the experiment for each of the four treatments, but at the period (71-106) days of the experiment, the increase in the percentage of adding watermelon seeds to 4.5% was positively reflected in The fourth treatment, as it was significantly superior ($P < 0.05$) compared to the control treatment and they were 215.8, 192, 194.2 and 278 g for each of the first, second, third and fourth treatments, respectively. While in the general average of the four treatments, treatment with watermelon seed powder did not show any significant differences, and the results in the table showed that the groups treated with different levels of watermelon seed 0, 1.5, 3 and 4.5% did not show any significant effect in the rate of the total weight increase for the period (0-35 days) reached 4.33, 4.63, 4.50 and 4.60 kg, respectively. This was also observed in the period of (36-70 days) of the experiment for each of the four treatments, as well as when the period (71-106) days of the experiment period did not show significant differences, as the total weight increase rate for this period was 6.85, 6.73, 6.80 and 6.83 kg for each of the experimental treatments compared to the control treatment, respectively, and we also note the absence of significant differences in the overall total weight increase among the four treatments, Also, no significant difference was observed in the groups treated with watermelon seeds compared to the control group in the period of 36-70 days. Also, no significant difference was observed between the treatments within the period 71-106 days of the experiment, where the average body weight in this period was 38.41, 38.99 and 39.56 and 43.25 kg, respectively, and the general average of this trait did not differ significantly between the experimental and control treatments, as it reached 32.73, 32.94, 33.42 and 33.99 kg, respectively. Regarding the weekly Provender intake, it is noted from the results in Table (3) that there are no significant differences between the groups treated with watermelon seeds compared to the control treatment within the period (0-35 days) of the experiment, as the average amount of Provender consumed weekly in this period was 5.69 and 5.75, 5.82 and 5.63 kg, respectively, And there were no significant differences in the quantity of provender ingested during the period (36-70 days) of the experiment, as well as the period from (71-106 days), as the average intake amounted to (6.76, 6.82, 6.93, 6.83), (8.17 ,8.19, 8.31 and 8.34) kg for the experimental treatments compared to the control, respectively. As well as the total Provender intake, it did not differ significantly between the four treatments, and the average total Provender intake in these groups was 104.61, 105.08, 106.77 and 105.43 kg, respectively.
Table (3) shows that there are no significant differences in the food conversion efficiency for the period from 0-35 days in this study, as it reached 6.73, 7.05, 7.36 and 7.78 kg for the four treatments, respectively, and the levels were close and insignificant for the period from 36-70 days, in addition to the period from 71-106 days, as the experimental treatments did not differ significantly compared to the control group, There were no significant differences in the final weight, which amounted to 44.30, 41.95, 42.35 and 43.25 kg for each of the experimental treatments compared to the control group, and the results were in agreement with what was stated by Eldin et al., 2011 and El Hassan, 2017.

Table (4) Effect of using different levels of crushed Watermelon seeds on some physical characteristics of Awassi sheep blood (mean ± standard error).

fourth	third	second	first	Trial duration / day	Trait
1.56±6.05	**1.67 ±6.78**	**2.58±9.68**	**3.17±6.58**	**35-0**	WBC (10^3/ml of blood)
1.02±6.88	**1.41±6.89**	**1.48±8.83**	**1.96±6.61**	**70-36**	
1.08±8.86	**1.60±9.00**	**1.06±8.39**	**1.01±8.90**	**106-71**	
1.03±3.74	**0.09±4.24**	**0.18±3.84**	**0.22±4.28**	**35-0**	red blood cell count (10^6/ml of blood)
0.44±4.51	**0.50±4.60**	**0.25±4.31**	**0.31±4.66**	**70-36**	
0.55±4.67	**0.56±4.71**	**0.35±4.58**	**0.31±4.73**	**106-71**	
2.61±9.10	**0.59±10.78**	**0.48±10.08**	**0.43±11.48**	**35-0**	haemoglobin gm/100ml of) (blood
0.38±11.58	**0.85±11.28**	**0.53±10.30**	**0.68±10.45**	**70-36**	
0.71±11.00	**0.66±11.03**	**0.77±9.90**	**0.35±9.88**	**106-71**	
4.61±30.03	**2.59±35.57**	**2.48±33.26**	**3.43±37.89**	**35-0**	PCV(%)
1.38±38.21	**1.85±37.22**	**3.53±34.00**	**3.68±34.49**	**70-36**	
2.71±33.00	**1.66±36.37**	**2.77±32.67**	**2.35±32.6**	**106-71**	

- The absence of different letters horizontally means that there are no significant differences between the experimental treatments (P≤0.05).
- First treatment: control group 0% watermelon seeds. - The second treatment: the second group 1.5% watermelon seeds.
The third treatment: the third group 3% watermelon seeds. Fourth treatment: the third group 4.5% of the watermelon seeds.
It is evident from Table (4) that there is no significant effect of using different levels of crushed watermelon seeds on the numbers of white blood cells in the serum of sheep experimental treatments compared to the control treatment in the period (0-35 days), which amounted to 6.58, 9.68, 6.78 and 6.05 × 10^3 / ml of blood, respectively, as well as in the period from (36-70 days) there was no significant difference in the four experimental treatments, as their values reached 6.61, 8.83, 6.89 and 6.88 x 10^3 / ml of blood, and this also happened In the period (71-106 days) of the experiment, there was no significant significance in the experimental treatments compared to the control, it was 8.90, 8.39, 9.00 and 8.86 x 10^3/ml of blood for the four treatments, respectively.
The results in Table (4) did not show a significant difference in the number of red blood cells in the period (0-35 days) of the experiment, which amounted to 4.28, 3.84, 4.24 and 3.74 x 10^6 / ml of blood for the four treatments, respectively, and there were also no significant differences Between the groups treated with watermelon seeds and the control treatment in the period (36-70 days), and there was also no significant effect of the experimental treatments compared to the control group for the period (71-106), its value was 4.73, 4.58, 4.71 and 4.67 x 10^6 / ml of blood for the four treatments respectively, The results of the experiment showed in Table (4) that the hemoglobin concentration did not indicate any significant difference between the treatment groups compared to the control group, as it reached 11.48, 10.08, 10.78 and 9.10 g/100 ml of blood for the four treatments, respectively, in the period (0-35 days) from The experiment, and that the duration (36-70 days) of the experiment did not appear from the use of crushed watermelon seed any significant effect on the concentration of hemoglobin of the experimental treatments compared to the control

treatment, as well as the duration (71-106 days) in which the concentration of hemoglobin was not significantly affected by the levels of addition of The crushed watermelon seeds and it reached 9.88, 9.90, 11.03 and 11.00 g/100ml for the four treatments, respectively.

Table (4) records the case for the volume of the packed red blood cells that did not show a significant difference during the period (0-35 days) of the experiment, which amounted to 37.89, 33.26, 35.57 and 30.03. Also, no significant effect of the experimental treatments was observed compared to the control in the period (36 -70 days), in addition to the duration of (71-106 days) of the experiment, there was no significant difference in all treatments, as the percentages amounted to 32.60, 32.67, 36.37 and 33.00, respectively,

Fourth treatment	Third treatment	Second treatment	First treatment	The day of the experiment	Trait
0.079±4.116	**0.330±3.767**	**0.371±4.335**	**0.179±3.822**	**35**	Threonine T3 nmol/L
0.162±2.461	**0.192±2.326**	**0.226±2.405**	**0.200±1.837**	**70**	
0.191±1.755	**0.030±1.947**	**0.165±1.762**	**0.104±2.103**	**106**	
1.372±4.571	**1.437±4.437**	**0.384±5.784**	**0.894±5.448**	**35**	thyroxine T4 nmol/L
c0.136±4.434	**bc0.453±5.808**	**ab0.89±6. 651**	**a0.885±8.474**	**70**	
0.603±7.658	**0.089±8.220**	**0.510±7.667**	**0.319±8.728**	**106**	
0.004±0.021	**0.008±0.031**	**0.094±0.119**	**0.003±0.023**	**35**	thyrotropin TSH mU/L
0.140±0.830	**0.088±0.994**	**0.083±0.858**	**0.132±1.000**	**70**	
a0.637±1.276	**b0.043±0.206**	**b0.038±0.082**	**b0.072±0.207**	**106**	
0.697±1.867	**0.469±0.975**	**0.364±1.509**	**0.311±0.889**	**35**	growth hormone GH ng/ml
0.058±0.202	**0.007±0.142**	**0.005±0.137**	**0.025±0.152**	**70**	
0.135±0.195	**0.007±0.018**	**0.002±0.007**	**0.002±0.008**	**106**	
0.041±0.800	**0.087±0.750**	**0.095±0.825**	**0.063±0.725**	**35**	urea g/100ml
a0.085±0.675	**ab0.085±0.625**	**bc0.075±0.425**	**c0.041±0.300**	**70**	
0.029±0.750	**0.025±0.575**	**0.168±0.700**	**0.048±0.475**	**106**	
0.920±33.925	**0.958±33.490**	**1.371±34.950**	**0.898±33.575**	**35**	Creatinine mg/100 ml
1.558±21.475	**1.129±24.625**	**1.882±23.125**	**1.682±22.300**	**70**	
3.161±33.950	**3.475±34.600**	**1.145±33.900**	**2.099±36.625**	**106**	

Red blood cell values are affected towards an increase in small ruminants in response to external stimuli or mistreatment during husbandry and daily dealing with animals, which leads to the release of adrenaline and thus to the occurrence of contractions in the spleen and this leads to the release of more red blood cells in the circulation (Gartner et al., 1969).

On the contrary, only psychological calm can reduce the negative effect on the spleen, and this can only be achieved by holding the animal for 15-20 minutes before making the decision to take a blood sample. Several studies have indicated that hemoglobin values and pocked cell volume pcv decreased during the first week of life; Then it stabilizes with a slight downward trend, during the first few months and then increased with age which may be due to different breed, management and environmental factors (Schalm et al., 1975).

Table (5) Effect of using different levels of crushed watermelon seeds on some hormones, urea and creatinine in the blood of Awassi sheep (mean ± standard error).

- The absence of different letters horizontally means the absence of significant differences between the experimental treatments (P≤0.05).
- First treatment: control group 0% watermelon seeds. - The second treatment: the second group 1.5% watermelon seeds.
- The third treatment: the third group 3% watermelon seeds. Fourth treatment: the third group 4.5% of the watermelon seeds.

The results of the statistical analysis are shown in Table (6) for adding different levels of crunch watermelon seed 1.5, 3, and 4.5 % to the experimental animals provender, as there was no significant effect on the 35th day of the experiment from the addition on the concentration of thyrotropin hormone (TSH), its concentration was 0.023 and 0.119, 0.031 and 0.021 mmU/L for the experimental treatments compared to the control treatment, and this was also found on day 70, as no significant effect was observed for the four treatments, which were 1.00, 0.85, 0.99 and 0.83 mmU/L, respectively, while there was a difference Significant (0.05 ≥P) for treatment with 4.5% watermelon seed powder in the level of thyroid stimulating hormone (TSH) on day 106 of the experiment for the fourth treatment compared to the third treatment and the control, as it reached 0.20, 0.08, 0.20 and 1.27 mmU/L for the four treatments, respectively.

The results in Table (6) showed that the groups treated with different levels of watermelon seeds 1.5, 3 and 4.5% did not show any significant effect (P < 0.05) on the T3 threonine hormone concentration rate compared to the control group. The concentration of this hormone was 3.82, 4.33, 3.76 and 4.11 nmol/liter in the blood of the experimental treated sheep compared to the sheep of the control treatment. Also, there was no significant change on the 70th day of the experiment, as the levels of this hormone reached 1.83, 2.40, 2.32 and 2.46 nmol/liter in the blood of the four groups respectively, as well as on day 106, the concentration of this hormone did not differ significantly in the experimental treatments compared to the control treatment, as its concentration reached 2.10, 1.76, 1.94 and 1.75 nmol/liter, respectively. As for thyroxine hormone T4, the data in Table (6) indicated that the treatment with different percentages of watermelon seeds did not have any significant effect during the 35th day of the experiment, but the increase in the time period with the addition of different percentages of watermelon seeds to the provider presented to the experimental sheep on the 70th day had Significant effect (P < 0.05) in gradually decreasing the level of this hormone, as the third and fourth treatment decreased significantly compared to the control and second treatment, and the levels reached 8.474, 6.651, 5.808 and 4.434 nmol/L for the four treatments, respectively. Whereas, day 106 did not differ significantly between the experimental treatments and the control group, and its concentrations were 8.72, 7.66, 8.22 and 7.65 nmol/L, respectively. Table (6) shows that the use of different levels of crushed watermelon seeds in some hormones for the blood of the Awassi sheep, where the results of the statistical analysis of the concentration levels of GH showed that the level of this hormone was not affected significantly on the 35th day of the experiment, its concentration reached 0.88, 1.50 and 0.97 and 1.86 ng/ml for the experimental treatments, respectively, And its concentration was not significantly affected on the 70th day of the experiment and it reached 0.15, 0.13, 0.14 and 0.20 ng/ml for the four treatments, respectively. Also, no significant superiority was noticed on the 106th day of the experiment and its concentrations were taken 0.008, 0.007, 0.018 and 0.195 ng for the treatments. Experimental compared to control treatment. It is noted from the results of the statistical analysis in Table (6) that the treated with crushed watermelon seeds had no significant effect on the level of blood urea concentration on the 35th day of the experiment, as the urea concentrations in the experimental treatments were 0.725, 0.825, 0.750 and 0.800 g/100 ml for the

four treatments, respectively. While on the 70th day of the experiment, an increase in the level of urea concentration was observed, as it increased in the fourth treatment with a significant difference (0.05 ≥ P) compared to the control treatment and the second treatment, and the concentration level reached 0.300, 0.425, 0.625 and 0.675 g/100 ml for each of the four treatments, respectively. And there was no significant effect on serum urea level on day 106 of the experiment, and the values were 0.475, 0.700, 0.575 and 0.750 g/100 ml for the four treatments, respectively. The results in Table (6) did not indicate a significant difference in the creatinine level of the blood serum of the experimental sheep fed on different percentages of watermelon seed powder 0, 1.5, 3, 4.5% for the four treatments, respectively.

Its level on the 35th day of the experiment reached 33.575, 34.950, 33.490 and 33.925 mg/100 ml for the four experimental treatments, and no significant effect was observed on the 70th day of the experiment. Its level in the blood of sheep in the four treatments reached 22,300, 23.125, 24.625 and 21.475 mg/100 ml, respectively. Also, on day 106, there was no significant significance in the creatinine level, as its level reached 36.625, 33,900, 34,600 and 33.950 mg/100 This indicates that there are no significant differences in the level of creatine between the experimental treatments compared to the control treatment. The protein source consumed has a significant effect on thyroid hormone concentration, (Carvalho et al., 2000), and long-term lack of essential amino acid intake alters thyroid axis activity (Carew et al., 1997 and Saggau et al., 2000). Deficiencies in these nutrients vary in their individual effects on plasma thyroid hormone concentrations. (Carew et al., 1997), On the contrary, the TSH concentration of 1.276 in the treatment increased significantly by 4.5% ($P < 0.05$) compared to the treatments 1.5 and 3% and the control 0.082, 0.206 and 0.207, respectively. Elevated TSH concentration had no effect on plasma T3 levels. Conversely, plasma T4 level decreased only due to lysine restriction. Possible explanations for these findings could be increased thyroid hormone secretion, alteration of T4 to T3 conversion or changes in hormone clearance (Carew et al., 1997), The results also indicate that the level of growth hormone GH was not significantly affected by the level of addition of watermelon seeds over the five, ten and fifteen weeks. As for the level of blood urea concentration, it increased in the treatment 4.5% of watermelon seeds 0.625 with a significant difference (0.05 ≥ P) for the treatment. The second treatment was 1.5% and the control was 0.425 and 0.300, respectively.

An increase in dietary protein leads to an increase in urea production. If animals are fed increased amounts of protein, this can lead to an increased production of urea in the blood serum and can also be referred to as an age-related increase in serum urea. As well as this increased protein catabolism and the consequent increase in urea formation, at least in part, to the increase in serum urea that accompanies conditions associated with tissue damage (Witting et al., 2006). The results did not indicate a significant difference between the treatments compared to the control in creatinine concentration.

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