# EFFECT OF UREA ON SOME PRODUCTIVE AND PHYSIOLOGICAL TRAITS OF AWASSI LAMBS

**Hameed Ali Wedah, Ahmed Jawad Al-Yasseri, WafaaHameed Al-Samaraae[1] and AlaaSalehJassim**
Animal Production Department, College of Agriculture, Al-Muthanna University, Iraq.
[1]Animal Production Department, College of Agricultural Engineering Sciences, University of Baghdad, Iraq.

***Abstract***
***The study was conducted at the animal field of the First Agricultural Research and Experiments Station, the College of Agriculture, Al-Muthanna University, from 8/15/2019 to 2/15/2020, to determine the effect of adding different percentages of urea in the diets on the values of blood characteristics and some production and physiological characteristics. A total of 20Awassi lambs, 4 month age were used. Placed in typical sheds in hygienic conditions, underwent a treatment program and a vaccine to ensure safety from diseases. The animalsstudy were divided into four groups, which were (the control group, a diet devoid of 0% of urea, the second, third and fourth groups whose relationships include urea in graded rates of 1%, 1.5% and 2% respectively) for a period of 60 days. The results showed a significant superiority of (P≤0.05) in the diet to which urea was added by 2%, followed by the treatment to which urea was added by 1.5% over the other treatments in the production, physiological and blood parameters values, while the treatment with added 1% urea did not show any significant difference from the control group. Conclude from the results of the research that the addition of urea to the diets of Awassi sheep in gradual proportions led to the improvement of many productive, physiological and blood characteristics, reflects the high economic return when raising commercial sheep herds to boost the local and global economy.***

***Keywords: urea, blood characteristics, productive and physiological traits, Awassi lambs.***

## Introduction

Sheep contribute about 50% of the animal production in Iraq, constitutes the first product of important human foodstuffs (such as red meat, milk and its derivatives, and leather), as well as wool production, the total number of sheep in Iraq is estimated at 5 million, the most of them were Arabi and Awassi sheep, it was reared to produce meat and then milk (Al-Jalili and Alkass, 1984). Local sheep were characterized by low production of meat and milk, due to genetic and environmental factors, because of the more likely qualities of their viability in harsh environmental conditions to the detriment of productive ones, the production efficiency of ewes was low, necessitates attention to it according to the latest developments in modern science in the management, care and improvement of flocks (Alkass*et al*., 1993). Growth was

defined as the increase in weight during a specific period of time,includes the increase in the number and size of cells, it is not limited to a specific period, circumstance, or body condition, not limited to the longevity of the organism and at different levels (Al-Khuzai, 2002).

Al-Saegh and Alkass (1992) show that the growth was a spontaneous biological physiological process that occurs in the bodies of all living things, it was extremely important for animal development, a result of natural biological processes, physiological and environmental functions, several factors affect growth, including animal breed, as the growth rates vary in sheep breeds and between individuals within the same breed. The subspecies was associated with the environment and conditions, the basics of breeding, as the breeds of sheep live in multiple and geographically diverse environments, the existence of a natural difference between the strains (Al-Douri, 1983).

The study aims to know the effect of adding different percentages of urea to the diets on the values of blood characteristics and standards and some productive and physiological characteristics.

**Materials and methods**

The study was conducted at the animal field of the First Agricultural Research and Experiments Station in the College of Agriculture / Al-Muthanna University, from 8/15/2019 to 2/15/2020, to determine the effect of adding different percentages of urea in the diets on the values of blood characteristics and standards and some production and physiological characteristics.A total of 20Awassi lambs, 4 month age were used. Placed in typical sheds in hygienic conditions, underwent a treatment program and a vaccine to ensure safety from diseases. The animals study were divided into four groups, which were (the control group, a diet devoid of 0% of urea, the second, third and fourth groups whose relationships include urea in graded rates of 1%, 1.5% and 2% respectively) for a period of 60 days.

The animals were reared in modular pens with a stage, contains feeder and waterer basins, it was divided from the inside by metal partitions into three sections, the animals were placed in it. The study lambs were fed typical diets, contents of the diets were calculated on the basis of both the nitrogen and energy level and as in Table (1), the percentage of urea nitrogen from total nitrogen (NPN / N) was 18% in the diet of the second group, 25% in the diet of the third group, and 33% in the diet of the fourth group, in the four diets, the values of the digested protein in the small intestine resulting from the nitrogenous substances fermentable in the rumen converged (PDIN), where its value ranged between 112-116 g / kg dry substance,the difference in the values of the digested protein in the small intestine resulting from the fermentable energy in the rumen (PDIE) was more different in the four diets, quantity ranged from 102-116 g / kg dry substance.The group feeding system was used to feed ewes as experimental diets, apply twice a day at eight in the morning and at two in the afternoon. Between feeding periods, the ewes were released into the barn scene to allow them freedom of movement.The feed was provided on the basis of 4% of the

body weight according to the (National Research Council NRC) method, as well as grazing on natural pastures daily for 3 hours a day.

**Table (1) The feed composition, nitrogen ratios, and nutritional value of the diets used in the experiment.**

| Items | | Diets | | | |
|---|---|---|---|---|---|
| | | T1 | T2 | T3 | T4 |
| Barley | | 68 | 69 | 69 | 69 |
| Wheat bran | | 7 | 8 | 8 | 7 |
| Yellow corn | | 10 | 10 | 10 | 10 |
| Sunflower meal | | 12 | 9 | 9 | 9 |
| Urea | | - | 1 | 1.5 | 2 |
| salt | | 1.5 | 1.5 | 1.3 | 1.5 |
| Limestone | | 1.5 | 1.5 | 1.2 | 1.5 |
| Vitamins & Minerals (1) | | 1 kg / 1 ton | 1 kg / 1 ton | 1 kg / 1 ton | 1 kg / 1 ton |
| Nutritional value in 1 kg dry matter * | UFV | 1.03 | 1.03 | 1.03 | 1.03 |
| | PDIN (g) | 116 | 113 | 114 | 115 |
| | PDIE (g) | 116 | 105 | 106 | 107 |
| Nitrogen content (g / kg dry matter) | Nitrogen | 26 | 26 | 26 | 26 |
| | Nitrogen urea (46%) | 0 | 4.6 | 5.8 | 6.9 |
| | NPN / N% | 0 | 0.18 | 0.3 | 0.5 |

(1) The mixture of vitamins and minerals used is a type of Tonovate prepared from Safco Veterinary Medicines Company / Jordan. * Calculated from the chemical analysis tables of Iraqi fodder materials (Al-Khawaja and others, 1978). UFV is the unit for estimating the net energy value of food and equals 1,855 kcal for barley.
PDIN is the unit for estimating the value of the protein digested in the small intestine resulting from the nitrogen fermentable in the rumen.PDIE is the unit for estimating the value of protein digested in the small intestine resulting from fermentable energy in the rumen.NPN / N was estimated by the following equation = amount of urea (g / kg dry substance) x 0.46 / total nitrogen (g / kg dry substance)

Lamb live weight was estimated and measured in kg, where weighed male and female each week, the average weight gain of lambs was calculated, using a sensitive electronic scale to weigh young lambs, the scale with a ruler is 50 kg for the weight of the largest and heaviest lambs, studied a number of traits, including (body length, breast circumference, abdominal circumference, front height and butt height), measured in cm using a ruler for small measurements and a graduated tape measure for large measurements.
All data were analyzed statistically using the statistical analysis system and the SPSS version 17 program. The current results represent the rates of values ± the standard error, and the results of the values were represented by a significant level ($P \leq 0.05$). For comparison between the averages, the Duncan Multiple test was used.

**Results and discussion**

The results showed that there were significant differences at the probability level (P 0.05) for the mean of the studied traits among the study groups on the basis of a number of traits and according to the sequence of weeks.

Table (2) showed the existence of high significant differences and at a probability level (P≤0.05) for the studied values between the different factors, the fourth treatment significantly outperformed the rest of the treatments in measurements of body weight, chest circumference and abdominal circumference, while the third treatment outperformed compared to the second treatment, which was significantly superior to the control treatment.

**Table (2) The effect of the type of feed to which urea was added, with different concentrations, on the animal's weight, the length and width of the neck, the length of the front and back legs, the chest and abdomen circumference of the animal ± standard error.**

| Traits | Study groups | | | | Sig. |
|---|---|---|---|---|---|
| | T1 | T2 | T3 | T4 | |
| Body weight (kg) | ± 18.55 0.06c | ± 18.65 0.04c | ± 19.70 0.06b | ± 21.85 0.05a | * |
| Neck length (cm) | ± 43.20 0.22c | ± 43.45 0.30c | 025 ± 46.60 b | ± 48.80 0.28a | * |
| Neck width (cm) | ± 15.50 0.18c | ± 15.60 0.15c | ± 19.70 0.16b | ± 22.80 0.18a | * |
| Back Rolls Length (cm) | ± 40.25 0.22c | ± 40.35 0.21c | ± 44.30 0.22b | ± 45.90 0.23a | * |
| Front Leg Length (cm) | ± 42.45 0.05c | ± 42.50 0.06c | ± 44.60 0.08b | ± 46.90 0.09a | * |
| Animal's breast circumference (cm) | ± 65.35 0.33c | ± 65.25 0.29c | ± 67.38 0.25b | ± 69.80 0.32a | * |
| Abdominal circumference of the animal (cm) | ± 74.40 0.35c | ± 74.45 0.32c | ± 77.35 0.30b | ± 79.70 0.31a | * |

**Blood test results**

The results of the current study showed high significant differences and at a probability level (P≤0.05) for the studied blood values between the different treatments, as the studied blood values varied and varied (total number of red blood cells, total number of white blood cells, hemoglobin rate, erythrocyte sedimentation rate. The percentage of platelets, the average volume of compacted blood cells, the average blood volume, the rate of hemoglobin, the rate of the erythrocyte hemoglobin count, the rate of the erythrocyte hemoglobin count, and the differential count of leukocytes that include neutrophil, acid, base, monocyte and lymphocytes). These results are in agreement with the results of Al-Ani (1978) Who studied blood values and various parameters of blood measurement, while not agreeing with the results Al-Amin*et al*.(1998).

Table (3) shows high significant differences at a probability level (P ≤ 0.05) for the studied blood values.Where all the treatments of adding urea as a source of nitrogen

outperformed the control treatment in each of the total number of red blood cells, the hemoglobin rate, the erythrocyte sedimentation rate, the percentage of platelets and the average volume of compact blood cells, as well as in the values of the rate of blood cell volume, the rate of hemoglobin of the blood cell, the rate of the rate of the red blood hemoglobin, the rate of the PCV and the rate of the white blood cell count. These results are in agreement with the results of Karkutli et al. (2010), while they are not in agreement with the results of Al-Qaisi et al. (2003).

The results of the current study for analyzing blood values showed a high significant decrease and a probability level (P 0.05) for the values of the red blood cell count, the hemoglobin rate value, the erythrocyte sedimentation rate, the percentage of platelets and the average blood cell volume compiled from the normal values of sheep and goats for these values, it also showed a significant increase in the white blood cells count rate and differential count values from the normal values, this difference in results is due to the difference in the environmental and physiological conditions, the nature of the feeding and the breeding system between the different species and the study animals, as the increase in the values of the red blood cell count, the value of the hemoglobin rate, the erythrocyte sedimentation rate, the percentage of platelets, and the average volume of compacted blood cells is due to the presence of The condition of anemia in the studied plant animals due to the type of feed provided, as for the increase in the values of the rate of leukocyte count and its differential count, it is due to the presence of a state of internal infections according to their levels and according to the physiological condition of it, whether slight or severe, and the health and physical condition of the animal in the studied plant animals.

**Table (3) The effect of the type of feed to which urea was added, with different concentrations, on the animal blood parameters and values ± the standard error.**

| Traits | Study groups | | | | Sig. |
|---|---|---|---|---|---|
| | T1 | T2 | T3 | T4 | |
| **Red blood cell count (X * 106 / µl)** | ± 18.55 0.06c | ± 18.65 0.04c | ± 19.70 0.06b | ± 21.85 0.05a | * |
| **White blood cell count (X * $10^3$ / µl)** | ± 43.20 0.22d | ± 44.45 0.30c | 025 ± 46.60 b | ± 48.80 0.28a | * |
| **Hemoclobin (hemoglobin) (g / dL)** | ± 15.50 0.18d | ± 17.60 0.15c | ± 20.70 0.16b | ± 22.80 0.18a | * |
| **Average Agglutinated Blood Cell Volume (%)** | ± 40.25 0.22d | ± 42.35 0.21c | ± 44.30 0.22b | ± 45.90 0.23a | * |
| **MCV rate (Fl)** | ± 42.45 0.05d | ± 43.50 0.06c | ± 44.60 0.08b | ± 46.90 0.09a | * |
| **PCV rate (%)** | ± 65.35 0.33c | ± 65.25 0.29c | ± 67.38 0.25b | ± 69.80 0.32a | * |

**Table (4) The effect of the type of feed to which urea was added in different concentrations on the animal blood parameters and values ± the standard error.**

| Traits | Study groups | Sig. |
|---|---|---|

| | T1 | T2 | T3 | T4 | |
|---|---|---|---|---|---|
| **MCH (pg)** | ± 18.55<br>c 0.06 | ± 18.65<br>c 0.04 | ± 19.70<br>b 0.06 | ± 21.85<br>a 0.05 | * |
| **MCHC (g/dl )** | ± 43.20<br>d 0.22 | ± 44.45<br>c 0.30 | 025 ± 46.60<br>b | ± 48.80<br>a 0.28 | * |
| **HCT (%)** | ± 15.50<br>d 0.18 | ± 17.60<br>c 0.15 | ± 20.70<br>b 0.16 | ± 22.80<br>a 0.18 | * |
| **ESR (mm/hr)** | ± 40.25<br>d 0.22 | ± 42.35<br>c 0.21 | ± 44.30<br>b 0.22 | ± 45.90<br>a 0.23 | * |
| **RDW (%)** | ± 42.45<br>d 0.05 | ± 43.50<br>c 0.06 | ± 44.60<br>b 0.08 | ± 46.90<br>a 0.09 | * |
| **PLT (X*10³/µl)** | ± 65.35<br>c 0.33 | ± 65.25<br>c 0.29 | ± 67.38<br>b 0.25 | ± 69.80<br>a 0.32 | * |

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