

Studying the effect of giving doses of different levels of the group of vitamins AD3E on some productive and doll traits For young male goats the local

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Abstract

This study was conducted in the animal field of the College of Agriculture and Marshlands / University of Dhi Qar for the period from 6/12/2021 to 3/16/2022, and within that period the preparatory period was for 16 days (for adaptation), to study the effect of giving doses of different levels of the group of vitamins AD3E on some productive and doll traits For young male goats the local. The study included (12) animals between the ages of (3-4) months and their average weight (16.0-16.65) kg. Male Iraqi black goats were selected from local markets, purchased and all veterinary medical examinations were conducted for them, to ensure their safety and freedom from diseases, and the goats were divided. Randomly to (three treatments), each treatment included (four) animals for each treatment, which included the first treatment (control).

T1 = 0 mL AD3E, left for comparison untreated with vitamins AD3E, T2 = 1 mL AD3E, and T3 = 2 mL AD3E. A concentrated diet of 3% of the live body weight was provided in the morning and in the evening, as the amounts of feed provided were adjusted depending on the progress of the new weight for each group. All treatments were fed on a ration containing crushed components, namely (crushed barley by 30%), (wheat bran by 26%), (corn). Yellow crushed 20%), (flour 20%), (urea 1%), (salts 3%) In addition to wheat straw provided as a -form side feed.

The results were statistically analyzed using a complete random design, and the study concluded the following:

- 1- It showed a significant increase in the weights of treatment T3 in weeks 6, 8, 10, 12 and recorded averages (23.75, 27.97, 32.75, 38.00) kg.
- 2- The increase in weight showed a significant superiority of T3 in the amount of increase in total and daily weight with an average of (22) kg and (261) g / day, respectively.
- 3- As for the efficiency of feed conversion, there was a significant decrease with the lowest average in favor of T3 treatment, which amounted to (3.90) kg feed / kg weight gain compared to the rest of the treatments.



- 4- The results of the analysis showed a significant increase in the Packed Cell Volume(PCV) in the second and third months, and T3 treatment outperformed the rest of the treatments with an average of (48.75, 53.00)%, respectively.
- 5- As for the hemoglobin concentration, the significant increase was for each of the T3 treatment and 33456the second and third months, with an average of (16.00, 17.25) g/cm³, respectively.
- 6- The results of white blood cells showed a significant increase in the second and third months in favor of T3 treatment with an average of (8.84, 6.63) x/cm³ respectively.

I. INTRODUCTION

Goats are among the best domesticated ruminants with the ability to transform raw materials of poor nutritional value into products rich in nutritional components, and are characterized by high reproductive efficiency and a high proportion of twins that may reach 150-400% (Haenlein; 2004).

Imbalance of the contents of the feed with vitamins and the lack of the necessary quantities to meet the animal's need of vitamins A, D₃, and E in the feed, especially the harvested feed. This has necessitated the need for an external supply of these vitamins on a regular basis to cover their physiological requirements and maintain their high performance and production, since the availability of these AD₃E vitamins is considered essential as they are not available as other water-soluble vitamins. Vitamins, and vitamin K is not available in sufficient quantities from the rumen microbes (Hafez YM ; 2012).

Nutritional supplements, whether with feed or water or injected into the animal, are important substances that can improve the efficiency and performance of the animal, such as improving the level of immunity, as the use of AD₃E with the vaccine leads to an increase in the production of antibodies that enhance the humoral immune response to the vaccine in sheep given the enterotoxin vaccine, which acted as a highly effective Immunostimulants (Rashid & Yüksek ; 2019). Recent studies have confirmed the use of AD₃E for strengthening immunity and disease resistance and its efficacy in treating many diseases, including Ecthyma (Salarvand et al ; 2022).

The aim of this study was to demonstrate the effect of AD₃E dosing on: weight, total and daily weight increases, food conversion efficiency, and hematological characteristics, including: (white blood cells, volume of compacted blood cells, and hemoglobin concentration).

II. MATERIALS AND METHODS

2-1- Experiment design:

This study was conducted in the animal field at the Faculty of Agriculture and Marshlands / University of Dhi Qar for the period from 6/12/2021 to 3/16/2022, including the preparatory period. The study included (12) 4-month-old domestic goats with weights ranging from (16.00 - 16.65 kg). The animals were divided into three groups on the basis of weight and age as follows



- 1- The first treatment, which is the control group(c), which included 4 animals fed a concentrated feed of 2.5% of their body weight, in addition to green fodder and grazing, and they were left without any treatment for the purpose of comparison with the other groups
- 2- The second group included 4 animals that were given 1 ml of Dimavit AD3E solution diluted with distilled water (39 ml of distilled water for every 1 ml of AD3E) at a dose of 10 ml of diluted solution for each animal, according to the medical instructions for using the preparation, The treatment was given two doses every week of AD3E
- 3- The third group, which included 4 animals, dosed 2 ml of Dimavit (AD3E) product diluted with distilled water (38 ml of distilled water for every 2 ml of AD3E), so that the diluted solution became (40 ml). So that 10 ml of the diluted solution is given to each animal. The treatment was given two doses every week of AD3E

Animals were fed 3% dry matter of their body weight on two meals, morning and evening. The ration ingredients were crushed and mixed well to a homogeneity and packaged. The components of the ration were (barley 30%, wheat bran 26%, ground corn 20%, flour). 20%, urea 1%, salts 3%). With hay as a side feed

2-2- Veterinary Care:

Veterinary care was continued for the duration of the trial. Animals were given Ivermectine 250 mg/ml in 1 ml subcutaneously to prevent external and internal parasites and treat liver worms.

2-3- Measurements and samples:

Goats were weighed, weighed and recorded every two weeks until the end of the study period. Blood samples were collected monthly from the beginning to the end of the study.

2-4- Calculation of blood components:

2-4-1-White Blood Cell (WBC)

The number of white blood cells was counted using a special counting slide by drawing blood using a special microbabit to withdraw these cells, as 380 microns were taken from a Turkish solution consisting of (1.5 ml glacial acetic acid, 1.0 ml methyl violet dye, a concentration of 1%, and distilled water complemented to 100 ml) and 20 microns from the blood sample and placed In a glass tube, shaken well and left for 5 minutes. Drops of this mixture were placed on the counting slide after neglecting the first drops and left the slide for two minutes to stabilize the globules, and then counted the number of white blood cells In the four squares For the counting slide using a microscope under the power of small magnification (John and Lewis; 1984).

Number of white blood cells/cm³ = number of cells In the central large square x 20 (dilution correction factor) x 10 (volume correction factor).

2-4-2-Packed Cell Volume(PCV)

The (Microhematocrit) method was used to calculate the volume of the compacted cells, where a sample of blood was drawn by capillary action into the capillary tube from one end to the height of at least two-thirds of the capillary tube, and then the dry end was closed with wax and placed in a microcenterfuge centrifuge (3000 cycles/ minute) for 5 minutes, and then the reading is taken by means of a compacted blood cell meter (Dacie and Lewis ; 1974)



2-4-3-(Hb) Hemoglobin concentration

The hemoglobin concentration was calculated by using the Sahli apparatus, which is a glass tube with divisions dedicated to calculating the percentage of hemoglobin at a concentration (g / 100 cm) by calibrating the hemoglobin of 0.1 caliber hydrochloric acid (Schalm et al; 1975).

2-5-Statistical analysis

A complete random design (CRD) was used to analyze the statistical analysis of one factor with three parameters (Revised Least Significant Differences (RLSD) using the ready-made statistical program (V.26) (SPSS ; 2020).

III.RESULTS AND dISCUSSION

3 -1- adjectives. the Productivity

3-1-1- Weight of young goats males

Table No. (1) showed that there were no statistically significant differences at (2) weeks for the experimental treatments, where the average weight of the treatment was T3 (16.00) kg, T2 reached (16.65) kg, and T1 reached (16.20) kg. And the average weight showed an arithmetic increase in favor of the two treatments AD3E (T3, T2) compared to the T1 group, and the average weight of the T3-treated group was (17.00) kg, and the average weight of the treatment T2 was (17.37) kg, and the average weight of the control T1 treatment was (16,433) kg. The arithmetic increase in favor of the AD3E dose group compared to the control group persisted In (4) weeks, as the mean of the experimental treatments were (T3, T2, T1). (17,97 ,18,40 ,20,00) kg respectively.

The significant Increase appeared between the experimental treatments in the sixth, eighth, tenth and twelfth weeks of the experiment, with the superiority of groups that took doses of AD3E compared to the control group. In the sixth week, the average weight of the experimental treatments (T3, T2, T1) was (23.75, 19.87, 17.70) kg, respectively .

At week eight the average weight of the experimental treatments was (T3, T2, T1) (18,77 ,21,70 ,27,97) . kg respectively.

In the tenth week of the experiment the average weight of the experimental treatments was (T3, T2, T1) (24,10 ,27,70) . (20,00 kg respectively. At the end of the experiment and in the twelfth week, the average weight of the experimental treatments (T3, T2, T1) was (38.00, 27.10, 21.56) kg, respectively . The reason may be due to the role that vitamin E plays In improving the appetite of the goats and increasing their consumption of feed during their growth stages (Al-Tamemmy ; 2001) This study agreed with a study (AL-Absawi et al ; 2020) .

Table (1) Mean weight of the group of control animals and groups that took different doses of AD3E for the duration of the study (± standard deviation)

| | animal weights |
|--|----------------|
|--|----------------|

| Treatment | the week | | | | | | |
|-------------|------------------|------------------|------------------|---------------------|--------------------|--------------------|--------------------|
| | 0 | 2 | 4 | 6 | 8 | 10 | 12 |
| T1 | ±16.20 1.562 | ±16.433 1.457 | ± 16.96 1.386 | ± 17.70 b 1.25 | ± 18.66 b 1.184 | ± 20.00 c 1.311 | ± 21.56 c 1.553 |
| T2 | ± 16.65 2.530 | ± 17.37 2.52 | ± 18.45 2.54 | ± 19.87 ab 2.543 | ± 21.75 ab 2.53 | ± 24.10 b 2.544 | ± 27.10 b 2.557 |
| T3 | ± 16.00 4.15 | ± 17.00 4.24 | ± 20.05 4.33 | ± 23.75 a 4.28 | ± 27.97 a 4.06 | ± 32.75 a 3.60 | ± 38.00 a 3.24 |
| Significant | N.S | N.S | N.S | 0.05 | 0.05 | 0.05 | 0.05 |

The vertically different letters indicate that there are significant differences between the mean of the treatments under the 0.05 level of significance .N.S: There are no significant differences between the means.T1 = 0 ml AD3E , T2 = 1ml AD3E , T3 = 2 ml AD3E

3-1-2- Estimation of the total and daily weight increases for young male goats

The results of Table (2) showed the total weight gain (kg) for the different experimental treatments and there was a significant increase for treatment T3, whose average was (22.00) kg, and it was significantly superior to treatment T2, whose average was (10.45) kg, which was significantly superior to the control group T1, which averaged Weighing (5.36) kg.

As for the daily weight gain (g/day), the results showed that there is a significant superiority of the different experimental treatments at a significant level ($p < 0.05$), where the T3 treatment excelled with an average weight gain of (261.00) (g m/day) compared to the T2 treatment group, which averaged Its weight was (124.40) (g m/day), and It outperformed the T1-treated group with daily weight gain, with an average of (63.80) (g m/day).

The reason Is that the Increase in the total and daily weight of the experimental treatments with different levels of vitamins (A, D3, and E) compared to the control group is due to the fact that vitamin A acts as a stimulator of growth and promotes growth. It is an antioxidant and increases animal feed consumption and thus improves weight gain (Al-Kinani ; 1989). Vitamin D3 also plays an important role In increasing bone growth and development of young animals, especially in their early developmental stage, when bone growth Is actively increased and therefore their weight increases (O'Brien et al ; 2012). This study is in agreement with the study of; (Abdelhamid et al ; 1992) giving Rahmani lambs vitamin A, and the study of (Morake; 2019) and (AL-Absawi et al ; 2020)

Table (2) shows the total weight gain (kg) and daily weight gain (g/day) for the control group and groups that dosed different levels of AD3E for the duration of the study (\pm standard deviation).



| Treatment | Total weight gain (kg) | Daily weight gain (g/day) |
|-------------|------------------------|---------------------------|
| T1 | c 1.34 ±5.36 | c 11.45 ±63.80 |
| T2 | b 2.74±10.45 | b 17.62 ±124.40 |
| T3 | a 3.52 ±22.00 | a 25.36 ± 261.00 |
| Significant | 0.05 | 0.05 |

The vertically different letters indicate that there are significant differences between the mean of the treatments under the 0.05 level of significance. N.S: There are no significant differences between the means. T1 = 0 ml AD3E, T2 = 1ml AD3E, T3 = 2 ml AD3E

3-1-3 - Feed intake and feed conversion efficiency

Table (3) indicated that there were no significant differences in the amount of feed Intake of young goats for the experimental treatments throughout the experiment period, and the table showed an arithmetic increase in the amount of feed Intake for the T3 treatment group, where its average was (68.04) kg, followed by the arithmetic increase of the experimental treatment T2, with an average of (55.12) kg, and then the control treatment ranked last in the amount of feed Intake, whose average amount was (47.57) kg. As for the feed conversion efficiency of the different treatments, it showed a significant increase for the control treatment T1, which averaged (8.87) (kg feed/kg weight gain) compared to the rest of the experimental treatments (T2 and T3), where their average was (5.27, 3.90) (kg feed/kg weight gain) straight.

Table (3) shows the feed intake (kg) and feed conversion efficiency (kg feed/kg weight gain) for a group of control animals, and for a group of animals that were given different levels of AD3E (± standard error)

| Treatment | feed consumed kg | Feed conversion efficiency (kg feed/kg weight gain) |
|-------------|------------------|---|
| T1 | 47.57 | a 1.35 ± 8.87 |
| T2 | 55.12 | b 1.09 ±5.27 |
| T3 | 68.04 | b 1.40 ±3.09 |
| Significant | N.S | 0.05 |

The vertically different letters indicate that there are significant differences between the mean of the treatments under the 0.05 level of significance N.S: There are no significant differences between the means. T1 = 0 ml AD3E , T2 = 1ml AD3E , T3 = 2 ml AD3E

3-2- adjectives. the doll

3-2-1-Packed Cell Volume (PCV)

The results of Table (4) indicated that there were no significant differences in the PCV volume values in the first month, while significant differences appeared in the second and third months of the experiment between the experimental treatments. The results of the first month showed that there were no statistically significant differences despite the arithmetic increase in treatment T3 with an average of (38.33)%, followed by treatment T2 with an average of (35.33)%, and then treatment T1 with an average of (32.33)%. As for the second month of the study, the results showed a significant increase in favor of T3 with an average of (48.75%) compared to the two treatments T2 and T1, respectively, with an average of (43.75, 42.00)%. The increase remained in the third month of the trial for the T3 treatment. Which had a rate of (53.00)% compared to treatment T2 which recorded an average of (48.25%) significantly superior to treatment T1 which recorded a mean of (44.25%).

The reason for the increase in PCV in the second and third month is because the vitamins worked to protect the platelets and red blood cells of young goats from the dissolution resulting from the oxidation process, until the end of the experiment (NRC ; 1985) and (Can ; 1997) the results of this study were in agreement with what was indicated by both (Al-Asadi et al ; ٢٠٢٠) and (AL-Absawi et al ; ٢٠٢٠) and (Toma et al ; 2021)

Table (4) The Packed Cell Volume (PCV) for the group of control animals and the group of animals that were given different levels of AD3E throughout the study period (± standard deviation)

| Treatment | Packed Cell Volume (PCV) | | |
|-------------|---------------------------|--------------|---------------|
| | Month1 | Month 2 | Month 3 |
| T1 | 4.04±32.33 | b 1.82±42.00 | c 1.70± 44.25 |
| T2 | 4.16 ±35.33 | b 2.21±43.75 | b 0.95±48.25 |
| T3 | 4.50±38.33 | a 2.21±48.75 | a 2.58±53.00 |
| Significant | N.S | 0.05 | 0.05 |

The vertically different letters indicate that there are significant differences between the mean of the treatments under the 0.05 level of significance N.S: There are no significant differences between the means . T1 = 0 ml AD3E , T2 = 1ml AD3E , T3 = 2 ml AD3E



3-2-2- (Hb) hemoglobin concentration

The results of Table (5) showed that there were no significant differences in hemoglobin Hb values in the first month of the experiment, despite the presence of an arithmetic increase for T3 treatment, which recorded an average of (12.33) g/cm³, followed by treatment T2 with an average of (11.33) g/cm³ and treatment T1. The lowest average treatments were (10.67) g/cm³, while the significant increase appeared in the second and third months of the experiment for AD3E treatments (T3 and T1) compared to the T1 group.

Treatment T3 was significantly superior in the second and third months, with averages of (16.00, 17.25) g/cm³, respectively, compared to treatment T2 (14.25, 15.75) g/cm³ for the second and third months, respectively, and treatment T2 significantly outperformed treatment T1, which recorded the lowest mean value. For the second and third months (13.50, 14.50) g/cm³, respectively.

One of the important reasons for the increase in hemoglobin may be due to a group of vitamins an important role in changing the proportions of blood components among them, as vitamin A has an important role that works to protect and preserve cells from destruction and thus increase their number, which leads to an increase in the level of hemoglobin (Nadide and Ebru ; 2005).

Table (5) Hemoglobin concentration, g/cm³, for the group of control animals and the group of animals that dosed different levels of AD3E for the duration of the study (± standard deviation)

| Treatment | Hemoglobin HP | | |
|-------------|---------------|--------------|--------------|
| | Month1 | Month 2 | Month 3 |
| T1 | 1.15±10.67 | c 0.57±13.50 | c 0.57±14.50 |
| T2 | 1.52±11.33 | b 0.95±14.25 | b 0.50±15.75 |
| T3 | 1.52±12.33 | a 0.81±16.00 | a 0.95±17.25 |
| Significant | N.S | 0.05 | 0.05 |

The vertically different letters indicate that there are significant differences between the mean of the treatments under the 0.05 level of significance N.S: There are no significant differences between the means . T1 = 0 ml AD3E , T2 = 1ml AD3E , T3 = 2 ml AD3E

3-2-3-numbers, white blood cells

The results of Table (6) showed that there were no significant differences in the mean values of white blood cells in the experimental treatments and during the first month of the study, and the average values recorded for the experimental treatments were (T1, T2, T3) (3.66, 3.64,3.76) × 10³ cells/cm³. In the second month of the study, treatments T3 and T2 were significantly superior with averages (6.63 and 5.70) 10³ cells/cm³, respectively, compared to treatment T1, which averaged (4.85) 10³ cells/mm³. The significant increase continued in the third month of the experiment in favor of



treatment T3, with an average of It was (8.84) 10^3 cells/cm³ compared to treatment T2 and T1, with averages of (6.90 and 6.07) 10^3 cells/cm³, respectively.

The reason for this is that AD3E vitamins improve the level of animal protection from infectious agents, which has a positive effect in overcoming the effects of stress factors that affect animal health and increasing the strength of the immune system to resist all diseases (Oystein et al ; 2010). as the results of these The study agrees with the study and (Asadi et al ; 2020). and

(AL-Absawi et al ; 2020) ,(Toma et al ; 2021)

Table (6) White blood cell count 10^3 cells/mm³ for group of control animals and group of animals that dosed different levels of AD3E for the duration of the study (\pm standard deviation)

| Treatment | White blood cells | | |
|-------------|-------------------|-------------------|-------------------|
| | Month1 | Month 2 | Month 3 |
| T1 | 0.62 \pm 3.66 | b 0.28 \pm 4.85 | b 0.58 \pm 6.07 |
| T2 | 0.85 \pm 3.76 | a 0.93 \pm 5.70 | b 0.52 \pm 6.90 |
| T3 | 0.73 \pm 3.64 | a 0.59 \pm 6.63 | a 0.93 \pm 8.84 |
| Significant | N.S | 0.05 | 0.05 |

The vertically different letters indicate that there are significant differences between the mean of the treatments under the 0.05 level of significance N.S: There are no significant differences between the means. T1 = 0 ml AD3E , T2 = 1ml AD3E , T3 = 2 ml AD3E

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