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***Research Article***

# Effect Cannabis Oil on the Growth Performanceand some Biochemical Indicators in Blood Serum of MaleLambs Awassi Breed Sheep

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**Keywords**
Cannabis, Biochemicalindicators, Growth efficiency, Awassi lambs.

**Abstract**

The present study was conducted to investigate the effectsofcannabis oil as a dietary supplementation on the growth characteristics and some biochemical indicators in the blood serum of rams. In this study 18 Awassibreedlambs aged between 6 to 8 months, weighing between 25to 30 kg were randomly put into three groups of 6 lambs. The first group was a control group, without treatment, the second group wastreated with adding cannabis oil in a dose of 5 ml, and the third groupwas treated with adding cannabis oil in a dose of 10 ml. ,respectivelyfor 30 days. The results showed that the circumference of the thigh and the length of the body of treated rams were improved significantly in comparison to the control group, while no significant differences appeared in the chest circumference of the rams. Furthermore, significant differences ($p \leq 0.05$) were found in the levels of Cholesterol, total Protein, Albumin, Globulin, blood Urea, and ALT, AST enzyme activities, whereas, no significant differences observed in serum Glucose levels in the serum between the treated groups compared to the control. The best results were found with the dosages of 10 ml which can play a good role in the improvement of the growth efficiencyand some biochemical traits in the blood serum of rams, as well as, protecting rams from oxidative damages.

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## 1. Introduction

Cannabis, also known as marijuanamedical , is a group of terpenes and phenolic compounds found in cannabis species, which originated in Central Asia andcurrentlygrown all over the world. The highest concentration of hemp was observed in plant flowers. (Adams and Martin,1996) the potential benefits of medicinal cannabis include appetite-stimulating and anti-emetic effects, pain relief, and sleep improvement, (Abrams, 2016). The Cannabidiol (CBD) uses has become increasingly popular in both human and veterinary medicine due to the changes in the federal legislation of cannabis, making the distribution of cannabis and hemp products legal in the United States, as long as it contains less than 0.3% tetrahydrocannabinol (THC) (Kogan et al., 2017). Recently, new production concepts such as organic poultry production have aroused the interest of nutritionists. Within organic production, there is a great need for knowledge about fed value, nutrition strategies, and fed use (Jakobsen andHermansen, 2001). Cannabis seeds are best known for the most unsaturated oils derived from the vegetable kingdom and have been named the most balanced in nature because they contain a perfectly balanced 3:1 ratio of linoleic acid (LA) and alpha-linolenic acid (ALA). LA:, ALA was identified as the optimal condition for long-term healthy human nutrition. (Puthpongsiriporn and Scheideler, 2005) have reported that dietary fluid containing 1: 2 and 1: 4, ALA: LA ratios have more production of antibodies against Newcastle virus (NDV) and infectious bronchitis (IBV) virus without any traces Negative to performance. Additionally, HS is a good source of iron (1,680 ppm) that can increase iron concentration in diets. The veterinary consensus is that research that is needed and that many will consider its use, but current FDA recommendations discourage the use of cannabis oil products in domestic animals, and the regulatory policy surrounding the use of cannabis oil is uncertain (Landa et al., 2016). However, clinical trials of cannabis are limited. Although there have been few research studies on cannabis, it has been observed that some doctors caring for cancer patients in the United States who recommend medicinal cannabis often do so for symptom management (Doblin and Kleiman,1991). Most modern studies are directed to researching the extent of The possibility of benefiting from cannabis, which is a controlled substance, where it looks for its symptoms when consumed, although studies are limited and few. However, the role of cannabis oil in sheep needs to be studied comprehensively. In contrast, there has also been evidenceto suggest that cannabis may have therapeutic potential. So this study aimed to influence the treatment with two levels of cannabis oil on some growth traits and some biochemical parametersin the serum of Awassirams.

## 2. Materials and Methods

This study was conducted in the animal field of the Department of Animal Production at the College of Agriculture - the University of Kirkukduring 15 April 2020 to 15July 2020 on 18 Awassi lambs for the period of a 30-days trial. The lambs were randomly distributed into three groups of 6 lambs. The first treatment wascontrolwithouttreatment, the second treatment adding cannabis oil in a dose of 5 ml and the third treatment was adding cannabis oil in a dose of 10 ml. The three groups were randomly distributed at a rate of homogeneous primary

weights during the preliminary period for two weeks before the experiment was conducted.Alltheanimals underwent a veterinary program for the duration of the experiment by dose and vaccination.The lambs were fed throughout the experiment period collectively for each group of treatments after placing them in half-closed and equal pens area. The proportions of the concentrated fed components were of the crushed barley 12%, wheat bran 22%, yellow corn 50%, soybean ratio 14%, vitamins 0.5, fed salt 1.25%, and limestone 1.25%. The experimental animals were fed by 2.5% of their weights on two mornings and evening meals, with green fodder and straw provided free of charge, then the amount of concentrated fed was adjusted according to the weight increase of the animals, as were the molds of mineral salts available in front of the lambs for the duration of the experiment, where the fodder and water were cut off from the experimental animals about 12 hours before the blood drawing process, the blood was collected by jugular vein by a 5 ml medical syringe, the blood was emptied into sterile plastic laboratory tubes, then placed in a centrifuge at 3000rpm for 15 minutes to separate the blood serum from the rest of the blood components, then put the blood serum in sterile, sealed, plastic tubes kept under a temperature of -20 ° C. The level of cholesterol, glucose, total protein, albumin, Globulin, Urea, ALT and AST enzymes in the blood serum were measured by several CORMAY SAs by an auto biochemistry analyzer (Model accent 200).

The data were statistical analysis using the SAS2001statistical software program using CRD Complete Randomized Design according to the mathematical model: Yij= Ti + Ti + eij, and The meanswere compared according to the Duncan (1955) polynomial to estimate the significant differences between the treatment groups.

## 3. Results and Discussion

The results in Table (1) show noany differences between the treatmentsregarding the chest circumferencecharacteristic, while significant differences were observed in the thigh circumferencecharacteristic($p \leq 0.05$). The third treatment was superior to the control group of the coefficients. And also,concerning the trait of the body height, a significant difference was observed ($p \leq 0.05$) for the second treatment on the other factors of the experiment, which isconsideredasone of the important economic indicators in judging the extent of animal growth and development. Previous animal studies on cannabis intake have indicated a stimulating effect on appetite, which increases fed intake. This may be attributed to the endocannabinoid system, which may serve as a regulator of feeding behavior, as the endocannabinoidenhances the ability to increase appetite in mice (Mechoulam et al., 2006). in addition to the participation of CB1 receptors in the hypothalamus in the stimulatory or edible aspects (Fride et al,. 2005).

**Table 1.** Effect of different levels of cannabis oil on some growth characters of male Awassi lambs

| Parameters | Treatment | | | |
|---|---|---|---|---|
| | Control | 5% | 10% | LS |
| Chest circumference | 35.0 ±1.7a | 38.0 ±0.5a | 37.5 ±2.0a | N.S |
| Leg circumference | 36.1 ±1.0c | 39.6 ± 0.8b | 47.7 ±0.9a | 0.05 |
| body height$^{cm}$ | 72.5 ±1.2b | 77.8 ± 0.6a | 70.3 ±2.4b | 0.05 |

Means with different letters within each column differ significantly (P≤0.05) according to Duncan's test.

In Table (2) shows the effect of some of the characteristics of the lambs for the study coefficients, where the statistical analysis showed the presence of significant differences at the level (p≤ 0.05) of cholesterol and the superiority of the second treatment over the control group. The increase in weight as the increase in the metabolic rate is caused by the thyroxine hormone produced by the thyroid gland. No significant differences were seen in the level of glucose. The differences were significant (p≤0.05) in the level of total protein in the third treatment compared to the control group, that the increase in the total protein indicates that the body is working on building protein and also may be due to an increase in metabolic activities in the body and thus the total protein in the blood serum as an indication. This is positive for the general condition of the body, as the total protein is the indicator of the growth processes in the animal's body. When it increases its concentration in the blood, it indicates that the animals are in a state of growth and an increase in their weight, and it employs the protein to build the body cells. Perhaps this is due to the cannabisintake that maybe likea regulator of feeding behavior. The differences were significant in the level of albumin in the treatment parameters of cannabis oil compared to the control group and showed significant differences in the level of Globulin in the third treatment when adding cannabis oil at a dose of 10 ml compared to the second treatment and the control group.

**Table 2.** Effect of different levels of cannabis oil on serum biochemical metabolites of male Awassi lambs

| Parameters | Treatment | | | |
|---|---|---|---|---|
| | Control | 5% | 10% | LS |
| Cholesterol (mg/dl) | 26.5±3.1 b | 41.5±41.5a | 33.5±2.5 b | 0.05 |
| Glucose (mg/dl) | 46.0±5.2 a | 40.5±5.2 a | 33.5±2.0 a | N.S |
| Total Protein (mg/dl) | 6.2±0.0 a | 6.6±0.0 b | 6.8±0.0 a | 0.05 |
| Albumin (mg/dl) | 3.3±0.0 ab | 3.60±0.0 a | 3.3±0.1 b | 0.05 |
| Globulin (mg/dl) | 2.7±0.0 c | 3.0±0.0 b | 3.5±0.1 a | 0.05 |

Means with different letters within each column differ significantly (P≤0.05) according to Duncan's test.

**Table 3.** Effect of different levels of cannabis oil on Urea, ALT and AST concentration in serum of male Awassi lambs.

| Parameters | Treatment | | | |
|---|---|---|---|---|
| | Control | 5% | 10% | LS |
| Urea | 62.5±9.2a | 53.5± 0.3 b | 54.5±8.9b | 0.05 |
| ALT(U/mL) | 12.5±0.2a | 12.0±0.6 a | 10.0±0.0 b | 0.05 |
| AST(U/mL) | 59.5±4.3 b | 76.0±0.0 a | 53.0±0.0 b | 0.05 |

Means with different letters within each column differ significantly (P≤0.05) according to Duncan's test.

ALT = alanine aminotransferase; AST = aspartate aminotransferase

Table (3) shows the presence of significant differences (p≤0.05) as the level of blood urea decreased in the addition coefficients compared to the control group, and this indicates that cannabis works to remove oxidative damage that occurs in the kidneys and stops poisoning occurring at the nephron region (Nephrotoxicity) and the removal of inflammation and increases the efficiency of the kidney in in urea excretion through diuresis and thus lowers the level of urea in the blood. Statistical analysis showed significant differences between the treatments for the ALT enzyme with significant superiority (p≤0.05), where it decreased significantly in the third treatment compared to the control group. It was also observed that the effectiveness of the AST enzyme in the third treatment was decreased compared to the control group. The effectiveness of antioxidants such as cannabis, work to remove free radicals and prevent oxidation of proteins and amino acids, thereby reducing the effectiveness of the enzymes transporting amine in the body.Thismight be the reason that the improvement in the growth and some biochemical characteristics in the blood serum related to the role of phenolic compounds found in the types of cannabis.

## Conclusion

The present investigation has shown the beneficial effects of supplementation of cannabis oil in a dose of 10 ml on the growth performance and some biochemical characteristics in rams' blood serum that may providebetter protection from oxidative damage. This is considered adequate for use as nutritional supplements with no harmful side effects on sheep.When there is no prior research conducted on the use of cannabis on the ruminants, this study is entirely new and the first study conducted on the ruminant animal.Thismayalso play a good role in the growth efficiency of lambs.

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