EFFECT OF ADDED DIFFERENT LEVELS OF MELISSA LEAVES POWDER TO DIET ON SOME PRODUCTIVE TRAITS OF ARABI SHEEP

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Abstract

The experiment was conducted in the animal field at the first agricultural research station, College of Agriculture, Al-Muthanna University from 10/11/2019 to 15/2/2020, a total of 12 female lambs (weaning) were used, the animals were divided into four groups by adding melissa leaves powder in a ratio of 0, 2, 4 and 6 g per kg of feed, each group contained 3 lambs of the Arabi sheep, The results indicated that the high levels of the leaves of the added melissa leaves to feed (6 g / kg of feed), gave significantly best results in some productive traits studied (body weight, weight gain, feed consumption and conversion factor) compared to other levels.

Keywords **:** Melissa leaves powder, productive traits, Arabi sheep.

Introduction

The sheep breeding sector is one of the important sectors as a component of livestock, one of the most important areas of trade and work and inexpensive breeding, contributes greatly to food security (Atsan *et al.*, 2007)**.** The people of Iraq have the advantage of raising sheep, the main product of animal protein important in human nutrition, helps meet the local industrial requirements of raw materials for leather, wool and fats, and the use of their waste as fertilizers for agricultural lands (Al-Jubouri and Al-Rubaie, 2009). Arabi sheep were a domesticated breed, native to southern Iraq, the southeastern regions of Iran, and the northeastern regions of the Arab world, reared for the purpose of producing meat and milk, in some areas wool production was raised, especially in African countries, the main objective is the production of meat (Al-Dabbagh 2011). Characterized as large animals with high weights and distinct characteristics, descended from very ancient origins and dynasties, stretched from the Arabian Peninsula across the Strait of Bab al-Mandab to the mouth of the Red Sea (El-Helou, 2015). Arabi sheep growing fast, medium size, the birth weight for females is 4.0 kg, the average weight of a ripe ewe is 2.38 kg, average height of the body is 2,70 cm, while birth weight 4,4 kg for males, the average weight of a mature ram is 3.53 kg with an average body height of a whore 2, 81 cm, (El-Jailawi *et al.*, 2011). Arabi sheep are characterized by several colors, but it is common for white with a black head or black or brown color, wool is characterized by the rough type used to manufacture carpets, distinguished from sheep with Fat-tailed (El-Helou, 2015). Melissa officinalis is a perennial herbaceous plant that follows the genus Melissa species, a dense and perennial plant, 30-60 cm high (Ceylan *et al.*, 1994). The characteristic flavor of the plant comes from its contain of terpenes citronellal, citronellol, citral and geraniol (Patora *et al.*, 2003). Melissa leaves contain volatile oil, the main components of which are citral, citronil, and geraniol, as well as impure and bitter substances (Holla *et al.*, 1997).

This study aims to know the effect of adding the powder of melissa leaves to diet on some productive traits of the Arabi sheep.

Materials and Methods

The experiment was conducted in the animal field at the first agricultural research station, College of Agriculture, Al-Muthanna University from 10/11/2019 to 15/2/2020, a total of 12 female lambs (weaning) were used, the animals were divided into four groups by adding melissa leaf powder at 0, 2, 4 and 6 g/ kg of feed for T1, T2, T3 and T4 treatments, respectively, each treatment contained 3 lambs of the Arabi sheep. Sheep were placed in separate adjacent cultures, the lambs were numbered and their weights recorded every four weeks with an animal scale, the weight gain was calculated every four weeks by the following formula:

Weight gain = final weight - primary weight

In addition to measuring feed consumption and feed conversion factor every 4 weeks.

Female lambs were fed on a mixture of concentrated feed standardized for all treatments consisting of a group of fodder materials (crushed barley + buckwheat bran + salt) according to table (1). Feed concentrates are provided to all animals in the morning and evening. The table shows the chemical composition of the feed provided. As for coarse fodder, the sheep were fed collectively according to the groups, according to the available green fodder, such as the *Alfalfa*, or the free hay, barns equipped with blocks of mineral salts throughout the duration of the experiment and the water offers freely.

Table 1 : Percentage of concentrated feed ingredients provided for experiment animals.

Feed materials	Percentage (%)
barley	45
Wheat bran	37
Soybean meal	15
Salt + lime	3
Total	%100

Table 2 : Chemical analysis of the feed used in the experiment.

Dry matter	96.45
Ash (%)	3.08
Protein (%)	27.92
Fat (%)	9.13
Fibers (%)	15.17
Phosphorus (%)	3.04
Potassium (%)	2.52

Data were analyzed using Complete Random Design (CRD), to study the effect of the studied parameters on the productive characteristics, the mean differences in mean were compared to the Duncan (1955) multiple range test, use the SAS Ready Statistical Program (2012).

Results

Table 3. show that there were no significant differences between all levels of the leaf powder in the beginning of the experiment, significant superiority of the level of 6 g/kg of powdered leaves of melissa at the level 0 and 2 g/kg of feed at the fourth week of the Arabi sheep's life, at the eighth week of life, significant superiority was observed for level 6 g/kg feed at level 2 g/kg for superior food in turn morally at the expense of level 0 g, at the end of the experiment (12 weeks), the level exceeded 6 g/kg feed was a significantly compared to the level 4 g / kg feed significantly compared to the level 2 g/kg feed, while the level decreased 0 g/kg feed significantly compared to the level 2 g/kg feed.

Table 4 shows a significant improvement in the weight increase of the Arabi sheep when adding the powder of melissa leaves to diet at a level of 6 g/kg feed at the 4 and 8 weeks of age compared to the level of 2 g/kg feed, the superior role morally at the expense of the level 0 g/kg feed, at the end of the experiment (12 weeks), the level exceeded 6 g/kg of feed compared to the level 2 and 4 g/kg of feed, which exceled compared to the level of 0 g/kg of feed, with

regard to the total weight increase, the significant superiority of the high level of melissa leaf powder (6 g/kg feed) continued at the level of 4 g/kg of feed. The superior in turn was at the expense of the level 2 g/kg feed, which was superior to the level 0 g/kg feed.

Table 5 indicates a significant increase in the consumption of fodder for the Arabi sheep when adding the powder of melissa leaves to the diet at a level of 6 g/kg feed compared to other levels at the fourth week of life, at the eighth week, the feed consumption rate increased at the level 0 and 6 g / kg feed compared to the level 2 and 4 g / kg feed, at week 12, the total feed consumption increased the feed consumption rate at the level of 6 g / kg of feed at the expense of the level of 2 g / kg of feed, which increased significantly compared to the level of 0 g / kg of feed.

Table 6 show a significant improvement is observed in the feed conversion factor of 0 g / kg forage compared to other levels, while the coefficient of nutritional conversion of all levels of the leaves of melissa leaves improved compared to the level 0 g / kg of feed at the fourth week of life, at the end of the experiment (12 weeks) and the total food conversion factor, a significant improvement in level of 6 g / kg feed was observed compared to the level of 2 g / kg, which improved significantly compared to the level of 0 g / kg of feed.

Table 3 : Effect of Different Levels of Melissa Leaves Powder on Average Body Weight of Arabi Sheep (kg).

Melissa leaf powder (g / kg feed)	Age (Week)			
	0	**4**	**8**	**12**
0	12.45	14.83 b	18.73 c	23.63 d
2	11.93	14.76 b	19.24 b	25.48 c
4	12.16	15.22 ab	19.93 ab	26.58 b
6	12.33	15.62 a	20.64 a	27.87 a
Sig.	N.S	0.05	0.05	0.05

Table 4 : Effect of Different Levels of Melissa Leaves Powder on Average Weight gain of Arabi Sheep (kg).

Melissa leaf powder (g / kg feed)	Age (Week)			Cumulative weight gain
	4	**8**	**12**	
0	2.38 c	3.90 c	4.90 c	11.18 d
2	2.83 b	4.48 b	6.24 b	13.55 c
4	3.06 ab	4.71 ab	6.65 b	14.42 b
6	3.29 a	5.02 a	7.23 a	15.54 a
Sig.	0.05	0.05	0.05	0.01

Table 5 : Effect of Different Levels of Melissa Leaves Powder on Average Feed consumption of Arabi Sheep (kg).

Melissa leaf powder (g / kg feed)	Age (Week)			Cumulative feed consumption
	4	**8**	**12**	
0	7.19 d	21.26 a	39.49 c	67.93 c
2	10.89 c	20.34 b	43.43 b	74.66 b
4	11.93 b	20.72 b	43.36 b	76.48 ab
6	12.53 a	21.39 a	44.83 a	78.75 a
Sig.	0.05	0.05	0.05	0.05

Table 6 : Effect of Different Levels of Melissa Leaves Powder on Average Feed conversion factor of Arabi Sheep (kg feed / kg weight gain).

Melissa leaf powder (g / kg feed)	Age (Week)			Total feed conversion factor
	4	**8**	**12**	
0	3.02 b	5.45 a	8.06 a	6.08 a
2	3.85 a	4.54 b	6.96 b	5.51 b
4	3.90 a	4.40 b	6.52 bc	5.30 bc
6	3.81 a	4.26 b	6.20 c	5.07 c
Sig.	0.05	0.05	0.05	0.01

Discussions

A significant improvement was observed in all studied productive traits when using level 6 g of leaf powder, melissa / kg feed, significant improvement may be due to active compounds such as Eugenol, Terpenoids and Flavonoids, works as antioxidants and substances that improve digestion by stimulating the release of digestive enzymes, which increases the utilization of nutrients, leads to weight gain and weight gain (Kennedy *et al.*, 2006). Their effect may be as pathogenic antimicrobials, raises the body's immunity and increases the body's immune response, reflects on public health, thus obtaining better production performance represented by average body weight and weight gain compared to the control treatment (Zheng and Wang, 2001). May explain the reason for the moral superiority in the treatment with a high concentration of extract of the melissa plant to increase the proportion of flavonoids, that affected the appetite, consequently, it led to an increase in feed consumption, reflected the weight gain (Schutz *et al.*, 2006). May be due to the content of flavonoids on antioxidants, it has the ability to remove free radicals due to its inherent ability in the body's reaction to allergies, viruses and carcinogens, also shows anti-parasitic and anti-microbial activity, flavonoids have their anti-inflammatory and antimicrobial efficacy (Aiyelaagbe and Osamudiamen, 2009). The improvement may be due to the fact that the essential oils have a positive effect on the digestive system, helps to restore the balance of microbes and increase the absorption of nutrients, which can mainly be attributed to turbine compounds (Wannissorm *et al.*, 2005).

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