



EFFECT OF ADDING CORIANDER (*CORIANDRUM SATIVUM*) POWDER TO THE DIET IN THE RUMEN BACTERIAL COUNT AND SOME BLOOD PARAMETERS IN AWASSI EWES

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Abstract

This experiment was carried out at the College of Agricultural Engineering Sciences, University of Baghdad to investigate the effect of *Coriandrum sativum* seeds powder on Rumen bacterial count and some blood parameters such as packed cell volume (PCV), Red blood cell (RBC), White blood cell (WBC), Hemoglobin (HB), Glutamic-oxaloacetic transaminase (GOT) and glutamic-pyruvic transaminase (GPT) determination in Awassi ewes. Sixteen Awassi ewes aged 3-4 months and weighed 17-20 kg were used in the experiment. Ewes were randomly separated into four groups where each group consisted of four ewes fed in the group feeding system. Two ratios of 30:70% and 70:30% concentrate:roughage respectively, with or without supplemented coriander 6 g/head/day were used for the analysis. Results showed that non-significant effects in all blood parameters that measured in this study. But, the Rumen bacterial count was affected by adding the coriander powder to the high concentration diet ($P < 0.05$) 13.00 ± 0.28 .

Key words : *Coriandrum sativum*, Blood parameters, Rumenal bacterial count, Awassi Ewes.

Introduction

Coriander (*Coriandrum sativum* L.), is one of valuable medicinal, seasoning and oliferous plants (Nurzynska-Wierdak, 2013). The coriander essential oil is used for medicinal purposes (Duarte *et al.*, 2012). It is used as antimicrobial against selected pathogenic and saprophytic microorganisms, indicating that it may be useful as a disinfectant (Elgayyar *et al.*, 2001). such as a stomachic, diarrhea and dyspepsia of various origins as well as for its digestive stimulation (Platel and Srinivasan, 2004). The coriander essential oil is contents to decanal 17.2%, E-2-dodecanol 16.5%, E-2-decenol 14.2%, nonane 3.4%, undecanal 2.1%, phytol 2.1%, tetradecanal 1.9%, and E-2-tridodecanol 1.7% and linalool 1.1%. (Nurzynska-Wierdak, 2013). Barwary (2019) Reported that, the addition of medicinal plants to diets of ewes had a positive effect on blood parameters. Mohammed SF *et al.*, (2018) showed that the adding of coriander to low concentrate diet increased the daily weight significantly (0.162g/day) compared with the control (0.047g/day). The aim of this study is to investigate the effect of adding

coriander seed powder in Awassi diets on some blood parameters and bacterial count in rumen.

Materials and Methods

Growth experiment

An experiment was carried out in the animal field at the College of Agriculture, University of Baghdad. Sixteen Awassi ewes with 3-4 month old, 17-20 weight were considered for the experimental duration of 56 days. Ewes were divided randomly to four representative groups each including four ewes fed on concentrate:roughage and two concentrates (30:70 and 70:30) with or without addition of 6 g/head/day to the concentrate feeding of the ewes at 8 am every day after feeding Alfalfa hay. The Formulation of the concentrated diet was contents Yellow corn 38%, Barley 15%, Soybeans 10%, Wheat bran 35%, Salt 1% and Limestone 1%.

The components and chemical composition of the concentrate, roughage and coriander was shown in table 1. All ewes weighed at the beginning of experimental duration and then weekly to measure the weight increase.

Table 1: The components and chemical composition of the concentrate and rough ration and coriander (dry mater)%.

Ingredient (%)	Concentrate	Alfalfa hay	<i>Coriandrum sativum</i>
DM	98.12	90.82	94.07
OM	92.44	79.63	91.09
CP	13.05	9.88	15.09
CF	12.00	30.66	21.39
EE	0.97	0.02	0.14
NFE	66.42	39.07	54.47
ME(MJ/kg DM*)	12.06	8.20	10.54

Metabolizable energy (ME) values are estimated according to the equation

*ME(MJ/kg DM) = 0.012(C.P) + 0.005(C.F) + 0.031(E.E) + 0.014(NFE); Nitrogen free extract (NFE) was calculated by the following formula % NFE = OM – (CP % + EE% + CF%)

Blood sampling

Blood samples were collected for all animals from jugular vein to measure Packed cell volume (PCV), Red blood cell (RBC), White blood cell (WBC), Hemoglobin(HB), Glutamic – oxaloacetic transaminase (GOT) and glutamic –pyruvic transaminase (GPT) determination.

Rumen bacterial count

At week before the end of the experiment rumen fluid was collected from three animals of each treatment using rubber tube by Mana Syphon method (Chithra and Leelamma, 1997, Saeed, 2011). Rumen bacterial count was determined according to Noveir and Halkman (2000).

Statistical analysis

Data were statically analyzed as 2*1 completely randomized designs (CRD) experiment using statistical program (SAS, 2005) and data were tested according to Duncan's multiple range test (Duncan, 1955) following: the mathematical equation given below:

$$Y_{ij} = \mu + T_i + e_{ij}$$

Y_{ij} : Observation value

where, μ : mean; T_i = Effect of treatment; and e_{ij} = standard error.

Table 2: The effect of low and high concentrate supplemented with *Coriandrum sativum* on rumenal bacterial count.

Rumenal bacterial count (cfu log/ml)	Parameters
13.00±0.28a	With <i>Coriandrum sativum</i> 70:30
10.00±0.14c	Without <i>Coriandrum sativum</i> 70:30
13.00±0.17a	With <i>Coriandrum sativum</i> 30:70
12.00±0.28b	Without <i>Coriandrum sativum</i> 30:70

* Significant

a and b: Means in the same row for each item with different superscripts differ significantly; * (P<0.05); NS: Not significant

Results and Discussion

Table 2 showed that the addition of *Coriandrum sativum* with high concentrate level significantly affect (P<0.05) 13.00±0.28 compared without adding *Coriandrum sativum*. These result agree with that finding McIntosh *et al.*, (2003) suggested that activity of ruminal protozoa was affected by essential oils treated with 100 mg/kg. The results showed that the effects of essential oils on ruminal microbial fermentation may be independent and that these compounds are more effective when addition high doses compared with low doses (Giannenas *et al.*, 2011).

Table 3 showed that no significant effects of feed type or coriander powder addition on GPT, GOT, HB, WBC, RBC and PCV. These results agree with the finding (Giannenas *et al.*, 2011) the Supplementation of essential oils to diet did not significantly affect on blood parameters.

Conclusion

It can be concluded that addition of coriander to Awassi ewes ration not effect on blood parameters measured. But, the addition of coriander with high level concentrate diet led to increase the total bacterial count. Perhaps this is because the added percentage of coriander is insufficient to show the significant differences between the treatments. We recommended studying the effect of other ratios from coriander on the studied traits.

Table 3: The effect of low and high concentrate supplemented with *Coriandrum sativum* on some blood parameters.

PCV%	RBC(u/l)	WBC(u/l)	HB(g/dl)	GOT(mg/dl)	GPT(mg/dl)	Parameters
31.66±1.20a	6.85±0.75a	9166.67±712.58a	11.90±0.63a	104.87±10.62a	15.56±4.55a	With <i>Coriandrum sativum</i> 70:30
31.66±1.66a	7.94±0.34a	11600.00±1311.49a	12.16±0.76a	99.63±10.30a	15.98±2.56a	Without <i>Coriandrum sativum</i> 70:30
32.00±1.00a	7.79±1.26a	12833.33±2016.87a	12.03±0.70a	100.69±2.88a	16.27±2.26a	With <i>Coriandrum sativum</i> 30:70
34.00±1.52a	8.59±0.79a	9233.33±0.79a	12.16±0.70a	107.98±8.02a	14.01±1.22a	Without <i>Coriandrum sativum</i> 30:70
NS	NS	NS	NS	NS	NS	Significant

a and b: Means in the same row for each item with different superscripts differ significantly; * (P<0.05); NS: Not significant

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