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 17-20kg 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 ration 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-tridecncenal 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 du-ration of 56 days. Ewes were divided randomly to four representative groups each including four ewes fed on concentrate: roughage respectively, 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, rough ration and coriander was shown in table 1. All ewes weighed at the beginning of experimental duration and then weekly to measure the weight increase.
Effect of adding coriander (*Coriandrum sativum*) powder to the diet in the Rumen bacterial count

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

<table>
<thead>
<tr>
<th>Ingredient (%)</th>
<th>Concentrate</th>
<th>Alfalfa hay</th>
<th>Coriandrum sativum</th>
</tr>
</thead>
<tbody>
<tr>
<td>DM</td>
<td>98.12</td>
<td>90.82</td>
<td>94.07</td>
</tr>
<tr>
<td>OM</td>
<td>92.44</td>
<td>79.63</td>
<td>91.09</td>
</tr>
<tr>
<td>CP</td>
<td>13.05</td>
<td>9.88</td>
<td>15.09</td>
</tr>
<tr>
<td>CF</td>
<td>12.00</td>
<td>30.66</td>
<td>21.39</td>
</tr>
<tr>
<td>EE</td>
<td>0.97</td>
<td>0.02</td>
<td>0.14</td>
</tr>
<tr>
<td>NFE</td>
<td>66.42</td>
<td>8.20</td>
<td>54.47</td>
</tr>
</tbody>
</table>

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 statistically 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
- \( \mu \): 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.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Ruminal bacterial count (cfu/log/ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>13.00±0.28a</td>
<td>With Coriandrum sativum 70:30</td>
</tr>
<tr>
<td>10.00±0.14c</td>
<td>Without Coriandrum sativum 70:30</td>
</tr>
<tr>
<td>13.00±0.17a</td>
<td>With Coriandrum sativum 30:70</td>
</tr>
<tr>
<td>12.00±0.28b</td>
<td>Without Coriandrum sativum 30:70</td>
</tr>
</tbody>
</table>

* 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.
References


