A FEEDING STRATEGY OF LAMBS TO INCREASE NUTRIENT UTILIZATION AND REDUCE FEED COST

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ABSTRACT

Five experimental rations were evaluated in this study of which 33% and 66% of concentrate feed mixture (CFM) was replaced by yellow corn grains (YCG) or crushed yellow corn ear (YCE) and their effects on lambs performance were also studied. These rations contained different levels of CFM (3%, 2%, or 1%); YCG (2%, or 1%); YCE (2%, or 1% of body weight), and rice straw ad lib. Forty Barki male lambs of average 25.85-Kg body weight were divided into five groups and assigned at random to the experimental rations for 140 days. Five metabolism trials were conducted during weeks 11 and 12.

Results obtained show that replacement of CFM with YCG or YCE increased digestibility coefficients, nutritive values, nitrogen balance, concentrations of plasma TP, albumin, glucose, and improved daily gain. It also gave the best feed conversion, economical efficiency and the lowest feed cost/Kg weight gain.

It is concluded that using local raw materials in formulating rations may reduce costs without adverse effects on animal performance.

Keywords: concentrates, lambs, digestibility, metabolism, growth, performance

INTRODUCTION

Feeding feed cubes to ruminants may result in variable performance of animals. Large variations are detectable in the chemical analysis and nutritive values due to the variations in feed cube components.

It is advisable to farmers to “dilute” the concentrated feeds or increase the concentrations of certain feed ingredients in order to obtain good profits

Feeding supplementary feed ingredients individually (the so called “straights”) is a good practice by farmers in some other countries (e.g Britain, Newman, 1989).

Rations based on such feeding strategies seem to be more consistent in their nutritive value (Wright, 1989).

The present study was conducted to evaluate the effect of “diluting” concentrates feed mixture (commonly available in local markets) which, usually, has no consistent components and, hence, variable chemical composition with some individual feed ingredients such as yellow corn grains or ears on lambs growth performance and nutritive values of rations.
MATERIALS AND METHODS

Animals and management
Forty male Barki lambs of average 25.85 ± 1.00 Kg live body weight (LBW) were used in this study during the period from autumn to the beginning of winter season (Sept. to Jan.). Therefore, the experimental period was 140 days. Lambs were divided into five similar groups of eight animals each and randomly assigned to the tested rations. Lambs were group fed. Different concentrates were offered to animals twice a day at 8 am and 3 pm, while rice straw was offered ad. Lib. Water was available for animals at all times. After the 10th week of the experiment, five metabolism trials were conducted to determine the digestion coefficients and feeding values of the four experimental rations. Three animals from each treatment were used. The preliminary and collection periods of the metabolism trial were 15 days.

Experimental rations
Feeding treatments were as follows:
1- Concentrates feed mixture (CFM) at 3% of LBW, and rice straw ad. Lib. (control ration, G1)
2- Concentrate feed mixture (CFM) at 2% of LBW, 1% of LBW as yellow corn grains (YCG), and rice straw ad. Lib. (G2)
3- Concentrate feed mixture (CFM) at 1% of LBW, 2% of LBW as yellow corn grains (YCG), and rice straw ad. Lib. (G3)
4- Concentrate feed mixture (CFM) at 2% of LBW, 1% of LBW as yellow corn ears (YCE), and rice straw ad. Lib. (G4)
5- Concentrate feed mixture (CFM) at 1% of LBW, 2% of LBW as yellow corn ears (YCE), and rice straw ad. Lib. (G5)

Corn grains and corn ears were ground coarsely. Feeds were offered twice daily and water was available for animals at all times. Feed and water intakes were recorded. Chemical composition of feed ingredients is presented in Table (1).

Table 1. Chemical analysis of ingredients of the experimental diets.

<table>
<thead>
<tr>
<th>Item</th>
<th>DM</th>
<th>OM</th>
<th>CP</th>
<th>CF</th>
<th>EE</th>
<th>Ash</th>
<th>NFE</th>
</tr>
</thead>
<tbody>
<tr>
<td>CFM*</td>
<td>86.36</td>
<td>93.89</td>
<td>14.21</td>
<td>12.11</td>
<td>2.81</td>
<td>6.11</td>
<td>64.76</td>
</tr>
<tr>
<td>Rice straw</td>
<td>86.71</td>
<td>84.36</td>
<td>4.11</td>
<td>37.02</td>
<td>1.21</td>
<td>15.64</td>
<td>42.02</td>
</tr>
<tr>
<td>Yellow corn grains</td>
<td>86.64</td>
<td>98.71</td>
<td>9.04</td>
<td>1.81</td>
<td>3.71</td>
<td>1.29</td>
<td>84.14</td>
</tr>
<tr>
<td>Yellow corn ears</td>
<td>86.26</td>
<td>98.41</td>
<td>8.50</td>
<td>7.93</td>
<td>2.94</td>
<td>1.59</td>
<td>79.04</td>
</tr>
</tbody>
</table>

*Concentrate feed mixture contains: 37% wheat bran, 27% undecrinated cotton seed cake, 25% extracted rice bran, 5% molasses, 3% limestone, corn, 2% and 1% mineral salt.

Sampling techniques and analytical methods
Samples of feeds, feces, and urine were analyzed according to A.O.A.C. (1990). Blood samples withdrawn from the jugular vein were let to flow into heparinized tubes. Blood samples were immediately centrifuged at 4000 rpm for 20 minutes and frozen at –20 °C till time of analysis according to A.O.A.C. (1990). Samples of rumen fluid were collected using stomach
tube. Rumen liquor was sampled at the middle of the experimental period. The samples were withdrawn just before morning feeding, 3 and 6 hrs post feeding. Samples were filtered through double layer cheesecloth and pH values were immediately recorded (Beckman pH meter). Few drops of saturated solution of mercuric chloride were used to stop microbial activity. The samples were frozen for TVFA’s determination (Kromann et al., 1967).

Data were statistically analyzed using GLM procedures of SAS (1992).

RESULTS

Results in Table (2) indicate that the replacement of different proportions of CFM with either crushed YCG or crushed YCE resulted in better ration digestibility coefficients. While the control ration showed the lowest DM, OM, EE, and NFE digestion coefficients, the dilution of CFM recorded 5% or more increments.

<table>
<thead>
<tr>
<th>Item</th>
<th>G1 (%)</th>
<th>G2 (%)</th>
<th>G3 (%)</th>
<th>G4 (%)</th>
<th>G5 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DM</td>
<td>64.91 b</td>
<td>72.07 a</td>
<td>72.93 a</td>
<td>69.60 ab</td>
<td>70.73 ab</td>
</tr>
<tr>
<td>OM</td>
<td>68.78 b</td>
<td>74.34 a</td>
<td>75.10 a</td>
<td>71.43 ab</td>
<td>73.88 a</td>
</tr>
<tr>
<td>CP</td>
<td>62.94 a</td>
<td>62.89 a</td>
<td>61.74 b</td>
<td>62.70 a</td>
<td>61.35 b</td>
</tr>
<tr>
<td>CF</td>
<td>53.32 a</td>
<td>52.47 ab</td>
<td>50.99 c</td>
<td>53.01 a</td>
<td>51.99 b</td>
</tr>
<tr>
<td>EE</td>
<td>71.65 b</td>
<td>74.30 a</td>
<td>75.89 a</td>
<td>73.71 ab</td>
<td>71.26 ab</td>
</tr>
<tr>
<td>NFE</td>
<td>74.25 c</td>
<td>80.84 a</td>
<td>81.09 a</td>
<td>77.47 b</td>
<td>80.93 a</td>
</tr>
<tr>
<td>Nutritive value, %</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TDN</td>
<td>66.15 c</td>
<td>72.55 ab</td>
<td>73.37 a</td>
<td>69.62 b</td>
<td>72.38 ab</td>
</tr>
<tr>
<td>DCP</td>
<td>7.07 a</td>
<td>6.15 b</td>
<td>5.57 c</td>
<td>6.33 b</td>
<td>5.04 c</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Item</th>
<th>G1 (%)</th>
<th>G2 (%)</th>
<th>G3 (%)</th>
<th>G4 (%)</th>
<th>G5 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N intake, g/h/d</td>
<td>22.10</td>
<td>20.83</td>
<td>17.56</td>
<td>20.13</td>
<td>15.14</td>
</tr>
<tr>
<td>Fecal N, g/h/d</td>
<td>8.19</td>
<td>7.73</td>
<td>6.72</td>
<td>7.31</td>
<td>5.86</td>
</tr>
<tr>
<td>Digested N, g/h/d</td>
<td>13.91</td>
<td>13.10</td>
<td>10.84</td>
<td>12.82</td>
<td>9.28</td>
</tr>
<tr>
<td>Urinary N, g/h/d</td>
<td>8.80</td>
<td>7.64</td>
<td>5.12</td>
<td>7.64</td>
<td>3.91</td>
</tr>
<tr>
<td>N retention, g/h/d</td>
<td>5.11 b</td>
<td>5.46 a</td>
<td>5.72 a</td>
<td>5.18 b</td>
<td>5.37 a</td>
</tr>
<tr>
<td>Retained/digested N,%</td>
<td>36.74 b</td>
<td>41.68 b</td>
<td>52.77 a</td>
<td>40.41 b</td>
<td>57.87 a</td>
</tr>
<tr>
<td>Retained/ intake, %</td>
<td>23.12 b</td>
<td>26.21 b</td>
<td>32.57 ab</td>
<td>25.73 b</td>
<td>35.47 a</td>
</tr>
<tr>
<td>Water intake, l/h/d</td>
<td>2.442 c</td>
<td>2.580 b</td>
<td>2.802 a</td>
<td>2.650 b</td>
<td>2.773 a</td>
</tr>
<tr>
<td>Water intake/Kg DMI</td>
<td>2.11 c</td>
<td>2.20 b</td>
<td>2.45 a</td>
<td>2.21 b</td>
<td>2.56 a</td>
</tr>
</tbody>
</table>

a,b,c, and means with different superscripts in the same row differ significantly (P<0.05)
On the other hand, results presented in Table (3) revealed that nitrogen balance, nitrogen balance as percent of digested nitrogen, and nitrogen intake increased significantly (P<0.05) with each increment in the level of replacement (G2 to G5).

Lambs of the control group (Table 3) drank less water on average than did other groups.

**Rumen liquor parameters and blood plasma metabolites**

Table (4) shows the average values of some rumen liquor parameters (pH values and TVFA’s concentrations) at different times (0, 3, and 6 hrs post feeding). Some variations in pH values took place. Groups (3 and 5) had lower pH values, while G1 (control) showed higher values. The mean pH values of the five rations exhibited similar trend. They showed higher values at zero time, then decreased at 3 hrs and raised again after 6 hrs post feeding. Overall average of ruminal pH decreased with increasing proportions of YCG or YCE in rations.

<table>
<thead>
<tr>
<th>Item</th>
<th>Time after feeding (hr)</th>
<th>G1</th>
<th>G2</th>
<th>G3</th>
<th>G4</th>
<th>G5</th>
</tr>
</thead>
<tbody>
<tr>
<td>PH</td>
<td>0</td>
<td>6.87</td>
<td>6.80</td>
<td>6.75</td>
<td>6.84</td>
<td>6.80</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>6.19&lt;sup&gt;a&lt;/sup&gt;</td>
<td>6.17&lt;sup&gt;a&lt;/sup&gt;</td>
<td>6.10&lt;sup&gt;b&lt;/sup&gt;</td>
<td>6.18&lt;sup&gt;a&lt;/sup&gt;</td>
<td>6.11&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>6.50</td>
<td>6.43</td>
<td>6.42</td>
<td>6.47</td>
<td>6.44</td>
</tr>
<tr>
<td>Ave.</td>
<td></td>
<td>6.52&lt;sup&gt;a&lt;/sup&gt;</td>
<td>6.47&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>6.42&lt;sup&gt;b&lt;/sup&gt;</td>
<td>6.50&lt;sup&gt;a&lt;/sup&gt;</td>
<td>6.45&lt;sup&gt;ab&lt;/sup&gt;</td>
</tr>
<tr>
<td>TVFA’s</td>
<td>0</td>
<td>5.70&lt;sup&gt;c&lt;/sup&gt;</td>
<td>6.07&lt;sup&gt;b&lt;/sup&gt;</td>
<td>6.24&lt;sup&gt;a&lt;/sup&gt;</td>
<td>5.82&lt;sup&gt;bc&lt;/sup&gt;</td>
<td>5.97&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>9.42&lt;sup&gt;c&lt;/sup&gt;</td>
<td>9.55&lt;sup&gt;b&lt;/sup&gt;</td>
<td>9.82&lt;sup&gt;a&lt;/sup&gt;</td>
<td>9.51&lt;sup&gt;b&lt;/sup&gt;</td>
<td>9.73&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>7.84</td>
<td>8.10</td>
<td>8.03</td>
<td>7.95</td>
<td>8.07</td>
</tr>
<tr>
<td>Ave.</td>
<td></td>
<td>7.65&lt;sup&gt;b&lt;/sup&gt;</td>
<td>7.91&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>8.03&lt;sup&gt;a&lt;/sup&gt;</td>
<td>7.76&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>7.92&lt;sup&gt;ab&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

a,b,c, and means with different superscripts in the same row differ significantly (P<0.05)

Concentrations of TVFA’s in rumen liquor samples of the five lamb groups were significantly different at zero, 3, and 6 hrs post feeding, and so were the overall averages. The values of TVFA’s concentrations at 3, and 6-hrs post feeding were higher than those recorded before feeding for all groups. Replacement of CFM with YCG or YCE had affected TVFA’s concentrations at different time intervals.

Plasma total protein, albumin and globulin concentrations (Table 5) were slightly higher for YCG (G2 and G3) and YCE (G4 and G5) than control group. Albumin/globulin ratios were similar among rations. Plasma glucose content was significantly lower in animals of the control group than other groups.

**Table 5: Effect of type of concentrates on some plasma contents**

\[1384\]
Table 6: Performance of lambs fed different experimental rations

<table>
<thead>
<tr>
<th>Item</th>
<th>G1</th>
<th>G2</th>
<th>G3</th>
<th>G4</th>
<th>G5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Initial weight, Kg</strong></td>
<td>25.75</td>
<td>25.88</td>
<td>25.88</td>
<td>25.75</td>
<td>26.00</td>
</tr>
<tr>
<td><strong>Final weight, Kg</strong></td>
<td>43.25</td>
<td>44.45</td>
<td>45.49</td>
<td>43.47</td>
<td>44.31</td>
</tr>
<tr>
<td><strong>Total gain, Kg</strong></td>
<td>17.50</td>
<td>18.57</td>
<td>19.61</td>
<td>17.72</td>
<td>18.31</td>
</tr>
<tr>
<td><strong>Daily gain, g/h/d</strong></td>
<td>125.00b</td>
<td>132.64b</td>
<td>140.07a</td>
<td>126.57b</td>
<td>130.79b</td>
</tr>
<tr>
<td><strong>Daily feed intake, g/h/d</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CFM</td>
<td>880.99</td>
<td>610.69</td>
<td>309.82</td>
<td>594.47</td>
<td>303.52</td>
</tr>
<tr>
<td>Rice straw</td>
<td>339.53</td>
<td>332.99</td>
<td>327.96</td>
<td>335.93</td>
<td>330.49</td>
</tr>
<tr>
<td>Yellow corn grains</td>
<td>--</td>
<td>306.33</td>
<td>621.65</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Yellow corn ears</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>296.89</td>
<td>606.32</td>
</tr>
<tr>
<td>TDMI</td>
<td>1220.52a</td>
<td>1250.01a</td>
<td>1259.43a</td>
<td>1227.29a</td>
<td>1240.33a</td>
</tr>
<tr>
<td>TDNI</td>
<td>807.37c</td>
<td>906.88ab</td>
<td>949.23a</td>
<td>854.44b</td>
<td>897.75ab</td>
</tr>
<tr>
<td>DCPI</td>
<td>86.29a</td>
<td>76.88ab</td>
<td>70.15ab</td>
<td>77.69ab</td>
<td>62.51b</td>
</tr>
<tr>
<td><strong>Feed conversion</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kg DM/Kg gain</td>
<td>9.76a</td>
<td>9.42a</td>
<td>8.99a</td>
<td>9.70a</td>
<td>9.48a</td>
</tr>
<tr>
<td>Kg TDN/Kg gain</td>
<td>6.46a</td>
<td>6.84b</td>
<td>6.78b</td>
<td>6.75b</td>
<td>6.86b</td>
</tr>
<tr>
<td>Kg DCP/Kg gain</td>
<td>0.69a</td>
<td>0.58ab</td>
<td>0.50b</td>
<td>0.61b</td>
<td>0.48b</td>
</tr>
<tr>
<td>Feed cost*/Kg gain, LE</td>
<td>5.21</td>
<td>4.90</td>
<td>4.52</td>
<td>4.94</td>
<td>4.62</td>
</tr>
<tr>
<td>Economic efficiency**</td>
<td>1.80</td>
<td>1.93</td>
<td>2.11</td>
<td>1.90</td>
<td>2.07</td>
</tr>
</tbody>
</table>

a, and b, means with different superscripts in the same row differ significantly (P<0.05)

Results in Table (6) indicate higher daily weight gain in lambs fed YCG or YCE rations as separate ingredients compared with CFM ration (G1). Highest average daily gain was recorded for G3 (140.07 g/h/d) followed by G2 (132.64 g/h/d). Replacement of CFM with YCG or YCE had higher total DMI (non-significant) and daily TDN intake (P<0.05) than G1 (control). Control group had higher DCP intake (P<0.05) than other groups.

Feed conversion as Kg DM/Kg gain and as Kg DCP/Kg gain was better for rations including separate feed ingredients than control. On the other hand, results showed that feed conversion as Kg DCP/Kg gain was better for ration (5) than others.
Feed cost/Kg weight gain (L.E.) and economic efficiency were in favor of feeding feed ingredients as separate components than CFM (G1).

**DISCUSSION**

Results in Table (2) show that feeding coarsely ground corn grains or ears increased DM, OM, EE, and NFE digestibilities and, therefore, TDN values. Digestion coefficients of CP and CF and, hence, digestible CP decreased. This might be due to the higher contents of OM, EE, and NFE and lower contents of CP in YCG, and YCE (Table 1). These results are in accordance with Abou-Raya et al., (1980) and Fahmy et al. (1995). Singh et al. (1980) and El-Sayes and Gaafar, (1998), found that grains supplementation increased DM, OM, EE and NFE digestion coefficients, and decreased CF digestibility. Mehrez, (1995) reported that the addition of quantities of readily available substrates (in the form of cereals) to poor quality roughage increased its rate of fermentation in the rumen through more colonization of rumen bacteria. Kennedy and Milligan (1980) suggested that grains could be used to increase nutrient utilization. However, this might be due to the variation in the availability of energy from corn grains or ears compared to CFM ration. Aly et al. (1982) reported that increased digestibilities of nutrients may be due to increased energy utilization.

Linden et al. (1984), Van Gylswyk and Schwartz, (1984), and Gihad et al. (1994) observed that the digestibility of CF declined linearly as the proportion of grains increased in the diet. The lower CF digestibility associated with feeding corn grains or ears might due to their contents of high readily fermentable carbohydrates. This slightly increased rumen TVFA’s concentrations and decreased pH values (Table 5), resulting in lower cellulolytic activity, thus reducing the fermentation of fiber (Chase and Hibberd, 1989).

On the other hand, Iwuanyanwu et al (1990) reported that low protein content in rations caused CP digestibility to decrease. Hanafy et al. (1998) found that the low DCP value of corn grains included in rations could be related to its low CP contents compared with CFM.

The results in Table (3) indicated that increasing coarsely ground corn grains or ears from zero to one or two percent of LBW (high energy diet) decreased nitrogen intake, nitrogen in feces and urine, and increased nitrogen retention calculated as gram N/h/d or as percentage of digested nitrogen or nitrogen intake. This increase in N utilization in these groups maybe due to the lower dietary fiber content (Taie, 1998). Higher nutrient digestibilities, therefore, could be attributed to better fermentation rate and NH₃-N concentration leading to higher microbial protein synthesis (El-Bedawy et al., 1993). This protein has more balanced amino acid pattern than that of CFM as suggested by El-Ayek, (1999). Angami et al. (1992), Sultan and Loerch, (1992), and Taie et al. (1998) found that N retention was higher with high-energy diets. Similar improvement was obtained in N retention as percentage of N digested and N intake. Lower CP concentration reduced N
waste, particularly in the form of urinary N. Susmel et al. (1995) and Wright et al. (1997) supported this suggestion.

In Table (3), water intake (l/h/d) and water intake/Kg DM intake increased with increasing level of energy in the rations. These results agree with Shafie et al. (1994) and Solouma, (1999). They found that high energy level in the ration increased drinking water more than the low level of energy.

Rumen pH is one of the most important factors affecting the fermentation in the rumen and influences its function. Overall average of ruminal pH values (Table 4) ranged from 6.42 to 6.52 indicating optimum rumen environment for degradation of straw (Bhartava and Orskov, 1987). The trend of pH values might reflect the increase in TVFA’s production in the rumen through the first 3 hrs post feeding. This may due to fermentation process of non structural carbohydrates causing pH to decrease until relatively absorbed from the rumen wall resulting in an increase in pH value (6 hrs post feeding) (El-Sayed et al., 1997). Ashmawy (1998) stated that rumen pH was closely related to VFA levels in the rumen. Average ruminal pH values decreased and total VFA’s increased with increasing corn grains or ears in rations (Table 4). Ørskov, (1973) reported that grain diets decreased rumen pH. Lower pH values (G2 to G5) may be due to relatively more fermentation of NFE (Gihad et al., 1989). On the other hand, the higher TVFA’s concentrations may be associated with increased NFE intake (Table 1) (Fouad et al., 1997). Haaland et al (1992) and Das, (1996) attributed that to the availability of essential nutrients required for microbial activity. Moreover, Van’t Klooster, (1986), reported that intake of large quantities of fast fermentable carbohydrate cause a disturbance in the rumen ecosystem. The rate of VFA production may in this situation exceed the rate of VFA absorption through rumen epithelium and, therefore, VFA concentrations increase in rumen juice.

Data given in Table (5) revealed that levels of total protein, albumin and globulin slightly increased (non significantly) and glucose increased (P<0.05) with each increment in the level of replacement. These results were within the normal ranges recorded by Varley, (1969). The increased plasma total protein and its fractions may be due to stimulation of protein synthesis and as a response to the increase in regulators of growth hormone synthesis (Wood et al., 1987). Growth hormone has a major role in the movement of amino acids and peptide transport and subsequently blood protein anabolism (Hussein, 1986). The increase in plasma glucose may be attributed to the increase of carbohydrate metabolism and the increase in the rate of intestinal glucose absorption (Harper et al., 1979).

Barki breed sheep is one of the subtropical breeds that are raised mostly under unfavorable conditions of management and environment including less availability and seasonal fluctuations in feed supply (Aboul-Naga and Aboul-Ela, 1987). Results indicated that slightly decreased DM intake of rice straw corresponded with increasing levels of corn grains or ears. Mehrez, (1995) reported that if the diet contains grains at relatively high proportions then fermentation of the roughage part will be depressed mainly because of lowered rumen pH (Table 4) as a result of acids produced and
less saliva secreted during chewing and rumination and decreased the straw intake.

Barki lambs performance (Table 6) indicated that partial replacement of CFM with corn grains or ears had slightly decreased roughage intake, increased total DM and average daily gain as well. O’Ferall and Keane (1990) reported that increasing the dietary energy level increased the daily gain. The higher daily gain for lambs fed the diets containing corn grains or ears (G2 to G5) was associated with a high energy availability of grains, mainly because of the greater ruminal degradation of starch (Oliveria et al., 1995). Higher production of total VFA’s (Table 4) and greater ruminal bacterial yields (Poore et al., 1993) as well as increased ruminal propionate concentration and decreased molar proportions of acetate to propionate when starch availability in the rumen increased (Overton et al., 1995), increased starch fermentation in the rumen and resulted in increased microbial protein synthesis. Subsequently, increased daily gain (Chen et al., 1994) and to the associative effect of using the two kinds of concentrates (Yu, et al., 1998). There was appreciable improvement in total MDI, daily TDN intake, average daily gain and feed efficiency as Kg DM/Kg gain and reduction in feed cost/Kg weight gain and increases in economical efficiency for group (3) than other groups.

CONCLUSION

The concentrate feed mixture (CFM) is one of the important feeds for ruminants. But due to the continuous lack of local production (leading to a decreased productivity of the animals), it maybe safely recommend to use the raw materials such as corn grains or ears as a substitute for the CFM in lamb rations without having a negative effect on its health. It caused a reduction of production cost of one Kg of meat and increased the growth rate, hence, reducing time required for marketing.

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crude protein level and limestone buffer in diets fed at two levels of

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نظام لتغذية الحملان لزيادة الاستفادة من العناصر الغذائية وتقليل تكاليف التغذية

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استخدمت في هذه الدراسة خمسة أنواع من العالق تم بها استبدال جزء من العالق المثلي به وزنا من حليب الثروة الصفراء أو ملحوظ كيزلان الثروة الصفراء لمعرفة آثر ذلك على القيم الغذائية وأداء الحملان، وكانت العالق كالتالي:

1- علف مركز نسبة 3% من وزن الجسم
2- علف مركز بنسبة 3% من وزن الجسم مع حليب ثروة صفراء (1%)
3- علف مركز نسبة 1% من وزن الجسم مع حليب ثروة صفراء (1%)
4- علف مركز بنسبة 2% من وزن الجسم مع ملحوظ كيزلان ثروة (1%)
5- علف مركز نسبة 1% من وزن الجسم مع ملحوظ كيزلان ثروة (2%)

وقد قسم الأرز كمادة مائة لحص في العالق الخمسة

استخدم في هذه التجربة أربعون رايحة بوزن متوسط وزن ۲۵.۸۵ كجم قسمت إلى خمس مجموعات بالتساوي واستمرت تجربة التغذية ۱۲۰ يوما ثم خلالها اجربة خمس تجارب تجريب غذائي وجمع سائل الكرش وعينات دم.

وُضح النتائج أن الاستبدال أدى إلى زيادة معدلات الهضم والمغذية الهضمية وفضلة الأزور مع ارتفاع البروتين الكلي والاليتروجين ولجاوز الدم مع تحسن معدلات النمو وارتفاع الكفاءة التحويلية والاقتصادية وانخفاض كليو الدم وان لم تتأثر كثيرا فيم الأس الهيدروجيني ومجموع الاحماض الدهنية الطيرة لسائل الكرش.

وينتقل من ذلك أن استخدام المواد الخام المحلية في تصنيع الاعلاف يمكن أن يخفض تكاليف تصنيع العالق دون أي تأثير على أداء الحيوان.

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