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ABSTRACT

The study was designed to determine the meat yield and dressing percentage of young rams aged 24 months belonging to three breeds i.e. Turki, Afghan Arabi (AA) and Baluchi, from Afghanistan. Data collected from 36 animals (12 rams each from Turki, AA and Baluchi) during February to May, 2011. Pre-slaughter live weight of Turki, AA and Baluchi was about 49.33 ± 0.31, 45.83 ± 0.49 and 40.71 ± 0.66 kg, respectively and were significantly different (P<0.05). Rams Body Condition Score (BCS) data showed that all the selected animals were almost of similar body conditioned. Carcasses weights were significantly higher (P < 0.05) in Turki than the other two breeds (27.79 ± 0.25 kg versus AA 24.80 ± 0.26 kg and Baluchi 21.13 ± 0.35 kg). Dressing percentage of Turki (56.33 ± 0.44%) was significantly higher (P < 0.05) than AA (54.11 ± 0.18%) and Baluchi (51.90 ± 0.22%). Proportion-wise weights of various parts in dressed carcasses of three breeds revealed that Baluchi sheep had the highest proportional weights of the body components, followed by AA and Turki. Mutton proportion were found significantly higher (P<0.05) in Fore and Hind limbs of Baluchi sheep. Fat tail proportion contributed significantly (P <0.05) higher 23% of carcass weight in Turki sheep as compared to 7% in Baluchi sheep. AA hooves weight (0.82 ± 0.004kg) was significantly higher from the Turki (0.77 ± 0.01) breed rams, however, little variation appeared from Baluchi (0.81 ± 0.007kg ) rams. Fore limbs weight of Turki breed was significantly higher (4.94 ± 0.04 kg) than AA (4.57 ± 0.04kg) and Baluchi (4.26 ± 0.07kg) while weight of hind limbs of Turki was higher than Baluchi and AA (6.91 ± 0.06, 6.44 ± 0.11 and 6.19 ± 0.05kg, respectively). Collective weight of Neck, Ribs and Brisket of Turki sheep (5.46 ± 0.04 kg) was significantly higher than AA (5.16 ± 0.06kg) and Baluchi sheep (4.87 ± 0.08kg). Weight of loin area of Turki sheep (2.17 ± 0.01kg) was significantly (P< 0.05) higher than AA and Baluchi sheep (1.71 ± 0.03 and 1.94 ±0.02 kg) respectively. The results of present study revealed that Turki breed had better potentials for mutton production under Afghanistan conditions than AA and Baluchi.

Key Words: Meat Yield, Baluchi, Turki, Afghan Arabi, Liveweight, Dressing Percentage Offal Weight, Sheep

INTRODUCTION

In 1960’s the livestock sub-sector was a significant component of the largely agrarian and pastoral economy of Afghanistan, with about 85% of the rural population being dependent on agriculture as their main livelihood. A large population of cattle, sheep, goats, camels and poultry were kept and used for sufficient meat and milk supply to the human population. During 1970s Afghanistan exported approximately one million sheep to some of its neighbors, mainly Iran, and other livestock species (FAO report). Khan and Iqbal (1999) cited that report which valued unrecorded exports of live sheep to Iran in 1977 to 1979 was a worth of US$ 33.0 million.

According to Khan and Iqbal (1999) sheep population in 1995-1996 was reached around 22.01 million heads. The said authors further reported that cattle, horses, and camels population have attained the pre-war level while sheep, goats and poultry have increased substantially.

Afghanistan has variety of sheep breeds, important from the commercial point of view; there are two types of native sheep breeds i.e. Fat-tailed and Fat-rumpled (Coop, 1988). The Fat-tailed breeds include Baluchi, Gadai or Gadik (Panjsher Gadik and Wakhan Gadik), Ghiljai or Ghilizai, Hazaragi, Kandahari or Qandahari, Morkaraman (triple purpose red colour, originated from Turkey, but presently also found in Iran and Afghanistan; Macit, 2006) and Karakul. The Fat-rumpled breeds comprise Afghan Arabi (AA) and Turki.

Among the exotic sheep breeds found in Afghanistan, Marco Polo’s sheep have been documented. Baluchi breed sheep originated in the southwestern Pakistan and seem to be introduced centuries ago by the Pakistani nomads who used to come to Afghanistan for grazing in summer season. Baluchi sheep is Pakistani area of Baluchistan also known as Mengali, Taraki, Shinwari, Araghi, Farahani, Kermani, Khorasani (Yazdi, 1997). This
breed is relatively smaller in size as compared to Turki and AA sheep. In the northern areas AA sheep also occupy an important place. Afghan Arabi sheep has large weighing about 45-50 kg and black in color with a white stripe along the forehead. Some specimens of brown or white color are also found and are famous as good producer of mutton. In the North-Eastern parts of the Afghanistan, Turki sheep were found. These animals are mostly brown with a low yielder of poor quality wool. However, its mutton production was higher due to its large size. Average Turki sheep live weight was around 50-55 kg. Turki sheep were also introduced to Pakistan by the migratory flocks and also with refugees of Afghan Russia war. In Pakistan the said breed is known as Balkhi (Hasnain, 1985).

Post-war development has stimulated the farmers to develop the sheep production according to the modern trend in meat demand and supply. A study was designed to determine comparative liveweight of young rams, carcasses weight, dressing percentage, weight of various primal cuts and meat potential of three afghan sheep breeds i.e. Turki, Afghan Arabi and Baluchi for meat yield.

MATERIALS AND METHODS

The study was conducted in the slaughter houses of Northern region of Afghanistan (i.e. Baghlan and Kunduz) where, mostly Turki, AA and Baluchi breeds of sheep were reared for mutton production and they were slaughtered for fresh and dried meat locally known as “Landi”. The data were collected for four months during 2011. A total 36 male young rams (Male adult Sheep) aging 24 months and of similar body condition score were selected randomly belonging to three breeds (12 each from Turki, AA and Baluchi). The age of the slaughtering animals was determined by dentition. During the study following parameters were recorded:

Live Body Weight

Selected sheep live weights were recorded using weighing Balance (AECO AS-9) before the slaughtering. Weight was recorded in kilogram (kg).

Body Condition Scoring (BCS)

Scoring was made on the basis of feeling the level of muscling and fat deposition over and around vertebrae in the loin region. In addition to the central spinal column, spinous and transverse process of loin vertebrae were felt and used to assess an individual body condition score(1-5) as mentioned by Khan et.al. (1992)

Body Measurement

Length (cm), height (cm) and girth (cm) of the animal were measured by flexible tape (BUTTERFLY BRAND).

Blood Drained

The blood was drained in a well-washed plastic bucket and its weight (kg) was measured by balance (Diamond: Koh-e-Noor).

Weight of Head, Skin and Legs

Head and skin of animal was weighed separately by balance (Diamond: Koh-e-Noor). Four legs were weighed collectively by sensitive electric digital balance (Acculab®-ALC-1100.2 & Acculab®-ALC-320.3).

Weight of Fore Limbs, Hind Limbs, neck+ribs+brisket and Weight of Loin

The above mentioned cuts were made from carcasses. The loin was determined as the distance between the back of the ribcage and the front of the hip. Each cut weighed separately by balance (Diamond: Koh-e-Noor).

Weight of organs of thoracic and abdominal cavity, abdominal fat and testis

Heart, lungs, gall bladder, abdominal fat, liver, kidneys, testis and Spleen were separated carefully from each other and weighed by sensitive electric digital balance (Acculab®-ALC-1100.2 & Acculab®-ALC-320.3).

Carcass Weight

Weight of carcass was determined as “the portion of the animal left after the removal of head, skin, viscera except the kidneys and abdominal fat and weighed by dial balance (Diamond: Koh-e-Noor).

Dressing Percentage

Dressing percentage was calculated as weight expressed as percentage of the live weight of the animal according to the following formula as used by Warriss, 2000.

Dressing percentage= Carcass weight / Live body weight x 100

Statistical Approach

The data was collected and analyzed as means, ± standard errors (SE); the mean was compared through ANOVA for difference among breeds & was ranked using DMR test. SPSS package was used for carrying out all statistical calculations.
RESULTS AND DISCUSSION

The results of the study revealed that on average the two year old rams of Turki breed were significantly (P<0.05) heavier followed by AA and Baluchi (Table 1). It is also revealed that Turki and AA rams body girths were found bigger than Baluchi, however due to smaller no of observations data did not qualify significance level (Table 1). Results further revealed that Turki live body measurements were longer in length, bigger in height than by Baluchi (Table 1). The result of the three sheep breeds also confirmed that dressed weight was also significantly higher for Turki sheep, followed by AA and least was recorded for Baluchi sheep (Table 1). However, the results totally changed, if proportion wise data of different parts of the dressed carcasses of studied breeds were when compared. Hind and forelimbs mutton proportions were higher (8.0%) in Baluchi sheep as compared to AA and Turki sheep (Fig 1). Baluchi sheep also showed 4% higher proportion neck and chest meat as compared to AA and Turki. Baluchi sheep also showed 1.0 and 2.0% higher proportion neck and chest meat as compared to Turki and AA respectively (Fig 1). In Turki sheep, fat tail proportion was 23% of dressed carcasses, whereas in Baluchi sheep fat-tail proportion was 7.0% of the dressed weight. Since Turki sheep were heavier at live-weight and also produced heavier carcasses but in term of proportion result strongly favored the Baluchi sheep and significantly (P<0.05) considered as out class followed by AA and Turki (Fig 1).

Table 1. Mean (+ SE) of Live Body weight, Body condition scoring, body measurement and Dressing percentage of Turki, Afghan Arabi and Baluchi sheep in Afghanistan

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Turki Mean ± SE</th>
<th>Afghan Aravi Mean ± SE</th>
<th>Baluchi Mean ± SE</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body weight</td>
<td>49.33 ± 0.31</td>
<td>45.83± 0.49</td>
<td>40.71± 0.66</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>Blood condition</td>
<td>4.50 ± 0.15</td>
<td>04.45± 0.00</td>
<td>4.17± 0.21</td>
<td>NS</td>
</tr>
<tr>
<td>Body measurement</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Length</td>
<td>85.08 ± 0.23</td>
<td>78.00± 0.72</td>
<td>74.00± 0.43</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>Height</td>
<td>76.92 ± 0.38</td>
<td>72.17± 0.78</td>
<td>67.08± 0.42</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>Girth</td>
<td>85.18 ± 0.31</td>
<td>85.07± 0.8</td>
<td>81.67± 0.48</td>
<td>NS</td>
</tr>
<tr>
<td>Dressing percentage</td>
<td>57.50± 0.44</td>
<td>55.80± 0.18</td>
<td>53.06± 0.22</td>
<td>&lt;0.05</td>
</tr>
</tbody>
</table>

Parameter means are compared in rows of above table for three breeds and each variable with different superscript are significantly different at P<0.05 and NS stands for not significant at P < 0.05

Highest blood quantity drained for Turki was (1.52 ± 0.02) kg at slaughtering, followed by AA and Baluchi sheep (Table 2). Head and skin weight (kg) of Baluchi sheep (2.31 ± 0.02 and 3.30 ± 0.04) was significantly (P<0.05) higher than AA and Turki sheep. However there was little variation among the hooves weight of all three breeds (Table 2). Weight of fore and hind limbs (4.94 ± 0.04 and 6.91 ± 0.06kg respectively) of Turki breed was significantly higher than AA and Baluchi sheep (Table 2). Collective average weight of Neck, Ribs and Brisket of Turki breed (5.46 ± 0.04kg) was significantly higher than AA and Baluchi breed (Table 2). Abdominal fat (kg) was higher in Turki (0.57 kg) than AA and Baluchi breeds (Table 2).

A significant difference was observed for body weight, dressing percentage, length and height measurements of the body (Table 1). Live weight of Turki breed (49.33kg) suggested that Turki was relative heavier than Baluchi and AA in Afghanistan. However, adult Turki rams live weight in Pakistan was (75 kg) and also called as Balkhi (Ibrahim et. al., 2011). Turki sheep length, height and girth also supported that Turki breed sheep were smaller in size than the sheep reared in Pakistan (Hasnain, 1985). Baluchi sheep liveweight was (40.71 kg) in Afghanistan, where as Pakistani Baluchi sheep was lighter in weight (37.0 kg) (Hasnain, 1985; Mason,1996). Iranian Baluchi sheep (40- 60 kg) seemed to be the heaviest in live weight in comparison to Pakistani and Afghan sheep (Reza Valizadeh, 2006).

Table 2. Average weight of Blood, Head, Skin, Hooves, Fore limbs, Hind Limbs, Neck+Ribs+Brisket of Turki, Afghan Arabi and Baluchi sheep.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Turki Mean ± SE</th>
<th>Afghan Aravi Mean ± SE</th>
<th>Baluchi Mean ± SE</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood drained(Kg)</td>
<td>1.52 ± 0.02</td>
<td>1.48 ± 0.02</td>
<td>1.32 ± 0.02</td>
<td>b</td>
</tr>
<tr>
<td>Head(Kg)</td>
<td>2.10 ± 0.04</td>
<td>2.24 ± 0.01</td>
<td>2.31 ± 0.02</td>
<td>a</td>
</tr>
<tr>
<td>Skin(Kg)</td>
<td>2.56 ± 0.04</td>
<td>3.18 ± 0.04</td>
<td>3.30 ± 0.04</td>
<td>a</td>
</tr>
<tr>
<td>Hooves(Kg)</td>
<td>0.77 ± 0.01</td>
<td>0.82 ± 0.004</td>
<td>0.81 ± 0.007</td>
<td>b</td>
</tr>
<tr>
<td>Fore Limbs(Kg)</td>
<td>4.94 ± 0.04</td>
<td>4.57± 0.04</td>
<td>4.26± 0.07</td>
<td>c</td>
</tr>
<tr>
<td>Hind limbs(Kg)</td>
<td>6.91± 0.06</td>
<td>6.19± 0.05</td>
<td>6.44± 0.11</td>
<td>b</td>
</tr>
<tr>
<td>Neck, Ribs and Brisket(Kg)</td>
<td>5.46±0.04</td>
<td>5.16±0.06</td>
<td>4.87±0.08</td>
<td>c</td>
</tr>
<tr>
<td>Abdominal fat(Kg)</td>
<td>0.57±0.03</td>
<td>0.37±0.03</td>
<td>0.34±0.02</td>
<td>c</td>
</tr>
</tbody>
</table>

Parameter means are compared in rows of above table for three breeds and each variable with different superscript are significantly different at P<0.05
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Fig. 1. Overall proportion of various dressed carcasses components of the three Afghanistan breeds of sheep studied as described as a percentage of live weight.
Fat tail in Baluchi sheep was smaller and compared to the fat tail in Turki sheep. In Baluchistan Pakistan, the Baluchi sheep were reared for milk, meat and wool purpose where as in Afghanistan it was mostly kept for mutton production.

Turki and Baluchi dressing percentage in the present study were found (2.0 - 3.0 %) higher than the Pakistani same breeds (Hasnain, 1985). However fluctuation in dressing percentage data may be due the availability of biomass to the selected sheep. Since 70% of the flocks in Afghanistan are kept under transhumance system and grazed in the good quality pastures, therefore it might have helped the selected sheep to gain more carcass weight. The dressing percentage of studied sheep was also similar to the world class record US breed i.e. 57%. All of the present study sheep showed higher dressed weight as compared to Mokaraman breed (Macit. 2002). Heavier head weight (kg) in Baluchi breed suggested that genetic differences existed from the Turki and AA. Heavier heads also supported strong skull and jaw bones and facial muscle. Heavier heads indirectly favoured good intake of biomass and regurgitation which lead to higher proportion of mutton in Baluchi sheep. Heavier hooves of AA also suggested that more firm body confirmation. Macit, (2002) reported that the skin weight of Mokaraman breed sheep is much higher (4.5kg, 4.4kg and 3.8 kg) than the present study (2.56kg, 3.18kg and 3.30kg) slaughtered at the same body weight. Higher skin weight might be due to un-sheared wool at the time of slaughtered or might be due to long and heavy wool production in the Mokaraman breed.

Average fore limbs was higher in present study than (2.86kg) reported by Johnson et al. 2005. Weight of abdominal fat for Turki sheep in the present study was found almost similar to the values (0.53kg) reported by Macit, (2002) slaughtered at the same body weight, while this weight for Afghan Arabi and Baluchi sheep were also found similar as reported by Macit, (2002), slaughtered at the same body weight. The higher abdominal fat content in the Turki breed sheep give an edge to other studied breeds of sheep as the higher content of fat could ensure the better survival ability of the breed in the severe weather conditions.

CONCLUSIONS AND RECOMMENDATIONS

Among all three selected breeds, Turki, was heaviest on live-weight basis and better dressing percentage and higher content of abdominal fat in the same age group and body conditioned animals. However Turki performance in term on mutton proportion in the carcass were found significantly lesser then Baluchi sheep. Which performed outstanding in term of mutton production. Turki breed give more blood upon slaughtering following Afghan Arabi and Baluchi. The lesser weight of head and skin weight of Turki breed made it yield more dressed weight as compared to AA and Baluchi. The higher ratio of fore and hindslimbs weight confirmed Baluchi sheep as the best among the three breeds of sheep. Further research may be conducted to see the meat characteristics of the above breeds such as meat tenderness, palatability and juiciness.

REFERENCES


Reza, V. 2006. Iranian sheep and goat industry at a glance. Ferdowsi Univ. of Mashhad,Mashhad, Iran.


