Simental is one of the European dual purpose cattle breeds imported into Turkey in order to increase milk and meat production. Recently, the breed has been distributed in large numbers to farmers in the eastern region of Turkey via agricultural projects. The eastern region of Turkey has different weather conditions from the rest of the country, especially in winter. The temperature generally drops below zero °C for 4-5 months, and there is a lot of snow. Under these environmental conditions, the Simental calves are weaned younger than native breeds. This means that the Simental calves are generally weaned not less than 4-5 months of age. In Turkey, the price of milk is more expensive than calf starter. The amount of milk fed to the calves has to be limited to encourage the calves to consume dry feed for economic reasons. If the Simental calves reared under the harsh climatic conditions of Eastern Turkey were weaned early, the feed cost to farmers would drop and their profit would increase.

An investigation was conducted in the eastern region of Turkey in order to compare the growth, feed efficiency, and body measurements of Simental calves weaned at 5 and 7 weeks of age.

The effect of weaning ages on the growth characteristics and feed efficiencies of Simental calves

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The experiment was conducted at Atatürk University, Erzurum, Turkey. Twenty new-born Simental calves were used in this research. The calves were born in the fall to winter (September-February). The calves were allowed to stay with their dams to receive colostrum for the first two days. Then, they were allocated to the treatment groups for weaning at 5 weeks and 7 weeks of age, according to sex.

The calves were housed in a building containing individual pens and were furnished with water, milk feeders, hay, and calf starter feeders. The calves were fed during the six months research period. Two different calf starters called starter I and II were utilized in this research. Starter I contained 20% protein, 5% ether extract, 5.1% ash, and 8% cellulose, while starter II had a composition of 15.5% protein, 5.5% ether extract, 9.8% ash, and 9% cellulose. Starter I, which has relatively high protein content, was fed for the period between birth and 4 months of age, and then, starter II was offered to the calves. The dry hay whose approximate composition was 7% protein, 5% ether extract, 10% ash, and 28.4% cellulose was available in the pens throughout the study. The quantity of starter and hay that remained in the feeders were weighed daily and the amount consumed was recorded.

The amount of milk given the calves was 8% of their birth weight as suggested by Reddy et al.4 This quantity of milk remained constant during the milk feeding period.

The weights were taken and recorded at birth, weaning (5 or 7 weeks), and 3 months of ages of the calves. The experimental data were subjected to ANOVA by using Minitab statistics package programme.

Results and discussion
The data related with various weights of Simental calves at birth, weaning, and 3 months of age are given in table 1. The average birth weights of calves assigned to the weaning age groups were not found to be significantly different (P>0.05).

However, the average birth weight of male calves was 6.8kg heavier than female calves. This difference was statistically highly significant (P<0.01).

The weaning weights of Simental calves weaned at 5 weeks of age were lighter than those of calves weaned at 7 weeks of age as would be expected. The results are in agreement with findings of Ugarte,2 and Winter.4,5 The common result of these studies regarding weaning weight is that weaning weight increases as

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The third author, Dr. Tuzeman, is an associated professor in the Department of Animal Science at Ataturk University and results were analysed and the manuscript was prepared in The Ohio State University.

Agric & E Ind, Vol 45, Nos 3 & 4
age increases.

The weight differences in favour of calves weaned at 7 weeks of age disappeared at 4 months of age. The average 4 months weight of calves was not influenced significantly by either age of weaning or sex of calves (table 1).

Daily weight gains for the entire trial period (four months) were not significantly affected (P>0.05) by treatments under the cold environment of Eastern Turkey. The results in this research were similar to those under other environmental conditions reported by Quinones and Preston, Jorgenson et al., Winter and Yun and Chung.

The amount of consumed dry matter of feed per kg weight gain in a period between birth and 4 months of age was not significantly (P>0.02) influenced by either weaning time or sex (table 2). This finding is in agreement with results of Winter and Ogundulu. The feed efficiency ratio of calves weaned at 7 weeks of age was lower (P<0.01) than that of calves weaned at 5 weeks.

Gains in heart girth, body length, height at withers and chest depth were not significantly influenced by weaning time and sex.

The results of this research suggest that it is possible to wean Simmental calves reared in harsh environmental conditions on Eastern Turkey at 5 weeks of age without having adverse effect on their growth.

**REFERENCES**


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**Table 1. The Performance of Simmental Calves**

<table>
<thead>
<tr>
<th>Weaning Ages (Weeks)</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>5 n=10</td>
<td>37.5±2.96</td>
<td>38.3±2.01</td>
</tr>
<tr>
<td>Weaning</td>
<td>44.7±1.43</td>
<td>50.0±3.17</td>
</tr>
<tr>
<td>4 Month</td>
<td>86.1±3.29</td>
<td>94.5±7.79</td>
</tr>
<tr>
<td>Daily Gains in Weight (kg):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Birth --- Weaning</td>
<td>2.99±0.02</td>
<td>0.19±0.01</td>
</tr>
<tr>
<td>Weaning --- 4 Month</td>
<td>0.52±0.06</td>
<td>0.92±0.06</td>
</tr>
<tr>
<td>Birth --- 4 Month</td>
<td>0.49±0.05</td>
<td>0.79±0.04</td>
</tr>
</tbody>
</table>

*: P<0.05
**: P<0.01
S: Significance
NS: Non-Significant

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**Table 2. The Feed Efficiencies and Body Measurements of Simmental Calves**

<table>
<thead>
<tr>
<th>Weaning Ages (Weeks)</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth --- Weaning</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>5 n=10</td>
<td>3.34±0.37</td>
<td>2.07±0.25</td>
</tr>
<tr>
<td>Weaning --- 4 Month</td>
<td>3.81±0.27</td>
<td>0.02±0.03</td>
</tr>
<tr>
<td>Birth --- 4 Month</td>
<td>5.22±0.95</td>
<td>4.92±0.06</td>
</tr>
</tbody>
</table>

*: Feed Efficiency = Consumed dry matter of feed (kg) / Weight gain (kg)
**: P<0.05
*: * P<0.01
S: Significance
NS: Non-Significant

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*Agric & E Instr*, Vol 45, Nos 3 & 4