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Material and Methods

Forty (40) pregnant Bali (6-7 months of pregnancy) cows were used in this study. They were kept under a small holder (1-5 cows/farm) at South Sulawesi, Indonesia. The animals were fed with natural grasses and urea multinutrient molasses block (UMMB) 0.5 kg/head/day. The animals were divided into two groups of 20 cows. The first group was treated with moringa oleifera leaves 250 g/head/day and the second group was left without moringa oleifera treatment (control group). The treatment of moringa oleifera leaves was started at the 6th - 7th months of pregnancy until the animals showed the first postpartum estrus.

During the study, body weight and daily gain of the animals before parturition were recorded. At the time of parturition, body weight of the calf were measured. After parturition, the onset of first estrus was detected by visual observation twice a day. The mean interval of postpartum anestrus was significantly (P<0.05) in compared to that in control animals (210.05 vs 204.14 kg) and (0.48 vs 0.39 kg/head/day), respectively. Birth weight for the calf of the treated animals was significantly higher (P=0.05) in compared to that in the control animals (17.22 vs 14.50 kg). Mean interval of postpartum anestrus was significantly (P<0.01) shorter in compared to those in control groups (128.3 vs 148.7 days). It can be concluded that the supplementation of moringa oleifera leaves can induce a high daily gain of the pregnant cow, increase birth weight of the calf and shorten the interval of anestrus in the suckling Bali cows.
interval between parturition and the first post partum estrus was calculated. The means differences of body weight, calf birth weight and interval of postpartum anestrus between the two treatments were analyzed by Student t-test.

Results and Discussion
Table 1 shows the mean daily gain of the pregnant cows supplemented with moringa oleifera leaves were significantly higher (P<0.05) in compared to those in control cows (0.48 vs 0.39 kg/head/day). Birth weight for the calves of the treated animals was significantly higher (P<0.05) in compared to those in the control animals (17.20 vs 14.5 kg). Mean interval between parturition and the onset of first postpartum estrus was significantly (P<0.01) shorter in the treated animals in compared to that in control animals (128.3 vs 148.7 days). These results showed that moringa leaves is potentially used as animal feed, because the supplementation of Moringa oleifera leaves both before and after parturition of pregnant cows could increase body weight gain and shortened the duration of postpartum anestrus and increased birth weight of the calves born.

Table 1: Body weight, daily gain, birth weight and postpartum anestrus in pregnant Bali cows supplemented with moringa oleifera leaves

<table>
<thead>
<tr>
<th>No.</th>
<th>Parameter</th>
<th>With Moringa</th>
<th>Without Moringa</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Body weight (Kg)</td>
<td>210.05 ± 13.3</td>
<td>204.05 ± 6.6</td>
</tr>
<tr>
<td>2</td>
<td>Daily gain (Kg/kapita/day)</td>
<td>0.48 ± 0.04</td>
<td>0.39 ± 0.04*</td>
</tr>
<tr>
<td>3</td>
<td>Birth weight of the calves (kg)</td>
<td>17.22 ± 5.16</td>
<td>14.5 ± 3.3*</td>
</tr>
<tr>
<td>4</td>
<td>Postpartum anestrus (days)</td>
<td>128.3 ± 10.3</td>
<td>148.7 ± 10.0**</td>
</tr>
</tbody>
</table>

Absolute fetal weight increased rapidly during the later stages of gestation. In cows and ewes, about 90 % of birth weight is achieved during the later 40% of gestation (Ferrel, 1991). Lindsay, Martin and Williams (1993) stated that in the late pregnancy, during the period of rapid absolute growth of fetus, poor feeding results in smaller offspring than normal. This is probably a direct result of inadequate maternal supply of nutrients to the fetus. In this study, the supplementation of moringa oleifera leaves during the later stage of pregnancy could increase body weight of the animals. This indicated that the food supplement has high level of nutrients needed for fetal development. The leaves of Moringa oleifera contain high levels of protein, vitamins and minerals (Chawla uria.l., 1998, Dogra, et al. 1975). The higher birth weight for the treated animals in this study was supported by Topal, Aksoyali, Bayram and Yaganoglu (2010) who showed that the birth weight was affected by body condition score of the dam during birth.

Following parturition there is a period when the cows do not come to estrus. The duration of this postpartum anestrus is affected by several factors including season of the year, level of nutrition before and after parturition, suckling, and milk production (Terqui, Chupin, Gautier, Perez, Pelot, and Mauleon, 1982, and Peters and Ball, 1987). The shorter interval of postpartum anestrus in cows supplemented with high quality food in relation to the high body weight before parturition found in this study was similar to that report by Peters and Riley (1982), who showed a significant negative correlation between body weight at calving and the length of the acyclic period in beef cows.

It can be concluded that the supplementation of moringa oleifera leaves could increase body weight, shorten the postpartum anestrus, and increased the birth weight of the calves born. This indicating that Moringa oleifera leaves has a potential to be utilized as a food stuff for beef cows.

References