Research Paper

EFFECT OF THE FED SHATAVARI (ASPARAGUS RACEMOSUS) ON BODY WEIGHT AND PUBERTY OF SAHIWAL HEIFERS

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To investigate the effect of shatavari on growth and puberty, sixteen Sahiwal heifers was selected from the institute herd. The treatment group sahiwal heifers were fed Shatavari @150 mg/kg BW/day once in morning. The fortnightly body weight, dry matter intake and blood samples from each animal were collected. In plasma samples Growth Hormone (GH) and cortisol was estimated. The body weight of the heifers varied (P<0.05) between the group due to more feed intake (P < 0.05) and increase in plasma GH levels (P < 0.05). The incidence of puberty and age at first service was achieved earlier in the treatment group in comparison to control suggesting that shatavari could be fed to augment growth and puberty in sahiwal heifers.

Keywords: Plasma hormone, Feed intake, Body weight, Puberty, Sahiwal

INTRODUCTION

The profitability of a dairy farm depends upon the growth of the heifer and their timely conception. The average age at first calving in Sahiwal cattle is 46 months which is much higher than that of Holstein heifers cows (29 months) (Bashir, 2006; and Rehman, 2006). Age at puberty and calving is highly related with body weight of the heifers (Moore et al., 1990), which can be bred after attaining 60% of their adult body weight (Hammond, 1960). Thus feed and management program for replacement of heifers will have a lifelong effect on their productivity. Heifer growth rate is an indicator of management level. Feeding, housing and other management needs are constantly changing between birth and first calving. The variability in the growth rate of heifers may reflect that seasonal availability of forages (quantity and quality) and management decisions to adjust heifer growth to a desired rate. The birth body weight of Sahiwal calves is 20 to 25 kg in male and 18 to 23 kg in female. Estimates of age at puberty in Bos indicus cattle in the tropics and subtropics range between 16 and 40 months (Ahuja et al., 1961; McDowell et al.,1976; Malik

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and Ghei, 1977; and Aria and Cristofori, 1980). The hormonal manipulation of the growth is always questionable. But there are several herbs which have been described in the Ayurveda to improve the general well beings, growth, milk production and reproduction of both human and animals. Shatavari (Asparagus racemosus) is an important medicinal plant of tropical and subtropical part of India. This plant belong to Liliaceae family, is common at low altitudes in shade and in tropical climates throughout India, Asia, Australia and Africa. The information on use of Shatavari is lacking in Sahiwal animals. In this the effect of herbal feed supplement Shatavari was investigated on growth performance and onset of puberty of Sahiwal heifers.

A total sixteen Sahiwal heifers was selected having similar body weight and age group. All animals were fed as per NRC (1989) with berseem and concentrate (1.5 kg/d/heifer) during growing stage. The quantity of concentrate was increased as per the age of heifer. The treatment group heifers were fed Shatavari @150 mg/kg BW/day once in morning with the concentrate and feeding of concentrate + Maize + Jowar fodder. Control group heifer received concentrate + Maize + Jowar only. The fortnightly body weight of each animal was recorded early in the morning between 7:30 a.m. to 8:30 a.m. before providing the animals with any feeding stuff or water, using electronic weighing machine with a precision of 200 g during the experimental period. Concentrate mixture, green fodder and dry feed was sampled fortnightly and analyzed for Dry Matter (DM). Plasma Growth Hormone (GH) and cortisol was estimated using Enzyme immunoassay kits. Data was analyzed by two ways ANNOVA.

**Table 1: Mean Values of Hormones, Body Weight and Reproductive Performance of Control and Treatment Group Cows**

<table>
<thead>
<tr>
<th></th>
<th>Control</th>
<th>Treatment</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cortisol, ng/ml</td>
<td>3.52±0.068</td>
<td>3.44±0.08</td>
<td>NS</td>
</tr>
<tr>
<td>GH ng/ml</td>
<td>5.41±0.15</td>
<td>6.33±0.11</td>
<td>P&lt;0.05</td>
</tr>
<tr>
<td>DMI, kg/d</td>
<td>4.70±0.09</td>
<td>5.35±0.18</td>
<td>P&lt;0.05</td>
</tr>
<tr>
<td>Growth Rate, g/d</td>
<td>223.2639</td>
<td>345.3472</td>
<td>P&lt;0.01</td>
</tr>
<tr>
<td>Age at Puberty, days</td>
<td>739.66±19.17</td>
<td>713.60±16.10</td>
<td>P&lt;0.05</td>
</tr>
<tr>
<td>Av. Age at First Service, days</td>
<td>846.10±24.0</td>
<td>817.40±20.37</td>
<td>P&lt;0.05</td>
</tr>
</tbody>
</table>

Note: NS = Non-Significant.

**Figure 1: Effect of Shatavari Feeding on Growth Rate, Age at First Puberty and Age at First Service in Control and Treatment Group Sahiwal Heifers**

**Figure 2: Effect of Shatavari Feeding on Plasma Hormones and Dry Matter Intake in Control and Treatment Group Sahiwal Heifers**

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The dry matter intake of the heifers was more (P < 0.05) in treatment group heifer due to the saponin contents of shatavari.

Plasma cortisol concentration was similar in both the groups and indicated no adverse effect of shatavari feeding on health of animals. Cortisol is considered to be indicator of biological stress (Rao and Pandey, 1981; and Rao and Pandey et al., 2007). The anti-stress properties of shatavari resulted in non-significant changes in the cortisol hormone during the experimiental period and corroborates earlier finding (Kumar et al., 2008) that Shatavari supplementation does not cause any stress in cattle (Kumar et al., 2008). However plasma GH levels were more (P < 0.01) in treatment group and contributed to higher growth rate (P < 0.01) in treatment group heifers. The average age at puberty of Sahiwal heifers in control group was more (P < 0.05) than treatment group and was significantly lowered by feeding of shatavari. Berhane (2000) reported that supplementation of Shatavari @100 g on alternate day leads to 100% estrus and 75% conception in treatment group compared to control group. Similar improvement in reproductive performance was also reported by Berhane (2000) with doses of 100 g Shatavari in crossbred cows. Further, supplementation of shatavari lowered age at puberty and age at first services in the treatment group of Sahiwal heifers. Sharma (2011) reported significant increase of weight of ovaries, uterus, breast and teats in female rats due to feeding supplementation of Shatavari @30 mg/100 g bw.

It was concluded that feeding of shatavari could be practiced to augment growth and puberty through manipulation of intrinsic growth hormone release in Sahiwal heifers.

References


