BIOCHEMICAL ATTRIBUTES VIS-A-VIS OESTRUS RESPONSE IN CROSS BRED HEIFERS TREATED WITH COMPOUNDED HERBAL DRUGS

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KEY WORDS
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Biochemical parameters
Oestrus response
Cross bred heifers

ABSTRACT
The effect of compounded herbal drugs (M:A:W and A:W:M) on biochemical parameters of blood viz, serum protein, glucose, total erythrocyte count (TEC) and haemoglobin (Hb) concentration, cholesterol and their relationship with oestrus response were observed on eighteen anoestrus cross-bred heifers in three different seasons that is spring, rainy and winter. The results revealed that compounded herbal drugs have significant (p<0.05) impact on all aforesaid biochemical parameters of blood. It was found maximum in M: A: W (T1) treated group under normal range. When analysing the relative importance of biochemical parameters with oestrus response it was also found maximum (72.22 %) in M: A: W (T1) treated group followed by A: W: M (T2) and minimum in control (T3) group. In respect of seasons only blood cholesterol was significantly (p<0.05) affected in treated groups while serum protein, glucose, TEC and Hb were found to be non-significant. The level of blood cholesterol and oestrus response was found best (171.16 mg/100mL and 66.67%, respectively) in spring season. Where as the combined effect of treatments and seasons did not reveal any significant impact on biochemical parameters. But in case of oestrus response it was found best (100%) in spring season treated with M: A: W (T1) compounded herbal drugs.

INTRODUCTION
Efficiency of reproduction constitutes the fundamental base for production of the livestock economy. High fertility coupled with a sustained and regular reproduction comprises the base for profitable production. The level of nutrition and feed supplements greatly influence the growth rate of the heifers to reach to puberty. Scientists are trying to regulate the breeding not only to safe gaurd the health of animals but also to adjust animal reproduction coherently so as to suit the managemental practices. In addition to above, the herbal medicines are being used primarily in the developing countries from very long time and the scientists have understood the test of time for their safety, efficacy, cultural acceptability and lesser side effects. Koutecka (1997), Sawale and Dhoble (1999) and Deshpande et al. (2000) have used herbal preparations proved to be more effective than hormonal treatment. Recently, Mehrrota et al. (2009) and Patil et al. (2011) have found promising effect of herbal preparation on induction of heat in goats. A lot of modern medicines are being used to overcome the aforesaid problem but it produced higher side effects and these are too costly. The certain blood constituents are associated with abnormal oestrus cycle of the cows. Low level of blood glucose in anoestrus cows stand as the indication of sub-normal energy status (Mc Clure, 1965). Prasad et al. (1984), Sharma (1984) and Manowar and Singh (2001) reported that the blood glucose concentration was higher in cycling cross-bred heifers and cycling lactating cows than non - cycling heifers and lactating cows. Purohit and Kohli (1977) reported that Cholesterol is reckoned to play an important role as a precursor of all steroid sex hormones and estimation of its level serves as a complementary aid to determine the functional status of pituitary gland. Herbal formulation have not only improved the fertility rate; also shown significant increase in blood protein, glucose and on other side reduced total urea levels in the blood of crossbred cows (Arzumanzan and Dorotjuk, 1964; Agarwal et al., 1982; Saba et al., 1999; Kumar et al., 2010). Similarly the total erythrocyte count and haemoglobin concentration where found higher in lactating crossbred heifers and cycling lactating cows than non - cycling heifers and lactating cows. The present study was conducted with a view to see the efficacy of three herbs Ashwagandha (Withania sominifera), Satavari (Asparagus racemosus) and Kapi-Kachchu (Mucuna pruriens) along with certain minerals (Zn, Co, Fe and Cu) on biochemical parameters of blood and its relative importance with oestrus response of anoestrus crossbred heifers.

MATERIALS AND METHODS
The present study was carried out in the Department of Animal Husbandry and Dairying, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi (U.P.), India. Eighteen (18) growing crossbred heifers of approximately similar bodyweight were selected before each experimental trail and distributed...
randomly into three treatment groups viz T₁ (Control), T₂ (M:A:W treated) and T₃ (A:W:M treated) comprising six heifers in each group. Experimental trials were conducted in three different seasons categorized as spring (February to April), rainy (July to September) and winter (November to January) seasons. The period of each experimental trail was three months including one month of pre-experimental feeding. Pre-experimental feeding has done to reduce the effect of nutritional variability of experimental heifers. In the present investigation Ashwanganda (Withania sominha), Satavari (Asparagus recemosus), Kapi-kachhu (Mucuna pruriens) and certain minerals (Cu, Fe, Co and Zn) were used into two different-compounded designating as M:A:W (Mucuna pruriens – 50%, Asparagus recemosus-24%, Withania sominha-24% and Minerals-2%) and A:W:M (Asparagus recemosus - 50%, Withania sominha-24%, Mucuna pruriens-24% and Minerals-2%). During the entire period of each experimental trail, all the experimental crossbred heifers were maintained under an identical management system with balanced feeding. The quantity of compounded herbal drug was 2% of concentrate (1.5kg) given to a treated crossbred heifer in each treated group (M: A: W or A: W: M). The data regarding biochemical parameters of blood obtained by the analysis of serum protein in blood by Modified Biuret and Dumas method (1971), glucose content by glucose oxidase and peroxidase (GOD-POD) method, blood cholesterol by the method adopted by (Wybenga et al., 1970) total erythrocyte or red cells count (TEC) and haemoglobin (Hb) concentration where determined by the procedure of Kolmer et al. (1969). The oestrus response of cross-bred heifers were observed by the visual and rectal observation and denoted in percentage. The data obtained from biochemical observation were analysed by appropriate statistical tools as per methodology enunciated by Snedecor and Chochran (1968).

RESULTS AND DISCUSSION

The efficacy of compounded herbal drugs on biochemical parameters of blood and their relativity with oestrus response in reference to seasons are presented in Table 1. An insight data in the table showed significant (p<0.05) impacts on all the biochemical parameters of blood excluding TEC in the present investigation. Serum protein, blood glucose and blood cholesterol were found maximum (7.92g, 55.61mg and 170.36 mg/100mL of blood, respectively) under normal range in T₂ followed by T₁ treated groups while the minimum (7.61g, 52.02mg and 160.5mg/100mL of blood, respectively) in control (T₁) group. But TEC content was more (7.06) in T₁ group followed by T₂ (6.99) group and minimum (6.95) millions/mm² in T₃ group and a reverse trend was observed in respect of haemoglobin concentration. The compounded herbal drugs have not only influenced the biochemical parameters of blood but also influenced the oestrus response of crossbred heifers. It was also observed maximum (72.22%) in T₁, followed by T₃ treated groups and minimum (11.11%) in control (T₁) group. Further, Table also elucidated that positive relativity of biochemical parameters with oestrus response of cross-bred heifers in reference to treatments. As perusal of result shown in Table 2 revealed that the impact of compounded herbal drugs on biochemical parameters of blood and relativity with oestrus response in reference to seasons. The effect of seasons on serum protein, blood glucose and Hb concentration were found to be statistically non-significant but they are analysed significantly (p<0.05) influenced by the seasons and it was found that serum protein (7.70, 7.80, 7.83), glucose content (52.02, 55.61, 54.14), blood cholesterol (160.50, 170.36, 168.22) of blood, respectively) under normal range in T₁ group comprising higher concentration of Mucuna pruriens might have increase the oestrogenic level in circulating blood through increased level of blood chole-

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Groups</th>
<th>Seasons</th>
<th>CD</th>
<th>p&lt;0.05</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serum Protein (g/100mL)</td>
<td>T₁ (Control)</td>
<td>T₂ (M:A:W)</td>
<td>T₃ (A:W:M)</td>
<td>p&lt;0.05</td>
</tr>
<tr>
<td>Blood Glucose (mg/100mL)</td>
<td>52.02</td>
<td>55.61</td>
<td>54.14</td>
<td>1.42</td>
</tr>
<tr>
<td>Blood Cholesterol (mg/100mL)</td>
<td>160.50</td>
<td>170.36</td>
<td>168.22</td>
<td>4.20</td>
</tr>
<tr>
<td>Total Erythrocyte count (million/mm²)</td>
<td>6.95</td>
<td>6.99</td>
<td>7.06</td>
<td>NS</td>
</tr>
<tr>
<td>Haemoglobin g%</td>
<td>10.24</td>
<td>10.69</td>
<td>10.54</td>
<td>0.20</td>
</tr>
<tr>
<td>Oestrus Response (%)</td>
<td>66.67</td>
<td>27.78</td>
<td>38.89</td>
<td>-</td>
</tr>
</tbody>
</table>

Table 2: Impact of compounded herbal drugs on biochemical parameters of blood and relativity with oestrus response in reference to seasons

mg/100mL of blood, respectively) under normal range in T₂, followed by T₁ treated groups while the minimum (7.61g, 52.02mg and 160.5mg/100mL of blood, respectively) in control (T₁) group. But TEC content was more (7.06) in T₁ group followed by T₂ (6.99) group and minimum (6.95) millions/mm² in T₃ group and a reverse trend was observed in respect of haemoglobin concentration. The compounded herbal drugs have not only influenced the biochemical parameters of blood but also influenced the oestrus response of crossbred heifers. It was also observed maximum (72.22%) in T₁, followed by T₃ treated groups and minimum (11.11%) in control (T₁) group. Further, Table also elucidated that positive relativity of biochemical parameters with oestrus response of cross-bred heifers in reference to treatments. As perusal of result shown in Table 2 revealed that the impact of compounded herbal drugs on biochemical parameters of blood and relativity with oestrus response in reference to seasons. The effect of seasons on serum protein, blood glucose and Hb concentration were found to be statistically non-significant but they are analysed significantly (p<0.05) influenced by the seasons and it was found that serum protein (7.70, 7.80, 7.83), glucose content (52.02, 55.61, 54.14), blood cholesterol (160.50, 170.36, 168.22) of blood, respectively) under normal range in T₁ group comprising higher concentration of Mucuna pruriens might have increase the oestrogenic level in circulating blood through increased level of blood chole-

Table 1: Impact of compounded herbal drugs on biochemical parameters and oestrus response in different groups of cross bred heifers

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Groups</th>
<th>T₁ (Control)</th>
<th>T₂ (M:A:W)</th>
<th>T₃ (A:W:M)</th>
<th>p&lt;0.05</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serum Protein (g/100mL)</td>
<td>7.61</td>
<td>7.92</td>
<td>7.81</td>
<td>0.18</td>
<td></td>
</tr>
<tr>
<td>Blood Glucose (mg/100mL)</td>
<td>52.02</td>
<td>55.61</td>
<td>54.14</td>
<td>1.42</td>
<td></td>
</tr>
<tr>
<td>Blood Cholesterol (mg/100mL)</td>
<td>160.50</td>
<td>170.36</td>
<td>168.22</td>
<td>4.20</td>
<td></td>
</tr>
<tr>
<td>Total Erythrocyte count (million/mm²)</td>
<td>6.95</td>
<td>6.99</td>
<td>7.06</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td>Haemoglobin g%</td>
<td>10.24</td>
<td>10.69</td>
<td>10.54</td>
<td>0.20</td>
<td></td>
</tr>
<tr>
<td>Oestrus response (%)</td>
<td>11.11</td>
<td>72.22</td>
<td>50.00</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>
terol seem as the immediate precursor for formation of the steroid hormones and spring season play a catalytic role in increasing the level of cholesterol in blood. Such findings bear parallelism with the earlier thinking of (Agarwal et al., 1982; Kumar et al., 2010) that a little higher value of serum protein in the crossbred cows during oestrus period. Similarly, (Saba et al., 1999) reported that the serum protein along with fertility rate have increased in calves when treated with certain herbal and mineral supplements. Patil et al. (2011) have also reported that herbal uterine tonic improved the fertility rate in goat and both finding are collaborating with the present findings. A positive relationship between higher blood protein levels and fertility rate in cows was reported by Arzumanjan and Dorotjuk (1964). Serum protein concentration in blood is increasing after herbal treatments might be due to herbal medicines also contain some amount of protein and may be utilized by experimental heifers. In case of blood glucose the (Prasad et al., 1984) marked a low blood glucose level in crossbred cows under anoestrus as compared to oestrus condition. Similar results have reported by Sharma et al. (1984) and Manowar and Singh (2001). While, in refer- ence to blood cholesterol Purohit and Kohli (1977) reported that cholesterol concentration in the blood undergoes as steep rise during oestrus. The compounded herbal drugs probably increase the concentration of blood cholesterol which is pre-cursor of steroid hormones by which heifer comes under oestrus condition. Lastly, it can be concluded that com-pounded herbal drug influenced the biochemical parameters of blood under normal range which ultimately affects the oestrus response of cross-bred heifers.

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REFERENCES


