ISSN:0976-4933
Journal of Progressive Science
Vol.04, No.02, pp 115- 119 (2013)

Relative importance of hematological parameters of blood in the assessment of estrus response of anoestrus cross-bred heifers treated with compounded herbal drugs

S.K. Singh[1] and D.P. Singh
Department of Animal Husbandry and Dairying
Institute of Agricultural Sciences, Banaras Hindu University
Varanasi – 221005 (U.P), India

Abstract

Herbal medicines have stood the test of time for their safety, efficacy and cultural acceptability, economical and lesser side effects. In view of this contest an experiment trail was conducted to identify the efficacy of compounded herbal drugs (M:A:W and A:W:M) on hematological parameters of blood viz, hemoglobin, total red cells or erythrocyte count (TRC) and total leukocytes count (TLC) and their relationship with estrus response of eighteen anestrus cross-bred heifers in three different seasons (spring, rainy and winter) for the period of 90 days including one month of pre-experimental feeding in each season. Results revealed that compounded herbal drugs have significant ($P<0.05$) impact on hemoglobin and total leukocytes count while total red cell were found non-significant. When assess the relative importance of hematological parameters with estrus response it was found maximum (72.22%) in M:A:W (T_2) treated group followed by A:W:N (T_3) and control (T_1) group. Therefore, in case of seasons the hematological parameters only TRC after treated with compounded herbal drug has significant ($P<0.05$) Impact, while hemoglobin and TLC were found non-significant. The level of TRC and estrus response were found best (7.09 mill./cumm and 66.67%,respectively) in spring season. Whereas the combined effect of treatments and seasons did not reveal any significant impact on hematological parameters but assessing the relativity to estrus response concern, it was found best (100%) in spring season treated with M:A:W (T_2) compounded herbal drugs.

Keyword-Compounded herbal drugs, hematological parameters, estrus response and cross-bred heifers.

Introduction

Herbal medicines are being used primarily in the developing countries for primary health care. They have stood the test of time for their safety, efficacy, cultural acceptability and lesser side effects. As per available records, the herbal medicine market in 1991 in the countries of the European Union was about $

[1] **Animal Science, Krishi Vigyan Kendra, Belipar,Gorakhpur (U.P.)**

6 million (May be over $ 20 billion now). In 1996, the U.S.A. herbal medicine market was about $ 4 billion and with the current growth rate may be more than double by the turn of the century. Amongst the developed countries Germany holds the lead and has published individual monographs on therapeutic benefits of more than 300 herbs. In developing countries, China has compiled data on over 800 medicinal plants and exports large quantities of herbal drugs. India has prepared only few monographs and its exports are dismal. Efficiency of reproduction constitutes the fundamental base for production of the livestock economy. High fertility coupled with a sustained and regular reproduction comprise the base for profitable production. In case of indigenous cattle breeds, late maturity of heifers followed by long calving intervals are the main problems, which make dairy industry uneconomical.The level of nutrition and feed supplements, influencing growth rate affects the age at which the ruminants reach puberty. The restriction of energy, protein and minerals delay the onset of puberty in heifers. Scientists at large have been 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 manage mental practices. In addition to above herbal medicines are being used primarily in the developing countries. They have stood the test of time for their safety, efficacy, cultural acceptability and lesser side effects. Kaikini and Pargaonkar (1976) reported that the anoestrus animal treated with herbal preparation gives better results than modern medicines. Similarly, Koutccka (1997), Sawale and Dhoble (1999) and Deshpande *et al*, (2000) have used herbal preparations proved more effective than harmonal treatment. Recently, Mehrotra *et al.,* (2009) have found promising effect of medicinal plants on induction of heat in goats. A lot of modern medicines are being used to overcome the aforesaid problem but they produced higher side effects and these are too costly. Certain blood constituents too may be associated with abnormal cycling of cows and the hematological analysis of blood reveal the efficacy of drugs as a medicine or additive. The present study has been conducted with a view to see the efficacy of three herbs Ashwagandha, Satavari and Kapi-Kachchu (*Withania sominifera, Asparagus recemosus and Mucunapruriens)* along with certain minerals (Zn, Co, Fe and Cu) on hematological parameters of blood and its relative importance with estrus response of anoestrus cross-bred heifers

Materials and methods

The present study was carried out in the Department of Animal Husbandary and Dairying, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi (U.P.), India. Eighteen (18) growing cross-bred heifers of approximately similar body weight were selected before each experimental trail & distributed randomly into three treatment groups viz T_1 (Control), T_2 (M:A:W treated) and T_3 (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 Ashwagandha (Withaniasominifera), Satavari (Asparagus recemosus), Kapi-kachchu (*Mucunapruriens)* and certain minerals (Cu, Fe, Co and Zn) were used into two different compounding designated as M:A:W (*Mucunapruriens – 50%, Asparagus recemosus-24%, Withania sominifera-24% and Minerals-2%)* and A:W:M *(Asparagus recemosus-50%, Withania sominifera-24%, Mucuna pruriens-24% and Minerals-2%)*. During the entire period of each experimental trail, all the experimental cross-bred 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 cross-bred heifers in each compounding (M:A:W or A:W:M). The

data regarding hematological parameters (Hemoglobin, Total Red Cell & Total Leukocytes Counts) of blood obtained by the method given by Kolmar *et al*, (1969). The estrus response of cross-bred heifers were observed by the visual and rectal observation and denoted in percentage. The data obtained from hematological observation were analyzed by appropriate statistical tools as per methodology enunciated by Snedecor and Chochran (1968).

Results and discussion

The efficacy of compounded herbal drugs on hematological parameters of blood and relativity with estrus response in reference to treatments are presented in table-1. An insight into the data highlighted in table significant ($P<0.05$) impacts were noticed on two hematological parameters of blood viz. hemoglobin and total leukocytes count, blood glucose and blood cholesterol which had been analyzing in present investigation. Hemoglobin was found maximum (10.69 g) under normal range in M:A:W (T_2) treated group fallowed by A:W:M (T_3) treated group while the minimum (10.24 g) in control (T_1) group. The compounded herbal drugs have not only influenced the hematological parameters of blood but also influenced the estrus response of cross-bred heifers. It was also observed maximum (72.22%) in M:A:W (T_2) treated group fallowed by A:W:M (T_3) treated group and minimum (11.11%) in control (T_1) group. Further, table also elucidated that positive relativity of hemoglobin with estrus response of cross-bred heifers in reference to treatments.

Table-1 Efficacy of compounded herbal drugs on hematological parameters of blood and relativity with estrus response in reference to treatments

Parameters	**T_1 (Control)**	**T_2 (M:A:W)**	**T_3 (A:W:M)**	**CD ($P<0.05$)**
Hemoglobin (g/100ml)	10.24	10.69	10.54	0.20
Total Red Cells (mill/cumm)	6.95	6.99	7.06	NS
Total Leukocytes Count (Cumm)	9316.67	9508.90	9686.67	292.01
Estrus response (%)	11.11	72.22	50.00	

As perusal of result shown in Table-2 revealed that the impact of compounded herbal drugs on hematological parameters of blood and relativity with estrus response in reference to seasons. The effect of seasons on hemoglobin and total lecukocytes count were found to be statistically non-significant but they are analysed maximum (10.58 g and 9587.78/ 100ml blood) in spring and rainy season, respectively. When the data of total red cell or erythrocytes count was taken into account the higher level of TRC (7.09 g /100ml blood) under normal range was analyzed in spring season followed by rainy (6.97 g/100ml blood) and minimum (6.94 g/100ml blood) in winter season. TRC level in the blood was significantly ($P<0.05$) influenced by the seasons. The estrus response in present study was observed maximum (66.67%) in spring season followed by winter (38.89%) and rainy (27.78%) season.

Table-2 Efficacy of compounded herbal drugs on hematological parameters of blood and relativity with estrus response in reference to seasons

Parameters	Spring Season	Rainy Season	Winter Season	CD (P<0.05)
Haemoglobin (g/100ml)	10.58	10.38	10.52	NS
Total Red Cell (mill/cumm)	7.09	6.97	6.94	0.12
Total Leukocytes Count (cumm)	9495.56	9587.78	9428.89	NS
Estrus response (%)	66.67	27.78	38.89	

NS: Non-significant

Table-3 Combined effect of seasons and treatments on hematological parameters of blood and relativity with estrus response

Combinations of Seasons & Treatments	Hemoglobin (g/100ml)	Total Red Cells (mill/cumm)	Total Leukocytes Count (cumm)	Estrus response (%)
S × T_1	10.32	7.02	9360.00	33.33
S × T_2	10.78	7.10	9476.70	100.00
S × T_3	10.65	7.16	9650.00	66.67
R × T_1	10.10	6.87	9463.33	0
R × T_2	10.58	7.02	9510.00	50.00
R × T_3	10.45	7.02	9790.00	33.33
W × T_1	10.32	6.96	9126.67	0
W × T_2	10.70	6.86	9540.00	66.67
W × T_3	10.53	7.01	9620.00	50.00
Mean	10.49	7.00	9504.08	44.44

NS: Non-significant (S = Spring season, R= Rainy season,W = Winter season, T_1-ControlT_2 = M:A:W and T_3– A:W:M)

The result presented and tabulated in Table-3 clearly indicate the combined effect of seasons and treatments on hematological parameters of blood and their relativity with oestrus response. The table illustrated that the combination between seasons and treatments (S×T) did not reveal any significant effect on the hematological parameters, while in case of oestrus response it was observed maximum (100%) in spring season with M:A:W (T_2) treated group and minimum (0%) in rainy and winter seasons with control group (T_1). When considered the relativity of estrus response with hematological parameters it was observed that estrus are positively correlated with the level of hemoglobin under normal range. The findings reveal that T_2 group comprising higher concentration of *Mucuna pruriens* might have increase the estrogenic level in circulating blood through increased level of hemoglobin which play an indirect role in formation of the steroid hormones and spring season play a catalytic role.

Conclusion

Such findings bear parallelism with the earlier thinking of Selukar *et al,* (2001) reported that *Withania somnifera, Asparagus recemosus* and other herbs increase the hemoglobin content in blood and similarly Jinjie *et al,* (2000) collaborating with the present findings. A positive relationship between higher hemoglobin levels and fertility rate in cows was reported by Arzumanjan and Dorotjuk (1964). Hemoglobin concentration in blood is increasing after herbal treatments might be due to herbal medicines utilized by experimental heifers. The compounded herbal drugs have not influence the total red cells of count of cross-bred heifers neither above nor below the normal range is the indicative of normal functioning of reticulo endothelial (RE) system. While, in reference to total leukocytes count it was increased in the treated group probably due to herbal formulation containing copper which enhanced the production of TLC in blood of cross-bred heifers. So, it can be concluded that compounded herbal drug influenced the hematological parameters of blood under normal range which ultimately affects the oestrus response of cross-bred heifers.

References

1. Arzumanzan, E.A. and Dorotjuk, E.N. (1964). The importance of biochemical factors in controlling infertility in cows. *Anim. Breed. Abst.*, 33(4): 3327.
2. Deshpande, R.S.; Dhoble, R.L. and Sawale, A.G. (2000). Efficacy of indigenous drugs in the treatment of post-partum anoestrum in buffaloes. *Indian Journal of Anim. Reproduct*., 21:115-116.
3. Jinjie,W.; Zhang,X.R.; Liu,Y.; Guo, Y. and Yang, K.L. (2000). Changes of haemorrheology parameters of dairy cows. Ith endometritis befor and after prevention and treatment. *Journ. Nan Jing Agril. Unil*.; 23:65-68.
4. Kaikini, A.S. and Pargaonkar, D.R. (1976). Anoestrum in cows.*1st All India Symposium on Animal Reproduction, Vol.-I,* P.A.U., Ludhiana, India.
5. Kolmer, J.A.; Spaulding, E.M. and Robinson, W.H. (1969). Approved Laboratory technique. *Scientific Book Agency, Calcutta*, 50-126.
6. Koutecka, L. (1997). Clinical evaluation of herbal Prajana for inducing ovulatory oestrus in cows and sows. *Indian Journ. Indi. Medi.,* 18(2) : 123-127.
7. Mehrotra, S.; Umashankar, Hoque, M. and Agrawal, S.K. (2009). Follicular development and induction of oestrus in anoestrus goats by medicinal plants. *Indian Vet. Journ.,* 86:527-528.
8. Purohit, M.L. and Kohli, I.A. (1977). Variation in the blood serum cholesterol level in Rathi cows during oestrus. *Indian Vet. Journ., 54:286-290.*
9. Sawale, A.G. and Dhoble, R.L. (1999). Efficacy of herbal preparations for induction of oestrus in cows. *Indian Vet.Journ.,*76:906-908.
10. Selukar, P.S. ; Dakshinkar, N.P. ; Sarode, D.B.; Road, A.M. and Kothekar M.D. (2001). Efficacy of herbal drugs in non-specific hypogalactia of cows. *Indian Vet. Journ,* 78:249-250.
11. Snedecor, G.W. and Chochran, W.G. (1968).Statistical methods.*7thedi.Oxford and International Book House,* New Delhi.

Received on 22.10.2013 and accepted on 10.12.2013