

STATUS OF TRACE ELEMENTS DURING OESTRUS CYCLE IN REGULAR AND REPEAT BREEDING RED KANDHARI COWS

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ABSTRACT

A study was conducted to evaluate the status of trace elements in regular and repeat breeding Red Kandhari cows. The average serum copper, zinc, manganese, iron and cobalt values in repeat breeder cows were 0.43 ± 0.03 , 1.21 ± 0.12 , 0.30 ± 0.00 , 0.89 ± 0.01 and 0.039 ± 0.001 ppm, respectively, which were significantly lower than the values of 0.62 ± 0.04 , 2.02 ± 0.02 , 0.55 ± 0.03 , 1.32 ± 0.02 and 0.048 ± 0.004 ppm, respectively in regular breeder cows.

KEYWORDS : Trace elements, Repeat breeding, Regular breeding, oestrus cycle, Kandhari cows

INTRODUCTION

Red Kandhari is a local breed of Marathwada region of Maharashtra state. It is well known for excellent draft capacity, moderate breeding efficiency, moderate milk production and considerable disease resistance. Repeat breeding is one of the major problems in dairy cattle that affects fertility and in turn incurs great economic loss to the farmers. The cause of repeat breeding is a major problem and might be due to nutritional imbalance, pathological disorders, hormonal disturbances, gynaecological problems, and deficiency of trace elements etc (Jain and Madan 1984). The present study was designed to estimate and compare certain serum trace elements during various stages of estrus cycle in regular and repeat breeding cows.

MATERIALS AND METHODS

Two groups of regular breeding and repeat breeding of Red Kandhari cows were formed on the basis of record and per rectal examination, consisting of six animals in each group.

All the animals selected for the experiment were adult and maintained under free range system and let loosed for grazing in the field from morning 8.00 am to 4.00 pm. The animals have free access to drink water and were not provided with any additional feed and fodder. The blood samples of each cow from both the groups were collected on 0 day (on day of oestrus or on the day of artificial insemination), second and third blood samples were collected on 8th and 15th day respectively, from the day of insemination.

From each animal 10-15 ml of blood was collected in the sterilized test tube and kept without disturbing at an angle of 30°C to obtain serum. The serum samples were digested by using acid mixture (nitric acid and perchloric acid) as per procedure described by Hilliard and Smith (1979). The serum samples were analyzed by Atomic Absorption Spectrophotometry for copper, cobalt, iron, manganese and zinc. The data were analyzed by using statistical procedures and interpretations based on statistical findings (Snedecor and Cochran, 1989).

RESULTS AND DISCUSSION

The data presented in Table revealed that the mean serum level of trace elements Copper, Zinc, Manganese and Iron were significantly ($P < 0.01$) higher in regular breeder cows as compared with

Table. Mean+SE values of trace elements during oestrus cycle in regular and repeat breeding cows.

Trace Elements	Reprod- uctive Status	Values of Trace Elements (ppm)			
		0 Day	8 th Day	15 th Day	Mean
Copper	Regular	0.70 ± 0.06	0.60 ± 0.03	0.56 ± 0.05	0.62 ± 0.04**
	Breeder				
	Repeat	0.48 ± 0.04	0.46 ± 0.07	0.36 ± 0.06	0.43 ± 0.03
Zinc	Breeder				
	Regular	2.06 ± 0.12	1.98 ± 0.06	2.03 ± 0.22	2.02 ± 0.02**
	Breeder				
	Repeat	1.41 ± 0.18	1.23 ± 0.09	0.99 ± 0.04	1.21 ± 0.12
	Breeder				
Manganese	Regular	0.59 ± 0.08	0.58 ± 0.03	0.47 ± 0.03	0.55 ± 0.03**
	Breeder				
	Repeat	0.29 ± 0.03	0.31 ± 0.03	0.28 ± 0.06	0.30 ± 0.00
	Breeder				
Iron	Regular	1.28 ± 0.10	1.36 ± 0.10	1.33 ± 0.11	1.32 ± 0.02**
	Breeder				
	Repeat	0.92 ± 0.04	0.89 ± 0.04	0.87 ± 0.04	0.89 ± 0.01
	Breeder				
Cobalt	Regular	0.044 ±	0.045 ± 0.004	0.056 ± 0.003	0.048 ± 0.004*
	Breeder	0.005			
	Repeat	0.037 ±	0.038 ± 0.005	0.041 ± 0.003	0.039 ± 0.001
	Breeder	0.006			

*and ** indicates significant at $p < 0.05$ and $p < 0.01$, respectively.

repeat breeder group of cows whereas the serum level of Cobalt in regular breeder cows were significantly higher ($P < 0.05$) as compared to repeat breeder cows. The observations of present investigations were in agreement with the findings reported by Datta *et al.* (2002). Ahmet *et al.* (2008) revealed that copper deficiency symptoms in cows include delayed or suppressed estrous, impaired ovarian function, decreased conception, increased incidence of retained placenta, infertility and early embryonic death, which support the findings of present investigation of significantly decreased serum copper concentration in repeat breeder cows. In case of zinc similar findings were reported by Kalita and Sarmah (2006). Zinc deficiency may lead to reduction in GnRH secretion by hypothalamus and eventually lead to decreased levels of luteinizing hormone and follicular stimulating hormone and arrest of ovulation (Kaswan and Bidwal 1995). Significantly higher manganese in regular breeder cows corroborates with the findings of Jai *et al.* (2007). Abhilash *et al.* (2008) reported that manganese deficiency can lead to suppression of estrous, irregular estrous cycle, silent heat, cystic ovaries and reduction in conception rates. Lower level of serum iron results in anaemia which in turn affects reproduction adversely in the form of repeat breeding, requiring increased number of inseminations per conception and occasionally leading to abortion (Randhawa and Randhawa, 1995). Lower level of serum iron plays a significant role in causing failure of conception and embryonic death due to change in molarity of the oviductal fluid in repeat breeding of cows and buffaloes (Jain and Madan 1984). Significantly ($P < 0.05$) higher cobalt in regular breeder cows than that of repeat breeder cows are comparable with the findings of Bhoopendra *et al.* (2007). Clinical signs of cobalt deficiency are delay in onset of puberty, anaemia, delayed uterine involutions and the most common manifestation of cobalt deficiency is a marked reduction in conception rate (Hidiroglou 1979). Lower level of serum cobalt plays a significant role in causing low fertility and delayed or depressed estrous (Underwood and Suttle 1999). Non significant difference in the values of trace elements such as copper, zinc, manganese, iron and cobalt was recorded on 0, 8th and 15th days of estrous cycle in regular and repeat breeder cows.

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