

## IMPROVEMENT OF CONCEPTION RATE IN CROSSBRED CATTLE BY USING GnRH ANALOGUE THERAPY

IFTIKHAR A. ANJUM, R. H. USMANI, M. T. TUNIO AND S. H. ABRO<sup>1</sup>

Department of Agricultural Sciences, Allama Iqbal Open University, Islamabad;  
<sup>1</sup>Sindh Agriculture University, Tandojam, Pakistan

### ABSTRACT

This study was carried out to evaluate the effect of Dalmarelin (Lecirelin acetate, GnRH analogue) administration at the time of artificial insemination (AI) on conception rate in repeat breeding crossbred cows. A total of 64 cows maintained at the Military Farm Okara, Pakistan were included in the study. The experimental cows were divided into two groups A and B, with 32 cows in each group. Cows of group A received no treatment at the time of AI and served as untreated control, while 32 cows of group B received Dalmarelin therapy at the time of AI. The cows were examined for pregnancy 60 days post insemination per rectum. A total of 12 animals out of 32 were pregnant with a conception rate of 37.5% in control group and in treatment group 22 animals out of 32 were pregnant, having conception rate of 68.75% ( $P < 0.05$ ). The study revealed that use of GnRH analogue therapy improved the conception rate in repeat breeding crossbred cows when it was administered at the time of AI.

**Key words:** Conception rate, GnRH, crossbred cows.

### INTRODUCTION

Crossbreeding provides an important tool for improving the production potential of non-descript cattle by crossing with high milk producing exotic dairy breeds. Crossbreeding has resulted in reduction of 10-12 months in age of maturity and age at first calving. Milk production in crossbred animals has also improved by 75-140% over their indigenous parents (Anonymous, 1996). Presently, a fair number of crossbred cattle are found in the country.

Gonadotropin releasing hormone (GnRH) is a protein hormone produced by hypothalamus. This hormone controls the synthesis and release of luteinizing hormone (LH) and follicle stimulating hormone (FSH), both originating from the pituitary gland. The combined action of these two hormones regulates follicular development, ovulation and corpus luteum (CL) function. For many years, GnRH agonists have been used to manipulate reproduction in dairy cattle (Douglas, 1998). Various GnRH agonists have been used with variable success for enhancing pregnancy rates and shortening the interval to first postpartum ovulation in dairy cattle.

Different economical and reliable methods are used to evaluate financial returns from the use of GnRH at time of insemination to enhance fertility in dairy cows. Some studies have shown that response to GnRH treatment varied with the herd fertility level. Herds with conception rate of 60% benefited from the treatment only at second or later service. Selection of the second/third insemination for the GnRH as treatment usually resulted in the greatest total return (Weaver *et al.*,

1988). The enhancement of fertility necessary to achieve the break-even point with GnRH treatment at third service was 2% for low and 5% for higher conception rate herds. Baseline herd conception rate, estrus detection efficiency, replacement cost, value of excessive days not pregnant and cost of treatment have the greatest effect on return from treatment. Herds with higher conception rate and low replacement cost are likely to get least benefit from GnRH treatment at insemination.

This study was designed to examine the potential use of exogenous GnRH given at the time of insemination for improvement of conception rates in repeat breeding crossbred dairy cattle.

### MATERIALS AND METHODS

#### Selection of animals

The study was conducted at the Military Farm Okara, Pakistan from March to May, 2004. A total of 64 healthy cyclic crossbred (Friesian x Sahiwal and Red Sindhi) repeat breeder cows were selected randomly. Cows that were cycling normally, with no clinical abnormalities and failed to conceive after at least two successive inseminations were included. Age of these cows ranged from 44 to 232 months and their lactation number varied from 1 to 13. These cows were divided into two groups A and B, with 32 cows in each group. Normalcy of genitalia of all the animals was confirmed through rectal palpation. These all 64 animals were maintained under the same routine feeding and management conditions of the farm. The routine feeding consisted of available green fodder with

concentrate ration according to the daily milk yield. Vaccination was carried out as per vaccination schedule.

### Heat detection and AI

Estrus detection in experimental cows was carried out twice daily by experienced herd persons. Only those animals were selected and recorded in heat which stood still while being mounted/ridden by other female cows or vasectomized bulls. The animals were also observed for behavioural symptoms like frequent urination, bellowing, raised tail, restlessness and licking of external genitalia. Different visible external changes like vulvular edema and absence of wrinkles on vulvular lips, vaginal hyperemia, wetness and mucus discharge were also observed. Animals showing signs of true heat were inseminated using frozen semen thawed at 37 °C for 30 seconds.

### Treatment and post treatment monitoring

The crossbred cows of Group 'A' served as untreated control. Group B cows received single injection of 2 ml Dalmarelin (50 ug Lecirelin, Fatro) intramuscularly at the time of insemination.

Animals were examined per rectum 60 days post insemination for pregnancy. Data was statistically analyzed by using Chi-Square tests (Agresti, 1996).

### RESULTS AND DISCUSSION

In group A, out of 32 animals, 12 conceived with a conception rate of 37.5%. In group B out of 32 animals 22 were pregnant. The conception rate in group B was 68.75%. Comparison of conception rate revealed significant difference between groups A and B ( $\chi^2 = 5.08$ ,  $P = 0.02$ )

This project was carried out to study the effect of Dalmarelin (GnRH analogue) on repeat breeding crossbred cows in relation to improvement of conception rate. A conception rate of 68.75% was observed in cows given GnRH which is in accordance with the observations of Rangnekar *et al.* (2002), who reported 70% conception rate in 10 repeat breeder Holstein Friesian cows. Similarly, Shelar *et al.* (2002) reported conception rate of the GnRH treated group as 60%.

A conception rate of 37.5% was observed in cows of control group which is in accordance with the

observations of Rangnekar *et al.* (2002), who reported 40% conception rate in 10 repeat breeder Holstein Friesian cows. The similar observation was reported by Shelar *et al.* (2002). According to Sajjad *et al.* (2007), GnRH treatment of buffalo bulls at weekly intervals significantly decreased sperm mid-piece and tail abnormalities compared to control ( $P < 0.05$ ). However, this treatment had no effects on semen volume, sperm motility, sperm concentration and semen pH.

In conclusion, the findings of this study revealed that use of GnRH analogue improved the conception rate in repeat breeding crossbred cows, when it was administered at the time of AI. It is, therefore, suggested that GnRH analogue can be effectively used to overcome the problem of repeat breeding in crossbred cattle.

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