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THE PROFILE OF FOLLICULAR DEVELOPMENT IN REPEAT BREEDER CROSSBRED COWS BASED ON ULTRASONOGRAPH EXAMINATION

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Introduction

Repeat breeding is one of the main problems that can affect the reproductive efficiency and productivity in cattle. The incidence of repeat breeding in cows so high and very detrimental to farmers. The most obvious loss are low calf production (ideally every 12 months to produce one calf, in fact, every 18 months or more just to produce one calf), approximately 35% pregnancy rate, and increased operational costs.

Repeat breeding in general can be caused by (1) failure of fertilization and (2) due to early embryonic death (Linares, 1980). Failure of fertilization and early embryonic death might be due to management factors, infections, environmental, hormonal, nutritional and ovarian disorders ((Swensson and Andersson, 1980; Zemjanis, 1980; Copelin et al, 1988). Ovarian disorders that often happens is that the ovaries activity that are not optimal. The disorder follicle development (folliculogenesis) may influence the ovulation and in the event of delayed ovulation. Ideally, folliculogenesis including sequential process of recruitment, selection, growth and maturation during the cycle of female animals and ends with ovulation. This process is regulated by the interaction between hormone, growth factors, genetic and cell communication system (Roche and Bolland, 1991).
Ultrasound scans have been used to determine the pattern of follicular growth at the age of two weeks prior to puberty in beef cows and heifers (Savio et al, 1988; Ginther et al, 1989; Sunderland et al, 1994.), in post partum cows (Savio et al, 1990.), in pregnant cows (Tatcher et al., 1991), in cattle after estrus synchronization treatment (Stock and Fortune, 1993) and in anovulatory cows (McDougall et al., 1995).

At present, note that the patterns that arise in the development of follicles is a pattern of two follicular waves (Pierson and Ginther, 1988) and three-wave patterns of follicular (Stock and Fortune, 1993). Cycles with one and four follicular waves have also been reported but only slightly (Carriere et al, 1994.). The aim of this study was to determine the pattern of follicular development in cows that experienced repeat breeding in a natural cycle and cows that PGF-2α is injected based on an ultrasound examination.

**Material and Methods**

Ten crossbred cows suffering from repeat breeding, which is owned by farmers, aged between 4 to 8 years, have been bred more than 3 times, the non-pregnant, healthy and have normal estrous cycles. Cows were then divided into 2 groups, each consisting of 5 head. The control group, are cows with natural estrus cycle, whereas the treatment group is the cow with the results of the estrous cycle after estrus induction using prostaglandin F 2α.

All cows were observed for estrus cycle lust either naturally (control) or with an injection of prostaglandin F 2α. On the first day after estrus (day 1) started the examination of ovarian follicle diameter either by rectal exploration or using electronic ultrasound-made Honda HS 2000VET with 7.5 MHz linear array.
Examination performed on all cows once every 2 days during one cycle. The data observed is the growth and follicle size. The result data of examination using ultrasound were recorded and analyzed by descriptive and T-test. Animals that showed estrus were mated directly through artificial insemination (AI). Pregnancy diagnosis by rectal exploration was performed 3 months after AI.

Results And Discussion

The pattern of follicular development in repeat breeder cows with an ultrasound examination can be seen in Figure 1. below.

In the early development of follicles (after ovulation), the average diameter of the follicles are about 3 mm. This condition is the same as opinion of Renis (2001) which states that after ovulation the diameter of follicles in groups are about 2-5 mm. But in this research, there is one cow that the follicle does not ovulation but gradually decline. The existence of unovulatory follicles could be due to the low concentration of luteinizing hormone (LH).

The results (Figure 1) shows that the pattern of follicle development in the natural cycle group consists of 2 waves of follicle development. In the first wave, maximum follicular diameter (dominant) (11.60 mm) was achieved on day 8 of the estrous cycle, while the maximum diameter of follicles (follicles De Graaf) (15.40 mm) on the wave-2 occurred on days-20 of the estrous cycle. These conditions seem to be similar to the conditions follicles in fertiles cow. It is said that, during the estrous cycle in cows could be occured 2 waves follicular growth (Ginting et al, 1989.), or three waves (Taya et al., 1996).
Diameter of dominant follicle in wave 1 is not as big as in wave 2 (11.60 mm vs. 15.40 mm). At wave 1, from a group of follicles, only one follicle that grows with the size of the dominant follicle. The growth of one follicle reaches the dominant follicle may be due to hormone levels of follicle stimulating hormone (FSH) was not able to stimulate follicular development as a whole (Rensis, 2001). The existence of this dominant follicle may be hinder small follicles to obtain adequate gonadotropin. These barriers occur passively by pressing the concentrations of FSH, or actively by reducing the sensitivity to FSH (Driancourt, 1991). On days 10 of estrous cycle, the diameter of dominant follicles to shrink and with it occurred a 2nd wave of follicular development, and the peak occurred on day 20 of estrus cycle (follicle de Graaf) which is characterized by symptoms of estrous. Rapid development of follicles in the wave 2 thought to be caused by adequate of FSH levels in the blood. This is in accordance with the opinion Rensis (2001) which states that the development of follicles in cows that have 2 waves of follicle development, the follicles will grow rapidly and become De Graaf follicles (matured follicles). In the present research, profile of ovarian follicles of repeat breeder PO cattle that has injected by prostaglandin F-α can be seen in Figure 2.
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