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Follicular dynamics in Serrana goats

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Abstract

Twenty-two Serrana goats were studied through two successive estrous cycles in order to characterize their follicular dynamics during the breeding season. The ovaries of the goats were scanned daily by real-time ultrasonography and all follicles ≥3 mm were measured and classified. The data were classified by the number of follicular waves per goat to test the hypothesis that temporal and morphological differences between the last follicular wave of an ovary, irrespective of ovulation, will affect the selection of the next ovulatory wave.

The mean interovulatory interval was 20.7 ± 1.0 days (mean ± S.D.). Three to five waves per estrous cycle were observed and 61.3% (19/31) of cycles had four waves. In estrous cycles with four waves, the day of onset of the first, second, third and fourth wave was 1.4 ± 1.0, 6.9 ± 1.4, 11.6 ± 1.8 and 16.8 ± 1.6, respectively. No differences ($P > 0.05$) were found between the day of onset of the first and second waves for estrous cycles with three, four or five waves. However, the day of onset of the third and fourth waves occurred later when the number of waves per estrous cycle increased ($P < 0.001$). The duration of the interwave interval (time between the day of onset of two consecutive waves) was longer when the second wave was ovulatory. The length of the growth phase (2.4 ± 0.9 days) and size (5.9 ± 0.7 mm) of the dominant follicle in the second wave were lower ($P < 0.01$) than for the first wave (3.3 ± 1.2 days and 6.6 ± 0.9 mm, respectively) and the fifth wave (4.1 ± 1.2 days and 7.5 ± 1.0 mm, respectively). Within pairs of ovaries, the onset of the last wave occurred later ($P < 0.05$) and was less variable in ovulatory ovaries (day 16.8 ± 1.4, $n = 20$) than in anovulatory ovaries (day 15.1 ± 3.7, $n = 20$). The length of the growing phase was longer ($P < 0.001$) in the last waves of ovulatory ovaries (3.1 ± 0.9 days) than in the last waves of anovulatory ovaries (1.7 ± 0.8 days). These results support the hypothesis that the day of onset of the ovulatory wave is related to or, at least, conditioned by the luteolysis and the decrease in plasma progesterone.

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In summary, the estrous cycle of Serrana goats is characterized by sequential follicular wave growth with a great variability in their onset and duration, with the exception of the ovulatory wave. The temporal and morphological differences observed in the last wave of estrous cycle provide strong evidence for the role of progesterone in their regulation.

Keywords: Estrous cycle; Follicular dynamics; Ovary; Goat; Ultrasonography