Can the Measurement of "Ano-Genital Distance" Predict Fertility of Dairy Cows?

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The ano-genital distance (AGD) is the distance from the anus to the clitoris in females, or to the base of the penis in males. The AGD in human babies is a reflection of the level of exposure to testosterone during in utero (fetal) development, with AGD being much greater in normal males than in females. Thus, AGD in the adult is indicative of prenatal androgen exposure and reportedly associated with several reproductive health outcomes in humans. The objectives of this preliminary study were: (1) to characterize variations in the measurements of AGD in a population of dairy cows and (2) to determine associations between categories of AGD and traditional reproductive indices as well as the concentration of estradiol (E2) at estrus. The AGD in 93 lactating Holstein cows were measured using a digital caliper. To increase precision, the average of three AGD measurements in each animal was used. All cows were subjected to fixed timed AI at ~75 d postpartum following an Ovsynch protocol. The traditional reproductive indices of 1st service conception rate and Days Open were determined for the current lactation. Estradiol was measured in blood at approximately 30 h before expected ovulation time. Cows were ranked based on AGD, from longest to shortest AGD, and those in the top and bottom 50th percentiles were classified into LONG (n=47) and SHORT (n=46) AGD categories. Data were analyzed using the MIXED, after blocking for parity, and GLIMMIX procedure of SAS. The AGD ranged from 96 to 149 mm and mean (±SE) AGD were 129.8±0.9 and 111.4±0.9 mm for cows categorized as LONG and SHORT AGD groups, respectively. The 1st service conception rate was significantly higher in cows of the SHORT than those of LONG AGD group (48.9 vs 21.7%; P<0.01). Similarly, cows in the SHORT AGD group had fewer days open compared to those in the LONG AGD group (93.9±2.8 vs 105.0±2.8d; P<0.01). However, the concentration of estradiol at estrus did not differ between AGD groups.

Take Home Message: Cows with longer ano-genital distance (AGD) were less fertile than cows with shorter AGD. These results must be validated with a larger population of dairy cows. If confirmed, the simple measurement of AGD could be used as a female fertility trait.