

# FACTORS AFFECTING GROWTH OF THE CONCEPTUS IN LACTATING DAIRY COWS AND NON-LACTATING DAIRY HEIFERS

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## ABSTRACT

Embryonic loss in dairy cows continues during the fifth and sixth weeks of pregnancy in lactating dairy cows. There is an association between smaller embryos and pregnancy loss during this period.

The objective was to examine the potential factors that affect embryonic growth from day 33 to 45 of pregnancy. Lactating Holstein and Guernsey cows and non-lactating heifers were examined by transrectal ultrasonography on d 33, 35, 38, 40, 42, and 45 of pregnancy. Length (l) and width (w) of the embryo and amnionic vesicle were measured. The volumes for the embryo (e\_vol) and amniotic vesicle (a\_vol) were calculated [volume =  $\frac{4}{3} * \pi * (0.5 * l) * (0.5 * w) * (0.5 * w)$ ].

Multiple factors collected during two years were analyzed using a GLMSELECT and PROC MIXED procedure (SAS Inst., Cary, NC). Breed (Holstein versus Guernsey) and month of pregnancy (January versus February or March-May) significantly affected the growth rate of the conceptus. Insulin and insulin-like growth factor 1 (IGF1) also had a lesser effect on rate of conceptus growth.

Normal embryonic growth was observed to occur in two separate manners. The first being slower initial growth with increased late growth. The second being linear growth across the study period. The significant effects could alter growth, but not to a significant enough degree to cause embryonic loss. These data allow us to understand factors that do not influence conceptus growth, and quantify normal conceptus growth variation in a larger study group.