Embryonic loss in dairy cows continues during the fifth and sixth weeks of pregnancy in lactating dairy cows. Smaller or slower growing embryos are more likely to die during this period. The objective of this study 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 ultrasound examinations on days 33, 35, 38, 40, 42, and 45 of pregnancy. Length (l) and width (w) of the embryo and the placental layer nearest the embryo (amniotic vesicle) were measured. The volumes for the embryo (e_vol) and amniotic vesicle (a_vol) were calculated [volume = 4/3*π*(0.5*l)*(0.5*w)*(0.5*w)]. Multiple factors collected during two years were analyzed including health, milk production, immune function, and individual cow records. Breed (Holstein versus Guernsey) and month of pregnancy (January versus February or March-May) significantly affected the growth rate of the conceptus. Holstein cows had larger embryos compared to Guernseys. Cows pregnant in January had smaller embryos compared to cows pregnant in other months. 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.