**Supplementary Figure 1.** Box and whisker plots displaying body weight of male (a) and female (b) CD-1® mice fed one of four experimental isoenergetic high-fat (40% fat of total energy) diets with fat content consisting of either 100% U.S. fat blend (CO) or 70% U.S. fat blend and 30% fish oil (FO), dairy fat (BO), or echium oil (EO), respectively. & = *P* < 0.05, FO-, BO-, or EO-fed mice vs. CO-fed mice collapsed by sex within each respective month. Data were analyzed at 3, 6, 9, and 12 months of experimental feeding via linear mixed model with an unstructured covariance, specifying diet, sex, and time as fixed effects.

(a)

(b)

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(a)

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(b)

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**Supplementary Figure 2.** Box and whisker plots displaying total body weight gain of male (a) and female (b) CD-1® mice fed one of four experimental isoenergetic high-fat (40% fat of total energy) diets with fat content consisting of either 100% U.S. fat blend (CO) or 70% U.S. fat blend and 30% fish oil (FO), dairy fat (BO), or echium oil (EO), respectively. & = *P* < 0.05, FO-, BO-, or EO-fed mice vs. CO-fed mice collapsed by sex within each respective month. Data were analyzed at 3, 6, 9, and 12 months of experimental feeding via linear mixed model with an unstructured covariance, specifying diet, sex, and time as fixed effects.

**Supplementary Figure 3.** Plasma estradiol concentrations of a subset of female CD-1® mice at 5 (n = 9) and 14 (n = 30) months of age. \*\**P* < 0.01.