

P. W. Huff, M. Q. Ren, F. Lozeman, R. J. Weselake, and J. Wegner

**Expression of Peroxisome Proliferator-activated Receptor (PPAR $\gamma$ ) mRNA in Adipose and Muscle Tissue of Holstein and Charolais Cattle.**

Peroxisome proliferator-activated receptor  $\gamma$  (PPAR $\gamma$ ) regulates adipogenesis and lipid metabolism-related gene transcripts. The role, however, of PPAR $\gamma$  in different adipose depots and muscle in Holstein and Charolais cattle is still unclear. We used 20 animals (10 from each breed) for semi-quantitative reverse transcription polymerase chain reaction (RT-PCR) to measure PPAR $\gamma$  mRNA levels in subcutaneous (SC), perirenal (PR), omental (OM), and intramuscular (IM) adipose depots as well as *longissimus* muscle (MU). IM fat was dissected from muscle tissue in MU. Holstein were characterized by their higher OM ( $P < 0.01$ ) and PR ( $P < 0.05$ ) fat weights while the Charolais had a higher body weight ( $P < 0.001$ ) and a larger *longissimus* muscle area ( $P < 0.001$ ). The IM fat content and marbling scores tended to be higher in Holstein. No significant differences in PPAR $\gamma$  mRNA expression were observed between these two breeds for any tissue. In both breeds, MU PPAR $\gamma$  had the lowest expressed mRNA level ( $P < 0.05$ ). In the IM fat depot, expression was higher ( $P < 0.05$ ) than MU, but lower than the SC, PR, and OM fat depot PPAR $\gamma$  mRNA levels. Only OM PPAR $\gamma$  mRNA levels were higher ( $P < 0.05$ ) than SC and PR in Charolais. To characterise the role of PPAR $\gamma$  mRNA in bovine adipogenesis, correlations were performed among PPAR $\gamma$  mRNA, carcass characteristics, and adipogenesis-related genes.

**Abbreviations:** PPAR, peroxisome proliferator-activated receptor; RT-PCR, reverse transcription-polymerase chain reaction; SC, subcutaneous; PR, perirenal; OM, omental; IM, intramuscular; MU, *longissimus* muscle; LPL, lipoprotein lipase

**Key Words:** adipose tissue, muscle tissue, PPAR $\gamma$ , cattle