

Expression Analysis of Solute Carrier (SLC2A) Genes in Milk Derived Mammary Epithelial Cells during Different Stages of Lactation in Sahiwal (*Bos indicus*) Cows

Mukesh M,

Abstract

Solute carriers (SLC2A/ GLUT) are one of the major types of transporter superfamily that have been predominantly involved in active transport of glucose across the plasma membrane. Glucose uptake by mammary epithelial cells (MECs) is an important step in the milk synthesis during lactation, and hence directly influences the milk yield. Use of MEC isolated from milk has been speculated to be a good alternative to mammary gland tissues in order to understand the expression profile of important genes associated with lactation, in particular large dairy animals where obtaining biopsies is sometimes difficult. The present study was therefore undertaken in milk purified MECs to assess relative mRNA expression of major solute carriers/glucose transporters (SLC2A/GLUTs) viz., SLC2A1(GLUT1), SLC2A(GLUT4), SLC2A8(GLUT8), SLC2A12(GLUT12) and hexokinase (HK2) genes during; early(10-20 days), peak (30-50 days), mid (100-140 days) and late (215-245 days) lactation stages of Sahiwal cows. MECs were isolated from fresh milk, using Dyna Beads coated with anticytokeratin 18 antibodies. For normalization of qPCR expression data, 10 known housekeeping genes (HKGs) from different functional classes were evaluated. A panel of four best stable HKGs; eukaryotic translation elongation factor 1 alpha (EEF1A1), ribosomal protein L4(RPL4), glyceraldehyde-3-phosphate dehydrogenase (GAPDH), actin- beta (ACTB) were identified through ge Norm, Norm Finder and Best Keeper analysis. Expression level of SLC2A1 was significantly higher during early and mid-lactation stages. The stage specific expression about of major SLC2A/GLUT and HK2 genes indicate their functional role in regulating glucose uptake in MECs of Sahiwal cows.

Mukesh M,
National Bureau of Animal Genetic Resources, Karnal, Haryana, India, mmukesh26@gmail.com