

# Glucose Transporter Expression in Bovine Monocytes

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## Introduction

The transition from involution of the mammary gland to lactation exerts substantial glucose demands on the dairy cow to support copious milk synthesis and secretion. Immune dysfunction also occurs at this time, with a concurrent high incidence of periparturient disorders. Macrophages are known to increase during the periparturient period and to have enhanced inflammatory properties. Little is known, however, about how the prioritization of glucose towards the mammary gland affects glucose uptake by macrophages. The objective of this study was to identify glucose transporter expression (GLUT) in bovine monocytes and examine how they alter during lactogenesis and following stimulation with endotoxin.

## Materials and Methods

Blood samples from 10 dairy cows were collected 28-35 days before expected calving and at  $5 \pm 2$  days after calving. Monocytes were isolated from total peripheral

blood mononuclear cells, and GLUT isoforms 1,3, and 4 were assessed for mRNA and protein expression following endotoxin stimulation.

## Results

The expression of GLUT isoforms changed as a result of lactogenesis and stimulation with endotoxin. Although differences were observed between isoforms, the onset of lactation generally served to decrease overall GLUT expression.

## Significance

This study identified for the first time the presence of GLUT isoforms in bovine monocytes. The changes in GLUT expression with respect to lactation stage warrant further investigation to ascertain how glucose may be utilized by monocytes during the periparturient period, and how energy utilization may contribute to periparturient immune dysfunction.