

The Effect of Insulin Sensitivity on Metabolic Disorders

Prior to parturition, tissue sensitivity to insulin decreases in response to the repartitioning of glucose supply by the cow, ultimately causing a mobilization of body reserves (non-esterified fatty acids) to compensate for lost energy. The mobilization of body reserves increases leptin, a hormone responsible for controlling feed intake, causing a consistent suppression of feed intake and insulin insensitivity.¹ The resulting negative energy balance suppresses immune function and promotes metabolic disorders.²

Chromium Propionate is a highly bioavailable chromium source, shown to improve insulin sensitivity and promote glucose uptake. Greater sensitivity of tissues to insulin likely increases clearance of glucose from the blood sooner, partitioning more energy to body reserves and decreasing the interval between meals.¹ The improvement in energy balance decreases free fatty acid levels, leading to less metabolic risk.

What is the value of decreasing metabolic disorders?

- Non-esterified fatty acids (NEFA) levels increase when a cow is in negative energy balance.
- An increase in free fatty acid levels and/or β -hydroxybutyrate levels can lead to ketosis, a major metabolic disorder in transition dairy cows.³

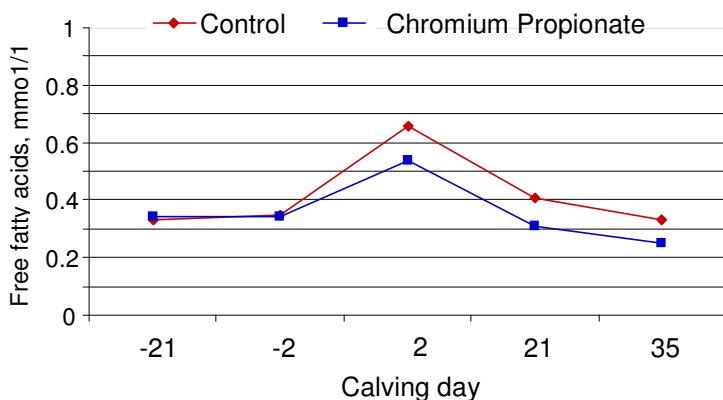


Figure 1. Effects of chromium propionate on **free fatty acid** levels in serum (publication pending).³

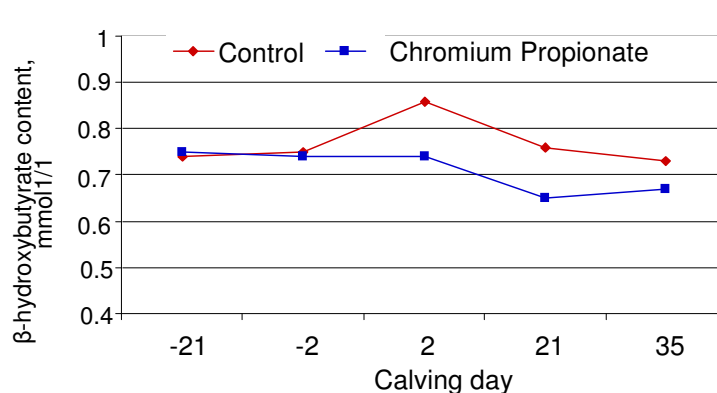


Figure 2. Effects of chromium propionate on **β -hydroxybutyrate** levels in serum (publication pending).³

- Cows suffering from one metabolic disorder are at greater risk for contracting others.²
- Initiation of ketosis can start a chain of events that could have a long-term negative impact on cows.
Value: One case of ketosis can cost a producer up to \$145 per early lactation period.⁴



References

1. Allen, M.S. and B.J. Bradford. Nutritional Control of Feed Intake in Dairy Cattle. 2009.
2. Bradford, B. Inflammation and Transition Cow Disorders. 2009.
3. Duan, B. Effect of Chromium Propionate on Milk Production, Milk Composition and Blood Indices in Dairy Cows. 2009. (Publication Pending).
4. Galligan, D.T. and J.D. Ferguson. Prevention and Treatment of Postpartum Diseases. 1996.