Can chromium help

Supplemental chromium increases the sensitivity of body tissues to insulin, which can improve dry matter intake and milk production of transition cows.

By MARY BETH DE OÑARZA*

ACTIVATION performance is dependent on the success of the transition period from three weeks before to three weeks after calving (Greenway, 1995). Much progress has been made with dry cow and fresh cow nutrition and management to reduce metabolic diseases during this time. On many commercial dairies, the incidence of clinical disease during the transition period is low, but there are still ample opportunities to reduce subclinical issues and improve performance.

Negative energy balance

Most transition cows experience some degree of a negative energy balance due to their high energy demands and insufficient dry matter intake. To meet these needs, body fat reserves are mobilized and converted to non-esterified fatty acids (NEFAs) to be used as an energy source. Blood NEFA concentrations are about 0.25 milliequivalents (mEq) per liter for a dry cow and rise three weeks before calving to more than 0.6 mEq per liter on calving day.

High plasma NEFA levels are typically associated with metabolic problems during the transition period (Odk et al., 1995; Chandler, 1997). Glycogen stores in the liver have been depleted, and glycogenolysis will continue to produce glucose, which will be used as an energy source. Insulin sensitivity, as expressed by the amount of glucose required to produce a certain amount of insulin, is reduced. Insulin resistance will increase, and glucose will enter the cow's blood in increased amounts to be used as an energy source.

Negative energy balance is a significant problem during the transition period. Problems during the transition period are typically associated with metabolic disease and subclinical issues, especially those related to energy balance.

Insulin sensitivity

When a cow is said to have "insulin resistance," the normal amount of glucose required to produce a certain amount of insulin, as expressed by the amount of glucose required to produce a certain amount of insulin, is reduced. Insulin resistance will increase, and glucose will enter the cow's blood in increased amounts to be used as an energy source.

Insulin sensitivity

Insulin binds to receptors on the body's cells similarly to a lock and key. Once insulin has "unlocked the door," it binds to the cell and is used as an energy source to produce adenosine triphosphates (ATP) to be used as energy sources. When insulin levels are low, the body will release NEFAs, which are fats stored in the body, to be used as an energy source.

Insulin sensitivity is increased during pregnancy, when the amount of insulin required to produce a certain amount of glucose is reduced. Insulin sensitivity is decreased during the transition period, when the amount of insulin required to produce a certain amount of glucose is increased. This is because the body is in a state of negative energy balance.

Neonatal period

During the neonatal period, from one to 90 DIM (days after calving), glucose clearance rates are reduced. Glucose clearance rates are reduced due to the high energy demands of the neonate. At this time, glucose levels are low, and the body is in a state of negative energy balance.

Chromium status

Chromium status in the cow is critical for the production of milk and energy. Chromium is involved in the conversion of glucose to energy, which is used to produce milk and energy. Chromium is also involved in the production of insulin, which is used to control the amount of glucose in the blood.

Chromium supplementation

Chromium supplementation is recommended for transition cows. Chromium supplementation can improve dry matter intake, milk production, and glucose clearance rates.

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insulin sensitivity?

In a similar study, Spears et al. (2010) supplemented 0, 0.3, 0.6, 0.9, or 1.2 mg of supplemental chromium per kg of diet dry matter) to grazing dairy cows. Chromium reduced ruminal lactate, serum insulin and insulin-glucone ratio for 15 minutes after glucose infusion, indicating greater insulin sensitivity.

Intake, milk production

Spears et al. (2010) reviewed the literature and concluded that most studies showed nutritional chromium significantly increased or tended to increase milk production and intake. However, the effect was greater when supplemental chromium was administered in an organic form other than chromium propionate. Researchers at the University of Wisconsin (Hayle et al., 2001) supplemented cows with 0, 0.03, 0.06 and 0.12 mg of chromium as chromium nitrate per kg of total digestible nutrients, respectively. Production increased by 0.08, 0.20, 0.41 and 1.03 mg of dry matter intake for 28 days and before after calving.

In a study by Bryan et al. (2004), cows were supplemented before calving, and glucose tolerance was improved by increasing calving. There was a linear improvement in prepartum intake with chromium supplementation. A quadratic supplementation had a quadratic effect on intake and milk production after calving, with non-lorage fiber supplemented with 0.49 mg/kg being highest.

Using a chromium amino acid chelate, Spears et al. (1999) improved intake and production in pregnant cows with high fat-corrected milk yield — when 0.5 mg of chromium per kilogram of dry matter intake was fed six weeks prepartum to 16 weeks postpartum.

Some researchers have attempted to determine if dietary chromium affects the response of cows to supplemental chromium. Smith et al. (2006) fed a high-roughage diet (72% of dry matter) or low-forage diet (18% of dry matter) with two levels of supplemental chromium (0.63 or 0.66 mg of chromium per kilogram of metabolic bodyweight) per day. The study was conducted from late pregnancy to early lactation (J. Anim. Sci. 85:501-509).


There are additional studies that indicate greater Insulin sensitivity. In a similar study, Spears (2010) reported that chromium supplementation improved insulin sensitivity in pregnant dairy cows: Strategies to optimize metabolic health. J. Dairy Sci. 82(Suppl. 1):145-1461.


Chromiuim and dietary nutrition. Proceedings ol the Mid-Surface Ruminant Nutrition Conference, Dallas, Texas.


McNamara, J.P., F. Valdez and J.P. McNa­

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