PROTEKTA®

How X-Zelit Works to Reduce Milk Fever and Hypocalcemia...

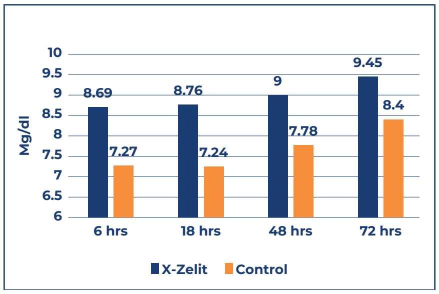
INTRODUCTION

Traditionally, milk fever prevention programs have attempted to directly alter Ca status of dairy cows at calving. Examples of common approaches include feeding pre-fresh dairy cows diets containing anionic salts, limiting dietary Ca, feeding hyper-dietary Ca and administering Ca boluses.

IMPROVING BLOOD CALCIUM

New research (Cornell University, UW-Madison, UVM Germany) has discovered that restricting dietary P in pre-fresh cows significantly improves blood Ca status of cows at calving which greatly diminishes hypocalcemia and milk fever. These and other new studies have discovered that modestly restricting dietary P to pre-fresh cows reduces the release of a bone hormone called fibroblast growth factor-23 (FGF23). FGF23 plays a central role in P metabolism regulating the active form of vitamin D and P absorption from the kidneys, intestines and bone mobilization of both P and Ca.

Blood Calcium Levels



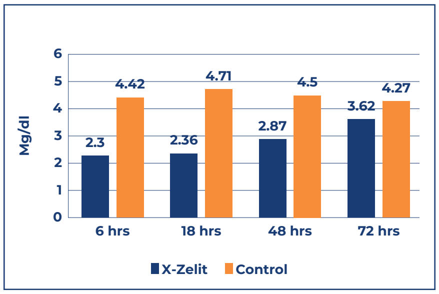
Cornell data, Journal of Dairy Science 2019 (30 cows per treatment)

When X-Zelit is fed to pre-fresh cows for 12 – 18 days, in combination with feeding modest levels of dietary P and Ca, enough P is bound to likely cause a reduction in FGF23, yielding a rapid release of both Ca and P from bone thereby increasing blood Ca. Elevation of blood Ca at calving induced by feeding X-Zelit, a dietary P binder, and subsequent reductions in milk fever and hypocalcemia has been observed in numerous studies and on commercial dairies.

BLOOD PHOSPHORUS

When X-Zelit is properly fed, it induces a modest dietary P restriction and blood Ca level at calving is significantly improved and with far less variation between cows. Blood Ca improvement is a consistent response observed in studies, with a corresponding lower blood P also observed.

Blood Phosphorus Levels

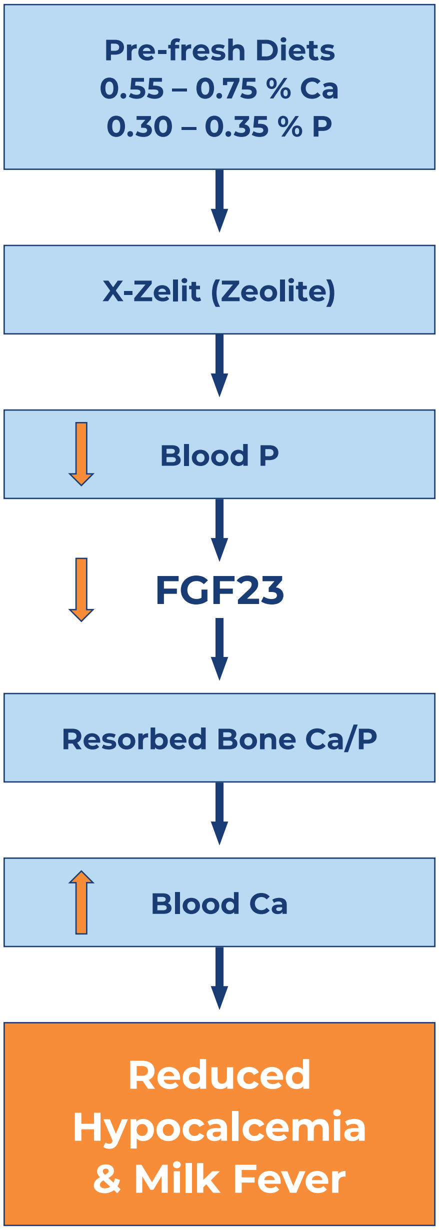


Cornell data, Journal of Dairy Science 2019 (30 cows per treatment)

This brings us to question why is X-Zelit so efficient at binding P? The short answer is because the dairy cow recycles a large fraction of P into saliva to form rumen buffers. This form of P (PO4) is abundantly available to be bound. A study at the University of Wisconsin has demonstrated that the amount of P in saliva is reduced when feeding X-Zelit. These phosphorus restriction effects are temporary, with saliva blood P levels recovering rapidly after calving when X-Zelit is no longer fed.

MECHANISM

Below is a simplified mechanism adapted from Crenshaw et al., 2010. J. Anim. Sci. The effects of FGF23 on kidney function are omitted for brevity.



KEY RESEARCH

X-ZELIT RESEARCH

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