YMCP® Vitall bolus by TechMix

TechMix Redefining hydration to keep animals drinking, eating & producing.

Accredited Research:

The effects of an oral supplement containing calcium and live yeast on circulating calcium and production following i.v. lipopolysaccharide infusion in dairy cows

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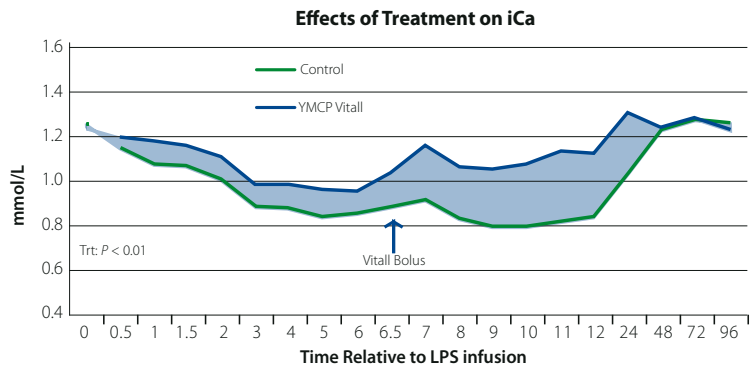
Summary
Providing the oral supplement, YMCP Vitall® bolus, to fresh cows is an approach that can markedly ameliorated a hypocalcemic status, improve dry matter intake, and milk yield in the days following administration. Overall, utilizing an oral supplement may be a valuable management strategy to improve animal well-fare and productivity during and following immunoactivation.

Experimental Study Design
Lactating Holstein cows (n = 12; 269 ± 20 DIM; 760 ± 13 kg BW; 2.7 ± 0.3 parity) were housed in individual box-stalls, jugular catheterized and allowed 4 d to acclimate.
The trial consisted of 2 experimental periods (P). During P1 (3 d), cows were fed ad libitum and baseline data was collected. At the beginning of P2 (96 h) all cows were challenged with lipopolysaccharide (LPS), 0.375 µg/kg BW adminstered IV. Cows were assigned randomly to 1 of 2 treatments: 1) control (CON; no supplement; n = 6) or 2) YMCP Vitall, administered 0.5 pre- and 6.5 h post-LPS infusion (CLY; n = 6).

Treatments
1. Control (CON; LPS Challenge -No Supplement)
2. YMCP Vitall (CLY; LPS Challenge + administration of 1 dose at .5 hour pre LPS infusion and again at 6.5 hours post respectively)

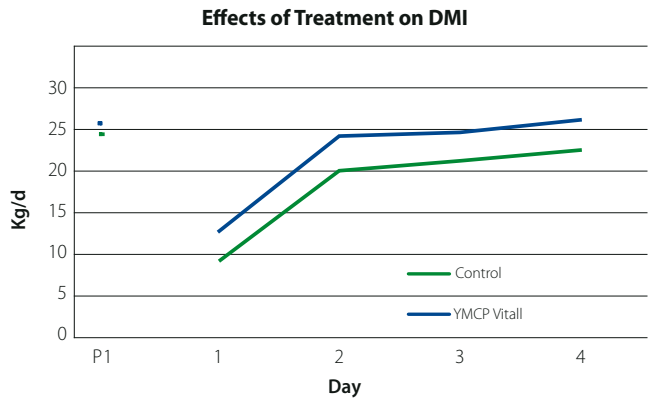
Results
Detailed ionized calcium, dry matter intake, and milk yield results are graphically displayed below:

Effects of YMCP Vitall Supplementation

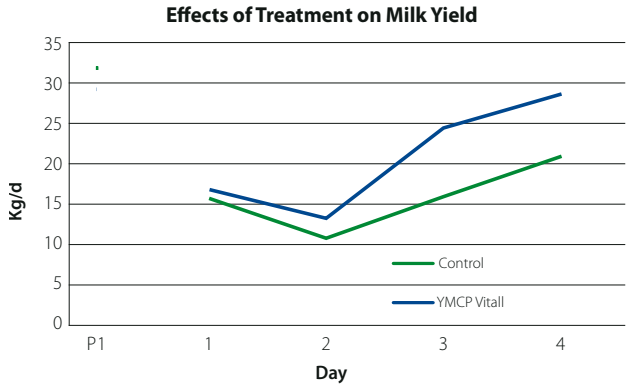


AMELIORATED 469% by 48 h AUC

Effects of YMCP Vitall Supplementation



INCREASED 22% during P2



INCREASED by 7.3 kg/d by Day 4

Effects of YCMP Vitall Supplementation

Both control and YMCP Vitall groups showed similar obvious response to LPS challenges. This included increased body temperature and respiration rate and decreased circulating blood glucose between 3 and 12 h post LPS-infusion. LPS markedly decreased DMI (60%; $P < 0.01$) similarly for both treatments on d 1, but overall (d1-4) DMI tended to be reduced less (14 vs 30%; $P = 0.06$) in YMCP Vitall supplemented vs CON cows, representing 22% increased DMI. LPS reduced ($P<0.01$) milk yield on d 1 and 2 (48 and 61%, respectively). Overall (d 1-4), YCMP Vitall supplemented cows tended ($P = 0.11$) to produce more milk (32%) following the LPS challenge and this effect was most pronounced on d 4 (20.7 vs 28.0 kg/d; $P <0.04$).

Conclusion

Supplementation of YMCP Vitall around the time of elevated levels of LPS markedly ameliorated hypocalcemia, improved DMI, and milk yield. All fresh dairy cows face significant health risks associated with suppressed immunity and a multiple nutritional component approach has proven to get cows back on feed quickly and ensure a rapid recovery. In summary, utilizing YMCP Vitall is a valuable management strategy to improve animal welfare and productivity.

YMCP® Vitall bolus by TechMix

TechMix
REDEFINING HYDRATION

YMCP® VitaII bolus by TechMix

TechMix Redefining hydration to keep animals drinking, eating & producing.

Accredited Research:
Effects of maintaining eucalcemia following immunoactivation in lactating cows.

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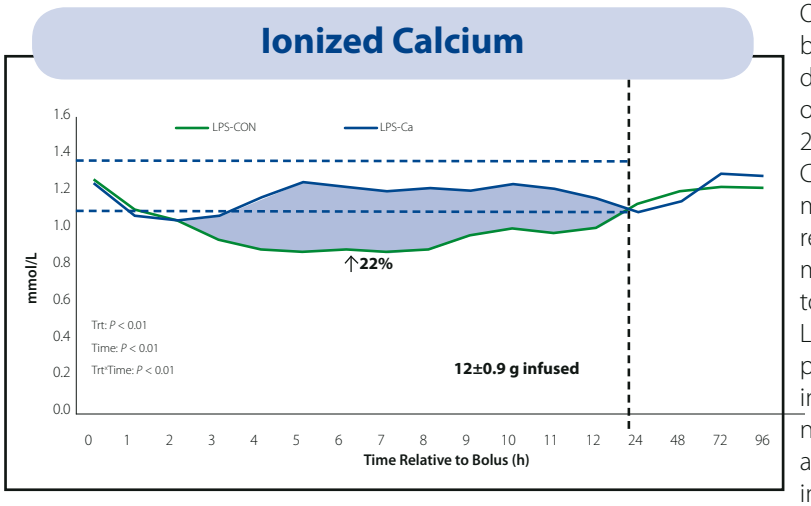
Summary
Immunoactivation results in a profound period of hypocalcemia. Calcium (Ca) plays a multifaceted role in the complex of immune system biochemical reactions. Thereby it could be assumed that limiting calcium during periods of heightened risk of immunoactivation, such as the prefresh period, could be detrimental to recovery. The objective of this study was to determine if intravenous supplementation of calcium during periods of immune challenge would aid or expedite cow recovery. All cows herein were challenged with LPS but only treatment 2 (LPS-Ca) cows received a supplemental Ca IV. Through monitoring of blood Ca levels, using an iStat machine, by experimental design those cows were enabled to remain in a eucalcemic state. Despite maintaining eucalcemia, Ca supplemented cows were found to have increased inflammatory biomarkers and significant reductions in production parameters. Ultimately, supplementing with just Ca delayed recovery from an immune challenge and proved not beneficial for challenged cows.

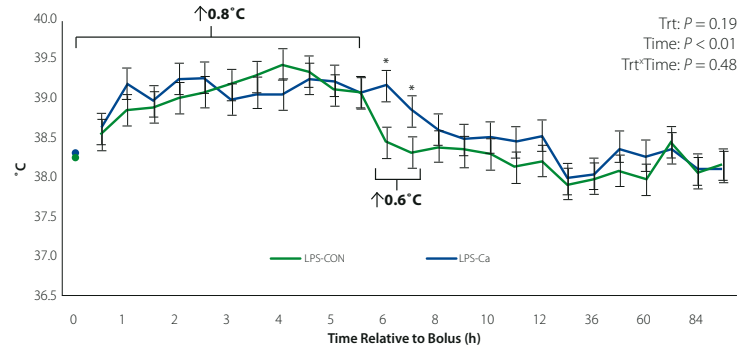
Experimental Study Design
Twelve non-pregnant lactating Holstein cows (717 ± 20 kg BW; 176 ± 34 DIM; parity 3 ± 0.2) were enrolled in a study containing 2 experimental periods (P); during P1 (3 d), cows consumed feed ad libitum and baseline values were obtained. At the initiation of P2 (4 d), cows were assigned to 1 of 2 treatments.

Treatments
1. LPS administered (LPS-CON; 0.5 µg/kg of BW LPS; n = 6)
2. LPS administered + eucalcemic clamp (LPS-Ca; 0.5 µg/kg of BW LPS; Ca infusion; n = 6).



Results
Overall, dry matter intake (DMI) was not improved by Ca supplementation. Though DMI did not differ due to treatment, Ca supplemented cows observed a more profound period hypophagia for 2d post-LPS, relative to baseline (45% vs 34% LPS Controls; P < 0.01). On d 1 following LPS infusion, milk yield decreased (61%) in both treatments relative to P1, however, the decrease tended to be more pronounced with Ca infusion (15%, relative to LPS-CON cows; P = 0.07). Overall circulating LPS-binding protein (LBP) continuously increased post-LPS, at 24 h circulating LBP in LPS-Ca cows increased (68%), relative to LPS-CON cows. While not significant (P = 0.28), circulating serum amyloid A (SAA) was numerically increased (47%) in LPS-Ca cows throughout P2, relative to LPS-CON cows.

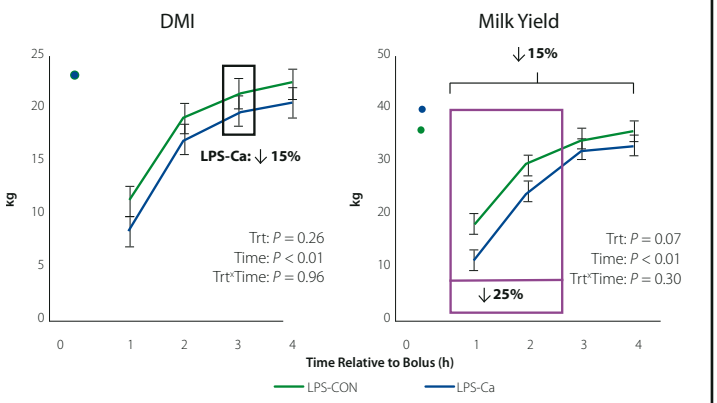
Rectal Temperatures

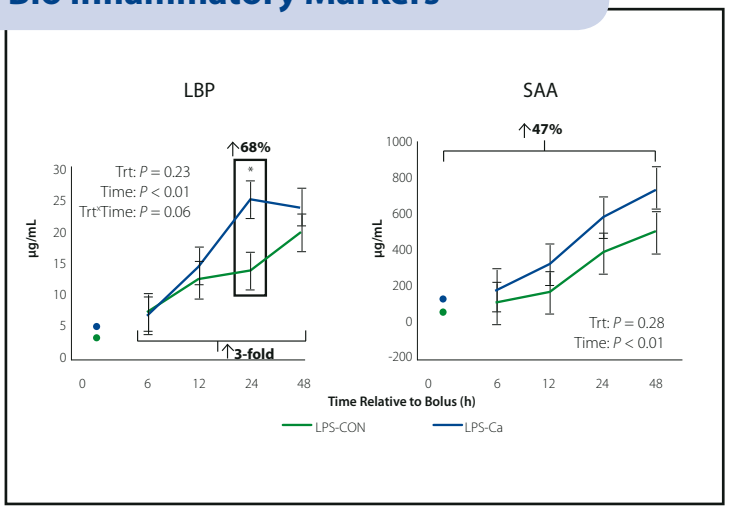


Conclusion

Supplementation of solely Ca following LPS challenge failed to improve dry matter intake and was detrimental to milk production. Furthermore, Ca supplementation increased concentration of inflammatory markers which could at least partially explain the observed production deficits. Despite current industry efforts to support blood Ca values following freshening this study would indicate that fresh cows, especially cows experiencing immunoactivation, would not benefit from an intervention providing solely calcium.

Production Parameters and Bio Inflammatory Markers





Summary

We are familiar with the fresh cow metabolic disease complex and how following an initial challenge the risk of experiencing second episode of illness is greatly heightened. But why do some cows transition with no issue while others experience a life-threatening challenge?

The underlying link between problem cows has been an observed up-regulation in the immune system prior to calving, prepartum immunoactivation. Science has yet to fully be able to explain why this phenomenon occurs. It has also been demonstrated that immune challenged cows go from a eucalcemic state to a hypocalcemic status very rapidly. Previously, lactogenesis was thought to be solely responsible for cows becoming hypocalcemic. Thereby it could also be assumed calcium was the limiting factor for fresh cows.

Previous research has shown the immunoactivation causes a depletion of blood Ca. However, the research presented here demonstrates that replacing just the calcium, correcting hypocalcemia, does not aid in the recovery process. More importantly these studies have proven that a multiple nutrient approach working to address the dietary and microfloral needs of fresh cows is much more effective at recovery than a single nutrient approach. Fresh cows need more than just calcium.