



The Effect of Insulin Sensitivity on Health in the Feedlot

Several reports, over recent years, have documented performance and health-augmenting effects of supplemental dietary organic chromium in feedlot cattle. In stressed feeder calves, dietary chromium supplementation has been shown to reduce morbidity and increase weight gains while improving feed efficiency¹. Performance benefits of supplemental chromium are often magnified during periods of cattle production stress resulting from transportation and feedlot acclimation, environmental factors, and ration transitions. These stress periods are often associated with health consequences such as bovine respiratory disease or shipping fever.

During stress, glucose metabolism increases simultaneously with increased secretion of the hormone cortisol into blood¹. Cortisol acts antagonistically to insulin because it prevents entry of glucose into peripheral tissues (muscle and fat) to spare it for tissues of higher demand (brain and liver)². Chromium supplementation has been shown to be effective in diminishing the adverse effects of stress by reducing cortisol levels³. This reduction in cortisol levels tends to improve immunity, frequently resulting in enhanced growth performance.

Research has shown that cattle fed chromium propionate at 0.3 mg/kg can lower the percentage of cattle treated at least once and decrease mortality in the feedlot^{4,5} (Figures 1 and 2).

Figure 1. Morbidity - % Cattle Treated

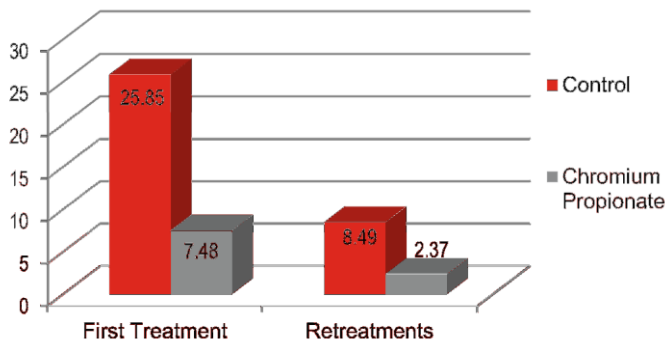
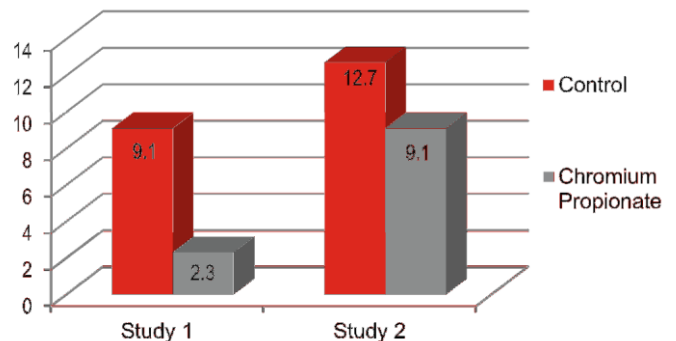


Figure 2. % Mortality



WHAT IS THE VALUE OF IMPROVING ANIMAL HEALTH?

Research continues to accumulate that illustrates the negative impact that morbidity has on the performance and carcass merit of feedlot cattle. The economic impact of bovine respiratory disease (BRD) in feedlot cattle was studied by Schneider, et al. (2009). When comparing cattle never treated for BRD (0) with cattle that were treated once (1), treated twice (2), and treated three or more times (3+), a decrease in performance and carcass merit was observed associated with a respective decline of \$23.23, \$30.15, and \$54.01 in carcass value⁶.

Recent Iowa State University research also studied these relationships, and the effect health status has on feedlot performance and carcass traits (Table 1)⁷. In this summary, cattle receiving one medical treatment gained 5% slower than healthy cattle, and cattle treated two or more times gained 8.4% slower than healthy cattle. In addition, 71.5% of the never treated cattle graded choice or better as compared to 53.4% of the cattle treated two or more times. A summary of the Texas A&M Ranch to Rail database comparing performance and carcass merits showed similar economic results^{8,9}. From 1991-1995 healthy cattle averaged \$92.26 more profit per head than did sick cattle. The Ranch to Rail program for 2000-2001 had even more dramatic economic improvements with healthy cattle averaging \$151.18 more profit per head.



Animal health has a significant impact on overall profitability in the feedlot, resulting in high treatment costs, negative performance effects, and decreased carcass trait values. In summary, research data continues to confirm the importance of health in the feedlot, implying that the prevention of sickness offers the highest return on investment.

Chromium Propionate is a highly bioavailable source of chromium for use in cattle feeds¹⁰. Chromium propionate allows cattle to utilize energy more efficiently. The primary role of chromium is to potentiate the action of insulin. Increased insulin activity promotes intracellular glucose uptake, providing more efficient energy utilization.

Table 1. Effect of health on feedlot performance and carcass traits

Item	No Treatment	Single Treatment	2 or More Treatments
No. of Head	22,830	3,080	1,628
Final Weight, lb	1,184	1,158	1,144
ADG, lb	3.22	3.06	2.96
Days on Feed	170	179	183
Treatment Cost, \$/hd	\$ -	\$ 23.40	\$ 54.07
Death Rate, %	0.1%	5.5%	14.1%
USDA Quality Grade			
Choice or Prime, %	71.5%	61.7%	53.4%
Select, %	26.6%	34.5%	37.7%
Standard, %	2.0%	3.9%	8.8%

Feedlot cattle are often faced with immune challenges that demand an increase in energy efficiency in order to prevent sickness. Research has demonstrated that chromium propionate has a consistent and repeatable response optimizing insulin sensitivity, increasing the opportunity to maximize feedlot performance and increase profits.

References

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