

# Effect of Niashure Supplementation on Newborn Calves Subjected to Cold Stress

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Niashure™ NIACIN



## Abstract

The effect of NiasShure supplementation on newborn calves subjected to cold stress was tested in Havre, Montana in January of 2014 through April 2014. NiasShure- ruminally inert, precision release niacin- was originally used as a sweating agent in dairy cattle to help limit heat stress. This system led to the notion that the same method could be used to increase blood flow in newborn calves to prevent potentially life threatening cold stress. If this idea were shown to be successful, it would provide ranchers with a suitable supplement for extreme calving conditions in order to increase calf survival rate. This experimental study found that pregnant, NiasShure supplemented Black Angus cattle birthed calves that had higher heart rate and core body temperature averages during cold stress than the calves born to cows deprived of the supplement. Due to the leeway for error in this study, several more trials have been conducted in the 2015 calving season in Havre and at MSU.

## Methods

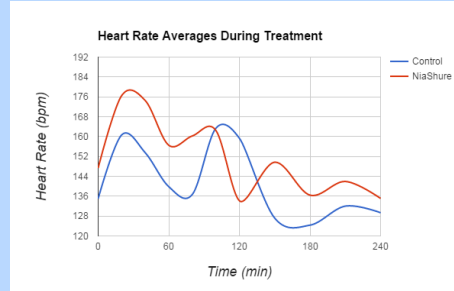
### Cow Protocol

Bred angus cattle were randomly assigned to control and treatment groups. Both group were fed a supplement of two pounds of grain once a day. A ruminally inert niacin product (Niashure) was added to the grain supplement fed to the treatment group. Feeding started 2 weeks before expected birth date and continued for two weeks after parturition. Cows were continually monitored during the interval of expected calving date.

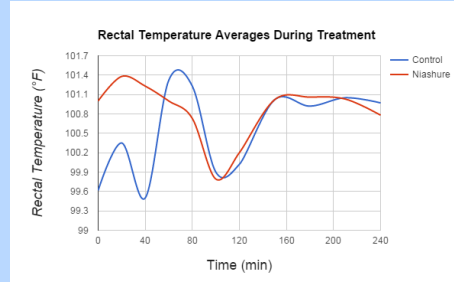
### Calf Protocol

20 minutes after birth, calf was weighed and fed 30 mL/ kg of body weight, then muzzled and returned to mother for three hours. 3.5 hours after parturition a catheter was placed into jugular vein, a heart rate monitor was fitted, and a temperature data logger was secured in the rectum. At hour 4, the calf was placed into a 0 degree Celsius environment and continually monitored to ensure the safety of the calf. At 20 minute intervals (0, 20, 40, 60, 80, 100, and 120 minutes) 10 mL of blood was drawn from the calf and replaced with 10 mL of solution. Succeeding the blood drawn at 120 minutes, the calf was returned to pen with mother and was observed until successfully nursing. The calf was removed from the pen and blood samples were taken at 150, 180, 210 and 240 minutes.

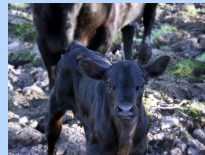
## Results



Time (min)	Control Rectal Temp (°F)	NiasShure Rectal Temp (°F)
0	99.6167	101
20	100.35	101.38
40	99.5	101.23
60	101.32	101
80	101.23	100.73
100	99.9	99.7917
120	100.02	100.2
150	101.02	101.02
180	100.92	101.06
210	101.05	101.03
240	100.97	100.78



Time (min)	Control Heart Rate (bpm)	NiasShure Heart Rate (bpm)
0	135	147.33
20	160.67	176.5
40	153.5	174.5
60	139.83	156.5
80	136.67	160.25
100	163.33	162.5
120	159.33	134.17
150	127.17	149.67
180	124.33	136.42
210	132	141.92
240	129.33	135.08



## Conclusion

The information gathered in this experiment helped to further the understanding of the effectiveness of feeding NiasShure to increase cold stress resistance in newborn calves. Based on the results of the study, on average, feeding NiasShure increased both the heart rate and core body temperature of the calves during the 240 minute interval that began 4 hours after the calf was born. To further understand the impact of feeding a NiasShure supplement to cattle in late gestation, additional tests such as calorimetry and thermal imagery could be utilized to measure energy requirements and brown fat deposition.

## Implications

Calves that passively receive a NiasShure supplement consequently have increased blood flow, potentially leading to better cold stress response. In the calving industry, an increased ability for calves to cope with cold stress would greatly improve calf survival rate. NiasShure supplementation has the potential to revolutionize the field, especially in climates such as Montana. Being a relatively inexpensive supplement, NiasShure can positively impact cold stress response with minimal cost and may lead to a higher calf crop yield, thereby directly influencing profit.