



## A REVIEW OF FEEDLOT DATA FROM CATTLE FED NUTRIVANTAGE (2007-2014)\*

We have had many questions regarding the use of NutriVantage for beef in feedlot cattle and the data that were generated from incoming calves through heat-stressed feedlot cattle. The following summary provides the data accumulated from KNG's PDC as well as field trials conducted from Kentucky to northwest Iowa.

In 2007, Kent researchers started a study (KFDLT 07M 188S, Table 1) using highly stressed 500-lb steer calves from Kentucky sale barns to evaluate NutriVantage for beef (a synergistic blend of natural ingredients, organic acids, vitamins and complexed trace minerals) in diets fed to incoming cattle. Calves fed NutriVantage for beef ate 13.3% more dry matter and had 18.2% more weight gain than control calves. The control diet can be described as the best starter program that KNG had developed to date. The health data from this animal set demonstrated that NutriVantage for beef reduces morbidity substantially and mortality by 75%.

**Table 1: Effect of MFG 150 on Incoming Calves**

Treatment	MFG	ADG, Lb	DMI, Lb	F/G	Deaths
1	0	2.09	13.43a	6.77	4
2	x	2.47	15.22b	6.16	1
3	2x	2.27	14.40ab	6.52	5

<sup>ab</sup> Treatment means within the same parameter with unlike superscripts are different ( $P < .05$ )

That same year (KFDLT 07M 188, Table 2) KNG staff found that finishing cattle benefitted from consuming NutriVantage for beef. Average daily gains were stimulated in a linear fashion ( $P=.14$ ) as the level of NutriVantage for beef increased as did dry matter intakes (linear effect  $P<.01$ ). It was the intake effect that increased gains.

**Table 2: Finishing Steer Performance as Affected by Dietary MFG 150 Concentrates**

Treatment	MFG	ADG, Lbd	DMI, Lbc	F/G
1	0	3.49	18.17a	5.22
2	x	3.52	19.02ab	5.42
3	2x	3.65	19.38b	5.33

<sup>ab</sup>( $P < .05$ ) <sup>c</sup>Linear effect ( $P < .01$ ) <sup>d</sup>Linear effect ( $P = .14$ )

As the two aforementioned trials were being concluded, field trials were being started in Kentucky with a very large back grounding company who purchased high risk calves, straightened them out health and performance wise and re-sold them as feeders. The initial study (KFT 08FR 1, Table 3) found that in over 600 calves, those fed NutriVantage for beef ate 13.8% more dry matter and gained 15.6% more body weight than control steers. Health records from this group of cattle also revealed that calves fed NV had significantly less 2, 3 and 4th pulls and 66% less deaths. A second trial at this facility (KFT 09FR 2, Table 4) that was supposed to last 40 days was shortened to 14 days as the control group was a wreck and the owners placed them all on NV. By day 14, the NV group showed a 63% reduction in death loss and about a 50% reduction in re-treats.

continued



## NUTRITION NOTES (continued)

**Table 3: Field Evaluation of NutriVantage for beef (2008)**

Treatment	NutriVantage	ADG, lb	DMI, lb	F/G	Deads, #
Rebound Plus	-	1.73	11.59	6.70	12
Rebound Plus	+	2.00	13.19	6.60	6

**Table 4: Field Trial 2 (2009)**

Treatment	NutriVantage	Cattle Treated*			
		Once	2x	Chronics	# Deaths*
1	No	149	65	38	33
2	Yes	118	32	14	12

\*Out of 318 head/treatment

In Minnesota, dairy beef is a major contributor to the feedlot cattle fed out for slaughter. The calves are generally purchased shortly after birth and may go through a few owners before being harvested. Established dairy beef feed programs are capable of supporting excellent performance if calves are healthy when they are received. This health aspect in a lot of feeding situations with Holsteins is a problem as sickness and death can plague a producer. In 2007 (KDB 07MN 1), a producer in Minnesota initiated a trial at his location as he had issues with performance and death loss. One hundred and seventy-eight 200# Holstein calves were assigned to two treatments based on body weight and fed to 425 lb. Both sets of calves were fed a corn/pellet program and the only difference was the addition of NV to the test group (Table 5). Calves fed NutriVantage for beef gained faster (12.4%) and consumed more dry matter (6.3%) than control calves. Feed efficiency tended to be improved. Death loss was reduced by 69.6% in the NutriVantage for beef group compared to the calves not fed NutriVantage for beef.

**Table 5: Effect of NutriVantage for beef Technology on Lightweight Holstein Steers (200-425 Lb)**

Treatment	Description	ADG, Lb	DMI, Lb	F/G	Death Loss, %
1	Precision Dairy Beef*	2.67	9.36	3.50	7.9
2	PDB & NutriVantage	3.00	9.95	3.32	2.2

\*PDB

Kent researchers again evaluated the use of NutriVantage for beef in diets for finishing cattle (KFLT 09M 198GF, Table 6) where the NutriVantage for beef level and feeding methods were studied. It was found that providing cattle NutriVantage for beef via a complete feed or so many pounds per ton of complete feed and mixed in a TMR wagon was superior to providing it via a supplement or balancer. In determining the correct concentration of NutriVantage for beef to fed, we found that there is a peak amount (ppm) where intakes and thus gains were maximized. More or less than this amount curtailed cattle response to NutriVantage for beef. It should be noted that performance, regardless of NutriVantage for beef concentration, never fell below that observed in control cattle. In addition to revealing feeding method responses, the use of NutriVantage for beef in finishing cattle diets the last 28 days again provided more profit for the producer by producing a heavier animal upon slaughter.

continued



**Table 6: Effect of NV Feeding Method on Feedlot Performance**

Trt	Description	Days	ADG, Lb	DMI, Lb	F/G
1	Control, No NV	138-166	3.54ab	23.12	6.78cd
2	NV, 25#/Ton TMR*	138-166	4.04b	23.54	5.93d
3	NV Equiv. in Balancer**	138-166	3.34d	23.52	6.98c
4	NV 16.7#/Ton TMR*	138-166	3.65ab	23.08	6.56cd
1	Control, No NV	0-166	3.48c	20.89cd	6.08de
2	NV, 25#/Ton TMR*	0-166	3.57c	20.74d	5.82e
3	NV Equiv. in Balancer**	0-166	3.32d	20.94cd	6.32f
4	NV 16.7#/Ton TMR*	0-166	3.47cd	21.39c	6.18df

<sup>ab</sup>(*P* < .05) <sup>cd</sup>(*P* < .10) *LSD means* \*Concentration per ton of complete feed \*\*Equivalent to that of 25# NV/ton complete feed.

Also in 2009, NV was studied in creep feeds (KCC 09M 199C). Calves fed NV gained faster and consumed more feed than those without NV. In this trial, HP Creep was the mode of delivery. With the value of today's feeder calves, every pound of calf is worth a great profit potential to the cattle owner.

The NV trial results in 2009 (KFLT 09M 198GF) led KNG to evaluate yearling cattle response to NV just the last 30 days prior to slaughter as the 198GF trial demonstrated that a large portion of the NV response was obtained in the last weigh period prior to harvest. Further thought led KNG to team NV up with this last weigh period with a powerful repartitioning agent (Optaflexx, Elanco) as the two products seemed to work at different sites within the animal.

In 2010, another investigation was initiated to evaluate the effect of NV, Optaflexx (OPT) or NV + OPT on fat cattle 28 days prior to harvest (KFLT 10M 201F, Table 7). Data indicated that cattle fed NV + OPT gained significantly faster than those steers fed no additive, NV by itself or OPT by itself. Cattle fed just OPT gained faster than those fed NV or none of these feed additives. Dry matter was stimulated in cattle fed NV approximately 4% compared to cattle not fed additives and by 5.4% compared to those fed only OPT. Cattle fed just NV did not exhibit significant improvements in feed efficiency when contracted to control steers but when OPT was consumed F/G improved significantly. As in all previous NV studies, increased gains were mediated through higher dry matter intakes.

**Table 7: Effect of NutriVantage for beef & Optaflexx on Finishing Steer Performance 28 Days Prior to Harvest**

Treatment	Description	ADG, Lb	DMI, Lb	F/G
1	Control – No Additive	3.38d	22.11abc	6.55a
2	Optaflexx – Last 28 Days	3.94b	21.79c	5.50b
3	NutriVantage – 28 Days*	3.63c	22.96a	6.34a
4	NutriVantage – 28 Days + Optaflexx**	4.18a	22.87ab	5.51b

\*NutriVantage for beef last 28 days only.

\*\*NutriVantage for beef w/Optaflexx (200 mg/hd/day) for 28 days. <sup>abcd</sup>*LSD* (*P* < .15)

In a refereed, published poultry paper, Edmonds et al, (2014) showed that mortality was decreased significantly (40% units) in broilers fed diets with NV compared to control birds when heat stress occurred due to a failure of the ventilation system in keeping the air moving adequately. Edmonds and others (under review) at USDA and Iowa State conducted basic studies evaluating the effect of injecting young pigs with lipopolysaccharide (LPS) to create stress. Data revealed that the immune system reacted positively in the presence of MFG 150 (NV) and LPS and data suggest that body temperature was lowered in pigs fed MFG 150 and injected with LPS compared to LPS injected pigs alone.

Heat and humidity can result in high mortality in feedlot cattle as some situations like shade, water and air movement are inadequate. Based on the data from the above KNG, USDA and Iowa State study, NV was evaluated in feedlot situations in the field where heat and humidity were an issue during the summer of 2012.

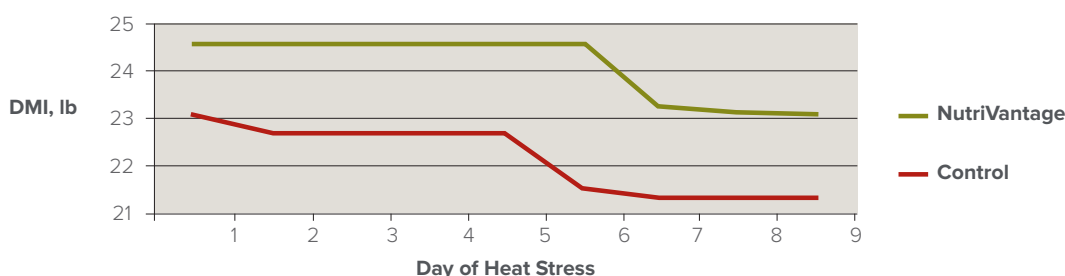
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The initial study was done in south central Illinois in a confinement facility with a onetime capacity of about of 3-4,000 head. A total of four pens of heavy cattle (1150-1250 lb) were placed on test where two random pens received the control diet and two other random pens received the test diet (control feed + NV). The NV was added at the rate of 25 lb per ton of totally mixed ration (TMR). Pens were located close to one another as to eliminate pen location variability and pen weights were similar. Ambient temperatures ranged from 95-103 degrees F during the nine-day trial. Control cattle consumed 7.8% less dry matter than those fed NV and the latter were observed to be less stressed as indicated by no excessive panting as compared to the control cattle where panting was prevalent. No death loss occurred. The second trial was implemented in northwest Iowa involving about 1360 head of yearlings (1250 lb) which were distributed into six pens. The trial was conducted when air temperatures ranged from 78-101 degrees F. The great majority of the days' temperatures were in the mid to upper nineties. Dry matter intakes of cattle fed NV were significantly ( $P<.10$ ) higher than control yearlings. The increase was about 10.5% across the week study. A gain, no cattle died due to the weather. Both field trials support the theory that NV influences and moderates the effect of air temperature and humidity on cattle dry matter consumption and therefore gains while improving their observed comfort. The Illinois data set is represented by Figure 1 and the Iowa data by Table 8.

**Figure 1: Effect of NutriVantage on Intake During Heat Stress (Illinois)**



**Table 8: Influence of NutriVantage for beef on Intakes of Cattle During Three Weeks of Heat Stress\***

Treatment	Daily Dry Matter Intake, Lb
1	23.52
2	25.98

*\*( $P<.10$ ), Sioux County, Iowa 1,360 head of 1,250 lb cattle*

In total, this paper summarizes eight years of research, at the KNG facility, Iowa State University and in the country. These trials support the statement that the use of NutriVantage for beef improves the health of incoming calves while significantly decreasing death loss. The data of Edmonds et al.(in review, KNG, USDA and Iowa State) lend some insight that the mode of action may be immune system regulation. A healthy calf will eat more and therefore gain better as the effect on feed efficiency in cattle is minimal at best. The pig data of Edmonds may also suggest that the body may regulate its temperature more efficiently when fed MFG 150. This may explain the results we see when cattle are under heat stress, yet intakes are unaffected by the heat or stimulated compared to control cattle. Finally, the use of NV with OPT has been shown to significantly increase gains compared to either one alone and certainly to control cattle.

*\*Literature cited upon request.*

*NOTE: The product tested in this research was named BoVantage®. In 2019, the name changed to NutriVantage®, however all ingredients remained the same. All research findings for the product formerly named BoVantage apply to NutriVantage.*

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