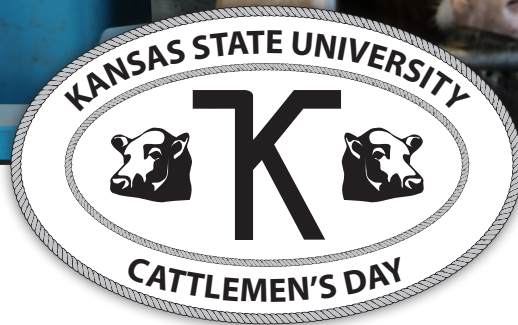


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# CATTLEMEN'S DAY 2019

## BEEF CATTLE RESEARCH

SUMMARY PUBLICATION





# CATTLEMEN'S DAY 2017



BEEF CATTLE  
RESEARCH

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## Evaluation of Two Implants for Steers on Early-Intensively Grazed Tallgrass Native Range

Jaymelynn Farney

**Objective:** To evaluate the effect of two implants that have different lengths of effective use on stocker cattle gains within an intensive early double-stocked native tallgrass prairie grazing system.

**Study description:** Stocker steers (n = 281) were implanted with Revalor-G (Merck Animal Health, Madison, NJ) or Synovex One Grass (Zoetis, Inc., Kalamazoo, MI) and grazed on tallgrass native range for 90 days during the summer. The steers were individually weighed, after an overnight shrink, on the day of implanting, at midpoint of grazing, and the end of the grazing period. Total gains and average daily gain were evaluated.

Item	Revalor-G <sup>1</sup>	Synovex One Grass <sup>2</sup>	Standard error of the mean	P - value
Season long grazing				
Initial weight (day 0), lb	554	567	6.0	0.10
Midpoint weight (day 44), lb	666	666	3.7	0.42
Final weight (day 91), lb	781	782	7.7	0.77
Average daily gain, lb	2.6	2.5	0.04	0.35
Body weight gain, lb	223	221	5.1	0.65
Gain from beginning of grazing through midpoint (day 0-44)				
Average daily gain, lb	2.5	2.6	0.10	0.45
Body weight gain, lb	106	108	3.7	0.58
Gain from midpoint through end of grazing period (day 45 – 91)				
Average daily gain, lb	2.6	2.5	0.10	0.47
Body weight gain, lb	119	115	3.1	0.48

<sup>1</sup>Merck Animal Health (Madison, NJ) implant treatment.

<sup>2</sup>Zoetis, Inc. (Kalamazoo, MI) implant treatment.

**The Bottom Line:** Cattle performance was similar regardless of hormone amount and coating technology for these implants when used during a short duration grazing period with stocker steers.



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## Trends in “Natural” Value-Added Calf Programs at Superior Livestock Video Auction

*Ken Odde*

**Objective:** This study utilized data from Superior Livestock Video Auction to investigate trends in the use of “natural” value-added calf programs.

**Study Description:** Nine years of data (2010-2018) were evaluated for enrollment trends in all natural programs and non-hormone treated cattle. Multiple regression was used to determine the relative value of calves enrolled in the non-hormone treated cattle program.

**Results:** The percentage of lots enrolled in natural value-added calf programs increased from 2010-2018. The percentage of lots in the non-hormone treated cattle program increased markedly (5.2 - 23.8%) over the nine-year period. Non-hormone treated cattle brought significantly higher prices in 7 of the 9 years evaluated.

**The Bottom Line:** Price advantages for non-hormone treated calves may not be sufficient to justify not using growth-promoting implants on calves.



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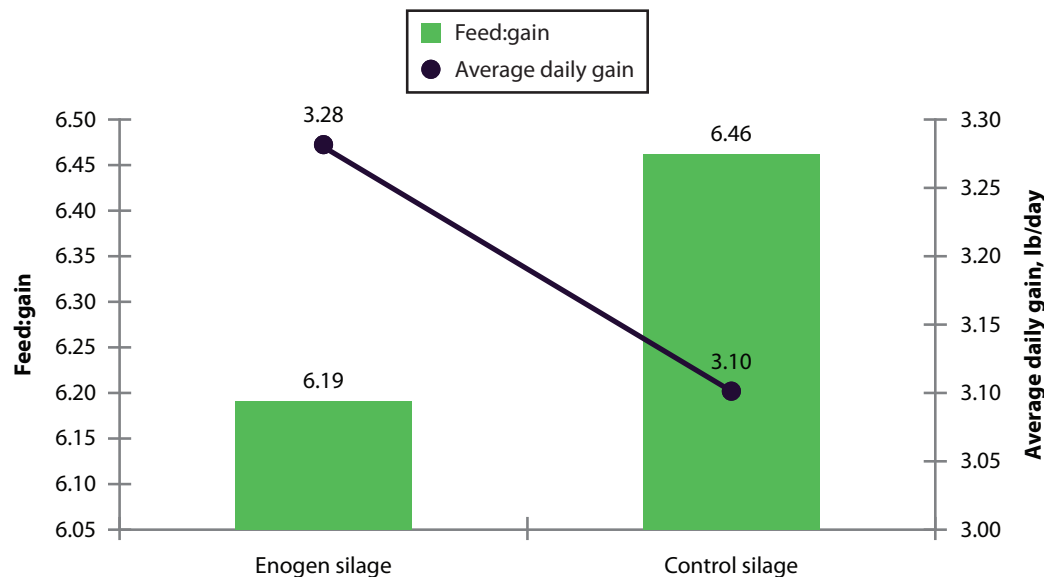
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# Syngenta Enogen Feed Corn Silage Containing an Alpha Amylase Expression Trait Improves Feed Efficiency in Growing Calf Diets

Marissa Johnson

**Objective:** To determine the growing calf response when fed Enogen Feed corn silage containing an alpha amylase expression trait.

**Study Description:** Crossbred steers of Tennessee origin (n = 352) were used to determine the effects on performance when fed Enogen Feed corn silage with either Enogen Feed corn or control corn at ad libitum intake.



**The Bottom Line:** When fed in an ad libitum fashion to growing calves, Enogen Feed corn silage improves the efficiency of feed conversion by 4.4% and average daily gain by 6.0%.



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# Quality Grade Has No Effect on Top Sirloin Steaks Cooked to Multiple Degrees of Doneness

*Brittany Olson*

**Objective:** The objective of this study was to evaluate the effect of cooking top sirloin steaks from four quality grades to multiple degrees of doneness (rare, medium, well-done) on beef palatability traits.

**Study Description:** Beef top sirloin butts (n = 60; 15/quality grade) from four U.S. Department of Agriculture quality grades [Prime, Top Choice (Modest and Moderate marbling), Low Choice, and Select] were selected from a Midwest beef processor. Top butts were transported to the Kansas State University Meat Laboratory, fabricated into 1-in steaks, vacuum packaged, and aged for 28 days at 39.2°F. Following aging, steaks were frozen until cooked for consumer sensory analysis and Warner-Bratzler shear force.

### Least squares means for consumer (n = 238) ratings<sup>1</sup> of the palatability traits of four quality grades cooked to three degrees of doneness

Treatment	Juiciness	Tenderness	Flavor	Overall like
Quality grades				
Prime	63.3 <sup>a</sup>	60.5	59.7	60.3
Top Choice <sup>2</sup>	61.5 <sup>ab</sup>	60.5	55.7	58.2
Low Choice	57.7 <sup>b</sup>	59.9	55.1	56.5
Select	56.5 <sup>b</sup>	56.6	54.1	54.3
SEM <sup>3</sup>	2.0	2.0	1.9	2.1
P – value	0.02	0.41	0.09	0.16
Degree of doneness				
Rare (140°F)	75.8 <sup>a</sup>	71.6 <sup>a</sup>	63.8 <sup>a</sup>	67.3 <sup>a</sup>
Medium (160°F)	58.3 <sup>b</sup>	57.8 <sup>b</sup>	56.2 <sup>b</sup>	56.2 <sup>b</sup>
Well-done (170°F)	45.4 <sup>c</sup>	48.8 <sup>c</sup>	48.5 <sup>c</sup>	48.5 <sup>c</sup>
SEM <sup>3</sup>	1.7	1.5	1.7	1.7
P – value	< 0.01	< 0.01	< 0.01	< 0.01
Quality grade × degree of doneness				
P – value	0.78	0.99	0.96	0.94

<sup>abc</sup>Least squares means within the same main effect (quality grade or degree of doneness) without a common superscript differ ( $P < 0.05$ ).

<sup>1</sup>Sensory scores: 0 = extremely dry/tough/dislike; 50 = neither dry nor juicy, neither tough nor tender, neither like nor dislike; 100 = extremely juicy/tender/like extremely.

<sup>2</sup>U.S. Department of Agriculture marbling score of modest<sup>00</sup> - moderate<sup>100</sup>.

<sup>3</sup>SEM (largest) of the least square means.

**The Bottom Line:** These results indicate that quality grade has no effect on the eating quality of top sirloin steaks. Therefore, it is unnecessary for consumers, retailers, and foodservices to pay premium prices for higher quality top sirloin steaks, regardless of the degree of doneness they will be cooked to.



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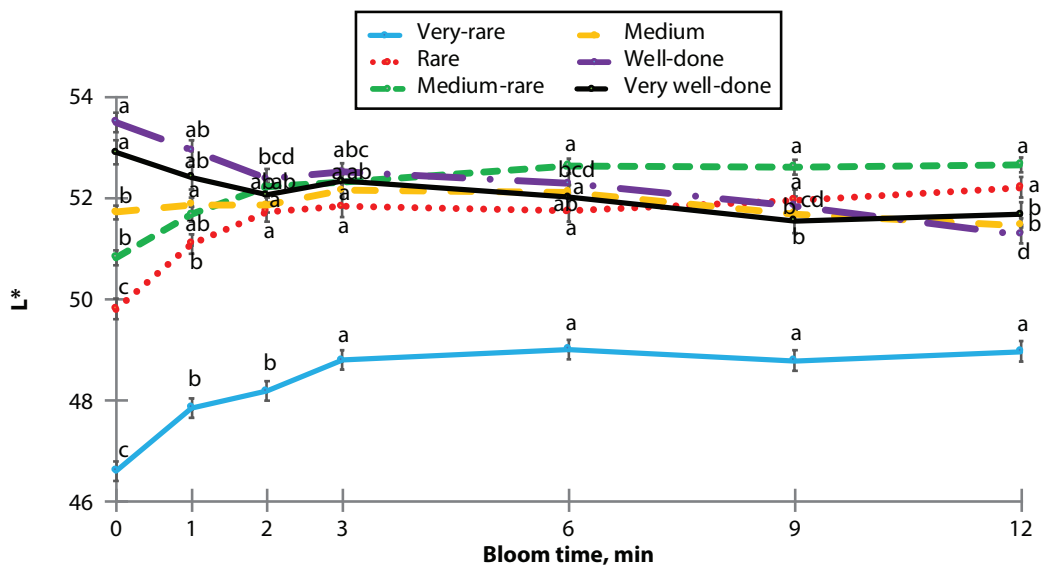
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# Effect of Degree of Doneness, Quality Grade, and Time on Instrumental Color Readings from Beef Strip Loin Steaks Cooked to Six Degrees of Doneness

Lauren Prill

**Objective:** The objective of this study was to determine the effect of quality grade and time after cooking on the instrumental color of steaks cooked to varying degrees of doneness.

**Study Description:** Beef strip loins (n = 24) from 12 animals representing five quality treatments [Prime, Top Choice, Low Choice, Select, Select Enhanced (108%)] were collected. Each steak was cooked to a peak internal temperature of very-rare (130°F), rare (140°F), medium-rare (145°F), medium (160°F), well-done (170°F), or very well-done (180°F). Each cooked steak was cut in half, perpendicular to the long axis of the steak, and lightness (L\*), redness (a\*), and yellowness (b\*) was evaluated on the internal face of the medial side at 0, 1, 2, 3, 6, 9, and 12 minutes post-cutting using a Hunter Lab Miniscan spectrophotometer.



Least squares means for the interaction ( $P < 0.01$ ) between time and degree of doneness on L\*<sup>1</sup> color readings of beef strip loin steaks

<sup>1</sup>L\* scale: 0 = black, 100 = white.

<sup>abcd</sup>Means within a degree of doneness without a common superscript differ ( $P < 0.05$ ).

**The Bottom Line:** The impact of time on internal cooked color was dependent on degree of doneness, with steaks cooked to lower degrees of doneness becoming lighter and more red in color with time and steaks cooked to higher degrees of doneness becoming darker. Additionally, quality treatment had no impact on cooked color measures of non-enhanced steaks. These results provide insight into cooked beef color changes related to time and how this might impact degree of doneness perceptions by consumers.



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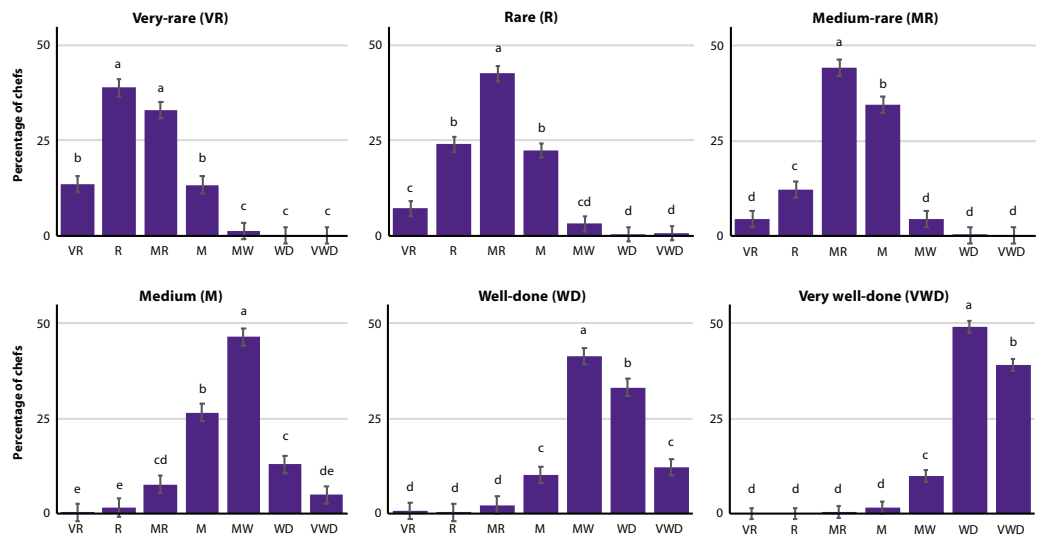
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# Chef Evaluation of the Degree of Doneness of Beef Strip Loin Steaks Cooked to Six End-Point Temperatures

*Lauren Prill*

**Objective:** The objective of this study was to assess foodservice steak preparation practices and chefs' abilities to identify degrees of doneness of beef strip loin steaks.

**Study Description:** Beef strip loins (n = 24) from 12 animals representing five quality treatments (Prime, Top Choice, Low Choice, Select, and Select Enhanced) were collected. Steaks were cooked to an end-point temperature of very-rare (130°F), rare (140°F), medium-rare (145°F), medium (160°F), well-done (170°F), or very well-done (180°F). Each cooked steak was cut in half, perpendicular to the long axis of the steak, and photographs were taken immediately of the internal face of the lateral side. A digital survey was developed for chefs for the electronic evaluation of the images of the cooked steaks. Chefs (n = 83) were recruited via email from around the U.S. using an established database of chefs from all segments of the industry.



### Percentage of chefs that correctly identified the represented degree of doneness on photographs of cooked beef strip loin steaks

<sup>abcde</sup>Means within a degree of doneness without a common superscript differ ( $P < 0.05$ ).

**The Bottom Line:** Chefs did not report they use the current published degree of doneness temperatures. Additionally, chefs commonly rated steaks one degree of doneness above the degree of doneness category commonly associated with the end-point temperature.



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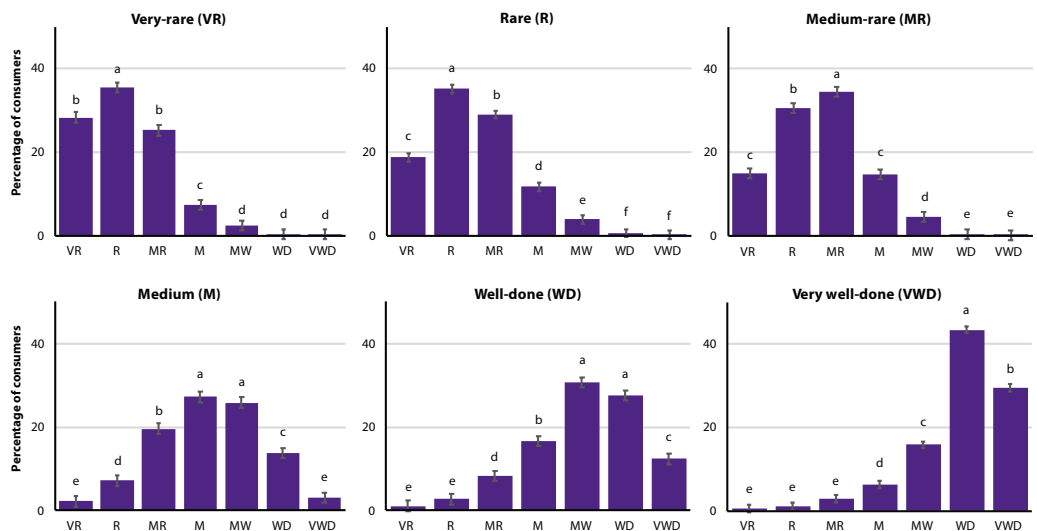
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# Consumer Evaluation of the Degree of Doneness of Beef Strip Loin Steaks Cooked to Six End-Point Temperatures

Lauren Prill

**Objective:** The objective of this study was to assess consumers' degree of doneness practices in addition to their ability to identify beef steak degrees of doneness.

**Study Description:** Beef strip loins ( $n = 24$ ) from 12 animals representing five quality treatments [Prime, Top Choice, Low Choice, Select, and Select Enhanced (108%)] were collected. Steaks were cooked to an end-point temperature of very-rare (130°F), rare (140°F), medium-rare (145°F), medium (160°F), well-done (170°F), or very well-done (180°F). Cooked steaks were cut in half, perpendicular to the long axis of the steak, and photographs were taken immediately of the internal face of the lateral side. A digital survey for consumers was developed for electronic evaluation of the cooked steak images. Consumers ( $n = 1,134$ ) answered a demographics questionnaire, followed by questions pertaining to temperature and determining degree of doneness. Next, 10 steak images depicting varying degrees of doneness were randomly selected by Qualtrics Software for each consumer to identify the degree of doneness of the steak pictured.



### Percentage of consumers that correctly identified the represented degree of doneness on photographs of cooked beef strip loin steaks.

<sup>abcde</sup>Means within a degree of doneness without a common superscript differ ( $P < 0.05$ ).



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**The Bottom Line:** Consumers do not have a good understanding of beef degrees of doneness, and are unable to consistently and accurately identify degrees of doneness of steaks cooked to specified end-point temperatures. This can create challenges when consumers communicate their degree of doneness preferences at foodservice establishments.

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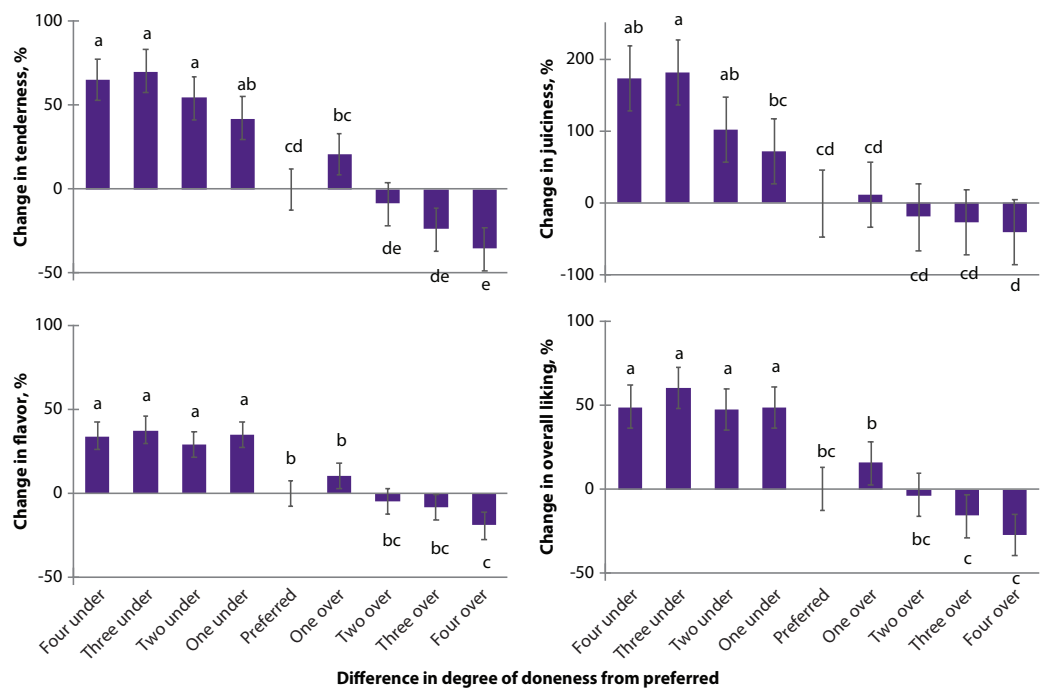
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# Visual Degree of Doneness Has an Impact on Palatability Ratings of Consumers Who Had Differing Degree of Doneness Preferences

*Lauren Prill*

**Objective:** The objective of this study was to determine the impact of feeding consumers of varying degree of doneness preferences steaks cooked to multiple degrees of doneness on their perceptions of beef palatability.

**Study Description:** Paired Low Choice frozen steaks from the posterior half of the strip loin were randomly assigned a degree of doneness of rare (140°F), medium-rare (145°F), medium (160°F), medium-well (165°F), or well-done (170°F). Consumer panelists, prescreened to participate in panels based on their degree of doneness preference, were served steak samples cooked to each of the five degrees of doneness under low-intensity red incandescent lighting to mask any degree of doneness differences among samples. Next, consumers were served steak samples under white incandescent lighting, with white fluorescent background lighting. Pre-screening consumers for degree of doneness preference allowed for a measure of the impact of “missing” the consumer’s ideal degree of doneness and quantification of the impact of both undercooking and overcooking steaks on consumer beef palatability ratings.



**Percentage change in consumer sensory ratings between the red- and white-lighted testing to assess the impact of undercooking and overcooking steaks.**

<sup>abcde</sup> Means within the same sensory characteristic without a common superscript differ ( $P < 0.05$ ).

**The Bottom Line:** When steaks are overcooked, palatability ratings decrease; however, undercooking has a positive effect on palatability perception regardless of the consumer’s degree of doneness preference.



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