

# Effect of Castration on Health and Performance of Newly Received Stressed Feedlot Calves

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## Story in Brief

Three-hundred-sixty-eight lightweight newly received calves were used in two separate experiments to examine the effect of method of castration on receiving health and performance. These comparisons are relevant due to the large number of lightweight calves purchased in the southern Great Plains to be backgrounded for summer and winter grazing programs or to be sent directly to the feedlot. In the first experiment three treatments were examined: 1) purchasing castrated males; 2) purchasing intact males and banding them shortly after arrival; or 3) purchasing intact males and surgically castrating them shortly after arrival. Few differences were observed in the first experiment; however, banding intact males shortly after arrival did decrease daily gain by 19% compared with purchasing steers, and by 14.9% compared with surgically castrating intact males shortly after arrival. No differences were observed for intake, feed efficiency, or morbidity. The second experiment examined the differences between purchasing castrated males (steers) or purchasing intact males and surgically castrating them shortly after arrival (cut bulls). In Exp. 2, steers gained .58 lb more and consumed 1.26 lb more feed (DM basis) per day compared with cut bulls. Steers also had less overall morbidity, having a fewer number treated for bovine respiratory disease compared with cut bulls.

Key Words: Castration, Morbidity, Calves

## Introduction

Historically producers that purchase lightweight, early-weaned calves have the goal of improving quality and maximizing performance through management. The initial purchase price of these lightweight “low-quality” calves is generally less than those of “high-quality” calves at the same weight. If the quality of these lightweight calves can be improved through management, increased profit can be realized by the producer. This same theory is also believed to be true when looking at the purchase of steers vs bulls. A survey done by Oklahoma State University of eastern Oklahoma sale barns in 1997 and 1999 showed that, on average, bull calves sold for \$2.00-3.00/cwt less than steers of similar weight (Smith et al., 1999). However, there is little information available to Oklahoma producers on the additional production costs associated with purchasing lightweight bulls vs steers for use in stocker operations. Therefore, the objective of these studies was to evaluate differences in performance and health status of steers vs knife-castrated or band-castrated bulls.

## Materials and Methods

**Experiment 1.** Two loads of mixed crossbred male calves (n = 140, BW = 339 ± 24 lb for load one, and n = 123, BW = 319 ± 28 lb for load two) assembled from Oklahoma sale barns were received at the Willard Sparks Beef Research Center in Stillwater, OK, during the summer and fall of 1999, respectively. Upon arrival, calves were individually weighed, ear-tagged, and bull

calves were randomly assigned to either surgical or band castration treatment groups. Calves from each load received similar processing. The day following arrival all calves were vaccinated with BRSV-Vac<sup>®</sup> 4<sup>TM</sup>, given a Covexin<sup>®</sup> 8<sup>TM</sup> (clostridial bacterin), medicated with Micotil<sup>®</sup> and treated for parasites with Ivomec Plus<sup>®</sup>. Bull calves were castrated using a Newbery knife and a single crimp emasculator or banded according to treatment. All steers were revaccinated with BRSV-Vac-4<sup>TM</sup> on d 14 of the trial.

Steers were housed in eight uncovered pens per load. Animals in each treatment group were fed identical diets (Table 1) ad libitum. Feed was delivered twice daily at 0800 and 1400 for the first load and once daily at 0800 for the second load. Calves were weighed on d 0 and 42 with all calves being held off of feed and water overnight prior to 42-d weights.

**Table 1. Receiving diet composition (DM)<sup>a</sup>**

Ingredient	% DM
Soybean hulls	33.0
Corn, whole shelled	26.5
Wheat midds	16.9
Cottonseed hulls	10.0
Supplement	
Cottonseed meal	7.5
Soybean meal	4.3
Limestone	1.2
Pellet partner <sup>TM</sup>	.68
Bovatec <sup>TM</sup> 68	.023
Vitamin A 30,000	.020
Selenium 600	.011
Vitamin E 50%	.003
<sup>a</sup> Formulated to contain 82.85 Mcal/cwt NEm, 51.41 Mcal/cwt NEg, and 15.43% CP on a DM basis. The diet also provided 31g/ton of Lasalocid and 6.81 I.U. of Alpha Tocopherol /lb.	

Prior to the morning feeding, calves were evaluated for clinical signs of sickness. If the animal was determined to have clinical signs of sickness a severity score was assigned (1=mild, 2=moderate, and 3=severe) and the calf was removed from its home pen and taken to the processing facility for objective evaluation. A rectal temperature of 104°F or greater was required for the calf to receive treatment unless the calf was assigned a severity score of 3, at which time the calf was treated regardless of rectal temperature. All calves were metaphalactically treated at the initiation of the experiment with 1 ml/cwt of Micotil<sup>®</sup>. Medical treatments for calves classified as morbid after d 1 of the experiment consisted of Nuflor<sup>TM</sup> for the first treatment and Excenel<sup>TM</sup> for the final treatment. Rectal temperature, weight, severity of sickness and treatment data were recorded for each calf pulled.

**Experiment 2.** One load of mixed crossbred male calves (n = 105, BW = 367 ± 47 lb) assembled from Oklahoma sale barns was received at the Willard Sparks Beef Research Center in Stillwater, OK, in January 2000. Upon arrival, calves were individually weighed and ear-tagged. Calves that were castrated prior to purchase (n = 24) were randomly assigned to one of two pens, and intact males (n = 81) were randomly assigned to one of four pens. The day following arrival all intact males were surgically castrated using a Newbery knife and a single crimp emasculator. The processing, evaluation, and treatment procedures were similar to Exp. 1. All calves were weighed on d 0, 28, and 42 of the trial. Calves were fed once daily following evaluation of health status, and the diet was identical to that of Exp. 1 (Table 1).

**Statistical Analysis.** Data were analyzed using the GLM procedure of SAS (SAS Inst. Inc., Cary, NC) as a completely random design. Pen served as the experimental unit for gain, dry matter intake, and efficiency. Health data were analyzed with individual animal used as experimental unit. Interaction terms for load in the first experiment were not significant (P=.98) and were removed from the model.

## Results and Discussion

**Experiment 1.** Performance data are shown in Table 2. Banded calves gained less (P<.02) than either of the other two treatment groups. Surgically castrated calves did not differ from calves castrated prior to placement in the feedlot. Feed:gain and dry matter intakes did not differ between treatment groups. Health data are listed in Table 3. No differences could be detected in first or second treatment rates. There were no differences in recovery rates from first treatments.

**Table 2. Receiving performance Experiment 1**

Item	Treatment <sup>a</sup>			SEM <sup>b</sup>	Prob. > F
	Steers	Banded bulls	Cut bulls		
Calves	83	74	106		
Pens	2	3	3		
Weight, lb					
Initial	337	329	326	30.24	
Final	420	400	409	37.13	
Daily gain, lb/d	1.99 <sup>c</sup>	1.67 <sup>d</sup>	1.92 <sup>c</sup>	.09	.022
Intake, lb/d	8.00	7.81	7.57	.33	.49
Feed:gain	3.36	3.69	3.44	.09	.19

<sup>a</sup>Calves entering the feedlot as steers; calves banded on d 1; calves surgically castrated on d 1  
<sup>b</sup>SEM=standard error of the least squares means  
<sup>c,d</sup>Means within a row containing different superscripts differ significantly (P<.05).

**Table 3. Health response by castration treatment group (Experiment 1)**

Item	Treatment <sup>a</sup>			SEM <sup>b</sup>	Prob. > F
	Steers	Banded bulls	Cut bulls		
Calves	83	74	106	--	--

1 <sup>st</sup> Med. rate <sup>c</sup>	.34	.33	.43	.15	.45
Retreat rate <sup>d</sup>	.03	.07	.07	.10	.38
2 <sup>nd</sup> Med. rate <sup>e</sup>	.04	.04	.01	.02	.22
% Treated					
at least once	34.90	37.80	42.40	--	--
> 1 time	7.20	10.00	7.70	--	--

<sup>a</sup>Calves entering the feedlot as steers; calves banded on d 1; calves surgically castrated on d 1  
<sup>b</sup>SEM=Standard error of least squares means  
<sup>c</sup>Average number of times calves received 1<sup>st</sup> treatment  
<sup>d</sup>Average number of times calves that received the 1<sup>st</sup> treatment received a second treatment within 7 d  
<sup>e</sup>Average number of times calves received a second treatment after recovery from initial sickness

**Experiment 2.** Performance data are summarized in Table 4. Calves castrated prior to purchase (steers) had significantly improved daily gain ( $P=.02$ ) and dry matter intake ( $P=.03$ ) compared with calves castrated at processing (bulls). No difference was observed in feed:gain. Health performance of calves in Exp. 2 is summarized in Table 5. Number of times removed from the pen was significantly less ( $P=.02$ ) for steers vs bulls suggesting a healthier appearance. In addition, number of treatments with Nuflor® was significantly reduced ( $P=.03$ ) in steers vs bulls, and second treatment and time of recovery tended ( $P<.10$ ) to be lower in steers vs bulls.

Item	Treatments <sup>a</sup>		SEM <sup>b</sup>	P – value
	Steers	Cut bulls		
Calves	24	81	--	--
Weight, lb				
Initial	363	372	2.98	--
Final	462	448	5.52	--
Daily gain, lb/d	2.35	1.77	.13	.02
Intake, lb/d	8.85	7.59	.33	.03
Feed:gain	3.77	4.32	.23	.13

<sup>a</sup>Calves entering the feedlot as steers; calves surgically castrated on d 1  
<sup>b</sup>SEM=Standard error of least squares means

Item	Treatments <sup>a</sup>		SEM <sup>b</sup>	P – value
	Steers	Cut bulls		
Calves	24	81	--	--
Pulls <sup>c</sup>	.50	.93	.16	.02
1 <sup>st</sup> Med. rate <sup>d</sup>	.33	.59	.10	.03
Retreat rate <sup>e</sup>	.00	.12	.06	.07
2 <sup>nd</sup> Med. rate <sup>f</sup>	.00	.11	.06	.09

% Treated				
at least once	33.30	59.30	--	--
> 1 time	.00	23.50	--	--
<sup>a</sup> Calves entering the feedlot as steers; calves surgically castrated on d 1 <sup>b</sup> SEM=Standard error of least squares means <sup>c</sup> Average number of times calves were removed from their pen for possible treatment <sup>d</sup> Average number of calves which received Nuflo <sup>®</sup> <sup>e</sup> Average number of calves that received first treatment followed by second treatment within 7 d <sup>f</sup> Average number of calves that received a second treatment after recovery from initial sickness				

### Implications

Although more experiments comparing the effects of purchasing steers vs bulls on performance, health, and economics are needed, data from Exp. 2 suggest that the lower cost associated with purchasing bulls may be out weighed by the additional cost of decreased performance and increased morbidity. Medical costs were much higher for bulls compared with animals purchased as steers. Medical costs escalate when cattle require more than one medical treatment.

### Literature Cited

[Smith, S.C. et al.](#) 1999. Oklahoma Cooperative Extension E-955.

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