Dehorning - Effects on Performance and Economics Castration Methods - Performance/Economic Evaluation

Frank K. Brazle
Kansas State University
Manhattan, Kansas

Dehorning

There are many dehorning methods used today, from complete removal of the horn, to various degrees of tipping horns. The data presented in this paper will only deal with complete horn removal.

Research by Zinn *et al.* (Table 1) showed a slight reduction in gain and a slight increase in sickness when 400 - 500 lb. cattle were dehorned at arrival. Research by Brazle (Table 2) on yearling (600 lbs) cattle (health was straightened out before dehorning) also showed a slight reduction in gain. Much of the reduction in gain occurred in the first 30 days after dehorning. Zinn showed (Table 3) that when calves are bulls and are castrated, the added stress of dehorning does not reduce gain at the same rate as dehorning steer calves. The cost of dehorning in loss of gain and health at arrival is around $5.00/hd. This does not include the cost of dehorning. On yearling cattle that are healthy at time of dehorning, the loss of gain is about $5.00/head. If a calf is a bull and is castrated at the time of dehorning, the additional reduction for dehorning in performance is not as great as in steers.

Table 1. Influence of dehorning on health and performance of feedlot calves.

	Dehorning	
	−	+
Initial wt., lbs	434	441
Wt. gain, lbs/d	2.01	1.96
Feed intake, lbs/d	10.70	10.70
F/G	5.00	5.38
Health		
Sickness, %	32.80	42.40
Sick days	1.75	1.75

Zinn *et al.* 1985. California Feedlot Report.

Table 2. Effects of dehorning.

	Control	Dehorned	
Wt., lbs	590	592	
ADG, lbs			
26 d	1.62	1.47	P<.10
73 d	1.43	1.36	
Total, 99 d	1.48	1.39	

Brazle, F.K. Two trial summary. 400 hd. All cattle were over health problems.

Table 3. Influence of castration and dehorning on health and performance of feedlot calves.

	Condition On Arrival				
	Steers No Horns	Steers Horned	Bulls No Horns	Bulls Horned	
Initial wt., lbs	427	443	440	440	
Wt. gain, 29 d, lbs/d	2.19	2.14	1.83	1.78	P<.05
Feed intake, lbs/d	11.10	11.30	10.30	10.10	P<.05
F/G	5.08	5.29	5.68	5.70	
Health					
Sickness, %	37.50	45.00	28.10	39.70	
Sick days	1.73	1.95	1.76	1.56	

Zinn, *et al.* 1985. California Feedlot Report

In a price survey in 1988, the difference in price for a 500 - 600 lb. steer calf was reduced $.50/cwt for horns or about $3.00/hd. Therefore, the cost of lost production in buying horned cattle and dehorning them for resale as feeders, favors buying dehorned cattle if everything else is equal.

Bruising of fat cattle results in a $5.00 loss to the industry for each animal. Therefore, the reduction of value for bruises on fat cattle is close to the reduction in gain for dehorning. However, all bruises in fat cattle may not be caused by horns. When you consider partial dehorning, which most likely does not set the cattle back as much as dehorning to the head, then the reduction in gain should be less.

Cutting Bulls

Research by Zinn *et al* (Table 4) shows a reduction in gain the first 28 days of about ½ lb. and an increase in sickness on 500 lb. calves purchased as bulls and castrated at arrival compared to steers. This is in agreement with earlier research indicating a half a pound of gain loss the first 30 days. However, research in 1985 (Brazle, *et al*, Table 5) shows that the reduction in gain on 500 lb. bull calves castrated at arrival continues into the grazing period. Work by Zinn *et al* (Table 6) with 500 lb calves shows a reduction of gain up to 169 days in the feedlot. A six-trial summary of research by Brazle (Table 7) showed a reduction of gain during a 76 day growing period after the first 26 days. The data on cutting 500 lb. or larger bulls shows a reduction in gain

Table 4. Influence of castration on health and performance of yearlings during a 28 d receiving period.

	Purchased As		
	Steers	Bulls	
Pen	Steers	Bulls	
Wt., lbs			
Initial	515	524	
Final	552	554	
Wt. gain, lbs/d			
1 - 28 d	3.12	2.70	P<.05
Dry matter intake, lbs			
1 - 28 d	14.90	14.40	P<.05
F/G, 1 - 28 d	10.60	11.90	P<.05
Morbidity			
% treated	26.70	61.80	P<.05
Sick days	4.40	4.50	

Zinn, 1986. California Feedlot Report.

Table 5. Purchase bulls vs steers, 500 lbs.

	Bulls	vs	Steers	
Transit shrink, %	8.84		10.50	
ADG, 28 d, lbs	1.57		2.52	P<.01
Pasture, ADG, lbs, 77d	1.66		1.90	P<.01
Temp. OBB, °C	39.60		39.40	
Antibody titers, log 2,	2.96		4.02	P<.05
BVD, IBR	2.93		2.99	

Brazle, *et al.* 1985. JAS Abstract.

Table 6. Influence of castration on weight gain.

	Castration		
	–	+	
Initial wt., lbs	530	494	
Wt. gain, lbs/d			
1 - 29 d	2.96	2.42	P<.05
30 - 169 d	2.88	2.63	P<.05
1 - 169 d	2.89	2.60	P<.05

Zinn *et al*, 1985.

Table 7. Comparison of steers to castrated bulls.

	Steers	Purchased Bulls Castrated at Arrival	
Wt., lbs	542	540	
ADG, 26 d	2.12	1.40	P<.003
ADG, 76 d growing period	1.60	1.18	P<.05
Health			
Morbidity, %	15.00	35.00	P<.05
Mortality, %	2.81	4.88	P<.05

Brazle, Six trial summary. 3,900 head. 1985 - 91.

occurs for 100 or more days past the time of castration plus an increase in incidences of morbidity and mortality. The discounts needed for a 550 lb bull calf compared to a steer calf is from $31.52 to $36.82/head ($5.73 - $6.69/cwt). The price discount found in salebarns in Kansas during 1987 was $1.70 cwt in the spring and $4.37 in the fall for 500 - 600 lb bull calves compared to steers. Some of the health differences between steer and bull calves may be the vaccination program. However, the social problems that occur when young bull calves are mixed may explain some of these problems. The reduction in gain may be partly caused by stress and mixing of cattle and castration. The long term reduction in gain may be due to reduction of tissue in the body. Bulls have a higher degree of muscle mass caused by high levels of hormones. The conversion of muscle tissue to fat tissue to complete the change from a bull to a steer most likely is not very effective.

Castration Methods

When should we castrate calves? Because bull calves grow faster than steer calves, one might be led to believe that the longer we wait to castrate a calf, the quicker he will get to slaughter. Research data at Iowa showed that calves castrated at birth to 3 months of age reach slaughter 11.6 days earlier than calves castrated at weaning.

From a stress standpoint, knowing when to castrate newly purchased bull calves is a problem. Zinn delayed castration to 28 days on light weight calves (260-270 lbs) resulting in better gains and reduced sickness. However, when castration was delayed to day 7, reduced gains and increased sickness and medication costs were the result. The size of calves and the degree of stress may determine when to castrate. If castration is delayed, it should be delayed long enough to allow the calves to overcome the stress of shipment and return to good health. Twenty-one to 28 days, or longer, may be needed for all calves to be in good health.

The question of what method of castration is best in terms of the animal's health and gain is hard to answer. Research by Zweiacher *et al* (1979) showed 400 lb bull calves castrated by elastractor ligation (Table 8) gained better with less health problems than with an emasculator. Other research by Brazle comparing surgically castrated calves (253 lbs) to elastrator banded bull calves resulted in a trend toward less health problems and better gain with surgically castrating bulls at arrival (Table 9). Other research on heavier cattle comparing surgically castrated bulls with EZE device banded bulls resulted in gain and health data (Table 10) favoring the surgically castrated bull calves.

Table 8. Trial 1 and 2-Effects of method of castration on animal performance & health (28d).

	Steer	Emasculator	Elastrator-Ligation	
No. hd.	38	42	43	
Initial wt., lbs	400	387	381	
ADG, lbs	3.56	1.32	1.76	P<.05
Treated for sickness, %	2.60	14.30	11.60	P<.05
Treated for scrotal infection, %	---.--	0.00	0.00	
Hemorrhage score, average	---.--	1.60	1.00	
Death loss, %	---.--	2.40	---.--	

Zweiacher, *et al.* JAS 1979.

Table 9. Effects of castration method on the gain and health of calves.

Item	Purchased Steers	Surgically Castrated Bulls	Elastrator Banded Bulls	
No. cattle	118	190	188	
Wt., lbs	253	253	253	
ADG, lbs, 33 d	1.85	1.63	1.47	P<.05
Mortality, %	6.40	10.60	14.00	
Morbidity, %	75.00	81.00	78.00	
Medication days/ animal purchased	5.81	6.86	7.09	
Drug cost/hd, $	10.43	12.37	12.52	

Brazle, F.K., 1992 Kansas Cattlemen's Day.

Table 10. Effects of castration method on the gain and health of yearlings.

Items	Purchased Steers	Surgically Castrated Bulls	EZE Device Banded Bulls	
No. cattle	20	20	20	
Wt., lbs	660	660	660	
ADG, lbs., Receiving and pasture 110 days	2.05	1.78	1.58	P<.05
Medication days/ animal purchased	.35	1.45	2.20	P<.05

Brazle, F.K. 1992. Kansas Cattlemen's Day

Research by Zweiacher, looking at different castration methods at different times after arrival, did not show a clear pattern as to which methods would be best in terms of reductions in health and gain of calves. In reviewing data, it should be made clear that no method of castration of 500 lbs or larger bulls will immediately transfer that animal into a steer. It must undergo certain body changes that will have a negative effect on gain. The methods and time of castration may change with different sets of cattle and operations and environmental conditions which make it impossible to clearly determine the best methods. Hot weather may dictate methods using less bleeding than cold weather. In the end, the risk and discount of buying bulls must be recovered in the purchase price of that animal.