Prevalence of Horns in a Pen Does Not Affect Incidence of Carcass Bruising in Feedlot Cattle

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Abstract

Disbudding and dehorning are two common practices done to remove horns from cattle to prevent injury to handlers and other cattle and to reduce bruising of carcasses. Bruised carcasses result in substantial reduction in profit due to trim loss, increased sanitation risk, and loss in time on the rail during processing. Previous research has indicated that cattle with horns increased hide damage of cohorts and caused injury to handlers. Cattle with horns cause circular shaped bruises that lead to trim loss due to bruising. Cattle with tipped horns do not have a lower bruising rate than cattle with intact horns. The objective of this study was to evaluate the effect of horn prevalence within groups of slaughter animals and the incidence of bruising on the carcasses of those same cattle.

Keywords

bruising, cattle, horns

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Introduction

Disbudding and dehorning are two common practices done to remove horns from cattle to prevent injury to handlers and other cattle and to reduce bruising of carcasses. Bruised carcasses result in substantial reduction in profit due to trim loss, increased sanitation risk, and loss in time on the rail during processing. Previous research has indicated that cattle with horns increased hide damage of cohorts and caused injury to handlers. Cattle with horns cause circular shaped bruises that lead to trim loss due to bruising. Cattle with tipped horns do not have a lower bruising rate than cattle with intact horns. The objective of this study was to evaluate the effect of horn prevalence within groups of slaughter animals and the incidence of bruising on the carcasses of those same cattle.

Key words: bruising, cattle, horns

Experimental Procedures

Carcasses from beef cattle (n = 4,287; 27 lots) originating from 13 different feedlots in Texas and Kansas were observed at a commercial abattoir in Southwest Kansas. The population included steers, heifers, and a combination of Holstein and beef breeds. Observations were made during 3 separate days and data collections took place during February, March, and December of 2014.

All cattle were evaluated for presence or absence of horns, and horns were measured for length and diameter, and carcasses were subsequently evaluated for presence and location of bruising after the hides had been completely removed. Measurements included the length of the longest horn from base to tip and the tip-to-tip distance between the tips of both horns. Prevalence of horns was determined by dividing the total number of horned cattle within each lot by the total number of all cattle in the same lot. Bruise location and severity were scored on each carcass (Figure 1). If a carcass had multiple bruises in multiple regions, each individual bruise location and severity was recorded. If multiple bruises were found in one region, only the most severe bruise was recorded.

For bruises that occurred along the dividing line of 2 regions, the region that contained the majority of the bruise, subjectively determined, was recorded. Prevalence of bruising within a lot was determined by dividing the number of cattle in a lot with bruises by the total number of cattle in the lot. Lot number, horns (yes or no), and harvest date data were evaluated as categorical responses using the GLIMMIX procedure of SAS (SAS Institute, Inc., Cary, NC) and a binomial distribution was assumed. The Link = Logit option of the model statement and the ILINK option of the LSMEANS statement were used to calculate the likelihood ± SEM. A simple linear regression using the PROC REG procedure of SAS was used to evaluate the prevalence of bruises vs. the prevalence of horns. Lot was the experimental unit and significance was determined at $P \leq 0.05$.

Results and Discussion

Out of 4,287 cattle, 7.7% of the animals had horns (Table 1). The average lot prevalence of cattle with horns was 6% across all 27 lots of cattle and ranged from 0 to 26.5%. The average length of the longest horn was 4.4 in. with a range of 1.2 to 11 in. and the average distance from tip-to-tip was 15.6 in. with a range of 5.5 to 25.6 in.

Bruising prevalence of carcasses was 55.2% with a range of 0 to 98% (Table 1). The distribution of bruises over the carcasses showed the dorsal midline was the most frequently bruised portion with 61.8% of all bruises occurring in Regions 2, 5, and 8 (Figure 1). Region 5 was the most frequently bruised region, accounting for 33.6% of bruises recorded (Figure 2). The remaining bruises were distributed throughout the left side (Regions 3, 6, and 9) and right side (Regions 1, 4, and 7) of the carcasses (19.5 and 18.6%, respectively). Severity of bruises were classified as minor (38.8%), moderate (35.6%), and severe (25.6%) and the distribution of severity by location on the carcass indicated that the most severe bruises were in region 9 (Figure 2). Results from these data indicate a poor relationship (adjusted $R^2 = 0.09$; Figure 3) between prevalence of bruising and prevalence of horns within a lot. However, bruising prevalence and horn prevalence were significantly influenced by feedyard origin ($P<0.05$; Figure 4) suggesting that bruising could be occurring due to other factors such as, facility design, cattle handling, and trailer type.

Implications

Contrary to most published data reporting an increased prevalence of bruising in groups of horned cattle, the current study did not find a relationship between the prevalence of horned cattle within a lot and subsequent prevalence of carcass bruising within those same lots. Most importantly, the authors would like to reemphasize the most prevalent location of bruises within these data being along the top of the animals' backs indicating other likely sources of bruising. Further research to evaluate animal handling facility design, cattle trailer design, and animal handling practices that may contribute to bruising is needed.

Table 1. Descriptive statistics of bruised and horned carcasses by lot (n = 27) for 4,287 beef cattle harvested at a single packing plant in Southwest Kansas

Item	Average	Minimum	Maximum	Standard deviation
Horned carcasses, %[1]	7.7	0	26.5	7.4
Bruised carcasses, %[2]	55.2	0	98.0	23.2

[1] Percentage of cattle with horns per lot.
[2] Percentage of bruised carcasses per lot.
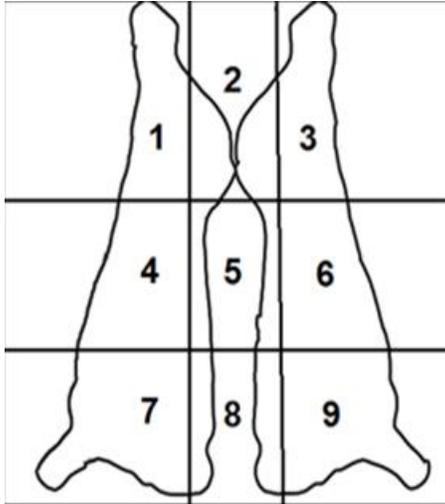
Figure 1. The Harvest Audit Program carcass diagram used to determine location of bruises for 4,287 beef cattle harvested at a single packing plant in southwest Kansas. 1 = right hind limb, 4 = right barrel, 7 = right forelimb. On the midline of the carcass, 2 = midline tailhead, 5 = midline thoracic cavity, 8 = midline shoulder and top of neck, and on the left side of the carcass, 3 = left hind limb, 6 = left barrel, and 9 = left forelimb.
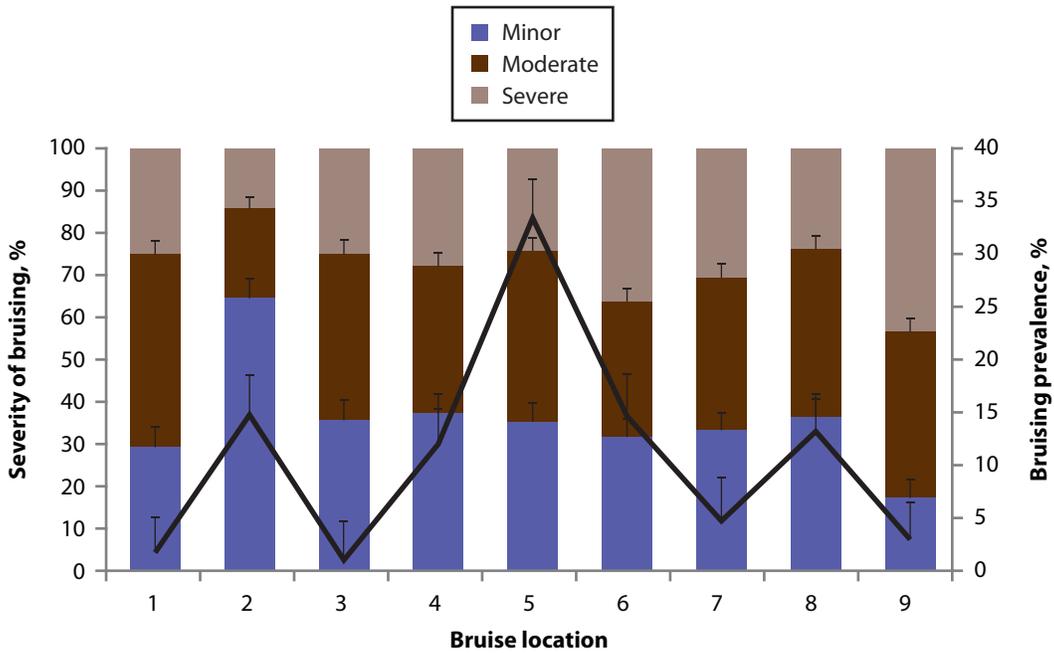
Figure 2. Severity of bruises by region of the carcass for 4,287 beef cattle harvested at a single packing plant in southwest Kansas. The percentage of the most severe bruises by location follow Harvest Audit Program definitions. Severity of bruises by bruise location were defined as: Minor bruises were ≤ 2.0 in.; Moderate bruises were 2.0 to 5.98 in.; Severe bruises were ≥ 5.98 in.

$$y = -0.9229x + 62.338$$
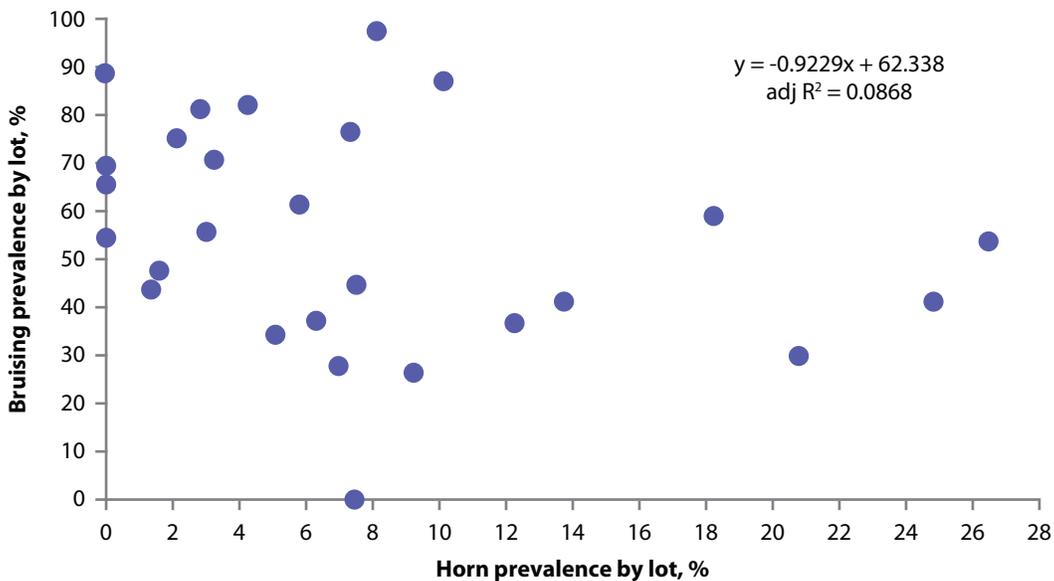$$\text{adj } R^2 = 0.0868$$

Figure 3. Simple linear regression model comparing the relationship between the prevalence of bruising and prevalence of horns for 4,287 beef cattle harvested at a single packing plant in southwest Kansas. (Standard error of the least squares mean = 12.033.)
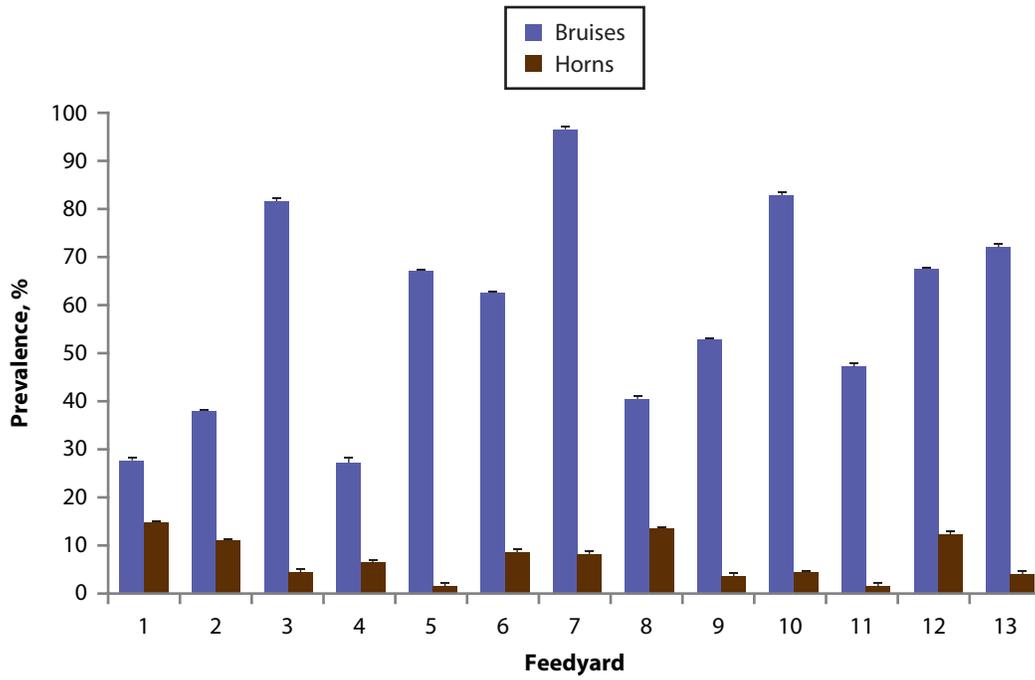
Figure 4. Prevalence of bruises and horns by feedyard for 4,287 beef cattle harvested at a single packing plant in southwest Kansas. (Standard error of the least squares mean = 0.609; P<0.05.)