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## Relationship Between Trauma Sustained at Unloading and Carcass Bruise Prevalence in Finished Cattle at Commercial Slaughter Facilities

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### Abstract

Bruising in cattle can be an indicator of poor animal welfare, as well as a significant cause of economic loss due to decreased carcass value. Previous literature suggests sources of trauma causing bruising in beef carcasses include horn prevalence, rough transport conditions, cattle handling techniques, cattle temperament, and vehicle design; however, evidence of correlations between such trauma and actual carcass bruising is limited. The objective of this study was to evaluate the relationship between trauma sustained at unloading and carcass bruise prevalence in finished cattle at commercial slaughter facilities.

### Keywords

animal welfare, bruising, finished cattle

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### Authors

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### Introduction

Bruising in cattle can be an indicator of poor animal welfare, as well as a significant cause of economic loss due to decreased carcass value. Previous literature suggests sources of trauma causing bruising in beef carcasses include horn prevalence, rough transport conditions, cattle handling techniques, cattle temperament, and vehicle design; however, evidence of correlations between such trauma and actual carcass bruising is limited. The objective of this study was to evaluate the relationship between trauma sustained at unloading and carcass bruise prevalence in finished cattle at commercial slaughter facilities.

Key words: animal welfare, bruising, finished cattle

### Experimental Procedures

Whole lots of finished beef cattle were observed at commercial slaughter facilities in July and August of 2015. All cattle in a lot were observed by a trained observer during unloading at the slaughter facility. The observer noted all potentially traumatic events between the animals and the trailer during unloading. Traumatic events were categorized by location in which they occurred (back, shoulder, rib, or hip).

A second trained observer evaluated the same animals' carcass (hide off) to determine bruise prevalence, location, and size. The Harvest Audit Program Bruise Scoring System was used to evaluate carcass bruising. Using this system, the carcass is divided into a grid of 9 sections (Figure 1), and each section represents a location on the carcass. Bruise size was recorded as Small (<2 in. in diameter), Medium (2-6 in. in diameter), or Large (>6 in. in diameter). Bruise color was used as an exclusion factor. Yellow bruises were presumed to be over 24 hours old, therefore were recorded, but not included in the statistical analysis.

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<sup>1</sup> Cargill Meat Solutions, Wichita, KS.

## Results and Discussion

A total of 9,860 head in 75 lots were observed for traumatic events and carcass bruising. Approximately 20.4% of animals in each lot experienced traumatic events. Average carcass bruising prevalence by lot was 68.2%. More than half of the bruising observed occurred along the dorsal midline, or topline, of the carcasses (Figure 2, Table 1). Of the bruises observed, 28.6% were considered Small, 41.8% were considered Medium, and 29.6% were considered Large.

There was a significant correlation observed between traumatic events and carcass bruising ( $P < 0.05$ ). When broken down by location, the only significant correlation between traumatic events and carcass bruising was found in the dorsal midline, or topline, location ( $P < 0.05$ ).

## Implications

Bruising prevalence found in the current study is higher than results of other studies in the United States. Most bruising occurs along the dorsal midline, or topline, of the carcasses, where trim has the most economic impact. In addition, trauma at unloading is positively correlated with bruises found on carcasses at commercial slaughter facilities. More research is needed to determine where trauma is most likely to occur during the transport process, and the economic and welfare implications of bruising will be key drivers in the process of gleaning such information.

**Table 1. Location of carcass bruising**

Location	Mean, %	SEM <sup>1</sup>
Left side	26.5	1.10
Midline	53.5	1.12
Right side	20.0	1.04

<sup>1</sup>SEM=Standard error of the mean.

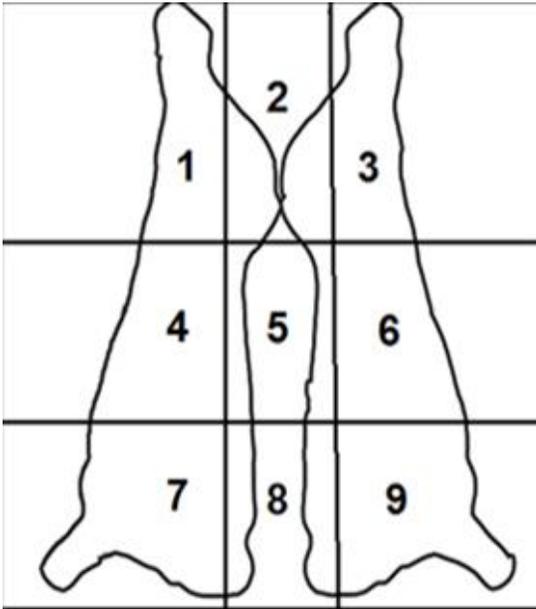


Figure 1. Nine-section grid used in the Harvest Audit Bruise Scoring System to determine location of carcass bruising.



Figure 2. Example of carcass bruising observed along the dorsal midline of finished cattle carcass.