

PRESENCE OF BRUISES IN CATTLE SLAUGHTERED IN URUGUAY

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Abstract

Usually, in most parts of the world, many of slaughtered cattle have different degree of injuries that could determine partial or total condemnation of the carcass. Carcass's bruise is a very important problem when high commercial value meat cuts are involved. The objective of this work is to identify the most frequent injuries in the bovine carcasses observed during the slaughter process. Uruguayan's Agricultural and Livestock Ministry licensed and inspected abattoirs were visited periodically to register all kind of bruises presented in each carcass. Following a new specially designed procedure for this project carcass damage were identified, classified, and quantified by zone and degree of muscle participation.

From 14681 beef cattle (29362 half carcasses) observed, 45.3% (13301 half carcasses) of them had at least one injury. Most of the lesions were in both sides of the carcass. The injured half carcasses had: one lesion 50% (6659 half carcasses), two lesions 31% (4133), three lesions 11% (1488) and four or more lesions 8% (1021). From the total damaged carcasses 10333 had one or more bruises on the round zone, 2209 half carcasses had one or more bruises in the rib-plate zone, 1416 half carcasses had bruises on the loin region and 1900 half carcasses had lesions on neck and shoulders without considering vaccination abscesses. Many carcasses had bruises in more than one zone. Results are already preliminary but they clearly show the great importance that good management practices in animal handling have in welfare and in a good meat quality production.

INTRODUCTION

In most world abattoirs carcass' bruises are very common.^(11,14) Damaged lowers the meat quality and produces great economics loses.⁽¹³⁾ In some occasions cattle come from auction markets with several loading and unloading increasing the injury probability^(3,5,24,25). Consequently, bad handling causes animal stress and decreases meat quality. Immediate consequences are "dark cuts", condemned zones and low quality from the organoleptic point of view^(8,9,15,16). A relationship has been established between transporting different breeds of cattle and pH decrease and the presence of dark cuts^(4,20,22).

Once in the abattoirs, cattle is downloaded from the trucks and left on restraints layer over night. Many times, restraints lack some of the basic conditions required to keep the animals' welfare, such as water availability, rough floor to prevent slipping and cool shadow⁽¹⁾. Afterwards, animals are weight before entering the slaughter procedure^(23,26,27,28).

Transport time is related with the time cattle or pigs need to recover from the stress⁽¹⁴⁾. Therefore, the cortisol concentrations increased and Creatine phosphokinase (CPK) activities recovered more slowly after longer transportation⁽²⁴⁾.

On the other hand, bruises, dark cuts and plasmatic electrolyte levels increase when stock density increases and animals are transported for more than 6 hours on crowded transportation (17,18,19).

All over the world, awareness about animal welfare is increasing as it could be a commercial barrier to meat trade^(2,12). In the US, 45% of carcasses have some kind of traumatic lesion⁽¹¹⁾. In Canada, 78% of the carcasses have bruises and losses reach more than 200 million Canadian dollars.⁽²¹⁾ In Uruguay, animals to be slaughtered are transported mostly in trucks by road sometimes in bad conditions, however, there is a big concern to all involved in the meat chain is the presence of bruises in the carcasses to be slaughtered in the country⁽⁷⁾. Consequently, the objective of this work is to identify the most frequent injuries in the bovine carcasses observed during the slaughter process.

MATERIALS AND METHODS

Uruguayan's Agricultural and Livestock Ministry licensed and inspected abattoirs were visited periodically during 9 months, from December 2001 to August 2002. The arrivals of trucks transporting cattle and the animal unloading were observed. The next day, the slaughter was observed to register all kind of bruises presented in each carcass. All animals were identified according to a special number to be able to detect them in the slaughter plant.

Following a new specially designed procedure for this project carcass' bruises were identified, classified, and quantified by zone and degree of muscle participation by couples of trained observers placed in the which registered data in special designed score sheets (schema).

Carcasses were divided into three zones: 1) the butt or round zone, including the silverside, rump, sirloin, and eye round cuts, involving the *M.tensor fasciae latae*, *M.gluteus biceps*, *M.sacrocaudalis*, *M.gluteus medius*, and *M. semitendinosus* 2) the rib zone, including rib plate, Spencer roll cuts, involving the cranial part of *M. longissimus dorsi* and the intercostals muscles; 4) loin zone, including *L. dorsi* muscle and 3) shoulder zone, including chuck and brisket, neck and scapular muscles^(29,30).

Each bruise was classified according to its' deepness of the damage and the portion of tissue removed. Degree 1: only superficial tissue is involved; degree 2: fat, connective tissue and muscular tissue is involved and it may be occurred a partial condemnation; degree 3: so deep until the bone and big part of muscle tissue need to be removed, total condemnation of the cut and maybe changes on carcass destination.

Data was registered with an Olympus digital camera and with a Sony Digital 8 Video Camera Recorder (DCR-TRV230/TRV330/TRV539).

From the statistical point of view, data were analyzed by the software Intercooled Stata v.7.0

RESULTS AND DISCUSSION

From 14681 beef cattle (29362 half carcasses) observed, 45.3% (13301) of them had at least one injury (graph 1). Most of lesions were in both sides of carcass.

The injured half carcasses had: one lesion 50% (8031), two lesions 31% (4979), three lesions 11% (1767) and four or more lesions 8% (1285) (graph 2).

Bruises on the round zone were 10333, the rib-plate zone were 2209, bruises on the loin zone were 1416 and lesions on the shoulders without considering vaccination abscesses were 1900. Notice that many carcasses had bruises in more than one zone (graph 3).

In the ROUND zone according to deepness (including the highest commercial value cuts), 78% degree 1 (superficial), 19.5% degree 2 (middle) and 2.5% degree 3 (deep). In the LOIN

zone, 79% were degree 1, 18% degree 2 and the 1,5% degree 3. In the RIB-PLATE zone in relation with deepness, 77% degree 1, 19% degree2, 3.5% degree 3. In the shoulder zone 77% degree1, 22.5% degree2 and 5.3% degree 3. Vaccination abscesses were not consider in this study. (Graphs.4,5,6,7)

Results are still preliminary but clearly show the great importance that good management practices in animal handling have in welfare and in a good meat quality production.

This study has been done in a Research Project of the Veterinary School of Uruguay “*Identification of Critical Points affecting pre-slaughter cattle welfare and its consequences on carcass and meat quality*”

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