Influence of handling systems on meat quality of beef and some remarks concerning slaughter handling of reindeer

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Abstract: The combined effects of corral design and corral time on the incidence of DFD (dark, firm, dry meat) in young bulls and calves (C.W. 100–110 kg) has been studied in two projects comprising about 1800 young bulls and 600 calves. Three different types of corral design were tested – individual pens, large free-range pens (6–10 animals per pen), and tethering. For each corral type, various holding periods were studied. The use of a so-called delivery-pen at the producer's was also evaluated. The delivery-pen is used for the holding of animals destined for slaughter which are gathered the day before delivery in order to assist the transporter and to make loading a one-man job. In the calf project a low ceiling in the corral to prevent mounting was tested.

The ultimate pH (pH_u) was measured in several muscles. Muscles with $5.80 \leqq pH_u < 6.20$ were classified as moderate DFD and muscles with a $pH_u \geq 6.20$ as DFD.

The main result can be summarized:

- In Sweden DFD is the most common meat quality deficiency in beef and veal. The shelf life and the frying characteristics will be reduced.
- The use of individual pens vis-à-vis large free-range pens resulted in a considerably reduced incidence of DFD meat.
- Long holding periods (i.e. overnight) versus short periods in individual pens caused a minor increase in DFD incidence. A corresponding comparison for large pens resulted in a very substantial increase.
- When young bulls that had been tethered at the producer's were kept tethered overnight in the corral prior to slaughter, hardly any DFD meat was found.
- The use of a delivery-pen caused a dramatic increase in DFD incidence.
- No more than 4–5 calves should be housed in a pen, especially if they have to be fenced overnight.
- The ultimate pH was clearly reduced by lowering the ceiling in the calf-corral to prevent mounting.

The results have been used in the Swedish slaughter industry since 1985. The DFD incidence has been reduced to a minimum. Based on our results and results from Finnish studies on reindeer it is possible to give some theoretical and concluding remarks concerning slaughter handling of reindeer.

It would be recommendable to:

- shorten the slaughter handling procedure as much as possible. Especially the handling moments of individual animals.
- move the abattoir to the reindeer instead of moving the animals to the slaughter house.
- slaughter the reindeer during the autumn season. The DFD incidence increases dramatically during the winter season when the animals often will be in a negative energy balance.
- introduce electrical stimulation of the carcasses to avoid the problem of cold shortening.

Finally, to present detailed recommendations how to handle reindeer at slaughter ensuring (i) optimal meat quality and (ii) proper animal welfare it is necessary to study the various moments in the slaughter chain and during different slaughter seasons.