



# Vet Call

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## Avoid dark-cutter discounts

*Packers, feeders and commercial and seedstock producers all play a role in reducing the number of dark cutters at harvest.*

### Dark-cutter disdain

The 2000 National Beef Quality Audit (NBQA) reported that 2.3% of audited carcasses were classified as dark cutters. Packers routinely are forced to lower the price of dark-cutting carcasses by 20% to 40% and to sell them to alternate markets. According to a May 24 U.S. Department of Agriculture (USDA) Agricultural Marketing Service (AMS) news report, dark-cutting beef was discounted an average of \$27 per hundredweight (cwt.). A dark-cutting carcass that weighed 700 pounds (lb.) would be discounted, on average, \$189.

The term *dark cutting* is used for meat that does not bloom or brighten when it is cut and exposed to air. Beef customers select cuts at the retail case that appear youthful and are a bright cherry-red color. The beef from carcasses classified as dark cutters will appear dark red to almost black. Even though this beef may be more tender and just as juicy as its bright-red counterpart, consumers will pass on the dark cuts at the grocery store because they think that they have either been in the case too long or came from an old animal.

Beef becomes dark as a direct result of stress before harvest. Preharvest stress depletes the muscle of its primary energy source — glycogen.

When muscle is converted to meat, glycogen is broken down to generate lactic acid. The accumulation of lactic acid drops the muscle pH from around 7.0 to around 5.6. This is an important process because the lower pH enables beef to be more resistant to microbial spoilage, enhances the beefy flavor and assists in generating the bright cherry-red color we associate with fresh beef. Prolonged stress prior to harvest can metabolize much of the muscle's glycogen, leaving little to be converted to lactic acid. Without glycogen to be converted to lactic acid, the pH will not decline, the beef color will be dark red to purplish-black, the texture

will be dry and sticky to the touch, and the beef may acquire a “gamey” meat flavor.

### Management effects

The reason for the large discount of dark-cutting beef is justified. Dark-cutting beef is not sold as whole cuts through retail channels; therefore, cuts with the highest value (such as the middle meats, rib and loin) are discounted as manufacturing beef, sold at a reduced price to the catering trade,

or ground into hamburger.

Experiments have shown that different feedyards have different percentages of carcasses that are dark cutters. It is apparent that creation of dark cutters is influenced by management philosophy, facility construction and cattle-handling procedures. In

addition to cattle handling, gender, weather, genetics, disposition and implant strategy have also been shown to affect the number of dark cutters.

Bulls are the most prone to producing dark-cutting beef, and intact heifers are more prone to the condition than steers or spayed heifers. This may be due to differences in hormone secretion between sexes and/or differences in behavior. Bulls are more likely to be aggressive and fight than steers or heifers, and heifers have been shown to have a more excitable temperament than steers. In addition, heifers showing signs of estrus just prior to harvest can have a high risk of becoming dark cutters. Cattle that become excitable during sorting, hauling, penning and overcrowding can be candidates for dark cutting.

Colorado researchers reported that the occurrence of dark-cutting beef is highest during very cold weather combined with precipitation, which increases the rate at which the body loses heat and causes shivering. The prolonged, repeated muscle contractions can significantly reduce muscle glycogen stores.

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The number of dark-cutting carcasses is also high in hot weather or when large fluctuations in temperature occur during short periods of time. The researchers noted that during periods with a high temperature averaging above 95°F for the two days prior to harvest, intact heifers produced higher percentages of dark cutters. Among steers and spayed heifers, temperatures above 95°F for the two days prior to harvest did not have as significant an effect. When average temperature was below 32°F for the two days prior to harvest, more heifers were dark cutters than when temperatures were above 32°F. Average temperatures below 32°F for the two days before harvest had no effect on the number of dark-cutting steers.

Aggressive implant strategies used during the finishing phase and terminal implants given less than 100 days before harvest have also been shown to increase the risk of dark-cutting carcasses. Fasting alone does not cause dark-cutting carcasses, but fasting accompanied by exercise can cause glycogen to be depleted and the meat to be dark.

### Who's responsible?

A great deal of the responsibility for preventing dark cutters belongs to packers (for decreasing stress once cattle arrive at the harvesting facility) and to feeders (for decreasing stress when handling cattle and during transport). Packers should manage arrival so that trucks are unloaded promptly and cattle are not held overnight. In addition, cattle should not be mixed with cattle from other pens, because social fighting increases the risk of dark cutters. Facilities and employee training should allow cattle to be moved quietly and without electric prods.

Similarly, efficient transfer of cattle from the feedlot to the packing plant, including well-designed facilities and good handling practices by feedlots, can reduce the occurrence of dark cutters. Commercial cattlemen and seedstock producers have a role in preventing dark cutters by selecting against cattle with excitable temperaments and by using cattle-handling methods that do not increase fear of humans.

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