

Dark Cutters  
Max Irsik DVM, MAB  
Beef Cattle Extension Veterinarian  
University of Florida College of Veterinary Medicine  
[irsikm@ufl.edu](mailto:irsikm@ufl.edu)

The term 'Dark Cutting' is used for meat that does not bloom or brighten when it is cut and exposed to air. Beef customers prefer beef cuts to be a bright pinkish color at retail, they avoid dark colored meat.

Dark cutting beef (DCB) is largely linked with pre harvest stress and the excess mobilization of muscle glycogen—energy store—in the live animal prior to slaughter. This utilization of glycogen in a live animal pre-slaughter if excessive reduces the amount of available glycogen post slaughter which will be converted to lactic acid and an associated reduction in muscle pH. The conversion of glycogen to lactic acid is a chemical reaction known as glycolysis and occurs in the muscle tissue. Post mortem production of lactic acid causes the meat pH to decline from the neutral value of 7.2 found in the live animal. The amount of pH fall is again determined by the quantity of glycogen available in the muscle for conversion to lactic acid. Pre harvest stress decreases the amount of glycogen present in the muscle thus reducing the amount of lactic acid that will be formed post mortem. Desirable beef has an ultimate pH in the range of 5.3 to 5.7. If the quantity of glycogen in muscle tissue is low, then the amount of lactic acid produced is reduced, and the pH remains above 5.8, then dark cutting beef is a more likely outcome.

Dark cutting beef tends to have a seasonal pattern. The seasonal highs are generally about the last two weeks in August through the first week of December. The average annual rate is approximately 5% of cattle slaughtered. Consumers tend to associate the off color of DCB with advanced animal age or lack of freshness therefore they do not want to pay top dollar for DCB. The most common end point uses for DCB is dilution into ground beef, processed meat items, or it may appear in lower priced fast food steak houses. There is also some interest in adding value to DCB with pre cooked items.

In addition to the unacceptable appearance, dark cutting beef has the following characteristics:

- a high water holding capacity due to less acidity
- dark cutting beef is often juicier than normal beef after cooking.
- reduced shelf life – bacteria grow more rapidly due to the higher pH and moisture;
- a sticky texture
- high pH of 6.0 or greater
- meat color is dark red to black
- a full blown dark cutter is discounted one quality grade in industry

The following have been identified as contributors to dark cutting beef:

- low energy intake by livestock
- poor livestock handling

- mixing groups of animals
- severe weather conditions during transport
- growth promotants (maybe)
- animal disposition
- bullers
- nutritional stress (lack of feed or water)
- cattle type (animals with a higher occurrence of white muscle fibers)
  - Exotic or continental European breeds have a slightly higher percentage of their muscle fibers in these white muscle fibers.

Dark Cutting beef is a problem for our industry. Consumers are less accepting of the meat produced from these animals. Meat from dark cutting animals is often discounted. There are management considerations that a cow calf producer can incorporate into their management scheme which may help to decrease the incidence of dark cutters. However the incidence of dark cutters is influenced to a greater extent at the feed yard and packing plant. It has been reported that the control of ante mortem stress through proper management would be the most effective method to reduce the incidence of dark cutting beef. Managers at these locations should monitor the incidence of dark cutters and make appropriate management changes as indicated.

## References

1. <http://www.dpi.nsw.gov.au/agriculture/livestock/beef/market/publications/dcb>
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3. G. H. Dolezal Dark Cutting Beef, What We Do and Don't Know. Proceedings of the Academy of Veterinary Consultants. 2007