

Dark Cutting Beef



What are dark cutters?

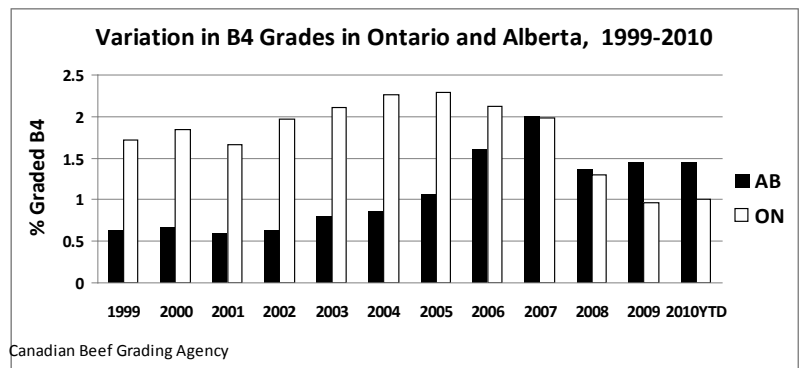
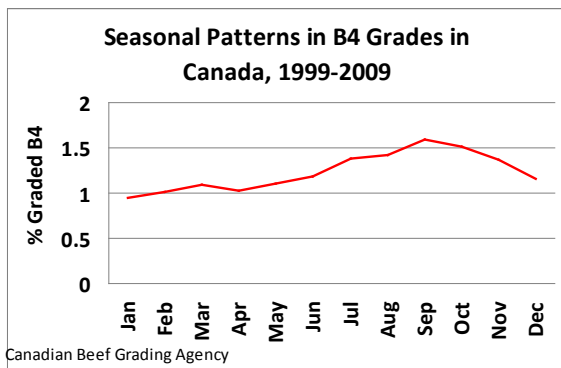
Dark cutting carcasses have purplish-black rather than bright red lean meat. A bright red “A” grade carcass is shown on the left; a dark cutter (B4 grade) is shown on the right. Dark cutting beef resembles vacuum packed beef. While vacuum packed beef will brighten up (or “bloom”) after the package has been opened, dark cutting beef will not. Dark cutting beef looks unappealing to consumers, may spoil faster, and is not sold at retail stores. As a result, dark cutters are severely discounted at packing plants.

How common is dark cutting?

Dark cutting is most common during the late summer and early fall (see the graph on the left). This is true in both eastern and western Canada. However, dark cutting used to be about three times more common in Eastern than in Western Canada. This changed in the fall of 2005 when an unusually high spike in the incidence of B4’s occurred in both Eastern and Western Canada. Since then, the seasonal incidence of dark cutters has fallen below historical levels in the East, but has increased in the West. The seasonal variation still follows the same pattern, but the graph has shifted up in the West and down in the East. Dark cutters were more common in Western Canada than in Eastern Canada in 2009, and it is shaping up that way again in 2010 (see the graph on the right).



Photos courtesy of the Canadian Beef Grading Agency



Why does dark cutting occur?

Normally, energy in the muscle continues to be metabolized as the carcass cools. This metabolic process creates lactic acid, which causes the muscle pH to drop and the meat to turn red. If the animal was severely stressed before processing, the muscle energy stores may already be depleted. This means that the metabolic processes that normally turn the beef bright red will not happen, the

Dark Cutting Beef *continued*

pH will remain high, and the meat will remain dark. It can take up to a week for muscle energy stores to return to normal levels in severely stressed cattle.

Predicting exactly which stresses will cause dark cutting is difficult. For example, some cattle that have been in truck rollovers may not become dark cutters and some very calm 4-H calves will grade B4. Most loads of fat cattle have no dark cutters. Some loads will have one or two B4's and in rare cases up to a quarter of the load may grade B4, even though all the cattle have been managed similarly. Dark cutting is difficult to research because thousands of animals often need to be studied in order to get any meaningful assessment of how animal management influences dark cutting. Factors that may increase the risk of dark cutting include:

- Mixing of unfamiliar cattle (especially bulls or stags) several hours before slaughter;
- Heifers that are in heat and riding;
- Cattle that have been switched from a high energy to a low energy diet shortly before slaughter;
- Cattle that have been off feed or water for too long before slaughter;
- Cattle that are held at packing plants over the weekend before slaughter;
- Aggressive implant regimes;
- Temperature stress;
- Some breeds or bloodlines may have a higher incidence of dark cutting, but the role of genetics is generally believed to be quite minor, compared to environmental and management factors;
- Absence of electrolyte therapy at slaughter plants.

These factors have been known for many years, and feedlots and packers take measures to avoid dark cutters. Several of these factors have been examined and do not appear to be responsible for the current situation. For example, dark cutting may be more common in heifers, but Alberta has not changed the ratio in steer to heifer slaughter since 2004. Ontario has historically had a higher incidence of dark cutters than Alberta, but Ontario hasn't seen the same dramatic increase in recent years as Alberta. Alberta packing plants are killing no more cattle now than they were in 2004, so inadequate holding capacity doesn't appear to be a problem. Implants are not likely the cause, as few new implants have entered the market since 2004.

Some Beef Science Cluster researchers at the Lacombe Research Station and the University of Alberta suspect that carcasses that are rapidly chilled may bloom more slowly. These carcasses could be graded B4 even though muscle pH might be normal. These researchers are measuring muscle temperature and pH changes in carcasses with dark coloured lean. If the rate of carcass chilling affects lean colour, it is possible that adjustments to cooler management may help reduce the incidence of B4 grades. More information on this research is available at <http://www.cattle.ca/projects-in-progress>. Click "New technologies to evaluate beef carcasses" under the Beef Quality heading.

Proudly funded by:



The Beef Cattle Research Council (BCRC), a division of the Canadian Cattlemen's Association, sponsors research and technology development and adoption in support of the vision of the Canadian beef industry to have high quality Canadian beef products recognized as the most outstanding by Canadian and world customers.

FOR MORE INFORMATION VISIT:
www.cattle.ca/research

or contact

CANADIAN CATTLEMEN'S ASSOCIATION

#310, 6715 - 8th St. NE, Calgary, AB T2E 7H7

Tel: (403) 275-8558 Fax: (403) 274-5686