

# Cull Cow Beef Quality Issues: Cow Condition and Muscling<sup>1</sup>

Amie Imler, Matt Hersom, Todd Thrift, Joel Yelich, and Max Irsik<sup>2</sup>

## Thin or Emaciated Cattle

Thin and emaciated cattle are in a *negative energy balance*, which means they are using more energy than they are consuming. These animals will lose weight with an associated decrease in their performance. Although it is rare for cattle to reach states of emaciation, it is not rare for cattle to be in a negative energy balance for short periods during the year. Cattle that have just calved and those that are lactating can enter into a negative energy balance until production diminishes, the calf begins to eat grass, or sufficient supplemental feed (i.e., hay, corn, etc.) is provided. Additionally, as cattle age, it becomes more difficult for them to maintain weight or replace lost *body condition* (i.e., visual assessment of the amount of fat tissue the animal has) following periods of high productivity. There are several concerns associated with thin and emaciated cattle (Figure 1).

## Low Carcass Weight, Yield, and Quality

Thin or emaciated cattle have typically experienced a negative energy balance for an extended period of time. When animals are not consuming enough energy for maintenance and production, they will mobilize tissue stores within their body to make up for the deficit in energy consumed. Many times these cattle do not have ample fat stores and will mobilize muscle tissue as an energy source. This results in lower-valued whole muscle cuts. Additionally, in cases of

extremely emaciated cattle, the lean tissue is also referred to as “washy” because it is soft and lacks rigidity and firmness. Primal cuts from such carcasses usually cannot be sold as higher quality cuts but rather are used for ground beef. These cattle typically will produce lightweight carcasses and are susceptible to bruising. Since red meat yield and carcass weight are the two primary components that processors and cattle producers get paid for, thin or emaciated cattle hold very little value to the industry.



Figure 1. A cow that is excessively thin is at risk to produce a low-quality carcass, to be susceptible to sickness, or to present other beef quality assurance issues.

Credits: Matt Hersom UF/IFAS

1. This document is AN311, one of a series of the Animal Sciences Department, UF/IFAS Extension. Original publication date December 2014. For more articles in the *Cull Cow Beef Quality Issues* series, go to [http://edis.ifas.ufl.edu/topic\\_series\\_cull\\_cow\\_beef\\_quality\\_issues](http://edis.ifas.ufl.edu/topic_series_cull_cow_beef_quality_issues). Visit the EDIS website at <http://edis.ifas.ufl.edu>.
2. Amie Imler, former graduate research assistant, Department of Animal Sciences; Matt Hersom, associate professor, Department of Animal Sciences; Todd Thrift, associate professor, Department of Animal Sciences; Joel Yelich, associate professor, Department of Animal Sciences; and Max Irsik, clinical assistant professor, College of Veterinary Medicine; UF/IFAS Extension, Gainesville, FL 32611.

The Institute of Food and Agricultural Sciences (IFAS) is an Equal Opportunity Institution authorized to provide research, educational information and other services only to individuals and institutions that function with non-discrimination with respect to race, creed, color, religion, age, disability, sex, sexual orientation, marital status, national origin, political opinions or affiliations. For more information on obtaining other UF/IFAS Extension publications, contact your county's UF/IFAS Extension office.

U.S. Department of Agriculture, UF/IFAS Extension Service, University of Florida, IFAS, Florida A & M University Cooperative Extension Program, and Boards of County Commissioners Cooperating. Nick T. Place, dean for UF/IFAS Extension.

## “Downer” Cattle Risk

Thin or emaciated cattle are generally in a weakened state, which makes it difficult for them to stand, be hauled, or handled for any length of time. Consequently, processors are unlikely to even bid on these cattle because of their increased risk of becoming “downer” cattle. Cattle that are down at a harvest facility are not eligible to enter the human food chain. They are condemned with all tissues considered inedible.

## Public Perception and Animal Well-Being

Thin or emaciated cattle pose a public perception and animal welfare problem to the industry. Cattle that are in such states of negative energy balance are unacceptable, and many consumers view these cattle as starved and abused.

## USDA Suspect

Thin or emaciated cattle are often held as USDA Suspect because they are in a high health-risk class. Inspectors generally identify these animals for residue testing because they may have been treated for a condition that was associated with a loss of body condition. These cattle, even if producers followed the product withdrawal time, could still contain a drug residue. Thin or emaciated cattle have a reduced ability to clear residues from their body, which will extend a product’s withdrawal time beyond what is labeled on the product. As such, cattle producers should be extremely cautious when administering treatments to thin cattle that are destined for the market.

## Best Management Practices

Cattle producers can minimize the quality defects associated with thin or emaciated cattle.

1. *Improved Cattle Management*—Cattle producers should monitor their cattle herd and adjust their nutritional management to meet their changing needs throughout the year. By sorting out thin cattle from the herd and providing supplement on an as-needed basis, cattle producers can save money as well as improve their herd’s overall body condition more efficiently. By sorting cattle on condition or size, cattle producers can help thinner, smaller cattle that are more likely to be pushed from the feed bunk by fleshier, larger cattle. Cattle producers can also monitor cattle age and dentition to determine which cattle are more likely to lose excessive condition during the production season. Those that have excessively worn teeth will not be able to forage as well, making them more prone to weight loss. These cattle should be sold before they become too thin or emaciated.

2. *Timely Marketing*—Cattle that are older, have worn or missing teeth, or are in a production state that would facilitate excessive weight loss should be marketed sooner rather than later. These animals, especially many dairy cattle that produce large amounts of milk each day, can lose weight rapidly. Cattle producers should work to identify thin animals or those that could drop condition quickly. These animals should be marked for harvest in order to generate a salvage value that would be otherwise lost if harvest were delayed.

3. *Culling during Limited Feed Resources*—Cattle producers should consider culling cattle when feed resources are limited. Timely culling can help maintain cattle condition for the remaining herd mates as well as prevent forced sales of thin or emaciated cattle. Often, older animals are some of the initial culls when feed resources are limited.

4. *Euthanasia*—When cattle producers identify cattle in the herd that have dropped too much condition and are weak and emaciated, they should consider humane euthanasia as an alternative to marketing these animals. Animals that are in a welfare-compromised state due to poor nutrition should not be taken to a market where the public can raise concerns over animal handling and care. The producer should invest in additional feed resources for these animals or consider euthanasia as a means of salvage.

## Overconditioned and Fat Cattle

On the opposite end of the spectrum are cattle that are carrying too much body condition or are excessively fat at the time of harvest. These animals usually are lower producing cattle with lower maintenance requirements than other herd mates. Often, cull cattle that are excessively fat are those that have failed to reproduce or raise a calf for one or more production cycles. Overconditioned cattle pose two main beef quality concerns to the industry.

## Reduced Efficiency

Fat deposition, when compared to muscle and bone deposition, is inefficient from a growth standpoint. It takes more energy (i.e., feed and resources) to deposit one pound of fat than it does to deposit one pound of muscle or bone. Except in feedlots where one of the primary objects is to deposit fat for enhanced marbling, excessive fat deposition in the cow herd is unnecessary and expensive. If cattle have excess body condition, the cattle producer is either spending too much money on feed or not managing cattle appropriately. Generally, it is a management issue rather than a feeding issue.

## Increased Processing Costs

Cattle that reach harvest in excessive condition hold less value for the processor. Beef sourced from the non-fed market is generally leaner and is utilized to meet lean beef needs or in the ground beef production. Most buyers of non-fed beef prefer leaner carcasses, equivalent to a body condition score of 4 to 5 in the live cow. Excessive fat forces processors to expend resources on trimming this fat which increases the production cost for a product that has less value for the processor.

## Best Management Practices

The presence of fat or overly conditioned cattle in the non-fed market is an avoidable beef quality problem.

1. *Improved Cattle Management*—Cattle producers should monitor their cattle herd and alter their nutritional management so cattle that do not need supplement or high quality pasture do not receive excessive nutrients. These cattle can maintain their body weight on lower quality pasture without expensive supplementation. By sorting these cattle from the herd and away from those animals that need additional supplementation, cattle producers can more efficiently control their herd's overall body condition.
2. *Timely Marketing*—Cattle that have been identified as culls should be sold as quickly as possible in the correct market window for their class of cattle. For cull cows, the best marketing window is generally in the first quarter of the year. Market cattle before they develop too much condition and become a beef quality problem.

## Excessive Variation in Cattle Weight/Size and Muscling

Historically, the beef industry has been known for its lack of consistency in both live animals and meat products. There are many independent cattle producers across the country making the breeding and genetic decisions that result in the widespread variation throughout the non-fed market. Much of the variation present in cull cattle is observed in divergent carcass weight and degrees of muscling. For instance, mature bulls that were selected to emphasize growth in their calves can be too heavy; in contrast, older cows that have begun to age and lose weight may be too light, resulting in carcasses of less than 500 pounds and poor lean muscle yields. Variability in cattle size and muscling can lead to several beef quality issues within the harvesting and consumer segments.

## Reduced Efficiency

Variability in any form is typically inefficient from a business management perspective. The time required and the costs associated with harvesting and fabricating a heavyweight carcass and a lightweight carcass are similar. However, processors do not obtain the same revenue from these two carcasses since they are paid on a carcass weight and red-meat yield basis. Obviously, processors will receive more money for the heavyweight carcass or the carcass that has more muscling (red meat yield) compared to the lightweight, light-muscling carcass. As such, processors prefer to harvest larger cattle that have the potential to make them more money. It should be noted that although processors usually prefer heavier cattle, carcasses can be too big. Carcasses that exceed 950–1000 pounds are not acceptable in the beef manufacturing industry. They are too large for the production chain, slowing harvest time and adding to the lack of uniformity in beef cattle. Additionally, excessively large animals put more strain on plant equipment and personnel, adding to the repair and maintenance costs for a beef plant.

## Best Management Practices

Although difficult to change, cattle producers should work to make breeding and genetic decisions that will help reduce variation within their herd and across the industry.

1. *Improved Cattle Selection and Breeding Management*—Cattle producers should make focused and strategic breeding decisions each year to improve cattle uniformity within their cow herds and calf crop. When cattle producers make a herd more uniform, it becomes easier to apply the same management across the herd, which will help improve both beef quality and the production process.
2. *Timely Marketing*—Many of the cattle coming to the non-fed market with insufficient muscling and carcass weights are not acceptable to the packing industry. These cattle have been managed poorly. Cattle producers should identify cattle that are at a higher risk of becoming emaciated, either because of age, lameness, or dentition, and then market them before they lose too much weight.