

Acidosis in American Cattle: Possible Solutions to a Corn-Rich Diet

By Sara Redd

“The meat that we eat in this day and age is produced in a feed lot. It's grain-fed meat, and we produce a characteristically obese animal, animals whose muscle tissue looks more like fat tissue than it does lean meat in wild animals,” commented Loren Cordain in the documentary *King Corn*. Watching this educational and thought-provoking video in my economics class, I wondered, like the film’s narrators, about the effects of corn feed. But instead of focusing on its effects on humans who consumed its byproduct, beef, I wondered about the feed’s effects on the cows that ate it. For centuries, cattle were fed primarily grass. In the 1950’s, though, American cattle experienced a radical change in diet, transitioning from grasses to high-starch foods such as corn (Burros 1). Not designed for corn consumption, their digestive systems were unable to handle the stress and became highly acidic. To this day, cows still experience health problems because their starchy diets remain the norm (“They Eat What?...”). Cattle evolved eating fibrous grass, but in United States feedlots they are forced to consume a corn-rich diet, causing the potentially fatal condition acidosis. The acidosis problem can be limited by improving feeding methods directly, taxing high-starch feed, altering federal subsidies for corn and grass, and/or by increasing public awareness of cattle malnutrition and its effects on the beef Americans purchase.

Acidosis, the most common nutritional disorder in the feedlot, is caused when cattle consume large amounts of quickly fermentable feeds, such as corn, soy, and wheat. When food enters the rumen, or first stomach of the cow, lactic acid is produced and usually buffered by bacteria. However, when cattle consume too many simple starches, the ruminal bacteria cannot keep up. In an attempt to counteract this overproduction of lactic acid, water from the circulatory

system is drawn into the rumen, resulting in immediate dehydration and low blood pH. Cattle affected by acidosis may experience liver abscesses, fungal rumenitis, bloat, immobility, weakness, depression, diarrhea, low body temperature, weak pulse, growth impairment, damaged and overgrown hooves, abdominal distension, temporary blindness, grunting, and kicking (Boyles).

Feedlot owners can directly affect the prevalence of acidosis in their cattle without making significant changes to current practices. For example, the location and mix of feed contributes greatly to starch consumption and its effects on acid production in the rumen. Even if feed already contains excessive grain content, the problem is worsened when cattle are deprived of a sufficient acclimation period. Accidental grain “overdoses” can be prevented by safely securing grain stores where cattle are unable to reach them. Additionally, animals must be introduced gradually to starchy foods so ruminal bacteria can adapt, and a minimum of 10-20% roughage (grasses, hay) should always be included. Fibrous yet still cheap materials such as whole, not ground oats, lupin, and sorghum may also slow down digestion and aid in the process of adjustment. When switching between different feeds, it is advisable to mix the two over a period of about seven days, continually increasing the percentage of new feed (Walker 1-3). The *Cattle Network* lists similar measures for limiting acidosis among cattle. The network advocates feeding cattle dry corn not high-moisture, early harvest corn, adding calcium to feed, feeding at the same time each day, and using three to four step-up diets over a period of three to four weeks. Cattle owners would be motivated to take such actions against acidosis considering it could earn them \$10-13 per head when cattle are sold (“Acidosis”).

However, if cattle owners are unwilling or unsure about taking these measures, it may be necessary to tax high-starch cattle feed or the resulting meat and dairy in an attempt to encourage

owners to purchase more fibrous, healthier alternatives. Increasing input costs for owners of corn-fed cattle would allow owners of grass-fed cattle to more easily compete in the beef and dairy markets. From a consumer standpoint, a tax on corn-fed beef and dairy might prompt some to purchase their grass-fed counterparts. The market would adjust, allowing grass-fed cattle to gain a larger market share and limiting the number of cows who suffer due to high-starch consumption.

Cattle owners, though, cannot be blamed for the low price of starchy feed, especially corn, that causes ruminal acidosis. Federal corn subsidies since the New Deal Era have led to the production of enormous quantities of corn far outpacing the free market Demand. In fact, in 2007 alone, 300 million tons of corn were harvested. It's no surprise considering that, between 2003 and 2005, American taxpayers contributed \$34.75 billion in crop subsidies. It is this massive outpouring of federal expenditure that has allowed corn to become so cheap and widely used in everything from soda pop to cattle feed ("Bushels & Cents..."). The USDA confirms these startling statistics, claiming that around 80 million acres of land are used for the corn crop each year, the majority of which is the main energy ingredient in livestock feed. Indeed, "corn is the most widely produced feed grain in the United States, accounting for more than 90 percent of total value and production of feed grains" ("Corn"). Ultimately, the solution to acidosis in cattle may be to alter the federal subsidies for feed grains and grasses. Currently, "the government provides income support to the feed grain sector through nonrecourse marketing assistance loans, direct payments, and counter-cyclical payments." Without government payments, eight percent fewer corn farms would be able to cover their cash costs (Hoffman 27, 23). That's not to say that these corn farmers as well as others unwilling to accept lower profit margins would be without hope if federal aid to corn farmers were cut or eliminated. Instead, the free market dictates that

they should produce another crop that may or may not provide a less-starchy feed for cattle. To combat this problem, the federal government could only limit federal aid for feed corn and leave unchanged aid for corn used to produce ethanol and other goods. The subsidy money previously used for feed corn could be used to support farmers who grow grasses, sorghum, and other fibrous cattle feed. The overall effect would be to shift subsidies away from starchy, acidosis-causing feed crops towards healthier feed alternatives without significantly altering, for example, the market for ethanol corn.

Consumers of beef and cow dairy can also play an important role in reducing cattle suffering due to acidosis. They may choose to purchase directly from local suppliers at farmers' markets or at farms, where they can inquire about and even see the conditions in which cattle are kept and how they are fed. At the grocery store, consumers can look for "grass-fed" or "pasture-raised" beef and dairy products or give up beef and cow dairy products all together ("They Eat What?..."). There are also a select few farms in the country which take mail-orders for grass-fed beef, such as River Run Farm in Oregon and Western Grasslands in California (Burros 2). Unfortunately, though, few consumers may be motivated to change their buying habits simply because cattle are suffering before death. Instead, they be may be interested in the fact that grass fed beef is lower in both unsaturated and saturated fats and higher in omega-3 fatty acids, which boost the immune system and help prevent cardiac disease (Sagon). Additionally, health problems caused by acidosis in corn-fed cows increase the need for cattle to receive antibiotics ("They Eat What?..."). In fact, according to the *King Corn* documentary, "live stock now consumes 70% of the antibiotics in the United States." Pathogens in the cattle soon become resistant to these antibiotics and, thus, when humans eat or handle raw or undercooked beef, they could be infected with pathogens that cannot be treated by antibiotics ("Antibiotics in

Animals...”). Consumers, if made aware of these potential health risks, might decide to purchase grass-fed beef. Ideally, this trend away from corn-fed cattle meat would be sufficient to force at least some cattlemen to switch their animals to a grass diet.

Though plausible and effective, these solutions will not occur spontaneously. On the individual level, Americans can be conscious consumers of beef and cow dairy. They can spread the word by contacting government representatives and by informing friends and family about the humanitarian and health issues surrounding grain-fed cattle. Individual cattle owners can care for their animals appropriately, avoiding undue suffering while benefitting financially in the process. As a group, Americans can be effective lobbyists, protestors, and boycotters. They can stand up against the unfair treatment of cattle by advocating for new and improved policies so that cattle may live in peace before death.

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