

A NEW WAY FOR HEALTH CARE PROVIDERS AND NUTRITIONISTS TO IMPROVE PATIENT COMPLIANCE TO DIETARY RECOMMENDATIONS

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DIET AND HUMAN HEALTH

The current state of health of the average American adult is enough to make any dedicated health care provider cry. The epidemic of obesity is bad enough, with 66.7% of Americans overweight or obese. (1) Even worse is the skyrocketing childhood obesity rate; a full 15% of Americans under the age of 18 are obese. (2) The economic impact of obesity and its related health conditions on the United States (U.S.) economy is staggering and has been estimated at about \$118 billion in the late 1990s, or about 12% of the national health care budget, according to the Worldwatch Institute in 2000. (3) Factor in the millions of people with hypercholesterolemia, potentially leading to a host of degenerative medical problems, and the stage is set for a health crisis of monumental proportions. (4) Medical and social services in this country could be overwhelmed. If an effective way to manage these twin risk factors isn't found, there will, inevitably, be millions of premature deaths from stroke, heart disease, diabetes, and other chronic diseases devolving from these widespread primary problems of obesity and/or hypercholesterolemia. (5)

Nutrition is one of the cornerstones of management for both obesity and hypercholesterolemia. (6) In addition, numerous clinical trials have demonstrated efficacy of certain medications to help control the appetite, or to lower blood cholesterol levels. (7) However, optimum alleviation of these problems with minimum pharmaceutical-induced side effects, is achieved through an integrated approach involving patient nutritional management as well as appropriate medications.

Managing the weight of obese patients has been a tough assignment for nutritionists. The root of the problem is not only how much the obese patient eats, but what is eaten. (8) A less obvious problem is the lower nutritional value of many unprocessed foods, due to modern intensive production methods. (9) One class of nutrient whose nutritional value is being called in question is meat from animals fattened in typical feedlots. It is well-documented that grain-fed beef has significantly lower levels of numerous important nutrients, including Omega-3 fatty acids, beta-carotene, Vitamin E, CLA (conjugated linoleic acid), than grass-fed beef. In addition, grain-fed beef has unfavorable Omega 6:Omega 3 ratios and sharply increased levels of saturated fat, when compared with grass-fed beef. (10) There are also valid concerns about antibiotic-resistant bacteria, growth hormone residues, and pesticide/chemical residues in grain-fed beef, and their effects on the people who eat it. (11)

Physicians, especially cardiologists, have been advocating for years a diet change for their patients at risk for heart disease. Current recommendations usually point to a "Mediterranean"-style diet, including:

- no processed foods
- eat a wide variety of fruits and vegetables daily
- reduce or eliminate alcoholic beverages
- eat at least one serving of a good source of Omega-3 fatty acids every day (such as from fish, walnuts or canola oil)
- avoid the "wrong" type of fats (trans and saturated fats) by switching from butter to margarine, by not eating red meats (including beef), and by not eating fried foods (12)

Unfortunately, despite their best efforts, many nutritionists and cardiologists are frustrated by their patients' refusal to comply with the recommended diet plan. (13) There are many factors that contribute to these management failures: cheap, readily available fast food is one; ever-increasing portion sizes in our restaurants and at home is another. Many patients get bored with chicken and flatly refuse to eat fish. Convincing most patients to give up their beef is hard: Americans, culturally, are programmed to eat beef. Men, especially, are beef-eaters, and cherish a tender, juicy steak. (14)

Many cardiologists and nutritionists have realized that their current recommendations are falling on deaf ears; accordingly, they've started modifying their recommendations to elicit a higher compliance rate in their patients. If a patient refuses to give up processed foods, then at least eat less of them. If a patient

refuses to stop drinking adult beverages, then at least drink less and switch to red wines. If a patient won't give up his beef, then choose lean cuts of beef with high nutrient content. It is more effective to encourage Americans to eat more HEALTHY beef than to get them to add fish to their diet.

GRAIN-FED VERSUS GRASS-FED BEEF: THE DILEMMA

What many doctors and nutritionists overlook in their recommendations is the heightened nutritional value of grass-fed beef. As recently as the 1930's, the vast majority of beef eaten in the United States (as well as world-wide), was grass-fed. The practice of fattening cattle on grain in feedlots, known as "Confined Animal Feeding Operations" or "factory farming" did not become common practice until the late 1940's. (15) As previously stated, grass-fed beef has sharply higher levels of several vitamins and essential fatty acids, along with much lower fat content. In addition, because the bovine digestive system is designed for forage, not grain, there's no need to give grass-fed cattle antibiotics; therefore, grass-fed meat production does not contribute to the risk of antibiotic residues in meat or antibiotic-resistant bacteria such as E. coli strain 151 or MRSA. Other benefits of grass-fed production include no hormone use, minimal pesticide use, and a stress-free, humane lifestyle for the cattle in the production program. (15)

Americans are increasingly turning to grass-fed beef as a means of keeping their favorite protein source in their diet AND also lowering their caloric intake and cholesterol risks. (11) Grass-fed beef is in very short supply--producers sell out their inventory as soon as they announce availability; the volume of grass-fed beef production is expected to increase by 20%/year for the next decade, with over 1,000 ranches having made the switch. Despite this heavy demand, there simply isn't enough good grassland available to grass-feed the American beef herd as that herd is currently constituted.

The modern beef animal is a poor choice for grass-fed beef production. The current beef business model is an animal designed to grow from 80 lbs to 1200 lbs in 14-16 months. This beef animal is tailored for the intensive production methods of feedlots, where the nearest meal was in the feed bunker. He is designed to tolerate the highly stressful and artificial conditions of the confinement in the feedlot, and be able to consume startling quantities of antibiotic-laced grain products and convert them into 2.5-3.0 lbs of muscle-based weight gain per day. (16) Unfortunately, the typical "modern" beef animal is not motivated, hardy or athletic enough to hustle a grass-based living in the commonly harsh environment of the majority of American rangelands. Traditional European beef breed-type cattle simply take too long to grow on grass, and have difficulty fattening & finishing their growth without grain supplementation, antibiotics and hormone implants. With their straight frames, heavy muscle, and ponderous movement, they lack the agility and flexibility needed to deal with mountainous and uneven terrain. The cost of grass-fed meat will be much higher than factory-farm meat because the modern beef animal is designed for feedlots, not pastures. (16)

Another hindrance to the use of the current beef animal is inconsistent tenderness. It is well-documented that marbling (the white flecks of fat distributed between muscle fibers of steaks and other cuts of beef) does not guarantee tenderness. Genetics dictate tenderness more than anything else. (17) The other influence on tenderness is age and activity. All things being equal, the less exercise the beef animal gets, and the younger it is, the better the chance of tender meat. Grain-fed cattle move about very little in search of food; consequently, their meat (muscle) is heavily marbled with fat and is less toned. They fatten and finish their growth at a much younger age when fed the high-intensity all-grain diet. Grass-fed cattle move about significantly in their search for forage, and take longer to fatten and finish; their meat will be much leaner, but possibly less tender.

Health-care providers and nutritionists end up with a dilemma: how can they recommend a food product that their patients have difficulty acquiring? How can they NOT recommend a food product that will help their patients, even if it's hard to find?

THE CHALLENGE

What is needed for adequate production of grass-fed beef is a beef animal that can thrive in any environment, grow fast and get fat utilizing a variety of naturally-occurring vegetation, and provide naturally tender & juicy, lean meat, at a reasonable price, on an exclusively grass-fed diet at a young age. We need a "green" cow that is genetically tender!

In the search for the perfect beef animal, DNA testing of breeding animals for specific traits has become a very hot topic. (18) It is now standard operating procedure for seedstock producers. (Seedstock producers are the dedicated breeders who are responsible for selectively breeding strains of cattle to attain intensified levels of desirable traits. Bulls from seedstock producers are the sires or grandsires of most of the animals in beef production in the United States) (19) Numerous genetic traits have been identified on the bovine genome, but the 3 traits that affect the beef industry more than anything else are marbling, tenderness, and efficiency on feed. (18)

Marbling is the measure of intramuscular fat in the meat of the animal; due to the USDA's grading system, the marbling grade determines the final value of the animal's meat. The desirable grades are Select, Choice and Prime; less than 1% of beef grades out as Prime. Intramuscular fat from marbling contributes to juiciness and flavor of the meat, but has nothing to do with tenderness. (17)

Tenderness of the meat is largely determined genetically; this has been demonstrated with precise, objective laboratory tests measuring the shear strength needed to cut a piece of beef. Age of the animal also influences tenderness, with younger animals having more tender meat than older animals. Age-related tenderness is what fuels the urgency of pushing the beef animal's growth to the point where it is ready for slaughter by 14-16 months of age. By contrast, prior to the factory farming business plan, the typical beef animal went to slaughter at 3-5 years of age. (17) Finally, as stated above, activity levels can affect tenderness; feedlots are designed to minimize activity of the feeder cattle, to help protect tenderness.

Efficiency on feed measures how much food does it take for an animal to gain a pound of weight; this value is highly influenced by genetics. Obviously, the less food needed, the better. Beef animals with high efficiency on feed will gain weight faster than those whose genetics are less favorable; they'll also be ready for slaughter at a younger age. (17)

Numerous cattle seedstock producers are routinely DNA testing all their calves, to determine which animals have the most factors in their DNA for these desirable traits. By selecting for sires and dams that carry more factors, seedstock producers hope to (eventually) produce an animal that is genetically-programmed to be heavily marbled, very tender, and efficient on feed. This beef animal will do well in the modern factory farm setting, but will have the same difficulty with hardiness and durability as his forebears.

THE SOLUTION

In the search for an alternative to the modern beef animal to put into a grass-fed production business plan, a readily-available solution was found. Here, in the United States, lives a breed of cattle little influenced by man or weakened by the genetic manipulations of the animal husbandry industry: the Criollo.

Criollo cattle were first brought to the New World with Christopher Columbus, with his second expedition in 1493. Hardy and durable, these cattle came from the desert country of Andalusia, in southern Spain. Having already evolved in a hot, dry climate with scarce feed and less water, these cattle were ideally suited to survive the rigors of an ocean crossing and adapt rapidly to a new environment. The conquistadores brought Criollo cattle with them to all areas of the western hemisphere. Criollos spread rapidly across the arid and semi-arid regions of the western United States and northern Mexico. They flourished in a hostile environment, learning to utilize all available vegetation and stretch every ounce of drinking water. In villages all over Mexico and the southwest United States, each household kept a criollo cow for milk, and ate the meat from her calves. Each village or two shared a Criollo bull, whose job was to cover all the cows in his area. A docile temperament was critical, as the Criollos were taken out to graze each day by the village boys, on foot. (20)

Over the next 400 years, the unique traits that define the Criollo breed were solidified:

- hardy & self-sufficient, needing little or no human intervention to thrive
- the ability to range far, eat a wide variety of vegetation, and aggressively hustle a living; supplementation is unnecessary
- tolerance of extreme heat, cold & drought
- long-lived (a Criollo cow commonly will wean 20 calves)
- exceptional fertility (a Criollo bull will routinely cover 75 cows /season; European beef bulls usually cover only 24 cows/season)

- extreme calving ease with low birth weights and vigorous, fast-growing calves
- docile, tractable temperament (21)

Criollo beef is the crown jewel of the breed's many desirable characteristics. Criollo, genetically, are naturally tender and lean. DNA testing reveals that, of 6 available DNA markers for tenderness, Criollos usually have at least 4. DNA markers for marbling indicate that they are genetically programmed to be lean, with little backfat. Interestingly, since their meat is predominantly red muscle fibers, rather than the white muscle fibers as is found in the European beef breeds, Criollos will marble in a shorter feeding period than other beef animals. The third major genetic trait identified with DNA markers is the Feed Efficiency Ratio; Criollos typically have 6 or more of the 8 markers that have been available. Such a genetically-programmed efficiency with forage explains how Criollos can thrive in environments where other cattle starve. Genetically programmed to be lean, tender, and highly efficient with their forage, Criollo are ideally suited to be the animal business model for large volume grass-fed beef production. (22)

THE SOURCE

The American Criollo Beef Association (ACBA) was formed in 2008. The Association's mission is to be a dynamic, member-driven breed association dedicated to the promotion of purebred Criollo cattle as a means of improving consumer health, restoring/protecting the environment, and maintaining the traditional ranching way of life by educating the consumer, health care professionals, the rancher, the range manager and the beef industry in general about the unique and valuable characteristics of the breed. The ACBA website provides additional detailed information about the Criollo too broad for the scope of this paper.

The ACBA administers the Certified Criollo Beef Registry (CCBR). The CCBR's mission is to maintain a data base of pure Criollo seedstock to supply the commercial producer the breeding animals he needs to produce the highest quality grass-fed beef. To qualify for the Registry, beef animals must first be DNA tested and meet rigorous test standards. If the beef animal in question scores adequately high on its DNA testing, it is then visually inspected to verify it has the desirable physical characteristics of the pure Criollo. Any hint of tainting with European, Zebu, Longhorn, or other blood, will preclude the animal's acceptance into the Registry. Less than 40% of animals submitted for entry into the Registry qualify. With such stringent selection criteria, the Registry assures a steady supply of seedstock with extraordinary consistency for lean, tender meat and the desirable traits unique to Criollo. The buyer of CCBR breeding stock is assured that his animals will be hardy, efficient, long-lived and fertile; they will produce the same.

Health care professionals and nutritionist can confidently recommend grass-fed Criollo beef as a high-quality healthful source of beef to their patients, with high patient compliance. The buyer of Certified Criollo Beef meat is assured that he will be providing a healthful, wholesome, tender and delicious eating experience for his customers or family, raised in an environmentally-friendly and humane manner.

The ACBA urges cardiologists, nutritionists, and other healthcare providers to visit the Association's website, both to learn more about the Criollo, and order delicious, healthful Criollo beef.

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