

Third in a four-part series

Are We Feeding Cattle and Starving People?

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With scenes of starvation appearing daily on television broadcasts, it's necessary for people to realize the importance of beef cattle in feeding the present and future generations of the world. However, within the last decade it has become fashionable to criticize beef cattle production as wasteful and inefficient. Some critics have gone as far as saying that feeding cattle increases the number of hungry people in the world.

In his book *The Philosophy of Vegetarianism*, author Daniel Dombrowski makes serious allegations against animal agriculture.

He states, "Ironically we are now at the stage of technological development when all in the world should be well nourished, yet technology has in-

tensified the desire to eat meat. Witness the incredible yields of millions of acres of corn in the Midwest—to feed equally incredible numbers of animals raised for the table. Something worse than mere bad taste is involved in a meat eating diet: animals suffer unnecessarily, and they are killed unnecessarily, food is grown inefficiently while human beings starve, and future generations are ignored by today's wasteful land uses." In these few sentences Mr. Dombrowski has managed to place the problem of world starvation squarely on the shoulders of America's farmers and ranchers. Is he right? Can we better feed a hungry world by not raising cattle as a source of red meat?

It is important to understand the di-

gestive mechanism that sets beef cattle apart from humans and how this relates to raising animals for food. Ruminants are cud-chewing mammals with a multi-compartmental stomach. The largest stomach compartment which is the rumen, is a large fermentation vat where billions of bacteria, protozoa, and yeast break down ingested plant materials by microbial fermentation. This fermentation process produces fatty acids that provide energy for the animal. Rumen microbes also produce ammonia from dietary nitrogen compounds and use it to synthesize microbial proteins. The microbial proteins are broken down in later stages of digestion, and the resulting amino acids and fatty acids are absorbed from the intes-

Recent carcass work favors implanting for leaner beef, better cutability

While today's health-conscious consumers are demanding leaner beef products with lower fat content, cattlemen are looking for tools to help them produce this consumer-preferred beef.

Results from beef industry carcass contests and university studies show that the natural hormone estradiol in some brands of growth promotant implants can help produce leaner beef.

Two carcass contests during the past year demonstrated that fact quite clearly, said Dr. Larry Hollis, technical services representative in Texas for Syntex Animal Health, Inc.

At the Texas Cattle Feeders Association (TCFA) Fed Beef Carcass Challenge in Amarillo last fall, six of the seven major awards—including Grand Champion Carcass—were implanted with Synovex which contains the natural hormone estradiol, along with the natural hormones progesterone for steers and testosterone for heifers.

Hollis noted similar results at the Beef Empire Days in June at Garden City, Kansas. A total of 320 animals appeared in a live beef judging contest, including 135 heifers and 185 steers. The top five winners in the steer category and four of the top five winners in the heifer category were all implanted with Synovex.

"These results are very consistent qualitatively with

the findings of a recent Oklahoma State University study," Hollis said. "That study involved over 2,000 head of yearling cattle and showed that implanting significantly increases ribeye area, dressing percentage, and cutability scores. It also reduced fat thickness over the rib, as well as kidney, heart and pelvic fat."

Studies linking natural-hormone-based growth promotant implants with the deposition of carcass protein date back at least to the mid-1950s. Deans, *et al.*, in 1956 noted a 3.1 percent improvement in carcass lean and a 3.4 percent decrease in carcass fat in steers implanted compared with non-implanted controls.

More recently, a study by Byers and Klosterman in 1979 showed nearly a six percent increase in total protein and an 8.1 percent decrease in body fat from implanted steers when compared with non-implanted controls. Rumsey in a 1982 study that looked at protein deposition in finishing steers observed a 22 percent increase in protein compared with non-implanted controls.

With consumer demand shifting toward leaner beef, it makes sense to use all the tools available to fill that demand, Hollis said. Historical and contemporary research studies as well as today's carcass contests seem to indicate natural-hormone-based growth promotant implants make a positive contribution to lean beef.

tines. They are used to maintain the animal's body and to synthesize products such as meat. It is the ruminant's unique digestive process that enables them to utilize the highly fibrous materials that come from range lands, pastures, crop residues and hay and silage. The ruminant's ability to utilize forages is important because cellulose is the most abundant chemical constituent in the dry substance of plants, but it cannot be digested by humans because we do not possess the fermentation machinery of the ruminant. In addition, the nitrogen in the microbial proteins can be derived economically from non-protein compounds such as urea that cannot be utilized by humans.

Therefore, in the presence of an economical urea supplement (the cost of nitrogen in the form of urea is less than the cost of nitrogen in a common protein supplement), the efficiency of conversion of protein in the feed to protein in the meat produced by ruminant animals can actually exceed 100 percent. Thus according to Heather Smith Thomas in **Red Meat: The Original Health Food**, "Many feedlot cattle may actually return more human edible protein than they consume." She adds, "The efficiency of conversion by ruminants may greatly exceed 100 percent if we consider only the quantities of plant products that ruminants consume which are digestible by man, since ruminants also eat much material not edible to humans. The ruminant, with its special digestive system, is literally a walking protein factory."

In the United States only 21 percent of our land can be used for producing foods directly consumable by humans. This seems like a lot of land to grow wheat, vegetables and the like, but intensively farmed land wears out more quickly and needs more frequent crop rotation. This is why 50-75 percent of the arable land in the United States is used for forage production, temporary grasslands and soil improvements (fallow, for example). On a world wide basis, only 11 percent of the land area is capable of producing foods for direct human consumption. So most of the world's land area cannot be used to directly supply human needs. In fact, 23 percent of the world's land area is suitable only for raising ruminants and that's not counting the forest and waste land where cattle can also

graze. Numerically 12 billion acres of the world's land is pasture and range land which produce forages that only livestock can digest. For an idea of how much land that is, the United States has but 2.5 billion acres of land area, total.

Critics of livestock production have made many claims about how much energy, in the form of nutrients, goes into producing a pound of beef protein without realizing that much of our beef is fed from land unsuitable for

A person would have to eat about 2.2 lb. of corn every day to get his RDA of protein, ingesting 3,455 calories, as compared with eight ounces of beef, which contains 560 calories.

growing crops. Furthermore, USDA statistics show that 98 percent of the grain fed to animals in the United States is corn, sorghum, oats and barley which are not major sources of human food in this country and these crops are usually grown in areas that will not grow human food crops. Also food by-products such as peanut hulls and beet pulp and crop residues such as corn stalks and straw are used to feed cattle. According to USDA statistics, of the total United States beef ration including that used to support the cow herd, 83 percent comes from roughages and only 17 percent from concentrates. The heavy use of concentrates is during the finishing phase when beef cattle on feed consume 72 percent of their ration as concentrates and 28 percent as roughages.

Why are concentrates fed to cattle during the feedlot period? According to information from CAST (Council for Agricultural Science and Technology), grain has a high density in terms of energy and roughages do not. Stomach capacity limits the amount that an animal can eat. With a high-roughage ration, the energy intake in excess of maintenance requirements permits growth of only a pound or so per day. A high-energy ration composed largely of grain provides enough energy in excess of maintenance requirements to produce daily weight gains as much as three times those made by animals on a high-roughage diet. This feeding of con-

centrates takes place almost exclusively in the finishing stage and amounts to less than two pounds per pound of liveweight of all beef pro-

duced.

These facts differ greatly from Frances Moore Lappes' claims in *Diet For a Small Planet*, where she states,

"Every pound of beef on our table represents 16 pounds of grain and legumes removed from the total available to a hungry world." Actually four-

Leading runners boost meat diet

Nine of the top runners in the United States—including America's top marathoner over the past 21 months—have been named to the "All Carnivore Running Team" by the Carnivores Running Club. The honorary team recognizes runners who excel in track and/or road racing and advocate meat as a part of an athlete's balanced and varied diet, according to Walt Barnhart, club president.

"It's time we put the myth that eating meat is bad for health and performance out to pasture," said Barnhart. "Our team members—and other athletes—recognize the many benefits of including meat in a training diet."

Team members are:

***Don Norman**, who has run a 26.2 mile marathon in just over 2 hours, 11 minutes, the fastest marathon by an American in the past 21 months. Norman, who runs for the **New Balance Track Club**, says he is "a firm believer in meat in our diet." He notes that many vegetarian runners suffer from some form of anemia, and some of these he has "talked into eating meat."

***Jerry Kokesh**, a former president of the Road Runners Club of America (RRCA) and a veteran of 36 marathons, including Boston four times. A **Team Adidas** captain and competitor, Kokesh finds meat "an important source of high-quality protein and iron, necessary to all competitors."

***John Wellerding**, currently ranked ninth among U.S. marathoners. A former All-American who now runs for the **Brooks Racing Team**, Wellerding says "meat plays a vital role in providing the essential nutrients needed to maintain (his) energy levels."

***Chuck Elkins**, who has placed in the top three in his age category in 69 of the 76 races he has entered since late 1984. He won his age category in 46 of those races. Elkins, a former director of membership services for the **National Cattlemen's Assn.**, says red meat "is an important part of a balanced diet."

***Diane Bussa**, who is currently one of the top U.S. women in the 25K (15.5 mile) and is ranked third in the half marathon. Bussa runs for the **Brooks Racing Team**, and feels red meat "helps rather than hinders athletic performance."

***Martyn Brewer**, a two-time All-American who has set a number of 10K (6.2 mile) course records and was ranked in the top 10 in the 20K for 1984 by *Track and Field News*. Brewer, who runs for the **Brooks**

Racing Team, says "meat plays a large role in (his) training diet."

***Tom Fitzpatrick**, who has won numerous 10K races in the Chicago area, including one in 1985 that he won for the seventh year in a row. Fitzpatrick says "meat plays an important role in (his) running" because of the protein it provides.

***Cindy Mironovich**, an All-American who was third in the mile at the AAU Nationals in 1983 and is the Colgate Games record holder in the 1,500 meters. Mironovich says she is disturbed by the negative publicity meat has received in the athletic press, and feels meat "is an enjoyable and healthy addition to an athlete's balanced diet."

***Nancy Ditz**, who was women's winner in the 1984 "Bay to Breakers" race in San Francisco and was seventh in the 1984 Olympic Trials marathon. Ditz, who runs for the **Puma Track Club**, includes meat in her diet because "it has important nutrients hard to find elsewhere and it tastes good."

"These outstanding runners certainly aren't the only top American runners who eat meat, but they are among the best," said Carnivore President Barnhart. Barnhart pointed out that other world-class runners—including marathon world-record holder and Olympic champion Carlos Lopes of Portugal—are noted for their carnivorous eating habits.

Honorary captain for the 1985 team was Bob Kerrey, Governor of Nebraska. Kerrey, who served in Vietnam and was awarded the Congressional Medal of Honor, the Bronze Star and the Purple Heart, has been running regularly for seven years. Kerrey has also worked to draw attention to the plight of farmers, livestock producers, and meat processors in an attempt to help agriculture acquire fair prices for its products.

This is the first year the Carnivores Running Club has named an honorary team. Those honored receive a complimentary box of steaks from Omaha Steaks International, one of the country's premier suppliers of quality steaks for restaurants and to consumers by mail, and training gear from the club.

The Carnivores Running Club, with about 350 members in 33 states and several foreign countries, is a not-for-profit club dedicated to the idea that meat is a healthy, valuable addition to an athlete's diet. Most of its members are associated with the livestock and meat industry.

fifths of the weight of beef animals results from consumption of roughages produced from lands with few alternative agriculture uses, from crop residues and crop by-products. Frances Moore Lappes' statement indicates a lack of knowledge about beef production and a naive view of the world hunger—food distribution problem.

As stated in an article in **Nutrition Today** ("The Ruminant and Nutrition," March-April, 1979) by Harlow Hodgson, PhD., "Americans consume about 645 kg of food per capita per year—nearly 1.8 kg (4.0 lb.) per day. About 273 kg are of animal origin. Ruminants provide 212 kg—about one-third of our total food consumption. Dairy products provide about one of every 4 kg of food consumed in the United States, and beef and veal provide about 10 percent of our food consumption." Dr. Hodgson further states, "Interestingly, since forages supply 80 percent of the feed units consumed by ruminants, the primary production in forages accounts for 26 percent by weight of the food consumed in the United States. This is more than is supplied by any other crop."

The National Live Stock and Meat Board published a report ("Does Grain Feeding Rob The World of Food for Hungry People?") containing some interesting information. In the feedlot, the typical steer will consume about 2,125 lb. of corn and about 130 lb. of soybean meal. This feed contains a total of about 260 lb. of protein which could have been eaten by humans. After 130 days in the feedlot, the steer will yield a 660-lb. carcass which contains about 337 lb. of raw separable lean meat. In this lean is 72.5 lb. of meat protein. Thus the ratio of the feed protein which could have been used directly by humans to the meat protein which will be eaten directly by humans is about 3.6 to one.

About eight ounces of red meat will provide the protein RDA for an adult male human. On a strictly weight basis, the human would have to consume about 35 ounces of corn to eat this much protein. Two facts become evident. First, a person would have to eat about 2.2 lb. of corn every day to get his RDA of protein, ingesting 3,455 calories, as compared with eight ounces of beef, which contains 560 calories. Secondly, this 2.2 lb. of corn compares with the eight ounces of meat in a 4/1 ratio. But the steer

in the feedlot will consume human-digestible protein only in a 3.6/1 ratio to the meat protein he produces. By adding the protein he already has "manufactured" out of grass and other ruminants-only feed, the steer has improved the protein production of corn considerably.

Economics is the final deciding factor in the competition between animals and humans for the crops produced. If the price of products consumed directly as human food is high enough, and if the land could produce human as well as feed grains, crops used for direct human consumption would replace crops grown as animal feed. However, if there is a lower demand for crops used for human consumption and these grains could not be profitably produced, much of this

land will probably be used to produce grains and forage for the animal industry. Thus, under these conditions, the use of this land to produce feed for cattle should not be considered as competition between beef cattle and humans for food.

With the world population growing at a faster rate than crop land can support, better utilization of forage lands is necessary. Dr. Harlow Hodgson in an article in **Nutrition Today** ("The Ruminant and Nutrition" March-April, 1979) estimated that, "... the forage lands in the cool, temperate regions alone could produce annually over 100 million metric tons of beef if already known technology were widely used. This compares with current total world production of 42 million metric tons of beef."

Dr. Hodgson concludes that, "The already large contribution of forages and ruminant animals in food production can be greatly expanded in the future by using nonarable land resources together with forage production on arable land as needed for sound soil management. This expansion would not only multiply the world's food supply but also increase its nutritional quality. Ruminants should not be viewed as competitors with humans but, conversely, as benefactors. The forage and ruminant resources offer a potent but largely unappreciated avenue for improving the quality of human life. In every way it would be a tragedy of the first order for man if he failed to exploit to the fullest this remarkable resource, the ruminant animal." **AJ**