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Beef Production and Consumption

Meat production and consumption in the United States seem to be reaching a major watershed. Increased prices for beefsteaks and roasts are meeting consumer resistance, and shoppers are turning instead toward hamburger, poultry, and pork. Operators of cattle feedlots say they are losing money. Their costs have risen faster than their proceeds. Factors that have increased in cost include transportation (some animals are trucked a long distance) and interest.

When cattle are prepared for market on feedlots, they consume large quantities of grain. In the conversion of grain to meat, ruminants are comparatively inefficient; as much as 8 kilograms of food is required to make 1 kilogram of meat. By contrast, the ratio for poultry and swine is about 2.5 to 1. In future, the price of grains is likely to rise, reflecting higher energy costs for production. Diversion of some grain to produce gasohol is likely. At the same time demand for grain for export will also increase, bringing further pressure on its price.

Most cattle are now fattened at large feedlots, some of which handle tens of thousands of animals. Until recently, the major trend in cattle husbandry was toward larger installations, but current economic factors have been forcing a reassessment. The present practice minimizes one of the most valuable potentials of ruminants—their ability to use forage as food. Ruminants have four stomachs, the first of which is the rumen. After food is ingested it spends considerable time in the rumen, where it is worked over by a complex and interacting microbial flora. Cellulose is broken down to glucose and subsequently converted to other products including acetic acid, propionic acid, butyric acid, and to methane, which escapes. In the presence of nitrogen, part of the glucose is converted into microbial protein, which is subsequently digested and absorbed by the animal.

When the principal diet of ruminants is grain, some of its food value is destroyed by microbial activity in the rumen. Thus from the standpoint of overall food supply it is desirable to emphasize the role of forage in the production of beef. Instead of decreasing the supply of food by consumption of grain, ruminants can increase food availability by converting roughage to protein. Moreover, much forage is available on land, such as hillsides, that is not suitable for tillage. In addition, agricultural practice may evolve in ways that make more forage available. Current cropping on some lands leads to excessive soil erosion. Such losses could be minimized if crop rotation including forage crops were employed.

A major difference between grain-fed and forage-fed cattle is fat content. Animals from feedlots often have five times more fat on their carcasses than do grass-fed cattle. In preparing cuts of prime beef from animals nurtured on grain, large quantities of fat are trimmed away, and even so the remaining meat is laden with fat. Forage-fed animals have much less waste and a higher protein content. In spite of warnings about the role of saturated fats in cardiovascular problems, consumers generally prefer steaks with a high fat content. But under the influences of price and medical warnings, preferences seem to be changing. Consumers are willing to pay higher prices for lean hamburger than for that containing much fat.

Current economic pressures are giving added urgency to research designed to lessen costs of beef production. Programs for increasing the efficiency of livestock in food conversion are particularly active. Some breeders maintain that gains can be obtained through crosses of breeds. Part of the effort is being devoted to animals designed for forage-feeding. Another object for investigation is the rumen. Better control of the nature of the flora of this organ could result in substantial improvements in the efficiency of growth. For several years a selective antibiotic, Monensin, has been available which tends to favor organisms that produce propionic acid rather than acetic acid and methane. Investigations aimed at achieving even better control and efficiency are in progress.—PHILIP H. ABELSON