

What Makes BEEF Taste Good?

Carl B. Roubicek

The term "beef" presents an entirely different mental picture to different people.

To some it projects the mental image of cattle on the range. Others visualize steers fattening in a feedlot. Another group associates "beef" with the carcass on the rail in a packing house, while still others see it as meat in the supermarket display case or on the butcher's block. Then there is that segment of the population that mentally sees a slab of roast or a T-bone steak on a platter.

It Tastes Good

Perhaps we cannot all agree as to just what the term "beef" means. We can, however, agree on the term "eating quality" of beef. We associate this term with tenderness, flavor and aroma. That is what all of us want when we eat beef.

Every manufacturer is concerned with consumer satisfaction for his product. The dissatisfied customer is not likely to buy the product again if he has a choice. This also applies to beef. We must give serious thought to the problem of assuring satisfactory "eating quality" each time beef is sold.

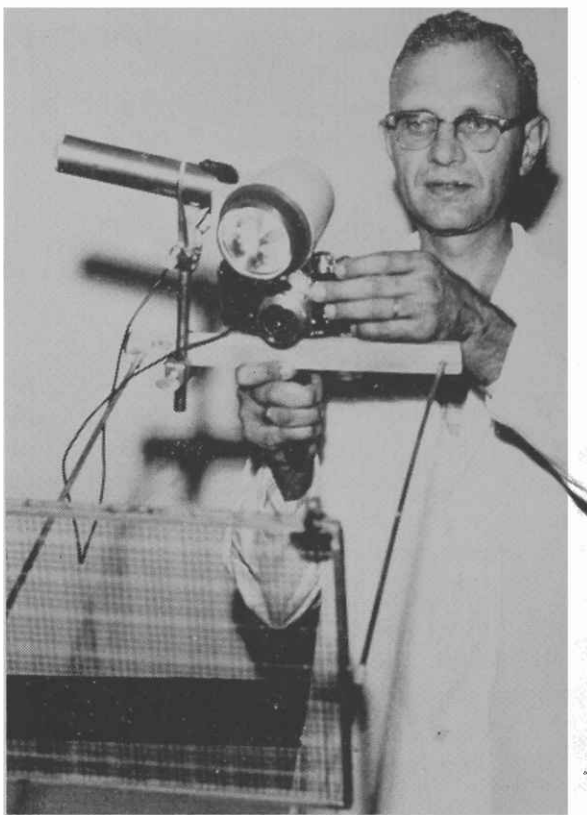
We find marked differences in "eating quality" of beef. It appears that the variation here is as great as it is for most bovine production factors such as rate of gain, milk production and feed efficiency.

Why Does Quality Vary?

In attempting to find the reason for this variation, our first thought is likely to be feedlot treatment. We study the amount or type of concentrate fed, the type of roughage or concentrate-roughage ratio. Drugs or hormones in the ration are also likely suspects to account for the desirable or undesirable aspects of "eating quality" of beef.

But if we face the facts, we must recognize that the feedlot is not the whole answer. In a group of animals that have received identical feedlot treatment we still find definite differences in the quality of beef produced.

Dr. Roubicek, in the Department of Animal Science, is in charge of the meats laboratory and teaches courses in carcass evaluation, cutting and utilization.



ACCURATE MEASURING of lean meat in the rib eye is done by photographing the piece of meat with a screened grid between camera and subject.

A Matter of Heritability

If we are to look further for a possible answer to our problem we come face-to-face with genetic factors. The possibility that inheritance may affect tenderness or flavor of beef may, at first sight, seem a little far-fetched. That is, we can understand how genes can make one animal's coat red, another black. Genes can also make one animal polled, another horned. We also know they are responsible for the ton bull or the 400 pound dwarf. We see how genetic factors can influence many of the production traits in beef cattle, such as rate of gain, fertility and efficiency of gain. We can, therefore, assume that inheritance can influence the carcass and meat quality.

Before we can separate the effects of range or feedlot management from genetic factors, we do have to establish a definite measure of quality. Some of the items that have been used are:

- | | |
|--------------------|------------------------|
| 1. U.S.D.A. Grade | 5. Tenderness |
| 2. Area of rib eye | 6. Flavor |
| 3. Carcass cut-out | 7. Dressing percentage |
| 4. External fat | 8. Marbling |

Let's discuss the actual value of these items, one by one:

1. U.S.D.A. Grade

U.S.D.A. Grade is primarily a subjective measure. The conformation of the carcass, apparent age of the animal, and the fat distribution are all used for grade determination. The grader uses his judgment for each of these factors.

2. Area of Rib Eye

The beef carcass is separated into front and hind quarters by cutting between the 12th and 13th ribs. The large muscle along the back bone is known as the rib eye. The area of the rib eye is at least

partially indicative of the amount of muscling in the entire carcass. That is, we expect a 750 pound carcass with a 14 square inch rib eye to have more red meat throughout the carcass than a similar animal with a 10 square inch rib eye.

3. Carcass Cut-out

Carcass cut-out is of limited value. That is, the percentage of the various wholesale cuts will only vary by a percent or two between animals that are completely different in conformation. For example, we cannot look at carcass cut-out percentages and tell if they are from a Hereford or a Holstein.

4. External Fat

The outside fat or bark is measured at the 12th rib separation where rib eye area is determined. Excessive outside fat does mean waste for the retailer. Any fat in excess of 3/8 of an inch does not add to the "eating quality" of beef. In fact, for most people, more fat than this is actually unpalatable.

5. Tenderness & 6. Flavor

Tenderness and flavor are extremely important in determining "eating quality" of beef but they are very difficult to measure objectively. Mechanical methods for determining tenderness are used. It still requires careful preparation of the meat sample and considerable experience in interpreting results. Flavor can be determined only by use of a taste panel.

7. Dressing Percentage

Dressing percentage is a rather arbitrary figure. The procedure used for taking final live animal weights and carcass weights must be very carefully controlled to have a dressing percentage figure that has real meaning. Under these conditions, dressing percentage is directly associated with the relative amount of fat on the carcass.

8. Marbling

Marbling is determined by a score system designed by the U. S. Department of Agriculture. This system of scoring notes whether marbling in a sample of meat is "slight," "moderate," "adequate," etc. Marbling, the presence of cells of fat interspersed in the muscle, is judged as an indicator of tastiness in beef.

We do have some information on genetic effects for these traits. It appears that about 50 percent of the variation we find in carcass grade for animals fed alike is due to their inheritance. About 70 percent of the differences in rib eye area is due to genetic factors. The heritability of outside fat and dressing percentages are about 50 percent. Since tenderness and flavor are difficult to measure objectively, we find the known heritability of these
(Continued on next page)

Use Right Chemical, Right Methods for Weed Control In Lettuce

W. D. Pew and H. Fred Arle

Because of increasing labor costs, chemical weed control continues to interest commercial growers of lettuce. However, certain problems, especially those caused by abnormal climatic conditions, make it difficult to determine the value of such a practice.

Recent studies using CDEC* for control of purslane in head lettuce give us a better understanding of plant reactions to this material in commercial fields.

In these studies, the three-pound-per-acre rate of application appeared most nearly ideal. This rate is based on an overall application to a bed 24 inches wide. Although total gallonage per acre may vary widely, the 30- to 40-gallon rate appears most desirable. Smaller quantities are difficult to apply uniformly, while larger amounts increase costs and are more difficult to transport through the field during application.

Dr. Pew is Horticulturist and Superintendent at the Mesa Branch Experiment Station. Dr. Arle is Plant Physiologist, Crops Research Division, Agricultural Research Service, U.S. Department of Agriculture, and located at the University's Cotton Research Center at Phoenix.

*2-chloroallyl diethyldithiocarbamate (CDEC) is available commercially as Vegadex.

Beef Eating Quality

(Continued from Page 8)

two factors is low, about 15 to 20 per cent.

Live animal scores at weaning, in the feedlot, or at slaughter tell us nothing about the carcass except for fat. Apparently an experienced judge can fairly accurately estimate fat on a steer but he is not able to accurately estimate rib eye area or marbling.

Since inheritance plays a major role in the final carcass characteristics, it would certainly seem most worthwhile if the cattle producer would check on his steers when they go to the packing house.

Carcass Tells the Story

Obviously, this will not always be easy, but it would be worth considerable effort. If the rancher could actually follow his steers from the feedlot to the rail he could fairly compare his steers with others and see if the animals he produces have obvious faults or exceptional merit.

In this competitive age, we cannot afford to let our whims and fancies interfere with the job of producing only a top quality product for the consumer.

Band Application Does Well

To reduce costs of material, a band-treating application procedure has proven satisfactory. For example, rates can be reduced a third by spraying the material in two 8-inch bands, one directly over each of the seed rows in the bed. This leaves the center 8 inches of bed untreated.

The maximum reduction through the use of banding appears to be about 50 per cent. This reduction would mean two 6-inch bands per bed treated. Bands narrower than 6 inches have not proven satisfactory. In the banding procedure, weeds in the center unsprayed area must be controlled through cultivation. Thus CDEC is used as a supplement to proper cultivation.

Must Judge Carefully

Best procedure for band application is to mount the tank and spraying equipment on the rear of the lettuce planting sled. Then the application can be made at planting time and can be regulated precisely. In any banding application it is important that the area sprayed is exactly proportionate to the amount of herbicide used. If the total bed coverage is 24 inches the two 8-inch bands would reduce the area and amount of spray material by one-third, so the amount used would then be 2 pounds of CDEC in 20 to 26 gallons of water per acre.

CDEC not only gives excellent purslane control, but it is also relatively effective in controlling Careless weeds (*Amaranthus* sp.). On several occasions, water grass, a serious weed in early fall-planted lettuce, has been effectively controlled. However, CDEC is not recommended primarily for control of water grass in lettuce fields. Any grass control is an additional benefit under certain conditions when CDEC is used to control other weeds.

Irrigate After CDEC Spray

Two important cultural procedures that have a direct influence on the effectiveness of this herbicide are (1) condition of the planting bed surface and (2) the timing of the first irrigation after planting and spray application. For best results, the bed surface should be free of large clods and generally smooth. The surface soil should not be made powder fine because such a soil condition interferes with water intake, seed germination and seedling growth.

The field should be irrigated as soon after the herbicide is applied as is feasible. The longer the delay between the herbicide application and the germina-

tion irrigation, the more adversely affected are the lettuce plants, reducing the stand, and retarding growth of lettuce seedlings. On CDEC-sprayed fields, it is important to keep irrigation water as low in the furrow as possible. Weeds will not be controlled where the sprayed surface is covered with water.

Rain, even in quantities as small as .10 of an inch, may create conditions that will cause a noticeable reduction in germination, emergence and early seedling growth of lettuce. Fortunately this type of stunting generally is temporary, and the final yield and head size are not affected adversely. Only in rare cases does this reduction in germination and growth become serious enough to require replanting.

Crusting, abnormally hot temperatures during the germination period, or excessive watering create a more serious problem than does the retardation caused by the herbicide. Growers should carefully assess the causes of poor stands before placing the blame and deciding whether replanting is necessary.



Cochise County

Mon. and

Wed., 6:55 a.m.—KAWT, Douglas

Sat., 12:15 p.m.—KAPR, Douglas

Coconino County

Tues., 8:10 a.m.—KCLS, Flagstaff

Graham County

Sat., 9:00 a.m.—KGLU, Safford

Maricopa County

Mon. thru Sat., 5:55 a.m.—

KRUX, Phoenix

Thurs., 12:45 p.m.—KTAR, Phoenix

Sun., 8:45 a.m.—KOY, Phoenix

Pinal County

Mon. thru Fri., 6:45 a.m. & 9:20 a.m.

Also Sun., 8:30 a.m.—

KCKY, Coolidge-Casa Grande

Mon. thru Fri., 6:55 a.m. & 9:30 a.m.

Also Sat., 12:30 p.m.—

KPIN, Casa Grande

Yavapai County

Mon., Wed., and Fri.,

6:10 p.m.—KYCA, Prescott

Mon., Wed., and Fri.,

6:45 a.m.—KNOT, Prescott

Yuma County

Mon. thru Fri., 6:30 a.m.—

KYUM, Yuma

Mon., 11:30 a.m.—

KVOY, Yuma

El Programa Mexicana

A weekly farm and home program broadcast in Spanish by Stations KEVT, Tucson; KVOY, Yuma; XEXW, Nogales; and XEFH at Agua Prieta.