NOTHING GOES TO WASTE

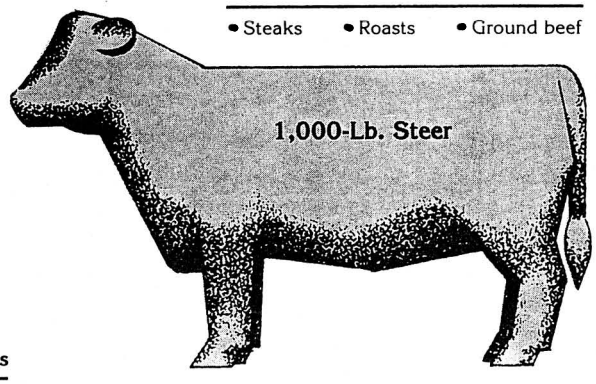
There's more to a steer than steak. Actually, an average 1,000-lb. market steer yields only about 440 lb. of beef. Most of what's left—around 40% of the animal's live weight—becomes by-products.

Although beef makes up about 5% of the total U.S. diet, Americans really eat even more—disguised in chewing gum, marshmallows, some margarines and gelatin capsules. And many more items are manufactured from cattle by-products —sporting equipment, bone china, cosmetics and photographic film are just a few.

All these dividend products come from parts of the slaughtered animal called the "fifth quarter" in the cattle industry. Of course, the carcass of a 1,000-lb. market steer is divided into only four quarters which total about 600 lb. and include fat and bone that will be trimmed at the retail counter. But almost all of the remaining 400 lb.—the "fifth quarter"—becomes by-products.

According to USDA economist Larry Duewer, by-products contribute over 10% to the packer's profit margin. So by-products benefit both cattlemen and consumers by increasing the value of fed cattle without further increasing retail beef prices.

Cattle Products: More Than Meat



Variety Meats

- Liver
- Brains
- Tongue
- Ox joints
- Kidneys
- Tripe
- Sweetbreads

Pharmaceuticals

- Rennet
- Epinephrine
- Thrombin
- Insulin
- Heparin
- TSH
- ACTH
- Cholesterol
- Estrogen
- Thyroid extract

Edible By-Products

- Oleo stock
- Oleo oil
- Gelatin
- Marshmallows
- Canned meat
- Candies
- Natural sausage casings

Inedible By-Products

- Leather
- Sports equipment
- Surgical sutures
- Soap
- Cosmetics
- Buttons
- China
- Photographic film
- Sandpaper
- Violin strings
- "Camel hair" brushes
- Explosives

Hide Value

In dollar value, hides account for about half of all by-product sales. Last year's average of $44.50 per 100 lb. of hide figured out to about $27 per animal. But hide prices have been erratic. During spring 1979, native heavy steer hides reached a record $90 per cwt., although 1979's average was only $73—still 64% above the 1980 price.

Volatile prices may reflect the primary hide market—export. Between 60- and 70% of U.S. hides are bound for world trade, and 90% of those go to Japan. Any change in Japanese demand or in U.S. supply can drastically affect hide prices. And some analysts suggest that dramatic price swings—as in 1979-80—could be a future trend.

However, some leather industry officials contend that leather would have a wider export market appeal and offer greater price stability for wholesalers. In 1980, the leather industry had export sales of $310 million. But only better grade hides are made into leather—latigo, suede or tooling. Those of lower quality can be used in the manufacture of felt and certain textiles, as binders for plaster and asphalt, or for base of some ointments and building-insulation materials.

Leather manufacturers usually buy hides complete with hair and trim them before making a finished product. This leaves another by-product—animal hair—one of the more difficult items to move. At one time, upholstery stuffed with animal hair was popular, but synthetics have practically wiped out this market. Animal hair is still used in the manufacture of artists' paint brushes, but only the fine hair from the animal's ear can be used.

Feed From Hair

Hair does contain a lot of protein, and researchers have developed it as a feed additive for livestock. It's a less expensive alternative to meat and grain as a protein source.

Tallows and greases are probably second to hides in by-product cash value. And the slaughter process provides an average 60 lb. per animal.

In 1975-76 alone, 2,580 metric tons were produced. This is much more than domestic use (about 1,500 metric tons) because demand has slipped over the last two decades. The average American consumer no longer eats tallow outright; lard was widely used in cooking before the 1960s but margarine and shortening have replaced it.

Today, edible tallow's major domestic use is as an additive in livestock and pet foods, again because it is a cheaper source of protein than meat itself. And it sells. The pet food industry is huge, with domestic sales reaching over $2 billion in 1980.

Some inedible tallow is still used industrially, mostly for lubricants, although its bigger market—soap—has virtually dried up with the introduction of synthetics.

From 1947 to 1964, tallow-based soap production some 2 billion lb.

Natural-Based Soaps

But concern over environmental pollution, particularly from detergents, has rekindled interest in natural-based soaps. And scientists working with USDA's Science and Education Administration have been successful in creating (but not yet marketing) completely biodegradable soaps that are at least 60% tallow. Unlike the old tallow-based soaps, these new varieties lather in cool or lukewarm water.

On the list of cash values for by-products, variety meats sold directly from slaughterhouse to supermarket come in third. This list includes hearts, stomachs, tripe, spleens, livers, kidneys, brains, tongues and sweetbreads. These foods are very high in nutritional content but have low appeal for many American consumers. However, higher red meat prices and acceptable—even gourmet—recipes have prompted some consumers to reconsider variety meat delicacies.

Perhaps variety meats are unfamiliar to most American dinner tables but salads and desserts made from gelatin—another beef by-product—are just about a national institution. Gelatin is a derivative of cattle collagen (cartilage in humans).

Gelatins also are used in making chewing gum, marshmallows and dissolvable medicine capsules. Some inedible products also use gelatin: Photographic film, printer rollers, window shades, sheet rock, matches, wallpaper, sandpaper, glues and adhesives.

New By-Product

A relatively new by-product market is for pharmaceuticals. Currently, about 140 medications are derived from cattle glands. But because the total weight of the glands is less than a pound per animal and processing them is so expensive, these by-products don't bring in a huge amount of money to the packer.

One such parmaceutical is insulin, used to treat diabetes. There are 5 million diabetics in the U.S. and at least one-fourth require insulin daily to regulate their blood sugar levels. The pancreas gland naturally manufactures insulin, but it takes the glands of 1,500 slaughtered animals to produce only one ounce of insulin refined for human use.

Another drug, clinically called corticotropin and more commonly known as ACTH, is available synthetically, but generally manufacturers derive ACTH from the pituitary gland of livestock. ACTH is used primarily in treating human adrenal gland problems. The pituitary gland of an average steer is tiny, weighing less than a tenth of a pound, and 10,000 glands are required to refine just one lb. of ACTH for human use. In 1976, the wholesale price for a single cattle pituitary gland was only 11¢. But researchers are quick to point out that some important by-product benefits simply cannot be measured in dollars.