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# Historical Development of Beef Quality and Grading Standards

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# Historical Development of Beef Quality and Grading Standards

ELMER R. KIEHL AND V. JAMES RHODES

Domestication of animals was among the first efforts of man to transform and adapt his environment to his needs. The first changes in domestication of animals were those associated with size and color. Selection for particular color sometimes was linked to the desire to facilitate distinction between stock of different owners and territories.<sup>1</sup> Probably the most consistent efforts in developing animals for specific needs were those involving the increase in size of horses in response to military needs in the Roman period. During medieval times the increasing weight of armor stimulated breeding of still larger horses. Similar evolution of the type of horses for great speed was an adaptation to special military purposes.<sup>1</sup>

## EARLY EFFORTS TO IMPROVE BEEF CATTLE QUALITY

While nearly all domestic animals have furnished human society with meat, emphasis on the development of meat-producing types is a relatively recent development.

The ancient Egyptians apparently evolved a beef-type from their native longhorn cattle when wealth amassed during the dynastic period encouraged production of improved cattle to meet the demand for superior beef.<sup>1,a</sup> However, it was not until the period of modern industrialization with its concentration of population in cities and the accumulation of wealth that demand for meat encouraged accelerated efforts toward improving meat producing animals.

Although British royalty engaged in cattle and sheep improvement efforts in the late seventeenth and early eighteenth centuries, the work of Robert Bakewell (1725-1795) is generally considered the beginning of scientific animal improvement.<sup>2</sup> Increasing urbanization of society in England and technological achievements in the eighteenth century undoubtedly were important factors in stimulating interest in livestock improvement. Also, the acceleration of enclosures, the gradual improvement of agricultural practices and the introduction of four-course rotation (turnips, barley, clover and wheat) made possible greater emphasis on animal agriculture in England.<sup>3</sup>

Bakewell realized that new opportunities were developing for marketing of meat animals and oriented his efforts to improve his animals in form, quality of flesh, and efficiency in meat production.<sup>2</sup> At first his efforts met with skepticism but soon a score of breeders were using similar procedures of inbreeding and selection. The work of the first generation of breeders led to the foundation of the several English breeds of beef

<sup>a</sup>Numbers refer to list of references in the back.



cattle which were the source of improved cattle in the United States.<sup>4</sup> The early breeders did not have in mind developing "new breeds." Rather, their efforts in the case of beef cattle were solely in improving the meat productive capacity of their own animals. As one author stated, "A definite economic need existed for an animal of a different kind."<sup>2</sup> Definite breeds came into existence later after some improvement had been achieved.

The effects of improved animal selection, feeding and management in the eighteenth century are shown in the average weights of cattle at the Smithfield market. In 1710, beef cattle averaged 370 pounds whereas in 1795 average weights were 800 pounds.<sup>5</sup> The average weights of cattle continued to increase into the nineteenth century in western Europe. During the period 1816-1867 the weight of cattle in Bavaria increased by 40 percent and during the following 50 years the average weight increased another 170 percent.<sup>6</sup> By far the greatest portion of this increase was due to improvement in quality and quantity of feed and forage production. Slaughter weights were further increased as feed supplies became sufficient to winter a larger proportion of cattle.<sup>3</sup> However, attention to breeding techniques and animal selection undoubtedly also contributed to increasing weights.

## BEEF CATTLE QUALITY IMPROVEMENT IN AMERICA

Not a single species of domestic animals is indigenous to this country. Cattle were first introduced into this country by the Spanish explorers in Florida, the lower Mississippi Valley, and the Southwest in the sixteenth century. The Spanish cattle introduced at this time and later were the foundation stock of the southwestern and California missions. The famous Texas Longhorn cattle of Spanish origin, now extinct, came from this stock.

Colonists from northern Europe brought cattle from their locales to settlements on the Atlantic Coast in the early seventeenth century. The types they brought were diverse; marked differences occurred in type, even among local provinces and cannons.<sup>7</sup>

Cattle continued to come into the country throughout the colonial period along with the new settlers. But since there was no improved breeding at this time, they no doubt were diverse in type. A few direct importations were made but they were large Danish cattle more suitable for draft purposes.<sup>7</sup> In many areas cattle ran wild in the woods, Indiscriminate crossing of diverse types of cattle did not result in improvement. Probably the best care and handling of cattle in the Colonial period was in Pennsylvania.<sup>7</sup>

In the Colonial and frontier economies the function of cattle was primarily to supply power and only secondarily to furnish subsistence in the form of milk and meat to the farm household. The excess of these requirements became available for market but the dominance of the needs of the household was overriding. For a long period in the colonies cattle were prized almost as highly for their hides as for meat. Many of the

colonial assemblies passed laws encouraging tanning of leather, prohibiting its importation, and regulating the making of shoes.<sup>8</sup>

Several stimulants to commercial beef cattle raising after the Revolution included: the opening of the corn growing area west of the Alleghenies, the rapid growth of eastern seaboard cities, the widespread introduction of clover in connection with gypsum after 1785, the initiation of county fairs and cattle shows in 1807<sup>9</sup>, and the development of an agricultural press after 1810.<sup>10</sup> Corn-fed Ohio and Kentucky cattle could make the drives east easier than swine. The first reported drove to reach Baltimore across the mountains arrived in 1805.<sup>9</sup> High beef prices, 1815 to 1819, 1834 to 1839, and during the fifties, encouraged large imports of improved European cattle.<sup>10</sup> Numerous cattle importing companies were organized, beginning with one organized by 50 Ohio farmers in 1834.<sup>10</sup>

Interest in breeding improvements continued throughout the nineteenth century. Many Shorthorns were imported before the Civil War and, in addition, many Angus and Herefords were imported after 1875. The "battle of the breeds" commenced about this time with its fads and emphases upon certain bloodlines.<sup>4</sup> State Department consuls made a comprehensive survey of foreign breeds in 1883 at the request of American livestock men.<sup>11</sup>

Improvements in American cattle were more pronounced in the second half of the nineteenth century than in the first half. It is true that the first cross of improved cattle on natives produced a larger quality improvement than further crosses. However, purebred imports before 1850 were not sufficient to cause significant impact.<sup>10, 12</sup> The range in average annual weights of cattle slaughtered in Chicago, 1852 to 1857, of 542 to 572 pounds suggests that large, well-bred and well-fed cattle were not plentiful.<sup>13</sup>

The failure to discover Mendel until 1901 hampered breeding efforts,<sup>14</sup> although publication of herd books was started for the major breeds in the last half of the nineteenth century.

While the economic characteristics of cattle such as feed efficiency and muscling could hardly be completely ignored, there seems to have been some overemphasis of minor characteristics such as color of hair, "facial expression," and symmetry of form.<sup>15</sup> More attention appears to have been given to external characteristics which would differentiate a

particular breed or bloodline than to physical factors which would indicate superior meat quality. There were exceptional writers who argued the case for emphasizing meat quality as a goal of breeding.<sup>16</sup> One American writer in 1883 cited many cases of prize winning show animals producing inferior meat.<sup>17</sup> A committee of the Ohio State Agricultural Society suggested an evaluation of feed efficiency and meat quality to compare the relative value of beef cattle breeds.<sup>18</sup>

The trend and direction of the breeding efforts may be observed in a review of the great livestock shows. The early emphasis was on increasing size and meatiness of animals. For example, the Smithfield (England) Cattle Club Show Announcement and Premium List for December, 1832, indicate the age and weight requirements to show as follows:

Class II. For the best ox of any breed, under 6 years of age, weight 160 stones [1280 pounds] and upwards, that shall not have had cake, corn, meal or seeds, previous to the 1st of August.<sup>16</sup>

These animals apparently had been grazed throughout much of their life and were permitted to have been fed only the last few months prior to the show date. The "advanced age" of these animals suggests that the emphasis was on utilization of grass rather than on the use of relatively expensive grains at this time. The judgment of excellence was not only based on appearance alive but also after slaughter. The judges were further reminded in the instructions that the objective of the show was to encourage the production of the "cheapest and best meats."<sup>16</sup>

A similar emphasis on meat qualities is noted later in the American livestock shows. At the first International Livestock Show at Chicago in 1900, a special carcass class competition was offered for the purpose "that the wasteful results of superfluous and extravagant overfeeding of animals intended for human consumption may be discouraged." "Judges are instructed to . . . award prizes to carcasses bearing a goodly portion of high class, edible, marbled meat." The promoters apparently believed that one of the ultimate objectives in producing beef animals was the absence of excessive fat.<sup>19, 20</sup>

The first shows had classes for fat cattle ranging to three-year-olds, whereas fat steer classes now exclude animals over 18 months.<sup>19, 20</sup> It has been reported that at the first shows animals of the different breeds were

unlike and that gradually type uniformity became noticeable. Today, uniformity is consistently found among the winners of classes.<sup>21</sup>

The influence of breeding, better feeding and management is shown in the comparison of average weights of winning steers at the International Livestock Show. In the first five years of the show, beginning in 1900, the winning steers averaged 1,693 pounds. For the five years ending with 1953, the winners in this class averaged 1,116 pounds.<sup>14</sup> The winning of the championship by a 15-month Hereford calf in 1906 generated great controversy.<sup>22</sup> However, the argument that market premiums were for lighter cattle was not to be denied. Yearlings won the carlot grand championship away from two-year olds in 1909 and every year immediately thereafter.<sup>23</sup> Much of the downward trend in weights and age since 1900, reflects the adaptation to consumer demand for smaller sized cuts.

By 1900 considerable transformation had taken place in the type of beef cattle. Probably the greatest improvement in cattle occurred in the western states. Rapid expansion of the cattle industry occurred there when interest in improved breeds was high. Consequently, western cattlemen were strong bidders for improved purebred stock of the central states; thus improvement was most marked in the West.<sup>24</sup>

It is evident that commercially important trade in beef was dependent in part on the improvement of cattle for meat purposes. As industrialization progressed first in England and later in the United States a growing market for meat appeared. In this development the role of the breeders was essentially that of "designing" cattle, which formerly had multipurpose uses, for a specific use as meat animals. The objectives of the early beef breeders emphasized meat qualities although at times breeders became imbued with certain details of fad and fancies of family lines and other relatively unimportant characteristics. An adjustment to general market demands for smaller animals and those which matured and fattened at younger ages was accomplished but this probably was stimulated more by the pressure for economy in feeding. It is probably true that after 1900 greater realization of market demands prevailed.<sup>b</sup> However, the ideal goal of uniformity and predictable and consistent performance of meat in terms of consumer satisfactions has not yet been attained.

<sup>b</sup>One writer traces these historical changes in price premiums: first, for large size in late eighteenth century; second, for large size with less waste in early nineteenth century; third, for large size quickly and efficiently produced in late nineteenth century; fourth, for small size (brought about by consumer demand for smaller cuts).<sup>22</sup>

## EVOLUTION OF STANDARDS FOR BEEF

The present problems in grading beef can be understood better when placed in the perspective of their historical development. Because of the nature of the development there is little choice but to recognize and discuss the interrelationships in the development of animal production, processing, and markets rather than merely to trace grade standards for dressed beef products.

The development of grade standards is a phenomenon associated with the growth of markets, commerce and urbanization of society. In the subsistence agricultural type economy of the Colonial period in this country, evidence suggests that there were efforts to evolve a language to facilitate trade. These occurred in part at the initiative of the parties involved but typically in the early days regulations concerning trade were promulgated by the local political authority.

Division of labor was elementary, and domestic trade, principally of staples, was typically a barter arrangement. Colonial regulations were designed chiefly for the protection of individual consumers and the community of consumers. They emphasized quantity standards but also provided for a minimum set of quality standards.<sup>25</sup> By and large, organized markets were unimportant prior to 1700 notwithstanding numerous statutes regulating markets.<sup>25</sup> Even as late as 1760 nine-tenths of the population of 1,500,000 were tillers of the soil. Boston, New York, and Philadelphia each had an estimated population of less than 18,000.<sup>26</sup>

Slaughtering, packing, processing, and curing of meats were once largely a farm household activity. Until very recent times this remained so among farm households in this country. However, beginning in the early Colonial period, farmers exchanged meat products beyond family requirements for goods and services of local artisans and trades people.



Trade in meat products did not expand much beyond these local exchanges throughout the Colonial period except for some isolated areas where specialized livestock production developed in response to foreign demand for livestock and meat products.

Regulations or customs concerning standards used in exchange might be classified in two broad types: (1) those which establish a "minimum" set of standards which the product must meet in terms of quality, packaging, quantity, and sanitation to be eligible for sale or barter, and (2) those which recognize differences in the acceptable quality of the product either because of the inherent differences in the product or those differences associated with preferences expressed by the market. The former type of standard was the predominant concern for nearly three centuries and was the object of much legislation from the Colonial period to the present.

Quality or grade standards evolved slowly. Only the crudest scale of classification of quality differences in meats was recognized before the twentieth century. No doubt this inertia in formulating standards stems from a number of sources inherent in cattle production, the characteristics of the trade, and the nature of the processing and packing industry from the earliest times to the present.<sup>27</sup>

### **A. Minimum Standards**

Although the development of markets was much slower in the Colonies than in contemporary Europe and especially England, many of the standards and regulations in force were adopted by the various Colonial settlements. Yet many of these were only superficially enforced, suggesting that the needs of Colonial America were different from those of Europe and adaptations to the American scene were necessary.<sup>28</sup>

*Local Minimum Standards.*—The Colonial laws dealing with the establishment of markets and fairs were an attempt to organize trade in a general way, to assure to all the people a fair chance to satisfy their needs. Colonial statute books and town records are filled with regulations pertaining to the method and time of sale and providing for public inspectors to determine and arbitrate in the matter of the minimum quality of agricultural products.<sup>25</sup>

The beginning of organized local trade in fresh meats developed, generally, late in the seventeenth century with the establishment of market days in the larger Colonial towns. Farmer-slaughterers sold meat to townspeople, usually under the provisions and regulations of the town authorities. Contrary to the general pattern, New Amsterdam (New York) established an organized market for meats at an early date, largely due to the influence of the butchers who formed an influential guild that jealously guarded its most monopolistic privileges granted by the city.<sup>29</sup> Weekly meat market days were established as early as 1656, and by 1683 fresh meat markets open during specified hours on Tuesdays, Thursdays and Saturdays were established.<sup>29</sup> Problems of sanitation and difficulty of inspection among widely separated private slaughtering establishments led the city to build a public slaughtering house in 1678 in which all slaughtering within the city was done until 1789.<sup>29</sup> City butchers as well as farmers bringing meat into the city were required to sell at the specified markets. All animals brought into the city for slaughter, however, were required to be slaughtered for an established fee by the "sworn butchers of the city."<sup>29</sup>

When Faneuil Hall in Boston was established in 1742 as a public market, rather crude regulations were voted regarding the quality of meats. One regulation ran thus: "No unwholesome, stale or blown meat or leparus swine shall be sold or exposed to sale in the market under penalty 10s."<sup>28</sup> Similar regulations were imposed in most of the larger town markets throughout the Colonial period. However, it cannot be determined to what extent local market regulations were actually carried out. In many instances they were not enforced.<sup>25</sup> In exchanges of most articles during this period the people determined for themselves the quality of goods. Only in cases of complaints did they apply to inspectors for quality determinations in accordance with the minimum standards then prevailing.<sup>25</sup>

*Export Minimum Standards.*—Probably the most concerted early efforts concerning classification and standardization in meats are those stimulated by and pertaining to the export trade, provisioning of ships, and supplying foreign and domestic army contracts. An inspector was appointed in New York in 1657 to inspect and certify quantity and weight of all meats for exportation.<sup>29</sup> The Assembly at Philadelphia passed an



act in 1729 outlining in detail the size and material of the shipping casks; provided for the inspection of the contents; and specified that each cask should receive an inspector's brand. These provisions were to prevent "unfair practices in the packing of beef and pork for exportation."<sup>8</sup> Prior to 1700 a statute was in force in Virginia which prescribed similar regulations. The justices of peace marked the barrels of meat from their jurisdictions and also stamped the quantity of their contents on the face of the barrel.<sup>30</sup>

These efforts for regulated inspection aimed not only to assure honest quantity measurements but also to exclude from trade products below a certain quality. At this time export trade had not become so large that the foreign customers knew the exporter through many dealings. Products were known rather by the colony or territory of origin. This fact led local producers to obtain government inspection laws in order to exclude inferior products. Thus they hoped to enhance the preference for the product of a particular locality or colony. The motives for such legislation in most of the colonies were similar. However, foreign trade of pickled and salt beef and pork was relatively small and averaged less than 6 percent of the total value of exports of colonies in the decade prior to the Revolution.<sup>31</sup>

In Massachusetts, state statutes regulated public inspections as late as 1856 principally for items exchanged in foreign trade.<sup>25</sup> As new territories were opened, similar "minimum standards" legislation was passed to increase opportunities for local producers to sell in distant markets. For example, the legislature of Missouri passed an inspection law in 1841 providing for an inspector general, to be appointed by the governor, for beef and pork. Two or more deputy inspectors appointed in each county were authorized to inspect and classify beef and pork. Detailed packing procedures were outlined. It was hoped that these measures would improve the acceptance of Missouri meat products in out-of-state markets.<sup>32</sup>

It appears that these laws largely fell into disuse at country points after the Civil War. The fact that they failed to be maintained "must be ascribed to the growth of industrial competition which had rendered them superfluous by giving opportunity for the elimination of inferior processes and products without interferences of the state."<sup>26</sup> Probably the more important factor was the growth of commercial meat packing at Cincinnati, Chicago, and other points which reduced the need for country inspectors.

The official inspection of products for distant markets shifted to these centers. A number of packers after 1840 specialized in foreign accounts and inspection criteria began to emphasize factors important in particular markets.<sup>8</sup>

By and large these promotional efforts involved the setting of simple minimum standards of quality and honest weights or measures. Only crude attempts were made at grading the products. Apparently geographical origin of products provided the only general clues to product quality. It was not until late in the nineteenth century that minimum standards for meats were generally established by federal legislation which again was stimulated in an effort to promote foreign trade.

*National "Minimum Standards."*—By 1885 several packing companies had become quite large and had developed a rather wide distributive organization. The role of the local butcher-slaughterers had declined in the major urban centers. Consequently, the development of national distribution of meat led to pressures for national legislation to regulate sanitation aspects of meat products moving in interstate commerce.

The larger, well known packers in the major centers had developed some standards of performance. But there were unscrupulous dealers. The literature of the period abounds in discussion of adulteration, false weights and mislabeling not only in meats but in most farm produce and preserved foods. State agricultural experiment stations began research studies in adulterations and many states operated an inspection service after 1885.

The need for national legislation based on review of the work of various state sanitary bodies, official reports, and laws of various states was developed by an early United States Department of Agriculture chemist.<sup>33</sup> The argument for supplementary national legislation recognized the changing character of the marketing of meats arising from the increasing movement in interstate commerce. Corrective measures to improve sanitation in meat processing, however, awaited pressures, first from exporters and cattlemen in their efforts to maintain foreign trade, and later from an aroused public.

A series of decrees and restrictions by European Countries, against the importation of American meat products began in 1878 when England placed controls on imports of chilled beef and live animals. In 1879 Italy, followed by other European countries in the 1880s, passed restrictions

against American pork products.<sup>8</sup> It was alleged that American products were packed under unsanitary conditions and that animals often were diseased. These actions were partly stimulated by fears of European slaughterers of competition from cheaper American livestock and meats which had begun to move in volume after 1875.<sup>8</sup> These restrictions led to aggressive efforts—especially by the federal and state governments—to control diseases in cattle and hogs.

Indicative of the importance attached to foreign trade was the action taken at a convention of cattlemen, March, 1890, attended by 400 delegates appointed by the governors of 11 major cattle producing states: "A vote was passed in favor of inspection of American meats by the general government on the ground that this would give our meats such a guarantee of purity and healthfulness that there would no longer be any excuse for restrictions against their importation into foreign countries."<sup>34</sup>

Congress passed a general meat inspection act in March, 1891, providing for pre-slaughter inspection of animals, the carcasses of which were to be sold in interstate or foreign trade. At first, inspection and certification were available only for dressed beef for export but they were extended to pork in 1894. In the original act no mention was made concerning sanitary conditions under which animals were slaughtered.

The purpose of the Act of 1891 was essentially that of promoting foreign trade in livestock and meats. Popular agitation stimulated a decade later by Sinclair's *The Jungle* and by other writers brought pressure for extending meat inspection to meat packing establishments for the protection of domestic consumers. More comprehensive regulations governing meats in interstate commerce are embodied in the Meat Inspection Act of June 30, 1906. Interestingly, on the same date, the Food and Drug Act was passed extending to foods, drugs and medicines a similar set of standards of wholesomeness, and prohibitions against adulteration and misbranding.

The consequences of both acts were considered generally prophylactic in nature as they provided minimum standards and for only the portion entering interstate commerce.<sup>28</sup> Trade within states was not affected except as individual states established similar regulation. In 1909, it was reported that almost 50 percent of the meat consumed in this country was uninspected.<sup>35</sup>

Since then standards of sanitation and minimum requirements for wholesomeness have improved and have been extended by states and municipalities to almost the entire commercial meat supply.

## B. Markets and Quality Grading of Beef

Colonial trade in fresh meats remained local and relatively unimportant. It was carried on chiefly during the winter slaughtering season because of the lack of refrigeration. The bulk of the commercial trade was packed, pickled or salted beef.

A clue to the extent of differentiation in live animal quality can be obtained from a brief review of prices and practices in livestock markets. In the eighteenth century the cattle of different localities which were driven into the several livestock markets had established varying reputations for excellence and were sold accordingly. They were generally sold by the head. In some instances, sales were based on a specified measurement of a fixed number of feet around the belly and "\$1.00 was added or subtracted for every inch over or under this measurement."<sup>8</sup>

*Beginning of Market Information Service.*—With the establishment of livestock markets, a need developed for market reports. Beginning in 1830, weekly market reports were issued by Boston papers and were widely copied in journals serving the territory. Farmers and drovers had depended on rumors concerning market prices and conditions and a typical reaction was, "exact reports now given are received with confidence and are of great importance to the farmers and drovers."<sup>12</sup>

A report for April 3, 1837, quoted prices for beef cattle "extra at \$9.50; first quality \$8.50 to \$9.00; second quality \$8.00 to \$8.50; third quality \$6.75 to \$7.75."<sup>12</sup> For market reports to be useful some attempt must be made to describe the livestock. In this instance of private market reporting someone undertook to array the quality of the animals into categories. While the terms provided some refinement useful for market reporting they probably did not apply consistently to the same degree of quality over time nor were they uniformly understood by farmers.

Fattened beef appeared to be a rare item in the market and called for special promotions and notices. In 1794, "the first notice of fat beef being offered for sale in this market" appeared in New York. The account gives the origin of the animal and who had fattened it.<sup>29</sup> In March, 1810, a

butcher advertised fat beef from two animals fed in Orange County, New York. Twenty premium cattle from Mount Vernon, New York, the "best ever exhibited" for sale in New York, were advertised by a leading butcher in 1821.<sup>29</sup>

High prices of all kinds of provisions after the War of 1812 attracted drovers of cattle from long distances to eastern markets. In 1817 a drove of 100 cattle from Ohio arrived in New York. Butchers again reported on their excellence and the fact that they had "been strongly fed on corn."<sup>29</sup> Feeding of beef cattle was not a common practice and availability of fed beef continued to be recognized as a special event in many localities.

An annual exhibition staged just before Christmas by Cincinnati butchers is indicative of this practice of recognizing "stall-fed" beef. A few days before Christmas "the noble animals which are to grace the (butchers') stalls on Christmas eve, are paraded through the streets decorated in fine style and escorted through the principal streets with bands of music and attendant crowds, especially of the infantry."<sup>37</sup>

After 1850, cattle were arriving by rail through all seasons of the year from the West and market quotations at eastern livestock markets began to take account of these movements in prices for cattle of different territories. Packed meats from western packers began to arrive in increasing volume.

Quotations on the provisions markets indicate crude grading of packed beef. The following provision quotation appeared in the *Country Gentleman* in 1853: "\$5.50 @ 6.12 for country prime; \$6.75 @ 7 for city prime; \$7.40 @ 6.12 for country mess; \$12.50 for repacked Maine—a new trade. The beef is packed at Portland, and is good quality; \$13.25 @ 13.50 for repacked Chicago; and \$14.25 @ 14.50 for extra do."<sup>38</sup> Quotations just after the Civil War carried similar designations of packed beef of various types with distinctions according to territory of origin.

Standardized practices in the packing of beef began around 1840 when American packed beef was first introduced in England on a rather small scale. Exploiting this market, however, entailed greater attention to packing methods than had heretofore been practiced by farmer-slaughterers and butchers for the domestic trade. The trade did not develop until American suppliers used acceptable standards of packing and beef from only the fattest cattle. The entire carcass except head, feet and shanks was



cut into pieces of 8 pounds each. These were packed under local inspection in tierces containing 38 pieces to which were added the salt and pickle. These huge casks weighed in excess of 300 pounds. These were packed and marked according to "quality" as "prime India beef" or as "prime mess beef;" the former was the higher "grade."<sup>39</sup> The quality differentiation was chiefly through packing of selected portions of the carcass in the respective classifications. The higher classifications of packed beef came from heavier cattle and excluded some portions of the carcass such as the neck and shank. The lower classifications included items not packed in the higher classification and the minimum permissible weight of cattle was less.<sup>40</sup>

No large scale attempt to trade-mark beef products occurred until more integrated slaughtering and packing operations developed around 1860. The beginning of extensive branding in meats is obscure but apparently it became fairly well established for processed and canned meat products at this time.<sup>37</sup> Before this packers were largely agents or dealers who obtained carcasses from a number of slaughterers to fill orders. Advertising under brand labels of such items as beef extract, cured hams, and lard appeared in home magazines before 1900.<sup>4</sup>

The beginning of national distribution of fresh beef made possible by refrigerated transportation led to the growth of branch house methods of distribution in large urban centers. One of the major reasons for the branch house development was the reluctance on the part of eastern wholesalers and brokers to handle western beef. Laws were passed in some states, particularly where butchers had aligned themselves with farmers, to allow no meat for sale except that which was inspected before slaughter by inspectors of that particular state.<sup>8</sup> In 1885 a major packer established an eastern branch house. By 1889 the five major packers were operating 544 branch houses.<sup>42</sup> Meat was shipped from central packing plants to the packer branch houses for local distribution to retail meat dealers. Packers thus owned the products until they passed into the hands of retail dealers. This provided the first opportunity for some simple product differentiation on a large scale by packers.

It appears that the classifications of dressed meat at this time were still based largely on weight, age, and the territory from which the animals originated. This practice in classification continued to have some

meaning in a rough quality differentiation scheme because breeding of animals and feeding practices were more homogeneous within areas than among them. No great changes appear in market quotations for beef compared to 50 years earlier. For example, the Boston provisions market for November 7, 1885, quoted prices for eastern and western beef in separate classes, each with terms such as "premium extra, extra so-called, good to prime, light to fair, fair to good."<sup>43</sup> A price differential existed between the eastern and western beef with western selling at a substantial discount. After 1890, local provisions quotations became increasingly brief in the eastern markets reflecting the importance of the branch house development.

Dressed fresh beef apparently was not branded or marked according to quality until late in the 1920s even though prices varied considerably by quality and its accurate recognition was an important tool in trading. The development of national distribution of beef through the branch house system after 1885 gave the major packers direct contacts with local butchers and meat retailers. A similar opportunity for contacts with retailers was offered through the extensive car-route system maintained by the major packers. Similarly, local slaughterers dealt directly with local retailers. Under these conditions quality identification by brand was probably thought not to be essential by either salesmen or buyers.

General classifications, however, existed in the wholesale dressed beef trade. The broad classifications of westerns, natives, fed Mexican, fed Texas, and pulp fed cattle carcasses were in common use. Some further quality distinctions were made in most markets such as extras, prime, choice, good, fair, common. These terms, however, had different meanings on the various markets. The relative proportions marketed of each of these classifications varied widely by season. In a given season of the year an entire classification would not be available.<sup>8</sup>

The impact of improvement in breeding, feeding, and management of cattle was gradual. It was not until the war-stimulated demand of 1914-18 that a fair degree of uniformity of fed cattle began to appear, seasonally. Cattle feeding operations became more specialized and an increasing proportion of the feeding operations passed to professional cattle feeders as contrasted to general farmers.<sup>44</sup> Under the stimulus of high prices cattle fattened largely on grass at ages ranging from two to four years grad-

ually gave way to increased grain feeding. Therefore, the old grass and special area classifications were rendered less useful by the early 1920s. The tendency toward greater uniformity and less extreme variations in the makeup of the cattle marketings at different seasons of the year was a prerequisite for a uniform grading system to be useful nationally all seasons of the year. Even today a marked seasonal pattern exists in the marketings of cattle of different grades but it is much less extreme than formerly.

Swift and Company is said to have begun experimenting with a grading system in 1922 which finally evolved a year later in grade classifications using a number sequence rather than descriptive terms.<sup>45</sup> Smith of Swift and Company felt that descriptive terms which became ordered or ranked in practice would be detrimental to the sale of grades carrying terms denoting inferiority. He further pointed out that it was not until the quality of beef cattle became more uniform throughout the season that beef packers introduced branded beef. It was not until 1927 after the initial success of marking federal grades that a packer stamped a quality brand on dressed beef.<sup>46</sup> However, packers apparently did not advertise their beef brands extensively at first and it was not until 1935 that a national packer advertised his dressed beef brands in a national magazine.<sup>47, 48</sup>

Some of the major packers objected to the first tentative United States Standards for beef carcasses on the grounds that beef could not be successfully sorted into as many as seven grades.<sup>49</sup> However, the modest success of the federal grading service led to efforts by the Institute of American Meat Packers to develop a system of beef grading. A committee of the Institute first recommended a set of standards in 1930, which was revised in 1935.<sup>50</sup> The grading of all dressed beef into four classes—steers, heifers, bulls and stags, and cows—was proposed. Within each class ten groupings or grades were provided to account for gradations in conformation, quality and finish. The grades were designated in a numerical sequence, 0 through 9, with the low numbers indicating the highest grade. The early objections of some packers that beef could not be graded into as many as seven classes appear to have been ill-founded.

Since 1930, there have been essentially two grade systems for carcass beef in this country—the federal grade standard and the packer grade sys-



tem as developed by the institute of Meat Packers. In both systems, until recent years, the grades were applied largely to the better finished beef carcasses. The other carcasses were generally merchandised ungraded or unbranded.

## DEVELOPMENT OF FEDERAL BEEF STANDARDS

### Grades for Market News.

Federal grades of beef were one of many developments generated in the early twentieth century by the demands of producers for market "reforms." The demand appears to have derived from a realization that the market system of the general economy had changed. But the forces leading to their development were often diverted and were at times inactive through a period of 25 years beginning in 1900.

The dynamic transition from a largely subsistence agriculture to commercial agriculture, the migration of farm produce processing from farm to factory, the growth of urban markets, the extension of transportation facilities and the expansion of domestic and foreign commerce after the Civil War created problems of adjustment in almost every phase of economic activity. One of the problems created, though belatedly recognized by most farmers, was that the new economic organization produced a very complex marketing process for their products. To some it appeared that a new group of men had wrested control of the marketing of their products. For over a quarter of a century the major preoccupation seemed to be concerned with learning the role of the distributors and processors in the new market system. During the period from 1895-1920, livestock producers and the public generally held that the large meat packers were exploiting both producers and beef consumers. During this period the packers came under scrutiny of the government for illegal combination and monopolistic control of prices and alleged unsanitary conditions under which meat processing was done.<sup>51, 52</sup>

The first comprehensive study of marketing problems in agriculture was that undertaken by the United States Industrial Commission, a special commission established by Congress in June, 1898.<sup>53</sup> The report described the distributive system for agricultural products in detail and also attempted to determine the shares of the consumers' price which went to producers and distributors in marketing for a number of farm commodities.

The report described cattle production and feeding areas and pointed out areas where increased feeding was taking place and hence better beef was in prospect. However, the report does not suggest any further progress at standardization of classification or grade terms except to recognize territories from which various "kinds" of cattle originated.<sup>53</sup>

The first major study specifically of the beef industry, undertaken again at the behest of Congress, dealt with prices of cattle and dressed beef, the margins between cattle and dressed beef, and an analysis of the profits of the beef packing industry.<sup>54</sup> While the report was primarily an investigation of the competitive aspects of the "Big Six," some insights were obtained on the nature of standardization of live cattle and beef.

During the first and second decades of this century a number of state experiment stations began studies of methods and costs of marketing particular commodities. Undoubtedly spurred by consumer interest, similar studies were sponsored in some of the larger cities by special commissions.<sup>55</sup> There were diverse opinions in Congress and elsewhere as to what might be accomplished or how market problems might be approached. The noteworthy work on market classes and grades of livestock and meats at the Illinois Experiment Station was the only serious effort to obtain standardization of terms and classifications.<sup>55</sup>

In response to continued demands for emphasis on problems of distribution in agriculture, Congress appropriated funds in 1914 to begin such work in the United States Department of Agriculture. The Office of Markets and Rural Organization was established to carry on research in marketing and distribution. Among the concerns of the Office of Markets was the establishment of a market reporting service as one means to improve efficiency in marketing.<sup>56</sup> It is interesting that the first efforts in the area of marketing of meat products were in obtaining price information pertaining to meat trade so the livestock market conditions could

be interpreted. Such information was obtained in five major cities beginning in 1916. It was not until 1918 that livestock market prices were first issued.<sup>49</sup>

### **Demand for Market News Service Accelerates Work on Grade Standards.**

At the outset, this venture of a national price reporting service confronted the Department with problems in interpreting the variety of class and grade designations then in use. The situation was not greatly different from that in the case of the Brighton Livestock Market in the eighteenth century.

A market reporting service on prices and quantities would be ineffective without uniformity in classification and grade terms and similar interpretation by all parties in the market. Private market sheets published by various market agencies and newspapers had been well established at most major markets around 1880.<sup>49</sup> But each of these used terms that had grown in usage at the particular markets. Prerequisite to a national reporting service was the standardization of terms and uniformity in classification.

In initiating this work the Department relied heavily on the series of studies at the University of Illinois on market classification and grades of livestock and meats that had been published in the period 1901-1910. The Illinois workers approached this problem through extensive investigation of trade practices at the Union Stockyards and meat slaughtering plants in the Chicago area. The task in formulating and sifting out a set of standards from the current classification practices of the trade is indicated in the following quotation from Professor Mumford's bulletin.<sup>57</sup>

The task undertaken is not an easy one. Some of the perplexities are: First, the somewhat variable nature of the different classes and grades due to variations in quality, condition, and visible supply of cattle, and the activity in the dressed beef trade; second, the difficulty of accurately describing animals typical of the various grades; third, the difficulty of securing photographs of average types representing the market grades; and fourth, a lack of uniformity in the classification of the various market grades of cattle and in the use of terms by those intrusted with selling, buying, and reporting the cattle market.

Different agricultural journals have different ways of reporting the market, while the same terms are not uniformly used in the same report in referring to the same grades of cattle.<sup>57</sup>

A later bulletin dealing with market classes and grades of meat followed a similar approach in wresting a set of standards from the chaotic trade practice.<sup>58</sup> Hall suggested a very comprehensive standard for all classes of carcass and wholesale beef. His standard used descriptive terms similar to those used by Mumford in his earlier work on live animal grades. The terms: Prime, Choice, Good, Medium and Common were used as grade designations indicating gradations in the degree of finish and conformation. Both authors set aside for special classification the cattle designated as Texas, Western, Distillery, etc., recognizing the apparent importance and persistence of these terms in the trade at that time.

These early studies then formed the basis for the first market news reporting service for both meat and live animals. It is interesting to note that the standards recommended by the workers at the University of Illinois found their first use in attempting to provide a national price reporting service. The trade did not use these standards in regular commercial trade. They were only used as guides in specifications for filling beef contracts for some of the major steamship lines and by the purchasing departments of a number of federal and state public institutions.<sup>59</sup>

The Department continued work on broadening the foundation of the original investigation by Illinois and in 1923 issued tentative national standards for carcass beef. After some revision they were included in a bulletin announcement in 1924.<sup>60</sup> Only slight modifications are apparent in the specification and terms compared to the original proposal by Hall of Illinois in 1910.

### **Grades for Retail and Wholesale Trading<sup>c</sup>**

The marking of official U.S. grades on carcass beef was commenced in 1927 at the request of the Better Beef Association. The story of the complex, and often colorful, personalities in the struggle to obtain carcass grading contrasts dramatically with the non-controversial evolution of live grades for price reporting purposes.

A review of the economic, political, and human factors behind the first marking of federal grades of beef shows that the impact of grading

<sup>c</sup>This section is taken from Missouri Journal Paper No. 2085, by V. James Rhodes.<sup>61</sup> A more intensive treatment of this particular episode was felt to be justified by the present almost complete lack of published analysis.

is so intertwined with other institutional aspects of our market structure as to render economic analysis exceedingly difficult.

*The Pioneer Promotion.*—Any record of the leaders of grade marking must surely place Alvin H. Sanders, Editor of the *Breeder's Gazette*, at the head of the list. Sanders' long and fervent campaign in the columns of his paper and through individual contact with livestock leaders was undoubtedly the chief individual contribution to the marking of federal grades. Paradoxically, Sanders was not interested in grades in the beginning, and was more inclined to favor private than government grades.

Sanders' primary motivation appears many times in his editorials. He wished to promote an increased demand for well-bred and well-fed beef which would increase the derived demand for purebred beef cattle.<sup>62, 63, 64</sup> Thus, he was able to relate his campaign very directly to the economic and sentimental interests of many of his readers and associates.

It is probably more than coincidental that Sanders' concern to increase the demand for better beef should develop in the agricultural recession of the early 1920s. Highly finished cattle were particularly penalized relative to other qualities in much of the 1924-26 period.<sup>65</sup> Demand for purebred animals was in the doldrums;<sup>64, 66, 67, 68, 69</sup> all sorts of "radical" farm reform measures were being proposed; and agreement was general that actions must be taken to restore agriculture's purchasing power. As a promoter and officer of the International Exposition and a life-long exponent of purebred quality, Sanders probably had several sentimental values threatened by the times. While Sanders apparently did not share the faith in the benefits of marketing reform shown by many, he could believe in a private campaign which would strengthen institutions and ideas which he had venerated for a lifetime.

Sanders' central argument rarely varied from the following: many consumers—the more well-to-do ones, especially—would buy better quality beef if they knew how to get it. But many eating places and retailers do not carry high quality and/or sell very poor quality meat instead. The argument varied over time in the color with which it was enunciated and the remedies suggested.

Sanders chose to dramatize the alleged inferior eating qualities of leaner beef with the terms "tiger-meat" or "cat-meat." "That splendid Siberian tiger at the other end of the row [in Lincoln Park Zoo] has

fangs that would warrant his doing his shopping with any ordinary American retailer of beef. But what can comparatively weak human teeth and jaws do with the super-tough red, lean stuff that is commonly vended in meat-shops? The fact that it is bought in such quantities, to the exclusion of the rich, tender corn-fed article, is the underlying trouble with cornbelt farming."<sup>70</sup>

Sometimes, the "cat-meat" term was applied to dairy animals and scrub beef, but as the campaign accelerated the term came to mean almost all beef except that type now graded Prime. The "cat-meat" term caught the fancy of many interested in the matter and appeared many times in the *Breeder's Gazette* and in other livestock publications. It seems probable that this phase of his campaign did much to develop and solidify popular ideas as to the relationship between beef palatability and factors like breeding and degree of fatness. "That is the lesson the public needs to learn: the lesson that *lean*<sup>d</sup> beef is necessarily poor beef."<sup>71</sup>

The remedy Sanders proposed was an educational campaign among the buyers for eating places and then among consumers. He was able to introduce several railroads to the presumed public relations advantages of buying prize show cattle at the International Exposition.<sup>72, 73, 74</sup> He publicized the "red ink menu" as a proper and fitting way to inform hotel and restaurant customers that the royal privilege of eating steak from prime, show-cattle beef could be purchased.<sup>73, 75</sup> He strongly criticized the New York Central Railroad when their red-inked menu appeared embellished with the photo of the head of a Jersey cow!<sup>76</sup> Sanders enthusiastically supported meat exhibits and posters designed to show the difference in visual appearance between prime beef and "tiger" meat.<sup>77</sup> The National Live Stock and Meat Board was asked whether its new consumer radio program in California would teach the superiority of prime beef or "the same old continental European story of how to make a banquet out of a few bones and a dash of 'cat-meat'."<sup>79</sup>

By mid-1925, Editor Sanders began to suggest that the government might be able to work out some system of "tagging meat" for what it was. He reported that Dr. Mohler, Chief of the Bureau of Animal Industry, enthusiastically agreed with the tagging idea. Sanders suggested that letters of interested readers would be sympathetically received by Jardine, Secretary of Agriculture.<sup>80, 81, 82</sup> The purposes of the "tags" were to simp-

<sup>d</sup>Italics in original.



lify buyer education and—much more important—to discourage the unscrupulous retailer from selling cheap beef as expensive beef.<sup>83</sup>

In November, 1925, the telling term "Better Beef" first appeared as applied to Sanders' campaign and the first contribution for a promotional organization was received from a Missouri County Agent.<sup>84</sup>

There was one other noteworthy promotional effort in this area prior to the organization of the first "Better Beef" committees in early 1926. A drive begun by O. M. Plummer of Oregon became known as the "truth-in-meats" campaign.<sup>78, 85, 86</sup> The truth-in-meats people had the same critical attitude toward consumer knowledge of and retail ethics concerning beef quality as did Sanders. However, as western producers of medium to good quality beef, they were less than willing to designate their product as "tiger" meat. Rather, this group was concerned with differentiating their product from "scrub" beef and from dairy cattle. In particular, the droves of dairy cattle slaughtered in the TB eradication drives of the early '20's damaged their market and aroused their concern.<sup>86, 87</sup>

What were the roles of the U. S. Department of Agriculture and the National Live Stock and Meat Board in promoting federal grading, "Better Beef," and "truth-in-meats?" While these agencies from the beginning were very cooperative, it appears doubtful that either provided noteworthy leadership in initiating the popular movements, although they made important contributions to the movement.

The Meat Board showed an early interest in grading as indicated by a resolution of general approval in June, 1925.<sup>88</sup> This resolution probably should be linked with the Board's support of BAE surveys of the retail meat trade in 1924 and 1925 and the resolution in 1924 calling for a study of factors affecting meat quality. No evidence was found to suggest who were the leaders in these Board actions nor what were their specific motivations. The Board's interests in retailing, meat quality, and grading appear to have been natural consequences of the Board's purposes, as stated in its first report: "education of the consumer in the true facts about meat and the conducting of new and important investigations into the nutritious value and marketing problems of the basic food."<sup>89</sup>

While results of the cooperative meat quality investigations were not available in time to affect the Better Beef movement, findings of the Bureau of Agricultural Economics studies of retail trade and meat consumers



were made available in early 1926 and were published as three bulletins later that year.<sup>90,91,92</sup> The 1926 Board report noted highlights of the BAE conclusions and emphasized that "deception, substitution and misrepresentation in the sale of meat by a small percentage of dealers was found to be one of the major factors which is harmful to the industry in general, and legislation probably will be required to correct these practices."<sup>88</sup> Housewives were reported to emphasize the importance to them of meat palatability.

At least one of the conclusions appears to have over-strained the data a bit. It was claimed that great consumer ignorance was shown by the fact that 50 percent of the housewives said their retailers handled either the "best or very good quality" meat, which was obviously wrong—in the researcher's opinion—since only about 9 percent of the nation's beef supply was of the top two grades which were the "best" and the "very good" quality meats. The 23 to 24 percent gross margins of an overcrowded and rather archaic retail meat industry also received attention.<sup>88</sup> The President of the American Hereford Journal Co. saw the truth-in-meats campaign as the solution of the "wicked waste" in retailing.<sup>93</sup> It was an unpleasant new era in American agriculture and nothing needed reforming as badly as middlemen.

Lloyd Tenny, C. V. Whalin, B. F. McCarthy and W. C. Davis of BAE were all enthusiasts for grades of farm products.<sup>60, 94, 95</sup> However, aside from a few articles published in cattlemen's and retailers' magazines<sup>96, 97, 98, 99, 100, 101</sup> and a few grading demonstrations to large buyers<sup>102</sup> there is no evidence that these men played important leadership roles in the Better Beef movement.

Although the grading service was not in the Bureau of Animal Industry until 1939, the BAI Chief, Dr. John Mohler, was a minor participant in the Better Beef campaign. Editor Sanders quoted a letter from Mohler on June 11, 1925,<sup>103</sup> praising Sanders' editorials, and saying that his Bureau was preparing a poster for consumer education on beef quality. A full-page black and white reproduction of this large color poster later appeared approving marbling as the guide to tender and juicy beef.<sup>104</sup> Sanders quoted Mohler as observing that all forms of successful marketing eventually involve grading.

Both BAE and BAI contributed to the prevailing confidence that adequate knowledge was already possessed to label beef for consumers as to eating quality. The fact that both agencies were cooperating with the Meat Board and many experiment stations in research designed to remedy admittedly great deficiencies in knowledge about beef quality and palatability apparently deterred few.

"Consumers must learn the lesson that very lean beef is always tough beef, and that the muscular tissues of animals are made tender and fully flavored only by the presence of plenty of fat," W. C. Davis wrote in March, 1926.<sup>97</sup> "Neither sound teeth nor a keen appetite can make common beef taste like good or choice beef," wrote Mohler in July, 1925.<sup>105</sup>

Grades were definitely "producer-oriented" in the sense that the promoters were primarily concerned with *benefits for producers*.<sup>e</sup> However as the foregoing statements of Sanders indicate, some of these promoters were aware that in order to derive benefits for producers, grades must have meaning in terms of consumer acceptability. There was wishful extension of some results of experience and/or research into an overstrong case for the relationship of consumer acceptability to grades. There was some injection of the gratuitous assumption that whatever costs more to produce must be better.<sup>106, 107</sup> There was evidence of a superiority tone inferring consumer objection to fat beef was due to ignorance.

The point is that rather than a denial that grades must bear some relation to consumer wants, there was, instead, the ready rationalization that the existing grades-wants relationship actually was one which would also greatly benefit midwestern breeders and feeders. It is in these special and divergent senses that grades were both producer and consumer oriented. It should be added that packers indicated some apparently honest doubts about this grade-quality thesis before grading became an issue.<sup>108, 109</sup>

*Organization of the Better Beef Association.*—Committees had been organized and "permanent" organizations founded to solve far smaller agricultural issues than the Better Beef issue had grown to be. Thus it was that John Clay of the John Clay and Co. commission firm and president of the Chicago International Exposition formed a committee representing the International to study the problem. At the call of Editor Sanders, who was also vice-president of the International, the committee

<sup>e</sup>"It is, of course, primarily the producer and only secondarily the consumer of prime beef in whom the *Gazette* is interested in connection with its fight on 'cat-meat.'" Sander's editorial.<sup>62</sup>

met in Chicago, April 27, 1926, with representatives of the three beef breed associations to consider the formation of a Better Beef Committee.<sup>72, 110</sup> At that meeting a committee of five<sup>f</sup> was appointed to plan the organization of a permanent body to further the promotion of the Better Beef program.<sup>110, 111</sup> Another committee of three headed by the respected New York breeder and financier, Oakleigh Thorne, began an investigation of the "grading and distribution of prime beef in all leading domestic markets. . . ."<sup>111</sup>

Secretary Jardine, after meeting with Oakleigh Thorne, offered on June 3 to stamp beef grades free of charge to all packers operating under Federal supervision, beginning July 1, at request<sup>g</sup> of packer.<sup>112, 113, 114</sup> Jardine's offer accelerated the organizational process. Plans for a better Beef Convention at Kansas City were quickly made.<sup>112, 115</sup>

At the Kansas City Better Beef Convention, July 22 and 23, 1926, the cattlemen were outnumbered by representatives from livestock markets, packing companies, railroads, agricultural organizations, Colleges, USDA, NLS and MB, agricultural press, and others. The 200-member group heard the points of view of many speakers and elected a nine-member Board of Directors.<sup>h, 113, 116, 117, 118</sup> Plans were made to incorporate in Illinois as the National Better Beef Committee. It was reported that one of the pioneer workers in the grading area, Louis D. Hall of Illinois, would be the executive secretary with headquarters in Chicago.<sup>i, 113, 119, 120, 121</sup>

*Reconciling the Industry Conflicts.*—The individual competition of thousands of cattlemen with each other is normally of a very impersonal and even friendly nature, since the market action of a single individual has no discernible impact upon the welfare of the group. The horizontal competition among a few groups of cattlemen who are related as to the quality of cattle they produce, and/or their production areas, loses its large

<sup>f</sup>The committee consisted of B. H. Heide and W. W. Wright of the International, Frank W. Harding of the Shorthorn Breeders' Association, W. H. Tomhave of the Aberdeen-Angus Breeders' Association, and R. J. Kinzer of the Hereford Breeders' Association.

<sup>g</sup>The Secretary specified that "Prime No. A 1" and "Choice No. 1" could be stamped even if no requests for stamping lower grades.<sup>112</sup>

<sup>h</sup>These included Thorne, Sanders, Tomhave, Harding, Kinzer and also W. Blayney (a Denver packer), R. M. Kleberg (manager of King Ranch and president of the Texas and Southwestern Cattle Raisers' Association), A. C. Shallenberger (Nebraska Congressman and Shorthorn breeder), and W. J. Tod (Kansas cattle breeder and feeder).

<sup>i</sup>The absence of coverage of this meeting and of the total movement by the general farm press is further evidence of the limited producer group involved.

group impersonality and tends to stimulate political conflicts. Likewise, vertical competition between the producer of cattle and the meat packer and meat retailer is conducive to political conflict.<sup>122</sup>

Conflict between producer group interests began to be felt at the first committee meeting on April 27, 1926. R. J. Kinzer and John Painter of the Hereford Association insisted that the promotional campaign must be supported by a grading and stamping scheme to assure consumers that they were getting the quality being promoted.<sup>1, 99, 123</sup> The usefulness of grading as a promotional aid was fairly readily accepted, but the further plea of the Hereford representatives for grading all qualities of beef was not accepted.<sup>123</sup>

Conflict between the Midwestern breeder and the Western producer became more evident at Kansas City. The "Better Beef" group (Eastern and Midwestern breeders) desired an organization to promote the Prime and Choice grades which Secretary Jardine stood ready to stamp. The "truth-in-meats" group (Western cattlemen) demanded grading of all beef and a promotional campaign which did not discriminate against their beef. In short, each group viewed grading as a device for product differentiation and promotion. The Western group admitted that their cattle were not top quality beef (for lack of feeding, not of breeding) but they insisted that they be differentiated from "common" beef and dairy carcasses.<sup>106, 113, 124</sup> The *Aberdeen Angus Journal* sided with Sanders and editorialized that "beef is either prime or it is not prime."<sup>125, 126</sup> Registered Angus cattle were very largely concentrated in the North Central region and in the East at this time, while Herefords were found more generally in the Southwest and West.<sup>127</sup> The *American Hereford Journal* became a spokesman of the western group. Kleberg reported that on arrival at the Kansas City Convention he found that "this meeting had decided before it opened that the two top grades of beef should be graded not considering the other."<sup>128, 129</sup> However, the mark-all-grades-sentiment apparently carried the day at Kansas City.<sup>113</sup> Oakleigh Thorne stated at the De Moines meeting of directors on August 28 that no director at that time wished to limit grading to the top 2 or 3 grades. Thorne added, however, that the Board members did not favor marking cutter or below and that they thought that it might not be practicable to mark the lower grades until a demand developed.<sup>106, 130</sup>

<sup>1</sup>W. C. Davis of BAE was making essentially the same argument to retail groups at this time.

The Board of the Better Beef Association then performed a rather extraordinary about-face of drafting a bill for compulsory grading of all beef in November and agreeing with packer representatives in December to the voluntary grading and marking of the top two grades.<sup>k, 131, 132, 133, 134</sup> Whether the November action was taken to satisfy the western interests and/or intimidate the packers or indicated the genuine desires of the majority of the Board is not clear. The *Hereford Journal* editor argued that the December agreement showed the real interests of the majority of the Better Beef Association Board, and declared that the fight for compulsory grading of all beef must go on.<sup>135</sup> C. M. O'Donel, retiring president, and R. M. Kleberg at the next convention of American National Live Stock Association after the December agreement both spoke in favor of compulsory grading of all beef.<sup>136</sup> In contrast, Sanders declared in November that "The *Gazette* does not subscribe to the proposition that the success of the Better Beef movement hinges entirely upon the installation of government grading."<sup>137</sup> Sanders was understandably enthusiastic about the December agreement to label voluntarily the two top grades and called for a vigorous promotional effort.<sup>134</sup>

The conflict was actually three-sided. The packers were extremely cool to any kind of grading and, of course, found the compulsory grading bill more objectionable than the voluntary-two-top-grades proposition. A little grading was done for the Pennsylvania Railroad dining car department and for some other institutional and retail buyers after the July 1, 1926, offer of Jardine,<sup>1, 138, 131</sup> but it became obvious at the Kansas City Convention that the packers were reluctant to accept grading. V. H. Munnecke, Armour vice-president, argued at Kansas City that all carcasses have to be sold, that the packer attempts to place every carcass where its particular degree of quality will bring the most money; therefore, beef is, in effect, graded already. Some people do not like those fat top grades, Munnecke added.<sup>m, 113</sup> The packers' position at Kansas City was weakened by the particular state of the market.<sup>113</sup>

<sup>k</sup>For a draft and discussion of the proposed bill, see *Hereford Journal*<sup>131</sup> and *Breeder's Gazette*.<sup>132</sup> After negotiations from December 6 to 16, a conference of representatives of packers and of the Better Beef Association obtained packer agreement for a one year experimental period to quote on their price lists Prime and Choice government grades and to make available those two grades when requested.<sup>133</sup>

<sup>l</sup>The Van Gelder Market of Brooklyn which began using government grades on September 14, 1926, was reportedly the first retailer to do so. By February, 1927, about 40 retailers in the New York City area were reportedly buying grade stamped beef.<sup>139, 140</sup>

<sup>m</sup>Armour president, F. Edson White, had earlier written Sanders that the consumer and not the producer is the judge of quality and that many consumers do not want large amounts of fat.<sup>109</sup>



The sparks of the producer-packer conflict were not noticeably fanned by any general anti-packer sentiment. The retailer was the culprit. Even though the National Association of Retail Meat Dealers supported grading, there was general agreement that there were many dealers engaged in quality misrepresentation.<sup>100, 113, 141</sup>

Nor was there an outright refusal of the packers to grade at the Kansas City meeting.<sup>142</sup> Perhaps the editor of the *Hereford Journal* was correct in claiming the packers were simply delaying until the whole movement faded away.<sup>113</sup> There was only one minor mention of grading (it cannot be done and would not help prices if it could) in the *National Provisioner* reports of the October, 1926, convention of the Institute of American Meat Packers, which suggests that packers were not overly impressed with the magnitude of the Better Beef movement.<sup>143</sup> The compulsory grading bill of November aroused more packer attention and was attacked by Wentworth of Armour in an article, which argued that the bill would not accomplish its admittedly commendable purposes. His objections were:

- (1) Beef grades cannot be uniform nationwide because choice quality for St. Louis or Los Angeles consumers is much less than choice for New Yorkers.
- (2) The small proportion of consumers who will pay for high quality beef are doing so already.
- (3) Stigmatizing medium qualities with a mediocre grade tag will reduce their salability.
- (4) There would still be confusing and irritating price variation within grades.
- (5) The bill does not prevent retailer misrepresentation of quality.
- (6) The government would obtain more control of one of our most fundamental industries.<sup>144</sup>

None of these arguments were particularly persuasive to most of those within the Better Beef movement. However, the argument that grade marking would hurt the sale of lower grades was of first-rate concern to Western producers.

Quite obviously all three parties in this triangular conflict saw through a glass darkly as to the economic consequences of this untried grade marking scheme. Our present inability after three decades of experience to do much better should temper our appraisal of their arguments.

*Early Days of Grade Branding.*—An essential feature of the December, 1926, pact between the Better Beef Association and the packer representatives was that buyer requests for graded beef would be promoted through a special program in the National Live Stock and Meat Board. A. T. Edinger on leave from BAE took vigorous charge of the promotion. Contacts were made with buyers for eating places and with retailers; thousands of explanatory bulletins and posters were distributed; radio talks were made to consumers.<sup>120, 145, 146</sup> In the first year about 500 retailers in 200 cities signified a desire to feature the government stamp.<sup>147</sup>

Grade marking was begun on May 2, 1927; its popularity grew slowly but steadily.<sup>n, 120, 148, 149, 150, 151</sup> Only an insignificant proportion of the total beef supply was graded the first few years, but the graded proportion of the top two grades was sizeable.<sup>152, 153</sup> By the last six months of 1935, some 24 percent of all federally inspected Prime, Choice, and Good grade steer and heifer carcasses were federally graded, which amounted to 7 percent of all federally inspected carcasses.<sup>154</sup> The *Hereford Journal* editor felt that progress was painfully slow and doubted in April, 1929, if a single cut of government graded beef could be found in a Kansas City retail shop.<sup>155</sup> The better prices for Prime and Choice cattle in 1927 were probably much more an effect of a 22 percent decline in receipts of those cattle than of any grade-stimulated increase in demand.<sup>156</sup> However, this price up-turn helped Sanders and the midwestern group to see the early days of grading in a much more favorable light than the western producers.<sup>157, 158</sup>

The major packers paid government grading the high compliment of imitation, beginning with Swift 3½ months after government branding got under way. Ingwersen of Swift credited the grading experience as a primary factor in their decision to private brand.<sup>157</sup> Sanders greeted the Swift announcement enthusiastically while Hazelton of the *Hereford Journal* characterized it as a monkey wrench thrown into the machinery of government grading.<sup>157, 159, 126</sup>

Packer grading caught on rapidly; all the Big Four packers instituted private brands by the end of the year.<sup>160</sup> As of May 1, 1929, the equivalent of 148,675 carcasses had been branded privately as compared to 110,800 branded with government grades.<sup>150</sup> Packers began marking a third grade in June, 1930, and Armour added a fourth grade in January, 1932.<sup>161, 162</sup> The volume of carcasses marked in the third packer grade in

<sup>n</sup>This date is generally treated as the beginning of grade markings although it clearly is not, since stamped beef was in retail stores the previous year.

1931 considerably exceeded the total number of first and second grade.<sup>162</sup> The Better Beef Association, the leading packers, and the USDA agreed in early 1928 to mark "Good" grade.<sup>76</sup> Sanders viewed this change with foreboding and commented that Good is not literally good and that it "means only as much as the label No. 3 would mean."<sup>163</sup> That Good is today's Choice grade. It is hardly surprising that Hazelton approved the extension to Good grade and repeated his desire to obtain compulsory grading.<sup>164</sup>

The old charges that grading was unworkable had largely disappeared. Packing personnel displayed considerable enthusiasm for grades and brands.<sup>160</sup> However, large and small packers rather speedily developed differing preferences for private brands and federal grades, respectively.<sup>165</sup> Although large bargaining power had not yet developed on the buying side, the present-day attitudes of packers had begun to develop.

The Better Beef Association is last mentioned as a cooperating agency by the National Live Stock and Meat Board Report of June, 1930.<sup>151</sup> Presumably, with its purposes largely accomplished and then with its founders awash in the far greater problems of the Great Depression, the Better Beef Association was discontinued. The Association's successes compare favorably with those of limited and special purpose farm organizations.

### Later Grade Changes

The official standards have been revised periodically. A July 1, 1939, amendment provided for beef produced from steers, heifers and cows to be graded on a single standard. Since all beef eligible for a given grade was considered similar, the consumer could make his selection on the basis of grade name without reference to the sex of the animals. A provision was made, however, for recording sex classes on the wholesale grading sheets because sex classes affect the cutting yields.<sup>166</sup>

An amendment of October, 1949, eliminated all references to color of fat as a criteria in grading. Up to this time a yellow coloring of fat on the carcass would result in downgrading of the carcass. The greatest change in carcass beef standards occurred in December, 1950. The former Prime and Choice grades were combined and designated as Choice, the former Good grade was renamed as Choice. The Commercial grade was divided into two grades by designating the beef produced from young



animals in the top half of Commercial as Good while the name Commercial was retained for the remainder of the beef in that grade. In June, 1956, official standards were further revised. The Commercial grade was further divided into two grades on the basis of maturity with the beef produced from young animals being designated as Standard while the term Commercial was retained as the grade name for beef produced from mature animals.<sup>167</sup>

The official standards now applicable include eight grades for beef from steers and heifers, seven grades for beef from cows and six grades for beef from bulls and stags. The grade designations and the factors associated with each grade are described in detailed subjective terms. The major grade factors have been conformation, quality and finish.<sup>o</sup> These factors are concerned with the proportions of fat, lean and bone of the carcass, and the quality of the meat. The carcass grade is based on a composite evaluation of the three major factors as each is determined subjectively by the graders.

The present grade terms and the brief popularized description of the top six grades below indicate their present general orientation to serve as consumer grades.

Prime—"As the name implies, beef of this grade is highly acceptable and palatable. Prime grade beef is produced from young and well-fed beef-type cattle. The youth of the cattle and the careful intensive feeding which it has had combine to produce very high quality cuts of beef. Such cuts have liberal quantities of fat interspersed within the lean (marbling). These characteristics contribute greatly to the juiciness, tenderness, and flavor of the meat. Rib roasts and loin steaks of this grade are consistently tender and cuts from the round and chuck should also be highly satisfactory."

Choice—"This grade is preferred by most consumers because it is of high quality but usually has less fat than beef of the Prime grade. More of this grade of beef is produced than of any other grade. Choice beef is usually available the year round in substantial quantity."

Good—"This grade pleases thrifty consumers who seek beef with little fat but with an acceptable degree of quality. Although cuts of this grade lack the juiciness associated with a higher degree of fatness, their relative tenderness and high proportion of lean to fat make them the preference of many people."

Standard—"Beef of this grade has a very thin covering of fat and appeals to consumers whose primary concern is a high proportion of lean. When properly prepared, such beef is usually relatively tender. It is mild in flavor and lacks the juiciness usually found in beef with more marbling."

Commercial—"Beef that is graded Commercial is produced from older cattle and usually lacks the tenderness of the higher grades. Cuts from this grade, if care-

<sup>o</sup>Recent announcements state that "finish or fatness, is not used as a grade factor." *Agricultural Marketing*, January, 1959. This change is presumably a partial recognition of the present negative value to the retailer of excessive finish.

fully prepared, can be made into satisfactory and economical meat dishes. Most cuts require long, slow cooking with moist heat to make them tender and to develop the rich, full beef flavor characteristic of mature beef."

Utility—"Beef of this grade is produced mostly from cattle somewhat advanced in age and is usually lacking in natural tenderness and juiciness. The cuts of this grade, as they appear in the retail markets, carry very little fat but provide a palatable, economical source of lean meat for pot roasting, stewing, boiling, or ground-meat dishes. For satisfactory results, long, slow cooking by moist heat is essential.<sup>168</sup>

There are two additional grades of beef—Cutter and Canner—which are used almost entirely in processed meat products and rarely are sold as block beef. The grades described above apply to steer and heifer beef. Cow, bull, and stag beef is not eligible for the Prime grade.<sup>167</sup>

The proportion of beef that was federally graded was rather small at the beginning. By 1940, approximately 8 percent of the beef produced was federally graded. After the period of compulsory grading during World War II (September, 1942, to October, 1946), the proportion of federal graded beef leveled off at about 25 percent.<sup>169</sup> Compulsory grading was reinstated in 1952 and 1953 during the Korean conflict. About half of the total beef slaughter has been graded since then.<sup>152</sup> In 1955, six billion pounds of beef were federally graded, representing about 45 percent of the total beef produced.<sup>170</sup>

Some have attributed the growth of federal grading to demand of consumers for graded beef.<sup>169</sup> However, a number of studies have shown that consumers generally are not well informed on federal grades or on beef quality.<sup>171, 172, 173, 174, 175</sup>

The greatest growth in beef grading coincided with the increasing trend to large local chain and chain retail grocery supermarkets. Many of the chains have central procurement organizations and operate wholesale distribution centers. Grading has apparently simplified procurement of beef for these large retail organizations. The role of the large supermarkets and chain retail organizations in increasing the proportion of beef that is graded is in a very real sense an aspect of countervailing power.<sup>176</sup> It has placed stronger buying organizations for beef, which have large volume requirements, between consumers and the large national packers. In addition, competition among retail stores in some areas has forced some small retailers to offer federally graded beef.

The desire to popularize certain grade names was a fundamental motivation of the Better Beef Association. This desire has been especially

evident among retailers with the rapid growth of self-service merchandizing of meats. The popularization through extensive advertising of U.S. Choice by large chain retailers has introduced a number of pressures. These include pressures of cattle producers of certain areas to change boundary lines of grades and suggestions of new grade names that carry connotations which could be promoted and advertised. Often rather strange alliances are formed in the various movements to change grade boundaries or grade terms.

The realignment and emphasis on graded beef in retail distribution made it possible from the very beginning for some small independent meat packers without widely recognized brand names to use federal grading as a means of competing with recognized national brands of the large packers.

This change in retail use of federally graded beef, particularly since World War II, has rendered brand names less effective for the larger packers and in consequence has caused some controversy within the packing industry concerning federally graded versus packer graded and branded beef. Small regional packers have generally supported federal grading while the larger packers have increasingly tended to discredit federal grading for various reasons, particularly on grounds concerning the definition, designation of grade terms, and the number of grades. But fundamentally the concern about federal grading is the result of the changed competitive interrelationships of larger packers vis-a-vis the large retailers. A review of the controversy concerning federal grading and the implication of this impact on competitive relationships within the beef industry would be an interesting one, but it is beyond the scope of the present study.<sup>9</sup>

<sup>9</sup>Recent papers on this subject with somewhat different viewpoints include Willard Williams, *op. cit.*, and Elmer R. Kiehl, "Current Controversies Regarding Federal Beef and Lamb Grading," Unpublished paper, December, 1959.

## DEVELOPMENT AND ORIENTATION OF RESEARCH ON BEEF QUALITY

Organized research relating to beef quality began after the state agricultural experiment stations were established by the Hatch Act in 1888. The early work emphasizing testing of breeds reflected the great interest in improved breeding and the widespread contemporary controversies concerning the merits of the different breeds of cattle.

Among the earliest studies on beef quality was a study to determine breed differences as related to feeding and how breeds responded in "growth and flesh." At the conclusion of the study the animals were slaughtered and a simple taste test of the beef was conducted. It was concluded that the "best flavor" was ascribed to the youngest animal and that a "great development in size was not a necessary condition for quality." While the objectives of this research emphasized feed efficiency, this study was among the first to consider meat quality as an important objective.<sup>177</sup> The author concluded further that type was more important than breed—a conclusion that must have recognized the difficulties of obtaining representativeness of animals of the different breeds.

Another rather extensive study with enlarged objectives was conducted by Schweitzer, a chemist of Missouri.<sup>178, 179</sup> The objectives included feed efficiency among breeds but emphasized the following: weights of vital organs, bones, and other parts of each breed; tensile and crushing strength of bones and muscles; and the influence of breed on marbling of meat, character of fat to fiber and the positions of fat in the body.

In the fall of 1885, an effort was made to obtain ten cattle from each of the various national beef-breed associations which were to be selected by them as being representative of the respective breeds. Although the associations agreed to the plan they failed for various reasons to deliver the animals. It was not until late 1888 that the experiment was underway with four animals each of Shorthorns, Herefords, Angus, "grade" and "scrub" on a feeding trial. Ten of the 20 head were sent to Chicago in November of 1890 to be exhibited at the American Fat Stock Show and apparently attracted wide attention as demonstrating the results of a feeding experiment.

The National Association of Agricultural Colleges and Experiment Stations in annual session at Champaign, Ill., adjourned to attend the show and to visit the exhibit. It appears that this group was deeply interested in this work and urged that "block experiments" and a complete chemical analysis of each animal be made. Apparently the Secretary of Agriculture through Dr. W. O. Atwater, Director of U. S. Experiment Stations, and others offered use of laboratories for the chemical analysis because the benefits "accruing to the stock interests of our country and the cause of biological science throughout the world, would be of so much importance."<sup>179</sup> The Connecticut (Storrs) and Utah Experiment Stations each offered to bear one-third of the cost of the chemical investigations.

The fact that the Connecticut group offered assistance is significant because the proposed work was related to their own pathbreaking work in nutrition and in the chemistry of foods reported below. The animals, however, were returned to the Missouri Station for slaughter and detailed chemical analysis of the beef.

Circumstances surrounding this study indicate the intense interest in the breed controversy and the hope that was placed in this work in finding answers. Another raging controversy of particular relevance to meat exporters was the charge that American beef was more "watery" than English beef. A meticulously detailed chemical analysis of various cuts was completed and reported. Conclusions of interest to us are those in connection with the results on palatability or juiciness of meat. The breeds were ranked on this score. The popular breeds did not rank first and the "grade" carcasses ranked higher than some purebreds. These results were inferred to be representative of the breeds and no doubt did nothing to

allay the fires of the breed controversy. The sample of two animals from each breed, of course, was not large enough to make any generalizations in terms of breeds. These studies are of historical interest in beef quality research to indicate the early interest of chemists in this field and also that researchers became involved in the breed controversies.

A study in Germany reported on several years later must have cooled the interest of American workers in making further slaughter comparisons by breed. In a large study involving 28 cattle of each of three breeds no differences were found that could be attributed to breed influence although differences within breeds were found.<sup>180</sup>

It seems that research emphasis in the area of meat then turned to chemical analysis of meat and expanded to include both human and animal nutrition. This change in direction in research was largely due to the efforts of Dr. W. O. Atwater, chemist at Wesleyan University, Middletown, Connecticut, who also served as Director of the Connecticut Storrs Experiment Station.

The Connecticut Experiment Station, along with several others, began a series of studies on chemical composition of feedstuffs and the chemistry and economy of food. Those studies under the direction of Dr. Atwater, beginning in 1880, were probably the earliest and most comprehensive of this period. Included in the report of 1891 is information on the amounts of nutrients furnished by various foods "for 25 cents."<sup>181</sup> In addition, a study of "dietaries" of several hundred persons were reported on. This was the first comprehensive work in this country on nutritional aspects of foods although European scientists had been at work in this area for over a quarter of a century. This particular study, and those continued by these workers, related nutritional values in terms of the well-known three-fold division of protein, fat and carbohydrates to the cost of these in various foods.<sup>182</sup>

In a later bulletin these workers suggested that studies of digestion, preparation and cooking, be undertaken.<sup>183</sup> Further indicating their broad thinking they suggested analysis of the food materials available by geographical regions or markets and their relative costs. They stated much fuel was wasted in cooking and much food was "badly" cooked. "A reform in methods of cooking is one of the economic demands of our times."<sup>183</sup> These two workers undoubtedly were responsible for develop-



ing widespread interest in foods, their nutritive value and costs. Dr. Atwater, also authored a bulletin of the U. S. Department of Agriculture on this subject.<sup>184</sup> Mr. Wood published a bulletin two years later on meat composition and cooking.<sup>185</sup>

The amazing aspect of the work of these investigators is that fundamental knowledge of meats presented by them 60 years ago was quite accurate and extensive even when compared to present standards. Great emphasis is placed on the wastes of the different cuts of meat by Woods and he developed extensive tables of many beef cuts showing net edible portions of them. His recommendations on cooking beef of various cuts are identical to many of those made today.

The general orientation of these later studies continued largely toward the discovery of how energy from foods can be obtained most cheaply. This great concern about economy of foods and relative costs of various cuts was later extensively reflected in articles appearing in contemporary home journals and in the press, generally. This can be attributed largely to the work of the small group of workers which followed the same pattern.

From 1900 to 1920 research on meat quality continued at several institutions. Some emphasized cooking, preparation, nutrition, and relative economy of cuts, while others continued further studies in beef quality in a limited way.<sup>186, 187, 188, 189, 190, 191</sup>

The Illinois work on market classes and grades was a landmark but did not have an impact on livestock production and marketing practices until after World War I. However, it appears that the proposals made by Mumford and Hall, although not recognized uniformly and officially in the market place found their way into publications and the early textbooks on livestock production and marketing.<sup>192</sup>

It seems that beef quality research became submerged in this period by the increasing interests of researchers in state colleges and the Department of Agriculture in meat prices, markets, and marketing and the spread between live cattle prices and beef prices.<sup>193</sup> These seem to have been symptomatic of the time when the public began to awaken to the fact that a market problem had arisen with a new distributive system which they did not understand. The overriding preoccupation was mainly with

the "beef trust," high beef prices, and the low return of cattle feeding to cattle producers.

Research related directly or indirectly to meat quality began to expand greatly in scope and extent after the passage of the Purnell Act, February 24, 1925, which provided funds to state experiment stations for expanded research in economic and social relationships in agriculture although it did not limit support to studies of such problems.

Following its passage, the Executive Committee of the Association of Land-Grant Colleges called a conference of the presidents, deans, and directors to formulate plans for the promotion of cooperative research among state experiment stations and the USDA on a number of broad national problems.<sup>194</sup> This conference selected six national projects, one of which dealt with the "factors influencing the production and quality of meats." Special committees were appointed for the purpose of exchange and coordination of research for each of the six national projects. These special sub-committees operated within the framework of the Land-Grant College Association until 1931 when coordination and development of research in these research areas were discontinued by the association. However, in the intervening years an imposing research program had begun at a number of state experiment stations on various aspects of meat and meat quality under the guidance of the Committee on Meat Quality.

Subsequently this activity was organized on a voluntary basis among participating states through the use of annual summer conferences composed principally of workers in animal husbandry and home economics, and sponsored in part by the National Live Stock and Meat Board. One of the activities of this conference called the Conference of Cooperative Meat Investigations, was to exchange research results and to improve research techniques in this field. This conference also established a special review committee with the responsibility for reviewing and abstracting published and unpublished meat research results produced by the cooperating institutions since 1925. A review of the abstracts provides a bird's-eye view of the range and nature of these studies. Our interest in these relate to the beef quality studies, which were conducted largely independently in the various state and federal experiment stations.

Studies of the relationships of breeding and feeding to carcass yield and quality in terms of color of fat and lean were emphasized. However,

a large share of studies were conducted in line with present interests in discovering the relationships of feeding practices and age of cattle to palatability or eating characteristics of beef. In the late thirties more emphasis was placed on chemical and histological studies of the nature of meats and nutritional aspects of meats. The conference became inactive in the early forties. The last report of the Review Committee of the Conference was issued in 1946.<sup>195</sup>

## CONSUMERS AND BEEF QUALITY

General consumer recognition and knowledge of beef quality is still quite limited. Grade terms of dressed beef have been generally known in the wholesale meat trade and presumably these have carried useful guides to consumers through the retail dealers. However, studies have shown that a large proportion of consumers fail to recognize beef quality in cuts and are not acquainted with the current grade terms.<sup>173, 174, 175</sup>

While it can be presumed that a large proportion of consumers are unaware of factors that may make up quality of beef, it is likely that many have an appreciation of the differences in quality.

Some quality recognition of cuts and also recognition of differences in finish probably extend back in antiquity. It is said that the ancients prized the loin and other heavily muscled portion of the carcass. Beefsteak societies apparently were formed in England during the reign of Queen Anne (1702-14) "when the science of cookery had made great strides."<sup>196</sup> These clubs were frequented by the nobility and celebrities of the time and were formed for the purpose of eating beefsteaks "in perfection." Apparently badges were worn by the members of the clubs. The choice cuts of the loin were prescribed in detail and cooking preparations were almost ritualistic. There must have been several early societies. One of the better known clubs, the "Sublime Society of Beefsteaks," was founded in 1735.<sup>197</sup> Of course, only a few could indulge in the ecstasy of eating the choicest cuts of beef.

Early home journals carried articles on meat cookery largely relating cumulative experiences of beef cooking. Little scientific work in meat

cooking had been done prior to 1900. One of the earliest accounts prescribes cooking a "shoulder piece" of roast beef using a covered stone jar without liquid and baking long and slow. "This is cooking scientifically. A low heat long kept up softens the fiber of the toughest meat, the stone ware gives a tempered steady heat—." In this process "common pieces of beef come out in this way as tender and juicy as choice meats." And "if anxious for the tenderness of the (round) steak" it should be pounded, salted and peppered, then left stand overnight and boiled for breakfast.<sup>198</sup> The principle of slow cooking continues to be advocated today.

Considerable emphasis was placed on selection of cuts. Appropriate cooking methods also were regularly prescribed for the less tender cuts.<sup>199</sup> Broiling was recommended for the tenderloin and sirloin steaks but a "broiled round steak is neither tender nor palatable."<sup>200</sup> After 1910 suggestions for cooking seem to be based more explicitly on research studies on cooking beef which began after the turn of the century. However, a considerable number of articles continued to appear on cut selection and on preparing the less tender cuts of the round and the forequarter. Toughness seemed to be more explicitly recognized after 1910. One author suggested that the reason for toughness was often due to lack of "aging" and pointed out the necessity for aging the carcass to obtain greater tenderness.<sup>201</sup>

Contemporary household magazines also offered suggestions to the housewife for "marketing for beef." On selection of beef, a market reporter in 1887 prescribed that good beef will have "fine, smooth, open grain, a good wholesome redness of color and will feel tender, while the fat should be white rather than yellow."<sup>199</sup> She also offered caution about odor as indicating either freshly slaughtered beef or "over-kept" or tainted beef. Information on availability of "choicest" beef in the New York market appears in terms of pointing out the "dearth of Kentucky cattle which are usually depended on in this season."<sup>202</sup> In subsequent issues it informs its readers of the plentifulness in the market of "premium cattle from the Illinois stock farms." Hall was the first to describe the wholesale meat grades then in use in the Chicago market.<sup>58</sup> Later his ideas appeared in *Good Housekeeping* in an article, "Better Meat for Less Money." While stressing important price advantages of the less tender cuts, he suggests to readers that greater discrimination among beef quality is

needed. He outlined some of the criteria to be used as guides in selection. He states further that:

"Satisfaction in buying meat depends in large measure upon the skill of the purchaser in discriminating between the choice, good, medium, common, and inferior grades, and in taking advantage of discrepancies that exist between market prices and food values of many of the cuts. A time may come in the Utopian future when, as some have suggested, our Government can regulate and brand the quality as well as the purity of our products."<sup>203</sup>

The information on "quality" was provided for only a short time and the emphasis in "marketing" suggestions until the 1930s remained on cut identification and cut names and reflected the local variations in terms.<sup>204, 205</sup>

This aspect of unstandardized terms still exists despite the efforts of the National Live Stock and Meat Board and other agencies to standardize terminology and cutting procedures for retail cuts.

The wide range in seasonal availability of quality beef continued to be referred to and it was not until in the 1920s that so-called premium or choice beef was more available throughout the season. The sporadic availability made references to quality, as associated with territories, useful. On the other hand this was one of the reasons for the lack of standardization of terms concerning quality of beef useful to consumers.

Only general recommendations on meat selection and quality criteria were made by household magazines and home economists.<sup>201, 206</sup> Purchasing recommendations in the *Journal of Home Economics* were similar to those made by the household journals. For example, one author recommended that particular care should be exercised in selecting "a neat and sanitary shop." Too large a carcass and heavy brisket show age and coarseness and toughness and the outside of the carcass should be well covered with fat; however, hard fat in lumps indicates staleness. Lean should be well "streaked with veins of fat" and the flesh should be a bright red.<sup>207</sup> These apparently were the rough guides for quality selection for the housewife in her dealings with the local butcher. But the emphasis in the contemporary home journals remained on opportunities for economizing by utilizing the cheaper cuts of the carcass. Suggestions for preparing the "tougher" cuts were given at length reminding readers that they were just as nutritious.

The efforts of providing information on proper cooking methods and meat selection have continued. With a large share of the beef now graded



there is a general educational program in many areas to acquaint consumers with the existence of grades, and how each grade of beef can be prepared most advantageously. However, even with these efforts the consumers' knowledge of meat quality is limited.

It can be safely stated that consumers have never taken independent action as groups for the development of quality standards. Only indirectly was some attention given to problems of consumers concerning beef quality. The influence of consumers as a group was largely one of a passive nature. The "consumer movement" which is said to have begun in the 1920s coincided with the greater interest in standardization and labeling of food and household products. This was a generalized movement concerning better standards for consumers' goods, but it was essentially an amorphous effort on the part of many organizations and groups which more or less served as spokesmen for consumers. One author stated that "at no time was a conference called and a resolution drawn up to launch a consumer movement. Rather independent action by widely separated groups occurred, and as consumer elements were recognized, some cohesion developed."<sup>208</sup> In some instances, organizations and so-called spokesmen for consumers were not representative of the consumer interest but were exploiting possibilities of their own gains under the guise of the consumer interest.<sup>209</sup>

Work of public agencies probably produced the most useful results in developing grade standards. It was stated by one writer, for example, that while much food product grading was only at the wholesale level, the Bureau of Agricultural Economics had rarely lost sight of the ultimate consumer. Dr. Tenney, head of the Bureau, stated in 1928 that standardization work in the next decade would increasingly recognize consumer needs. "If our grades do not meet the consumers' demand to a large extent, if not wholly, they are not the right grades."<sup>210</sup>

The view that the beef grades, which had descriptions of wholesale origin, would serve as consumer guides was expressed shortly after the federal beef grading service was established. Sherman stated that "the grading work. . . . is designed to aid in the merchandising of meats under exactly the right grade names so that when a housekeeper says she wants a good grade roast or steak she can be sure of getting one."<sup>211</sup>

In summary, beef grade standards were not developed in response to expressed consumer interests, but were supported largely by beef cattle

producers and the meat industry. Producers expected to benefit by using grades to tap a larger share of the consumer budget. It was rarely questioned whether the grading standards distilled from wholesale market practices would be excellent guides for maximizing consumer satisfaction and consumer expenditures on beef. In the postwar struggle among beef production areas and between animal species, questions have once again been raised about the factors affecting meat palatability. The answers to date underscore the necessity of well-designed, large scale studies to define accurately that which is now known in part.

## SUMMARY

Improvement in the quality of American beef cattle was associated with the growth of a highly productive domestic market economy. Similarly, beef quality regulations and standards have developed from rather simple colonial standards to those of the present, having national significance and application.

Throughout the period of development of quality standards many forces were at work. However, the major force has been that imposed by the growth of commercial markets, made possible because of a highly productive society which could afford beef consumption. Market structures have changed through time and as a consequence have guided the nature of application of beef grade standards.

During the largely self-sufficient economy of the colonial period cattle were prized more highly for their work under the yoke and eventually for their hides than for their meat. The rapid growth of several important coastal cities by the time of the Revolutionary War stimulated growth of markets for live cattle. Post Revolutionary War pioneer settlements west of the Alleghenies soon turned their attention to economic potentials of cattle raising for eastern seaboard markets. Cattle raising provided an opportunity to market abundant grass and grains to eastern markets. In the pre-railroad period the significance of cattle droves testifies to the importance of cattle raising in newly opened territories to supply beef to growing cities.

Growth of cities increased economic opportunities for improvement of cattle emphasizing beef qualities. American cattlemen turned to importation of improved European cattle. Although many cattle importing

companies were organized beginning in 1834 there was little improvement in cattle until after the Civil War. By 1900 a significant improvement in beef characteristics of American cattle was noted. Although feeding of grain to beef cattle had been practiced since the Revolutionary period it was not until after 1900 that a significant proportion of cattle for beef were fed grain concentrates. Since then the impact of improved breeding and of feeding practices has resulted in an increasing proportion of block beef that is highly acceptable in comparison to even 25 years ago. An expanding market for quality beef was an essential prerequisite.

From the beginning cattlemen have accepted and recognized quality standards for at least two major purposes:

- (1) To aid cattlemen in identifying differences in quality so that their knowledge of price and quality would serve them in bargaining more effectively with buyers, butchers, and packers.
- (2) To assist in the promotion of quality products in order to exploit both foreign and domestic markets.

As early as mid-eighteenth century, identification and recognition of quality evolved at local livestock markets. Private market news reporting, developed from these crude beginnings and based on local market terminology, became an important characteristic of livestock markets. Private market reports in newspapers and market sheets became even more important with establishment of large markets and packing centers at major railroad terminals. However, national distribution of beef and interrelationship of livestock markets forced attention to the inadequacies of price reporting by individual markets where quality terminology was not uniform. The need for a national price reporting system using uniform terminology was met with the establishment of the federal market reports, beginning on beef in 1916 and on live cattle in 1918. Federal price reporting, initially based on uniform terminology developed at the University of Illinois, soon was based on official quality grade terms originated by the federal government.

Market reporting has always been an essential element of trading where quality or other value differentiating factors were important. Uniform quality terms will continue to be important as long as cattle are diverse enough in quality to bring significantly different prices.

Marking of beef carcasses with federal grades was promoted in the 1920s as a means of bolstering the badly sagging demand for purebred

cattle. Marking was promoted by producer groups who were convinced that packers and retailers were not doing an adequate job of promoting their particular beef. This promotion was not without controversy as western cattlemen doubted the advantage to themselves of a marking system which promoted well fed cattle.

Producers were persuaded that the retail structure composed of hundreds of thousands of small meat shops was allowing much misrepresentation of quality and was failing to develop a potential market for expensive, highly finished beef. The problems of correct quality regulations to promote highly finished beef for the domestic market were not nearly as simple as had been the case with minimum regulations for export markets. Researchers were quick to admit that they knew little about the relationship of beef eating qualities to various visual characteristics.

Fortunately for the cause of quick action, the U. S. Department of Agriculture had available a set of carcass grades used in connection with its price reporting work. These standards must have had some relationship to consumer acceptance, or they would not have been useful in price reporting. Perhaps the meager use of carcass grades before World War II discouraged any careful study of the benefits of grading, the recipients of those benefits, or a comparison with other grading systems. In fact, these promotional aims of grade marking appear to have been confused in many minds with the second purpose of grades—as an aid to price reporting. Cattlemen have accepted the use of federal grades as an essential part of price reporting. Private reporting of prices on the basis of local market terminology was fairly satisfactory until railroads and national packers developed a national market for cattle and beef.

The use of grades for promotion naturally provokes some controversy as to whose product receives the better promotion and as to the relative promotional effectiveness of various grading systems.

One major change in carcass grades has been made since 1927. This change reduced the fat content of top grades by combining Prime and Choice and renaming Good as Choice.

Some attention has been given by preference researchers to exploring other possible modifications in grades. Relatively little attention has been given to the tendency of many large retailers to concentrate their beef purchases within a very narrow segment of the quality range. However, the major cause of controversy has been at the packer-retailer level, where

grades have become a major part of trading specifications since their compulsory use in World War II. It is interesting that a grade marking system promoted in the 1920s by producers to stop small retailer "misrepresentation" of quality should be extremely popular in the 1950s with the management of large retail chains who use grades as aids in buying and/or merchandising.

There is need for a more general understanding of why we have beef grades and of the importance of rethinking the purposes and usefulness of grades as market demands and structures continue to change.

Organized consumer efforts to regulate beef quality were never important except in the scarcity economy of the early colonial days. While efforts were made to prevent sales at unfair prices or of unwholesome qualities, the regulations were seldom enforced stringently after 1750. Organized consumer groups were not an influence in obtaining the marking of grades in 1920s. This is not to say that those promoting the grades were not interested in consumer satisfaction. Since successful promotion depends upon consumer acceptance, promoters were interested in establishing grades with a maximum impact upon consumer demand.

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