

# The Hereford bull: his contribution to New World and domestic beef supplies\*

by Joan E. Grundy

## *Abstract*

The most recognisable characteristic of the Hereford breed of cattle is its white face. This prepotent feature confers an advantage where visual evidence of ancestry is needed, and has huge economic importance in the commercial cattle trade, far outside the confines of the pedigree world. Hereford bulls were used extensively to upgrade cattle populations when there was a need for increased and improved meat supplies. In the late nineteenth century, when unimproved range cattle were upgraded to useful beef animals, the Hereford was more successful internationally than at home. In mid-twentieth century Britain the breed dominated the commercial beef trade, due to demand for beef from dairy-bred calves. The paper offers insights into the interaction between the pedigree and commercial sectors of the livestock industry in the improvement of national cattle stocks.

The Hereford bull has had a major role in ensuring the beef supply of the world's first industrialized country since the nineteenth century, firstly when the White-face upgraded the range cattle of the world's temperate grasslands, replacing indigenous and mongrel cattle with its own trademarked progeny and then secondly, in the last half-century when an increasing proportion of our beef has been supplied by British farms. In both of these periods the Hereford's role as a crossing bull has been of crucial importance in maintaining New World and domestic beef supplies.

In livestock markets all over the country are found the cattle from which most stock farmers make a living, and which finish up on the nation's dinner plates as rump steak, stewing beef and ox tongue. The regular day-to-day trade in commercial cattle does not make the dramatic headlines of the elite pedigree world, yet these workaday cattle have been estimated to comprise around 98 per cent of the national herd.<sup>1</sup> Commercial cattle are by no means a random collection of different breeds and cross-breeds: many are well-bred but unregistered; some owe allegiance to a particular breed type; others are the outcome of planned cross-breeding programmes. They are the products of commercial decisions made by individual farmers who are all working in the same business environment, aiming to produce what the consumer, through the meat trade, demands. It is in this context that the Hereford bull has proved himself.

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<sup>1</sup> Calculated for England and Wales, Dec. 1919, Ministry of Agriculture and Fisheries, *Census of pedigree livestock (1921)*, p. 12. See also n. 44 for a US estimate.

Developed as draught oxen, Herefords are alert, active and well muscled. They are adaptable and efficient grazing cattle, hardy enough to convert forage to beef under a wide range of climatic conditions. The Hereford is the ideal farmers' beast, not needing extravagant labour-intensive housing, expensive oilcakes or costly veterinary attention. But, in addition to these essential assets, the key to the breed's sustained popularity is its distinctive trademark, its white face; positive evidence that a Hereford bull has been at work. It is a characteristic so prepotent that every Hereford bull passes it to each and every one of his calves, regardless of the dam's coat colour or pattern. This trait, 'colour marking', has considerable economic value in the commercial cattle trade, where visual evidence of ancestry is vital (Figure 1).

Although early agricultural writers knew of the prepotency of the 'white face',<sup>2</sup> crossing bulls were not important to nineteenth-century cattlemen. The national breeds – at first Bakewell's Longhorns, which were steadily ousted by the improved Shorthorns of Booth, Bates and the Collings – were dual purpose, producing both milk and meat. By the early 1860s, two-thirds of Smithfield cattle were Shorthorns or Shorthorn crosses.<sup>3</sup>

The Hereford was one of several highly localized breeds and types. Sixty-one per cent of the bulls named in the first Hereford herd book of 1846 were bred in Herefordshire; 90 per cent in the three adjoining counties of Herefordshire, Shropshire and Worcestershire.<sup>4</sup> There was little trade in breeding stock outside areas local to the breed, but the Hereford was especially valued by graziers. Both store and draught beasts travelled the midlands and south of England, making their way towards Smithfield.

Founder breeders had no need to consider the merits of crossing bulls; their objectives were to produce muscular plough oxen and quality beef animals. They developed the breed by selecting market cattle which most closely matched their ideal, mating them to bulls of their own shrewd breeding, then selecting the best heifer calves to mother the next generation. The early Hereford breeders believed that a good animal was never a bad colour. Mottled faces, black noses, and light roans were all seen in the foundation herds of the breed. Pioneer breeders such as Benjamin Tomkins of King's Pyon would never reject a good animal because of its colouring. Two of his foundation cows were a mottle-face and a 'grey' (light roan), and in 1848 the Hereford Agricultural Society instructed judges not to discriminate on the grounds of face or body colour.<sup>5</sup> The first volume *The Herd Book of Hereford Cattle* includes plates of the four colours 'usually seen among Hereford cattle'. Fifty-seven per cent of bulls were white-faced, but a *mottle-faced* with a dark crest (31 per cent) appears on the frontispiece; others are grey and light grey.<sup>6</sup>

By the mid-1830s the merits of the Hereford as a crossing bull for improving later-maturing

<sup>2</sup> For example, at Petworth, Sussex, Lord Egremont found that Hereford × Sussex and Hereford × Devon calves 'uniformly had white faces and bellies'. Rev. Arthur Young, *General view of the agriculture of the county of Sussex* (1813), pp. 231, 264.

<sup>3</sup> E. L. Jones, 'Hereford cattle and Ryeland sheep: economic aspects of breed changes, 1780–1870', *Trans. Woolhope Club* 38 (1964), p. 40 (repr. in id., *Agriculture and the Industrial Revolution* [1974]).

<sup>4</sup> T. C. Eyton, *Herd Book of Hereford Cattle* 1 (1846).

The calculation is based on the 540 bulls bred by 90 breeders whose locations were identified. Volume 1 lists bulls only, calved between c. 1797 and 1846.

<sup>5</sup> James Macdonald and James Sinclair, *History of Hereford cattle* (rev. edn, 1909), pp. 50, 137. (The 1909 edition was a revision by James Sinclair of an earlier edition of 1886.)

<sup>6</sup> Eyton, *Herd Book*, 1. Colour was specified for 62% of the total of 555 entries.

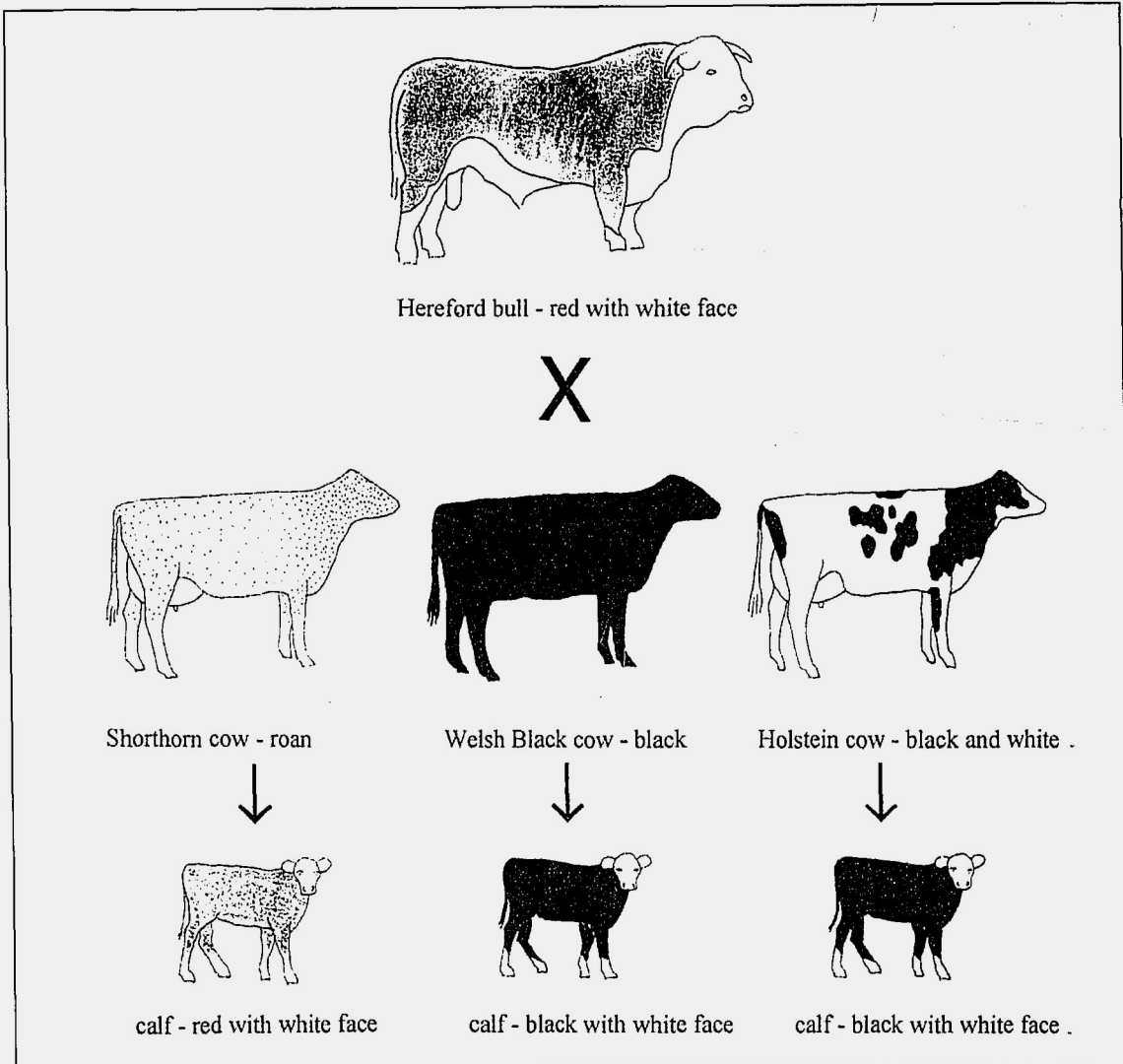


FIGURE 1. How a Hereford bull colour-marks his calves.

and less-meaty breeds were becoming appreciated, and the 'white face' recognized as the badge of the Hereford sire. An early printed reference, in 1834, describes the cattle which Radnorshire farmers had successfully improved. The Hereford cross produced a beast usually 'red or brindled, and the true white face of the Hereford marks the source whence the improvement in the stock was derived'.<sup>7</sup>

Over the following thirty years a definite preference for 'white-faces' became established among bull buyers and hence among bull breeders, indeed, in 1863 it was said that 'the all but universal appearance of the red-with-white-face Hereford is such, that when any animals of the

<sup>7</sup> William Youatt, *Cattle: their breeds, management and diseases* (1834), p. 58; also p. 30 on Devon: 'red with a white face which marks the Hereford cross'.

other classes are exhibited, the purity of their blood is questioned by those who are not cognizant of these facts'.<sup>8</sup> Although the ability of Hereford bulls to colour-mark their calves was recognized in the early decades of the nineteenth century, its potential as a marketable feature could not be exploited in the context of the cattle and meat trades of mid-nineteenth-century Britain. The right conditions for exploitation of this trait were created when strong demand from a growing industrial population for regular beef supplies coincided with the spread of speedy and reliable steam transport. The present paper shows how the colour-marking white face boosted the national beef supply, firstly in the late nineteenth century from North America's Great Plains, and secondly in the mid-twentieth century from the UK dairy herd.

## I

North America, the first major destination of British pedigree cattle exports, set the pattern of upgrading nondescript cattle with high performance European breeds, mainly British. By the 1860s Hereford cattle, along with other breeds, had found their way overseas in considerable numbers, but their real opportunities emerged with the settlement of the Great Plains. The period is well documented, partly due to the romance of the 2000-mile trail-drives of the cowboy era, immortalized by a legacy of Western films.

After the end of the American Civil War in 1865, railways pushed westwards across the prairies – the Union Pacific reached Abilene in 1867, the Canadian Pacific reached Calgary in 1883 – dissecting the buffalo ranges of the Great Plains.<sup>9</sup> Greater accessibility ensured the virtual extermination of the buffalo and the subjugation of native Americans by the late 1870s in the south and, up to a decade later, on the northern plains. To European eyes the land was now empty, and to stockmen the potential was obvious. The natural grasslands of the prairie would keep cattle the year-round just as they had kept the buffalo.

The governments of both the United States and Canada were keen to settle the West, and large enterprises quickly made use of the opportunities this provided. In the United States, the Homestead Act of 1862 allowed settlers to purchase after six months of residence, subsequent sales leading to aggregations into large holdings.<sup>10</sup> In Alberta, Canada, in 1881 individuals or corporations could apply for twenty-one-year leases of up to 100,000 acres at a cost of one cent per acre, to be stocked within three years at a density of one beast per 10 acres.<sup>11</sup> Canadian leases encouraged speedy stocking but, on all unfenced prairie, it was vital to lay claim to one's range by crowding out trespassing cattle. Investors from Europe and America moved in to furnish the capital, and cattle companies flourished.<sup>12</sup> For instance in 1882 the *Hereford Journal* featured a prospectus for the United States Cattle Rancho Company which proposed to purchase eight ranches in Colorado. £250,000 in £5 shares was needed to acquire ranging

<sup>8</sup> T. Duckham, *A lecture on the history, progress and comparative merits of the Hereford breed of cattle, read by him before the members of the Royal Agricultural College at Cirencester, Dec. 4 1863* (1863), p. 12.

<sup>9</sup> The term 'buffalo' (strictly bison) follows Frank Gilbert Roe, *The North American buffalo: a critical study of the species in its wild state* (1972), p. 3.

<sup>10</sup> Laurence A. Stoddart and Arthur D. Smith, *Range*

*management* (New York, 1955), p. 10.

<sup>11</sup> Chester Martin (ed. Lewis H. Thomas), *'Dominion Lands' Policy*, (Toronto, 1973), p. 179; also Shelagh Jameson, *Ranches, cowboys and characters: birth of Alberta's Western heritage* (Calgary, 1987).

<sup>12</sup> Ernest Staples Osgood, *The day of the cattleman* (Chicago, 1929, repr. 1957), pp. 94–97.

and grazing rights over 700,000 acres. The ranges were already stocked with 11,000 'well-graded Colorado cattle', that is, improved by the use of pedigree bulls from Great Britain, or by British strains. One hundred and fifty well-bred Hereford and Shorthorn bulls were also on the ranches.<sup>13</sup> A report of 1886 on eleven UK-financed cattle companies recorded the Cattle Rancho Company as leasing 153,607 acres on which were 13,500 cattle, the total capital being £105,600. The Prairie Cattle Company owned or leased 189,140 acres, with a herd of 124,212 head, and capital of £585,822.<sup>14</sup> One of the directors of the Dominion Cattle Company Ltd. (which wished to raise capital of \$800,000) was A. R. Boughton Knight Esq. of Downton Castle, Leintwardine (Herefordshire), a leading breeder of Hereford cattle. The president of the company, the Hon. M. H. Cochrane, kept Aberdeen-Angus, Hereford and Shorthorn cattle on his farms in Quebec and in 1881 leased 100,000 acres in Alberta. Company meetings were held in Montreal, but in 1884 an office was opened in Leintwardine.<sup>15</sup>

The combination of cheap land and overseas finance stocked the ranges at a phenomenal rate. In the United States, cattle numbers (excluding milk cows) in eleven western states had risen from 1.8 million in 1867 to 7.3 million by 1900.<sup>16</sup> On the Canadian ranchlands of southern Alberta, imports of cattle rose from 1352 head in 1880 to 16,282 in 1882; by 1886 estimates suggest there were 90,000 to 104,000 cattle in the 'grazing portion of the North-West'.<sup>17</sup> These cattle were largely drawn from Texas, which, with over three million cattle in 1870, was the great cattle reservoir.<sup>18</sup> Herds were trailed thousands of miles northwards to Colorado, Montana, and over the border into Canada. So great was the demand, a hotch-potch of stockers (store cattle), especially yearling and two-year-old breeding stock, was also moved west by rail from the old eastern states.

There were no indigenous cattle in the Americas, but by the mid-nineteenth century a 'collection' of cattle had become established. Settlers had shipped cattle to the New World for use as draught animals; as dairy cows for milk on the voyage; and as foundation stock for new herds in a new land. Animals of uncertain or mixed ancestry were widespread, and these found their way onto the plains, for pure-bred stock were too valuable to risk on the open range. The first cattle in the new territories, described in 1878, were of two main types. Texan cattle were of Spanish descent, with 'long, spreading, half-turned-back horns; long legs; thin, lanky body; big, ill-put-together bones, throwing the body high at the hooks and low on the rump and loins; ... generally yellow, red, roan, dun and black, with very often an iron-coloured stripe along the back'. The common cattle of Kansas, Colorado, Nebraska and the territories, descended from those introduced from several European homelands, were 'big-boned, too sharp along the back, too flat in the rib, and display too much muscle and far too little quality and evenness of flesh'.<sup>19</sup> Pioneer farmers in the New World saw Europe, especially Britain, as their market for

<sup>13</sup> *Hereford J.*, 2 Dec. 1882, p. 8.

<sup>14</sup> 'American cattle companies in 1885', *The Economist*, 20 Mar. 1886, p. 365.

<sup>15</sup> Hereford Record Office, A 74/504.

<sup>16</sup> The eleven states were Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington and Wyoming. Stoddart and Smith, *Range management*, pp. 3, 17.

<sup>17</sup> Simon M. Evans, 'Stocking the Canadian Range',

*Alberta History* 26 (1978), pp. 1-8. The prairie provinces of Alberta and Saskatchewan were carved from the Northwest Territories in 1905.

<sup>18</sup> Joseph G. McCoy (ed. Ralph P. Beiber), *Historic sketches of the cattle trade of the West and Southwest* (Kansas City, 1874, repr. 1966), p. 80.

<sup>19</sup> James Macdonald, *Food from the far west* (1878), pp. 30, 272.

the produce of the newly-settled land. Speedy and reliable steam transport, coupled with refrigeration, made it feasible to ship across the globe bacon and ham, cheese, butter and eggs – and also live cattle and fresh meat – all products which were more perishable than grain and wool. In 1884, the Wyoming Stock Growers' Association explored the possibility of exporting both 'beeves' and lighter cattle, via Montreal, 'to the very highest market, viz.: Great Britain'.<sup>20</sup>

The export from the United States to Great Britain of chilled meat, which began in the winter of 1875–6, was immediately seen as a threat to the UK producer. In 1877 the *Scotsman* despatched an agricultural journalist, James Macdonald, to North America for four months with the express purpose of reporting on the cattle industry and the meat trade. He assessed the cattle of the plains with a stockman's eye and his reports to the *Scotsman* were later re-published as *Food from the far west*.<sup>21</sup> (Although he favoured the Beef Shorthorn, James Macdonald was later to become co-author of the *History of Hereford cattle* and *History of Aberdeen-Angus cattle*.<sup>22</sup>)

Central to the expansion of the Hereford influence was Macdonald's recommendation to improve Spanish and common cattle. 'The beef of Texans, Cherokees, and the "common" American cattle ... will never meet a steady demand in Britain, or realize such prices as will remunerate its exporter – at least so long as it remains the quality it now is ... Texas beef ... is teasingly tough ...'. However, he considered that the beefing qualities of American cattle would be vastly improved over the next eight to ten years.<sup>23</sup> This would need the services of a vast number of well-bred bulls. Astute cattlemen, in both Britain and North America, began to promote their favoured breeds.

Both pedigree Shorthorns and Herefords had been introduced into North America in the second decade of the nineteenth century, and Aberdeen-Angus in the 1860s.<sup>24</sup> The Shorthorn, whose high-caste bloodlines were fashionable on both sides of the Atlantic, made the earliest headway with rapid expansion in the eastern states between 1866 and 1878.<sup>25</sup> But high priced, highly bred and highly fed favourites were unsuited to 'the iron environment of the open range', being too apt to hang around the homestead waiting for feeding time. Where improved Shorthorn bulls had been used, their progeny were leggy, and the bulls suffered in the Texan climate. There was urgent need for 'vigorous and impressive bulls that could stand grief and be depended upon to leave behind a progeny well adapted to the business of converting the wild grasses of the range into marketable beef ...'.<sup>26</sup> On the plains, cattle were

compelled to rustle for a living, not wholly when the air is soft and balmy and the grass green and abundant, but when it is dry and hard and even covered with snow for days and perhaps weeks at a time, the thermometer indicating 20 degrees or more below zero, driven before pitiless winds or forced to seek shelter beneath the rugged banks of hollows and ravines, with

<sup>20</sup> Osgood, *Cattleman*, p. 109.

<sup>21</sup> James A. Scott Watson and May Elliot Hobbs, *Great Farmers* (1951), p. 283.

<sup>22</sup> James Macdonald and James Sinclair, *History of Hereford cattle* (1886, rev. edn 1909); id., *History of Aberdeen-Angus cattle* (1910). Macdonald became Secretary of Royal Highland and Agricultural Society and his *Food from the far west* was studied in North America as well as in Britain.

<sup>23</sup> Macdonald, *Food from the far west*, pp. 47, 265, 293.

<sup>24</sup> James R. Barclay and Alexander Keith, *The Aberdeen-Angus breed: a history* (1958), p. 589; Macdonald and Sinclair, *History of Hereford cattle* (1909 edn), p. 295; James Sinclair, *History of Shorthorn cattle* (1907), p. 583.

<sup>25</sup> Sinclair, *Shorthorn*, pp. 607–11. See also J. R. Walton, 'Pedigree and productivity in the British and North American cattle kingdoms before 1930', *J. Historical Geography* 25, (1999), pp. 445–7.

<sup>26</sup> Alvin H. Sanders, *The story of the Herefords* (Chicago, 1914), pp. 417–8.

only snow for a bed and an angry sky for a cover. These are the conditions through which all range cattle are compelled to pass or perish ... [Ranchers] ... have generally adopted Herefords on account of their hardihood, activity, and self-reliance ... coupled with their aptitude to fatten on grass without other feed, and their wonderful impressiveness as sires, will always make the white-faces more popular than any other breed with our ranchmen.<sup>27</sup>

The most important promoter of the Hereford breed in the West was T. L. Miller. In 1872, while still running a fire and life insurance business in Chicago, he founded his Hereford herd at Beecher, Illinois. Miller purchased foundation stock in Ohio and in Ontario, Canada: in 1880 he travelled to England to purchase animals direct from the principal Hereford breeders. Miller quickly recognized both the opportunities on the Great Plains and the potential of the breed to take advantage of them.<sup>28</sup> His almost single-handed efforts launched Hereford cattle in the West. In 1874–5 he began to send pure-bred bulls by rail from his farm in Illinois to Denver, Colorado, and in 1876 to Las Animas on the Arkansas river; these bulls were bought by cattlemen from as far away as Wyoming and New Mexico.<sup>29</sup> The prepotent white face ensured that the first cross of the Hereford bull on range cows colour-marked the calves, providing immediate evidence of improvement and an instant impression of uniformity. C. M. O'Donel, manager of the Bell Ranch in New Mexico, noted that 'the popularity of the Hereford on the range is due undoubtedly to his conspicuous, uniform and attractive coloring which proclaims the blood even to the most inexperienced'.<sup>30</sup> This was a vital asset – Shorthorn crosses appeared in motley colours – yellow, red, black and brindle.<sup>31</sup>

As James Macdonald observed, the open, unfenced ranges made it impossible for a rancher to be certain that 'his own sires only shall mingle with his own cows'.<sup>32</sup> This restricted the use of pure-bred bulls, and economical fencing of range grazings had to await the coming of cheap barbed wire in the late 1870s.<sup>33</sup> In any case, the sheer number of improved bulls required to service the millions of 'narrow-chined, bad-backed'<sup>34</sup> plains cows posed problems of supply. Obtaining and multiplying pedigree animals quickly was a major obstacle. But even as little as a quarter-grade Hereford bull would produce white-faced progeny and therefore pure-bred bulls were not essential for the first stages of improvement. The early demand from the range was for grade (part-bred) bulls.<sup>35</sup> Farmers and stockbreeders in the Mid-West began the business of crossing pure-bred Hereford bulls with common and Shorthorn cows in order to rear grade bulls for the range. This, of course, also stimulated demand for pure-bred Hereford bulls.

Anecdotal evidence gives some idea of the size of the trade. In the mid-1880s T. L. Miller sold, to one cattle company in one season, 40 head of thoroughbred Herefords and 150 head of high-grades.<sup>36</sup> It was reported that, between 1882 and 1890, another cattleman, O. H. Nelson,

<sup>27</sup> Colorado rancher W. E. Campbell, quoted in T. L. Miller, *History of Hereford cattle* (Chillicothe, Mo, 1902), p. 523.

<sup>28</sup> Sanders, *Herefords*, pp. 348, 358, 433.

<sup>29</sup> Miller, *Hereford*, pp. 229, 322.

<sup>30</sup> Sanders, *Herefords*, p. 793.

<sup>31</sup> Miller, *Hereford*, p. 488.

<sup>32</sup> Macdonald, *Food from the far west*, p. 269.

<sup>33</sup> Osgood, *Cattleman*, p. 191; Walter Prescott Webb, *The Great Plains* (Boston, 1931), p. 309.

<sup>34</sup> United States Consular Reports, *Cattle and Dairy Farming* (Washington, 1887), p. 172.

<sup>35</sup> *Ibid.*, p. 113. The progeny of a Hereford bull and a common cow (or one of any other breed) is termed a 'half-grade', referring to the proportion of Hereford blood. A half-grade crossed with a purebred Hereford produces a three-quarter-grade; a half-grade Hereford × any other breed or cross produces a quarter-grade Hereford.

<sup>36</sup> Macdonald and Sinclair, *History of Hereford Cattle* (1886 edn), p. 311.

placed over 10,000 high-grade Hereford bulls on the ranges of the Texas panhandle.<sup>37</sup> Indeed, so severe was the scarcity of Hereford bulls that nearly all males were kept for use as sires, leading to a shortage of grade Hereford steers for the 1882 Chicago Fatstock Show: '... there has been such a demand for grade Hereford bulls to go west and south ... scarcely any [steers] can be got ...'.<sup>38</sup>

There is only anecdotal evidence of numbers of Hereford cattle exported to the United States during the crucial years 1880–86. The *Hereford Journal* reported news of the latest shipments in a regular column, 'Hereford Notes', usually gleaned from *Bell's Weekly Messenger*, which in 1884 estimated that during the previous five years 3900 to 4000 head of Herefords were exported to the United States, but no more than 200 head prior to 1880.<sup>39</sup> The early 1880s became known as the 'Yankee Boom' in Herefordshire as American buyers and their agents trawled the top breeding farms and bid recklessly at sales.<sup>40</sup> Earlier writers have recorded the excitement at celebrated sales where American buyers were prominent.<sup>41</sup> Almost the whole Stretton Court herd of 95 head was purchased in 1882 by A. H. Swan of Cheyenne, who became president of the Wyoming Hereford Association when it was founded the following year.<sup>42</sup>

Disparate data, of varying reliability, allow some assessment of the distribution of pedigree Hereford cattle, their extending influence, and their relative importance compared with other breeds in the period c. 1880 to 1920. Table 1 and Figure 2 show how the breed invaded the Great Plains after 1886. Figures 3 and 4, both based on the 1920 United States Census of Pedigree Cattle, shows the dominance the Hereford had achieved within a period of forty years. Figure 3 shows the importance of the mid-west as a source of well-bred Herefords; Figure 4 demonstrates the breed's complete dominance in the west and southwest. The latter point was emphasized in a report the *Hereford Times* carried on the census. The newspaper pointed out that, although total numbers of the main British beef breeds were, respectively, Shorthorn, 416,000; Hereford, 405,582; Aberdeen-Angus, 108,512, in the ranching state of Texas, where climatic conditions were severe, water scarce and grass poor, there were 70,000 Herefords, 4,000 Shorthorns and 2,000 Aberdeen-Angus, 'proof indeed of the superiority of the Hereford as a ranching breed'.<sup>43</sup> However, Table 1 and Figures 3 and 4 all underestimate the influence of pedigree Herefords on commercial cattle stocks in the West, as all data refer to animals registered in the American herd book. As only 3 per cent of beef cattle in 1920 were registered purebreds, hundreds of thousands of high-grade Herefords and their crosses are not acknowledged.<sup>44</sup>

So swift was the success of the Hereford that, by 1883, grade Hereford steers, unknown there

<sup>37</sup> J. Evetts Haley, *The XIT ranch of Texas and the early days of the Llano Estacado* (Chicago, 1929), p. 187.

<sup>38</sup> Miller, *Hereford*, p. 248.

<sup>39</sup> Sanders, *Herefords*, pp. 517–9. But see p. 87 below for restrictions imposed by American breeders on imported Herefords from 1883.

<sup>40</sup> The effects of the 'Yankee Boom' years in Herefordshire are the subject of a further study.

<sup>41</sup> Hereford Herd Book Society, *Hereford Breed Annual and Breeders' Guide 1923* (1923), pp. 7–12; id., *Hereford Breed Annual and Breeders' Guide 1924* (1924), p. 19; Macdonald and Sinclair, *History of Hereford cattle* (1909

edn); Miller, *Hereford*, p. 430. E. Heath-Agnew, *A history of Hereford cattle and their breeders* (1983).

<sup>42</sup> Osgood, *Cattleman*, p. 138; Macdonald and Sinclair, *Hereford* (1886 edn), p. 240.

<sup>43</sup> *Hereford Times*, 15 Oct. 1921. A distribution map from this newspaper report, 'States where Herefords predominate', is reproduced in Robert Wallace and J. A. Scott Watson, *Farm livestock of Great Britain* (1923), p. 112.

<sup>44</sup> The United States census of 1890 estimated that fewer than 1% of all cattle were pedigree. Walton, 'Pedigree and productivity', p. 457.



TABLE 1. Distribution of Hereford cattle in the USA, late nineteenth century to 1920.

	Eastern states (%)	States west of Mississippi river (%)	Total number
Cattle imported 1848-86	57.3	42.7	3703
Registered cattle alive in 1914 <sup>a</sup>	19.3	79.1	118,130
Registered cattle in 1920	6.7	84.3	369,111

Note: <sup>a</sup> based on an estimated 120,000 registered cattle living in 1914: the table excludes states with fewer than 250 head.

Sources: 1848-86 and 1914: Alvin H. Sanders, *The story of the Herefords* (1914), pp. 518, 1043. Sanders estimates no more than 200 prior to 1880; 1920: United States Department of Agriculture, *Yearbook 1921* (1922), p. 239. Data give the location of 91 per cent of the total of 405,482 registered Herefords at 1 January 1920.

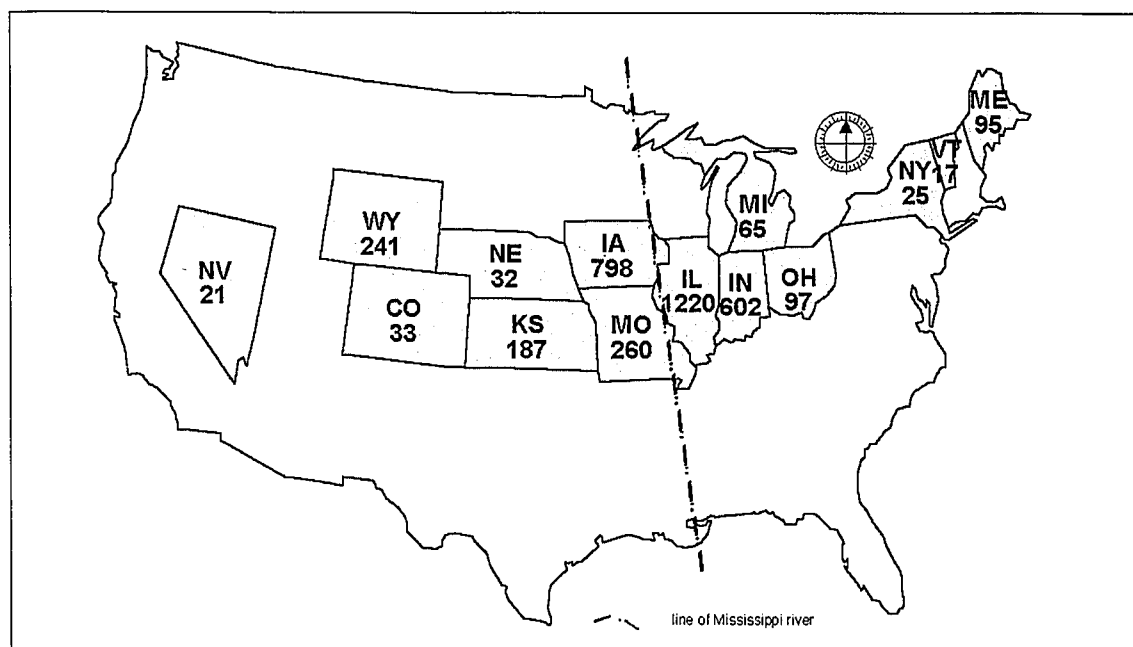


FIGURE 2. Destinations of 3703 Hereford cattle imported into the USA, 1848-86.

Source: as Table 1

five years earlier, were making top prices in the stockyards of Chicago, St. Louis and Kansas City.<sup>45</sup> By 1911-12 the noticeably longhorned range animal was rarely seen in the Chicago stockyards.<sup>46</sup> In 1923, two of the livestock industry's most knowledgeable commentators wrote that, as a result of Hereford influence, especially in the West, 'the beef industry of the United States was revolutionized'. The acceptable beef animal changed from the four- or five-year-old 2000 lb. ox to the fifteen- to eighteen-month-old superior quality steer.<sup>47</sup>

<sup>45</sup> Miller, *Hereford*, p. 318.

<sup>46</sup> *ICS Reference Library*, no. 242, section 49 (Scranton, Pa, 1913), p. 49. For data on the increased liveweight and higher value of upgraded beef cattle in Colorado,

Wyoming and Illinois, see Walton, 'Pedigree and productivity', p. 457.

<sup>47</sup> Wallace and Watson, *Livestock*, p. 112.

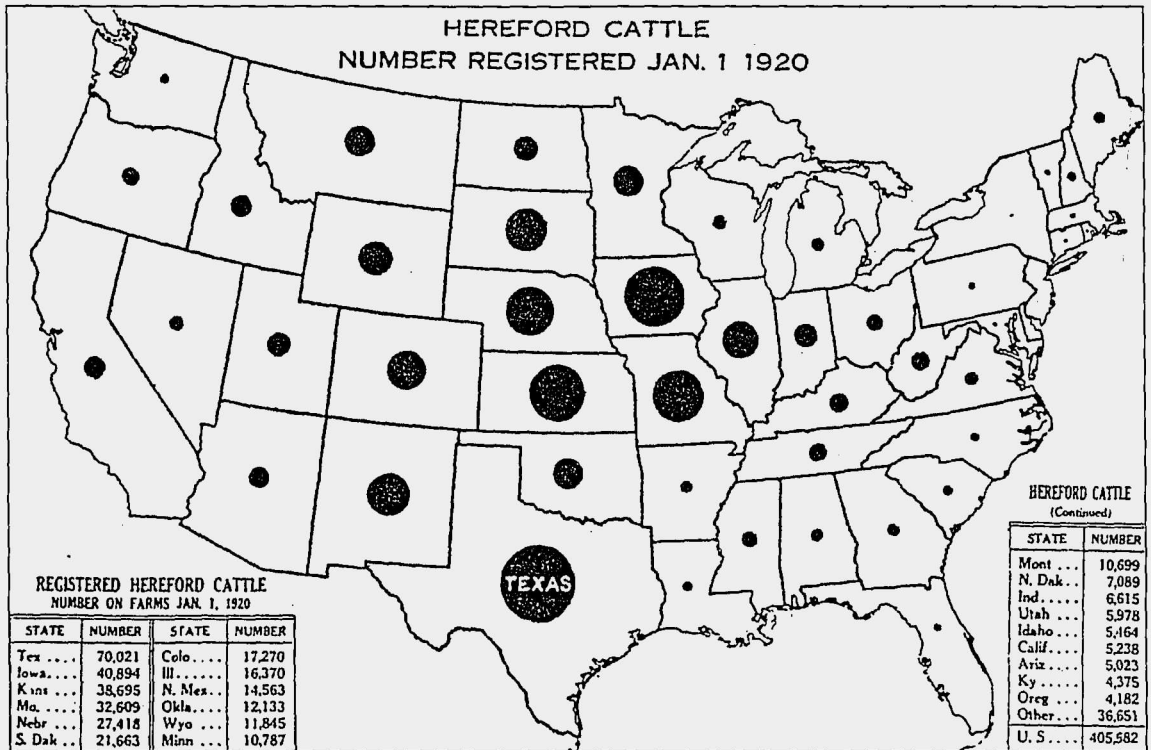


FIGURE 3. Distribution of registered Hereford cattle in the USA, 1920.

Source: as Table 1.

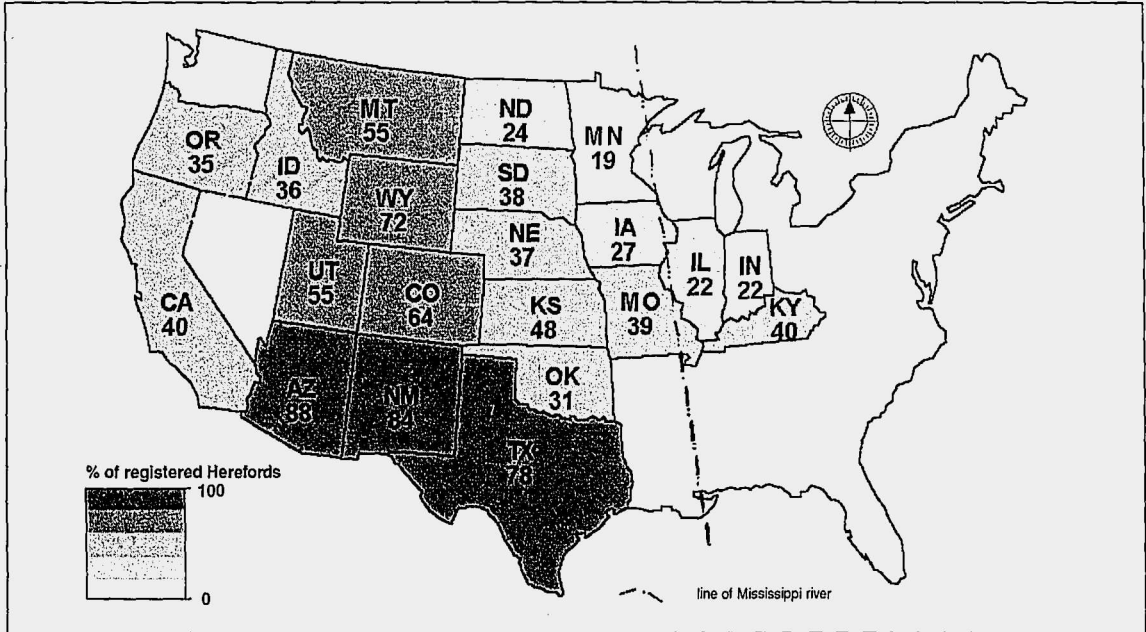


FIGURE 4. Hereford cattle as percentage of all registered beef cattle in the USA, 1920. In Rocky Mountain semi-arid states the Hereford is clearly dominant.

Source: as Table 1.

TABLE 2. Sources of beef imports, 1877 to 1924

Source	1877 (%)	1886 (%)	1910 (%)	1924 (%)
Europe	52.4	20.9	6.2	4.1
North America	47.6	79.1	24.8	1.6
South America			57.3	90.4
Australasia and South Africa			11.6	3.8
Total '000 tons	84	139	176	220

Notes: Figures for 1877 and 1886 are for live cattle and beef imports into the UK. Figures for 1910 and 1924 are for beef and veal sold through Smithfield Market. Total beef and veal imports into Great Britain and Ireland were (in '000 tons): 1910: 426; 1924: 640.

Sources: 1877 and 1886: P. G. Craigie, 'Twenty years' changes in our foreign meat supplies', *JRASE*, sec. ser., 23 (1887), pp. 465-500; 1910: Loudon M. Douglas, 'The meat industry in its relation to agriculture in the United Kingdom', *ibid.*, 71 (1910), p. 137; 1924: Ministry of Agriculture and Fisheries, *The trade in refrigerated beef, mutton and lamb* (Economic Series No. 6, 1925), pp. 58, 61.

Many of the cattle thronging the Kansas City and Chicago stockyards were destined for Great Britain. Both the threat to the British livestock industry, identified by *The Scotsman* in 1877, and the prediction by James Macdonald of improvement in eight to ten years, had become realities. In 1877 North American supplies of live cattle and beef were almost equal (by weight) to European supplies; nine years later they were four times greater (Table 2).

The Hereford's success on the Great Plains was founded on qualities which were valued in the Welsh Marches. It was an early-maturing animal, and an economical converter of grass to quality beef. Its ability to forage in the most hostile of environments, outwintering in the foothills of the Rockies and thriving in the arid deserts of New Mexico, soon became known in other grazing regions of the world. Its reputation for easy calving commended the breed to graziers and ranchers whose herds had to thrive without close supervision, yet be sufficiently docile to handle when necessary. From late in the nineteenth century reliable records survive of the numbers of registered Hereford cattle exported from Great Britain, and of their destinations. In the decade ending 1900-01, although North America was still taking 51 per cent of these exports, there was now strong demand from South America which accounted for a further 40 per cent. Three decades later (ending 1930-1), 62 per cent of exported registered Herefords went to South America, while North American demand had almost dwindled away.<sup>48</sup> The reorientation of the export trade was paralleled in the origins of imported meat supplies, now vital in feeding a growing industrial population. From the last quarter of the nineteenth century improved cattle began returning to the UK, both as carcasses and as live store and fat cattle. At first a high proportion was sourced from North America, but after 1900 South American supplies predominated (as may be seen in Table 2).<sup>49</sup>

By the 1930s, the Hereford could legitimately claim to be 'The Universal Beef Breed' (Figure 5,

<sup>48</sup> Hereford Cattle Society Offices, Hereford, Exportation Certificate Book.

<sup>49</sup> Between 1841-50 and 1900-4, meat imports increased

from nil to 41 per cent of total supplies. Richard Perren, *The meat trade in Britain, 1840-1914* (1978), pp. 3, 124, 208.

**HEREFORD CATTLE**

ALWAYS REDUCE THE COST OF BEEF PRODUCTION.

More Calves at Branding Time.      Fewer Deaths from Disease.  
Better Condition under Hardships.      Greater Weight in Shorter Time.

**The Universal Beef Breed**

The London Smithfield Club Results show:—HEREFORDS are on Top  
in Average Weights in Early Maturity Classes.



**EL GANADO HEREFORD**

REDUCE SIEMPRE EL COSTO DE PRODUCCIÓN DE CARNE.

Hay más terneros para las herranzas, menos muertes por enfermedad.  
Mejores condiciones de resistencia. Mucho más peso en tiempo mas corto.

**La Raza Universal de Carne**

Segun el Smithfield Club de Londres, el ganado HEREFORD esta por  
enfema en los pesos medios de las clases precoces.

WRITE FOR ALL      **W. G. C. Britten, Secretary,**  
PARTICULARS TO:      **The Hereford Herd Book Society,**  
ESCRIBA Y PIDA TODOS      **HEREFORD, ENGLAND.**  
LOS DETALLES A:

FIGURE 5. An example of Hereford breed society publicity, 1930.

Source: R. de Toll, *International Directory of Pedigree Stockbreeders* (1930–31).

which also shows the growing interest in Spanish-speaking markets), graphically illustrated by the sign above the entrance of the Hereford Cattle Society offices – the sculptured figure of a Hereford bull dominating the globe. At the end of the twentieth century, it could be said that the Hereford was ‘probably the most numerous and widely distributed beef breed in the world’ and had contributed to the genetic make-up of at least two dozen breeds worldwide. Twenty-five countries had their own Hereford herd books, with over 30 million cattle registered.<sup>50</sup>

## II

Despite success in pastoral countries worldwide, the Hereford remained extremely localized in its native land. The 1908 census of breed type of all cattle (not just pure-bred) in Great Britain demonstrated the overwhelming numerical superiority of the dual-purpose Shorthorn. Cattle of Shorthorn type were 64 per cent of the total herd of 4.5 million beasts; Hereford types amounted to only 6 per cent.<sup>51</sup> The 1919 *Census of Pedigree Livestock* revealed that the Hereford was one of the most localized breeds. Although there were nearly 12,000 pedigree Herefords in England and Wales, only nine English counties had more than 50. Seventy-one percent of

<sup>50</sup> Valerie Porter, *Cattle: a handbook to the breeds of the world* (1991), pp. 62–4; Hereford Cattle Society, breed publicity, 1996.

<sup>51</sup> Board of Agriculture and Fisheries, *The agricultural output of Great Britain* [Cd 6277] (1912).

pedigree Herefords were still to be found within the three counties of Herefordshire, Shropshire and Worcestershire (81 per cent if Breconshire is included). In contrast, out of a total of 36,000 pedigree Shorthorns, only Devon had fewer than 50.<sup>52</sup> Whilst it is remarkable that a breed which had colonized every continent of the globe had such restricted distribution in its native country, this was to change dramatically in the next half-century. As the pastoral countries of the New World (the destinations of British pedigree beef bulls) were becoming more industrialized, the imported beef on which we had formerly relied was increasingly being consumed in the countries of origin. In 1938, for example, 27 per cent of the meat produced in Argentina was exported; in 1954 this had dropped to 8 per cent.<sup>53</sup> Post-war government policy was in any case directed towards achieving greater self-sufficiency in temperate foods.

Wartime emphasis on milk production had accelerated a growing trend towards pure dairy breeds, and milk production continued to be profitable after World War II. The quest for higher milk yields led to specialized dairy breeds, particularly the British Friesian, ousting the dual-purpose Shorthorn (Table 3). The change to bony, angular dairy breeds meant that the living by-products of milk production – the bull calves, surplus heifers and cull cows – were less suitable for beef production than had been the dual-purpose types. (Cull cows supplied about 40 per cent of home produced beef in 1939.<sup>54</sup>) Since only a quarter of each year's crop of heifers was needed for dairy herd replacements, three quarters of the heifers and almost all of the bull calves would, if of suitable beef type, be available for fattening. This huge potential meat supply was a wasted resource. In Great Britain in the 1930s and 1940s, a million 'bobby' calves, fit only for pie meat and manufacturing, were slaughtered every year.<sup>55</sup> Not only was there wastage of calves which could be reared, there was also an urgent need to upgrade surplus dairy-bred calves into stock with recognisable beef-producing potential.

The nature of the cattle trade in the United Kingdom was such that commercial beef animals seldom remained throughout their lives on the farms where they were born. Calves judged likely to be worth rearing could change hands several times as store cattle before finally arriving on fattening farms. To encourage the rearing of the right type of calf, beef potential had to be recognisable at every stage of growth, from week-old calf to store beast 'close to profit'. The problem was remarkably similar to that in North America 60 or 70 years earlier: how to bring about country-wide improvement in the beefing qualities of the national herd – and quickly.

Dealing with calf wastage was straightforward. A government calf subsidy scheme was started in 1947 to encourage rearing of calves suitable for beef production or for breeding replacements in dairy or beef herds. In 1952 payments were restricted to steers of beef type, and to heifers suitable for beef breeding.<sup>56</sup> Upgrading the calf crop by mating lower-yielding dairy cows to beef bulls required a different strategy. As in North America, it would take time to multiply the necessary stud bulls, but following legislation aimed at improving the quality of bulls used

<sup>52</sup> Ministry of Agriculture and Fisheries, *Census of pedigree livestock* (1921). See also J. R. Walton, 'Pedigree and the national cattle herd, c. 1750–1950', *AgHR* 34 (1986), p. 156.

<sup>53</sup> G. P. Hirsch and K. E. Hunt, *British agriculture: structure and organisation* (1957, rev. 1960).

<sup>54</sup> Viscount Astor and B. Seebom Rowntree, *British*

*agriculture: the principles of future policy* (1939), p. 153.

<sup>55</sup> H. F. Marks (ed. D. K. Britton), *A hundred years of British food and farming: a statistical survey* (1989), table 17.5.

<sup>56</sup> W. E. Bowden, *Beef breeding, production and management* (1962), p. 337.

TABLE 3. Changes in sire type, England and Wales, 1936/37 to 1950/51

	<i>Beef</i> (%)	<i>Dairy</i> (%)	<i>Dual-purpose</i> (%)
1936/37 <sup>a</sup>	16.5	14.5	68.5
1937/38	16.0	15.1	68.6
1938/39	16.0	16.1	67.7
1939/40	16.0	17.6	66.4
1940/41	15.6	20.1	64.2
1941/42	14.3	24.4	61.3
1942/43	12.5	30.3	57.1
1943/44	10.8	36.3	52.9
1944/45	11.0	39.2	49.8
1945/46	12.0	39.4	48.6
1946/47	12.8	39.4	47.7
1947/48	12.5	42.4	45.1
1948/49	12.5	46.6	40.8
1949/50	12.8	50.8	36.4
1950/51	13.9	52.6	33.5

Note: <sup>a</sup> not all bulls were classified by type.

Source: data supplied by the Ministry of Agriculture, Fisheries and Food. Based on numbers of bull licences issued, England & Wales; data presented as three-year moving averages.

for service, the use of grade bulls was not acceptable in United Kingdom.<sup>57</sup> Instead, the government made use of the recently established national cattle artificial insemination (AI) service, now increasingly used in dairy herds.<sup>58</sup> This had the potential to bring about upgrading far more rapidly than by natural mating. Freetown Vanguard, one of the most prolific Hereford bulls, sired more than 50,000 calves during his ten years of AI service.<sup>59</sup> To ensure that beef-cross calves were readily identifiable to a potential buyer, in 1947 the government introduced free inseminations from bulls of colour-marking breeds. These were Aberdeen-Angus, Galloway (both of which sire black, polled calves) and, of course, Hereford. Naturally, colour-marked calves were eligible for calf subsidy and this meant a higher price for the week-old calf. So successful was this scheme that the subsidy on beef inseminations was halved two and a half years later, and withdrawn in 1951.<sup>60</sup> The effects on the demand for both beef AI services and for beef crossing bulls were dramatic (Figure 6).

Not only was there a general shift towards the use of beef sires, the ability to colour-mark his calves became an increasingly important attribute for a beef bull (Figures 7–8). Colour-marking

<sup>57</sup> Improvement of Livestock (Licensing of Bulls) Acts: 1922 Northern Ireland; 1931 Scotland; 1934 England and Wales. William C. Miller and E. D. S. Robertson, *Practical animal husbandry* (1952), pp. 583–7.

<sup>58</sup> Established in 1945, Bowden, *Beef breeding*, pp. 85–6.

<sup>59</sup> *Farmers Guardian*, 21 Mar. 1975.

<sup>60</sup> Bowden, *Beef breeding*, p. 113.

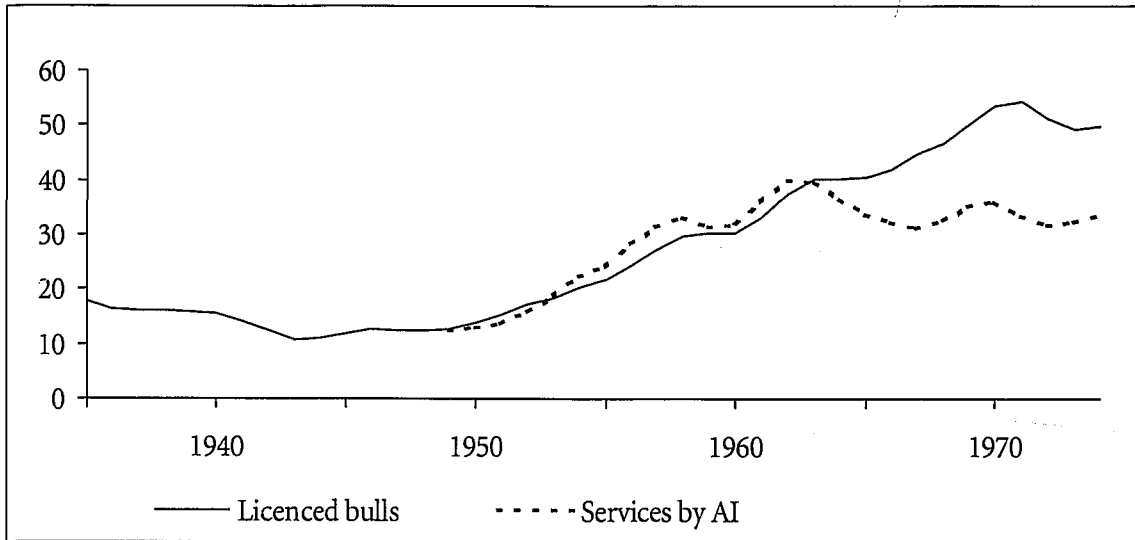


FIGURE 6. Demand for beef sires as percentage of total sire demand, 1935-74.

Sources: Licenced bulls: as Table 3. A.I. data: Milk Marketing Board (MMB), England and Wales. Data presented as three-year moving averages.

was (and remains) *the* most important feature of AI beef, due to the breeding in dairy herds of calves intended for sale. From 1950 until the early 1980s (apart from the three years 1956-58) the Hereford was responsible for more than half of all beef inseminations. Its only serious rival was the finer-boned Aberdeen-Angus, preferred by some dairy farmers because the incidence of difficult calvings in Friesian-type heifers could be reduced by the smaller calf. In 1969-70 60 per cent of heifer services were by Aberdeen-Angus bulls.<sup>61</sup> Herefords took an increasing share of the total market for beef bulls from 1937 to 1970. In 1936-37 35 per cent of licenced beef bulls were Herefords, 49 per cent by 1950-51, 61 per cent in 1960-61 but 78 per cent in 1970-71. Likewise 57 per cent of beef inseminations came from Herefords in 1950-51 but 65 per cent by 1970-71.<sup>62</sup> They also dominated the colour-marking breeds, increasing their share of this sector from 72 per cent to 90 per cent (Figures 7 and 8). The number of Hereford bulls licenced annually increased from around 2,000 in the late 1930s to nearly 6,000 in the early 1970s. Sixteen per cent of the latter total were non-pedigree, emphasising the strength of demand for crossing bulls.

The white-faced calf commanded a financial premium. In a Milk Marketing Board survey, the Hereford × Friesian cross topped calf prices in the years 1965-1970, and by 1969/70, 40 per cent of rearing calves marketed annually were of this parentage. They were of consistently good quality – fewer than five per cent of this cross were classified as 'bobbies', compared with up to 31 per cent for other breeds and crosses. A bobby calf in 1970 was worth less than £7.00, but Hereford × Friesian bull calves for beef rearing averaged £25.20.<sup>63</sup> As a result of the use of Hereford semen in AI, white-faced calves came to be found in markets far outside the native

<sup>61</sup> Milk Marketing Board, *Report of the breeding and production organisation*, 20, (1969-70), p. 89.

<sup>62</sup> Data supplied by the Ministry of Agriculture, Fisheries and Food of the number of bull licences issued

(as tabulated in Table 3).

<sup>63</sup> Milk Marketing Board, *Report of the breeding and production organisation*, 20, pp. 80-82.

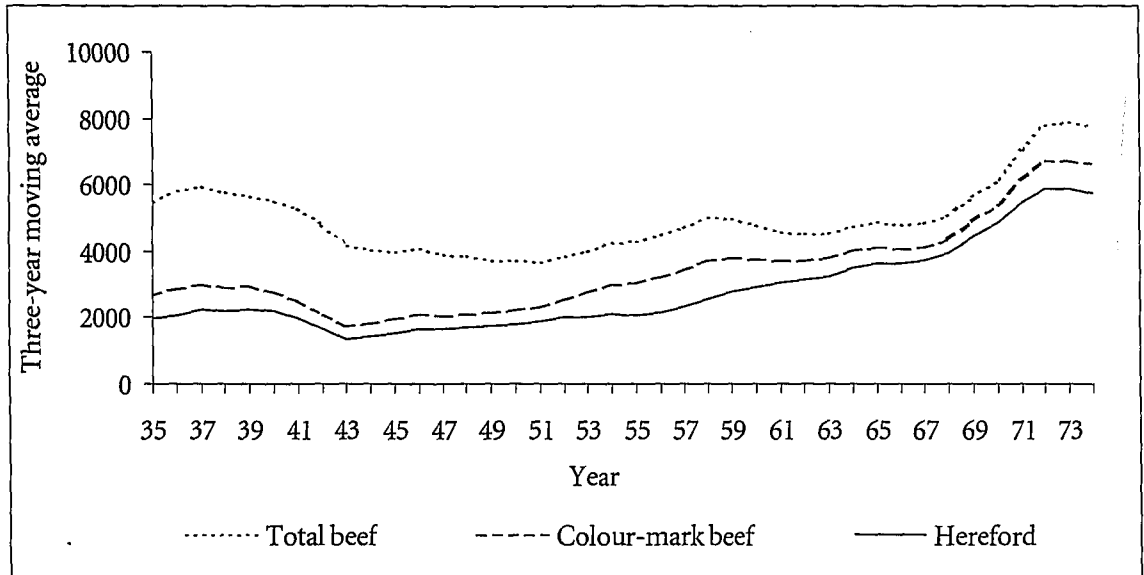


FIGURE 7. Demand for beef sires, licenced bulls, 1935-74.

Source: as Table 3.

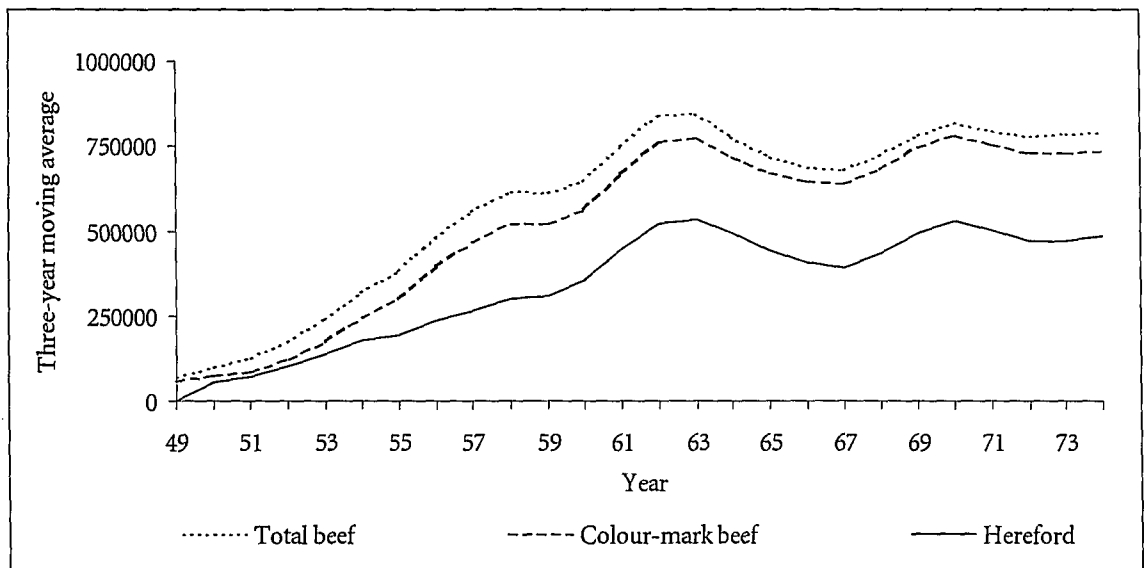


FIGURE 8. Demand for beef sires, AI services, 1949-74.

Source: as Figure 6.

haunts of the breed – in the dairying districts of Cheshire and Wiltshire, and in the former Shorthorn strongholds of the Cumbrian fells and Yorkshire Dales – resulting in a dramatic extension of the geographical distribution of the breed. By 1970, Hereford bulls were present in all the historic counties of England and Wales, except Middlesex and Rutland. However, there was still a noticeable concentration in the breed's historic homelands of the southern Marches and adjoining counties, where the Hereford had virtually no competition from any



TABLE 4. Counties with 100 or more licensed Hereford bulls, 1970/71.

	<i>Hereford bulls</i>	
	<i>Number</i>	<i>as per cent of total bulls in that county</i>
Herefordshire	875	98.1
Breconshire	425	97.9
Shropshire	326	64.8
Yorkshire	223	21.4
Radnorshire	197	97.5
Gloucestershire	186	70.7
Worcestershire	168	70.6
Montgomeryshire	161	80.5
Warwickshire	146	47.6
Hampshire	115	51.1
Devon	112	20.1
Staffordshire	100	35.5
TOTAL in England and Wales	4798	42.3

*Note:* counties are pre-1974 administrative units.

*Source:* As Table 3.

other breed (Table 4). This was not simply a success story for the Hereford breed, for the objective of boosting home-produced beef supplies had also been achieved. The nation's beef supply no longer depended upon imports but was bred, reared and finished on British farmland. In 1938, 50 per cent of UK beef and veal supplies were imported, but by 1980 the proportion had dropped to 9 per cent.<sup>64</sup>

In the late 1950s, however, undercurrents of change began to threaten all native breeds of beef cattle. Changing consumer tastes, particularly a desire for less saturated fat in the diet, led to a search among Continental breeds for cattle types which, being later-maturing, produced leaner, heavier carcasses than the native British breeds and were of superior conformation. These traits were valued by the butcher, as they made available economies of scale (fewer carcasses provided an equivalent yield of meat), and the carcasses yielded a higher proportion of expensive cuts of meat, with less fat trim. Once again, the main need was for crossing bulls to produce beef from the dairy herd. In 1961 26 Charolais bulls were imported for AI service. These were followed by a consignment of both bulls and cows in 1965, and by Simmental and Limousin stock in 1970 and 1971 respectively.<sup>65</sup>

The effects of these imports can be traced using AI data (bull licencing ceased in 1975). In 1970, Hereford bulls provided 65 per cent of all beef inseminations – but 15 per cent were by Charolais. By 1984, the Hereford, at 44 per cent, had been overtaken by Continental breeds (predominantly Charolais and Simmental), now 47 per cent.<sup>66</sup> They posed a severe challenge

<sup>64</sup> Marks, *Food and farming*, table 17.10.

<sup>66</sup> Data for AI supplied by the Milk Marketing Board

<sup>65</sup> Peter Johnson, 'Foreigners behind the cattle lines', *Farmers Weekly*, 30 Nov. 1973, pp. iii–ix. (see Figure 6).

to the Hereford because, in addition to their assets as beef producers, they also colour-marked their progeny. The Charolais diluted black coat colour to dun or silver and red to fawn or cream; the Simmental passed on his white face. Subsequent importations of other breeds gave further impetus to this trend, particularly as the Continental crosses proved to be well adapted to intensive systems of beef production, whereas early-maturing native breeds are more suited to forage-based diets.

### III

This study focuses on two highly successful periods for the Hereford breed, but these episodes are not simply accounts of the fortunes of a single breed: they illustrate two different approaches to the upgrading of cattle stocks on a countrywide scale, and offer significant insights into the symbiotic yet antagonistic relationship between pedigree and commercial sectors of the livestock industry.

The interaction between herd-books, pedigree and the commercial sector has interested earlier writers, predominantly using the Shorthorn as a model for detailed analysis. The show-ring 'fancy' and high caste bloodlines are irrelevant to commercial producers as long as their present stock meet market requirements, i.e. they are readily saleable at a price which pays. Ritvo has argued that the pedigree world was an art form irrelevant to working farmers and related more to status and genealogy than to practical considerations, a view which our analysis would support.<sup>67</sup> In early nineteenth-century England, the Hereford was much more a farmers' beast and did not attract aristocratic and fancy breeders. It was noted in 1868 that Herefords 'as a breed ... have been maintained principally by struggling tenant-farmers', for the lower price of good specimens, compared with Shorthorns, brought the best blood within their reach.<sup>68</sup>

International trade in breeding stock involves an element of speculation and relies on recorded proof of merit. Herefordshire farmers, who had hitherto relied on the local reputation of their cattle, did not see the advantages of pedigree until the 'Yankee Boom', when registration in the herd book became a prerequisite of entry and provided the passport into this highly profitable trade.<sup>69</sup> In 1882, the editor of the *Hereford Herd Book* wrote: 'Now that there is a very extensive demand sprung up for purebred Hereford cattle for exportation to America, their being entered in the English Herd Book is a *sine qua non*. Those who have hitherto ridiculed the idea of entering their herds, and who have not paid proper attention to keeping private herd books, anxiously send in such pedigrees as they can make out'.<sup>70</sup> Until breeding stock was sold outside local region, there was clearly little enthusiasm for formal association or for records other than private herd books, but it is highly likely that the threat posed by the American Hereford Breeders Association was an important catalyst.

<sup>67</sup> Harriet Ritvo, *The animal estate* (1990), pp. 45–81.

<sup>68</sup> H. H. Dixon, 'History of the rise and progress of Hereford cattle', *JRASE*, sec. ser., 4, (1868), pp. 277–290.

<sup>69</sup> E. Parmalee Prentice, *American dairy cattle* (New York, 1942), p. 433 points out that the sale of pure-bred stock had become a speculation, and (quoting Charles H. Hill, *The Guernsey breed* [Waterloo, Iowa, 1917]) held

that that high prices in the United States 'will only be forthcoming for animals whose purity of origin is demonstrable'.

<sup>70</sup> T. Duckham, 'What is a Hereford?', *Livestock J.*, 10 Nov. 1882, p. 431; quoted by E. H. Whetham, 'The trade in pedigree livestock, 1850–1910', *AgHR* 27 (1979), pp. 47–50.

Walton and Brassley have gone so far as to argue that pedigree had minimal effects on livestock improvement in the nineteenth century.<sup>71</sup> From the standpoint of the twenty-first century, it is perhaps too easy to devalue the benefits, in a nineteenth-century context, of meat animals which consistently produced uniform offspring and showed the ability to survive and thrive in the absence of modern nutritional and veterinary knowledge. Furthermore, early maturity frees for other use land previously used for three- or four-year-old store cattle. These aspects of improvement cannot be measured on the basis of individual animals. Livestock improvement by the upgrading of 'country bred' types means that commercial farmers *need* the produce of the elites of their favoured breed. When market requirements change, rendering current animals unprofitable, 'better', i.e. more suitable strains are sought. Walton has drawn attention to the more practical approach of breeders in North America, stating that 'free competition between rival cattle breeds ensured that the possibilities of pedigree were neither subordinate to nor subverted by fancy breeders as they were in Britain'.<sup>72</sup> It can be shown, however, that in the United States a newly-formed elite did attempt to control developments, supporting Prentice's view of pedigree registration as restricting choice of breeding stock in a manner never experienced in the first half of the nineteenth century.<sup>73</sup>

Americans who saw the opportunities on the Great Plains were businessmen as well as cattlemen, and their motivation was not status but money. The potential market for improved bulls was so great and the prospect of profit so tempting that, once a strong nucleus population of Herefords had been imported from the United Kingdom and Canada, American breeders restricted the trade to their own elite group, thus safeguarding their investment in imported pedigree cattle. They began by forming a breed society in 1881 and publishing a herd book.<sup>74</sup> Control was further tightened in 1883 by restricting entries in the American herd book to the produce of animals registered in volumes one and two, or in the first 13 volumes of the English Herd Book.<sup>75</sup> In 1885 a fee of \$100 was imposed for the registration of imported cattle.<sup>76</sup> As a restrictive practice the 'Volume 13 rule' had a precedent in the identification by American Shorthorn breeders, of 'the Seventeens', the unfashionable non-pedigree progeny of the 1817 Shorthorn importation.<sup>77</sup> The monetary value of well-authenticated, fashionable lineage was now clear. Taken together, these measures not only restricted British Hereford breeders, but also inhibited United States cattlemen from by-passing the newly-formed association by making their own direct importations from Great Britain.

Since the supply of pure-bred cattle was insufficient for the job, grade cattle became the

<sup>71</sup> J. R. Walton, 'Pedigree and the national cattle herd', pp. 169–70; P. Brassley, 'Livestock breeds', in E. J. T. Collins (ed.), *The agrarian history of England and Wales*, VII, 1850–1914 (2000), pp. 563–9.

<sup>72</sup> Walton, 'Pedigree and productivity', p. 456.

<sup>73</sup> Prentice, *Dairy cattle*, pp. 432–3.

<sup>74</sup> Sanders, *Herefords*, p. 520. The association purchased T. L. Miller's privately published *American Hereford Record* for \$5000. His first two volumes were published in 1881 and 1882 respectively.

<sup>75</sup> Sanders, *Herefords*, p. 521

<sup>76</sup> Sanders, *Herefords*, p. 1041; Macdonald and Sinclair,

*History of Hereford cattle* (1886 edn), p. 310. The \$100 fee was removed in 1891.

<sup>77</sup> Walton, 'Pedigree and productivity', pp. 445–6. The 'Volume 13 rule' came about due to the different registration practices of the two herd books. At this time, the English herd book required that all bulls should have four crosses of registered Hereford and cows three. The Americans, with their more mongrelized foundation stock, insisted on five for bulls and four for cows, as they wished to know 'not only that an animal was thoroughbred, but how and why it was thoroughbred'. Miller, *Hereford*, p. 251

currency of most ranchers and feeders. Low-grades could be multiplied independently of breed society – as were horses.<sup>78</sup> Pedigree was not relevant, but conformation, thriftiness, and reliable breeding were. A breeder who could supply high-grade cattle of the right type would find his stock in demand, but would need to maintain that quality from the stock of the pedigree elite. It is likely that up-grading was an ongoing ambition of many ranchers and producers of breeding stock, not necessarily with pedigree as the ultimate aim.

In the twentieth century, AI introduced new possibilities by making the services of quality, registered bulls of a variety of breeds available to commercial farmers at a reasonable price; breed societies varied in their attitude to this technology. There were legitimate concerns about the wide dissemination of the genes of unproven bulls and reduction of genetic diversity, but there were also fears about the effect on bull sales. The Hereford Herd Book Society did not allow registration of AI sired calves until 1969.<sup>79</sup> This ruling effectively prevented the formation of new pedigree herds or multiplication of pedigree cattle by AI, or upgrading commercial cattle to pure-bred Hereford without buying or hiring a bull.<sup>80</sup> However, it did not inhibit dairy farmers who wanted a more valuable cross-bred calf, nor commercial beef cattlemen whose raw materials were chiefly these dairy-bred calves.

Breed societies and the concept of pedigree have had both positive and negative influences on the improvement of commercial farm livestock. The recorded ancestry of pedigree animals offers assurance that heritable attributes will be passed on to progeny; visual inspection cannot guarantee this – animals of mixed ancestry will not breed true to type. However, once a herd book is closed, pedigree restricts improvement within a breed by limiting the gene pool. Although awareness of potential is increased by publicity and breed promotion, the high profile pedigree sector can be seen as impeding, by high prices and restricted supply, the pace of livestock improvement. Nevertheless, it cannot be disputed that the tiny proportion of pedigree animals laid the solid foundation for worldwide improvement of farm livestock, and it is in this context that the Hereford bull and his breeders played a major role in boosting the supply of prime fresh and chilled beef to the world's first industrialized country. The efforts of this committed group of breeders, in a small English county, transformed the quality of commercial beef cattle world-wide.

<sup>78</sup> R. J. Moore-Colyer, 'Aspects of the trade in British pedigree draught horses with the United States and Canada, c. 1850–1920', *AgHR* 48 (2000) pp. 48, 55.

<sup>79</sup> Hereford Cattle Society, breed publicity, 1996. (Registration was subject to stringent rules.)

<sup>80</sup> Contrast this with the attitude of the British Friesian Society, founded 1909. In 1950 the society itself purchased 17 Dutch bulls to stand at AI centres. J. K. Stanford, *British Friesians: a history of the breed* (1956), p. 177; G. E. Mingay, *British Friesians: an epic of progress* (1982), p. 186.