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CATTLE BREEDS FOR BEEF PRODUCTION IN W.A.

By J. L. ANDERSON, Senior Animal Production Officer

BREEDS develop because people select animals for characters which are useful to them in their own environment.

These characters, after some generations of selection, become "fixed" and animals within the breed then transmit them regularly to their offspring. The characters are then said to breed true.

The traditional beef breeds in Australia are those of British origin, the commonest being the Hereford, Shorthorn and Angus. But these are only a few of the many breeds which were developed in the United Kingdom. The large number of British breeds of cattle is the prime example of the adaptation of particular breeds to particular environments and needs, even in a country with a relatively narrow range of environments.

The Hereford, Shorthorn and Angus were developed for good lowland conditions while breeds such as the Highland, Galloway and Welsh were adapted to cold rough mountainous conditions. Other dual purpose breeds such as Dairy Shorthorn produced best from good land while the Red Poll was better on dry light land.

In Australia these British breeds have been asked to produce beef under many environments. It is a measure of the breeds' inherent variability that they have adapted to environments in Western Australia from the cold wet winters of the South-West to the hot tropical North.

Performance measurement

Although breeds were developed to match certain environments, selection can change their genetic makeup so that they produce well in several environments. The adaptability of a breed is shown by its performance in the new environment, so local testing is necessary. Performance is best measured in four ways:

- Fertility—in practical terms, the ability of a cow to produce a calf annually.
  It is not highly heritable, which means that it depends very much on nutrition and management.
- Mothering ability—reflected in the weight gain of the calf from birth to weaning.

This is generally a measure of the dam’s ability to produce milk, and is also affected by nutrition, but the dairy breeds might have an advantage in this character. It is extremely important in baby beef production.

- Growth rate—the weight gain of the animal from weaning to market weight.
  Growth rate is highly heritable and should be the main character used in assessing a breed for the improvement of beef production.
- Carcass quality—optimum ratio of lean to fat.
  Carcass quality is important and moderately heritable so must be considered in the assessment of the worth of a breed.

Breed comparisons

There are very few reports of comparisons in growth and size of different breeds under the same conditions anywhere in the world. Reports on a single breed are of little value, as without a standard of comparison it is impossible to separate breed differences from differences due to nutrition or environment.

British breeds

However, one comparison has been published and this derived from the animals exhibited in the Smithfield Show in the United Kingdom.* Although the animals were not reared under the same conditions they were reared under conditions which their owners considered ideal. More important, they came from a wide variety of farms and were therefore likely to represent breed averages because differences between feeding levels were evened out.

The four heaviest of the breeds were Friesian, South Devon, Hereford and Lincoln. After them came Sussex, Devon and Dairy Shorthorn. The next group includes Beef Shorthorn, Angus, Galloway and Red Poll. Finally, come the smallest breeds, Welsh and

Highlands. The Dexter is smaller still, its weight at 900 days being just over 700 lb. (Figure 1)

This suggests the great potential for beef production which exists in the larger dairy breed animals and in some breeds which have not received much attention here in Australia.

It is also of interest to look at trends in the liveweight of breeds over the years. Changes in liveweight of steers of two different age classes over 50 years show a considerable decline in weight of animals exhibited at Smithfield over this period. The average decline of all breeds at 22 months is just over 100 lb. and at 33 months just over 200 lb. It is impossible to know whether this represents a genetic decrease in size brought about by selection or whether it reflects the higher condition in which fat stock were exhibited years ago. (Figure 2)

The figures put the breeds into three groups according to the changes in their relative size:
- Those which became larger. The Devon and the Galloway have increased considerably.
- Those remaining same size. The Hereford, Sussex and Red Poll are included in this group. The South Devon and Highland breeds also changed little. They are the largest and smallest breeds in the group.
- Those that have become smaller. The Welsh, Angus and especially the Short-horn have changed their position from among the largest breeds to among the smallest breeds.

The Friesian was not included in the study because it has not had a long history of exhibition at Smithfield.

In general, the breeds are tending to converge, with the smaller breeds becoming larger and the larger breeds remaining stationary or decreasing in size.

There was no measure of overall merit as beef producers. Carcass quality was not considered and there are even fewer figures available to compare breeds on this important economic character.

Charolais

An important problem is to fit other breeds into the picture. The Charolais was recently introduced through semen importations and must be expected to increase in popularity. Most of our information on the Charolais comes from the report of the Milk Marketing Board in the U.K. ("The Charolais Report") following the introduction of Charolais bulls to the Board's artificial breeding service.

Charolais crossbred calves had growth rates 10.6 per cent. faster than Hereford crossbred calves and 5.7 per cent. faster than Friesian crossbred calves when all the years and systems of rearing were averaged out. In many different areas in the U.K., Charolais crosses always had an advantage in growth rate over other breeds and crosses.

The smallest advantage was 1.4 per cent. over pure Friesians. There was also an advantage in efficiency of food conversion so that the general conclusion from the British work...
was that Charolais crossbred calves out of the most numerous British dairy breeds grow faster and convert their food more efficiently than similar crosses by British beef sires.

The Charolais cross also had a higher percentage of lean meat in the carcass, and much less fat. (Lean meat, 52.3 per cent Herefords and 59.3 per cent Charolais. Fat, 29.5 per cent Herefords and 21.6 per cent Charolais.) As well as higher lean content, Charolais carcasses had a slightly higher proportion of high priced cuts, higher conformation scores on leg shape, loin rump and fore rib and were entirely acceptable to the trade.

The only disadvantage of the Charolais was that calves tended to be carried for a longer time than other breeds and were therefore heavier at birth. This gave a very slightly higher proportion of difficult calvings and also meant that there was a slightly higher mortality rate of calves in the first few days of life. But in general terms there seems to be some advantage in using this breed to produce beef from the dairy herd.

In the United Kingdom the exercise which was carried out with the Charolais breed is being repeated with two new breeds. These are the Simmentals from Germany and Switzerland and the Limousin from France. These breeds might also have a place in Australia, through importation of semen.

Zebu breeds

"Zebu" is a term used in the same way as "British" when referring to the many breeds of Asian and African humped cattle. Where a Hereford is a British breed so a Brahman is a Zebu breed.

The Zebu breeds developed in tropical Asia and Africa and a large number are recorded.

Zebus in Australia are mainly Brahmans, developed in America from several Indian breeds, and Africander, developed in South Africa. There are also a few Sahiwal and Red Sindhi cattle from Pakistan. These breeds are
seldom used as pure breeds for commercial beef production and it is difficult to find data on their performance.

They are heat tolerant and can maintain their body temperature within the normal range under much hotter conditions than can the British breeds. They are resistant to cattle tick and other external parasites. They are more active and can walk longer distances in difficult conditions, and can make more effective use of rough grazing than other breeds.

Their main use has been in the development of crossbreds that combine desirable characters of the Zebu and British breeds.

Santa Gertrudis is probably the best known. It was developed from the Brahman and Short-horn with about three-eighths Brahman blood. The Beefmaster, developed in America, is about half Brahman and has been selected solely on production criteria. It therefore has mixed colour and conformation but is a very efficient producer of meat under southern United States conditions. An Australian breed, developed in Queensland from Brahman and Shorthorn, is the Droughtmaster and this also is approximately half Brahman. The C.S.I.R.O. have developed a half Africander animal, again selected solely on production criteria, called the Belmont Red. There are also Brafords (Brahman - Hereford), Brangus (Brahman - Angus), Charbray (Charolais - Brahman) and others.

What part can these play in Western Australia? They were developed for tropical and subtropical conditions but their value in temperate areas has not been tested. The Brahman itself has the value of considerable hybrid vigour in the first cross when mated to British breeds and this may be useful in producing fast-growing steers but more so in producing the first cross heifer as a mother for commercial stock. This could duplicate in cattle the well-tried three-breed criss-cross breeding used in pigs. There are many problems with such programmes but they may have value in some situations.

The usual alternative to a crossbreeding programme is to choose a breed and begin grading up to that breed. Whatever breeding system is selected, the breed and the actual bulls being used should be chosen on the basis of tests of performance, particularly growth rate and carcass quality, to ensure the most efficient production of beef.