THE CATEGORISATION OF TYPES AND BREEDS OF CATTLE IN EUROPE

CATEGORIZACION DE TIPOS Y RAZAS DE VACUNO EN EUROPA

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SUMMARY

The domestication of cattle in Europe and North Africa dates back at least 8000 years. The Middle East was an early site of domestication but there is evidence of domesticated cattle in other parts of Europe at about this time. Subsequent movements of peoples and the development of cultural exchange affected the livestock populations. The understanding of the relationship between European breeds and types of cattle can be increased by a multi-disciplinary approach including ethnological, archaeological and socio-historical data, in conjunction with morphological characterisation and biochemical studies of livestock breeds and populations. Four European groups of cattle have been identified, namely the podolic of Asian origin, the shorthorn of northern European origin, the Central European group containing types of mixed origin, and the longhorn group in the western fringes of Europe, which may be remnants of cattle of the earliest civilisation.

RESUMEN

La domesticación de los bovinos en Europa y Norte de África data de al menos 8000 años. El Oriente medio fue un lugar primitivo de domesticación pero hay también evidencias coetáneas del proceso en otras partes de Europa. Los movimientos migratorios de los pueblos y el consiguiente intercambio cultural afectaron a las poblaciones ganaderas. La comprensión de las relaciones entre las razas y tipos europeos de ganado puede aumentarse mediante un análisis multidisciplinario, que incluya datos etnológicos, arqueológicos y sociohistóricos, así como la caracterización morfológica y estudios bioquímicos de las razas y poblaciones ganaderas. Se han identificado cuatro grupos de bovinos europeos: podólico, de origen asiático; shorthorn del norte de Europa; el de Europa Central con tipos de origen mixto y el longhorn, del extremo occidental de Europa que pueden ser relictos de los bovinos primitivos.

SOURCES OF EVIDENCE

Evidence for ancestral relationships between breeds of cattle may be sought in several research fields viz:

1. PHENOTYPIC CHARACTERISATION.
Those characteristics which have been influenced least by environmental

effect or artificial selection pressure will provide the best evidence, while the effects of convergent or divergent evolution will serve to confuse the evaluation.

Morphology can provide useful evidence. For example, the shape and size of the head and the horns in general are likely to have been affected less by selection.

The predominant colour of a population may also be indicative of its origin, although it may have been influenced during its later development by religion, culture and fashion. For example, the colour of cattle was of great importance to the Celts: red animals symbolised fertility and crops, black animals pestilence and death, and white animals the worship of the sun. However, colour alone without corroborating evidence can be misleading. On a farm in England, calves with the colour pattern of Gloucester cattle resulted from matings of a Jersey x Charolais bull with Friesian cows.

Size and conformation are likely to be less useful criteria; they are easily and rapidly affected by environmental conditions and systems of management. For example, a White Park cow weighs 630-640 kg, but its feral cousin the Chillingham, which has evolved separately for more than 700 years, weighs only 280 kg.

Phenotypic characterisation should be interpreted with the benefit of other evidence. For example, morphological studies of the Rubia Gallega breed in North-West Iberia are of limited value because the breed experienced significant introgression by the Shorthorn and South Devon breeds from Britain several decades ago.

2. HISTORICAL EVIDENCE. Historical evidence may be obtained from several sources. Firstly, archaeological sites yield large quantities of osteological material which can provide a general picture of the most common types of cattle at different periods. However, much of the evidence from this source in the past has been misleading.

Secondly, cave or tomb paintings from an early period have been found in Europe and North Africa. These probably give a more accurate representation of the type of cattle, subject to the artistic licence of the artist(s) and possible misinterpretation by later generations.

Thirdly, ethnological studies are particularly valuable and the movement and migration of peoples is likely to have been a significant factor in the distribution of livestock. Where the movement was rapid, or where the purpose was plunder, the effect may have been limited, but where trade and or settlement was the prime objective the movement of cattle would have been an integral part of the process.

3. BIOCHEMICAL EVIDENCE. The development of techniques such as blood-typing, genetic finger printing and other forms of DNA analysis has provided further opportunities to study breed relationships and make genetic distance calculations.

Several studies have been carried out to calculate genetic distance. Royle
(1980) studied several British breeds of cattle; Manwell and Baker (1980) covered a different range of breeds of cattle; Bowling (1990) and Cothran (1992) have studied many breeds of horses but their results do not agree in some respects.

Limitations on the value of such studies result from population bottlenecks and subsequent inbreeding in many breeds, and these together with unequal founder effect may distort the results. The accuracy of this evidence also relies on knowledge of introgression suffered by a breed so that only pure representatives of the original type should be included in the study, but it is clear that this requirement is not always properly recognised.

SITES OF DOMESTICATION

A further question that needs to be addressed is the identification of the site(s) of domestication. All domestic Bos taurus cattle are descended from the Aurochs, whose range extended westwards from a line linking the Gulf of Finland and the Persian Gulf, including North Africa but excluding Scandinavia except for Denmark and the southern tip of Sweden.

Probably cattle were domesticated first in Sumeria, and it is possible that all domesticated cattle derive from this single centre of civilisation spreading gradually to all parts of Europe. There is some evidence to support this hypothesis (Epstein, 1970). A theory has been advanced by Lauvergne (1979) to demonstrate that the breeds which are found most distant from the centre of diffusion are the oldest and most primitive breeds.

The alternative explanation is that Bos primigenius (Aurochs) was domesticated at several different sites in Europe and North Africa and the variety in the morphology of cattle would tend to support this proposition. There is evidence of ploughing in the lower Danube Valley (circa 4500 BC), in England and Poland (circa 3500 BC) and in Southern Spain (before 3000 BC). Domesticated cattle in the northern Sahara (6500 - 4000 BC) are depicted in rock paintings and show longhorned humpless cattle of various colours and patterns. Similarly in Egypt (2500 - 1500 BC) cattle exhibited varying characteristics including polledness. The Minoan civilisation in Crete (circa 1500 BC) placed great emphasis on the bull culture and the bulls used in the sport of bull-leaping were longhorned and spotted or pied. Cattle were used at an early stage for milk, meat, manure and draught.

This paper does not seek to explore the validity or relative merits of these theories. It will assess the evidence from morphological and historical information to construct a pattern of relationship between breeds of cattle in Europe.

CURRENT CATTLE TYPES IN EUROPE

The evaluation of the phenotypic characteristics of each breed of cattle in Europe enables a broad pattern of types to be drawn.
In some cases this information is devalued because of recent and significant introgression and has been discarded. Thus the phenotype of the Salers breed in France was changed by crossing with Highland and Devon cattle from Britain; the Mertola of Portugal is the result of relatively recent crossing with the Berrenda and the Alentajana; while the Cacereña of Extremadura has suffered some introgression from northern European breeds.

The following types of native cattle (i.e. before the recent expansion of breeds such as the Holstein/Friesian and Simmental) can be distinguished:

1. **PODOLIC.**
   - Distribution: Lower/Mid Danube, Balkans, Italy.
   - Long heads with long lyre horns.
   - Mainly grey in colour with black tail switch; usually fawn at birth; light-coloured muzzle **halo**.
   - Large size and rangy conformation.
   - Typical breeds: Grey Steppe (Hungary and other countries) Maremmana (Italy).

2. **NORTH EUROPEAN.**
   - Distribution: Poland, Czechoslovakia, Germany, Denmark, Benelux, England.
   - Short head and deep forehead, with short horns often turning down.
   - Mainly red but also brown, black and pied.
   - Medium size.
   - Typical breeds: Angeln (Germany), Danish Red (Denmark), Flemish (Belgium), Friesian (Netherlands), Polish Red (Poland); Lincoln Red, Sussex, Shorthorn (all England). This group also later influenced breed development by widespread use of Shorthorn cattle from England in the development of breeds such as the Bleue du Nord and Maine-Anjou.

3. **CENTRAL EUROPE.**
   - Distribution: Alpine region, northern Italy.
   - Short head, medium/short horns curving upwards.
   - Mainly shades of grey and brown; light-coloured muzzle "halo".
   - Medium size.
   - Typical breeds: Brown Swiss (Switzerland), Garfagnina, Pontremolese (both Italy).

   **(b) Pattern group.**
   - Distribution: Germany, Austria, Switzerland, Eastern France.
   - Short head, slightly concave; medium short horns curving upwards. Red, black, pied and various patterns.
   - Medium large size.
   - Typical breeds: Simmental (Switzerland), Pie Rouge de l’Est (France), Pinzgauer (Austria), Fleckvieh (Germany).

   **(c) Yellow-Brown (Chestnut).**
   - Distribution: Central Germany through France and northern Spain to Portugal.
   - Short head, concave face; medium horns but some variation. Yellow, red, brown; light-coloured muzzle (halo).
   - Variable size.
   - Typical breeds: Murbodner, Gelbvieh (both Germany), Tarentaise, Limousin, Blonde d’Aquitaine, Aubrac, Parthenaise, Villard de Lans.
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(All France), Leonese, Pyrenean, Asturian (all Spain), Mirandesa, Arouquesa, Minhota (all Portugal).

4. WESTERN EUROPE.
- Distribution: South-West Iberia, Wales, Scotland, Ireland.
- Long head sometimes slightly convex: long spreading horns curving upwards and sometimes more upright.
- Black is common, but also red, pied and other patterns, especially coloured points. The variety in colour persists in some breeds such as the Berrenda, but in other cases a particular colour has been selected to the exclusion of others. The White Park colour pattern (coloured points) was fixed in Ireland and Wales more than 2000 years ago, while black became the preferred colour of the Welsh Black breed less than 100 years ago.
- Variable size.
- Typical breeds: White Park, Kerry, Welsh Black (all British Isles), Berrenda, Negra Ibérica, Morucha, Retinta (all Spain), Camargue (France).

MAJOR MOVEMENTS OF PEOPLES IN PRE-COLUMBIAN EUROPE

1. SECOND-FOURTH MILLENNIA BC.
The first significant period was during the second, third and fourth millennia BC when a long period of established trading patterns allowed expansion in farming settlement and improvement in Europe. This period coincided with the wider use of cattle, especially in northern Europe, and permitted the most suitable and valuable type of cattle to spread within each trading area.

The Beaker trading area included the area now covered by British Isles, Benelux, France and Iberia. The Corded Ware area included southern Scandinavia and much of northern and eastern Europe.

2. BRONZE AND IRON AGEES.
(a) The Urn culture (2000 - 1000 BC) which originated in the mid-Danube area (Carpathian Basin) shows evidence of cultural conformity and the trade and exchange of ideas. Its main area of influence was central and eastern Europe but it spread further westwards across central Europe to include the whole of Italy and France and thus intruded on an area of Beaker trading in earlier times.

(b) The Celts (800 BC - 50 AD) continued the pattern of movement established by the Urn culture. They were a civilised people who originated in southern Germany and the eastern Alps and spread mainly westward penetrating as far as the Iberian peninsula and the British Isles. They also spread eastwards towards Scythia and southwards into the Balkans and Greece. Cattle were an important part of their culture and colour was of special significance.

The combined effect of the Urn culture and the Celts drove a deep wedge into the area influenced by the Beaker people thus enabling cattle from eastern Europe to move into central and western Europe.

It is likely that these were shorthorned cattle and it may be that

the expansion of the Celts into the Balkans and Greece accounts for the shorthorned cattle found in those areas.

The Celts were displaced later by the Romans but there is little evidence that the Romans significantly influenced the movement of cattle within their Empire other than as beasts of sport.

3. GERMANIC EXPANSION.

The earliest movement of peoples from Scandinavia and northern Europe started about 500 BC and also originated in the Corded Ware trading area.

Their cattle again seemed to belong to the Shorthorn type. For 1000 years these peoples slowly expanded their territory and created settlements, mainly in the eastern areas of the British Isles. Later the Franks continued this expansion during the 5th century AD. Their base was the Lower Rhine Valley but they spread southwards settling in territory vacated by the Romans. Thus they superimposed their culture on a further Beaker area, and the Frankish empire at its greatest extent occupied the area now covered by Benelux, France, Germany, Austria and Switzerland and penetrated into Italy and Spain.

The Vikings can be considered as part of the same movement some centuries later although their cattle were more variable in type. Their raids commenced circa 800 AD but they also made settlement in several coastal areas particularly around the mouths of the Loire, Seine and Rhine rivers and in much of eastern England and parts of Scotland and Ireland.

4. EASTERN INVASIONS. The Huns were the first Asian invaders. They were wholly nomadic and their excellent horsemanship was essential for the control of their grazing herds of livestock which included cattle. They dominated Eurasia as far west as the Lower Danube by the second half of the 4th century AD.

Their direct impact on Europe was brief as they were defeated by the Franks in 451 AD, but their indirect influence was significant.

They disturbed several other groups of peoples and these all migrated westwards. The Visigoths displaced from the lower Danube reached Greece (395 AD), sacked Rome (410 AD), were granted an area of Gaul by the Romans, defeated by the Franks (507 AD) and settled in Spain. The Alans also were disturbed by the Huns, migrated to the Carpathian Basin (406 AD) and from there moved with the Suebi and Vandals through central Europe and Gaul to Spain by 411 AD. The Suebi settled in Galicia but the other tribes crossed to North Africa. The Ostrogoths moved from Scythia passing through the Balkans (circa 450 AD) to Italy where they settled (489 AD). The Avars were descendants in spirit of the Huns. They dominated parts of Europe during the 7th and 8th centuries AD although their main effect was in the Balkans.

It seems likely that these Asian invaders introduced Podolic cattle to Europe but they generally moved too fast and too far to effect major cattle migrations after the first invasion of

the Huns. Their main effect was to push each existing population further westwards.

CORRELATION OF MORPHOLOGICAL AND HISTORICAL EVIDENCE

The historical evidence shows that the area of culture and trade established by the Beaker people in western Europe was eroded by two subsequent broad cultures which were superimposed in some areas. The Urn culture, Celts, Germanic and Scandinavian influences pushed into western Europe from the east and the north. The later Asian invasions then moved whole populations and cultures westwards in a knock-on effect. It has been noted previously (Alderson, 1989) that the only areas of Beaker culture not affected by later influences were Wales, parts of Scotland and Ireland and South-Western Iberia (figure 1).

The phenotypic characterisation of cattle in Europe fits this pattern closely (figure 2). The Podolic cattle are found in the area influenced most by the Huns and the Avars from Asia; the shorthorned cattle of northern Europe have their roots in the Germanic homelands; the mixing of these two groups probably produced the swiss and pattern groups of central Europe; the related yellow brown (chestnut) group was pushed westwards into France and northern Iberia; the longhorned cattle of western Europe occupy the relatively undisturbed Beaker areas. The great genetic distance of one breed in this group, the White Park (Royle, 1983), indicates its antiquity and remote relationship to other groups.

CATTLE OF THE AMERICAS

The cattle taken to the Americas from Spain in the aftermath of Columbus’ voyage of discovery derived mainly from the western longhorned type in Andalucía. Again this historical evidence is supported by phenotypic characterisation. The long horns, long head with a linear profile, and varied colours of the cattle of Andalucía (eg Berrenda, Retinta, etc) are reflected in the Texas Longhorn (USA), BON (Columbia), Santa Catarina or Lageano (Brazil) and some other Criollo populations (Argentina), which evolved in areas of spanish settlement. Most Brazilian Criollo breeds on the other hand developed in portuguese territory and they resemble the yellow brown cattle of northern Portugal (eg Mirandesa) which are more consistent in colour, have a shorter face with a more concave profile, and shorter horns (Primo, 1990).

FURTHER RESEARCH

The phenotypic characterisation and historical evidence outlined in this paper define the major groups of cattle in Europe. There are some inconsistencies. In particular the lack of a consistent type of cattle in Scandinavia provides an opportunity...
Figure 1. Cultural areas of influence in Europe up to the tenth century AD. (Areas de influencia cultural en Europa hasta el siglo X después de Cristo).

Figure 2. Phenotypic categorisation of breeds/types of cattle in Europe.
(Categorización fenotípica de razas/tipos de vacuno en Europa).

for further analysis. The categorisation of some other breeds invites reasons which are speculative. The Camargue cattle, whose habitat is the Rhone delta, conform to the description of the western longhorned group and their location may be explained by the isolation afforded by their native marshes. The shorthorned cattle of the Balkans and Greece are situated in a region dominated by Podolic cattle but probably they are a remnant of Celtic influence in that area. The characterisation of some breeds in North-Western Iberia, where the yellow-brown group blended into the longhorned western group, indicate that they combine features of both types (eg. Caldelana, Vianesa). Similarly the old Devon in England, at the frontier of Germanic expansion westwards, may be a mixture of northern european red and western longhorned types. The apparently random distribution of some colour patterns such as a white head (Simental, Groningen, Hereford), white belt (Swiss, Lakenfelder, Galloway, Somerset) and finching (Pinzgauer, Gloucester) are also matters of conjecture.

There is a need to obtain evidence from other sources to supplement the morphological and historical information. In particular DNA analysis comparative studies of each group would be valuable, and this should include especially feral populations such as the Mostrenca cattle in the Parque Nacional Doñana in Andalucía which may represent a remnant of the earliest cattle group in western Europe.

REFERENCES


