Extract from The Scottish Executive Publication
**THE STATUS OF TRADITIONAL SCOTTISH ANIMAL BREEDS AND PLANT VARIETIES AND THE IMPLICATIONS FOR BIODIVERSITY**
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## CHAPTER EIGHT: THE CONTRIBUTION TO BIODIVERSITY MADE BY THE BLUE GREY COW

**June 2005**

8.1 This chapter considers a case study of a traditional genotype. The Blue Grey cow is an interesting animal to study, since it is a crossbred between a bull which is classed as a minority breed (Whitebred Shorthorn) and a cow of a traditional Scottish breed (Galloway). The resultant cow is subsequently crossed with a variety of breeds, often continental breeds, to produce a finished beef animal for slaughter.

8.2 The pure Galloway is a true hill breed, kept in relatively harsh environments, particularly in the hills and uplands of southern Scotland. There are only a limited number of breeds which could be used in these types of farming systems. The Blue Grey cow is also able to survive in such conditions while able to produce calves which will satisfy the requirements of the market for quality meat.

### The performance of the Blue Grey Cow

8.3 There have been a number of experiments done over the years looking at the performance of Blue Grey cows and their calves. A comprehensive review of the reproductive performance of Blue Grey cows was undertaken by Osoro and Wright (1992). They reviewed the performance of a total of 321 spring-calving cows which had been used in a series of grazing experiments between 1984 and 1987 at the Hartwood Research Station of the Macaulay Land Use Research Institute. 237 of the cows were Hereford x Friesian while the remaining 84 cows were Blue Greys. The study looked at the performance of spring-calving cows (mean calving date 27th March). The mating period which was 10 weeks long each year started 1 week after turnout in the middle of May.

8.4 Earlier work, (Wiltbank et al, 1964; Dunn et al, 1969; Hansen et al, 1982 and Rutter et al, 1984) had established that a number of factors were responsible for the length of time taken to get cows back in calf. These included milk production, age of the cow, suckling and genotype. Also heavily implicated was the condition of the cow at calving which in turn is a function of the level of nutrition in the period up to calving.

8.5 By the end of the mating period, there were significantly more Blue Grey cows in calf than Hereford x Friesians, with Blue Grey cows achieving a pregnancy rate of 90% compared to only 83% in the Hereford x Friesian cows. Of those cows which were pregnant, the period from the start of mating to conception was shorter for the Blue Grey at 17 days as opposed to 27 days for the Hereford x Friesians. At calving the body condition score of the Blue Greys was higher (2.54 compared to 2.37). The calves, which were all sired by Charolais bulls, were however significantly heavier at birth when their dams were Hereford x Friesian cows rather than Blue Greys (41.2kg compared with 36.5kg). The calves of Hereford x Friesian cows also grew faster at 0.95kg/day rather than 0.84kg/day achieved by those from Blue Grey cows, presumably as a consequence of the higher milk yield in the Hereford x Friesian cows (Wright and Russel, 1987). As a consequence calves from Blue Grey cows tend to be 10-15kg lighter at weaning than those from Hereford x Friesian cows (Hodgson et al, 1980; Wright and Russel, 1987).

8.6 As part of the study, the age of the cow was also taken into account. Up to the age of 7 years there was no difference in the percentage of cows which were successfully got back into calf. However above this age, there was a significant decrease in the number of Hereford x

Friesian cows which became pregnant. At 10 years of age virtually 100% of the Blue Greys became pregnant while just over 60% of the Hereford x Friesians were able to get back in calf. This suggests that the replacement rate of the Blue-Grey cows would be considerably less than the Hereford x Friesian.

8.7 Other studies on the Blue Grey cow suggest that they calve slightly lighter than Hereford x Friesian cows, that their intake at pasture is less, but their milk yield is lower. Wright and Russel (1987) reported milk yields of 8.93kg/day for Hereford x Friesian cows and 6.88kg/day for Blue Greys. This lower milk yield is primarily a function of their partitioning less of their energy towards milk production and more towards body reserves. As a consequence they tend to be fatter than more productive genotypes and lose less weight in lactation (Hodgson et al, 1980). It is not clear if the superior reproductive performance of the Blue Grey compared to the Hereford x Friesian observed by Osoro and Wright (1992) is simply a consequence of their having a higher level of body condition. Body condition is known to have a strong effect on reproductive performance (Wright et al, 1992).

8.8 In an experiment looking at the post-weaning nutrition of calves Wright and Russel (1987) found that the Charolais-cross progeny of Hereford x Friesian cows were heavier than those from Charolais cross Blue Grey cows. The weight difference remained constant throughout the experiment. This suggests that the difference was not due to higher potential for growth, but to the higher milk yields which have been reported for Hereford x Friesian cows. McDougal (1978) argued that the milk yield of the Blue Grey could be improved by more rigorous selection of Whitebred Shorthorn bulls. This would require records to be kept of calf performance in order to identify those bulls which conferred improved milking ability on their daughters.

8.9 In conclusion, the Blue Grey cow tends to be fatter at calving and has higher reproductive performance and a more compact calving interval. Since it tends to be fatter at calving, it requires less expensive winter feeding. It also loses less weight during lactation and therefore requires less autumn feeding to return it to condition fit for calving. It is also able to sustain its higher reproductive rate to an older age thus leading to a much lower replacement cost than a Hereford x Freisian cow. The weaning weights of the calves are, however, lower than for genotypes with higher milk yield potential.

8.10 For these reasons, the Blue Grey is well suited to extensive production systems. Without the large fluctuations in body condition, the Blue Grey is well adapted to systems of lower inputs.

**Contribution of Blue Grey cows to wider biodiversity**

8.11 Common et al (1998) showed that Blue Grey cows could be used to bring about changes in the cover of different plant species is Nardus - dominated hill pasture. However it is not clear whether similar effects could have been achieved with other genotypes. Anecdotal evidence indicates that Blue Grey cows may be more prepared to forage over wider areas than the more productive genotypes such as Hereford x Friesian, but there is no experimental evidence to support this. Despite the considerable research on the Blue Grey there is a large gap in information as to whether it, or indeed any other breed or cross, contributes to greater biodiversity than other breeds.

**Conclusions**

8.12 Since the Blue Grey cow is a crossbred, its loss would have a serious detrimental effect on the population of its parent breeds. The Galloway in particular is important, being a true hill breed. The production of females for subsequent crossing with the Whitebred Shorthorn is a significant market for many Galloway breeders. Significant reductions in the numbers of Galloways would in turn have implications for the biodiversity of hill and upland swards.

8.13 The Blue Grey cow itself is important in that it can apparently survive in relatively harsh conditions on terrain which may be difficult to graze with other genotypes. The Blue Grey is well adapted to extensive conditions and is longer lasting and cheaper to feed than some other,

larger types of suckler cows. The Blue Grey is also easier to manage in terms of its reproductive performance, being easier to get back in calf after giving birth.

8.14 There is a need however for further studies of the impact of the Blue Grey (and indeed other breeds) on biodiversity and in particular its impact on the composition of upland swards. As has been stated earlier, little research has been conducted on the impacts of different genotypes on biodiversity.



The full report is available at:-
www.scotland.gov.uk/library5/environment/tsab-00.asp