EFFECT OF GENOTYPE AND PASTURE QUALITY ON DENTITION IN BEEF CATTLE

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The cattle industry estimates age of slaughter cattle, and therefore carcass quality, by the eruption of permanent incisor teeth (Maynard 1984). Dentition also plays an important role in lifetime productivity, since cows with worn or missing teeth are usually culled from the herd (Nunez-Dominguez *et al.* 1991). Both nutrition and genotype have been reported to affect dentition (Brookes and Hodge 1979). The aim of this study was to evaluate the importance of genotype by environment interactions (GxE) on age at teeth eruption, rate of tooth wear and teeth loss.

At Grafton N.S.W., 388 Hereford (HxH), Brahman x Hereford (BxH), Friesian x Hereford (FxH) and Simmental x Hereford (SxH) females grazed pastures of high, medium or low nutritive value for their entire postweaning lifetime (Hearnshaw 1993). All females were mouthed every 2 months to record permanent incisor eruption. Liveweight and body condition (CS) were also recorded. A cow was considered 2 tooth (2T) at the age of earliest eruption of 1 of the first pair of incisors; similarly when the 3rd, 5th or 7th tooth erupted, cows were classed as 4T, 6T, or 8T. The age of cows at eruption of 2, 4, 6 and 8T, and the weight and CS at 2T were analysed using a non orthogonal ANOVA (Payne *et al.*, 1987). Once all cows had 8T, cows were mouthed every 6 months to check for tooth loss and wear. Each tooth was scored for condition (normal, missing, broken, loose or twisted) and measured and scored for length (missing=0; <2mm=1; 2-8mm=2; >8mm=3). Thus a cow exhibiting all 8 teeth of >8mm length would score a maximum of 24. Data from 180 cows at 12 years of age was analysed using ANOVA and GLM procedures (Payne *et al.* 1987).

Rankings for both genotype and pasture quality were similar for age at eruption of 2, 4, 6 and 8T. Cows from high quality pastures were youngest, and cows from low quality pastures oldest at eruption, and SxH cows were oldest and FxH cows youngest. Mean ages in months at eruption of 2T, for example, were 25.5, 27.1 and 27.3 ± 0.2 for high, medium and low quality pastures, and 27.2, 27, 25.3 and 27.5 ± 0.2 for HxH, BxH, FxH and SxH respectively. Equivalent mean ages at eruption of 4T were: 33.4, 34.3, 35.9 ± 0.3 months for high, medium and low quality pastures and 34.5, 34.8, 32.7 and 35.6 ± 0.3 months for HxH, BxH, FxH and SxH respectively. However the range in age at eruption was 18-34 months at 2T; 27-45 months at 4T, 3 l-58 months at 6T and 37-63 months at 8T. Mean ages are similar to those reported by Maynard (1980) but ranges are greater. Liveweight and CS taken when 2T erupted were not closely related to age of eruption. BxH cows were always heaviest and in best condition, whilst HxH cows were lightest, and FxH in poorest condition.

For 12 year old cows on all quality pastures, BxH had more normal teeth and showed less tooth wear than cows from other genotypes. The greatest difference in genotypes for tooth wear and loss occurred on low quality pastures: for example, for BxH vs other genotypes; number of normal teeth, 7.5 vs 3.5; number of teeth in bad condition, 0.3 vs 4; length score of teeth, 22 vs 12.

GxE was generally small or unimportant for age of tooth eruption, tooth loss and tooth wear. When marketing animals for a specific dentition class, industry must be aware that both genotype and nutrition affect dentition, and that cattle could vary in age as much as 16, 18, 27 and 26 months at 2T, 4T, 6T and 8T respectively. Since BxH cows had more and better quality teeth at 12 years of age, dentition undoubtedly contributed significantly to the greater longevity and lifetime performance of these cows on all quality pastures (Heamshaw 1993).

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