THE BRACHYCEPHALIC HEREFORD DWARF

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ABSTRACT

The present study was undertaken to define the type or types of dwarfism occurring in the Hereford breed of cattle in New Zealand as a basis to further work on the biochemical anomalies involved.

The mating of 13 cows that had previously given birth to dwarf calves with a bull that had allegedly sired dwarf calves resulted in both dwarf and phenotypically normal calves in proportions compatible with an autosomal recessive type of inheritance. Dwarf foetuses produced from dwarf with dwarf matings were similar to a foetus of carrier with carrier mating. This observation helped confirm that the mode of inheritance was autosomal recessive.

Selected morphological measurements of 45 dwarfs of various ages, and five dwarf foetuses were compared with those of phenotypically normal cattle and with published measurements of dwarfs and normal cattle from North America. It was concluded that the measurements were compatible with those expected from a single mutant and that the type of dwarf found in New Zealand was similar to the most common form of brachycephalic dwarf described in the Hereford breed in North America. This was in accord with expectations inasmuch as available evidence indicates that dwarfism was imported into New Zealand via four bulls who were from dwarf carrying families.

Histological examination of bone growth plates of 29 dwarf animals of various ages up to maturity and from five dwarf foetuses showed that columns of proliferating cells

tended to be shorter and more irregular than those of normal animals and that there was a reduced number of hypertrophied cells. Electron microscopy showed normal appearing matrix and chondrocytes, except for more apparent dilations of endoplasmic reticulum in the latter. The histology of other tissues was normal.

Urinary mucopolysaccharides of three dwarf animals and three matched controls were similar. This and the essentially normal histology led to the conclusion that this form of dwarfism was not a mucopolysaccharidosis.

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