

TEETH WEAR

Prepared By C P MASSMANN For World Simmental Federation

ABSTRACT FROM: "The Effect of Brittle Hardness and Abrasive Hardness of Enamel on Degree of Attrition of Deciduous Teeth of Representative breeds of Bos Indicus and Bos Taurus Origin".

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Problem

Hereford cattle (Bos Taurus) exhibit severe dental attrition compared with indigenous-native cattle (Bos indicus) when kept on natural grazing with a high fibre content in the low rainfall areas.

Procedure

Determinations were made of the abrasive and micro hardness of the enamel of randomly selected animals representing Bos indicus (local Zebu type) and Bos Taurus (Hereford).

Animals of ages 4 - 5 months and 31 - 33 months were used. The 4 - 5 months animals were not yet weaned from their dams.

The percentage attrition in each breed was also determined by expressing the decrease in crown length of the left lateral incisor from one year of age until slaughter as a percentage of the length of the crown at the age of one year.

Results

There was no significant differences in the micro- and abrasive hardness of tooth-enamel of the two breeds at the age of 4 - 5 months. Any genetic differences that might have occurred at that age were obscured by a sufficient dietary intake of nutrients from the dam's milk. The degree of attrition that occurred in the dentition of animals from birth until 4 - 5 months of age was almost negligible.

Significant differences occurred between breeds in the percentage dental attrition, the abrasive - and micro-hardness of tooth enamel at the age of 31 - 33 months. The enamel hardness of native animals increased with advance in age whilst that of Hereford cattle decreased. The percentage dental wear experienced by native cattle from 1 year to 3 years was significantly less than that of Herefords. The Hereford experienced the most severe dental attrition during the month of inadequate nutrition. During the months, dental wear was further facilitated by a high fibre content of the natural grazing.

Although systemic influences may have been responsible for the differences in the hardness of enamel between breeds at 31 months of age, it seems likely that the factors responsible for these differences are genetically control led.

It seems evident, therefore, that whether variations is discontinuous, conforming to a simple Mendelian mode of inheritance, or continuous, governed by polygenic factors, genetic factors, directly or indirectly influence the quality of tooth-enamel which is basically described by its hardness or softness.

This leads to the supposition that owing to the differences in quality and abrasive properties of the natural grazing of the cool temperate low-altitude zones in which the exotic cattle were developed, compared with those of the sub-tropical areas in which the native animals originated, the forces of natural and artificial selection, attempting to create equilibrium between genotype and environment, may have been responsible for the differences in hardness of tooth-enamel of Hereford and native animals.

Other research in this regard:

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Steenkamp, J.D.G. 1970. Agric. Sci. S. Agr. Agroanimalia 2(2): 85-91.

Steenkamp, J.D.G. 1971. Africander Cattle Breeders' J., 15(1): 33-39.