

GROWTH OF THE METACARPAL BONE OF LAMBS AFTER SEVERE
FEED RESTRICTION IN EARLY POST-NATAL LIFE

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Skeletal size is a primary determinant of the size and productivity of an animal (Holmes 1973). It would be of interest to know, to what extent severe food restriction during the early, post-natal life of lambs affects their eventual skeletal size as mature sheep. Tulloh and Brimblecombe (pers. comm.) subjected lambs to a severe feed restriction for the first 42 days of post-natal life and then fed them ad lib. to 30kg liveweight (LW). Their evidence suggested that the rates of growth of the metacarpal and the femur were slower in the lambs during recovery than in their control group which was fed ad lib. from birth. A less severe restriction was imposed by Gali (1981) who found that, at 42kg LW, weights of both the humerus and femur, respectively, were similar to those of his control group but rate of bone formation apparently slowed down in his restricted group.

Because of the inconclusiveness of the above experiments, we have begun a long-term seriatum study of Comeback wethers using X-ray techniques. Twenty-six lambs were subjected to a restricted food intake of a reconstituted whole milk diet for the first 35 days of post-natal life and during this period they gained $1.2 \pm 0.01\text{kg LW}$; subsequently, they were fed the milk diet ad lib. until they were weaned at 30kg LW. They were then fed a diet consisting of 67.3% barley, 19.2% lupins, 9.6% lucerne, 1.9% molasses and 1.9% salt. Twenty-six control lambs were fed the same diets and treated in the same way except that they were fed ad lib. from birth. The front, left leg of each lamb was X-rayed at regular intervals and the data presented here cover growth to 50kg LW. A regression equation relating metacarpal length to LW was calculated for each surviving lamb. Within the same group, these equations were used to compute the common regression equation within that group. The common regression equations for the two groups are as follows:

$$\begin{array}{llll} \text{Control group:} & y = 9.30 + 0.0769 (+0.0013) x & n = 25 \\ \text{Treatment group:} & y = 9.32 + 0.0755 (\pm 0.0016) x & n = 24 \end{array}$$

y = length of metacarpal (cm); x = liveweight (kg)

There is no significant difference between these equations.

The results indicate that, up to a LW of 50kg, the early post-natal nutrition imposed in this experiment did not affect the relationship between-length of metacarpal and LW. It remains to be seen whether or not this situation will be maintained as the groups approach mature size.

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GALI, E.S.E. (1981). Acta Veterinaria (Beograd.) 31 (5-6): 237.

HOLMES, W. (1973). Proc. Br. Soc. Anim. Prod. 2: 27.

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