Rickets in Sheep

Elliott and Crichton[1] claimed that 'bent-leg' is of widespread distribution in Scotland. They found that cod-liver oil added daily to the diet of young rams less than a year old prevented the appearance of the rachitic condition. These observations were confirmed by Auchinachie and Fraser[2] and by Dunlop[3]. Recent experimental work by Ewer[4] has shown that the rachitic condition occurring in Welsh lambs brought to Cambridge could be prevented by the administration of a single dose of vitamin D_2 (25 mgm. calciferol in 10 ml. arachis oil) given orally to each animal. The protective action of this large dose lasted approximately two months.

On December 20, 1951, at Dalwine Farm, Ayrshire, thirty-eight ram hoggs reared on low-ground pasture from four months of age were individually numbered and weighed. The animals were allotted at random to two groups. One group comprising twenty animals (group *A*) received by mouth two million I.U. vitamin D. The remaining eighteen ram hoggs were retained as controls (group *B*).

The extent of the pasture on which both groups of animals grazed together was 15 acres, which had been ploughed and re-seeded in 1950.

Blood samples drawn from the jugular vein were obtained from ten animals in each group on January 12, and again on February 9, 1952, when the live-weight of the animals in both groups was again determined. The results are shown in Fig. 1. It will be observed that the animals which received supplementary vitamin D in December made a larger gain in live-weight than did the control group.

While vitamin D has been shown to have no effect on growth-rate when ram hoggs already have a sufficient store of the vitamin, half the severely rachitic animals lost weight during the experiment. The late development of the condition in the animal which made the greatest gain in live-weight in the undosed group shows clearly, however, that it is necessary for the animal to increase in live-weight before 'bent-leg' appears. Once rachitic symptoms develop, the animal is unable to move about and feed normally, at pasture or at the trough; consequently, a marked fall in live-weight rapidly follows.

The results of the blood analyses (Fig. 2) showed that whereas the serum calcium level of the dosed group was 11·3 mgm. per 100 ml., the corresponding figure for the control group was 6·73 mgm. calcium. A marked difference was also obvious even a month after dosing in the level of the blood phosphate in the two groups. The figure obtained in the undosed controls was less than 4 mgm. phosphorus per 100 ml.

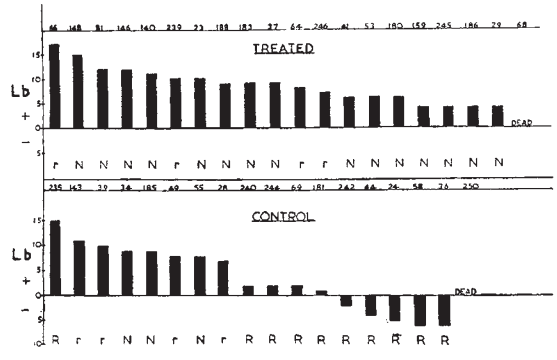

Fig. 1. Live-weight gains from ram hoggs during December 20–February 9. *N*, normal; *r*, rickets; *R*, severe rickets

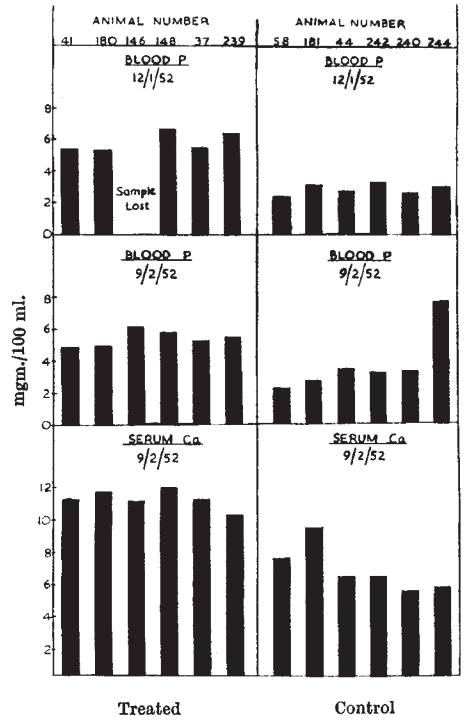

Fig. 2. Blood inorganic phosphorus and serum calcium levels of experimental animals

blood in all cases. In the dosed group, however, the blood analyses showed that the level of blood inorganic phosphorus was greater than 5 mgm. per 100 ml. in every animal. The clinical condition of five treated animals a month after dosing indicated, however, that the rachitic condition was beginning to appear.

Dosing of all the animals on February 9 with two million I.U. vitamin D_2 resulted in recovery and normal health and growth in the affected untreated controls.

It is now general practice in the south of Scotland on hill farms to administer a large dose of vitamin D_2 to the young rams about mid-December and again early in February. At all experimental centres in this area (seven), two administrations during the winter have been found to be necessary.

This treatment has been found to be sufficient to prevent the appearance of the rachitic condition 'bent-leg' during the winter months.

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Cytology of Meiosis in *Matonia*

Matonia pectinata R. Br. is one of the best known examples of a very ancient relict type among living ferns. As is well known[1], the fossil record goes back at least to the Cretaceous period and it extends geographically into the present Arctic Circle, yet the living species is confined to a few isolated mountains in western Malaysia.