

LETTERS TO THE EDITORS

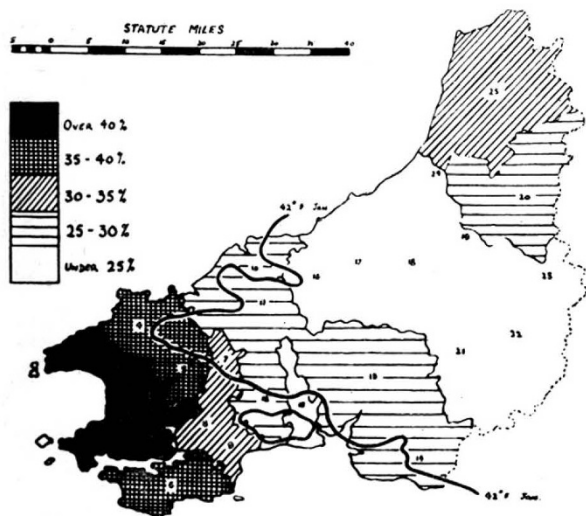
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Influence of Climatic Conditions on Autumn Calvings

ANALYSIS of the sales of surplus calves to Ministry of Food collecting centres in West Wales during the four years 1943-46 reveals the interesting fact that there is a fall in the percentages sold during the autumn months (September-December) from coastal to inland centres and from centres in the west to those in the east. Autumn deliveries to the milk depots in the region show the same trends: thus factory F in the west received during the month of December (average of the four years 1943-46) 94.6 per cent of its September deliveries, whereas factories C, D and G in the eastern areas received only 53.9, 52.7 and 52.1 per cent respectively. There is therefore considerable evidence that the coastal areas, and particularly West Pembrokeshire, have a higher incidence of autumn calvings.

It is believed that these variations are due not to differences in herd management as such but to environmental factors beyond the farmer's control, and particularly to climatic conditions during the months of relevant conceptions, namely, December-March. There is already evidence<sup>1,2,3</sup> in Great Britain that the duration of oestrus and probably the general fertility of cattle vary through the year with temperature, sunshine or both. If such differences can be caused by variation in climate through time, it is likely that they can be caused by variation in climate through space, and, in fact, the degree of winter fertility in West Wales appears to vary with both temperature and sunshine.

The accompanying map, on which the 42° F. isotherm for January has been superimposed,



- |                      |                        |                    |
|----------------------|------------------------|--------------------|
| 1 Croesgoch, 44      | 10 Cardigan, 28        | 18 Llanybyther, 20 |
| 2 Hasgurd, 41        | 11 Crymmych, 27        | 19 Lampeter, 23    |
| 3 Haverfordwest, 40  | 12 Whitland, 28        | 20 Tregaron, 26    |
| 4 Mathry Road, 37    | 13 Carmarthen, 26      | 21 Llandilo, 21    |
| 5 Clarbeston Rd., 37 | 14 Kidwelly, 23        | 22 Llangadock, 25  |
| 6 Pembroke, 36       | 15 St. Clears, 24      | 23 Llandoverly, 21 |
| 7 Clynderwen, 30     | 16 Newcastle Emlyn, 25 | 24 Ystrad, 24      |
| 8 Narberth, 31       | 17 Llandyssul, 22      | 25 Aberystwyth, 31 |
| 9 Kilgetty, 34       |                        |                    |

PERCENTAGE OF CALVES SOLD IN WEST WALES COLLECTING AREAS IN THE FOUR-MONTH PERIOD SEPTEMBER-DECEMBER FOR FOUR YEARS 1943-46, WITH 42° F. JANUARY ISOTHERM SUPERIMPOSED. THE ACTUAL PERCENTAGE FIGURE IS GIVEN AFTER THE NAME OF EACH CENTRE

indicates percentage sales of surplus calves during the autumn months (and the location of the milk depots). To the west of this isotherm the average January temperature rises to nearly 45° F. in some areas, whereas to the east it falls to below 39° F. in some inland districts.

Data for sunshine are scanty; but the distribution almost certainly follows the isotherm in general outline, and the amount declines sharply inland to the east. There is a marked coincidence between the area with a mean January temperature of more than 42° F. and the area with more than 30 per cent of calves produced during the autumn months.

These findings, which form part of a survey of animal health and production in West Wales, supported by a grant from the scientific branch of Messrs. Cooper McDougall and Robertson, Berkhamsted, will be published in detail elsewhere.

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<sup>1</sup>Hammond, J., "Reproduction in the Cow" (Edinburgh, 1927).

<sup>2</sup>Laing, J. A., *J. Agric. Sci.* (1945).

<sup>3</sup>Wilson, S. G., *J. Agric. Sci.* (1946).

Influence of Variation in Length of Day upon the Breeding Season in Sheep

ALTHOUGH it is well known that sheep, and particularly those of British origin, are seasonal breeders, there has been a lack of definite knowledge of the cause of this.

It has been shown<sup>1</sup> that the breeding season in the ferret is controlled by length of day and that light is the effective agent, causing anterior pituitary activity<sup>2</sup>, due in all probability to stimulation from an optico-hypothalamic relay.

In the British Isles, sheep breed in the autumn and winter months, and when transferred to countries in the southern hemisphere they reverse their time of breeding to conform to the new seasons<sup>3</sup>. This is evidence that in these animals the phenomenon of seasonality in breeding is due chiefly to some stimulus of the natural environment rather than to an inherent rhythm. There is some evidence<sup>4</sup> to suggest that seasonal change in length of day is the effective agent, and in the goat, also, experimental work<sup>5</sup> points in this direction.

In an endeavour to elucidate the problem, experiments were commenced in September 1946. The results so far available seem to warrant reporting and may be summarized as follows.

The natural breeding season of a control group of highly fertile Suffolk x Border Leicester-Cheviot ewes commenced in September, some 10-14 weeks after the longest day. In the absence of pregnancy the ewes continued to accept service from vasectomized rams at regularly recurring intervals of 16-17 days right up to the end of March, or some 10-14 weeks after the shortest day. Thereafter oestrus ensued.

A group of similar sheep, subjected to artificial irradiation with strong electric light in such a way that their daily quota of light rose gradually from nearly thirteen hours in mid-October to twenty-one hours at the end of January, ceased breeding two months before the control group, but likewise 10-14 weeks after their shortest day, which was in mid-October.