

# Coat Type in Relation to Cold Adaptation of Cattle

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Field studies of heat adaptation in European breeds of cattle led Bonsma (1949) to recommend the selection of short-haired individuals for hot environments. His findings are supported by more recent experiments using controlled conditions of temperature, light, and nutrition (Yeates, 1955, 1957, 1958).

As studmasters in the temperate zones may be concerned in providing short-haired cattle for the tropics, some measure of the performance of such animals under temperate zone conditions seemed desirable. Accordingly, the present experiment was undertaken at the C.S.I.R.O. Field Station, "Chiswick," near Armidale, N.S.W., where summer temperatures are mild but winters are cold by Australian standards with severe frosts and occasional falls of snow. The aim was to compare the performance of clipped cattle, representing the extreme in short coat, with that of animals with normal coats. The observations commenced in July 1957 and are still in progress (February 1958).

Twenty Hereford weaner heifers of similar coat character and four Galloway yearling heifers with very long, shaggy coats were divided on a weight and breed basis into two equal groups. In one group, the animals were allowed to retain their normal coats; the individuals of the other group were clipped every four weeks to maintain a coat length of approximately  $\frac{1}{4}$  inch or less.

Two Herefords from each group were individually fed equal rations, as a check on possible differential energy requirements. All other cattle were maintained on pasture. Records of weights after 16-hr. fast, together with rectal and skin temperatures were obtained for all individuals at intervals of two weeks.

Results of observations on all Herefords are shown in Figure 1, and mean air temperatures at "Chiswick," calculated on a fortnightly basis over the period of the experiment, have been included.

The Herefords with normal coats made slightly greater live-weight gains than the clipped animals ( $P < 0.05$ ). The main differences occurred in the first 12 weeks of the experiment when mean air temperatures were lowest (below 50°F); thereafter the live-weight curves were essentially parallel. Clipping significantly reduced skin temperature. ( $P < 0.001$ ) with greater differences occurring in the colder weather. Rectal temperatures were not significantly affected by clipping. The individually fed Herefords conformed to the same general pattern as the pasture fed animals in respect of rectal temperature, skin temperature, and weight gain.

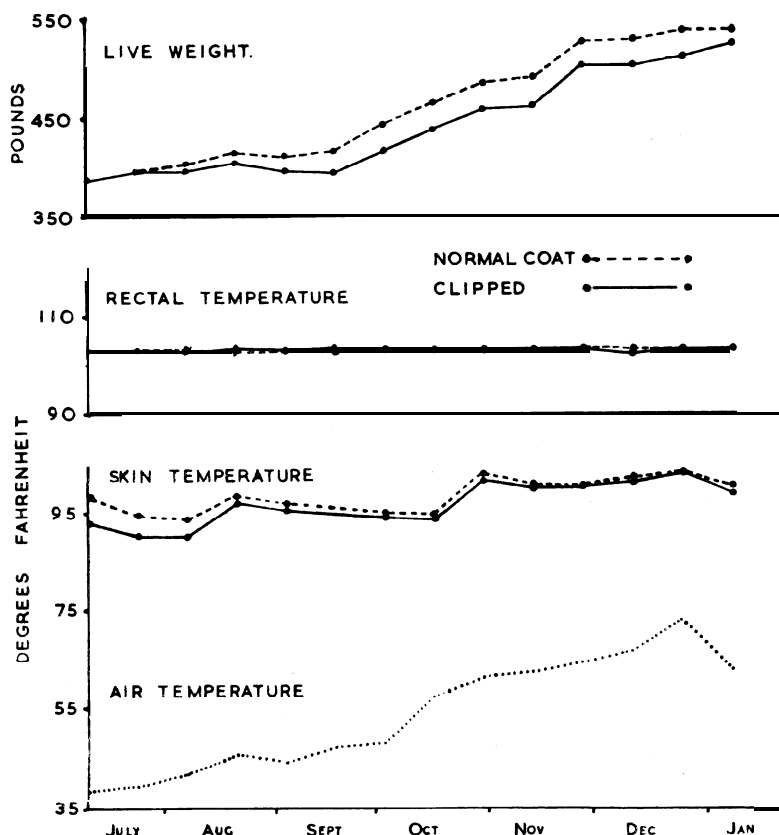
Separate analyses for the Galloways showed that although clipping significantly reduced skin temperatures ( $P < 0.001$ ) and slightly increased rectal temperature ( $P < 0.05$ ) it had no effect on live-weight gain. There was also no suggestion that differences in skin temperature were greater in colder weather.

The clipping must be considered at least as severe a test of the need for winter insulation as a naturally short coat. It would

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therefore appear that selection of short-coated animals in the temperate zone may safely be undertaken, even where individuals are not finally transferred to the tropics. Any slight set-back to their growth should be confined to the coldest months and, viewed in relation to the likely advantages of propagating this type of cattle for tropical regions, seems unimportant.

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