Thyroxine Implantation and Wool Growth of Sheep

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Reports of thyroxine administration come from New Zealand where Hart (1957) has demonstrated an increased rate of wool production varying from 5 to 15 per cent of total fleece weight in sheep. This increase was partly due to an increase in staple length, there being no change in count. L-thyroxine was implanted under the skin in the form of 30 mg pellets at a dosage rate of 60 or 90 mg per sheep during February or March. Trials were carried out in several flocks throughout New Zealand on varying levels of nutrition and an increase in wool production was shown in each case. It was also shown that there was a significant drop in the liveweights of the treated sheep.

Ferguson et al. (1956) found that dosing sheep with thyroxine increased wool growth, metabolic rate, and food consumption with a corresponding decrease in bodyweight. At higher dose levels the increase in wool growth was as much as 40 per cent but the sheep died of hyper-thyroidism. At lower dose levels the increase in wool growth was offset by an increase in food consumption.

At Werribee a trial with penned sheep was commenced in July 1957 to see what effect thyroxine had on wool growth, bodyweight and food consumption of two breeds of sheep.

A selection of Corriedales and Suffolk x Border Leicester/Merino wethers were each randomized into four groups of ten sheep on the basis of bodyweight. Each of these eight groups were housed in separate pens. Two groups of each breed were fed grass hay ad lib and the others were fed a restricted amount of the same hay. Daily food consumption of each group was determined by weighing the residues left in the troughs. In the case of the restricted groups there were no residues.

Liveweight changes were recorded by weighing all groups twice weekly.

One of the restricted-fed groups and one of the ad lib fed groups of each breed were given a single (90 mg) dose of thyroxine at the commencement of the trial. This was in the form of three 30 mg implants placed subcutaneously behind the shoulder of each sheep by means of a short needle implanting gun.

At the commencement of the trial an area on the side of each sheep was clipped free of wool by means of electric hair clippers. Subsequent samples were taken at monthly intervals from the same 10 x 15 cm area on each sheep. In addition total fleece weights (less bellies) were recorded when the sheep were shorn 4 months after the trial commenced.

1. All thyroxine treated groups lost liveweight amounting to about 10 per cent. This was in the nature of a steady decrease from the second to the seventh week after treatment. Liveweights then remained at about the same level for a further 8 to 10 weeks when the hormone treated groups commenced to return to their original weights.

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2. Groups feeding *ad lib* consumed 10 to 12 per cent more feed than those on a restricted diet. However, thyroxine neither increased nor decreased the food consumption of these groups.

3. A total of five sets of wool samples were taken at monthly intervals. Groups fed a restricted diet showed a 10 to 15 per cent increase in wool growth when treated with thyroxine. There was no increase in wool production by sheep feeding *ad lib* when similarly treated.

   In addition, with restricted feeding, thyroxine increased total fleece weight by 5 to 10 per cent, whereas there was no response from groups feeding *ad lib*.

4. There appeared to be no significant difference between the two breeds of sheep used either in rate of wool growth or total fleece weights.

5. Other effects of thyroxine were an increase in respiration rate and greater irritability. No deleterious effects were observed in any of the groups over the period of the trial.

**References**
