The Effect of the Thyroid on Wool Production

Produced for the CRC for Premium Quality Wool undergraduate program by;
Dr. Peter Wynn, The University of Sydney.
Thyroid Hormone

- Thyrotropin releasing hormone (TRH)
- Thyroid stimulating hormone (TSH)
- Triiodothyronine (T3) and thyroxine (T4)
Effect of thyroxine administration to whole body metabolism

<table>
<thead>
<tr>
<th>T4 (mg)</th>
<th>Heart rate</th>
<th>Respiration rate</th>
<th>Feed intake</th>
<th>Body temp</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>100</td>
<td>90</td>
<td>17</td>
<td>38</td>
</tr>
<tr>
<td>1</td>
<td>125</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>135</td>
<td>130</td>
<td>30</td>
<td>39</td>
</tr>
<tr>
<td>4</td>
<td>185</td>
<td>145</td>
<td>40</td>
<td>40</td>
</tr>
</tbody>
</table>

General effect - increased BMR
Effect of hypophysectomy and increasing doses of thyroid hormones on wool growth

- T4 was replaced in incremental injections
  - restores wool growth to pre-operative rates at minimal levels of T4

Source: Ferguson et al, (1965)
Removal of thyroid decreases wool growth

- wool growth depressed by 60%
  - decrease length, not diameter
    - Bulb cells to move to IRS when no T3
    - wool growth restored by T4 injections