Mineral Nutrition Problems in Grazing Sheep

Produced for the CRC for Premium Quality Wool undergraduate program by;
Dr. David Masters, CSIRO Animal Production.
The essential minerals for animals

**Macrominerals**
- Calcium
- Chlorine
- Phosphorus
- Magnesium
- Potassium
- Sodium
- Sulfur

**Microminerals**
- Cobalt
- Copper
- Iron
- Iodine
- Manganese
- Selenium
- Zinc
- Molybdenum
- Chromium
- Silicon
- Nickel
- Arsenic
- Vanadium
- Boron
- Lithium
- Lead
- Fluorine
- Cadmium
- Tin
RESPONSE

CONCENTRATION (in diet or tissue)

Deficient

Clinical range

Marginal range

Adequate

Recommended range

Toxic

90% critical value
<table>
<thead>
<tr>
<th>Mineral</th>
<th>Wool (g/kg)</th>
<th>Skin (g/kg)</th>
<th>Wool (mg/kg)</th>
<th>Skin (mg/kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium</td>
<td>0.5</td>
<td>0.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potassium</td>
<td>1.0</td>
<td>2.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Magnesium</td>
<td>0.34</td>
<td>0.06</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calcium</td>
<td>1.5</td>
<td>0.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phosphorus</td>
<td>0.2</td>
<td>0.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sulfur</td>
<td>35</td>
<td>0.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zinc</td>
<td>279</td>
<td>12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Iron</td>
<td>24</td>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Copper</td>
<td>7</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manganese</td>
<td>3</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Minerals and wool production

<table>
<thead>
<tr>
<th>Mineral deficiencies that affect wool growth</th>
<th>Mineral deficiencies that affect fibre structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Se, Co, Cu, Zn, S, P and probably most other severe deficiencies</td>
<td>Zn, Cu, I?, S?, Co?</td>
</tr>
</tbody>
</table>