

**Vitamin B<sub>12</sub> is an essential component of a number of enzymes which are involved in normal metabolism. It is stored in the liver and is necessary in sheep for energy production and vital for wool and body growth.**

### **What is cobalt?**

Cobalt is an essential trace element required by ruminants for the synthesis of vitamin B<sub>12</sub>. The micro-organisms in the rumen convert dietary cobalt into vitamin B<sub>12</sub>.

### **What are the effects of vitamin B<sub>12</sub> deficiency?**

Vitamin B<sub>12</sub> deficiency in sheep can cause a number of clinical signs including loss of appetite, decreased growth rates, weight loss, watery ocular discharge and anaemia. These signs can occur despite an abundance of available pasture. Young growing lambs are most at risk of developing clinical signs on deficient pastures, as they have a high energy requirement for growth. Growth rates and wool production are affected by marginal cobalt deficiency, with these losses exceeding 15% in severely cobalt-deficient areas. Ewes are also at increased risk with reduced lambing percentages, poor weight gains in suckling lambs, greater risk of metabolic disease (pregnancy toxemia), reduced wool production and infertility.

### **What are the factors influencing cobalt deficiency?**

Vitamin B<sub>12</sub> is dependent on the intake of cobalt from pasture and soil. Cobalt deficiency is associated with sandy coastal soil types and higher pH soils (limestone country). Prolonged weathering, leaching or intensive cropping can decrease the amount of cobalt in the soil. Pasture cobalt can vary with pasture species. A seasonal influence has shown that spring pastures have lower levels of trace elements due to faster growth, and lower uptake of elements from the soil. Some classes of sheep have an increased demand for vitamin B<sub>12</sub> which includes lambs, weaners and pregnant ewes.

### **What is the significance of vitamin B<sub>12</sub>?**

In Australia, cobalt deficiency tends to be more commonly a marginal deficiency rather than a severe deficiency. On these properties, clinical signs (reduced growth rates) may not be noted, but can be of significant economic importance. The cost of correction is small, compared to the resulting benefit.

### **Is it beneficial to combine a vaccination with vitamin B<sub>12</sub> supplementation?**

Vitamin B<sub>12</sub> is conveniently combined with clostridial and Cheesy Gland antigens in the Glanvac™ B12 and Glanvac™ S B12 vaccine range. The timing of the vaccination program coincides with the timings when vitamin B<sub>12</sub> supplementation is most beneficial.

**Ewes** - Vaccination of ewes with Glanvac™ B12 one month prior to lambing increases the vitamin B<sub>12</sub> that is stored in the foetal liver and will ensure higher levels are present in the ewe's colostrum. Vaccination at this time will also ensure maximum protection is passed on to the lamb against the clostridial diseases and Cheesy Gland.

**Lambs** - Vitamin B<sub>12</sub> stores in the newborn lamb's liver have been shown to decrease rapidly in the 60 days after birth and will generally provide the lamb with adequate vitamin B<sub>12</sub> until lamb marking. Vaccination routinely takes place at marking and inclusion of a vitamin B<sub>12</sub> supplement with Glanvac™ B12 will give further vitamin B<sub>12</sub> supplementation for the next 8-12 weeks, depending on the degree of nutritional cobalt deficiency. For 12 month protection against the clostridial diseases and Cheesy Gland, lambs require a second dose of Glanvac™ 4 weeks after the initial vaccination. Young weaners are rapidly growing and are more susceptible to vitamin B<sub>12</sub> deficiency than adult sheep. Vaccination with Glanvac™ B12 will ensure further vitamin B<sub>12</sub> supplementation for up to 12 weeks.

As vitamin B<sub>12</sub> has a high safety margin, it is safe to vaccinate sheep whose vitamin B<sub>12</sub> status may be unknown.

### **What is the correct vaccination schedule?**

For previously unvaccinated sheep, the primary course consists of two doses ideally given 4 weeks apart. This should be followed by a booster dose every 12 months. The ewe's annual booster dose should be timed for the last trimester in pregnancy, resulting in passive protection being available to be passed on to lambs. This will protect them in the first vulnerable period of life prior to them receiving their first vaccination at marking time.

Vaccination of lambs should occur at marking (from 6 weeks of age), followed by a second dose of Glanvac™ B12 4 weeks later. Annual boosters are recommended.

### **What is the correct dose rate?**

Glanvac™ 6 B12, Glanvac™ 6S B12  
1mL subcutaneously

Glanvac™ 3 B12, Glanvac™ 3S B12  
1mL subcutaneously

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