

## Lucerne – Nutrition and Health Issues

A high energy, high protein feed. Generally a good source of vitamins and minerals but there are a number of potential health issues

### Vitamin B12

- Needed for cell growth, glucose and wool production
- Cobalt (thought to stimulate appetite) is converted to B12 in the rumen. Cobalt deficient soils, young lambs (rumens not fully developed) and sheep on high energy rations may benefit from B12 supplementation
- Rate of B12 absorption is enhanced by slow gut flow but inhibited if rumen or small intestine damaged (eg worms)

### Vitamin A:

- Needed for normal bone growth & development, regulation of cell growth, maintaining 'normal' epithelial (surface cells on organs etc) tissue and light transmission to the brain ('night blindness')
- Deficiency may lead to a lowered resistance to infection
- Produced via conversion of carotene (pigment in plants)
- Lucerne pasture and hay are good sources of Vitamin A

### Vitamin E

- An antioxidant with a role in maintaining cell membranes.
- Lucerne pasture and hay are good sources of Vitamin E

### Vitamin D

- Obtained via irradiation (sunlight) and feed
- Acts as a hormone to regulate the calcium/phosphorus balance (helps with calcium absorption)
- Sun cured Lucerne hay is a good source of Vitamin D

### Minerals

	Needed (as % of DM)	Barley	Lucerne (late veg)
Ca	0.20-0.82	0.10	<b>1.30</b>
P	0.16-0.38	0.40	0.30
Na	0.09-0.18	0.02	0.15
S	0.14-0.80	0.18	0.30
Mg	0.12-0.18	0.14	<b>0.24</b>
K	0.50-0.80	0.60	<b>2.5</b>
Cu	7 to 11 ppm	>10 ppm	<b>16 ppm</b>
Co	0.1 to 0.2 ppm	0.1 ppm	0.1 ppm
Zn	20-33 ppm	16 ppm	27

## Calcium

- Important for nerve function, muscle contraction, blood clotting, activation of a number of enzymes and bone formation
- Lucerne is a good source of calcium

## Phosphorous

- Important for cell membranes, energy production, muscle contraction and bone formation
- Lucerne is a reasonable source of phosphorous

## Magnesium

- An enzyme cofactor involved in metabolism of carbohydrates, calcium, fats & protein plus is important for nerve conduction and muscle contraction
- Approx 70% of the animals magnesium is stored in skeleton but it is poorly mobilised. Of that ingested up to 25% is absorbed
- Lucerne is a reasonable source of Magnesium but excess Potassium and Calcium may affect availability
- High intakes of
  - K, Ca, P and Organic Acids decrease Mg availability
  - Na and carbohydrates increase availability

## Potassium

- Important for enzyme functions, muscle contraction, nerve impulse transmission, electrolyte, acid/base and water balance
- One of most abundant minerals so deficiencies are rare
- Lucerne is a rich source of potassium but this may reduce Mg absorption and lead to hypomagnesaemia or transit tetany unless supplemented

## Recommendations

### Provide Additional Roughage

- Lucerne during vegetative stage has low dry matter contents.
- Increasing DM intake reduces the risk of bloat, nitrate poisoning, red gut and scouring
- Reduces the rate of gut flow increasing Vit B12 absorption
- Improves Mg availability and absorption
- Provides additional Vitamin D
- Maintains 'effective fibre' levels stimulating cud chewing and saliva production (low saliva production may lead to a reduction in natural buffer production and acidosis)

Provide dry lick/powder supplements with salt (for sodium) and Causmag (for magnesium). Supplementary grain will further improve energy intakes, growth rates and magnesium availability

#### Vaccinate/Drench

- 5 or 6 in 1
- A,D,E and possibly B12
- Control worms

#### Potential Health Issues:

##### Acidosis/Laminitis

- *'Sugar' acidosis may occur on rapidly growing pastures high in sugar but low in effective fibre*
- *With rapid fermentation lactic acid is produced, the rumen pH drops leading to acidic conditions*
- *Symptoms include dehydration, scouring, abdominal pain etc and death*
- *Laminitis (similar to founder in horses) occurs due to increasing blood flow and pressure leading to blood vessel damage and swelling within the hooves*

##### Bloat

- *Cattle more susceptible than sheep*
- *Ammonia-induced bloat may occur due to high levels of rumen degradable nitrogen. Ammonia gas forms and animals are unable to remove it through belching = asphyxiation due to gas build up and pressure on lungs*
- *Risk highest in winter and spring and/or when Lucerne is fresh; on immature stands and if livestock are hungry when introduced to the stand*
- *Minimise risk by increasing energy intake, feeding roughage, alternate grazing and use of anti-bloat drenches or rumen capsules*

##### Fertility Issues

- *May be high levels of coumestans reducing ovulation rate in ewes*
- *High levels are exacerbated by plant stress due to*
  - *Leaf disease*
  - *Insect damage*
  - *Moisture stress*
- *Trials have shown 20%+ increases in expected lamb numbers in ewes grazing Lucerne compared to ewes on dry, mature pasture. Results are likely to be due to improved body condition, increased ovulation rates, reduced dry ewe numbers and (possibly) a by-pass protein effect similar to improvements found when 'flushing' ewes with lupins prior to joining.*

- *Recent findings however suggest that Lucerne may also reduce progesterone production during the first few weeks of pregnancy. Progesterone 'maintains' pregnancy and there is some suggestion that single bearing ewes grazing Lucerne may abort fetuses due to a reduction in this hormone. Fortunately twin bearing ewes appear to produce enough progesterone to maintain the pregnancy.*

### **Prolapse**

*High risk if:*

- *stock are grazing high energy feed low in fibre,*
- *ewe lambs,*
- *short docked tails,*
- *dusty conditions and/or*
- *over fat*

### **Pulpy Kidney**

- *A clostridial disease*
- *Can occur with sudden change in diet*
- *Symptoms include:*
  - *sudden death, tremors, frothing at mouth, convulsions, teeth grinding*

### **Red Gut**

- *May occur on lush, high protein, highly digestible feed such as Lucerne*
- *Causes bowel twisting or displacement*
- *Similar symptoms as pulpy kidney(bloated, rapid decomposition)*
- *Reduce risk by providing low protein roughage, vaccinating with A,D and E or alternate grazing*

### **Scouring**

*Can be caused by:*

- *Worms*
- *Acidosis*
- *Low effective fibre (low dry matter, high moisture feeds)*
- *Excess protein to small intestine*
- *Excessive Mg*