Minerals and vitamins for sheep and lambs

Optimal production with healthy animals and high gain involves knowledge of all nutrients used in the herd. Roughage, concentrated feed and grain are tangible and it is possible to receive an analysis or a package leaflet on those. Probably most people see minerals and vitamins in a different light. Of course, there is a tag on the bag, but what does it say and what is the requirements of the animals?

**VM Sheep package leaflet**

Additives (guarantee per kg) – the vitamins A and D are specified as international units e.g. 250,000 IU
A = 5,000 IU at 20 grams application.
Vitamin E is stated as DL-alpha-tocopherol (technical name) and with two** as 1,200 IU.
The micro minerals are expressed in mg/kg with information about the raw materials behind. The composition of raw materials is stated in descending order with or without percent.
Guarantee: expresses the macro minerals in percent.

**Directions for use:**

Here the animal groups for the product are mentioned and the application quantity. Shelf life is stated by expiry date/manufactured before.
Use is stated because of max. allocation of e.g. selenium
Classification/labelling is EU regulation with hazard class if any.

**Application:**

There is an instructive application and a max. allocation – according to law.

**Minerals and vitamins from forage**

Grass products such as fresh grass for pasture, silage and hay are providing most calcium (Ca), potassium (K), phosphorous (P) and a decent content of micro minerals. Depending on quality, the content of the vitamins A and E can be rather decent. Vitamin D is found in hay of good quality.

**Maize/whole crop** belongs to the “yellow feedstuffs” and in general, they do not contain many minerals and vitamins, however they contain quite a lot of K.

**Barley/peas** whole crop is very similar to grass.

**Grain products** also belongs to the “yellow feedstuffs” and in general, they do not contain many minerals and vitamins.

**Rapeseed cake/-meal** contains some P and sulphur (S).
Straw provides mainly K in large amounts. In general, the content must be seen relatively measured in gram/kg dry matter.

**What is the requirement?**

**Macro minerals**

**Ca (calcium):** 8.4 g/Fe (extra 10 g/day at twin lambs)
Ca is essential for the bone structure, strengthening of the muscle function and function with other minerals such as P. The ideal ratio of Ca: P = 1.5-2:1 in the ration.

**P (phosphorus):** 3.6 g/Fe (extra 3.4 g/day at twin lambs)
P is essential for the bone structure and contributes in a number of metabolic processes and in the energy conversion. Reduced appetite and a great deal of return to services are signs of deficiency of P.

**Mg (magnesium):** 1.6 g/Fe (extra 1.5 g/day at twin lambs)
Mg is involved in the bone structure and has a major function in the muscle- and nervous tissues. Mg is a bit like the “electrician of the animal” in connection with transfer of impulses. A too high allocation can lead to lameness and too low allocation can lead to cramps.

**Na (sodium):** 1.3 g/Fe (extra 1.2 g/day at twin lambs)
Na is very important for maintenance of the right pressure in the body liquids. Together with K and Mg, it has great impact on transfer of impulses to the nervous- and muscle tissues. Na is allocated as NaCl (sodium chloride) where chlorine is part of the formation of HCl (hydrochloric acid) in the abomasum. Deficiency symptoms are licking and searching for minerals in general. Na is the only mineral that ruminants can regulate themselves according to their requirement.

**K (potassium):** is normally not allocated as a mineral, but it is present in large amounts in the feed. K has as mentioned before great influence on e.g. Na and Mg and participates in several enzyme processes.

**Micro minerals**

**Mn (manganese):** 40-50 mg/sheep. Deficiency: Silent heat, late gestation and reduced birth weight. Formation of cysts if any. NOTICE! An overdose causes almost the same symptoms as deficiency.

**Cu (copper):** 5-10 mg/sheep (large difference between the breeds). Deficiency: Swayback (enzootic ataxia) in lambs, anaemia, lack of gain and changed wool pigmentation and wool length. Low fertility, dead embryos, abortion and more stillborn lambs. Toxic: 20-50 mg/kg body weight. However, it starts with 8 mg/animal per day at fast growing lambs. Copper is accumulated in the liver over time and that is why a poisoning may come insidiously.

**Zn (zinc):** 50-55 mg/sheep. Deficiency: Bad hoofs, swelled joints and knees. Low fertility, low birth weight. Wool and weight loss and reduced feed intake.

**Co (cobalt):** 0.08-0.11 mg/sheep. Deficiency: Reduced ovulation, slow down gain and increases the mortality at birth and right after birth. Takes part in formation of vitamin B12. Deficiency is therefore seen as “star-gazing” – is similar to deficiency of vitamins B.

**I (iodine):** 0.8-1 mg/sheep. Deficiency: Low fertility, stillborn lambs and reduced birth weight. Can give brain damage and lambs born without wool.

**Se (selenium):** 0.1-0.15 mg/sheep. Deficiency: diarrhoea, muscular stiffness and sudden deaths and weak immune system.

**Vitamins**

**Fat-soluble**

**Vitamin A:** 5,000 IU per sheep
Vitamin A is the heat- and thus the fertility vitamin. Ensures good inside linings and take parts in formation of good ova for conception.
**Vitamin D:** 400 IU per sheep
Takes part in the metabolism of Ca and P. It is important with extra application at late pregnancy and lambing, because of dim light in the winter period.

**Vitamin E:** 30 mg per sheep
Vitamin E is supporting e.g. vitamin A as antioxidant. Has influence on the immune system and has in interaction with selenium great influence on growth and viability in lambs.

**Water-soluble**
The vitamins B6, B12, niacin and biotin – also called the B-complex vitamins - are participating in the transformation of especially the carbohydrates.
Biotin is necessary for the formation of “keratin” that is used for the hoof structure.

How to cover the requirements so that it all comes together?

Through an all-round feeding with e.g. grass silage in form of ensiled first cut of grass before head emergence is stacked and wrapped up or in wrap bales that is placed on the flat side to avoid air intake.

Whole-crop silage of barley/wheat or maize silage can supply a large part of the energy but not many minerals/vitamins.

Good hay can supply protein and several good vitamins as well as some D-vitamin. Straw, given as ad libitum feeding, provides practically only a feeling of fullness, but that is also important for ruminants.

As supplementary feed or protein feed, we can recommend Sheep T (Fåre T) – a protein rich supplementary feed, which is allocated together with whole barley. Here the vitamin- and mineral requirements are covered with allocation of approx. ½ kg.

If you want a total solution in protein, we can recommend Sheep Mix (Fåre Mix), which is a more all-round protein mixture that partly covers the mineral- and vitamin requirements.
VM Sheep or VM Sheep Special (for organic herds) is allocated as top dressing on top of the roughage or in a BasisFeeder, where the sheep eat ad libitum. Approx. 20 grams per sheep per day will cover the requirement for minerals and vitamins.

Salto sheep, which is a mineral lick, will supply lambs and sheep with both salt and extra micro minerals (organic farmers may also use Salto sheep).
If extra vitamins are wanted in connection with “flushing”, we recommend a vitamin A, D and E in powder form or as vitacaps (vitamins capsulated in wheat starch).

**Balance in feeding and supply with minerals and vitamins all year round.**

Start with a good supply according to the standards. If necessary supplement with extra vitamins close to lambing providing a good lambing course with strong lambs and a healthy ewe.

In the nursing period, where the lambs have to thrive optimally, minerals and vitamins are allocated as top dressing in the beginning and later as ad lib where the lambs also can eat. If you want to cut down the vitamins because of the good grass, VM Sheep Mix can be recommended because that is an ad-lib mineral that is designed for ad lib feeding on pasture.

During this time, we also recommend to place a lick mineral close to the water through, because that will increase feed- and water intake.

In the dry period on pasture, the sheep can easily be supplemented with Sheep Mix grass until autumn where it is time for “flushing” again. At “flushing” protein and energy as well as extra minerals and vitamins have to be supplemented at full throttle.

In order to work out a correct feeding plan with a good balance of all nutrients we recommend a feed- and mineral analysis. Today several small Excel programmes for feed- and mineral calculations are available and people can use them even without an agricultural training background. The abovementioned text and the illustrated figure show that there are some complexes, which requires consideration, but you can leave it to your adviser or your “mineral man”, who always will be of assistance to you.