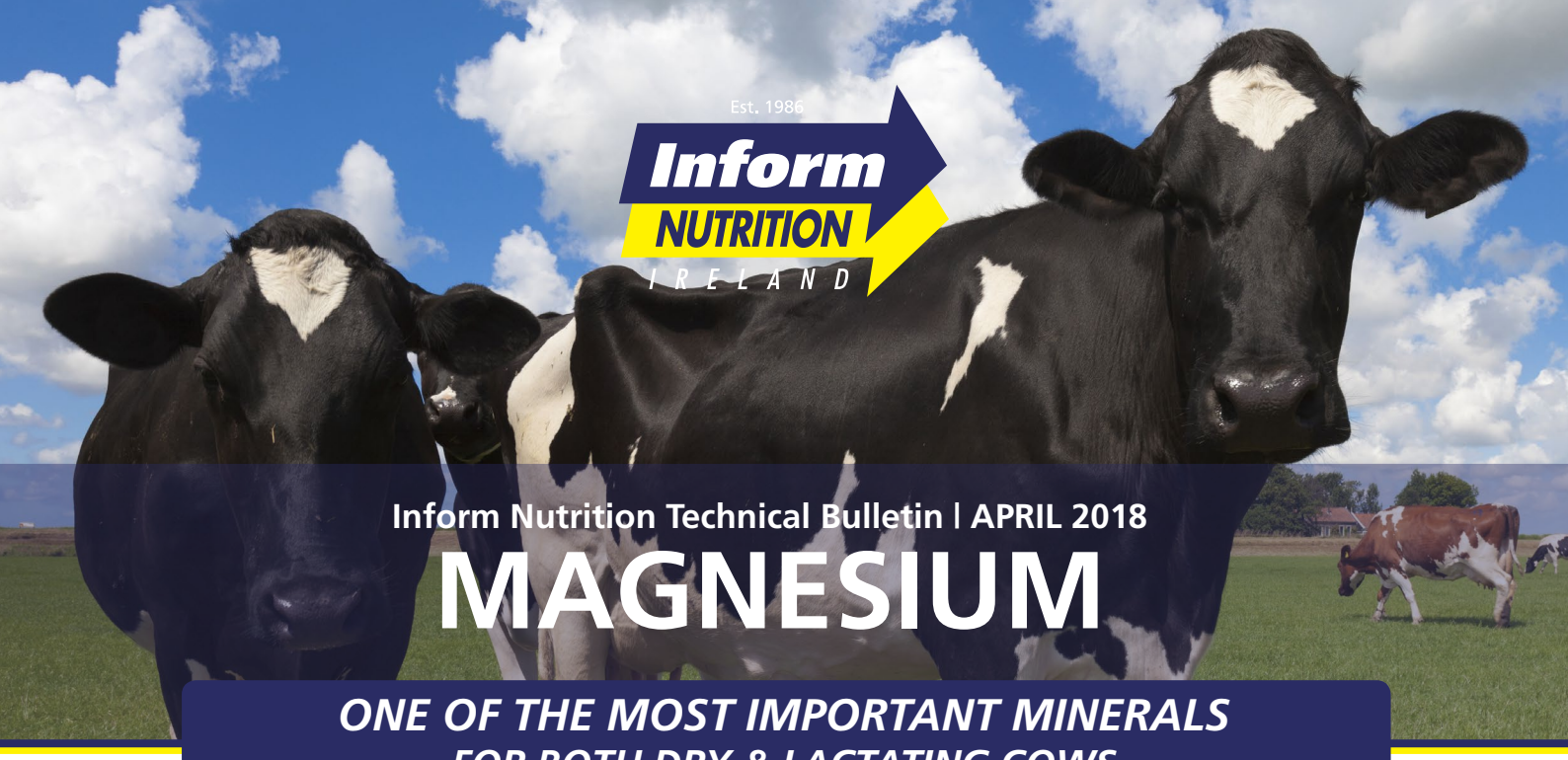

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MAGNESIUM

ONE OF THE MOST IMPORTANT MINERALS FOR BOTH DRY & LACTATING COWS

MAGNESIUM

Magnesium is one of the most important minerals for both dry and lactating cows. Very little usable magnesium is stored by the cow and therefore it must be fed daily. Ewe's and beef animals have also a requirement for magnesium. Farmers generally think of magnesium in terms of a single function i.e. its role in the prevention of grass tetany. However, magnesium is a more important mineral than this. Magnesium plays a role in over 300 biochemical functions in the cow.

Some of the important roles magnesium plays include energy metabolism, bone formation, nerve and muscle function, and calcium and phosphorus metabolism. For dry cows magnesium is a critical element, playing an important role in the metabolism of calcium around calving.

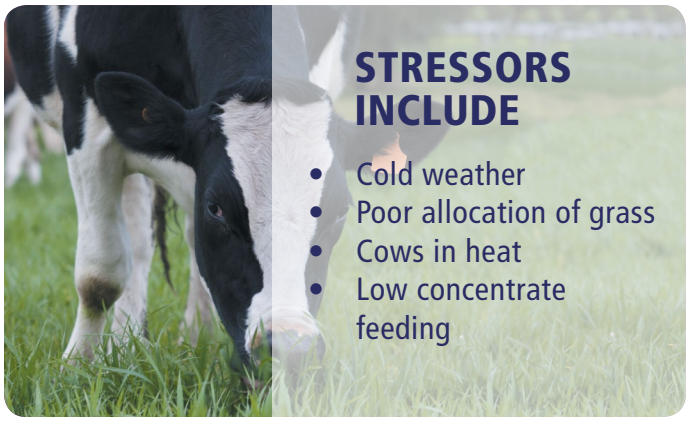
This is important in reducing the risk of milk fever, slow and difficult calving's, retained placenta, and a range of metabolic and immune issues related to calcium metabolism. To maximise production and fertility of our cows, we need to start to think of the important role magnesium plays in metabolism. This should entail a two-pronged approach, (1) supplementation (2) management of antagonist i.e. potassium (K).

Recommended Magnesium Supplementation

Month	April	May	June	July	August	September	October
Supplementary Magnesium (Lactating cows) (g/day)	23	38	34	26	43	40	24

TETANY

Tetany or grass tetany is caused by low blood magnesium levels in conjunction with some form of stress. Cold weather or poor allocation of feeds are typical examples of stressors seen where tetany is a problem. Cows in heat can also be an issue as these sometimes don't eat their allocation of feed in the parlour and are stressed. As well as a significant stressor cold weather also reduces herbage levels of magnesium and wet grass reduce concentration in the rumen. Concentration is an important factor in the absorption of magnesium. In terms of low blood magnesium this can be caused by a low intake of magnesium or the absorption of magnesium being blocked by high dietary potassium. Intake of low dry matter grass can also reduce absorption due to dilution in the rumen.



• Magnesium Absorption & Potassium

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- Magnesium Absorption

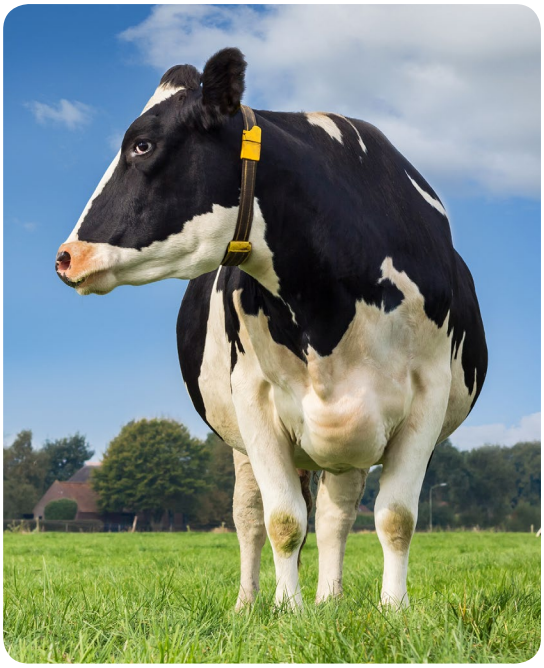
The rumen is the primary site of absorption. There are 2 methods of absorption: **PASSIVE and ACTIVE absorption.**

PASSIVE ABSORPTION	ACTIVE ABSORPTION
Passive absorption is essentially magnesium leaking across the gut. The level of absorption depends on the concentration in the rumen. Hence absorption will be poorer when cows are grazing low dry matter grass. **Passive absorption** would not be important in terms of getting the volume of magnesium into the cow to meet her daily requirements but is important in terms of sustaining life when other pathways are blocked.	**Active Absorption is the most important process.** An electrochemical gradient is required across the rumen wall to facilitate this process. High levels of dietary potassium interfere with this gradient and reduce absorption. Potassium level's in spring grass can be high, particularly where high levels have been applied in the recent months. While average grass potassium in May is approximately 3.2%, it not unusual to see levels in excess of 4%. More though needs to be put in to potassium use and timing on grazing ground in order to better manage the magnesium status of the lactating cow. The fact that symptoms of tetany are not being seen does not mean that cows have an optimum supply of magnesium for production and fertility.

• Requirements

Lactating Cows

Traditionally Lactating dairy cows were fed and are still fed one ounce (28 gram) of added magnesium (2 ounces (56gram) of Cal-mag per day). This recommendations come's from a time when potassium was largely applied in autumn and herbage potassium levels were significantly lower in spring grazing that they are today.



Looking at current recommendation based on potash levels a higher level would be required to get adequate levels absorbed on a consistent basis(Professor Weiss of Ohio State University (J. Dairy Sci, 87:2167-2171, 2004). A level close to 35 gram of added magnesium is desirable for dairy cows on higher potassium herbage's. This can be achieved by increasing the concentration of magnesium in the feed. However there is very little upward flexibility on this figure and if feeding levels need to be increased they can't. A better option might be leave the magnesium in the feed as is and add additional magnesium to the water (see below).

In terms of suckler cows the current recommendations of 28gram magnesium per head per day should be adequate in all but extreme situations.

Dry Cows

Traditional dry cows were supplemented with 15 grams of magnesium per day (100 gram pre-calver 15% magnesium). While increasing supplementation of magnesium in the lactating cow has been slow to increase, magnesium concentrations and feeding rates have increase significantly in dry cow supplements over the past few years. Target should be a minimum of 30grams of magnesium per head per day for both suckler and dairy dry cows.

• Supplementation Method

Lactating Animals -

Concentrate feed

For dairy farmers feeding concentrate adding magnesium in the form of Calcined magnesite is a good option. It is cost effective and if the cow eats the ration she is guaranteed to get her magnesium. An issue relating to intake cows in heat can be a problem.

Liquid Magnesium -

Magpak is a magnesium salt that is soluble in water. It also contains copper zinc and manganese. Additional trace element in the form of **LiquiTrace** can be added. It is mixed with water on the farm and can be fed using a Dosatron pump or Compsey dispenser. A Compsey dispenser is a simple way to feed magnesium and a short video on how to set up and use can be seen on our YouTube channel search for "Inform Nutrition".

https://www.youtube.com watch?v=7UKm1DV_59Y

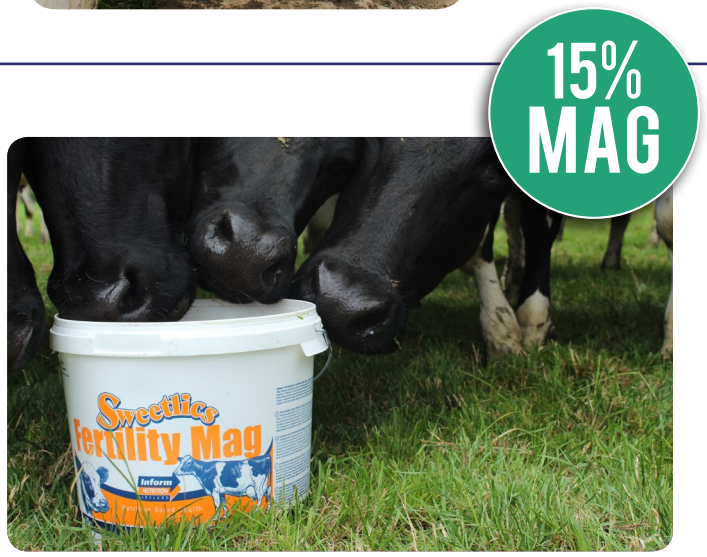
Magpak is a magnesium salt that is soluble in water. It also contains copper zinc and manganese

• Suckler Cows

As above liquid magnesium **Magpak** is an ideal method of supplementing magnesium. As most of the magnesium is supplemented during the breeding season additional trace elements in the form of Liqui-trace should be supplemented.

Magnesium Buckets are a popular method of supplementing magnesium to suckler cows. Again as most of the magnesium is fed during the breeding season **Sweetlics Fertility Mag** is an ideal product to use.

This contains 15% magnesium with a high concentration level of trace element ideal for the suckler during the pre-breeding and breeding season.



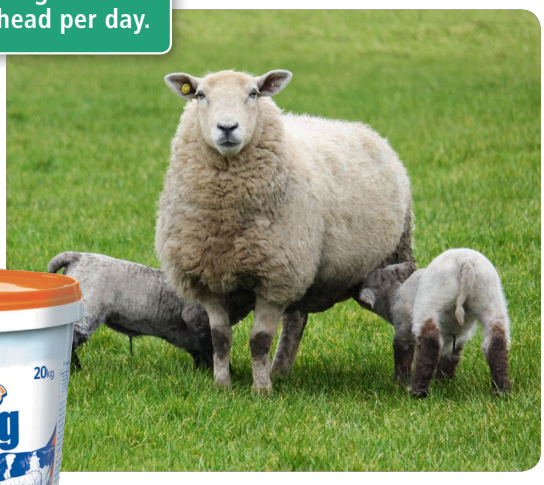
• Sheep

A daily target intake of 10 gram of calcined magnesite per head per day.

Magnesium for sheep
Ewes require magnesium particularly in the period pre and post lambing.

A daily target intake of 10 gram of calcined magnesite per head per day. Cal-mag is normally added to sheep feeds at 1%. Where concentrates are not being fed **Sweetlic's Easi Mag** is an ideal method of supplementing magnesium.

Cal-Mag or Calcined magnesite (magnesium oxide is the active ingredient) is a common source of magnesium used in minerals and feed. It does **NOT** contain calcium as often mistakenly thought. Calcined refers to the thermal process calcination which renders magnesium oxide digestible for ruminant animals.



Cal-Mag Rates

Other Common inclusions		
Metric Rates		
Feeding rate	**Cal mag inclusion**	**Magnesium for label***
56 grams in 8kgs	0.7% - (7kgs/Tonne)	0.60%
56 grams in 7kgs	0.8% - (8kgs/Tonne)	0.65%
56 grams in 6kgs	0.95% - (9.5kgs/Tonne)	0.72%
56 grams in 5kgs	1.1% - (10.1kgs/Tonne)	0.8%
56 grams in 4kgs	1.4% - (14kgs/Tonne)	0.95%
56 grams in 3kgs	1.9% - (19kgs/Tonne)	1.20%
56 grams in 2kgs	2.8% - (28kgs/Tonne)	1.65%
56 grams in 1kgs	5.6% - (56kgs/Tonne)	3.05%
Other common rates(bag addition rates)		
56 grams in 1.1kg	5% - (50kg/tonne)	2.75%
56 grams in 2.25kg	2.5% - (25kg/Tonne)	1.50%
56 grams in 4.5kg	1.25% - (12.5kg/tonne)	0.87%
Sweet Cal Mag rates(33.2% Magnesium) 90 grams of Sweetenend Cal Mag provides 30g Magnesium		
Cal Mag equilivant	Sweet Cal - Mag inclusion	Magnsium level for label
56 gram in 1.7kg	5% - (50kg/tonne)	1.91%
56 gram in 3.4kg	2.5% - (25kg/tonne)	1.08%
56 gram in 6.7kg	1.25% - (12.5kg/tonne)	0.66%

*Magnesium level for label includes a background allowance of 0.25%

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