

Est. 1975

**Inform**  
**NUTRITION**  
IRELAND

Inform Nutrition Technical Bulletin | April 2017

**SPRING 2017**

- FACTORS AFFECTING FERTILITY FOR THE BREEDING SEASON
- MINERAL SUPPLEMENTATION • GRASS TETANY • CONTROL/PREVENTION
- POTASSIUM : MAGNESIUM RATIO • MAGNESIUM REQUIREMENTS OF DAIRY COW
- MAGNESIUM SUPPLEMENTATION

## • Breeding Season

The breeding season for spring calving herds is fast approaching. The focus has switched, on many farms, from good dry cow management to the transition cow management, when farmers are trying to get the cows in the best possible condition and health for the breeding period. Profitability and fertility success on spring calving farms will depend greatly on the 6 weeks prior to calving and the 6 weeks after calving

**There are many factors affecting a successful breeding season including:**

1. Body Condition Score
2. Nutrition
3. Mineral Supplementation

### • Body Condition Score

Research has shown that having the cow in the correct body condition score leading up to breeding is a very important factor in getting the cow back in calf. It is vital to monitor cows who are over conditioned at calving as these are at the greatest risk of mobilising too much body condition after calving (NEB) and this has shown to dramatically decrease fertility, and also leads to metabolic disorders such as Ketosis.

Thus, it is of great importance to minimise the length of time a cow experiences NEB in the first 6-8 weeks post calving.

### • Nutrition

It is important to monitor Dry Matter Intakes with cows in the transition period. Cows take time to adjust to grass after being on a diet of mainly silage for the dry period. If grass availability is scarce or the weather is poor then is important to provide some form of supplementation. Options include increasing concentrate feeding in the parlour of a high energy nut or buffer feeding out of parlour. If farmers are buffer feeding with maize, beet, etc. then is important to balance with an appropriate post calver mineral Dairy Elite TRM (FP0075) Hi Fertility + chelates (FP0002)

## Mineral Deficiencies and their Symptoms

Mineral	Deficiency Symptoms
Phosphorus	<ul style="list-style-type: none"> <li>• Silent heats, poor conception rates, reduced oestrus cycles</li> <li>• Cows eating objects e.g. rope, plastic, stones</li> <li>• Reduced growth,</li> <li>• Reduced appetite</li> <li>• Poor milk yield</li> </ul>
Selenium	<ul style="list-style-type: none"> <li>• Poor sperm mobility</li> <li>• Retained placenta, anoestrous, metritis etc.</li> <li>• White muscle disease in calves</li> </ul>
Copper	<ul style="list-style-type: none"> <li>• Poor fertility</li> <li>• Weak immune system</li> <li>• Retained placenta</li> </ul>
Iodine	<ul style="list-style-type: none"> <li>• Early embryonic death, poor oestrus, abortion</li> <li>• Weak or dead calves</li> <li>• Reduced growth,</li> <li>• Reduced appetite</li> <li>• Poor milk yield</li> </ul>
Cobalt	<ul style="list-style-type: none"> <li>• Poor oestrus, reduced conception rates</li> <li>• Early embryonic death, poor oestrus, abortion</li> <li>• Reduced growth,</li> <li>• Reduced appetite</li> <li>• Poor milk yield</li> </ul>
Zinc	<ul style="list-style-type: none"> <li>• Compromised immune system</li> <li>• Poor sperm mobility</li> <li>• Poor conception rates</li> </ul>
Manganese	<ul style="list-style-type: none"> <li>• Poor fertility</li> <li>• Reduced conception rates</li> </ul>

## • Mineral Supplementation

Minerals which are typically deficient on Irish farms and impact on fertility include Copper, Iodine, and Selenium, and to a lesser extent Cobalt, Manganese and Zinc. These deficiencies can have very negative implications for the reproductive performance of the herd. It is therefore important that milking cows are supplemented with the appropriate minerals to ensure successful fertility results.

There are a number of ways to include minerals for the milking cow i.e.

- Include a good quality buffer if a farmer is diet feeding (Rumbuff FP5004 & FP5005)
- Include high quality water soluble minerals in water trough's to ensure good intakes (MagPak FP9170) (Liqui Trace FP3002)
- A mineral drench (Vet Tech Elite FP9978)

Cal Mag Inclusion Table

Kgs of Feed Fed	Provide 60g / Kg of Magnesium	Magnesium Kgs inclusion/Tonne
2	60	30
4	60	15
6	60	10
8	60	7.5

## • Grass Tetany

There has been exceptional grass growth throughout the winter and early spring and many farmers have had the opportunity to spread fertiliser. As soon as conditions allow, cows will be out grazing this lush spring grass. Grass tetany, or hypomagnesaemia, is caused by a deficiency of magnesium (Mg) in the blood. It continues to be a major cause of death amongst cattle in Ireland every year. This is a rapidly fatal condition in Suckler and dairy cows and a common cause of sudden death; i.e. an animal found dead in the field without any history of disease or ill-health in the previous days.

Cows cannot metabolise magnesium from body stores and must ingest sufficient magnesium on a daily basis to prevent deficiency and subsequent disease. It is common with suckler cows when they are grazing very bare, as well as lush pastures. In the case of dairy cows, it mainly occurs when they graze lush grass in the spring and autumn and the risk is increased for recently calved cows. Spring and Autumn grass is frequently low in Mg due to quick growth and heavy slurry spreading. This leads to high potassium forage which is an antagonistic to Mg uptake.



“ Cows cannot metabolise magnesium from body stores and must ingest sufficient magnesium ”

The level of Mg obtained from forage is depressed by factors such as:

- Heavy nitrogen fertilisation
- Rapidly growing swards
- High potassium in the soil
- Lush, low-fibre grass and high nitrogen, which result in a rapid passage through the gut and an increased ruminal pH, both of which further decrease magnesium absorption
- Low dietary sodium which is needed for Mg absorption from the intestine.

Grass tetany is also very much a disease associated with stress. The common stressors for both beef and dairy cows include:

- Cows in heat (not eating a lot that day and exerting a lot of energy rising on other animals, etc.)
- Bad weather conditions
- Changes in diet and pasture
- Transport
- Concurrent disease that may affect feed intake.

## • Control / Prevention

Control is based on providing a regular daily intake of magnesium during the period of risk; i.e. whenever cows are grazing lush young pasture (April to June and September, primarily).

Options for increasing magnesium intake include:

- ✓ Feeding concentrates with the addition of **cal mag. FP0014 sweet Cal Mag**
- ✓ The addition of a **rumen buffer, FP5005 Rumbuff, FP5004 Rumbuff+Yeast** or Buffer feeding with hay or straw prior to going out onto lush pasture prevents significant drops in ruminal pH and helps prevent hypomagnesaemia by reducing the rate of passage of food through the gastrointestinal tract, allowing more time for magnesium absorption
- ✓ Giving free access to high Mg minerals, either by way of powder mineral or mineral licks. **FP7002 Fertility Mag**
- ✓ Avoiding the grazing of cows on pastures that have had heavy slurry applications or the application of high potassium fertilizers
- ✓ The addition of Mg to the drinking water. **FP9170 Magpak +Cu, Zn, I**
- ✓ Regular liming of grazing land to maintain the correct soil pH and improve Mg uptake
- ✓ Pasture dusting with calcined magnesite can be carried out every second or third day



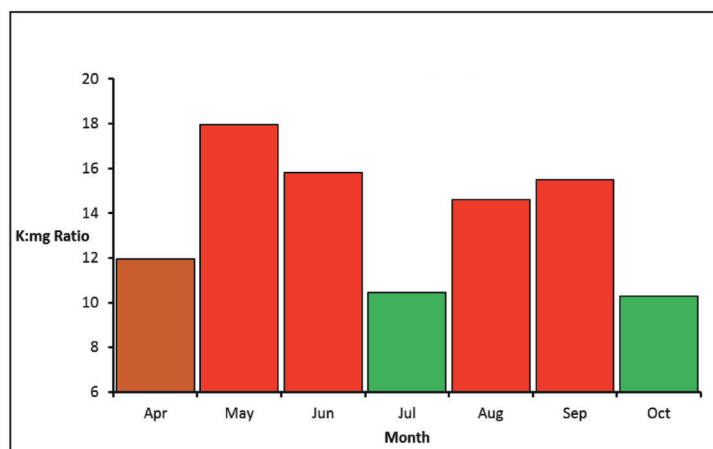
All these preventative strategies will reduce the risk of grass tetany, but no one measure will give guaranteed protection, especially if the cows are exposed to a significant stressor such as very cold, wet weather.

## • Potassium : Magnesium Ratio

Clearly maintaining a balance between Potassium and Magnesium intakes is important to avoiding hypomagnesaemia.

Within the Total Diet the Potassium:Magnesium ratio should be targeted at 7:1. Attaining this target will depend on the extent to which grass deviates from it.

Potassium:Magnesium Ratio in Summer Grass - Hypomagnesaemia Risk



“ Within the Total Diet the Potassium : Magnesium ratio should be targeted at 7:1 ”

The K:Mg ratio in summer grass peaks at 18:1 in May, and then declines to a low of 10:1 in July. With the start of the late growing season the K:Mg ratio sees a second peak of 15:1 in September before declining to its year low of 10:1 in October.

## • Magnesium Requirements of Dairy Cows

A review of the Magnesium requirements of dairy cows by Professor Weiss of Ohio State University (J. Dairy Sci, 87:2167-2171, 2004) demonstrated that Potassium has a much greater depressive effect on Magnesium digestibility than previously recognised by NRC. His study involved summarising Magnesium digestibility data from 8 experiments with 39 dietary treatments and 162 lactating Holstein cows. Weiss concluded that lactating

Holstein cows needed to consume an additional 18g Mg/day for every 1% unit increase in Potassium above 1%K in order to maintain the same intake of digestible Magnesium. When this relationship is used in conjunction with the T&J Grass Mineral Survey and compared with the target K:Mg ratio of 7:1, the following requirements are derived for a cow consuming 15kg DM grass:

**Magnesium Requirements of Dairy Cows**

Month	April	May	June	July	August	September	October
Grass Potassium (%)	2.47	3.16	2.97	2.63	3.33	3.27	2.52
J. Dairy Sci Req (g/day)	56	69	65	59	72	71	57
T&J K:Mg of 7:1 g/day	53	68	64	56	71	70	54

## • Magnesium Supplementation

The use of a 7:1 K:Mg ration appears to correlate well with the Weiss conclusions, and in this case can be applied to both dairy and beef cows at summer grass. Assuming grass on average provides 30 g/day (15kg DMI x 0.20% Mg) then the following level of supplementary Magnesium will be required. The need for additional Magnesium can be provided through both

concentrates and supplements. It should be recognised that the requirement for an additional 14g mg/day equivalent to 1oz/day Calcined Magnesite in May compared to October. These estimates are based on average grass Potassium levels, which by definition will have to be considerably higher than those reported here on a significant number of farms.

**Magnesium Supplementation**

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



**Ask your local Inform Nutrition Ireland account manager for further details**

- Sam Sweetnam - Munster - 086 043 7153
- Liam Lacey - Leinster - 086 770 2570
- Kevin Conroy - Connacht - 083 159 1892
- Robert Mollan Eringold Enterprises, N. Ireland - 07770 77 5 212
- Chris Mollan Eringold Enterprises, N. Ireland - 07739 06 1 672

