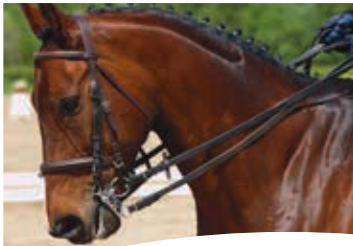
Welmin™

MINERAL RANGE



AGRITECH

Changes in the mineral profiles of grass and grass silages coupled with animal genetic advances over the past twenty years have placed greater demands on the mineral supplements being supplied to farm animals.

The ongoing challenge of producing a live calf per cow every 365 days coupled with optimum health and performance of mother and calf serves to highlight the importance of ensuring that a quality mineral is supplied from the beginning of the dry period at least until the cow is confirmed back in calf.

The anticipated increased milk yields of the post quota era undoubtedly place even greater mineral demands on the dairy cow. With regard to the production of beef, the constant strive for improved growth rates and feed efficiency further serve to highlight the importance of ensuring that the growing and finishing animal is adequately supplemented with all of the key minerals and vitamins which are required for optimum output from this production system. At Agritech we continue to advance our Welmin mineral range and supplements with the assistance of international sources and global research so that Irish farmers have access to a truly superior range of products.

INDEX

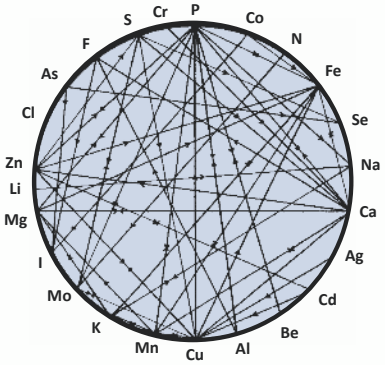
WELMIN MINERAL SUPPLEMENTS
For Improved Bioavailability, Health and Performance

Why do we need minerals?

The importance of minerals for the optimal maintenance of health and performance in livestock is crucial and deficiencies can lead to general disorders. Minerals perform very complex functions to the animal's metabolism. Accelerated developments in animal and plant genetics, coupled with a significant increase in the use of artificial fertilizers and animal slurry, have all contributed to a greater gap between the animal's requirement for supplementary elements and the level at which the current base diet can supply. The consequence of these positive developments is that there is now greater pressure on the diet of the animal to fulfil the macro, trace element and vitamin requirements of the modern day high producing animals. It can be assumed that the base diet is no longer capable of fulfilling these needs without supplementation. The shortfall is further compounded by the increasing levels of mineral antagonists which are now appearing in forages and rations.

Antagonists are lurking

Trace mineral deficiencies occur in two categories: Primary deficiencies and secondary deficiencies.
Primary mineral deficiencies occur as a result of the consumption of diets which are naturally low in one or more trace minerals. These usually require an extended period of time to develop and generally do not occur in modern well-managed livestock production systems.
Secondary mineral deficiencies are now much more prominent in modern livestock operations. These deficiencies develop when one or more other third party elements bind with the key minerals in the rumen thus rendering them mostly unavailable to the host animal. These third party elements are referred to as antagonists. Where this situation occurs we experience high mineral loss rates as they pass through the animal unabsorbed and ultimately being excreted in the manure. All of this results in more expense for the producer and an inadequate amount of minerals reaching the mineral storage points within the animal.



A mineral wheel indicating the known mineral antagonisms.

Are all trace minerals the same?

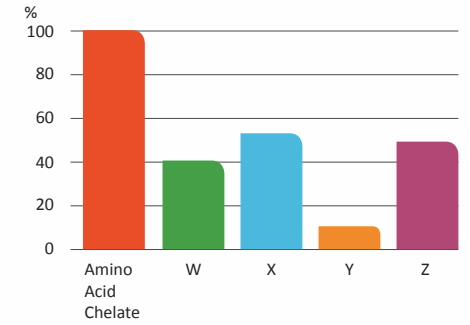
To address the difficult discussion about physiology, intestinal health and environmental pollution, the supply of trace minerals in the EU is regulated by law (EU Regulation 1334/2003). The maximum concentrations in feed have been significantly lowered over the years to reduce the heavy metal output in the environment. This background and the antagonistic threat has meant that the focus of mineral mixture assembly has switched from the crude level of each element supplied to the 'bioavailability' of the element. i.e the percentage of the amount fed to the animal which is actually retained by the animal.
Traditionally, trace minerals have been categorised as either organic or inorganic. The inorganic segment generally relates to each elements being presented in its own original natural form. 'Organic' means that the trace mineral is purposely bound when manufactured to another third party element which may be an amino acid, a proteinate, a polysaccharide complex or propionates. Although both organic and inorganic forms of trace minerals are used in livestock diets, important differences exist in the bioavailability of the two forms with independent research proving numerous times that the organic trace element ensure far superior absorption by the animal, especially in the presence of antagonists.

TECHNOLOGICALLY ADVANCED INGREDIENTS

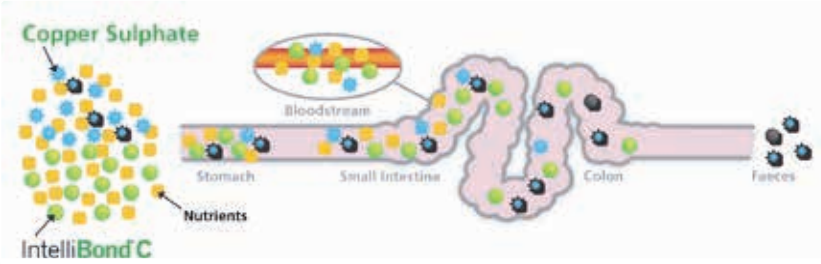
Response from Welmin Minerals

Agritech, through the Welmin™ range of mineral supplements, have been at the forefront in addressing this 'bioavailability' challenge. Since the early 1990's we have been tackling this complex problem.
We quickly identified that for maximum bioavailability of each element that it must be highly insoluble in the rumen.
At that time Keylate™ organic minerals were independently proven to be superior to all others in this regard with excellent absorption rates. We have continued this relationship right up to today through our inclusion of the now further improved Keyshure™ organic range of trace minerals in all of our mineral supplements.

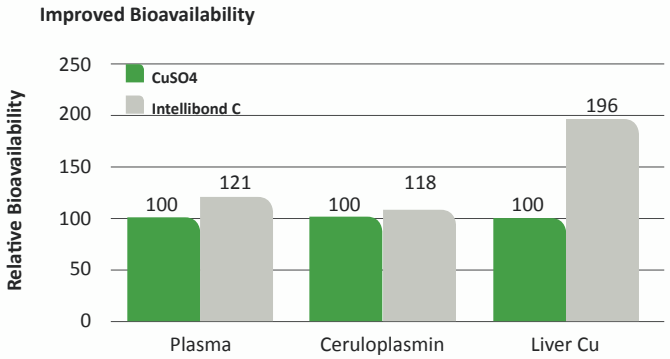
% of mineral remaining chelated in Keyshure™ chelate versus competitor products.



We now also include Intellibond C in many of our mineral mixtures. Intellibond C is a highly available source of **copper**. It works on a different principal to chelates with similar effectiveness. Intellibond C is one of a revolutionary new category of trace minerals known as hydroxyl trace minerals. Intellibond C is presented in a unique stable crystalline form with individual uniform particles. Intellibond C is not soluble at neutral rumen pH which results in a rumen by-pass trace element that gives increased trace mineral stability in the intestine. **Copper** from Intellibond C is released slowly over the full length of the small intestine resulting in more efficient **copper** absorption having a very good effect on overall intestinal health.



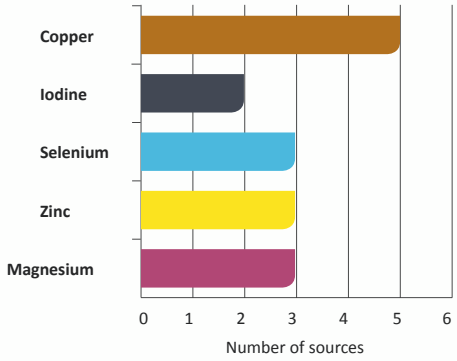
TECHNOLOGICALLY ADVANCED INGREDIENTS



It is now widely accepted that the inclusion of elements from multiple sources significantly enhances the absorption of each element. Agritech have embraced this superior approach, with many elements included from more than one source.

Agritech continue to adopt best practises to ensure maximum absorption by the animal.

Following extensive research from around the world the Welmin™ range of minerals has become a proven formula supplying the ultimate in terms of mineral, vitamins and other beneficial supplements.



Features of Welmin™ minerals

- *High levels of Keyshure™ chelated* **copper** *and* **zinc**.
- *Intellibond™* **copper** *for further levels of rumen bypass.*
- *Organic* **selenium**.
- *Multiple sources of* **copper**, **zinc**, **iodine**, **selenium** *and* **magnesium**.
- **Phosphorus** *levels up to 14% inclusion where required.*
- **Magnesium** *levels up to 30% to counter the increased demand for* **magnesium** *in breeding stock.*
- *High levels of* **vitamins A, D3** *and especially* **vitamin E**.
- *Significant levels of* **B vitamins**.
- *Immunowall* **yeast**.

Benefits to Livestock

- *Health*
- *Immunity*
- *Milk yield*
- *Growth rate*
- *Fertility*
- *Offspring*
- *Feed efficiency*
- *Rumen function*
- *Hoof condition*
- *Mobility*
- *Colostrum antibody levels*

BREEDING STOCK SUPPLEMENTS

WELMIN DRY COW ELITE

Welmin Dry Cow Elite is developed to meet the demands of the high production dairy herd during the dry cow period. It supplies a unique blend of mineral and vitamin supplementation for the developing foetus and ensures that the cow's immune system is adequately strengthened to deal with the rigours of the calving and transition period.

- Multi source inclusion of organic and chelated trace minerals optimising bioavailability, reproduction, immunity and performance, backed by worldwide research from leading brands of ingredients.
- High inclusion of **vitamin E**, supplying 10,000 iu/kg along with other essential vitamins and amino acids for improved health, immunity, reduced metabolic disorders, e.g . retained placenta, and aiding uterine cleansing post calving.
- High in **magnesium** and **phosphorous**.
- Multiple organic sources of protected trace minerals.
- Contains **yeast** with high concentrations of β glucans and MOS.
    - Immunity booster.
    - Pathogen agglutination.
    - Mycotoxin binder.
    - Improved stress resistance.

WELMIN DRY COW

Welmin Dry Cow is formulated to ensure adequate supplementation of the key minerals and vitamins during the dry cow period to boost the well-being of the dairy and suckler cow.

- Includes all the essential trace minerals to meet the demands of the dry period ensuring healthy calves which are up suckling soon after birth.
- **Magnesium** and high **vitamin D** inclusion will aid in counteracting clinical and subclinical milk fever and associated metabolic disorders, e.g. lazy calving, retained afterbirths.
- Organic **selenium** – for optimal **selenium** status.
    - Improved reproduction.
    - Improved antioxidant status.
    - Improved immune response.

WELMIN DAIRY ELITE

Welmin Dairy Elite is our superior specification formulation for the high yielding milking dairy cow. With continuous production throughout the year, mineral supplementation is vital through the full lactation to ensure a healthy and fertile animal and to maximise milk production.

- Multi source inclusion of organic and chelated trace minerals optimising bioavailability, reproduction, immunity and performance, backed by worldwide research from leading brands of ingredients.
- High vitamin and amino acid inclusion to optimise udder health and improved immune status.
- **B vitamins** play important roles in the production, reproduction and immune systems of the animal system.
- Added yeast is ideal nutrition for ruminal flora optimising performance and milk production.
- Biotin supplemented during lactation for increased milk production and improved fertility and reduced foot lesions.

WELMIN DAIRY BOOST

Welmin Dairy Boost is formulated to enhance and support the productivity of the lactating cow, improve calving interval and herd replacement index of the breeding herd.

- Contains a high **phosphorus** level - 8%.
- Generous levels of **copper** and organic **selenium** included for enhanced bioavailability.
- **Zinc**, **copper**, **iodine** and **selenium** from multiple sources will play a pivotal role in maximising the absorption of the essential trace minerals in the critical fertility period post calving.
- High levels of vitamins including **vitamin E** and **B12**.
- Welmin Dairy Boost gives an excellent return on investment.

BREEDING STOCK SUPPLEMENTS

WELMIN CEREAL FORAGE BEET BALANCER

Welmin Cereal Forage Beet Balancer is formulated to meet the needs of the dairy cow or beef animal where there is a greater requirement for phosphorous in the diet.

- High in available **phosphorous** (14%) to balance low **phosphorous** in maize, fodder beet and other root crops.
- Includes all the key essential trace minerals including chelated **copper** and **zinc** which contribute to improved conception, performance and overall health for a high performing dairy cow or beef animal.
- With added yeast for ruminal flora, optimising performance and milk production.

WELMIN HIGH MAGNESIUM

Welmin High Magnesium is specially formulated to assist in the prevention of grass tetany, due to Magnesium deficiencies. It has 25% Magnesium and is designed to be extremely palatable and dust free.

- Provides 30grams of essential **magnesium** per head per day for reduced losses due to grass tetany.
- **Magnesium** is essential for bone, soft tissue, and body fluids.
- Fully mineralised supplement including **copper** and **vitamins A**, **D3** and **E**.
- A very cost effective approach.

WELMIN THRIVOVIT SCC

Welmin Thrivovit SCC is scientifically formulated to meet the cow's daily requirements of the vital trace elements that are most deficient in Irish dairy herds, each of which are vital to healthy bodily functions.

- High inclusion levels of chelated **zinc** for reduced somatic cell counts and reduced lameness.
- Low **phosphorous** – Low **calcium** mineral suitable for all year round feeding, even in dry period if **calcium** is required.
- Multi source of **copper** inclusion for optimum supply and bioavailability.
- High vitamin and amino acid inclusion to optimise the cows genetic potential and maintain top condition.

WELMIN TRANSITION MINERAL

Dietary cation-anion difference (DCAD) is a measure of the levels of four macrominerals in the diet, potassium and sodium – positively charged cations and chloride and sulphur – negatively charged anions. DCAD affects blood buffering capacity and acidity in a cow's blood. A negative DCAD is desirable for the 14-21 days prepartum. Lowering DCAD to -8 to -12 meq per 100g ration dry matter increases blood calcium levels prior to calving which helps prevent milk fever, reduces udder oedema and can lead to fewer retained placentas and displaced abomasums.

- To determine DCAD levels forage testing is critical and the DCAD calculation can be made.
- Feed 14-21 days prior to calving if high risk of high DCAD
- Reduce metabolic disorders

AGMAG - Liquid Magnesium Supplement

AGMAG is a concentrated magnesium supplement also containing chelated copper, selenium and iodine, which is diluted by the farmer and administered to stock through the drinking water via a proportioner pump or Compsey dispenser.

Directions for use:

- AGMAG is supplied in 20 litre containers, to be diluted by the farmer prior to use.
- AGMAG must be shaken well before mixing.
- It is important that only the treated water is available.

BREEDING STOCK SUPPLEMENTS

TRIPLE TRACE - Liquid Trace Mineral Supplement

Triple Trace supplies the principal trace elements often deficient on Irish grass based farms, in a liquid form. It is supplied via water; better absorbed by the animal due to quicker passage rate through the rumen and therefore reduces interference from other mineral antagonists.

- Supply per head per day:

Copper	400mg
Iodine	90mg
Selenium	5mg

- The **copper** in Triple Trace is 100% chelated for maximum bioavailability to the animal.
- Convenient to use with three different options available.
- Also available with 6% added **phosphorus**.

WELMIN DRY COW ELITE - *BLOCK*

Welmin Dry Cow Elite Block provides superior levels of organic and chelated trace minerals together with all other essential minerals and vitamins to ease the demands of the transition phase in the dry cow.

- Contains 4,000 iu/kg of **vitamin E** and organic **Selenium**. This level of antioxidant and organic selenium provides the in-calf animal with a super boost ahead of calving to sustain her through the calving process.
- Contains 3% **phosphorous**.
- Includes yeast.
- Provides the dry cow with the extra essential trace elements including **copper** and **zinc**, which gives greater mineral bio availability to the animal.
- Low **calcium** and high **magnesium** helps reduce the incidence of milk fever after parturition.

WELMIN SUPER COW - *BLOCK*

Welmin Super Cow is a high mag fertility block with 15% magnesium and the added benefit of chelated trace elements and vitamins. This is an ideal block for the farmer who requires magnesium and also has fertility as a priority in their herd.

- Suitable as Dry Cow and post calving fertility block.
- Provides essential **magnesium** for reducing the risk of grass tetany in both dairy and beef cows.
- Ideal for the intensive farmer whose herd requirements demand a higher specification.
- The inclusion of **copper**, **zinc** and **manganese** allows for greater absorption and bioavailability.

WELMIN HIGH MAG 20 - *BLOCK*

Welmin High Mag is an economic 20% magnesium block in a highly palatable molassed base. The higher magnesium levels together with the essential trace elements will provide the beef and dairy cow with a source of magnesium which will further help reduce the risk of grass tetany.

- Suitable for Milking and Dry Cows
- Contains a full complement of trace elements including chelated **copper**.
- Reduces losses due to grass tetany.
- Molassed for extra palatability.

BREEDING STOCK SUPPLEMENTS

WELMIN HIGH MAG 20

WELMIN SUPER COW

WELMIN DRY COW ELITE

WELMIN OPTIMATE OMEGA 3 ENERGY & PROTEIN - *BLOCK*

Welmin Optimate Omega 3 Energy & Protein is a new feed block for milking cows and all young stock over 200kgs.

- It is a unique feed block containing high levels of omega 3 salmon oil with protein from multiple sources, protected protein from protected soya and extra protein from the added yeast, together with good levels of trace elements and vitamins.
- Feeding omega 3 fatty acids contained in fish oil to breeding stock has the potential to improve fertility, reduce embryo loss and enhance general health and appearance of the cows.
- For young animals the benefits will be a stronger immune system with improved health and thrive and a noticeable shine to the animal coat.
- When fed at grass the high energy levels allow the animal to utilise the high protein in fresh grass.

FISHMEG

An essential omega 3 fatty acid supplement for dairy cows for improved fertility, health, production and reproductive performance.

FishMeg is a natural source of high levels of omega 3 poly unsaturated fatty acids, PUFA's especially EPA and DHA. These essential fatty acids are important for many biological functions including fertility.

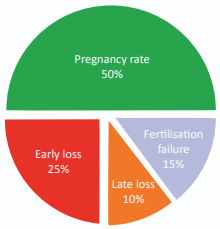
Fishmeg contains pure Scottish Salmon oil, rumen protected by nutrient enrobing production process, together with essential vitamins to give a fine, free flowing powder that is easily mixed into the feed. The enrobing process protects the fish oil and allows for slow targeted release in the intestine.

Omega 3 fatty acids act on the suppression of prostaglandin which can be increased due to hormonal imbalance with high yielding dairy cows. This can result in a reduction of progesterone secretion which affects the preparation of the uterus for the fertilised embryo.

Benefits of feeding FishMeg.

- Readily available source of EPA/DHA.
- Enhances reproductive performance.
- Reduces calving interval.
- Improved sperm quality and quantity.
- Increases milk production.
- Increases embryo survival rates.
- Improves animal health.
- Anti-inflammatory.
- Enhances animals immune system.

1990



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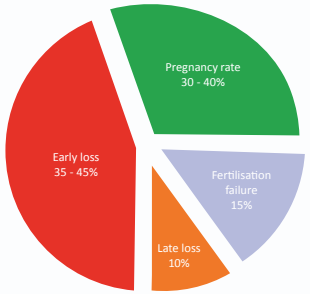

"Declining Pregnancy rates are almost entirely due to increases in early embryo loss" (MDC pd+)

WELMIN RUMICARE DAIRY & WELMIN RUMICARE BEEF

Rumicare has been developed to help counteract rumen and intestinal acidity and to promote adequate rumen protozoa populations in intensively fed animals and those consuming low fibre diets such as spring grass. Rumicare is formulated using a unique combination of phased release rumen buffering minerals.

- Phased release technology ensures constant and ongoing fight against SARA and clinical acidosis.
- Added Rumigest® yeast will enhance rumen bacteria populations and activity aiding better digestion of starch and cellulose.
- Rumicare supplies **calcium**, **magnesium** and **sodium** each of which are very beneficial to the animal, particularly the high yielding early lactating dairy cow.
- Lowers requirement for straw leaving more room for quality feed.
- Reduced indigestion, lameness and stress.
- Improved feed efficiency. Higher output per animal.
- Smoother transition diets with less setbacks including less displaced abomasums.

Always check the diet to ensure that adequate intakes of forage and forage particle size before using buffers.

SYMPTOMS OF SUB-ACUTE RUMEN ACIDOSIS (SARA)

The tell-tale signs of SARA are sometimes difficult to detect through visual observation.

Symptoms include:

- Bubbles on dung.
- Cows swishing their tails (due to passing acidic manure).
- Animals performing 5-10% below capacity.
- Increased lameness levels.
- Less than 80% of animals which are lying down observed chewing the cud.
- Mildly depressed demeanour.

WELMIN BEEF RUMIGEST®

Welmin Beef Rumigest® provides a blend of minerals, trace elements and vitamins to support optimum liveweight gain. It is an ideal mineral for all beef stock, for inclusion in TMR diets, top dressed on silage or added to concentrate.

- Welmin Beef Rumigest® is an essential supplement for young stock where low levels of concentrate are fed.
- Contains **copper** from multiple sources which both play an important role in the thrive of beef cattle, along with helping to ensure that female replacements reach puberty on time.
- Chelated **zinc** level helps prevent lameness during the indoor period.
- Beef Rumigest® contains high levels of **iodine**, which is an important part of Thyroxine, a naturally occurring growth regulating hormone.
- Beef Rumigest® has been shown to give excellent results to weanlings and is very cost effective.

WELMIN BEEF FINISHER

Welmin Beef Finisher provides a blend of minerals, trace elements together with high levels of vitamin E. It provides for optimum performance of the fattening animal in the finishing period.

- Welmin Beef Finisher with 6% **phosphorous** is the ideal balanced mineral for beef cattle on low phos diets.
- Chelated copper plays an important role in the intensive feedlot beef system.
- High chelated **zinc** level helps to prevent lameness during the indoor period.
- High levels of **vitamin E** allows for improved performance, better health and optimum resistance to disease, particularly important when feeding acid treated cereals where the **vitamin E** levels may be denatured.
- Contains Rumigest® yeast to allow rumen bacteria thrive and aid digestion of the intensively fed finishing animal.

BEEF AND YOUNGSTOCK SUPPLEMENTS

WELMIN MULTIBOOST

Welmin Multiboost is a supplement rich in macro and trace minerals along with a broad range of vitamins. Suitable for a wide range of animals including young stock, particularly replacement dairy heifers and calves, show animals, horses and also deer.

- Welmin Multiboost is heavily fortified with a broad range of vitamins, particularly the **B vitamins** essential for vigour and health in the young developing animal.
- Contains 8.5% oil from salmon oil and protected fats to give that extra thrive, vitality and sheen making it an ideal supplement for all show animals maintaining a healthy glow and suppleness to the skin.
- **Copper**, **selenium** and **zinc** from multiple sources for maximum bioavailability and thrive.
- Contains 4% **phosphorus** for improved growth and bone development.
- Farmers report excellent results when fed to their replacement dairy heifers during their first winter pre breeding.

WELMIN SUPER THRIVE - *BLOCK*

Welmin Super Thrive is a high specification block with high levels of macro and trace elements and vitamins. It is most suited to the demands of the growing animal as it provides valuable nutrients to ensure optimum growth and production.

- **Copper** and **zinc** levels from multiple sources including 34% chelated **copper**.
- Contains 4% **phosphorus** for improved growth and bone development.
- High levels of vitamins including key **B vitamins**.

BEEF AND YOUNGSTOCK SUPPLEMENTS

THRIVOMIN CALF SUPPLEMENT

Thrivomin Calf Supplement has been developed to provide the young calf with a balanced blend of trace elements and vitamins. It is a unique liquid supplement added to milk.

- Thrivomin Calf Supplement provides the required level of trace elements for the calf in the first 6-8 weeks of life.
- It has a high concentration of vitamins including **B vitamins B1**, **B2**, **B6**, **B12** and others. **B vitamins** play a key role in the health and vitality of the young pre ruminant calf.
- Contains 10% salmon oil.
- 10,000 mg/kg **vitamin E**.

THRIVOVIT MILK ACIDIFIER

Thrivovit milk acidifier is a whole milk supplement specially formulated with organic acids and concentrated levels of vitamins. Designed for use as an acidified nutritional supplement for calves fed on whole milk.

- Lowers the pH in whole milk.
- Organic acids allow better digestion and utilisation of milk proteins and fats.
- The lower pH factor maintains a digestive acidity level that is not conducive to pathogenic bacteria growth.
- Calves realise early growth potential with better digestion of nutrients.
- Fortification with vitamins supports healthy bodily functions.

VITASTART ELECTROLYTE GEL

Vitastart electrolyte gel is designed for use as a source of electrolyte salts and energy, maintain water balance and to provide a readily available glucose supply.

- Ideal to replenish fluids as a treatment for neo natal calf scours.
- Excellent supplement to boost purchased calves on arrival or in any stress situation.
- Contains **sodium bicarbonate** to counter the acidic digestive effects of calf scour.
- Contains **vitamin A**, **D3** and **E** for quicker recovery.
- Vitastart is not a veterinary medicine.

SHEEP AND HORSE SUPPLEMENTS

WELMIN SHEEP SPECIAL

Welmin Sheep Special is formulated to provide a balance of minerals, vitamins and trace elements and so provide the nutrition needed for peak performance at lambing, lactating and tupping times as well as for growth.

- A high spec balanced mineral supplying all of the key minerals and vitamins for a healthy flock and strong lambs.
- Welmin Sheep Special contains a small quantity of chelated **copper** to aid growth and fertility.
- Contains high levels of **cobalt** and complementary **vitamin B12** for maximum **cobalt** uptake.
- The high levels of **vitamin E** enhance red meat colour, preventing oxidation during storage which is a major advantage at the butchers counter.
- **Phosphorus** included for growth and skeletal soundness.

WELMIN SHEEP & WELMIN HIGH MAG SHEEP - *BLOCK*

Welmin Sheep Block is the ideal supplement for outdoor or indoor sheep providing all the necessary minerals and vitamins for a healthy flock and strong young lambs. With its highly palatable molasses base it is recommended for use pre and post tupping for optimum fertility rates.

- Welmin Sheep Block is formulated for the breeding ewe to ensure optimum fertility and strong lambs.
- Good levels of trace elements especially **cobalt** and **vitamin B12** to prevent pining are essential in order to avoid any unnecessary deficiencies.

SHEEP AND HORSE SUPPLEMENTS

WELMIN OPTIMATE OMEGA 3 SHEEP - *BLOCK*

Sheep have specific demands in terms of energy requirements at different times of the year. Welmin Optimate Omega 3 Sheep block is formulated to supply concentrated energy and protein for the ewe carrying twins or greater and post lambing in terms of milk supply.

- A unique feed block containing high levels of omega 3 salmon oil with protein from multiple sources, NPN from Urea, protected protein from protected soya and extra protein from added yeast.
- The benefit of fish oil with the high levels of omega 3 essential fatty acids EPA & DHA is to enhance fertility.
- Excellent boost of extra energy at tupping time.
- During the winter months when winter fodder is scarce the supply of added energy and protein will help to sustain the animal through harsher climates.

WELMIN HORSE - *BLOCK*

A high specification block suitable for horses and ponies of all disciplines, racehorses, mares, foals and hunters. Welmin Horse Block is suitable for leaving outside in the field or alternatively in the stable.

- Contains a wide specification of minerals and vitamins to ensure health and vitality.
- Added yeast to aid digestion.
- Contains 6.5% pure salmon oil to supply key omega 3 oils for coat, shine and general well-being.
- A full complement of **B vitamins** included.
- Contains chelated **copper** and **zinc**.
- Inclusion of **garlic** works as natures natural deterrent to flies which can be a summer nuisance.

SANITISE BEDDING CONDITIONER

Sanitise is a housing and bedding conditioning solution to promote a dry hygienic environment in the bedding of all livestock. The importance of a dry lying area is the foundation for success in the fight against disease causing bacteria which are present in the animal lying areas, due to leaked milk, uterine discharges, urine, faeces, animal perspiration and humidity. Inhibiting the multiplication of harmful bacteria will help counter the threat of mastitis and high cell counts on dairy farms.

Environmental mastitis control

Mastitis is the most costly disease to cope with on all dairy farms. A high percentage of mastitis cases during lactation have a direct connection with the hygiene regime in the dry period. Cubicle moisture and bedding contamination are the main factors that contribute to the spread of environmental mastitis. With extended use of cubicles hygiene is critical.

Sanitise

- Highly absorbent.
- Neutralizes the animal lying area ensuring it is kind to sensitive skin.
- Absorbs ammonia odours – enhances air quality.
- Includes essential oils with natural antibacterial properties and gives a refreshing odour and aneutralizing effect on ammonia which in turn will help to reduce respiratory problems.
- Contains a hoof conditioner to help counteract foot problems associated with animals standing in slurry and wet areas over long periods of time.
- Easy to disperse evenly over the target area with an application rate of just 50 grams per cubicle/square meter by hand or VINK applicator.

Usage in

- Cubicle houses.
- Straw sheds.
- Calf pens.
- Piggeries.
- Stables.

CHART OF KEY MINERAL BENEFITS AND DEFICIENCIES

Macro Minerals	Function	Deficiency Signs	Mineral Relationships
CALCIUM (Ca)	Bone & teeth formation, blood clotting, smooth muscle contraction	Milk fever, lazy calving, retained afterbirth, slow growth, bone fractures, lower milk yield, rickets, hypocalcaemia	Phosphorous, Magnesium, Fluorine, Sulphur, vitamin D
PHOSPHOROUS (P)	Bone & body structure, Fertility, Growth, milk yield, appetite control, energy metabolism and many key body functions. Makes up 29% of total minerals in the body	Reduced milk yield and milk protein, rickets, poor growth, irregular oestrus, silent heats, delayed/low conception, depraved appetite etc	Calcium, Sodium, Magnesium, Iron, Zinc, Molybdenum, Aluminium, vitamin D
SODIUM (Na)	Nutrient transfer, waste removal, major body electrolyte, involved in appetite(palatability), muscle and heart contraction, rumen and blood pH	Depraved eating behaviour, urine licking, lower milk production, Reduced male fertility	Potassium, Chloride, Sulphates
CHLORIDE (Cl)	Regulate osmotic pressure and acid base balance, manufacture of hydrochloric acid	Loss of appetite, weakness, craving for salt, blood alkalosis	Sodium, Potassium
POTASSIUM (K)	Osmotic pressure, acid-base balance, nerve transmission	Loss of hair glossiness, decreased feed intake	Sodium, Chloride, Magnesium
MAGNESIUM (Mg)	Enzyme activator, bone and muscle, muscle contraction	Grass tetany, lazy calving, retained afterbirth, retarded growth, muscle incoordination, salivation, convulsions	Calcium, Phosphorous, Potassium, Nitrogen, Iron
SULPHUR (S)	Sulphur-containing amino acids, detoxifier, B vitamins synthesiser, cellulose digestion, acid-base balance	Reduced microbial growth, poor appetite. Avoid excess Sulphur	Selenium, Copper, Molybdenum, Nitrogen, Rumen ph

Trace Minerals	Function	Deficiency Signs	Mineral Relationships
COBALT (Co)	Synthesis of vitamin B12 by the rumen microbes	Poor appetite, anaemia, rough hair coat	vitamin B12
COPPER (Cu)	Enzyme activation, blood synthesis, nervous system, hormonal system, development and maintenance of vascular and skeletal systems	Reduced milk production and growth rates,slower return to heats post calving,silent heats,reduced conceptions,delayed puberty in heifers, poorer health and lower immunity, loss of hair colour, scouring,lameness and stiffness. Deficiency also impairs immune response leading to poor response to vaccinations and parasitic treatments	Sulphur, Molybdenum, Iron, zinc, Note: A high proportion of ingested Copper is lost via faeces if not in highly available form
IODINE (I)	Synthesis of thyroxine (hormone)	Enlarged thyroid gland (goitre appearance) weak, dead or hairless new born calves, retained placenta, reduced growth rate, poor reproductive performance with increased early embryonic deaths, Abortions, lower milk butterfat	Manganese, Calcium, Cobalt, excess Potash and Nitrogen
IRON (Fe)	Part of blood haemoglobin, oxygen and electron transporter, enzyme systems, immune system function	Anaemia, retarded growth in foetus and youngstock. Excess generally more problematic than deficiency	Naturally magnetic excess iron affects uptake of Phosphorus, Calcium Copper and vitamin A and can induce Cobalt, Copper, Manganese, Selenium and Zinc deficiency
MANGANESE (Mn)	Growth, bone formation, brain and nervous system function, enzyme activation and insulin activity	Impaired growth, poor reproduction, shortening and bowing of joints	Calcium, Zinc, Iron, Phosphorous and Cobalt

CHART OF KEY MINERAL BENEFITS AND DEFICIENCIES

SELENIUM (Se)	Anti-oxidant, Enzyme formation (Glutathione peroxidase), protects cell membranes, stimulates production of antibody producing cells, immune function	Reproductive disorders, mastitis, reduced disease resistance, white muscle disease, retained placenta	vitamin E, Calcium, Sulphur, vitamin B6, Ascorbic acid
ZINC (Zn)	Enzyme activation, repair of damaged tissue, essential role in immune system, synthesis and metabolism of proteins and carbohydrates, teat keratin formation, transfer of carbon dioxide in red blood cells	Reduced growth rate poor skin condition. Elevation in somatic cell count, mastitis and slow healing of wounds. Hoof disfunction and stiff joints. Impaired sexual function in males and reduced conception rates in females	Iron, Copper, Manganese, Calcium, Phosphorus

Vitamins	Characterisation	Biological Function	Deficiency symptoms
VITAMIN A	Growth vitamin, epithelial-protective vitamin, anti-infective vitamin	Formation and protection of skin and mucous membranes: formation of visual purple and regulation of growth; essential for the immune system	Pathological changes in skin and mucous membranes; impaired fertility; depressed growth; mastitis; weak calves
VITAMIN D	Anti-rickets vitamin	Essential in calcium and phosphorous metabolism. Promotes growth and mineralisation of the bones	Disturbances of calcium and phosphorous metabolism. Softening and deformation of bones; milk fever; hypocalcaemia
VITAMIN E	Anti sterility vitamin, fertility vitamin	Powerful anti oxidant action. Involved in most aspects of reproduction. Regulation of muscle metabolism, increases immunity; better wound healing	White muscle disease, high cell counts, muscular dystrophy, mastitis, reproduction issues
VITAMIN K	Blood clotting vitamin	Important in blood clotting	Increase in blood clotting time; haemorrhaging from burst blood vessels
VITAMIN B1 Thiamine	Anti-neuritic vitamin; anti beriberi vitamin	Regulates carbohydrate metabolism; important for normal function of nerve tissue and heart muscle	Depressed growth; poor feed efficiency and scouring
VITAMIN B2 Riboflavin		Co-enzyme in protein & fat metabolism	Retarded growth; poor feed efficiency
PANTOTHENIC ACID	Anti dermatitis factor	Involved in protein, carbohydrate and fat metabolism	Changes in skin hair and mucous membranes; gastro intestinal disorders
VITAMIN B4 Choline		Choline is a component of lecithin and thus essential for fat metabolism	Disturbed fat metabolism with fatty liver; malformation of joints and bones; retarded growth
NICOTINIC ACID		Nicotinic acid and nicotinamide are involved in numerous metabolic reactions. They are essential for the normal function of skin and digestive organs	Skin changes and gastro intestinal disorders; retarded growth
VITAMIN B12	Anti-anaemia vitamin	Essential for normal blood formation, growth and protein metabolism	Poor weight gain; retarded growth, reduced feed efficiency. Synthesis in ruminants reliant on availability of cobalt
FOLIC ACID	Anti-anaemia factor	Active in protein and nucleic acid (DNA) metabolism; involved in formation of red blood cells	Abnormal blood picture
VITAMIN H BIOTIN	Skin vitamin	Involved in whole series of metabolic functions	Cracked hooves & soles, disturbed hair growth, skin inflammation

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