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## Covid 19: TGA SteriGENE Approval!

### Inside this issue:

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Covid-19 is now an official “on label” claim for SteriGENE and Trigene brands.

EA submitted our Coronavirus trial into the TGA (Therapeutic Goods Administration), the official Australasian licensing body for human products used in hospitals. The trial shows complete elimination of the virus.

Many many companies are making claims that their products kill Covid-19 but few have trial work to support their claims. Even fewer have submitted their data to a licensing authority to have it approved and placed legally in print and “on label.” Most disinfectant products are in

fact unlicensed. There are now nine official NZ and Australian Government licences listed for SteriGENE.

With the outbreak of Covid-19 there have been many spurious claims with companies rushing to a very hungry media with incredible assertions like that a particular product can remain active on surfaces for up to 30 days (seriously??).

Others gained coverage by stating that they are applying to TGA for approval but, to our knowledge SteriGENE (TriGene Advance) is the



first, or certainly one of the very first disinfectants to have the data scrutinized and receive approval.

The simple message is - use proven products. You can be confident in the SteriGENE and TriGene brand names and the claims that are made for them.

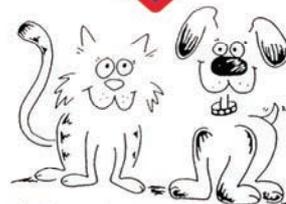



**HEP-ORA**  
**Dietary feed supplement for cattle, sheep, goats and camelids.**  
Supplying essential amino acids and vitamins to aid liver function.

**Dose:**  
Cattle:  
1 packet (125g) per cow per day.  
Sheep and goats:  
18-20g per day.

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Ingredients	
Niacin	6% w/w
Methionine (RP)	20% w/w
Maltodextrin	30% w/w
Choline (RP)	30 %w/w
L-Carnitine (as HCl)	5 %w/w



**Animal Welfare is Our Business**

## Oral Calcium Comparison

Over the last quarter of a century, since Calol revolutionised the oral calcium market in dairy cows there have been many ideas proposed. Different applications, different chemicals etc. All systems have strengths and weaknesses but only Calol has been able to show strengths that actually outweigh weaknesses, and they do that considerably.

Different calcium compounds such as calcium propionate and calcium formate have proven far less efficient than calcium chloride, for very good chemical reasons and it appears that all calcium salts are irritant. [Højbjerg et al, Scott and Van Wijk]

The oil based product Calol has overcome this factor of irritancy so is safe to use, [Furll et al, Højbjerg et al. Scott and Van Wijk, Wentink & Van den Ingh]

**"animal welfare considerations suggest that further investigations on the toxic and caustic effects of these salts should be undertaken."**

While boluses are a reasonably recent addition to the NZ market they are old technology overseas where they have exhibited considerable weaknesses. Cows with clinical signs of hypocalcaemia are a label contraindication so boluses are more in competition with starter drenches in the NZ market.

Also, despite claims to the contrary they have been shown to have toxicity problems in Europe. [Furll et al, Højbjerg et al]. The direct quotes from both these papers are interesting.

"Administration of CaCl<sub>2</sub> gels and boluses induce ulcerations in the ventral rumen as well as in the reticular groove. The soybean oil preparation was the best tolerated

product... and the aggressive effects of the gels and boluses on the mucous membrane in the rumen are deleterious." [Furll et al]

"The study has shown that oral treatment with all calcium products except Oil-water Emulsion led to changes in the mucous membrane of the reticulo-rumen. Of particular interest, Bolus, Aqueous Paste and Oil Paste were each shown to produce caustic effects on this membrane. It thus appears that calcium salts other than calcium chloride can ulcerate the mucous membranes of the reticulo-rumen, although the recognised caustic nature of calcium chloride can be avoided through the use of Oil-water Emulsion.

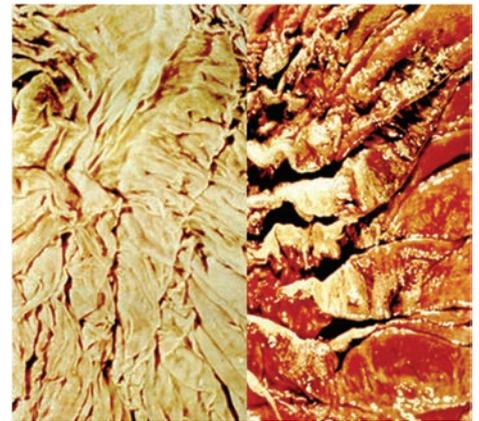
Because of the widespread, and possibly uncritical use of commercial preparations of calcium salts for the treatment of dairy cows close to calving, animal welfare considerations suggest that further investigations on the toxic and caustic effects of these salts should be undertaken." [Højbjerg et al]

All calcium containing products, when given orally reduce energy intake. [Aaes]. According to Aaes the possible mechanisms involved in the reduction of feed intake are:

- 1) Handling of the cows, (all)
- 2) Increase in the osmotic pressure, (all)
- 3) Effect of unsaturated fatty acids on the rumen function, (Calol? Starter drench?)
- 4) Effect of etching of the rumen wall. Starter Drench? (Gels, Bolus!)

Both Calol and starter drenches contain approximately 13 mJ of energy per dose, which counteracts the effect of reduced feed intake, boluses contain no energy. The reason boluses have such high irritan-

cy is because they are in contact with mucosa for such a long period of time. [Højbjerg personal communication] Therefore it could be expected that feed intake suppression would also be prolonged.



Calol from  
Wentink et al

Gel from  
Wentink et al

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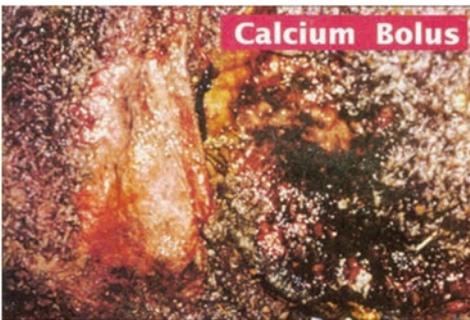
# Oral Calcium Comparison

(Continued from page 2)

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Bolus damage from Højbjerg *et al*



Cattle welfare

	Calol	Starter Drenches	Bolus	Reference
Treat cows with clinical MF	✓	✗	✗	Furl <i>et al</i> Schultken Stevenson <i>et al</i>
Prevents subclinical MF	✓	?	? *	Furl <i>et al</i> Roberts <i>et al</i> Schultken Stevenson <i>et al</i>
Toxic to mucosae	✗	?	✓	Furl <i>et al</i> Højbjerg <i>et al</i> Wentink & Van den Ingh
Proven nontoxic to mucosae	✓	✗	✗	Furl <i>et al</i> Wentink & Van den Ingh
Calcium → ↓ feed intake	✓	✓	✓	Aaes
Compensatory energy	✓	✓	✗	
Strengths	Proven safe Effective Clinical and subclinical Hygienic >25 years as market leader	Cheap – aimed at whole herd Supply energy	Less animal handling (recommend 2 doses)	
Weaknesses	Requires swallow reflex Individual cow treatment	Subclinical at best No substitute for nutrition	Cost Caustic No energy	
* Subclinical cows not tested: Trial quotes "all cows were confirmed clinically healthy before enrolment... Ca bolus has the potential to reduce the prevalence of subclinical hypocalcaemia in dairy cows"				

## Counting

A young pirate, proud of the scars on his arms and his back, seldom wore a shirt.

After a particularly hot and brutal summer, the pirate noticed several moles on his back that were certainly not there before. He remembered the dire warnings of his

mother, who cautioned him that without a shirt he was certain to get skin cancer.

So he hurried to a doctor the next time his ship was in port.

The doctor carefully inspected the moles and told the pirate not to worry.

"They're benign," he said.

Unconvinced the pirate said,

"Look again ye lubber! I'm sure there be at least ten."

## Treating Liver Disease in Cattle

The liver is prone to many diseases, from toxicoses to fatty infiltration. Acute liver failure is defined as acute liver injury that is severe enough that it compromises liver functions, including the following:

1. Protein synthesis
2. Glucose metabolism – glycogen production and glycogenolysis
3. Fat metabolism
4. Coagulation factor production
5. Immune function
6. Bile acid secretion
7. Bilirubin metabolism
8. Ammonia metabolism

Loss of liver function generates very similar symptoms whatever the cause. This makes differential diagnosis difficult as liver function tests are not reliable indices for various reasons:

1. One specific function of the liver may be affected by a number of extrahepatic conditions
2. Extensive damage of the liver is required to keep tests positive
3. Enzyme tests such as ALP and AST are very insensitive in most species.

The overall result is that symptomatic treatment is similar for many if not all diseases causing liver dysfunction but symptomatic treatment alone is not the best approach.

The first principle of treating liver dysfunction in cattle is to remove the cause, whether it be infection, toxicosis or nutritional imbalance. Then treatment is aimed at restoring liver function and includes rest, restricting protein and providing energy and vitamins, which then is a holistic approach.

Finally, antioxidants are of benefit

and, if possible, it is beneficial to improve bile flow and reduce the toxic products from excess ammonia metabolism.

The question could be raised as to whether this is pharmacology or nutrition, the line between the two is easily blurred but the therapeutic benefits are obvious.

The question also arises as to what effect liver dysfunction has on therapeutic medicine doses considering the fact that the liver is a major site for drug metabolism and elimination. As a rule it is often not necessary to adjust dose rates in patients with liver disease unless an adverse drug reaction is seen, the drug has a narrow safety margin (most commercial drugs do not have very narrow safety margins), or severe liver failure is present.

As protein is not a major factor in the diet of the dairy cow most support treatment for liver dysfunction really centres upon providing energy and vitamins.

### Energy

The liver is essentially the only site of gluconeogenesis for the dairy cow and has a role in the metabolism of fat. The dairy cow uses three strategies for biological energy management: increase feed intake, increase tissue mobilization (fat and muscle), and cellular adaptations for more efficient glucose use during the transition period.

As the liver is a major site of metabolism merely supplying energy is only part of the story, the liver needs to be able to assimilate and use the energy supplied; this is

"The question could be raised as to whether this is pharmacology or nutrition, "

where vitamin substrates play an important role.

"symptomatic treatment is similar for many if not all diseases causing liver dysfunction"

If energy is not supplied in a form that the cow can utilize then body tissue is broken down in the liver in order to supply energy. The system is rapidly overloaded and soon waste products from the process, mainly ketone bodies, accumulate and aggravate the condition as well as contributing further symptoms.



### The role of Vitamins

**Choline:** Any amount of fat deposited in the liver can create impaired levels of gluconeogenesis. The liver is an important site of metabolism where large molecule triglycerides are converted to the much smaller very low density lipoproteins (VLDL) to be excreted via bile.

The cow is not an efficient converter of triglycerides to VLDL and this process is further inhibited in liver disease. Choline is a precursor of phospholipids that enhances synthesis of VLDL and also enhances the mobilisation and elimination of triglycerides from liver leading to increased milk production, lower level of acetic and bu-

(Continued on page 5)

# Treating Liver Disease in Cattle

*(Continued from page 4)*

tyric acids and increased feed efficiency and carcass weight in beef cattle

**Methionine:** Acetyl-Methionine is a bioavailable source of methionine, an essential amino acid that contains both a methyl and a sulfur group and plays a key role in protein synthesis and several cellular functions. Methionine is required for the synthesis of S-adenosylmethionine (SAM-e) which is the major methyl donor in biological systems and an essential precursor of polyamines. Methionine also provides cysteine for the synthesis of glutathione (GSH), which protects cells from oxidative damage and plays a vital role in detoxification.

Hence methionine is strictly linked both to cellular methylation and redox buffering, making it a central metabolite for cellular homeostasis and hepatocyte function. SAM-e and GSH stores are known to be critical in the maintenance of mitochondrial function and hepatocellular survival, and methionine deficiency has been linked to hepatic lipid accumulation, overexpression of inflammatory cytokines, fibrosis, and oxidative liver injury due to the depletion of SAM-e and GSH in mitochondria.

Methionine is a metabolic precursor of choline, 28% of absorbed methionine goes to the synthesis of choline, and is a precursor in the formation of VLDL.

**Carnitine:** L-carnitine is essential for the transformation of fats into energy. The best known and most important biological function of carnitine is in the transport of fatty acids from cytoplasm into the matrix of mitochondria, where they are oxidized for energy production via the  $\beta$ -oxidation pathway.

The mitochondria are the power generators of the cell as they convert oxygen and nutrients into ATP (adenosine triphosphate). ATP is the chemical energy "currency" of the cell that powers the cell's metabolic activities. L-carnitine is the only physiological carrier for transport of fatty acids inside the mitochondria.

The reduced reliance on anaerobic glycolysis for energy production and the increase in ATP turnover from mitochondrial respiration lower metabolic acidosis, delay muscle fatigue and improve the maintenance of contractile force.

It prevents accumulation of fatty acids in tissues (anti-steatogenic action), removes acetyl groups, avoiding the formation of ketone

bodies (anti-ketogenic action) and improves muscular function and resistance to effort and shortens recovery times (physical recuperation activity).

L-carnitine also plays a role in ammonia detoxification and its administration has been proven to reduce blood ammonia levels, prevent ammonia toxicity and improve disorders of ammonia metabolism. It induces ureagenesis, improves the structural and metabolic integrity of mitochondria, prevents the inhibition of ureagenesis by acyl-CoA derivatives

**"L-carnitine is the only physiological carrier for transport of fatty acids inside the mitochondria,"**

L carnitine thus corrects metabolic balance in all states of toxicosis, fatty liver, fatigue and stress.

**Niacin** is an anti-lipolytic agent that may have potential for prevention of fatty liver. It limits the mobilisation of adipose tissue in the weeks around calving and stimulates the rumen flora leading to faster and more efficient rumen digestion. Niacin also favours gluconeogenesis by production of propionic acid.

*(Continued on page 6)*

# Protesting

An empathetic student was walking past a protest going on in front of the town hall.

Her interest piqued she asked one of the protestors what they were concerned about. Pandemic lockdowns? 5G towers? Vaccination? - but it was none of the usual.

The military industrial complex," the protestor explained. "It was

bad enough before, but now they are recruiting babies!"

The student, surprised and confused, asked the protestor what function babies were going to perform in the army.

The over zealous protestor replied grimly. "they go straight into the infantry."

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Supplying essential amino acids and vitamins to aid liver function.

**Dose:**  
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Sheep and goats: 18-20g per day.

By **ORAGENE**  
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Ingredients	
Niacin	65% w/w
Methionine (R)	20% w/w
Methocystein	30% w/w
Choline (R)	30 %w/w
L-Carnitine (as HCl)	5 %w/w

## Treating Liver Disease in Cattle

(Continued from page 5)

**B<sub>12</sub> gluconeogenesis** Vitamin B<sub>12</sub> (cobalamin) is a water-soluble vitamin and essential cofactor of two important enzymes: methionine synthase and methylmalonyl-CoA mutase.

The first catalyzes the regeneration of methionine and is necessary for the synthesis of proteins, nucleotides and the universal methyl donor S-adenosylmethionine (SAM-e) which plays a pivotal role as a methyl donor in a myriad of biochemical reactions.

The second catalyzes the conversion of methylmalonyl-CoA into succinyl-CoA, a key molecule of the TCA cycle.

This reaction is an essential step for the metabolism of odd-chain fatty acids, some amino acids (valine, isoleucine, methionine and threonine) and for the entry of propionic acid into the TCA cycle and subsequent conversion to glucose.

Intramuscular administration of vitamin B<sub>12</sub> has been shown to increase gluconeogenesis from propionate in liver slices of sheep, to decrease fat accumulation in the liver of cows and to improve milk and milk protein yields when given in early lactation.

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## The Proposition

An 84-year-old man is having a drink in Harpoon Harry's. Suddenly a gorgeous girl enters and sits down a few seats away. The girl is so attractive that he just can't take his eyes off her.

After a short while, the girl notices him staring, and approaches him. Before the man has time to apologize, the girl looks him deep in the

eyes and says to him in a sultry tone: "I'll do anything you'd like. Anything you can imagine in your wildest dreams, it doesn't matter how extreme or unusual it is, I'm game. I want \$100, and there's another condition."

Completely stunned by the sudden turn of events, the man asks her what her condition is. "You have to

tell me what you want me to do in just three words."

The man takes a moment to consider the offer from the beautiful woman. He whips out his wallet and puts \$100 dollars into her hand...

He then looks her square in the eyes, and says slowly and clearly: "Paint my house."

## Seawater Remedy

Nagy was complaining of aching feet. "It is all those years of standing in front of clients," declared the doctor, "take a holiday.

Go into the ocean, soak your feet in salt water and you will feel better."

When Nagy got to the ocean he went to the hardware store and bought two large buckets and headed for the beach.

"How much for two buckets of seawater?" he asked the lifeguard.

"A dollar a bucket," he replied, struggling to hold a straight face.

Nagy paid him, filled his buckets, went back to his hotel room and soaked his feet.

They felt so much better he decided to repeat the treatment that afternoon.

Again he handed the lifeguard two dollars and the young man said, "help yourself."

Nagy started for the water, then stopped in amazement. The tide was out.

"Wow," he said, turning to the lifeguard, "Some business you got here!"

## Supplying Energy To Cattle

### Parenteral

The fastest way to elevate energy levels is parenterally via glucose infusion. As well as simply being a source of energy, glucose or glucose precursors are also effective because they may cause an insulin response. Insulin is antilipolytic, i.e., it decreases lipid mobilization from adipose tissue. Slow-release insulin compounds are available but are not approved for use in food-producing animals.

40% dextrose infusions are registered for such use. These are effective but need to be given intravenously due to the high osmolality inducing oedema in tissues.

### Oral

Feeding propylene glycol daily to early lactating cows and fasted heifers has shown a tendency to increase the concentrations of plasma glucose and insulin and decrease the concentrations of non-esterified fatty acids (NEFA) and  $\beta$ -hydroxybutyrate.

Thus in early lactating cows and fasted heifers, propylene glycol decreases the proportion of butyrate in the rumen. After absorption propylene glycol is metabolized by either one of two pathways.

The first is through the direct conversion of propylene glycol to lactic acid.

The second, and probably principal pathway, forms lactic acid from phosphorylated propylene glycol. Lactic acid synthesized from propylene glycol equilibrates with pyruvate and is converted to glucose by the usual metabolic pathways.

Propylene glycol therefore remains as a very effective oral remedy to stimulate gluconeogenesis in the cow.

Molasses is also a good source of energy, being composed of unrefined sugar containing sucrose, glucose and fructose. It also has no protein.

## Providing Vitamins To Cattle

### Parenteral

Vitamin B<sub>12</sub> is available in many proprietary preparations, either alone or in some vitamin combinations.

Choline is available in only one preparation in New Zealand registered for dairy cattle, but it is a multivitamin/mineral mix that may not be entirely suitable for liver disease.

Methionine has been available as Veto-methionine in both New Zealand and Australia at an effective 20% concentration, but has now been discontinued. A generic has been registered in Australia. With 28% of methionine being converted to choline this concentration will satisfy requirements.

Metabolase and Metabolase Forte are both registered in New Zealand, with the latter now registered in Australia. The two products both deliver the same amount

of methionine per dose as Veto-methionine but also contain vitamin B<sub>12</sub> and the all-important carnitine. It is the only registered product containing carnitine and methionine.

### Oral

There are problems with oral dosing of both methionine and choline with both vitamins being totally used up by microbes in the rumen. The only practical way is to feed rumen protected choline and rumen protected methionine. These are available in Hep Ora, a nutritional product also containing carnitine and niacin.

Vitamin B<sub>12</sub> is readily supplied parenterally in many medications so there is not a great oral requirement.

**"The only practical way is to feed rumen protected choline and rumen protected methionine"**



Some propylene glycol products do contain cobalt from which ruminal microorganisms manufacture vitamin B<sub>12</sub> but, while fine for general nutrition, it is a little slow for animals with liver disease.



## COVID-19 THREE STEP PROTECTION PLAN

### STEP 1

#### HAND HYGIENE

With water = Use MediHex-4 375ml pump pack.  
Approved 4% Chlorhexidine hand scrub.

Without water = Use SteriGEL hand sanitiser.  
70% ethyl Alcohol with Aloe Vera.  
Keeps your hands protected and softer.



### STEP 2

#### SURFACES

Ready to use SteriGENE spray:  
Safe for use on plastics, metals and rubber. Safe for humans. 100% biodegradable. SteriGENE is a high level hospital grade disinfectant that has trial data to back up claims.

SteriGENE Wipes:  
Easy and convenient for quick use in small areas. Perfect for phones, keyboards, pens, eftpos machines and desks.



### STEP 3

#### THE WIDER ENVIRONMENT

SteriGENE Concentrate:  
Dilute with water and mop floors, walls, bathrooms, showers, high touch areas. Once diluted will remain active for 6 months.

Airstel - Disinfection fogger:  
A total release disinfectant bomb to fumigate on a monthly or bi-monthly basis. Perfect for use in shops, halls, meeting rooms, cafeterias, communal areas where groups gather.



**The Oragene 3 step COVID-19 plan is a comprehensive system based on proven and licensed products that you can trust.**

SteriGENE's government approvals include:

New Zealand: MPI C31, C32, C33, C37, C39, C41, Asure Quality

Australia: Therapeutic Goods Administration (TGA) as a high grade hospital disinfectant



Now TGA approved for Covid 19!



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