



ETHICAL AGENTS
VETERINARY MARKETING

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Saving Racing

Inside this issue:

- An Ongoing Problem 2
- Reading The Label 4
- Where Do They Go? 5
- Archaea 6
- Dropping the Ball 8



The New Zealand racing industry is worth \$1.6 billion to the economy and directly employs 14,000 people. It's reliant on TAB NZ distributions, but they are falling and that is hitting the industry hard, with the prospect of jobs and revenue lost. This is because TAB NZ has been facing increasing financial challenges over recent years and was facing an uncertain future, largely due to competition from offshore gambling websites.

Minister for Racing Kieran McAnulty has recently announced the approval of a 25-year partnership between TAB NZ and UK betting company Entain that delivers at least \$900 million in guaranteed funding for the racing industry over the next five years.

Entain, a UK based group that operates multiple sports betting providers globally, will use their economies of scale and significant technology and capital capabilities to deliver TAB NZ's betting, wagering and broadcast operations.

The Agreement provides an upfront payment of \$150 million upon approval of the agreement. In addition to this there will be a 50% revenue share from day-1 with guaranteed payments of at least \$150 million per year for the first five years.

This partnership will also allow TAB NZ to use Entain's expertise and economies of scale to make necessary upgrades and invest extensively in infrastructure and technology. It will be an improved offering for customers.

Gambling harm is an issue that needs to be addressed so TAB NZ has a \$5 million allocation for harm minimisation measures upon approval of the agreement. In addition, Entain has better harm minimisation technologies, such as facial recognition tools that can be rolled out in TAB venues.

The TAB was initially set up in 1949 as a monopoly to fund New Zealand racing and sports. In 2023 it went under

government control as TABNZ. The onset of unregulated online gambling changed the game and the racing and sports industry has been losing money ever since.

Therefore, Cabinet has decided an in-principle agreement to extend TAB NZ's monopoly for sports and racing betting to the online environment, subject to further work being done.

"By prohibiting online gambling outside of the TAB, the Government can place greater controls over the betting environment. We would expect to also see much more money allocated to harm minimisation, a fairer deal for Kiwi punters and sports codes and a greater focus on animal welfare," McAnulty said.

This certainly is a big fillip for the Racing Industry, bringing not only some much needed financial security but also ensuring a welcome focus on two issues the industry is keen to take responsibility for, problem gambling and animal welfare.

An Ongoing Problem

With the continual genetic pursuit of higher producing, faster milking dairy cows two perennial problems are destined to be always an issue. These are mastitis and milk fever. While hygiene improvements have assisted in reducing clinical mastitis to some extent and teat sealing is replacing a lot of whole herd dry cow antibiotics, we are destined to always require a modicum of antibiotic therapy in the early lactation period.

Similarly with milk fever where, despite the myriad of very capable preventative measures now available, the level of clinical milk fever in New Zealand dairy herds still seems to be stubbornly around 2-5%, depending on the source of information.

That does not, at face value, seem a lot, and is certainly good reason to keep up the preventative programs considering how genetic improvement for the aforementioned traits in the herd have progressed.

When one considers the fact that the level in the mid-90s was around 5-10%, i.e. at least double that of today, it shows that preventative programs have actually been effective.

What it does mean is that the overall problem will not go away and that farmers will need to be quick on their feet in spring time, a notoriously time poor period for farmers, in order to deal with cases as

they occur. Therefore, the message for spring time is “be prepared!”

If a farmer with 300 cows to calve generally has clinical milk fever of 2-5% that means that anywhere between 6 and 15 cows will be affected. There is probably not a farmer in the country who does not know which of these cows in the herd are the ones they have to look out for; these are the older cows that are high producers and probably have a family history of milk fever.

These old dears will always be a problem simply because DCAD measures, as practised in feedlots, are difficult to maintain at a high enough level for the more milk fever prone animals that are fed on pasture, and also because many preventative measures involve slowly absorbed calcium salts that just are not absorbed rapidly enough to counter the problem in these high producing cattle.

That means that most farmers will need to have a base supply of treatment options as, since a cow down more than half an hour has an increased risk of being a permanent ‘downer’, any clinical milk fever should be treated with urgency.

These options not only include injectable calcium but also the only truly proven effective and safe oral milk fever therapy, Calol. If the cow has a swallow reflex Calol alone is enough to restore her to

“There is probably not a farmer in the country who does not know which of these cows in the herd are the ones they have to look out for”

full function. If there is no swallow reflex then intravenous calcium is immediately indicated, followed by a bottle of Calol as soon as she can swallow, to prevent relapse; a peace of mind insurance! Generally, the first reflexes to return are those controlled by smooth muscle function and we have all seen cows urinate and/or defecate while intravenous calcium is being administered. This means a swallow reflex is also likely to be present.

The beauty of Calol is ease of administration and rapidity of effect. There have been numerous anecdotes of farmers spotting a cow ‘wobbly on the pins’ as the herd comes into the shed, giving them a bottle of Calol while slapping the cups on the others, to find at the end of milking the problem cow has recovered completely – a convenience factor that is priceless at this time of year.

Another classic use is for those milk fever prone old girls on the drop of calving. As stated above every farmer in the country will know which 2-5% of the herd these animals are. Farmers sometimes give them a ‘bottle under the skin’ before heading to bed in an often

(Continued on page 3)

Parachutes

The topic of the day for the trainee paratroopers was what you should do if your parachute malfunctions?

They had just gotten to the part about reserve parachutes when a

trainee raised his hand to ask a question.

“If the main parachute malfunctions,” he said, “how long do we have to deploy the reserve?”

Looking the trooper square in the face, the instructor replied,

“The rest of your life.”

An On Going Problem

(Continued from page 2)

vain attempt to pre-empt the problem. Most commonly the cow is down the next morning and the 'bottle under the skin' is still there, having not been absorbed in the cold. These cows are prime targets for a bottle of Calol with the net result being the cow stays on her feet and the farmer gets a good night's sleep. No need to dose the whole herd but target those high producing old girls.

One thing is certain, if there are clinicals there will be a higher per-

centage of subclinical cases in the herd; keep up the preventative measures but have both injectable calcium and Calol on hand for treatment.

Calol is the gold standard oral calcium supplement for treatment of clinical milk fever, and the starter drench Calstart, using the same emulsifying technology as Calol, is an easy to mix starter drench that stays in suspension making it an ideal whole herd preventative.



Nocturnal Antics

This guy goes for his annual check up at the medical centre.

The doctor says, "Larry, everything looks great. How are you doing mentally and emotionally? Are you at peace with God?"

Larry replies, "God and I are tight. He knows I have poor eyesight, so he's fixed it so when I get up in the middle of the night to go to the bathroom, poof! The light goes on. When I'm done, poof! The light goes off."

"Wow, that's incredible," the doctor says.

A little later in the day, the doctor calls Larry's wife.

"Mary," he says, "Larry is doing fine! But I had to call you because I'm in awe of his relationship with God.

Is it true that he gets up during the night, and poof, the light goes on in the bathroom, and when he's done, poof, the light goes off?"

"Oh, no," exclaims Larry's frustrated wife, "the silly old fool is peeing in the refrigerator again!"



Lost In The Desert

Tony, Vesna and Nagy were stranded in a desert. They were tired, thirsty and hungry and started losing hope of survival. As they were walking in the heat, they saw an old abandoned car.

They ran to it and Tony straight away popped the hood and ripped

out the radiator telling the other two, "whenever I'm thirsty I'll be able to have a sip of water from this radiator."

Next Vesna ripped off a seat from the car saying to the others, "whenever I get tired of walking, I'll be able to rest on this seat."

Finally, Nagy looks around and suddenly rips the door off.

The other two were confused and asked him, "how is that supposed help you here?"

Nagy replied, "whenever I feel hot, I'll roll down the window."

Reading The Label

When comparing products, it is not unreasonable for practitioners to just look at the ACVM approved labels to make comparisons. However, it's not just about reading the label, but deciphering what is actually written upon it.

Although the expectation should be that it is plain and simple, without complicated jargon, it often takes more than a cursory look if the ingredients are written down with differing units of measurement.

"In actual fact the answer is the complete opposite..."

This confusion is never intentional but may arise from different formats from differing countries, an obvious example being the imperial measurements used in the United States compared to metric measurements used throughout most of the rest of the world.

As an aside this explains why some container volumes from the United States appear to be odd sizes if the volume is stated in litres, where one gallon equals 3.79 litres.

Another source of error can be whether the ingredients are listed as per kg of product (as often required by ACVM) or instead as per dose.

Coaching

At a school meeting, the rugby coach shows the film of the most recent game and holds a question-and-answer period afterward.

One of the audience, who had played for the same school rugby team many years ago and had a son on this year's squad, posed a

question concerning the defensive performance. "I'd like to know," he said, "why kids these days are so weak on the tackle."

Apparent discrepancies often come to light in a new product launch such as recently with Cosecure boluses and several practitioners have compared the levels of cobalt and copper with that of the All-Trace bolus.

Some have come to the conclusion that levels of copper and cobalt are higher in the latter but nothing could be farther from the truth! In actual fact the answer is the complete opposite and the error, understandably, is down to how the ingredients are listed. Cosecure clearly states the levels of the three active ingredients as 13.4 g copper, 0.5g cobalt, 0.3g selenium per bolus. These are the elemental levels of each ingredient. They are listed this way as the copper and selenium are not incorporated as separate salts but each is bound in ionized form to the soluble glass bolus and released as such when the bolus dissolves.

Promotional material for All-Trace lists the active ingredients as the corresponding salts and at a per kilogram basis which, unintentionally, may give the false impression of higher levels. Cobalt carbonate is listed as 4.38 g/kg, which actually equates to 107 g per bolus. Copper (ii) oxide is 195.56 g/kg, i.e. 21 g/107g bolus and sodium selenite is 5.17 g/kg or 0.55g/107 g bolus.

That is still just the level of salts per bolus, the elemental levels being much different. As per the label and the IVS listing the elemental levels are, copper 16,500 mg, cobalt 239 mg, selenium 251 mg

Using these figures and claimed bolus dissolution rates, the per day figure of milligrams of active released from each product at the recommended dose rate of two boluses per animal is as per the table below.

Element	Cosecure	All-Trace
Copper	148.8 mg	138.0 mg
Cobalt	5.5 mg	2.0 mg
Selenium	3.3 mg	2.0 mg

Quite clearly levels of actives, on both a per bolus rate and a daily dose rate, are higher in Cosecure despite label confusion, and also Cosecure does not contain zinc and sulphur, both of which reduce copper absorption.

Thus Cosecure clearly wins out on levels of actives and buying decisions can be made on other factors such as the more consistent absorption of the soluble glass boluses, the cancellation of thiomolybdates in the rumen and the proven better conception rates.



"Gosh, I'm not sure," answered the coach. "But it could be hereditary."

Where Do They Go?

A paper by Gould and Kendall, reviewing all known data with reference to thiomolybdate toxicity, showed up some interesting features of the relationship between thiomolybdates, iron and sulphur in the binding of copper in ruminants.

First of all, in the absence of molybdenum and iron interactions, the absolute dietary requirement for copper is very low; experimentally this has been shown to be, <1.6 mg/kg DM.

What this essentially means is that, within the confines of the research, primary copper deficiency is extremely rare and most copper deficiency is secondary, i.e. thiomolybdate toxicity. However, one must assume that the data reviewed does not incorporate that from copper deficient areas such as we have in parts of New Zealand, where primary copper deficiency is real.

What it does highlight however is that, outside of areas of primary copper deficiency, thiomolybdate toxicity does occur, manifest as a secondary copper deficiency, and it is incredibly hard to actually diagnose.

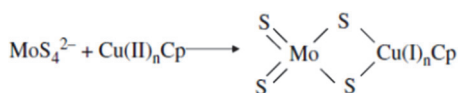
Molybdenum, sulphur (as sulfate, sulfide or sulphur amino acids), copper and iron all enter the rumen via feed, soil, water or supplements. Reactions occur between molybdenum and sulphur enabling the formation of thiomolybdate compounds which will readily bind copper.

In the absence of rumen-available copper (rumen-labile copper), thiomolybdates are able to be absorbed through the rumen wall and small intestine, allowing them to bind to copper containing substances, including enzymes whose activity will be reduced, thus causing clinical problems often quoted as cop-

per deficiency, even though it is strictly a thiomolybdate toxicity. Another interaction between iron, sulphur and copper will intensify the thiomolybdate problem by making copper unavailable to bind to the thiomolybdates.

We have manufacturers of copper oxide boluses claim that the copper is not available until it reaches the abomasum hence it bypasses the copper inactivating substances in the rumen. This oversimplification totally misses the point that, first of all any dietary copper will be inactivated in the rumen and, more importantly, thiomolybdates not taken care of in the rumen readily cross into the bloodstream where they seek out and inactivate copper containing enzymes such as caeruloplasmin.

Thiomolybdate does not actually remove copper from caeruloplasmin to inactivate it. The tetrathiomolybdate was suggested to bind to the caeruloplasmin through the sulfide (2S) groups, reducing the Cu (II) to Cu (I). Thus, the enzyme is inactivated but blood copper levels do not show as deficient.



Thus, we have seemingly normal copper levels on testing but the copper is reduced, hence inactive, and so the animal is in a state of thiomolybdate toxicity, manifest as a secondary copper deficiency with the attendant symptoms.

If these symptoms are subclinical such as, reduced weight gain, decreased food intake, reduced efficiency of food conversion, alteration in hair/wool texture and pigmentation (spectacles around eyes), delayed puberty, reduced conception rate, inhibition of oestrus, etc. then this fact, coupled with the lack of reduction in blood

copper levels, makes the diagnosis of the problem extremely difficult. Clearly thiomolybdate toxicity is much more prevalent than what is being reported.

The molybdenum uptake by plants, especially legumes, is increased when grown in wet soils. Molybdenum uptake is also

increased with increasing pH of the soil (liming pasture increases molybdenum uptake) and generally increases throughout the growing season.

To quote a few lines from the review summary: "Within the present review we have been able to provide evidence that: all classes of thiomolybdates are formed in the rumen; in the absence of available copper all thiomolybdates can be absorbed into the animal rapidly though the rumen wall or more sedately via the small intestine; thiomolybdates can bind to copper in biological compounds and are able to cause problems..."

With subclinical thiomolybdate toxicity copper levels still appear normal, giving more weight to the data proved by the trial work of Black and French which showed that by overcoming thiomolybdate toxicity reproductive performance, a major subclinical factor, can be dramatically improved.

References:

Black D and French N, Effects of three types of trace element supplementation on the fertility of three commercial dairy herds, *The Veterinary Record* · May 2004

Gould L and Kendall N, Role of the rumen in copper and thiomolybdate absorption, *Nutrition Research Reviews* (2011), 24, 176–182

"thiomolybdates not taken care of in the rumen readily cross into the bloodstream where they seek out and inactivate copper containing enzymes"

Archaea

A common explanation to lay people is that there are good bugs and bad bugs. We are well aware of pathogenic bacteria, those that are seemingly neutral and other vital cogs such as probiotics. Similarly with fungi, there are some like ringworm and respiratory pathogens whereas at the other end of the spectrum we eat mushrooms and blue cheese.

While it may be difficult to think of any 'good' viruses bacteriophages do fall into that category as does, from a human perspective, cowpox.

Some protozoans are harmful because they can cause serious diseases. Others are helpful because they eat harmful bacteria and are food for fish and other animals.

There is one group of unicellular organisms that does not however seem to have a single pathogenic species. In fact, their relationship with mammals is often symbiotic; these 'good guys' of the microbial world are the archaea.

"these 'good guys' of the microbial world are the archaea."

Archaea are unicellular and, like bacteria, lack a nucleus so are defined as prokaryotic. The Archaea, remain one of the biggest puzzles in microbiology, not even being discovered until the 1970s. They are similar to, but evolutionarily distinct from bacteria.

Archaea have been discovered in some of the most hostile environments on the planet, in conditions that would kill other forms of life. Many archaea have been found living in extreme environments, for example at high pressures, salt concentrations or temperatures.

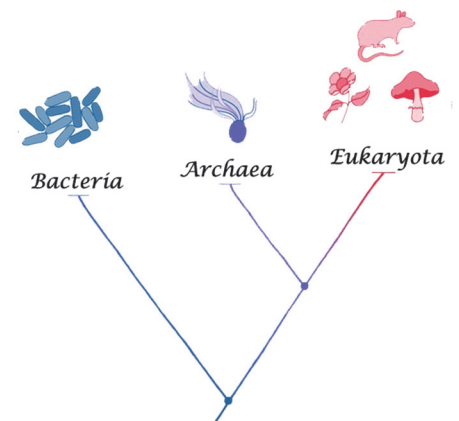
These types of organisms are called extremophiles. Their cell wall differs in structure from that of bacteria and is thought to be more stable in extreme conditions, helping to explain why some archaea can live in many of the most hostile environments on Earth.

Examples of archaea habitats are boiling hot springs and geysers such as those found in Yellow Stone Park, USA and ice such as the Arctic and Antarctic oceans, which remain frozen for most of the year.

Even more strangely, we have yet

to find a single species of Archaea that causes disease.

Prior to the discovery of archaea, it was assumed that there were two branches on the tree of life, bacteria on one branch and eukaryotes such as fungi, plants and animals on the other.



Archaea, while similar to bacteria have features in common with the eukaryotes, notably for the enzymes involved in transcription and translation, so are thought to be a third distinct branch on the tree of life. Thus bacteria, archaea, and eukaryotes represent separate lines of descent that diverged early on from an ancestral colony of organisms.

(Continued on page 7)

Panda

A panda walks into a bar. He gobbles some beer nuts, then pulls out a pistol, fires it in the air, and heads for the door.

"Hey!" shouts the bartender, but the panda yells back, "I'm a panda. Google me!"

Sure enough, panda: "A tree-climbing mammal with distinct black-and-white coloring.

Eats shoots and leaves."



The Maid

Mrs. Smythe was making final arrangements for an elaborate reception.

"Nora," she said to her veteran servant, "for the first half-hour I want you to stand at the drawing-room door and call the guests' names as they arrive."

Nora's face lit up. "Thank you, ma'am," she replied. "I've been wanting to do that to some of your friends for the last 20 years."

Archaea

(Continued from page 6)

Archaea are part of the microbiota of all organisms. In the human microbiome, they are important in the gut, mouth, and on the skin.

Their morphological, metabolic, and geographical diversity permits them to play multiple ecological roles: carbon fixation; nitrogen cycling; organic compound turnover; and maintaining microbial symbiotic and syntrophic communities, for example. (Syntrophy is the phenomenon of one species feeding on the metabolic products of another species to make the overall metabolism of both organisms feasible.)

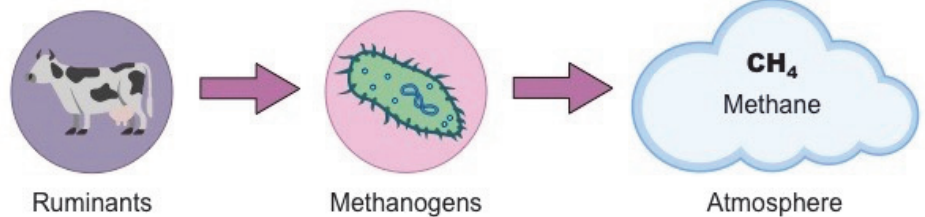


Texas

A man visits Texas. When he gets to his hotel room, he feels the bed. “Wow, this bed is big!”

“Everything is big in Texas,” says the bellhop.

The man heads downstairs to the bar, settles into a huge barstool and orders a beer. A mug is placed



No clear examples of archaeal pathogens or parasites are known, although could be because we have only known of the existence of archaea for a few decades.

Instead, they are often mutualists or commensals, such as the methanogens (methane-producing strains) that inhabit the gastrointestinal tract in humans and ruminants, where their vast numbers facilitate digestion.

Methanogens are also used in biogas production and sewage treatment, and biotechnology exploits enzymes from extremophile archaea that can endure high temperatures and organic solvents.

It is this methanogenesis in ruminants that is drawing a lot of attention on archaea.

Methanogenic archaea reside primarily in the rumen and the lower segments of the intestines of ruminants, where they utilize the reducing equivalents derived from rumen fermentation to reduce carbon dioxide, formic acid, or methylamines to methane (CH₄).

Research on methanogens in the rumen has attracted great interest in the last decade because CH₄ emission from ruminants contributes to global greenhouse gas emission and also represents a loss of feed energy.

Thus, while archaea have little or no ability for pathogenesis, and their host relationship is a symbiotic one, they do have some downside in that they do contribute to global warming.

This is not the fault of the humble archaea but is an anthropogenic problem that is seeing scientists attempting to devise means of controlling their populations within rumens.

However, there is currently no simple solution as the archaea, in their symbiotic role, are vital to normal ruminal digestion, and ruminal digestion is, of course, vital to the food chain of the burgeoning planetary population. Thus the problem is people not archaea and certainly not the dairy industry.

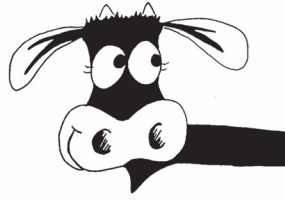
between his hands. “Wow these drinks are big!”

The bartender replies, “Everything is big in Texas.”

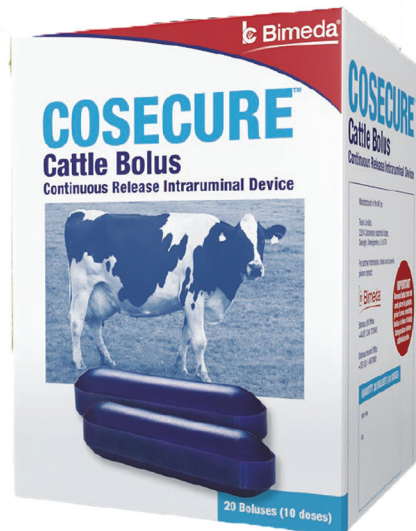
After downing a few, the now drunk man asks where the bathroom is. “Second door to the right,” says the bartender.

The drunk heads for the bathroom but accidentally enters the third door, which leads to the swimming pool, and he falls in.

Popping his head up from under the water and flailing his arms, he shouts, “Don’t flush, don’t flush!”



Animal Welfare is Our Business



Dropping the Ball

At first glance it looked like ACVM had done the right thing in its reassessment of penicillin products.

However it seems they have dropped the ball by focusing on the minutiae of tick boxes and making the recommendations formulation specific.

Risk profiles can be formulation specific but this has much more relevance for oral dosage forms which incorporate binders and disintegrants amongst the excipients. What we are talking about here is the release from the pharmaceutical stage.

With injectable aqueous suspensions this is mainly dictated by the type of salt, pH and particle size.

When the salt is the same across all products, as is the case with Penicillin G Procaine, this possible variable no longer exists. Similarly with pH, the preparation may contain buffers but that is only to regulate pH inside the bottle; this is for product stability, similar to the reason antioxidants and preservatives may be added. Once injected body pH takes control so that there is no real pH effect on release from the pharmaceutical stage meaning no real difference in pharmacokinetics.

Therefore, the main variable that could be taken into account is particle size. There are only three dynamilled Penicillin G Procaine products in the New Zealand mar-

ket. It does not seem logical that they should be dosed at a higher mg/kg basis than non dynamilled products. Two of these are absolutely identical, differing in label name only, yet have different dose rates awarded. Perusal of the dosiers also shows the extreme similarity between these two products and the reference product, therefore all three should have the same dose rate patterns.

At the end of the day this was a golden chance to standardize dosing at that recommended by most pharmacological texts, 25 mg/kg.

This would have been of great benefit to clinicians in the field but the opportunity has been lost.