

December 2018

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**Merry
Christmas**

**To all our clients
From the team
at EA**



Inside Story Headline

One of the 5 R's in antimicrobial stewardship is Review. This means checking progress so, three years down the track and thus 20% of the way towards the aspirational goal of NZ Inc. not relying on antibiotics for the maintenance of health in animals, the question is how well are we going?

It is not an easy one to answer, especially as we were already the 3rd lowest user in the world so are starting from a position where improvement is difficult.

The quickest reference guide is the MPI annual antibiotic sales review but it has pitfalls because it is total sales of active without too precise a measurement of how the active is used and one of the biggest drawbacks being that it is always a couple of years out of date.

The latest issue covers 2013 -2014 through to 2016 so is not entirely reflective of the current situation. Nevertheless it does give some interesting trends, particularly on the so called 'critically important antibiotics'.

Whilst our guidelines refer to green, yellow and red types of antimicrobials the WHO guidelines are much more stringent and really deem all antimicrobials used in veterinary medicine as highly important with some critical or highly critical.

This has seen a more intense focus on certain classes, notably fluoroquinolones, macrolides and 3rd and 4th generation cephalosporins. These are considered red light antimicrobials on the NZVA traffic light system.

Over the selected time period sales of all three red classes reduced despite overall sales increasing slightly. Apart from macrolides these three classes actually rate

quite low in the level of antibiotic sales so are dealt with separately in the article on the next page.

However what many do not appreciate is that, due to the vagaries of horizontal gene transfer, the bigger issue is overall antimicrobial use. How are New Zealand veterinarians faring in this regard?

The MPI figures are skewed wildly by first of all by the fact that zinc bacitracin dominates the figures but is only used in the commercial poultry industry and not by veterinary clinicians, therefore can be disregarded when assessing how practitioners are performing.

Secondly aminoglycoside use has fluctuated wildly but this is due to its widespread use in horticulture, especially the Psa outbreak in Kiwifruit. Aminoglycoside use rose 13% over the period in question to be 3 to 4% of total use but, considering that most use is in horticulture this class represents a minor portion of veterinary use.

So our main focus is on the more run of the mill penicillins, tetracyclines and sulphonamides (with trimethoprim) plus 1st and 2nd generation cephalosporins.

Sulphonamides, mainly used in equine medicine, make up 6% of overall sales. Sulphonamides themselves had increased sales of 8% over the reporting period.

Tetracyclines are mainly sold for production animal species and make up 12% of all use, so are important quantity wise. Sales have fluctuated for various reasons but overall they are up, in 2016, from the 2014 figures by 9%.

"due the vagaries of horizontal gene transfer, the bigger issue is overall antimicrobial use."

The major cephalosporin use is in dry cow therapy (DCT) and this increased a little over this period but now, with a push towards more selective DCT this should decrease considerably.

Finally the big one, penicillins, which make up a quarter of all sales. There has been a 27% increase in sales of all penicillins since the last period, mostly injectable penicillin G products. This is significant as WHO are reclassifying penicillin as 'critically important'.

Population increase has an effect but the poultry population increase of a massive 39% is not relevant as it does not impact on normal clinical practice. However the increase of 6.5% of the dairy population is a major factor. We can say that the profession is performing very well but, as always, can do better.

The Clerk

After issuing drivers' licences for 20 years, a clerk was transferred to the marriage licence office.

Almost at once he was in trouble.

Young couples were leaving his desk red faced and angry.

His superior asked what was wrong.

"I can't seem to help it," muttered the dismayed clerk. "I just can't get out of the habit of asking whether they want the licence for business or for pleasure."

The Red Menace

Looking at the antimicrobial classes deemed highest risk, or red light antimicrobials in our traffic light system, what are the risks that these represent?

With macrolides the risk is mainly the attendant one of antimicrobial resistance and the possible lack of efficacy in human medicine. The intense lobbying by pharmaceutical companies has already resulted in differences in classification between neighbouring jurisdictions.

The Antimicrobial Leadership Group (AMRLG) of NZVA have already shown no appetite for reclassification of macrolides and this action has strident support from the Dairy Cattle Vets (DCV) representatives.

In the meantime our colleagues across the ditch, while having a holier than thou approach to fluoroquinolone usage, have accepted the arguments of the lobby groups and APVMA has deemed macrolides not to be amongst the most critically important antimicrobials. This is in direct contrast to WHO opinion and that of relevant bodies in New Zealand.

Macrolide use is 10 to 11% of all sales therefore this class, and its classification, is very important. It is also timely to remember that more than 50% of macrolide sales are into the commercial poultry industry but veterinary use is still a very topical subject.

Major use in veterinary practice is still for dairy cow mastitis with price and convenience, the two poorest prescribing criteria, being major factors. There is a major opportunity for clinicians to show some leadership in this issue. It has happened in one or two large practices but it is not widespread as yet.

Third and fourth generation cephalosporins accounted for 25% of all cephalosporin class antibiotics in 2013 to 2014 but fell to 19% in 2016.

With all cephalosporins making up only 2 to 4% of total sales, and the level of third and fourth generation cephalosporins falling, then one could reasonably assume that the profession is doing well in this area.

The next lot of figures will give a truer guide as the presence of long acting third generation cephalosporins being sold entirely on convenience will give an authentic guide to how clinicians are really performing.

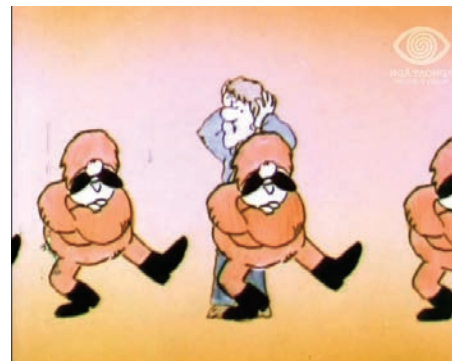
In the meantime these drugs are avoiding the unique risk faced by fluoroquinolones. That is because fluoroquinolones are the 'whipping boys' of prudent antimicrobial use.

The message has got through loud and clear not to overuse fluoroquinolones and, by and large, the profession has heeded this. There is still some concern about enrofloxacin use in small animal medicine although use did decrease by 7% between 2014 and 2016.

It may seem an oxymoron but the biggest risk attaining to fluoroquinolone use in veterinary practice is that fact that this class makes up less than 1% of all antibiotic sales.

Why is this an issue when one would think the profession should be wildly congratulated?

The answer is that, worldwide, pharmaceutical companies are moving away from antibiotic production in droves due to falling sales and an insecure market. With enrofloxacin generics having



established a major foothold in the market, and the constant clamour for less fluoroquinolone use, it is extremely difficult for the newer, more advanced chemicals to get market share. Overseas corporate bosses look at overall sales and are quick to 'pull the pin' on lower selling products.

Thus the unique risk with fluoroquinolones is not overuse leading to resistance, but a usage so low that these incredibly important products are withdrawn from the market and no longer available for use by clinicians when deemed necessary.

The Present

Nagy was discussing getting his wife a diamond ring for Christmas.

Tony said, "why don't you get her something practical—like a car?"

Nagy looked askance and said, "Did you ever hear of a phony automobile?"



Orozyme

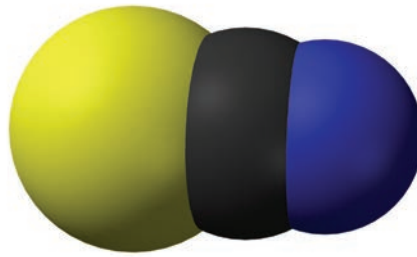
A decade and a half ago EA launched an exciting new product into the canine dental world, a product that did extremely well all around the country. That product was called Greenies® and had remarkable success, not only commercially but also bringing awareness of the need for oral care in small animal medicine.

Over time Greenies® has dropped away in the marketplace as it has neared the end of its product life cycle. This is due to several factors, such as formulation changes and market competition.

A significant factor in a product's life cycle is the development of newer technology and EA now has the benefit of the latest technology in this field, a field in which the company has been a pioneer in the New Zealand veterinary industry.

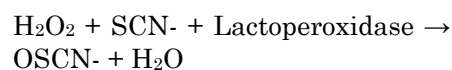
The new technology is in the form of Orozyme® dental care gel and, whereas Greenies® was effective by mechanical action and also contained a calcium chelator to inhibit tartar formation, Orozyme® utilizes a totally different approach. Orozyme® contains ingredients which aid in the formation of hypothiocyanate, an important oral antiseptic.

The enzyme complex contained in saliva - the peroxidase system - is an important factor in the maintenance of a healthy mouth. This system comprises three main elements, salivary peroxidase (also



known as lactoperoxidase), thiocyanate (SCN-) and hydrogen peroxide (H₂O₂).

The reaction produced by this lactoperoxidase system results in the production of a powerful oxidising ion hypothiocyanate (OSCN-), as illustrated below:



Hypothiocyanate has an inhibitory effect against a number of oral bacteria including the common cariogenic species *Lactobacillus*, *Streptococcus*, and *Actinomyces*. It has been demonstrated that at least 80% of the main strains of anaerobic bacteria responsible for periodontitis are sensitive to the hypothiocyanate peroxidase system. This reduction in the total bacteria count consequently inhibits the formation of dental plaque and tartar.

The efficiency of this system obviously depends greatly on the level of salivation. This, in turn can be affected by various factors including breed, type of diet and administration of particular medicines. Where production of saliva is not optimal the efficiency of the lactoperoxidase system

will be compromised. rapidly broken down in saliva by saliva catalase. The hydrogen peroxide content of saliva continues to be unknown as there is still no analytical method for detecting hydrogen peroxide.

"A significant factor in a product's life cycle is the development of newer technology"

The Orozyme® dental care gel contains components which stimulate hydrogen peroxide production, and components for optimizing OSCN production. Animals ingest glucose and starch through food. Amylase breaks down the starch contained in food to glucose. This glucose, and glucose pre-existing in nutritional components, is converted to hydrogen peroxide by glucose oxidase. Furthermore, superoxide dismutase breaks down superoxide anions (O₂) to H₂O₂ in the presence of two protons. The hydrogen peroxide thus produced is converted to OSCN with the SCN and lactoperoxidase contained in saliva.

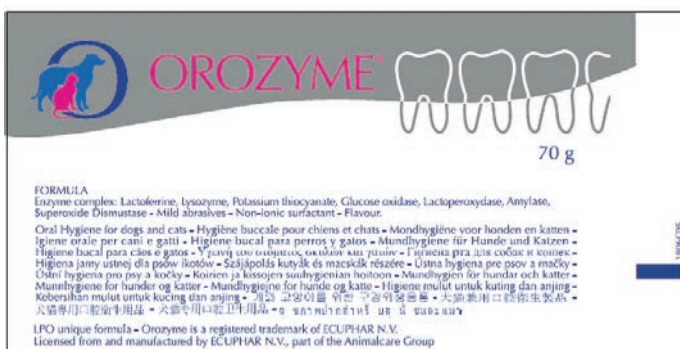
Orozyme® dental care gel consists of the following components: lactoperoxidase complex of: amylase, glucose oxidase, lactoperoxidase, superoxide dismutase, lysozyme, lactoferrin, potassium thiocyanate, mild polishing components, non-ionic surfactant, flavours, added equine colostrum (lactoferrin, IgE antibodies).

These ingredients not only boost the lactoperoxidase system but also supply a range of other enzymes which act synergistically to further enhance efficacy.

Amylase is not present in saliva but acts on starch to produce glucose, glucoamylase catalyses the

hydrogen peroxide can be

For the most part the efficacy of the lactoperoxidase system is limited by hydrogen peroxide. Hydrogen peroxide can be



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Orozyme

(Continued from page 4)

hydrolysis of carbohydrate other than starch into glucose. Glucose oxidase allows the glucose to react with oxygen to produce gluconic acid and hydrogen peroxide, fueling the lactoperoxidase reaction.

Potassium thiocyanate is added as an additional source of thiocyanate to be broken down to release hypothiocyanate.

Lactoperoxidase acts as a catalyst in the oxygenation of thiocyanate by the hydrogen peroxide to produce hypothiocyanate. This inhibits bacterial enzymes preventing the production of acids from sugars by the bacteria.

Hypothiocyanate also hydrolyses the cytoplasmic membrane of most bacteria found in the buccal cavity and has an antifungal effect on Candida.

Lactoferrin is an iron binding glycoprotein which has a strong bacteriostatic effect against gram negative

bacteria which usually have a high iron content.

Lysosyme has a bactericidal action on gram positive bacteria. Its lytic action assists the action of hypothiocyanate and lactoferrin.

Superoxide dismutase transforms thiocyanate into hypothiocyanate at a faster rate than lactoperoxidase alone.

Orozyme® comes in gel form with a free finger-brush to apply once daily directly to the mouth or on a paw for the cats to lick it off. The gel adheres to the gums permitting the ingredients to aid in breaking down existing dental plaque and weaken the bacteria responsible for forming plaque.

It is also available in collagen strips that are palatable and enhance the mechanical action of chewing of teeth and gums to assist the removal of plaque as well as enhancing the antibacterial action of the lactoperoxidase system.



"Hypothiocyanate has an inhibitory effect against a number of oral bacteria"

The Genie

A young couple were trying to find an apartment in Auckland but starting to despair.

The husband had bought a coconut for a treat and, when they cut off the top of the coconut smoke issued out and, to their astonishment, a genie appeared.

"Command and I will obey," thundered the genie.

Driven by hope the man nervously stuttered, "We would like to obtain an apartment in Auckland."

"If I could get an apartment for myself in Auckland," retorted the genie, "Do think I would have stayed inside a coconut?"



Divine Inspiration

A Cockney asked a Roman Catholic's help in choosing a bride. "I'm torn between Betty and Maria," he said, "Ow do you Catholics make such decisions?"

"I go to church," says his friend, "then I look up and pray, and the answer comes to me."

The next day the Cockney was all excited. "I did what you told me mate, and the answer was given to me."

"What happened."

"I went to you church, knelt in prayer, looked up and there it was, written in gold, high on the stained glass window. 'Ave Maria.'"

Flogging a Dead Horse

We all know that emotive subjects are rarely solved by reasoned debate, which puts industries such as the racing industry on the back foot when discussing animal welfare.

The issue of whip use is certainly emotive and, just as certainly, will not go away. We have jockeys claim the whip is necessary to help steer an unruly horse then using it to belt them home if they can get away with it. The steerage claim is not totally unreasonable but credibility is lost when six jockeys in one race are fined for over use.

On the other side of the coin we have strong statements put out by organizations such as SAFE that have no scientific basis whatsoever, yet are shouted from the roof tops as though they are gospel.

"credibility is lost when six jockeys in one race are fined for over use"

One recent comment is a prime example, "Horses have such sensitive skin that they can feel a fly land on their skin, so whipping causes inevitable pain."

Somehow inherent in this statement is the idea that horses feel pain more than other animals as

well as the fact that whipping does cause pain.

No rational person would argue with the latter sentiment and that really is the basis of the whole debate. However the over emotion shown with the rash generalization diminishes the credibility of the argument and it does not bear scientific scrutiny.

Do horses really feel pain more than other animals? Cowhide is certainly thicker than horse hide but does that make it any less sensitive? After all the majority of pain receptors are in the skin. Cattle and sheep do appear to be more stoic beasts than horses but that does not necessarily mean they feel pain any less.

The SAFE spokesperson clearly does not realise the difference between tactile receptors and pain receptors. Anybody who has had local anaesthetic injections knows that, while pain may be eliminated, touch sensation remains.

In the case of our horse with a fly landing on it, the fly lands on hair and movement of the hair brings touch sensation. This is the panniculus reflex, actioned by the cutaneous trunci muscles. This reflex is seen in most common domestic species.

Yet again it is a rash generalization, any dairy farmer can tell you about flies bothering cattle in the same manner, and who does not feel flies landing on skin?

It seems an oxymoron that horsey people claim to love their horses yet oppose any anti-whipping legislation. It is analogous to, but not quite the same as, people loving their kids but being totally opposed to that other great failure of legislation, the anti-smacking law. To be opposed seems to automatically put you in league with the bad guys. "So you want to belt kids do you?"

There are definitely some well-reasoned, well-meaning people involved in the anti-whipping brigade and it is not helpful to their cause that militant organisations come out with extreme and unscientific comments.

Many racing administrators feel it is only a matter of time before more stringent regulations come into place and fighting them will be acting like King Canute.

All people really want in situations like this is reasoned comment.

However it is a very emotive debate and so will probably never be won by logic.

Stable Talk

Several horses are in a stable. One of them starts boasting about his track record,

"Of my last 15 races," he says, "I have won eight."

Another horse breaks in, "Well, I've won 19 of my last 27!"

"That's good but I've taken 28 of

36," says another, flicking his tail.

At this point a greyhound who has been sitting nearby pipes up, "I don't mean to boast," he says, "but of my last 90 races I've won 88."

The horses are clearly amazed, "Wow" says one after a prolonged silence, "a talking dog!"



New Livery For KER

At the beginning of the year Kentucky Equine Research changed their KER logo to something more modern.

Now the whole livery has had an upgrade, being more bold and dynamic.

In the past the highly scientific researched products all had the same red, white and blue labels.

This was great for setting them up as a range but there got to be so

many great products with such similar livery that differentiation became more problematical.

Other products of more simple nutrition had a different look about them, mostly with dark backgrounds.

The new livery is across the whole range, so that every product from more common nutrition to specialized needs has a similar look, reflecting confidence in the KER sci-

ence and quality, but differentiated by colour coding.

The effect is dramatic and the products look professional, reflecting the science and quality behind them.

The new look for the livery goes hand in hand with the new, swept up logo.

It all represents a dynamic company in a dynamic industry.

Old



Kentucky
Equine
Research®

New





Aphorisms

An aphorism is a statement of truth or opinion expressed in a concise and witty manner.

- ◆ I read that 4,153,237 people got married last year. Not to cause any trouble....but shouldn't that be an even number?
- ◆ I find it ironic that the colours red, white and blue stand for freedom, until they are flashing behind you.
- ◆ When wearing a bikini, women reveal 90% of their body. Men are so polite they only look at the covered parts.
- ◆ Relationships are a lot like algebra. Have you ever looked at your X and wondered Y?
- ◆ America is a country which produces citizens who will cross the ocean to fight for democracy, but won't cross the street to vote.
- ◆ You know that tingly little feeling you get when you love someone? That's common sense leaving your body
- ◆ My therapist says I have a pre-occupation with vengeance. We'll see about that!
- ◆ I think my neighbour is stalking me as she's been Googling my name on her computer. I saw it through my telescope last night.
- ◆ Money talks ... but all mine ever says is good-bye.
- ◆ You're not fat, you're just easier to see.
- ◆ If you think nobody cares whether you're alive, try missing a couple of payments.
- ◆ I always wondered what the job application is like at Hooters. Do they just give you a bra and say,

"Here, fill this out?"

- ◆ The location of your mailbox shows you how far away from your house you can go in a robe, before you start looking like a mental patient.

