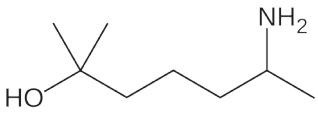
ausrichter
animal health news
Number 40

Why Heptaminol is an essential component of Kynoselen® – for managing muscle fatigue and muscle contractions in exercising and racing horses

Heptaminol



Studies in man and animals showed heptaminol prevented fatigue in nervous and muscle activity. Heptaminol has been shown to prevent fatigue of muscle and nervous activities. The cellular mechanisms underlying its action on skeletal muscle have been poorly studied. The results of our experiments show that heptaminol is able to increase the amplitude of tension during continuous repeated stimulation of single isolated twitch fibres.

Heptaminol has a positive inotropic effect on skeletal muscle.

Positive inotropic agents [Heptaminol] increase the force and strength of muscle contractions[1].

This information indicates the importance of heptaminol in managing and supporting muscles to delay muscle fatigue and to support muscle contractions in exercising and racing animals.

1 Br. J. Pharmacol. (1991), 104, 714-718

PRODUCT INFORMATION

Kynoselen™ Muscular Stimulant for Horses and Dogs

Each 100mL contains:

Heptaminol hydrochloride	0.5g
Disodic adenosine monophosphate	0.2g
Sodium selenite (selenium)	0.05g
Magnesium aspartate	1.5g
Potassium aspartate	1.0g
Cyanocobalamin (vitamin B12)	0.025g

ACTIONS

Muscle stimulant, selenium supplement.

INDICATIONS

An aid in control of muscular dystrophy and tying up syndrome in horses and dogs: aid in the treatment and prevention of muscular disorders due to selenium deficiency.

PRESENTATION

100mL.

WITHHOLDING PERIOD BEFORE RACING

Kynoselen contains heptaminol a prohibited substance under the rules of racing and competition. A withholding time needs to be applied following the last treatment and before presentation for racing. Consult a veterinarian or racing steward as to the withholding time.

APVMA Approval No: 41608/0901.

Vétoquinol

Sulfadimidine + Trimethoprim Injection – Horses

Sulfadimidine + trimethoprim injections are extensively used in horses. A very low level of reported adverse reactions (compared with the higher levels of fatal and near fatal adverse reactions following the administration of procaine penicillin to horses).

- Bactericidal activity
- Broad spectrum activity, gram$^+$ and gram$^-$
- Bacterial resistance is uncommon
- For treatment of respiratory disease and pneumonia
- Indicated for difficult to treat *E coli and Salmonella*

Sulfonamides or trimethoprim are not designated as prohibited substances under the rules of racing or competition.

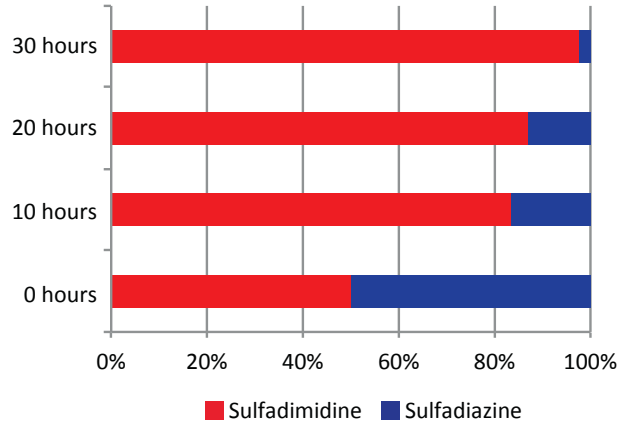
Comparison of plasma concentrations in horses administered Sulfadimidine or Sulfadiazine by injection

This study in horses compared plasma levels, half life and elimination of sulfonamides. It reports the different pharmacokinetic properties of sulfonamides in horses compared with ruminants. Sulfadimidine and sulfadiazine are structurally related.

In horses, the metabolism of each is different. Sulfadimidine is extensively metabolised in the horse.

Plasma concentrations at four [4] time points in the same horse administered 20 mg/kg of either sulfadimidine or sulfadiazine is reported.

Plasma concentrations µg/mL – Sulfadimidine or Sulfadiazine at different sampling time points – horse



Plasma Concentrations 1 µg/mL

Hours 0h 10h 20h 30h

Sulfadimidine 60 10 2.0 0.8

Sulfadiazine 60 2 0.3 0.02

1. Nouws JFM et al Am J Vet Res,Vol 48, No 3. March 1987

PRODUCT INFORMATION

Triprim® Antibacterial Injection

ACTIVE CONSTITUENTS:

Sulfadimidine 200 mg/mL

Trimethoprim 40 mg/mL

For the treatment of bacterial infections caused by bacteria sensitive to Trimethoprim + Sulfadimidine in Horses, Cattle, Sheep, Pigs, Dogs and Cats.

DIRECTIONS FOR USE

Do not administer to animals with known sulfonamide sensitivity, liver parenchymal damage or blood dyscrasia.

INDICATIONS

Systemic treatment for a range of bacterial infections caused by bacterial sensitive to trimethoprim + sulfadimidine of the respiratory tract (pneumonia, bronchitis), urogenital tract (nephritis, metritis), gastrointestinal tract (colibacillosis, salmonellosis). Secondary bacterial infections following viral disease. Mastitis, foot rot (cattle) and septicemia in all species. Wound and postparturient infections.

DOSE

Horses 10 mL per 200 kg bw daily by intravenous (IV) injection only.

Cattle, Sheep and Pigs by intramuscular (IM) or intravenous (IV) injection. 1 mL per 10-15 kg bw daily

Dogs 1 mL per 8 kg bw daily by intramuscular (IM) injection.

Cats 1/2 mL by intramuscular injection daily.

In severe cases dosage should be repeated for 1-4 days.

Transitory pain may be experienced following large volume injection. Doses of more than 10 mL should be injected at separate sites.

WITHHOLDING PERIOD

Meat: Do not inject less than 15 days before slaughter for human consumption.

Milk: Do not inject less than 72 hours before the collection of milk for human consumption.

DISPOSAL

Dispose of empty container by wrapping in paper and putting in garbage.

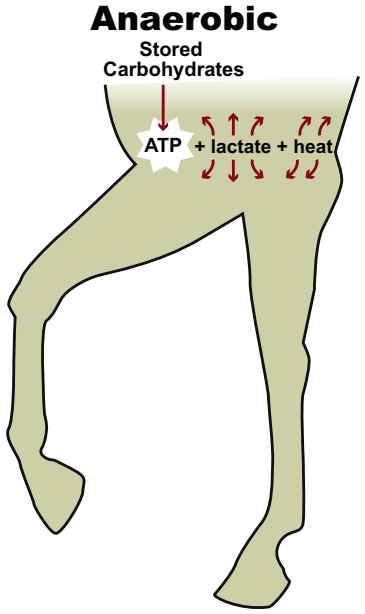
STORAGE

Store below 25°C (air conditioning). Protect from light.

Do not refrigerate. At low temperature crystallisation of the product may occasionally occur. This can be reversed by warming of the bottle in hot water.

richter pharma ag
Wels, Austria

Energy for Equine Performance: Anaerobic Metabolism



A horse's performance is dependent on a number of factors, including health, nutrition, and environmental temperature. Energy is defined as the capacity to do work. The amount of energy available for muscular work is the most important factor in a horse's performance. Athletic performance requires the efficient utilization of large amounts of energy transformed by metabolic pathways from chemical to kinetic energy for muscle contraction. This kinetic energy is in the form of adenosine triphosphate, or ATP. The muscles are capable of storing limited amounts of ATP for muscle contraction, but all athletic events need a constant flow of this energy source.

The way the horse creates more ATP is through the metabolism of fuel stores in the body. There are three main fuel sources utilized for the production of ATP in all athletes, including the horse. These include:

- carbohydrates
- fats
- proteins

Carbohydrates are stored mainly in the muscles and liver as glycogen. Glucose is also present in the blood, and it contributes energy during initial exercise. Through a process called glycogenolysis, muscle and liver glycogen is broken

down to produce ATP. Fats are stored in the muscle and in adipose tissue as a complex called a triglyceride, which is made up of three fatty acids and one glycerol molecule. Lypolysis is the metabolic action of breaking the triglyceride into its smaller parts (three fatty acids + one glycerol) for ATP production. Proteins are the building blocks of the muscle structure. They are made up of amino acids linked together by different bonds. Overall, proteins contribute very little to the production of ATP for work.

Equine athletes are dependent on the production of ATP to run, jump, or pull. However, ATP production is dependent on the muscle's ability to utilize fuel stores in the body, which is dependent on oxygen availability. The two main ways that the muscle utilizes fuel stores are anaerobic and aerobic metabolism. Anaerobic metabolism is not dependent on oxygen to break down fuel stores, and it provides a rapid means of producing a limited supply of energy. In the absence of oxygen, only carbohydrates may be metabolized for ATP production. The end products of anaerobic metabolism are lactate and heat.

Carbohydrates —Anaerobic→ **ATP, lactate, heat!**

Horses that utilize anaerobic metabolism usually have heart rates of greater than 150 beats per minute during exercise, meaning the intensity of the performance is high. Any event that lasts less than one minute at high intensities strictly uses anaerobic metabolism to produce ATP. Quarter Horses are capable of sprinting 400 yards in less than 20 seconds – a good example of muscles using anaerobic metabolism.

Bob Coleman, University of Kentucky

Phosphorus → metabolism → muscle energy

Richtafort Phosphorus 125 + Vitamin B12 Injection contains Oxybenzylphosphinic acid, a phosphorus proven to provide high levels of phosphorus in the muscle and as a very important source of muscle energy. It is converted into *adenosine triphosphate* (ATP), *adenosine diphosphate* (ADP) and *phosphocreatine* (creatine phosphate), important for muscle contractions.

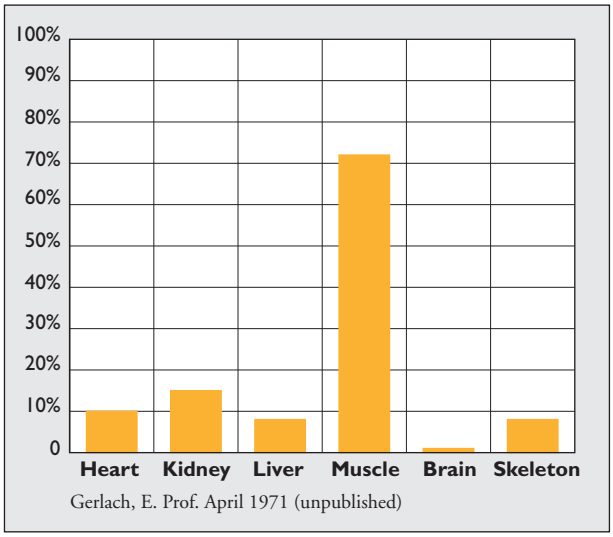
RICHTAFORT:

- Energise and prolong muscle activity
- Facilitate and promote recovery following illness (diarrhoea) or surgery
- Replace phosphorus lost in sweat during exercise or racing
- Improve appetite and well-being
- Improve cardiac function, and to increase blood flow and venous pressure
- The promotion of metabolic function
- To improve appetite
- For the Ca:P balance

+ VITAMIN B12 IS BENEFICIAL FOR:

- Red blood cells
- Tissue restoration and regeneration
- Metabolism of carbohydrate, protein and amino acids
- Tonic – increase appetite

Distribution of Richtafort after IV injection



Gerlach, E. Prof. April 1971 (unpublished)

PRODUCT INFORMATION

Richtafort™ Phosphorus 125 + Vitamin B_{12} Injection for Horses, Cattle and Dogs

ACTIVE CONSTITUENT

Each ml contains:

125 mg Sodium – oxybenzylphosphonic acid (equivalent to 20 mg/mL phosphorus);

50 µg Cyancocobalamin;
Vitamin B_{12}.

INDICATIONS

Phosphorus and vitamin B_{12} supplement; converts to muscle energy enzyme, AMP, ADP, ATP & cAMP. To energise cardiac and skeletal muscles.

DIRECTIONS FOR USE

By intravenous, intramuscular and subcutaneous injection.

Horses	5 mL/100 kg bodyweight
Cattle	5 mL/100 kg bodyweight
Dogs	1-5 mL

Repeat every second day or as required.

INTRAVENOUS INJECTION

To be used by or under the supervision of a registered veterinary surgeon.

WITHHOLDING PERIOD:

Nil.

PRESENTATION

100 mL vial.

APVMA Approval No 51215/0499

richter pharma ag
Wels, Austria

Foal Pneumonia Case Review

Foals, like other young animals, are especially susceptible to disease. A review of necropsy cases in foals over a one-year period at the University of Kentucky Livestock Disease Diagnostic Center was conducted to determine common pathologic diagnoses. A total of 272 foals, one day to six months of age, were submitted and examined in the one-year period. A variety of different pathologic diagnoses were made, and by far the most common diagnosis was pneumonia. There were 84 foals diagnosed with pneumonia, which represented 31% of all submitted foals. The cases were arbitrarily separated into age groups of 1-6 days, 1-4 weeks, and more than 1-6 months of age. Forty-two cases (51%) were less than six days of age, seven cases (9%) were 1-4 weeks of age, and 33 cases (40%) were 1-6 months of age. In two cases the age was not indicated. These data show the first week of life to be a critical time for the development of pneumonia; however, pneumonia is also problematic in older foals. Fillies comprised 58% of the cases. There were 71 Thoroughbreds (87%), four

Standardbreds, two Quarter Horses, two Miniature Horses, one American Saddlebred, one Hanoverian, and one mixed-breed foal. The high percentage of Thoroughbreds is consistent with the horse population of the area. Thirty-eight of the 84 cases (45%) had other pathologic diagnoses in addition to pneumonia. Common additional conditions included enteritis (inflammation of the intestinal tract), septicemia, and fractured ribs. Pneumonia in this group of foals was commonly associated with bacterial infection. Other causes of foal pneumonia, such as viruses and parasites, were not diagnosed. Of the 84 pneumonia cases, bacteria were isolated from 40 cases, and 44 cases had either no growth (38 cases) or nonpathogenic bacteria (six cases).

The foals had often been treated, and prior antibiotic therapy likely contributed to the inability to isolate bacteria even though there was likely an underlying bacterial etiology in many of these cases. The most commonly isolated bacterium from the cases of pneumonia was*E. coli,* which was cultured from 14 cases. *E. coli* was followed by *Rhodococcus equi* (13 cases), *Klebsiella pneumoniae* (8), *Streptococcus zooepidemicus* (7), *Actinobacillus equuli* (5), and *Enterococcus spp.* (5).

A variety of other bacteria were isolated on rare occasions. Thirteen cases had multiple bacteria isolated from the lung. *E. coli* was the most common bacterium isolated when a mixed culture was obtained. *E. coli* was isolated primarily from younger foals, with 71% of the isolates from foals less than 1 week old. *Rhodococcus equi* is typically associated with pneumonia in older foals, and in this group of cases all 13 were in foals more than one month of age. *Klebsiella pneumonia* was also recovered primarily from young foals, with seven out of eight cases in foals less than one week old.

The *Streptococcus zooepidemicus, Actinobacillus equuli,* and *Enterococcus* spp. cases were more equally divided between both young and older foals. These findings show that pneumonia is one of the most important disease conditions in foals and that foals in the first week of life are especially at risk. A relatively small group of bacterial organisms are typically associated with the cases of foal pneumonia.

Neil Williams, DVM, PhD, Dipl. ACVP, is the associate director at the University of Kentucky Livestock Disease Diagnostic Center, or LDDC.

Reprinted from the Lloyd's *Equine Disease Quarterly,* University of Kentucky, Department of Veterinary Science, July 2010, Volume 19, Number 3.

Penetration of methylsalicylate through equine skin

Abstract

Commercial formulations of non-steroidal anti-inflammatory drugs (NSAIDs) are developed for human use but the extent to which they will pass through equine skin is unknown. Skin was harvested from five Thoroughbred geldings from the thorax, groin and leg (dorsal metacarpal) regions and frozen (-20 degrees C) until required. Two grams of methylsalicylate (MeSa) gel was applied to defrosted full-thickness samples in diffusion cells and the penetration of MeSa and its active metabolite, salicylate (Sa), through skin samples were measured over 24 h.

Significantly higher (P < or = 0.02) total salicylate (AUC: MeSa + Sa) penetrated through skin from the leg region (5491.3 h mg/L), compared to thorax (3710.7 h mg/L) and groin (3571.5 h mg/L). In addition, there was a significantly higher (P0.01) rate of penetration of total Sa through leg skin in the first 6h after application.

It was concluded that the commercial formulation of MeSa would achieve therapeutic levels of total salicylate beneath sites of topical application, with a faster and more pronounced response through the leg region, compared with [copy to come].

Mills PC, Cross SE. Vet Dermatol. 2005 Oct;16(5):299-307.

Withholding time racing: Check with racing authorities as to the necessity of a withholding time after treatment and before racing.

Presentation: 100 g.

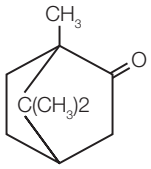
APVMA No 35762

richter pharma ag
Wels, Austria

Product information on active constituents – Phlegmon™ Black Label Ointment

Camphor

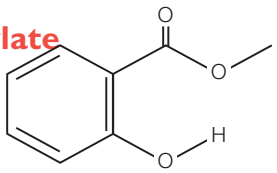
The principal form is *dextro*-camphor, which occurs in the wood and leaves of the camphor tree (*Cinnamomum camphora*). The structural formula of the molecule is …



Camphor has a characteristic odour; it crystallizes in thin plates and sublimes readily at ordinary temperatures.

Camphor has use in liniments and as a mild rubefacient, analgesic, and antipruritic.

Methyl Salicylate



$C_7H_6O_3 + CH_3OH \rightarrow C_8H_8O_3 + H_2O$

Salicylic acid is the basic substance of the salicylates which are non-steroidal anti-inflammatory drugs (NSAIDs). Methyl salicylates are nearly exclusively used as external rubefacient substances for treatment of neuralgia, myalgia (muscle pain), arthralgia (joint pain [arthritis]) and other pains arising from intertegumental structures, thus also certain rheumatic diseases. As methyl salicylate can be absorbed through the skin it is used in **counterirritant ointments and analgesic balms for painful muscles or joints.**

Methyl salicylate is used in cattle and horses. It is used topically in cream, ointments or solution for the cleaning of wounds of the skin and treatment of muscular and articular pain. The duration of treatment is usually less than one week.

The mechanism of action of the salicylates is based on the inhibition of the cyclo-oxygenase enzyme that intervenes in the synthesis of prostanoids from arachidonic acid, just as all salicylic acid derivatives. They also inhibit the release of PGF_{2a} and PGE_2 from thrombin-stimulated platelets as well as the synthesis of thromboxanes and favour the production of prostacyclin PGI_2. There is a reasonably good rank-order correlation between the potency of cyclo-oxygenase inhibition and their anti-inflammatory activity.

Ichthammol anti-inflammatory, antibacterial and antimycotic

Ichthammol is an active ingredient of natural origin. It is well-tolerated as a dermatological agent for the application to food and non food animals. The pharmacological actions include: an anti-inflammatory action which includes the effects on inflammation mediators. Antibacterial and antimycotic actions have been demonstrated in clinical use and confirmed in in-vitro studies.

Gayko G, Cholcha W, Kietzmann M: Berl Munch Tierarztl Wochenschr. 2000 Oct; 113(10): 368-73.

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