

# Talking Horses

The newsletter with news, views and practical advice

## From the editor...

At last, many areas are receiving good rains. In some places, higher than usual seasonal rainfall has resulted in severe flooding. With the prolonged wet weather, problems such as greasy heel, rain scald (mud fever) and soft hooves often develop in grazing horses on low lying or flat, poorly drained paddocks. We include a brief in this newsletter on each of these problems and some handy hints on managing persistent cases.

We also provide a review on sarcoids, the most common skin tumour in horses and donkeys, based on recent published papers. The review highlights some of the reasons for poor response to treatment alternatives for sarcoids in horses.

We discuss some new management changes and strategies to keep a check on worms, as well as minimise over-use and potential resistance build-up against the limited types of worming compounds currently available.

We also have the usual practical handy hints and more.

Keep safe and enjoy your horse companions.

*Dr John Kohnke BVSc. RDA*

### Special Note

## Glucosamine Use in Insulin Resistant and Foundering Horses

There is a belief that glucosamine (an amino sugar) widely used in horses with joint disease, should not be given in a joint supplement to horses with underlying glucose intolerance and insulin resistance (IR) suffering from Laminitis and Metabolic Cushing's Disease or Equine Metabolic Syndrome (EMS).

Recent studies in humans have failed to link the taking of glucosamine for joint problems with the elevation of blood glucose and increased insulin resistance in conjunction with Type II diabetes in aged patients. In horses, glucosamine is administered at up to 30mg/kg bodyweight and researchers have not definitely linked its use with elevation of blood sugars and insulin in IR horses. The dosage rate in horses is low as compared with the amount of sugar and NSCs taken in daily by a horse, even on a low GI diet. More studies are being carried out.

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### Handy Hint 1

**Open wounds** are common on the lower limbs due to non-elastic skin overlying hard bone, acting like a thin tissue on a cutting board when glanced or abraded by wire cuts, sharp-edged shoes causing over-reaches and even lacerations from sticks flicked up onto the lower limbs during exercise. Many wounds cannot be stitched to oppose the wound edges because either skin is missing, they are too old and have reduced skin circulation to enable cross-bridging during healing or are too large to suture. Seek advice from your vet for large open wounds greater than 2-3cms in diameter, especially if the underlying bone or a tendon is visible. Ensure that a tetanus booster is given within a few hours after the wound occurs. When cleaning open wounds, add 2 teaspoonsful of **plain, fine salt to one litre of boiled water** (cooled to body temperature). This makes 'normal' saline, a natural physiological fluid to irrigate the wound. Squirt the wound gently using a syringe to clean away discharges. Do not use tap water as it contains a high level of microbial contamination which may infect the wound. Plain water (no salt) can make the wound edges swell and leak serum as the electrolyte gradient allows water to enter the edges of the skin wound. This can significantly delay protective scab formation, cross-bridging and skin re-growth, which often leads to proud flesh or excessive scarring as the wound heals.

### Keep Open Wounds Clean

### Handy Hint 2

#### Do Joint Supplements Reduce Risk of Arthritis as a Horse Ages?

Owners of highly trained and talented horses often ask whether giving a daily joint supplement containing glucosamine and other joint active ingredients can provide protection as a horse ages. Studies in Germany indicate that daily doses of a glucosamine joint supplement had little protective benefit in otherwise sound horses up to 10 years of age. However, horses in dressage training over 10 years of age given this type of supplement had a reduced risk of developing joint unsoundness as they aged, compared with a control group which were not supplemented.

**Kohnke's Own Nutricart** is a new generation joint supplement, which following long term use, may assist joint health and function as a horse ages.

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## Kohnke's Own® Contact Details

FREECALL 1800 112 227 - FREE FAX 1800 112 228

Website: [www.kohnkesown.com](http://www.kohnkesown.com) - Email: [info@kohnkesown.com](mailto:info@kohnkesown.com)

Postal Address: PO Box 3234, Rouse Hill, NSW, 2155

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# SARCOIDS - A REVIEW

Sarcoid skin tumours are the most common type of skin 'cancer' in the horse, accounting for up to 90% of all skin growths affecting horses and donkeys. The majority are non-malignant, although they can invade the full thickness of the skin with a fibrous, epithelial growth which can attach to the underlying connective tissue. Sarcoids have historically been the most difficult skin tumours to treat and/or remove surgically, with a high recurrence within 12 months. Whenever a treatment or therapy is not totally effective, a multitude of herbal and other remedies are touted as being beneficial with anecdotal reports and testimonials of success. Some of these 'home-made' therapies may lead to partial regression for 6-12 months, but complete removal of lesions is often not achieved.

Up to 40% of horses can have multiple lesions and 50% of horses redevelop sarcoids following surgical removal of the primary lesions. Although most breeds of horses are susceptible, Appaloosas, Arabians, Quarter Horses, Warmbloods and Thoroughbreds appear to have the highest incidence. Geldings have double the risk as compared with mares. Standardbreds are considered to have the lowest risk of any breed because they have lower expression of skin specific antigen reactions, whereas the most commonly affected breeds have increased gene expression for skin antigens or allergy triggers. Surveys have shown that sarcoids are more common in donkeys and mules. Sarcoids usually initially develop in horses aged less than 4 years of age, but any horse which has its immune system compromised appears to have a higher risk of sarcoids.

## Sites of Sarcoids

The most commonly affected sites include the ears, corners of the mouth (lip commissures) and around the eyes, then the neck, legs, groin and under body. Studies have shown that in colder climates, the head and neck are more likely to develop sarcoids, possibly due to insect or fly attack, as compared to warmer climates, such as Australia, where the neck and limbs have a higher incidence. Sarcoids can also develop around the edges of wounds or even where a head stall or bit rubs in the corners of the mouth.

## Causes of Sarcoids

Although there is a definite genetically linked breed predilection for sarcoids, there are many other possible 'trigger' factors including UV radiation, trauma to the skin and viral infection. Surveys in the USA indicate that bovine papilloma virus (BPV), which cause skin warts and small tumours around the eyes, face and underbelly regions of cattle, have been associated with the development of sarcoids in horses and donkeys. Researchers have isolated

## Did You Know That...

- \* Sarcoids have not been reported in horses in Norway – where biting insects are not found due to the cold climate. Wet, warm weather with increased biting insect activity appears to be associated with an increased incidence of sarcoids in young horses under stress with compromised immunity due to respiratory conditions, heavy worm burdens or injury.
- \* Any flat or raised skin growth around the eye is most likely to be a sarcoid.
- \* Whilst sarcoids are the most common skin tumour (neoplasia) in horses, squamous cell carcinomas (SCC) around the lips, eyes, anus and external genitalia are the second most common skin tumour. They can also occur in the oesophagus, stomach, sinuses, tongue and hoof.
- \* Melanomas are the third most common skin tumour in horses, mostly affecting aged, grey horses. In non-grey horses, melanomas, arising from melanocyte pigment cells, metastasise and spread quickly due to a non-melanocyte origin and are similar to invasive skin melanomas in humans and dogs associated with hair follicles.
- \* The most common breeds affected by sarcoids, SCC and melanomas are Appaloosas and Arabians, with Paint Horses, Pintos and Draught Horse breeds having a higher risk than Thoroughbreds.
- \* Horses which are at risk of developing skin de-pigmentation around the eyes or lips as they age, including Paints, Appaloosas and especially grey Arabians, have a higher risk of melanomas.

BPV viral DNA and RNA of 2 out of 6 subtypes of BPV in sarcoid lesions on horses. A papilloma virus, similar to BPV, is suspected of causing sarcoids in Australian horses. The most common incidence occurs in mustering and cattle working station horses in the northern parts of Australia. It is thought that seasonal insect transmission from affected cattle to nearby horses could occur on cattle properties. The sarcoids are usually located on the skin under or adjacent to tack, such as breast plates, head stalls, bits and the girth, where the skin may be traumatised and attract biting insects, such as mosquitoes. Horses raised on dairy farms in the USA have a higher incidence of sarcoids.

Sarcoids are not likely to be spread from horse to horse. However, on an affected horse they can, if disturbed by surgery to remove them or local trauma, develop on multiple sites around or nearby the original lesion, as a result of so-called 'seeding' to surrounding tissue.

## Types of Sarcoid

There are five histologically classified types of sarcoid, with an additional form of mixed cell types originating from 2 or more primary types. The following table summarises the various types of sarcoids affecting horses.

**Reference:** Knottenbelt, D.C. (2005). Clin. Tech. Equine Pract 4: 278-295

Type	Signs	Common Sites	Sarcoid Appearance
Superficial Skin Sarcoids (Most common form).	Hair loss, skin scurf/scalding, thickened skin.	Neck, face, lip edges, sheath, above hocks and shoulder.	Flat, scaly, oval shaped with a thickened skin surface, more darkly pigmented than surrounding skin.
Verrucous Sarcoids	Lesions up to 6cm diameter, dry, horny surface.	Head, neck, under elbows, groin.	Wart-like, 'cauliflower' appearance.
Nodular Sarcoids	Sarcoids develop under skin with normal skin and hair overlying.	Eyelids, udder, sheath and groin. Trauma may trigger spread and growth.	Classified into Type A or B. Type A -subcutaneous only. Type B - attaches to underside of skin to reduce skin movement.
Fibroblastic Sarcoids	Fleshy, lumpy lesions on skin, often attached by strand of tissue (pedunculated).	Groin, legs, under elbows, around eyes and previous wound sites.	Fleshy, vascular 'proud flesh'- like lesions which ulcerate and bleed easily if knocked or rubbed by tack.
Malignant Sarcoids	Very invasive, aggressive form, spreading rapidly and into subcutaneous tissue.	Usually only elbows and jaw line.	Swollen, soft, weepy appearance with multiple tumour lumps and a raspberry-like surface.

### Biopsy Sample Size is Important

It is important to take a large sample size in preference to a needle or punch biopsy as the tumour and fibroblastic tissue type can vary within a sarcoid. This is especially important where the Sarcoid has been traumatised or treated with superficial medications prior to the biopsy. Many small sarcoids are histologically similar to the skin reaction to insect bites with eosinophil white blood cell infiltration, suggesting that some sarcoids are triggered by allergic skin bites in susceptible breeds of horses.

**Handy Hint 3**

### Sarcoids have no Pain Sensation

Common with all skin cancer tissue, sarcoids have no pain sensation themselves and most types, except the rarer fibroblastic form, do not bleed excessively, such as when swabbed with methylated spirits and pricked with a sterile hypodermic needle. However, discomfort can be associated with inflammation due to a surrounding injury or tack rubbing on the skin adjacent to a sarcoid to the skin. A sarcoid can become ulcerated, inflamed, infected or locally reactive due to trauma or irritant forms of topical chemical treatments applied to the skin in an attempt to remove it.

**Handy Hint 4**



## Diagnosing the Type of Sarcoid

The appearance, location and consistency of a sarcoid is used as a basis for primary identification of the type of sarcoid. This can be confirmed by biopsy of tumour to identify cell types. Surveys have shown that up to 50% of flat or Verrucous Sarcoids will transform into a more aggressive form when disturbed by a biopsy within 2 weeks of the sample being taken.

## Treating a Sarcoid

Although there are many herbal and 'grandma' treatments for sarcoids, many are either ineffective or cause partial regression and others result in proliferation of the sarcoid. Only the successful cases or those that would resolve anyway, are touted as a claim for such a therapy. There are many failures and recurrence of sarcoids following all types of therapy.

### Success Rates of Different Treatment Methods

Treatment Form	Success Rate	Complications 50 – 60%
Surgery alone.	Variable, often not long term.	Regrowth in 6 months. Large incisions require skin grafts to prevent a blemish.
Cryotherapy (Dry ice cooled probes to -20°C to -30°C inserted for 2-3 freeze thaw cycles)	70%. Generally, most types of Sarcoids are controlled.	Damage to surrounding skin, healing time 2-3 months. White hair regrowth. Not recommended around eyes.
Carbon Dioxide Laser (specialist therapy).	81% of sarcoids. Often combined with conventional therapy.	Cuts and evaporates tumour tissue – little collateral skin damage.
Radiowave - induced hyperthermia heats sarcoids to 50°C for 30 seconds - kills proliferative cells.	100% success when repeated twice 3 weeks apart. Regression 7-12 months	Large sarcoids can leave crater in skin when removed and slow to heal.
Radioisotope therapy.	Medical radiation therapy 50-100% regression for 12 months.	Often combined with surgical debulking.
Cisplatin applications - chemotherapy	87% free of sarcoids over 12 months.	Chemotherapy drugs need careful handling as toxic to humans.
Topical Cytotoxic Therapy (XXXTerra® therapy)	Claimed to regress 95% of sarcoids. Not available in Australia.	Contains zinc chloride and blood root extract. Safe on normal skin. Repeated every 6 days until tumour resolves.
Immunotherapy BCG (Regressin®) or Equimune®-stimulates host lymphocytes and natural killer cells to reject tumour.	50-80% remission - safe around eyes. Injected in multiple sites into tumour. Results in sloughing of sarcoids in 4-6 weeks.	Severe anaphylactic shock can occur after repeated injections.
Anti-viral immune-modulation	100% success rate in trials	Success suggests that sarcoids could be viral in origin. Still under development
Topical Herbal Therapies. Herbs with anti-viral effects may have some benefit- blends vary.	Variable success rates. Multitude of herbal combinations suggest 'hit and miss' therapy.	When all else fails, may be a last resort. May stimulate immune rejection response. But if it is flat, leave it alone!

References: Dr. A. Yu (2006) AAEP Convention 52: 478-482. & Dr. B. Epsy (2008) AAEP Convention 54: 68-72.

### Handy Hint 5

**General Rule of Thumb for Treating Sarcoids**  
Dr. Anthony Yu, a veterinary dermatologist at the University of Guelph, Ontario Canada, recommends that if a sarcoid is flat and level with the skin – leave it alone. It is unlikely to spread or enlarge, unless it is traumatised by tack rubbing on the lesion. However, if a sarcoid is raised and lobulated, treat it aggressively or surgically remove it. Sarcoids located around coronet or lower limbs should be removed as they are likely to be traumatised as a horse is worked.

### Handy Hint 6

**Do You Have a Number of Horses with Sarcoids?**  
If you breed or train Appaloosas, Arabians or Quarter Horses, then there could be a natural predilection to sarcoids, because they have increased genetically induced W13ELA antigen expression. If these animals share paddocks with cattle or are used as 'cow working' stock horses, there is a possibility that a number of these horses in a group will develop sarcoids, especially geldings between 1 – 7 years of age. In this case, it would be best to avoid running horses nearby to cattle, especially during periods of high biting insect activity following rain or during the warmer months, especially horse flies and mosquitoes, which may carry the BPV-like virus infection from cattle to horses.

## Worming - New Strategies

Dr. Craig Reinemeyer of East Tennessee, USA, presented a paper at the 55th Convention of the American Assoc. of Equine Practitioners held in Las Vegas in December 2009. He presented a new approach to controlling Small Strongyle (Small Redworm) infestations in horses, subtitled 'A Mandate for Change'.

His 'mandate' emphasises prevention and sustainability of control, rather than relying on chemical control with worming compounds alone. Many of the recommendations are based on already known data on worm lifecycles, egg hatching times and environmental factors which favour worm egg survival. Many horse owners are influenced by the commercial promotion of worming at regular set intervals and claims that worming alone will control worms. Currently, there are only 3 classes of worming compounds available and all are under threat of increasing resistance build-up due to over-use or poor dosing techniques. Widespread use of 'mectin' compounds and with no new, different acting compounds that are likely to become available, even in the long term because of the cost for Research & Development for wormers, the trend is an increased likelihood of large scale wormer resistance unless new strategies are adopted to better target and control worm populations in the environment and within horses.

### Facts and Stats

- \* Studies have shown that 99% of Strongyle spp worms are in the pasture phase of their lifecycle, with only 1% of the worm population infecting the horse, at any one time.
- \* Pasture contamination with infective stage larvae increases by 300% after rain on a contaminated pasture.
- \* Studies have also shown that egg hatching and larval development of Strongyle eggs is hampered by temperatures below 10°C and above 35°C, with optimum hatching speed at around 25-30°C in spring and autumn seasonal conditions. Highest infective larval populations on pasture thus occur during temperate seasonal conditions in spring and autumn.
- \* Infective Strongyle spp larvae can remain viable for 6 months in the protected micro-environment of the pasture base during damp, warm conditions and for up to 5 weeks under snow! Roundworm eggs can remain viable for up to 5 years in manure under sheltered areas, such as trees and in shaded, frost free moist areas.
- \* A combined pasture hygiene program to limit egg and larval contamination with strategic worming based on seasonal conditions, is from 5 to 10 times more effective in controlling worms than worming alone.

Resistance build-up by Small Strongyles (Small Redworms or Cyathostomes) against B-Z wormers is well known and there is now an emerging risk of resistance against the 'mectin' worming compounds. If resistance is allowed to build up against these compounds, then there will be very few alternative compounds which are effective against these worms. Wormer rotation is already limited, and will be more seriously hampered in the near future, because of the lack of new compounds. Recent surveys suggest developing Ascarid spp (Large Roundworm) resistance in foals to ivermectin in the USA and Europe, and local evidence that Oxyuris spp (Pinworms) may be developing resistance to older 'mectin' compounds as well.

Dr. Reinemeyer's 'mandate for change' includes a detailed discussion on egg hatching times, seasonal and lifecycle variations and tests for wormer efficiency by **Faecal Egg Count Reduction Testing (FECRT)**. Worm egg counts in manure are recommended in horses over 3 years of age and between 6-12 weeks after the previous worming, relative to the wormer used (ivermectin and moxidectin 10-12 weeks after their last use).

It is important to ensure accurate body weight estimation and efficient paste worming techniques when administering all types of wormers. Up to 80% of horse-owners under-estimate their horse's body weight by up to 15% when calculating a wormer dose and on average, 10% of the wormer dose is wasted by poor worming techniques when administering a paste wormer.

### A new strategy for worm control recommends the following...

1. Worm out relative to the age and individual horses within a group
2. Up to 50% of horses show some resistance to worms and continued worming may actually reduce this natural protective mechanism. Do not worm these horses so often - monitor by 3-4 monthly FECRT.
3. Do not worm out a horse too frequently and avoid worming at set intervals (eg every 6-8 weeks) throughout the whole year. Worm relative to seasonal risk of worm uptake and burdens in grazing horses.
4. Target worm control in young and old horses, based on age and FECRT.
5. Worm relative to seasonal transmission and pasture contamination rates. This may only require worming at 3-4 month intervals to gain control and reduce risk of wormer resistance.
6. Rotate to an older wormer for general non-seasonal control, leaving the 'mectins' for targeted control.
7. Perform FECRT by collecting manure for worm egg counts and segregate horses into low risk and high contamination relative to pasture conditions and manure egg count results.

Reference: C. Reinemeyer (2009) AAEP Convention 55: 352-360

**Kohnke's Own<sup>®</sup>**

## Products of the Month

**MUSCLE XL**

&

**GASTRO-COAT**

If your horse is faced with a hard competitive show season, daily training for dressage, eventing or jumping or showing and is travelled regularly to lessons or to competition, the chances are that his topline will start to fall away and he may become less tolerant to being geared-up, worked and travelled on a daily basis or even lose his appetite and become a 'picky' or slow eater!

Supplements of **Muscle XL** and **Gastro-Coat** can help maintain his topline and impulsion strength, as well as his ability to handle the daily training routine.

**Muscle XL** provides high quality whey isolates (Muscle XL only contains certified human grade whey isolates), organic zinc, organic sulphur and Vitamin E as specific 'muscle food' ingredients to build and maintain the topline and rump in conjunction with regular exercise.



For best results, it should be given in a small feed, or as a 'watery slurry' by syringe over the tongue, within 15 minutes of daily training for courses lasting 7-10 days at regular 2-3 week intervals.

Muscle XL is available in 800g (1 horse course), 2 kg, 6 kg and 10 kg packs.



**Gastro-Coat** contains natural high quality mucilages and gum-like compounds, which are often low or destroyed by the heat processing and long term storage of feeds. The mucilages help to encourage chewing and salivation. This helps ensure optimum stomach conditions and digestive function to maintain the appetite and willingness to work and travel without becoming uneasy and off feed.

Ideally, Gastro-Coat (3 scoopsful) can be mixed into a lightly dampened feed of 4 litres of lucerne chaff with 2 tablespoonsful of fine

Ag-Lime and given as a pre-exercise and travelling 'snack', about 30 minutes before each days training to help maintain proper digestive function and keep a horse on his feed, contented and willing for training and competition.

Gastro-Coat is available in 1 kg, 3kg, 6 kg, 10kg and 20kg packs.

**Disclaimer:** The information and recommendations in this newsletter have been presented as a guideline based on the veterinary experience and knowledge of the author, Dr John Kohnke BVSc RDA. Whilst all care, diligence and years of practical experience have been combined to produce this information, the author/editor, Dr John Kohnke, accepts no responsibility or liability for unforeseen consequences resulting from the hints and advice given in this newsletter.

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## Seasonal Information Sheet

# WET WEATHER PROBLEMS

### Greasy Heel

Many horse owners have a horse with white socks on the heels, pasterns and above the fetlock, especially on the hind limbs, which are prone to developing chronic greasy heel.

Greasy heel is caused by microbial invasion into the skin surface, producing a greasy discharge which tends to matt the hair. The inflamed skin dries out, cracks and can cause chronic discomfort and lameness. The skin reaction is also triggered by exposure to UV light, which causes a form of 'solar dermatitis' in sensitive horses. Horses normally graze walking away from the sun so that they are not blinded by the light. This grazing habit exposes the lower legs, especially the hind pasterns with white socks, to UV light under the damp conditions of winter when the angle of the sun's rays are lowest in the sky, especially in the southern Australian states.

### Handy Hint

#### Managing and Controlling Greasy Heel

Here's a useful remedy – gently scrub off the grease with a warm solution of laundry soap (eg. Sunlight® soap) using a soft brush. If very inflamed, apply a cortisone/antibiotic preparation for 3-5 days, as prescribed by your vet and then scrub off the scabs (be aware of withdrawal times when using prior to competition as cortisone residues will be detected in a swab). Consult your own vet for advice. Pat dry, apply weak PVP iodine solution (eg Betadine 10%) twice daily for 2-3 days, or until any broken skin is healed. Each morning apply a thin coating of a zinc cream or a UV factor 30+ sunscreen lotion to reduce UV reaction. It will help prevent recurrence and repel excess moisture and minimise skin cracking. Seek further advice from your vet.

### Handy Hint

#### Keep the Topline Dry Under Wet Conditions to Prevent Rain Scald

Cover the horse with a water proof rug if it is raining, but ensure the inside lining of the rug is clean and not contaminated with debris from the original infection. Do not leave the rug on if it is hot, as the horse may sweat and the moisture will keep the skin soft and encourage ongoing invasion by the Rain Scald organisms. In chronic cases, a daily supplement containing copper, zinc, organic selenium and vitamin A, such as Kohnke's Own Cell-Vital, Cell-Provide or Aussie Sport, is recommended to help maintain skin immunity as a pasture diet is often low in these nutrients.

In severe recurring cases, it is best to relocate the horse to another pasture or a drier locality. Consult your vet for advice.

### Rain Scald (Mud Fever)

Rain scald, or 'mud fever', most commonly results from the invasion of the skin layers by branching fungal-like bacterial organisms which contaminate dust, soil and mud. Rain scald is found on the flat parts of the top-line and rump, as the water does not drain off as quickly as compared to the sides of the body. A horse exposed to extended rainy conditions for 5-7 days can soften the skin. The organism invades the skin and hair follicles, resulting in inflammation and loss of skin in scab-like small tufts of hair, leaving a juicy crater of pus and exudates. Young horses, sick horses, horses under stress and aged horses are more prone to 'rain scald' because their immunity is not well developed, compromised or waning with old age. Some horses enjoy rolling in dusty areas or even in mud, which contaminates their topline and rump with soil borne micro-organisms. Horses sharing grazing pastures with sheep and cattle are more likely to develop greasy heel and rain scald because the same microbes cause skin conditions in these grazing animals.

There are a number of topical medicated shampoos or washes which are suitable to help control Rain Scald. The most commonly used is 10% Betadine® or Vetadine® wash, both containing slow-release PVP iodine. After lathering the coat and removing the mud and dirt, apply a second wash, lather it up and leave it on the skin for 10-15 minutes for the PVP iodine to release its iodine to help control the fungal-like infection. Washing it off promptly reduces its effectiveness. After rinsing, pat the skin dry with a clean towel. Repeat the iodine wash every second day for 3-4 washes until the skin clears up and the scabs heal.

### Soft, Wet Hooves

Wet, rainy winter conditions increase the moisture content of the soles and frog which are unable to dry out on low lying ground, clay based soils and flat paddocks. The soles soften, reducing weight bearing capacity, especially in heavy-weight horses and heavily pregnant mares at pasture. They may become lame and have difficulty in walking to graze. Build-up of mud contaminated with soil borne microbes under the soles and around the frog, can increase the risk of white-line disease, seedy toe, thrush and hoof abscesses. Hoof abscesses are most common following a dry period when hooves may dry out and develop hairline cracks and harbour soil microbes, especially in horses grazing on rough, stony country.

If the soles and frog are saturated and soft, clean away mud and wipe off excess moisture. Then apply methylated spirits with a Chux® wipe to repel excess moisture and help dry the soles. Then apply 10% Betadine PVP iodine to reduce microbial contamination. Repeat daily for 3-4 days to dry the hooves and harden the frog.

Applications of Kohnke's Own Hoof-Seal® will help to maintain normal moisture content within the sole, as the natural oil and breathable polyurethane blend, repel excess moisture uptake, as well as reduce mud and soil build-up on the sole and around the frog. Apply a thin coating after cleaning the hooves, repeat every second day for 3-4 times, then apply once a week.



### Handy Hint

#### Hoof-Seal for Dry Hooves

If a period of dry weather precedes rainy weather, apply **Hoof-Seal** once a week to the sole and frog to help maintain moisture levels and minimise shrinkage and cracking of the dried-out sole. When the wet weather arrives, apply Hoof-Seal every third day until the ground dries out and then once weekly thereafter.