

Ellse L, Sands B, Burden FA, Wall R. [Essential oils in the management of the donkey louse, \*Bovicola ocellatus\*](#). Equine Vet J. 2016 May;48(3):285-9.

Chewing lice are widespread and clinically compromising parasites of livestock and equids. Their management is complicated by growing levels of resistance to commonly applied insecticides. Hence, the development of novel approaches to their control is of major clinical interest. The objectives of the study were to assess the effects of incorporating the essential oils of tea tree and lavender into a grooming programme for populations of donkeys with natural infestations of *Bovicola ocellatus* in the UK and Ireland when louse populations were at their winter seasonal peak. The study design was an in vivo field trial. Suspensions of 5% (v/v) tea tree or lavender oil or an excipient only control were groomed into the coats of winter-housed donkeys (n = 198) on 2 occasions, 2 weeks apart. Louse counts were conducted before each application and 2 weeks later. After 2 applications, the groups groomed with lavender or tea tree oil suspensions had a significant reduction in louse intensity, with a mean decline in louse abundance of 78% (95% confidence interval 76-80%). Louse numbers in the groups groomed with excipient only either did not change or increased significantly. Donkey hair length had no effect on the decline in louse numbers. These results demonstrate that the inclusion of essential oil suspensions during grooming can be used to manage louse populations successfully.

Peachey LE, Pinchbeck GL, Matthews JB, et al. [An evidence-based approach to the evaluation of ethnoveterinary medicines against strongyle nematodes of equids](#). Vet Parasitol. 2015 May 30;210(1-2):40-52.

Cyathostomins are the most important gastrointestinal nematode infecting equids. Their effective control is currently under threat due to widespread resistance to the broad spectrum anthelmintics licenced for use in equids. In response to similar resistance issues in other helminths, there has been increasing interest in alternative control strategies, such as bioactive plant compounds derived from traditional ethnoveterinary treatments. This study used an evidence-based approach to evaluate the potential use of plant extracts from the UK and Ethiopia to treat cyathostomins. Plants were shortlisted based on findings from a literature review and additionally, in Ethiopia, the results of a participatory rural appraisal (PRA) in the Oromia region of the country. Systematic selection criteria were applied to both groups to identify five Ethiopian and four UK plants for in vitro screening. These included *Acacia nilotica* (L.) Delile, *Cucumis prophetarum* L., *Rumex abyssinicus* Jacq., *Vernonia amygdalina* Delile, and *Withania somnifera* (L.) Dunal from Ethiopia and *Allium sativum* L. (garlic), *Artemisia absinthium* L., *Chenopodium album* L. and *Zingiber officinale* Roscoe. (ginger) from the UK. Plant material was collected, dried and milled prior to hydro-

alcoholic extraction. Crude extracts were dissolved in distilled water (dH<sub>2</sub>O) and dimethyl sulfoxide (DMSO), serially diluted and screened for anthelmintic activity in the larval migration inhibition test (LMIT) and the egg hatch test (EHT). Repeated measures ANOVA was used to identify extracts that had a significant effect on larval migration and/or egg hatch, compared to non-treated controls. The median effective concentration (EC-50) for each extract was calculated using PROBIT analysis. Of the Ethiopian extracts *A. nilotica*, *R. abyssinicus* and *C. prophetarum* showed significant anthelmintic activity. Their lowest EC-50 values were 0.18 (confidence interval (CI): 0.1-0.3), 1.1 (CI 0.2-2.2) and 1.1 (CI 0.9-1.4)mg/ml, respectively. All four UK extracts, *A. sativum*, *C. album*, *Z. officinale* and *A. absinthium*, showed significant anthelmintic activity. Their lowest EC-50 values were 1.1 (CI 0.9-1.3), 2.3 (CI 1.9-2.7) and 0.3 (CI 0.2-0.4)mg/ml, respectively. Extract of *A. absinthium* had a relatively low efficacy and the data did not accurately fit a PROBIT model for the dose response relationship, thus an EC-50 value was not calculated. Differences in efficacy for each extract were noted, dependent on the assay and solvent used, highlighting the need for a systematic approach to the evaluation of bioactive plant compounds. This study has identified bioactive plant extracts from the UK and Ethiopia which have potential as anthelmintic forages or feed supplements in equids.

Reisinger N, Schaumberger S, Nagl V, Hessenberger S, Schatzmayr G. [Milk thistle extract and silymarin inhibit lipopolysaccharide induced lamellar separation of hoof explants in vitro.](#) *Toxins (Basel)*. 2014 Oct 6;6(10):2962-74.

The pathogenesis of laminitis is not completely identified and the role of endotoxins (lipopolysaccharides, LPS) in this process remains unclear. Phytogetic substances, like milk thistle (MT) and silymarin, are known for their anti-inflammatory and antioxidant properties and might therefore have the potential to counteract endotoxin induced effects on the hoof lamellar tissue. The aim of our study was to investigate the influence of endotoxins on lamellar tissue integrity and to test if MT and silymarin are capable of inhibiting LPS-induced effects in an in vitro/ex vivo model. In preliminary tests, LPS neutralization efficiency of these phytogetics was determined in an in vitro neutralization assay. Furthermore, tissue explants gained from hooves of slaughter horses were tested for lamellar separation after incubation with different concentrations of LPS. By combined incubation of explants with LPS and either Polymyxin B (PMB; positive control), MT or silymarin, the influence of these substances on LPS-induced effects was assessed. In the in vitro neutralization assay, MT and silymarin reduced LPS concentrations by 64% and 75%, respectively, in comparison PMB reduced 98% of the LPS concentration. In hoof explants, LPS led to a concentration dependent separation. Accordantly, separation force was significantly decreased by 10 µg/mL LPS. PMB, MT and silymarin could significantly improve tissue integrity of explants incubated with 10 µg/mL LPS. This study showed that LPS had a negative influence on the structure of hoof explants in vitro. MT and silymarin

reduced endotoxin activity and inhibited LPS-induced effects on the lamellar tissue. Hence, MT and silymarin might be used to support the prevention of laminitis and should be further evaluated for this application.

Wilford S, Woodward E, Dunkel B. [Owners' perception of the efficacy of Newmarket bloodroot ointment in treating equine sarcoids.](#) Can Vet J. 2014 Jul;55(7):683-6.

A retrospective questionnaire-based survey was used to determine the perceived efficacy of Newmarket bloodroot ointment in treating equine sarcoids. In 49 horses with 74 sarcoids, 64 sarcoids responded either completely (n = 49) or partially (n = 15) while 10 did not respond or worsened. Sarcoids < 2 cm responded better to treatment (P < 0.001) than did larger sarcoids.

Cecchini S1, Paciolla M1, Caputo AR2, Bavoso A1. [Antioxidant Potential of the Polyherbal Formulation "ImmuPlus": A Nutritional Supplement for Horses.](#) Vet Med Int. 2014;2014:434239. doi: 10.1155/2014/434239. Epub 2014 May 4.

In order to counteract harmful effects of oxidative stress due to pathological conditions or physical exercise, horses are often administered dietary supplements having supposed high antioxidant activities. The aim of the present study was to identify the in vitro antioxidant potential of "ImmuPlus", a polyherbal formulation (Global Herbs LTD, Chichester, West Sussex, Great Britain), containing three medicinal plants (*Withania somnifera*, *Tinospora cordifolia*, and *Emblica officinalis*), known in Ayurveda for their use in human disease treatment. Extracts obtained by different solvents (water, methanol, ethanol, acetone, and hexane) were tested for total antioxidant capacity, total reducing power, scavenging activity against DPPH radical, and total polyphenol and flavonoid contents. Our results showed that, except as regards hexane, all the used solvents are able to extract compounds having high antioxidant activity, even when compared to ascorbic acid. Regression analysis showed significant correlations between antioxidant properties and polyphenol/flavonoid contents, indicating the latter, known for their beneficial effects on health of human and animal beings, as major components responsible for the strong antioxidant capacities. Moreover, obtained results suggest the effective role of the polyherbal mixture as good source of antioxidants in horses.

Ellse L, Burden FA, Wall R. [Control of the chewing louse \*Bovicola \(Werneckiella\) ocellatus\* in donkeys, using essential oils. \*Med Vet Entomol.\* 2013 Dec;27\(4\):408-13](#)

Infestations by lice can be a significant clinical and welfare issue in the management of large animals. The limited range of commercial pediculicides available and the development of resistance have led to the need to explore alternative louse management approaches. The results of in vitro and in vivo trials undertaken to control populations of the donkey chewing louse, *Bovicola ocellatus* (Piaget) (Phthiraptera: Trichodectidae) using the essential oils of tea tree (*Melaleuca alternifolia*) and lavender (*Lavandula angustifolia*) are reported here. Results of contact and vapour bioassays showed that 5% (v/v) tea tree and lavender oils resulted in > 80% louse mortality after 2 h of exposure. On farms, separate groups of 10 donkeys sprayed with 5% (v/v) tea tree and lavender oil as part of their usual grooming regime showed significant reductions in louse numbers compared with a control group (0.2% polysorbate 80 in water). These findings indicate that tea tree and lavender essential oils can provide clinically useful levels of control of *B. ocellatus* when used as part of a grooming routine and suggest that with further development could form the basis of an easy to apply and valuable component of a louse management programme for donkeys.

Talbot WA, Pinchbeck GL, Knottenbelt DC, Graham H, McKane SA. [A randomised, blinded, crossover study to assess the efficacy of a feed supplement in alleviating the clinical signs of headshaking in 32 horses. \*Equine Vet J.\* 2013 May;45\(3\):293-7](#)

Feed supplements are commonly used by owners to alleviate headshaking; however, randomised, controlled trials are required to assess their efficacy. The object of the study was to determine the efficacy of a feed supplement for alleviation of the clinical signs of headshaking using a randomised, blinded, placebo-controlled trial. Using a crossover design, 44 horses previously diagnosed with chronic idiopathic headshaking received both the supplement and a matching placebo per os for 28 days with a washout period between of 14 days. Video recordings were taken at rest and exercise prior to the study and at the end of both periods of treatment. The degree of headshaking was assessed in a blinded, randomised manner by 2 veterinary surgeons. At the same time points, owners completed a questionnaire to assess the severity of headshaking signs. A Wilcoxon signed rank test was used to compare the scores while on supplement and placebo. Using the video assessments, there was no significant difference between scores while on supplement compared with placebo ( $P = 0.7$ ). Using the questionnaire responses, there was no significant difference between scores for any activity when the placebo and the supplement were compared with each other. However, owners reported significant improvement during all activities

for both placebo and supplement compared with pretreatment scores. The supplement offered no benefit over a placebo in alleviating the clinical signs of headshaking. There appeared to be a significant proxy placebo effect when the outcome was based on subjective owner perception of clinical signs. This study demonstrated no beneficial effect of this supplement on the clinical signs of headshaking. The study did show a significant placebo effect, thereby highlighting the necessity of properly conducted, randomised controlled trials, with blinding, to assess true treatment effects in trials in animals.

Hackett ES, Mama KR, Twedt DC, Gustafson DL. [Evaluation of antioxidant capacity and inflammatory cytokine gene expression in horses fed silibinin complexed with phospholipid.](#) Am J Vet Res. 2013 Oct;74(10):1333-9.

To evaluate antioxidant capacity and inflammatory cytokine gene expression in horses fed silibinin complexed with phospholipid. 5 healthy horses were orally administered increasing doses of silibinin phospholipid during 4 nonconsecutive weeks (0 mg/kg, 6.5 mg/kg, 13 mg/kg, and 26 mg/kg of body weight, twice daily for 7 days each week). Dose-related changes in plasma antioxidant capacity, peripheral blood cell glutathione concentration and antioxidant enzyme activities, and blood cytokine gene expression were evaluated. Plasma antioxidant capacity increased throughout the study period with increasing dose. Red blood cell nicotinamide adenine dinucleotide phosphate:quinone oxidoreductase I activity decreased significantly with increasing doses of silibinin phospholipid. No significant differences were identified in glutathione peroxidase activity, reduced glutathione or oxidized glutathione concentrations, or expression of tumor necrosis factor  $\alpha$ , interleukin-1, or interleukin-2. Minor alterations in antioxidant capacity of healthy horses that consumed silibinin phospholipid occurred and suggest that further study in horses with liver disease is indicated.

Payne SE, Kotze AC, Durmic Z, Vercoe PE. [Australian plants show anthelmintic activity toward equine cyathostomins in vitro.](#) Vet Parasitol. 2013 Sep 1;196(1-2):153-60.

Anthelmintic resistance in gastrointestinal parasites of horses is an increasing problem, particularly in cyathostomins, and there is a need to find alternative means for the control of these parasites. We screened crude extracts from 37 species of Australian native plants for their anthelmintic activity in vitro against cyathostomin larvae (development from egg to third larval stage), with the aim of identifying those species that may be suitable for incorporation into sustainable parasite management

programs. Water extracts from seven species, namely *Acacia baileyana*, *Acacia melanoxyton*, *Acacia podalyriifolia*, *Alectryon oleifolius*, *Duboisia hopwoodii*, *Eucalyptus gomphocephala* and *Santalum spicatum* completely inhibited larval development (100% inhibition compared to the control), while another 10 species caused 90% inhibition at the initial screening concentration of 1400 µg of extractable solids/mL. The seven most potent extracts produced IC<sub>50</sub> values (concentration of extract which resulted in a 50% inhibition of development) in the range 30.9-196 µg/mL. Fourteen extracts were incubated with polyvinylpyrrolidone (PVPP) before the assays, which removed the anthelmintic activity from 12 of these extracts, indicating that tannins were likely to be the bioactive compound responsible for the effect, while in two species, i.e. *A. melanoxyton* and *D. hopwoodii*, compounds other than tannins were likely to be responsible for their anthelmintic action. Our results suggest that a number of Australian native plants have significant anthelmintic activity against cyathostomin larval development in vitro. There is potential for these plants to be used as part of sustainable parasite control programs in horses, although more research is needed to identify the compounds responsible for the anthelmintic effects and confirm their activity in vivo.

Pearson W, Fletcher RS, Kott LS. [Oral rosmarinic acid-enhanced \*Mentha spicata\* modulates synovial fluid biomarkers of inflammation in horses challenged with intra-articular LPS.](#) *J Vet Pharmacol Ther.* 2012 Oct;35(5):495-502.

A biological extract of high-rosmarinic acid mint (HRAM) has previously demonstrated inhibitory effects on lipopolysaccharide (LPS)-induced prostaglandin E(2) (PGE(2)), nitric oxide (NO) and glycosaminoglycan (GAG) release in vitro. This study was undertaken to determine whether HRAM added to feed produces similar effects in horses challenged with intra-articular LPS. Eight horses received HRAM (0 or 28.1 ± 1.3 g/day; n = 4 per group) in their feed for 24 days in a blinded manner. On day 21, all horses received an intra-articular injection of LPS (0.3 ng) into their left or right intercarpal joint. Synovial fluid (SF) samples were taken on postinjection day (PID)-21 (i.e. prior to commencement of supplementation), PID0, PID0.25, PID0.5, PID1 and PID3 and analysed for PGE(2), GAG, NO, protein and total nucleated cells counts. Blood biochemistry and haematology screens were conducted at PID-21, PID0, PID1 and PID3. There was a significant reduction in LPS-induced PGE(2) and GAG in SF in horses supplemented with HRAM compared with controls and a tendency to increase complement recognition protein accumulation in synovial fluid of HRAM horses. Plasma from HRAM horses had reduced total white blood cells, segmented neutrophils (compared with baseline concentrations) and lymphocytes (compared with controls), and increased SF nucleated cell count (compared with baseline concentrations and controls). It is concluded that HRAM offered as part of the feed alter biomarkers of inflammation in SF of LPS-challenged horses. Larger studies that

seek to clarify effects of HRAM on synovial fluid cell counts and possible role of HRAM-induced interference with complement signalling are warranted.

Hackett ES, Mama KR, Twedt DC, Gustafson DL . [Pharmacokinetics and safety of silibinin in horses.](#) Am J Vet Res. 2013 Oct;74(10):1327-32.

To determine the oral bioavailability, single and multidose pharmacokinetics, and safety of silibinin, a milk thistle derivative, in healthy horses, 9 healthy horses were initially administered silibinin IV and silibinin phospholipid orally in feed and via nasogastric tube. Five horses then consumed increasing orally administered doses of silibinin phospholipid during 4 nonconsecutive weeks (0 mg/kg, 6.5 mg/kg, 13 mg/kg, and 26 mg/kg of body weight, twice daily for 7 days each week). Bioavailability of orally administered silibinin phospholipid was 0.6% PO in feed and 2.9% via nasogastric tube. During the multidose phase, silibinin had nonlinear pharmacokinetics. Despite this, silibinin did not accumulate when given twice daily for 7 days at the evaluated doses. Dose-limiting toxicosis was not observed. Silibinin phospholipid was safe, although poorly bio-available, in horses. Further study is indicated in horses with hepatic disease.

Shmalberg J, Xie H. [Acupuncture and Chinese herbal medicine for treating horses.](#) Compend Contin Educ Vet. 2011 May;33(5):E1-11.

Acupuncture exerts diffuse analgesic effects through the release of endogenous opioids and other locally and centrally acting mediators. Successful therapeutic interventions for various musculoskeletal conditions in horses are well documented, and acupuncture may significantly enhance performance. The use of acupuncture is specifically supported in treating nonsurgical gastrointestinal disorders, in which specific techniques can alter motility and contribute to visceral analgesia. This article describes the use of acupuncture and Chinese herbal medicine for equine reproductive management and for treating respiratory disease. A careful review of available data and ongoing efforts to enhance unbiased research should continue to guide practitioners of evidence-based medicine in refining the most useful applications of acupuncture and Chinese herbal medicine.

Tinworth KD, Harris PA, Silience MN, Noble GK. [Potential treatments for insulin resistance in the horse: a comparative multi-species review.](#) Vet J. 2010 Dec;186(3):282-91.

Insulin resistance and hyperinsulinaemia increase the risk of laminitis and horse owners and veterinarians should attempt to enhance insulin sensitivity in at-risk groups. In obese animals this may be achieved, in part, by promoting weight loss and increasing exercise, but such intervention may not be appropriate in non-obese insulin-resistant animals, or where exercise is contra-indicated for clinical reasons. An alternative approach to controlling insulin sensitivity in obese and non-obese horses may be the use of certain herbal compounds that have shown promise in humans and laboratory animals, although little is known of the effects of these compounds in horses. The herbs can be grouped according to their primary mechanism of action, including activators of the peroxisome proliferator-activated receptors, anti-obesity compounds, anti-oxidants, compounds that slow carbohydrate absorption, insulin receptor activators and stimulators of glucose uptake, with some herbs active in more than one pathway. Certain herbs have been prioritised for this review according to the quality and quantity of published studies, the reported (or extrapolated) safety profile, as well as potential for efficacy, all of which will hopefully motivate further research in this field.

Brindley MA, Widrlechner MP, McCoy JA, Murphy P, Hauck C, Rizshsky L, Nikolau B, Maury W. [Inhibition of lentivirus replication by aqueous extracts of \*Prunella vulgaris\*.](#) Virol J. 2009 Jan 20;6:8.

Various members of the mint family have been used historically in Chinese and Native American medicine. Many of these same family members, including *Prunella vulgaris*, have been reported to have anti-viral activities. To further characterize the anti-lentiviral activities of *P. vulgaris*, water and ethanol extractions were tested for their ability to inhibit equine infectious anaemia virus (EIAV) replication. Aqueous extracts contained more anti-viral activity than did ethanol extracts, displaying potent anti-lentiviral activity against virus in cell lines as well as in primary cell cultures with little to no cellular cytotoxicity. Time-of-addition studies demonstrated that the extracts were effective when added during the first four h of the viral life cycle, suggesting that the botanical constituents were targeting the virion itself or early entry events. Further analysis revealed that the extracts did not destroy EIAV virion integrity, but prevented viral particles from binding to the surface of permissive cells. Modest levels of anti-EIAV activity were also detected when the cells were treated with the extracts prior to infection, indicating that anti-EIAV botanical constituents could interact with both viral particles and permissive cells to interfere with infectivity. Size fractionation



of the extract demonstrated that eight of the nine fractions generated from aqueous extracts displayed anti-viral activity. Separation of ethanol soluble and insoluble compounds in the eight active fractions revealed that ethanol-soluble constituents were responsible for the anti-viral activity in one fraction whereas ethanol-insoluble constituents were important for the anti-viral activity in two of the other fractions. In three of the five fractions that lost activity upon sub-fractionation, anti-viral activity was restored upon reconstitution of the fractions, indicating that synergistic anti-viral activity is present in several of the fractions. Our findings indicate that multiple *Prunella* constituents have profound anti-viral activity against EIAV, providing additional evidence of the broad anti-viral abilities of these extracts. The ability of the aqueous extracts to prevent entry of viral particles into permissive cells suggests that these extracts may function as promising microbicides against lentiviruses.

Christen-Clottu O, Klocke P, Burger D, Straub R, Gerber V. [Treatment of clinically diagnosed equine sarcoid with a mistletoe extract \(\*Viscum album austriacus\*\)](#). J Vet Intern Med. 2010 Nov-Dec;24(6):1483-9.

Equine sarcoids (ES) are common, difficult to treat, and have high recurrence rates. *Viscum album* extracts (VAE) are used in human cancer treatment. The hypothesis is that therapy with VAE (Iscador P) is effective in the treatment of ES. Fifty-three horses (444 ES); 42 were treated with VAE or placebo as monotherapy; 11 were treated with VAE or placebo after selective excision of ES. A prospective, randomised, blinded, clinical trial was carried out. Horses were randomly assigned to treatment (VAE; n=32) or control group (Placebo; n=21). One milliliter of VAE (Iscador P) in increasing concentrations from 0.1 to 20 mg/mL or physiological NaCl solution was given SC 3 times a week over 105 days. Number, localization, and type of the ES were documented over 12 months. A subset of 163 clinically diagnosed equine sarcoid (CDES) lesions (95 VAE, 68 Placebo) was evaluated in detail, considering clinical findings and tumor volume. No undesired adverse effects were observed except for mild edema at the injection site in 5 of 32 horses (16%). Complete or partial regression was observed in 13 horses of the VAE group (41%) and in 3 of the control horses (14%; P<.05). After VAE treatment, 48 of 95 CDES (67%) showed an improvement compared with 17 of 68 CDES in the control group (40%; P<.01). Twenty-seven CDES had disappeared completely in the VAE group (38%) compared with 9 CDES in the control group (13% NS). VAE (Iscador P) represents a safe and effective treatment for CDES.

Sabini MC, Escobar FM, Tonn CE, Zanon SM, Contigiani MS, Sabini LI. [Evaluation of antiviral activity of aqueous extracts from \*Achyrocline satureioides\* against Western equine encephalitis virus](#). Nat Prod Res. 2012;26(5):405-15.

*Achyrocline satureioides* (Asteraceae) is a medicinal plant traditionally used in Argentina for the treatment of intestinal infections and various digestive disorders. Its infusion is widely utilised for respiratory problems and viral infections. The objective of this study was to investigate cytotoxicity, virucidal and antiviral properties of the cold aqueous extract (CAE) and hot aqueous extract (HAE) of this plant against Western equine encephalitis virus (WEEV). Cytotoxicity in Vero cells was evaluated by maximum non-cytotoxic concentration (MNCC), neutral red (NR) uptake and MTT reduction methods. To study the antiviral activity of aqueous extracts, plaque reduction assay was performed after pre-treatment of host cells, adsorption, penetration and post-penetration of the virus. Extracellular virus inactivation was also analysed by the same method. Extracts showed strong inhibitory activity after virus penetration with selective index values of 32 (NR) and 63.3 (MTT) for the CAE, and 16.2 (NR) and 24.3 (MTT) for the HAE. Both extracts exhibited virucidal action with lower efficacy than their antiviral properties. The present results demonstrate that aqueous extracts of *A. satureioides* are active against WEEV. Further studies are needed in order to identify which compounds could be responsible for this effect, and how they exert antiviral action.

Pisseri F, Bertoli A, Nardoni S, Pinto L, Pistelli L, Guidi G, Mancianti F. [Antifungal activity of tea tree oil from \*Melaleuca alternifolia\* against \*Trichophyton equinum\*: an in vivo assay.](#) *Phytomedicine*. 2009 Nov;16(11):1056-8.

Dermatophytes are a group of keratinophilic and keratinolytic molds, some of which are responsible for ringworm. Among them *Trichophyton equinum*, which mostly infects equids, can cause extensive outbreaks in stud farms. The conventional treatment of equine trichophytosis is topical, based upon medicated shampoos to reduce the spread of infection among the animals. Nevertheless the popularity of phytotherapy is at an all-time peak, and the interest for natural alternatives or complements to conventional drug therapy is challenging both in human and veterinary field. Among herbal remedies Tea Tree Oil (TTO) shows a wide range of antimicrobial activities. A randomized open clinical trial was carried out on 60 thoroughbred breeding horses affected by equine ringworm. The animals were randomly divided into 2 groups of 30 subjects. Diagnostic criteria were the presence of clinical signs and positive *T. equinum* culture. Specificity control using TTO mixture in 5 not dermatophyte affected animals was achieved also. The antimycotic activity against *T. equinum* of a mixture containing 25% TTO in sweet almond oil, was evaluated in vivo treating 30 subjects, the others were administered enilconazole 2% solution. The animals of both groups were topically treated twice a day for 15 days with a 25% mixture of TTO diluted in sweet almond oil and every 3 days, four times with enilconazole rinses, respectively. The clinical and mycological outcome were

evaluated at day 30 from the start of the treatments. Data analysis was performed by chi square test. All the treated animals showed complete clinical and aetiological healing. Part of control subjects also, showed an improvement and none of them exacerbate the lesions. This therapeutic protocol appears to be effective and versatile, being applicable immediately after physical examination, prior to have the laboratory response. It could be an alternative for practitioners interested in herbal medicines, contributing to fulfill the gap existing between in vitro and clinical studies.

Pearson W. [Concurrent use of veterinary drugs and herbal medicines in racing standardbreds](#). Can Vet J. 2009 Dec;50(12):1283-5.

Standardbred trainers from 1 racetrack and 7 off-track training facilities were surveyed to determine the most common drugs, and prevalence of concurrent herb administration. Furosemide (on-track) and anti-inflammatory drugs (off-track) were the most common drugs administered. Among horses on-track, 9.8% received herbs compared with 13.8% off-track horses; 67% and 58% of these horses, respectively, received concurrent drugs.

Williams CA, Lamprecht ED. [Some commonly fed herbs and other functional foods in equine nutrition: a review](#). Vet J. 2008 Oct;178(1):21-31.

Most herbs and functional foods have not been scientifically tested; this is especially true for the horse. This paper reviews some of the literature pertinent to herbal supplementation in horses and other species. Common supplements like Echinacea, garlic, ginger, ginseng, and yucca are not regulated, and few studies have investigated safe, efficacious doses. Ginseng has been found to exert an inhibitory effect on pro-inflammatory cytokines and cyclooxygenase-2 expression. Equine studies have tested the anti-inflammatory effects of a single dose of ginger, post-exercise. Echinacea has been reported to have anti-inflammatory and antioxidant properties. Yucca contains steroid-like saponins, which produce anti-inflammatory, antioxidant, and anti-spasmodic effects. However, some herbs have drug-like actions that interact with dietary components and may contain prohibited substances like salicylates, digitalis, heroin, cocaine and marijuana. Horses fed garlic at >0.2g/kg per day developed Heinz body anaemia. Drug-herb interactions are common and caution needs to be taken when implementing 'natural product' usage.

Colas C, Popot MA, Garcia P, Bonnaire Y, Bouchonnet S. [Analysis of iridoids from Harpagophytum and eleutherosides from Eleutherococcus senticosus in horse urine.](#) Biomed Chromatogr. 2008 Aug;22(8):912-7

LC/ESI-MS n methods have been previously set up to detect the administration of (i) Harpagophytum and (ii) preparations containing a plant capable of anti-stress properties: Eleutherococcus senticosus. Harpagoside has been found to be the main indicator of Harpagophytum administration in the horse. These methods have been applied to a large number of horse urine samples of various origins. Regarding the detection of Harpagophytum administration, harpagoside, harpagide and 8-para-coumaroyl harpagide were detected together in only one sample out of 317. Eleutheroside E was found to be the main indicator of Eleutherococcus senticosus administration. It was detected in post-administration samples collected from two horses having received a feed supplement containing Eleutherococcus senticosus for several days. Out of the 382 samples tested, eleutheroside E was found in an unexpected large number of urine samples (39%) of various origins and its presence cannot be only due to the sole use of herbal dietary supplements.

Pearson W, Orth MW, Lindinger MI. [Differential anti-inflammatory and chondroprotective effects of simulated digests of indomethacin and an herbal composite \(Mobility\) in a cartilage explant model of articular inflammation.](#) J Vet Pharmacol Ther. 2007 Dec;30(6):523-33.

Herbs are an increasingly popular treatment option for horses with cartilage inflammation, despite a relative paucity of research demonstrating efficacy. The research objective was to evaluate the differential anti-inflammatory and chondroprotective efficacy of a simulated digest of indomethacin and a commercially available herbal product in a cartilage model of osteoarthritis. Cartilage explant was integrated with simulated digestion of indomethacin and the herbal product in order to account, at least in part, for the actions of major digestive enzymes and pH. The resulting digests were ultrafiltrated (50 kDa), to account for absorption from the GI tract and movement into the cartilage matrix. We hypothesized that (i) a simulated digest of indomethacin would block interleukin 1 beta-(IL-1) dependent formation of prostaglandin E2 (PGE2) and nitric oxide (NO) without protecting cartilage against IL-1-induced glycosaminoglycan (GAG) release, and (ii) the herbal product would reduce PGE2 and NO in IL-1-stimulated explants, and inhibit release of GAG, in IL-1-stimulated explants. Results showed that indomethacin is an effective anti-inflammatory, evidenced by strong inhibition of IL-1-induced PGE2 and NO from cartilage explants. However, indomethacin provided no protection against IL-1-induced GAG release. Simulated digest of the herbal extract significantly inhibited IL-1-induced NO

production and GAG release, while having a slight increase in PGE2. These data provide evidence for the anti-inflammatory effect of indomethacin on IL-1-stimulated cartilage explants, and the herbal product Mobility may be a useful adjunct in arthritis because of its chondroprotective properties in IL-1-stimulated cartilage.

Pearson W, Charch A, Brewer D, Clarke AF. [Pilot study investigating the ability of an herbal composite to alleviate clinical signs of respiratory dysfunction in horses with recurrent airway obstruction.](#) Can J Vet Res. 2007 Apr;71(2):145-51.

Recurrent airway obstruction (RAO), known previously as chronic obstructive pulmonary disease (COPD), is a debilitating respiratory condition that significantly contributes to lost training days and illness in racehorses. Herbs are becoming increasingly popular for the prophylaxis or treatment of the clinical signs of RAO despite a paucity of research on efficacy and safety. We evaluated the ability of an herbal composite containing garlic, white horehound, boneset, aniseed, fennel, licorice, thyme, and hyssop to reduce the clinical signs of RAO, hypothesizing that the product would safely reduce signs and would improve the inflammatory cell profile within the lungs. The composite was fed to 6 horses with symptomatic RAO for 21 d in a crossover manner. Ventigraphs were used to record respiratory rate and intrapleural pressure; the proportion of inflammatory cells in fluid aspirated from the trachea was determined. Blood biochemical and hematologic screening was conducted to identify possible adverse effects. Treatment with the composite did not result in statistically significant changes in any of the parameters evaluated. A trend to a decrease in respiratory rate ( $P = 0.1$ ) and an increase in the proportion of macrophages ( $P = 0.1$ ) was observed in the horses receiving the herbal composite compared with placebo. These data indicate a potential for the herbal composite to safely reduce the elevated respiratory rate in horses with RAO. Future research with a greater number of horses is warranted to further characterize the effect of this product on horses with RAO.

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