Holistic Reflections
Connect ✿ Balance ✿ Evolve

Beccy Smith BSc.(Hons) EBW DAEP MIAEP
CEO Holistic Reflections
Yewcroft, Wilton, Egremont, Cumbria CA222PJ
Tel: 01946 825913 Mob: 07766 772245
E-mail: beccy@holisticreflections.co.uk
Web: www.holisticreflections.co.uk
www.holisticequine.co.uk

Is the herbicide Glyphosate causing laminitis and chronic illness in horses?

This chemical potentially pervades our horse's environment. It could be present in the vast majority of **horse foods, dietary supplements and non-organic plant based bedding**. It has been found in **ground-water** and can travel miles in the **air** during crop spraying where it can be ingested by plants, animals and humans. Although apparently safe in permitted doses, Scientists have discovered that it may actually be responsible for **chronic diseases in humans**. Due to potentially higher levels present in the horse's environment, could Glyphosate be responsible for **loss of performance and disease** in horses such as **laminitis, PPID, metabolic syndrome/IR, navicular syndrome, gastric ulcers, leaky gut syndrome, sweet-itch** and other immune conditions? Could it even contribute to **fertility issues and premature death**? Perhaps it causes **gait anomalies**, so-called **saddle fitting issues** and **training problems** too?

Background information

Glyphosate (the active ingredient of Roundup ®) is the most popular herbicide in the EU and increasingly throughout the world. Its use is on the increase in the last decade due to reduced costs of the chemical and the adoption of genetically modified (GM) crops (called "Roundup Ready®") which are resistant to its toxic effects. In addition, weed resistance is leading to higher rates and frequency of application, leading to a rise in residue levels. The EU's maximum glyphosate levels permitted in crops is set to rise as the industry anticipates greater levels used, however standards for residues in animal feed are far higher. The raise in permitted levels is not apparently related to its safety and the effects on animal health from ingestion of residues have been largely ignored.

It is difficult to get information about actual amounts of glyphosate in food and the environment as it is perceived to be non-toxic. The notion that it is safe has been popularized by Monsanto and as a consequence, farmers have not exercised caution in its application to crops. As such, during application it can be breathed in by animals and people and can drift onto nearby grazing paddocks and hay fields, and finds its way into water sources. It is inevitably found in variable amounts in manure from exposed animals as well as human and animal food sources. It has been found in the eggs, milk and meat of livestock fed permitted levels of glyphosate in their feed and even in human urine. No long term tests have been conducted on the health effects of glyphosate in humans and certainly there have been no scientific tests done on the effect of glyphosate on the health of horses.

Many crops are exposed to glyphosate; however the most influential source of potential exposure in the horse are found in **soy, wheat, oats, barley, peas, corn, sugar, carrots, linseed, rapeseed, sugar-beet and even forages such as alfalfa and grass hay**. The by-products and derivatives of these crops also may contain glyphosate. Management practices and proximity of horses to non-organic agricultural activity make horses especially vulnerable to glyphosate exposure.

Is glyphosate harmful?

There is sufficient research to indicate that Glyphosate may be toxic to mammals. While short term tests on rodents have shown no apparent toxicity; tests involving **life-long exposure in rodents have shown a decreased lifespan, liver and kidney dysfunction and an increased risk of cancer**.

Glyphosate inhibits cytochrome (CYP) enzymes. These enzymes play many crucial roles in maintaining homeostasis including detoxification of xenobiotics. Xenobiotics are foreign chemical substances found within the body. CYP enzymes are also important for hormone synthesis and breakdown (including oestrogen and testosterone synthesis and metabolism), cholesterol synthesis, and vitamin D metabolism.

Glyphosate is thought to disrupt the shikimate pathway of plants and the industry claims it is therefore safe for mammals as this pathway does not exist in mammals. However, it does exist in gut bacteria which play an important role in physiology including the detoxifying of xenobiotics, vitamin synthesis, immune system homeostasis, aid digestion and modulate the gut membrane permeability. Glyphosate exposure can cause gut dysbiosis and associated conditions including inflammatory bowel disorders. There are 10 bacteria cells for every single human cell so when considering the gastrointestinal tract of the horse; they have probably an even greater ratio of bacteria. The potential for loss of homeostasis and development of disease due to glyphosate is arguably greater in the horse than in the human.

Glyphosate has been linked to endocrine disorders and fertility problems. It is associated with depleted sulphate levels, impaired nutrient absorption and even anorexia nervosa.

It is hypothesized that health concerns associated with a modern western diet could be explained by biological disruptions that have been attributed to glyphosate. These include obesity, digestive disorders, Alzheimer's disease, depression, autism, Parkinson's disease, cancers and others. Other environmental toxins are undoubtedly contributing but the insidious and accumulative effects of glyphosate make it the prime candidate for increasingly common metabolic disorders in humans.

Hypothesised link between Glyphosate and loss of health in domestic horses

The horse is a non-ruminant herbivore. It could be argued that the health of the horses gut determines the health status of the horse and therefore his ability to perform. Given the scientific data and arguments, the possible effect of glyphosate on horses could be summarized as **impaired homeostasis and metabolic function leading to chronic disease, loss of performance and even premature death.**

Given the complexity with which glyphosate is thought to affect mammals, the following signs or diseases could indicate glyphosate exposure in horses:

- Behaviour associated with gut dysbiosis, e.g. "girthiness", saddle fitting issues, lameness or gait anomaly (especially involving the right hind limb), poor performance, training issues, cribbing or wind sucking, box walking, depression, etc.
- Diseases associated with gut dysbiosis
- Obesity (with or without fat pads)
- Anorexia, muscle loss or malnutrition
- Back pain/hind limb lameness/suspensory ligament "diseases"
- Exercise intolerance/chronic fatigue
- "Lifestyle" diseases such as insulin resistance, PPID and metabolic disease
- Navicular syndrome/disease (or other non-trauma lameness involving the musculo-skeletal system)

- Equine Digital Elastosis / laminitis / weak or deformed hooves
- Fertility problems
- Liver/kidney disease
- Colic
- Increased incidence and severity of infections, including parasites
- Allergies and intolerances such as sweet-itch and an intolerance to grass
- Increased chemical sensitivity with reactions and loss of health in response to wormers, vaccinations, medications and environmental pollutants

This list is not exhaustive and clearly more research needs to be done on the effects of glyphosate on horses.

Hypothesized link between Glyphosate and laminitis in domestic horses

Laminitis is increasingly associated with metabolic dysfunction. It could be argued that the possible triggers for the most prevalent form of modern laminitis (pain, stress, NSC, grass, medications, vaccinations, chemical wormers, environmental toxins, etc) only actually result in laminitis because of the accumulative effect of glyphosate and other environmental toxins on the metabolism of the horse. I believe modern management and grazing methods contribute to impaired nutritional state and imbalance and exposure to glyphosate could exacerbate this and lead to disease, grass sensitivity and laminitis.

If you suspect your horse is metabolically impaired, seek advice from an appropriate nutritionist and company such Thunderbrook Equestian. Discuss with your vet an appropriate, holistic and efficacious management plan to control or even reverse the condition. Seek help from a suitably qualified holistic hoof care professional who properly balances hoof to foot around the axis of the limb (such as a DAEP) and find a good body worker or alternative therapist who can help with poor postural conformation and soft tissue imbalance which can occur with prolonged dysbiosis and GI tract imbalance. Consider SCENAR-Cosmodic therapy which may reduce pain and return function at DNA level. Holistic Reflections provide unique holistic services including:

- Applied Equine Podiatry consultations and barefoot trimming services
- SCENAR-Cosmodic therapy for people, pets and horses)
- Equine Body Work
- Holistic Equine Consultations
- Spiritual healing for people, pets and horses
- Wellness consultation for people

Prevention of metabolic disease

Quite simply;

- avoid management practices and stress which burden the horse unnecessarily with chemicals and toxins, such as stressed pasture, clover and rye grasses as well as glyphosate
- feed the horse like a horse and therefore promote proper gastro-intestinal tract functionality,
- promote proper structures and functionality through proper stimulus and exercise,
- adopt a holistic and organic management system (see www.equiculture.net for more info)
- stable and ride your horse in an appropriate environment (away from intensive agricultural environment),

- understand exactly what is in your horses feed and supplements and how your horses forage is produced and if it contains agricultural by-products and potential gastro-intestinal irritants, avoid feeding them.
- Visit https://thunderbrook.co.uk/ for info, advice and products on reversing grass sensitivity, laminitis and other signs associated with nutritional imbalance.

Conclusion

There is evidence to associate the increasing use of glyphosate with increasing occurrence of chronic illness in the western world. Association does not demonstrate causation, however there are demonstrated mechanisms by which glyphosate may be instrumental in causing metabolic imbalance in horses and ultimately laminitis. The evidence demonstrates that further research on glyphosate and laminitis is imperative and exposure should be avoided.

Resources:

'Transcriptome analysis reflects rat liver and kidney damage following chronic ultra-low dose Roundup exposure' (2015 Environ Health, 2015 Aug 25; 14(1): 70. doi: 10.1186/s12940-015-0056-1). http://www.ehjournal.net/content/14/1/70.

Samsel, A. & Senell, S. (2013) 'Glyphosate's Suppression of Cytochrome P450 Enzymes and Amino Acid Biosynthesis by the Gut Microbiome: Pathways to Modern Diseases', *Entropy*, vol. 15, no. 4. Pp 1416-1463

For more information and assistance visit http://www.mdpi.com/1099-4300/15/4/1416, www.holisticequine.co.uk and www.holisticreflections.co.uk

Beccy Smith BSc (Hons) EBW DAEP (MIAEP).
Holistic Equine Podiatrist, founder and CEO of Circle Healing Centre Ltd T/A Holistic Reflections.