THE IMPACT OF NUTRITION ON HORSE EXCITABILITY

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Excitability in the horse is a major concern for many owners, from competing athletes to amateur riders. Any good rider will aim for the perfect balance between performance and control, seeking to provide enough energy to perform while being able to maintain the horse's behavior stable. These concerns are often brought up by horse owners we meet, and nutrition appears to be the likeliest culprit.

Although there are many factors that affect how the horse may become excitable, it is true that diet plays an important role in the energy intake of the equine athlete. This article presents a brief review of some nutritional factors that can affect your equine's excitability, and how to manage them.

First a definition of the term "excitability." Equestrians often refer to it as "bad energy." It's the barrel racing horse who attempts a bronco buck in the chute before tackling the cloverleaf. It's the dressage horse who spooks in the corner it has gone by 2000 times before but which has suddenly become frightening on a sunny day. It's the trail horse who dances and snorts down the path behind the barn it has been taking for years.

Excitability is an overload of unpredictable and unpleasant energy. It does not refer to the energy of the horse itself. The difference between the two is important to note because, just like us, every horse has its own personality and we should understand that some horses are naturally more energetic than others. This doesn't mean they are excitable, it only means that they are more active and need to expend more energy. The best example is to compare the racing Thoroughbred and the Canadian horse. Overall, they tend to have different energy levels, however, both can excitable at times.

The first cause of excitability is the dietary intake of non-structural carbohydrates (NSC) or sugars. The concept is rather basic: "simple" sugars or NSCs are easily assimilated by the animal and quickly enter the bloodstream as carbohydrates since they do not need to be broken down. Roughly, carbohydrates are either used as a source of energy, or turned into reserves as needed. The horse's metabolism uses carbohydrates as your car's engine uses gasoline to work. It is the simplest and most readily available source of calories. A food ration with high levels of simple sugars (NSCs) may in fact create an excess of available energy for the horse. It should be mentioned here that the excitability created by these sugars is not long-lived. Normally, this excess energy will appear a few hours after the meal and dissipate over the next four hours or so, the time that the digestive system needs to assimilate these sugars in the small intestine.

So, how do we reduce the chance of excitability due to high levels of simple sugars in the ration?

- By simply choosing low-sugar feeds! Obvious, isn't it? Grains, especially unprocessed ones, contain high levels of sugars. For example, oats, barley and corn cause significant

insulin responses in horses. Processing the grains, for example by flaking or extrusion, will alter the simple sugars they contain and reduce their NSC levels.

- By opting for feeds with a high fibre content to meet the horse's energy needs. Fibres, although they are carbohydrates, will not produce the same kind of insulin response as simple carbohydrates. Fibres are structural carbohydrates including pectin, hemicellulose, cellulose and lignin. As their name suggests, these types of carbohydrates give stiffness, thus structure, to hay stalks. They can only be broken down by special bacteria in the cæcum and hind gut. This means that they will not be rapidly digested and, accordingly, will not trigger the glycemic response that causes agitation. In fact, the bacteria that work hard to digest these fibres produce residues called volatile fatty acids (VFAs), some of which can be used as an energy source for the horse. The whole process remains slow will not cause an insulin response.
- The use of fats in the ration can help as well. While easily assimilated by the horse, fats are complex and must be broken down into simpler molecules to be used as a source of energy. They do not trigger a glycemic response and are mostly kept in reserve.

Another factor that can affect the horse's excitability is the vitamin and mineral intake. Too often we hear owners complain about their horse's energy after adding a complete supplement to their diet, or after making other dietary changes. Again, the explanation is rather simple, but first we must understand the role of vitamins and minerals in the equine metabolism. Much like carbohydrates, fats and volatile fatty acids are used as gasoline for your horse's engine while vitamins and minerals are its spark plug, creating the spark to "burn" that fuel. It should be noted here that vitamins and minerals are not a source of calories!

Vitamins and minerals cannot be converted into calories in the same way as carbohydrates and they play a completely different metabolic role. They are important cofactors and carriers for the metabolic reactions necessary for the proper functioning of the horse. A well-known example is iron, which is a component of the hemoglobin protein involved in the transport of oxygen in the bloodstream. Here, iron (a mineral) plays a facilitating role to transport oxygen through the horse's body. It is not used as a source of energy. Even if it is essential for breathing, iron will not affect the horse's excitability. It does play an indirect role in the energy level, however, since a horse that breathes well will be more energetic. This logic applies to the majority of vitamins and minerals. Even though each of them plays a different role, they are indirectly related to the overall energy of the horse.

While it is true that a horse with nutritional deficiencies (lacking enough vitamins and minerals to meet his needs) is calmer or apathetic, it is frankly unethical to deliberately deprive an animal to reduce its energy level. Let's we go back to the difference between excitability and energy: if the horse has too much energy for a task, perhaps he is not the right animal for the role it is being considered for.

When introducing a new supplement, which is expected to create a change in behaviour, it is recommended to do so gradually. This will have a stabilizing effect and reduce the behavioural changes in the horse as it begins to feel better after being "sick" (suffering from nutritional

deficiency). Supplementary intake should be increased very slowly and, when behavioural change is observed, the amount given should be maintained even if the ideal amount to balance the ration has not yet been reached. The horse will then gradually get used to the new intake of vitamins and minerals. When its behaviour has stabilized, the amount can again be increased until the desired level is reached. This way, the horse has time to adapt to its new diet and the spurts of excess energy will be limited.

Take home message

Remember the following recommendations in your quest for a ration that will not excite your horse:

- Choose a feed containing at least 15% fibre and beet pulp or soy hulls in the list of ingredients (which can be obtained from the manufacturer). The horse will therefore be provided with a readily digestible fibre that is also a source of energy.
- Provide sufficient levels of fat. The ration must be balanced with a complete supplement, introduced gradually so that the horse has time to adapt to the dietary change.
- Carefully read the feed's ingredient list and guaranteed analysis look for the NSC levels, the feeds contents and its source of energy.
- Do not neglect to provide vitamins and minerals, even though they are not sources of energy, they are essential for your horse's health!
- Lastly, and interestingly enough, hydration may affect a horse's excitability. In other words, a dehydrated horse may show signs of excitability.