

# Could Your Horse be Insulin Resistant?

By Claire C. Cox-Wilson RN, BA

Insulin Resistance (IR), sometimes referred to as "Equine Metabolic Syndrome", is not a disease, but more of a type of metabolism. Insulin, a hormone secreted by the pancreas, signals the insulin sensitive cells (in skeletal muscles & fat) to take up glucose from the blood. Insulin Resistance is a condition where cells do not respond to insulin. Easy keepers such as Arabians, Morgans, mules, donkeys, ponies & miniature horses seem to be more prone to IR.

## Symptoms of IR

Not all overweight or obese horses are IR, but that can be one of the earliest symptoms. Prominent fat deposits on the crest of the neck, at the tail base, along the withers or at other locations are common. Sometimes geldings will have swollen sheaths. Advanced cases of IR will display increased thirst & increased urination (polydipsia/polyuria) and lethargy. Skin & respiratory allergies are also common in IR horses. Occasionally, thinner horses can also be IR. Similar symptoms of polydipsia/polyuria & lethargy often lead to a misdiagnosis of Cushing's Disease. It is important to understand that Cushing's & IR are two distinctly separate conditions. Horses with advanced Cushing's often develop IR, but IR is not a precursor to Cushing's Disease.

IR horses are at high risk for laminitis and it has been acknowledged that IR is a pre-disposing factor to laminitis. A horse that has repeated bouts of laminitis should be tested for IR.

To determine if your horse is insulin resistant, you want to get non-fasting glucose/insulin levels from the same blood draw. It is important that it be a non-fasting draw. When we are dealing with an IR horse, we want to know what a typical meal causes in the way of a glucose & insulin rise. Feed either low sugar/starch hay or soaked hay (not a grain meal) 2-4 hours before the blood draw.

Be aware that normal glucose & insulin levels do not rule out the diagnosis of IR. A glucose:insulin ratio needs to be calculated. For more information on calculating a G:I ratio, go to this site:

<http://www.ecirhorse.com/index.php/ddt-overview/diagnosis>

Or you can use this on-line IR calculator: <http://www.freil.com/%7Emlf/IR/ir.html>

## Managing Insulin Resistance

The only way to manage IR is through strict diet & regular exercise. **Using starvation diets to lose weight are dangerous. Feed the horse either 1.5% of its current weight or 2% of its ideal bodyweight, whichever is larger.**

Any feed that has a **combined sugar & starch level of over 10% is not considered safe** for the IR horse. Fresh grass/pasture is not safe for the IR horse.

Properly rinsed/soaked/rinsed plain beet pulp (without molasses), is an ideal carrier of supplements for the IR horse because it produces an almost undetectable glycemic spike. In larger amounts, beet pulp is also the safest way to put weight on an underweight horse. The optimum diet for any horse, particularly the IR horse is a mineral balanced diet. By having your hay analyzed you can determine what minerals need to be supplemented & in what amounts. You can learn to do this yourself (See resources below) or have someone qualified do it for you.

Avoid treats such as carrots & apples and high sugar store bought horse treats, as these will cause a glycemic spike.

**Regular exercise** is the IR buster. There are studies that document the positive effect of exercise on insulin sensitivity.

### **Soaking vs. Testing Hay**

While it is true that soaking can lower the sugar (Ethanol Soluble Carbohydrates) level in the hay, it must be done properly. The hay must be totally submerged for ½ hour in hot water or 1 hour in cold water and then drained somewhere where the horse does not have access to the water. Soaking the hay in this manner can lower the sugar level up to 30%. However, soaking will NOT lower the starch level. I learned this lesson the hard way a few years ago.

In February 2008, we ran out of our yearly supply of bermuda hay and I bought a small stack at the local feed store to tide us over until our regular supplier's first cutting. I did NOT test this hay. By the end of March, Mr. T our IR Morgan was overweight, lethargic, drinking & urinating excessively and stumbling. He couldn't maintain a trot for more than 8-10 strides. His glucose:insulin ratio showed him to be a HIGH laminitis risk. I immediately sent a hay sample to Equi-Analytical Laboratories & started soaking the hay. The hay soaking did not improve Mr.T's symptoms. The hay analysis results showed a starch level of 9.0% & a sugar level of 3.4%, totaling 12.4%. By soaking, I was only lowering the s/s level by about 1%. I sold that hay & got a new batch that had a sugar level of 8.1% & starch of 3.8%. By soaking this new hay, I could conceivably lower the s/s level to 9.5%. Within 2 days, Mr. T's stamina improved drastically.

I reiterate- the safest way to go is to test your hay.

Please remember that Insulin Resistance is not a disease but a type of metabolism. It cannot be cured, but with management utilizing a low sugar/starch diet & exercise, many IR horses can lead long productive lives.

### **References/Resources**

Dr. Eleanor Kellon's "Cushing's & IR" course

Dr. Eleanor Kellon's "NRC Plus" course

Information on Dr. Kellon's on-line courses <http://www.drkellon.com>

<http://pets.groups.yahoo.com/group/EquineCushings/>

<http://www.ecirhorse.com/>

<http://www.equi-analytical.com/>  
<http://pets.groups.yahoo.com/group/ECHorsekeeping/>

**About the author**

Claire C. Cox-Wilson is a moderator & longtime member of the on-line Equine Cushing's & IR Group and several of its sister groups. Claire, a retired RN with fifty years of experience as a horseowner & a graduate of all of Dr. Kellon's equine courses assists horseowners all over the US with nutrition & diet balancing.

She can be contacted through her website:

<http://www.shotgunranch.me/>

or on Face Book: Shotgun Equine Nutrition



Mr. T...lethargic & overweight from high sugar & starch hay & with a dull coat from mineral imbalance.



Two months later Mr. T is alert, slimmer & sporting a glossy coat from a low sugar/starch diet with mineral balancing.