



# EMS

*Equine Metabolic Syndrome (EMS)*

**Insulin is a hormone that is formed in the pancreas. The main function of insulin is to transport glucose from the blood through the cell wall into the cell. Once in the cell, glucose can be combusted to supply energy to muscles or the brain or to be stored in the form of fat. The more glucose offered in food, the faster the body is inclined to store this glucose in the form of fat. This fat is employed as a reserve for poorer times.**

The blood sugar content has to stay within certain limits because too high or too low blood sugar contents may cause several health issues. When food contains (too) much glucose, increasing amounts of insulin are needed to regulate this process. Insulin resistance changes the receptors on the cell wall. The structure of the cell wall changes, which affects the reaction of the insulin receptors to the insulin. Then more and more insulin is needed in order to transport the glucose through the cell wall.

**It is of crucial importance to keep the blood sugar content of the blood within certain limits!**

This is realized by the co-operation between the pituitary glands, the pancreas and other hormone glands directed by the pituitary glands. The pituitary glands are the ones in charge. You could compare this with the function of a thermostat. When the temperature in the room has reached the required level, the thermostat switches off until it registers that the temperature gets too low and then switches on again, in order to maintain a constant temperature via a feedback system.

**Slow and stiff because of insulin resistance**

When glucose absorption is changed because of insulin resistance, the feedback system will malfunction. The high insulin content keeps on storing glucose as fat in the cell: the switch is stuck on 'storage'. When energy is needed and glucose has to be combusted, the combustion process will start up too slowly. In addition, it gets very hard for the newly formed glucose to penetrate the muscle cells because of the slow working of the insulin receptors. The result is sluggish and stiff movements.

**Frugal breeds**

Especially frugal breeds, such as the Iceland and Fjord horses and Shetland ponies are very sensitive to problems with the sugar metabolism. These breeds were born to perform heavy labor or survive in cold temperatures with little food; they have a natural ability to store their reserves to save energy for poorer times. In the Netherlands, however, we no longer have any of such poor times.

## EMS, clinical picture and complaints:

- overweight (in some cases underweight)
- fat buildup especially around mane and tail implant and belly
- navicular
- skin problems, such as summer eczema, sweet itch
- fatigue, muscle ache, muscle trembling and tying up
- unwillingness to work
- decreased fertility
- respiratory problems
- PPID
- increase of inflammation processes such as arthritis
- back complaints



## Advice:

- Adapt the food!  
Non-structural carbohydrates such as corn, wheat, bran, barley, oats and molasses should be reduced. Give plenty of roughage (with low sugar contents) such as straw, hay or 'lean' grass.
- Stress reduction.
- Supplements: provide a complete supplement that balances the glucose metabolism.  
You can also provide additional magnesium. Magnesium plays an important role in the stabilization of insulin receptors, the regulation of infection processes in the subcutaneous fat and the stabilization of the cell wall.

