METABOLIC RESPOSE TO EXERCISE

MEASURING FATIGUE

Introduction to Metabolic Response to Exercise

The Metabolic Response to Exercise profile (commonly referred to as MRE) is a post exercise blood test. It measures multiple variables in the horse's bloodstream that can provide a glimpse into how greatly the horse exerted himself during the course of a work. Essentially the test measure the utilization and status of the energy molecule Adenosine Triphosphate (ATP) during high speed exercise. Horses have a different way of processing aerobic energy as compared to humans, and as a result, equine aerobic exercise results in a great deal of waste agents being released into the blood stream. By examining these waste products, our veterinarians can deduce information about the horse's exercise and provide unique information to trainers and racing managers.

Application of the MRE Profile

The MRE profile essentially provides a scientific way of measuring a horse's fatigue, information that trainers have been approximating through traditional means for generations. The MRE profile is based on a proprietary grouping of variables (called conditions) that contribute to our unique MRE Score. The MRE Score is a 1-100 rating that compare's your horse's blood results with others in our database.

Though the MRE profile is one of Equine Analysis Systems newest services, the program already has over 500 horses in the database with over 40 Grade 1 Winners analyzed.

Performance Prediction:

Our research has demonstrated that horses that have the physiology to perform at the highest level have low MRE Score when working distances at or over ½ mile. When used in conjunction with other Equine Analysis Systems tests, the MRE can be the final piece of information to help horsemen to make important buy/sell or training decisions.

After each MRE test, your horse is compared to those in our database. Figure 1 demonstrates such a comparison.

Figure 1: Sample Comparison MRE conditions and Score
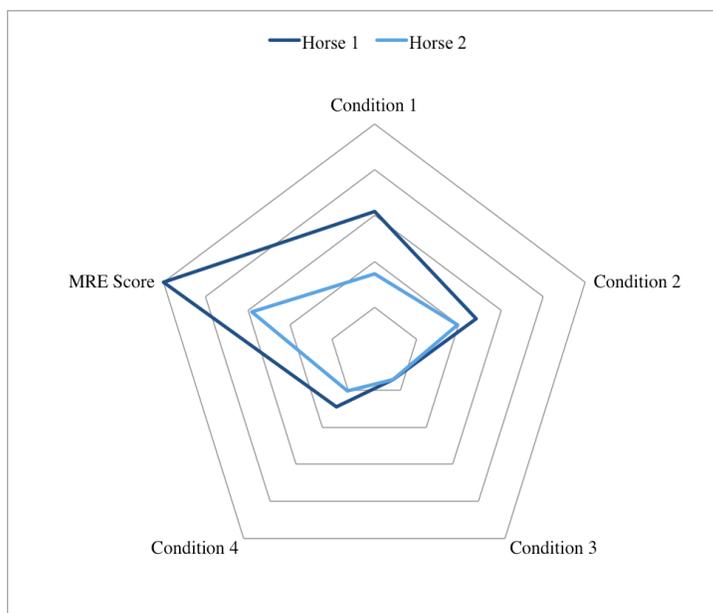
In this example, Horse 1 is a Claiming quality horse, while Horse 2 is a Grade 1 winner. As expected, the MRE Score for the Grade 1 Winner is considerably lower than that of the claiming quality horse. While the names and the units of the multiple conditions used to get the MRE Score have been obfuscated, the difference in the profiles between the two horses is very clear. Despite the fact that these two horses worked the same distance, over the same surface, in the same amount of time, the Grade 1 quality horse has considerably less aerobic waste product in his bloodstream at the conclusion of the work.

Over a 5 furlong work, an MRE Score of 30 is the cutoff for meeting Graded Stakes Standard. In figure 1, the Grade 1 Winner has an MRE Score of 29. In the same example the Claiming quality horse had a MRE Score of over 50. Over a 4 furlong work the criteria are slightly different with 25 being the MRE Score necessary to meet Graded Stakes Standard.

Surface Preference

In addition to being able to identify horses that are able to run with enough efficiency to succeed at the graded level, the MRE score can also help identify which surface your horse prefers. The number of starts a horse expects throughout his or her career has dropped almost 20% according to the most recent Jockey Club statistics. As such, trainers can no longer afford to waste precious starts trying to determine on what surface their horse will be most successful. Utilizing MRE, however, gives trainers the ability to definitively identify which surface their horse prefers with only two 4 or 5 furlong works. Figure 2 illustrates how dramatically surface can affect an MRE Score.

Figure 2: Sample Comparison MRE on different surface
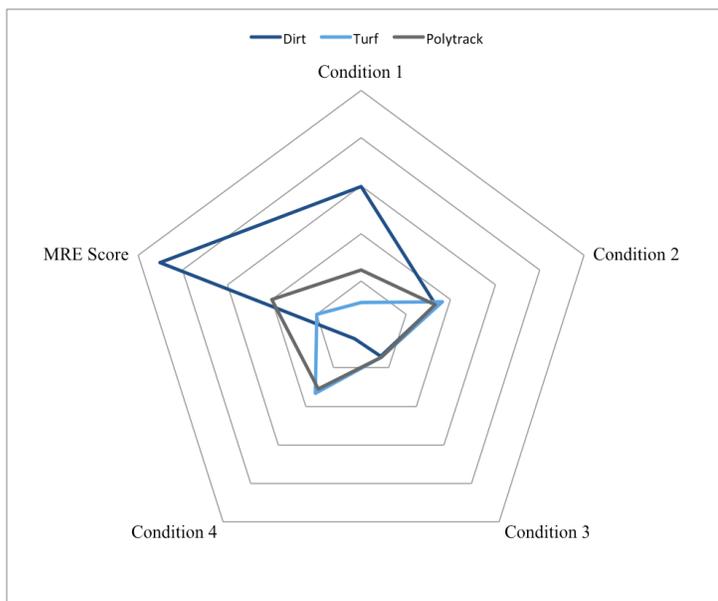
In this example, a filly that failed to break her maiden on the dirt was given a MRE profile on three different surfaces to help the trainer plan her next start. The results were revealing, and demonstrated that the filly was at her best efficiency on turf. The filly was moved off the dirt and won her next start in a turf stake race. She would go on to be a multiple stake winner and multiple graded stakes placed performer.

Conclusion

The MRE profile is a tool that has unique implications to the horseman. Many of our clients implement this procedure for young horses in training to help them make a final decision to enter the horse for sale or continue the investment in his or her training. In this instance, the MRE serves as a "capstone" giving our clients that last piece of information on the horse that has already received solid scores on all other Equine Analysis Systems tests. Often the results will be as expected, as horses that have high-level phenotypic and genotypic scores from our other technologies will inherently have the physiology to receive the best MRE rating. Occasionally, however, the results will not be as expected and will allow our clients to highlight horses that merit further investigation. The MRE can provide ample information as a standalone service as well, giving trainers of horses of all ages a scientific perspective on their horse's fatigue. As with all our technologies, our team would enjoy the opportunity to work with you in order to implement this new testing procedure into your organization.