

# **Lactate and Heart Rate Testing in Horse Conditioning Training**

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## **Where do we stand today?**

The improvement of heart rate wireless equipment by Polar and portable point to point assessment of blood lactate with the Lactate Pro allows many coaches now to do their own and most important sometimes daily assessment of their race horses.

The accuracy of the Polar Heart Rate watches with the proven lab like accuracy of the Lactate Pro will create two fronts in the horse coaching world, as it did in the humans coaching world. There is the "professional" group who tries to defend for as long as possible their "turf" of testing in combination with Labs and will try to question the accuracy over and over again.

Then we have the independent thinking and "pushing the limitation coaches" who see finally an easy and very cost efficient way of improving and adding to their experience.

## **Short lactate history**

The "father" of the lactate history is A.V. Hill, Nobel Prize winner 1920 proposed the idea of the cardiovascular/anaerobic model.

This model is still nearly a century later the choice for the majority of coaches and even exercise physiologists, despite the fact, that already in the 1980 major research showed some major problem and misconceptions with this model.

Leading researchers like G.A. Brooks from Berkeley California and a swell T. Noakes from Cape Town SA show with very nice and proper research that the use of lactate and the function of lactate is basically the opposite of what most people still believe.

## **From "the BAD" to "the UGLY" to "the GOOD"**

Most people, based on Hill's theory, believe that lactate or "lactic acid" is the cause of fatigue, sore muscles and other terrible interactions. This caused a training idea, where coaches try to make athletes "immune" or at least more resistant to lactic acid with hard and repeated intervals.

After years of "bad lactate", there was a break in the direction of trying to find a "magical" number. Leading the way by some German researcher (Mader, Kinderman, Hollmann and Hettinger) the focus now was, to find different models, formulas and statistics for ways of "golden" number in lactate workouts.

Ideas like aerobic and anaerobic threshold and trainings were pushed to the forefront. Absolute number, build on statistical ideas, like 2 and 4 mmol stated to be used and manipulated, as it was and still is impossible to get these values ever in any workout.

So the "ugly" lactate time was born, where we have as many formulas and "thresholds" as we have coaches.

The “good” lactate time was already in the coming in the early 1980, but as so often, it took time to overcome tradition and the “power” of established “education”.

Today we know, the lactate is an important part of the energy production in high intensities and high demand of energy supply.

Being able to test it in the field now and assessing the trends allows coaches to find individual training intensity zones.

Knowing the point (LBP or lactate balance point) where the exercising muscles start to “release” a too high lactate production into the blood stream, gives us now the opportunity to control in combination with heart rate the individual training as well as recovery situations.

Assessing the horse with a simple field test will lead and help the coaches now to develop a nice training schedule for each individual horse.

Basic idea is for the so called “structural” basic workout intensity, so we can build more muscle structure, who are able to use oxygen and lactate in a very efficient way, as well as to increase the supply lines (blood vessels = capillarization).

The next intensity zone is the area, where we can stimulate the ability to go as fast as possible, but still staying in the oxygen dependent energy supply ability.

Last but not least, thanks to the LBP we can design workouts to stimulate specific “transporters” who can move the powerful energy source, lactate, in energy “searching” muscles and or out of “overloaded” muscles.

All this will change the way we look at workouts and recovery plans, as well as race schedules and race tactics.

**By using Lactate Pro and Polar Heart Rate equipment in combination with a simple to use FaCT Canada Testing Software, you will soon feel more motivated and more in control on what you do with your horse and the workout ideas you had.**