Muscle/Ligament Assessment

Date: ...21st June 2019 ...

Owner: ...XYZ .....
Camel: ...Camel #1.....

Muscle:

Ligament:

Discipline: …….

Acoustic MyoGraphy (AMG) sensors were attached to the skin just above the *m.Gluteus medius* (GM) and *m.Biceps femoris* (BF) on both the left and right sides of Camel #1. Later the BF sensors were moved to measure from the Proximal Suspensory Ligament (PSL) of both hind legs. The photo below shows the CURO recording device positioned on an elastic girth between the two humps. You can also see the cables that run out from the CURO to the sensors that are positioned underneath the white squares of adhesive foam (Snøgg). Recordings were made in real-time from the CURO positioned on Camel #1 to an App running on an iPad up to 80-100 meters away.

Recordings from both muscles, and later from GM and the hind limb PSL´s were made at the walk and trot for both left-hand and right-hand circles (12 meter circle) on a soft grass surface. The results of these measurements can be found below.

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Info Fact: Acoustic MyoGraphy and the CURO system (Latin for "I Care") was invented by Dr Adrian Harrison D.Phil.cantab, in 2007, after which a company CURO-diagnostics ApS was formed in 2011 to commercially develop this technique (https://curo-diagnostics.com/).

At the WALK (see below), both muscles produced a very small amplitude signal (in this case a sign of highly efficient physical activity), and the **High Gain** filter was utilized as a result. Note the even use of the muscles (Left-side *versus* Right-side) as denoted by the balance scores of -1 and 0 for the two muscles, respectively. Note too that the muscles are being used alternately as Camel #1 walked around the 12 meter diameter circle.

At the TROT (see below), the activity of the muscles increased, but they remain perfectly even in terms of their balance and the E, S and T-scores are all very high – another indicator of healthy and well-trained muscle.

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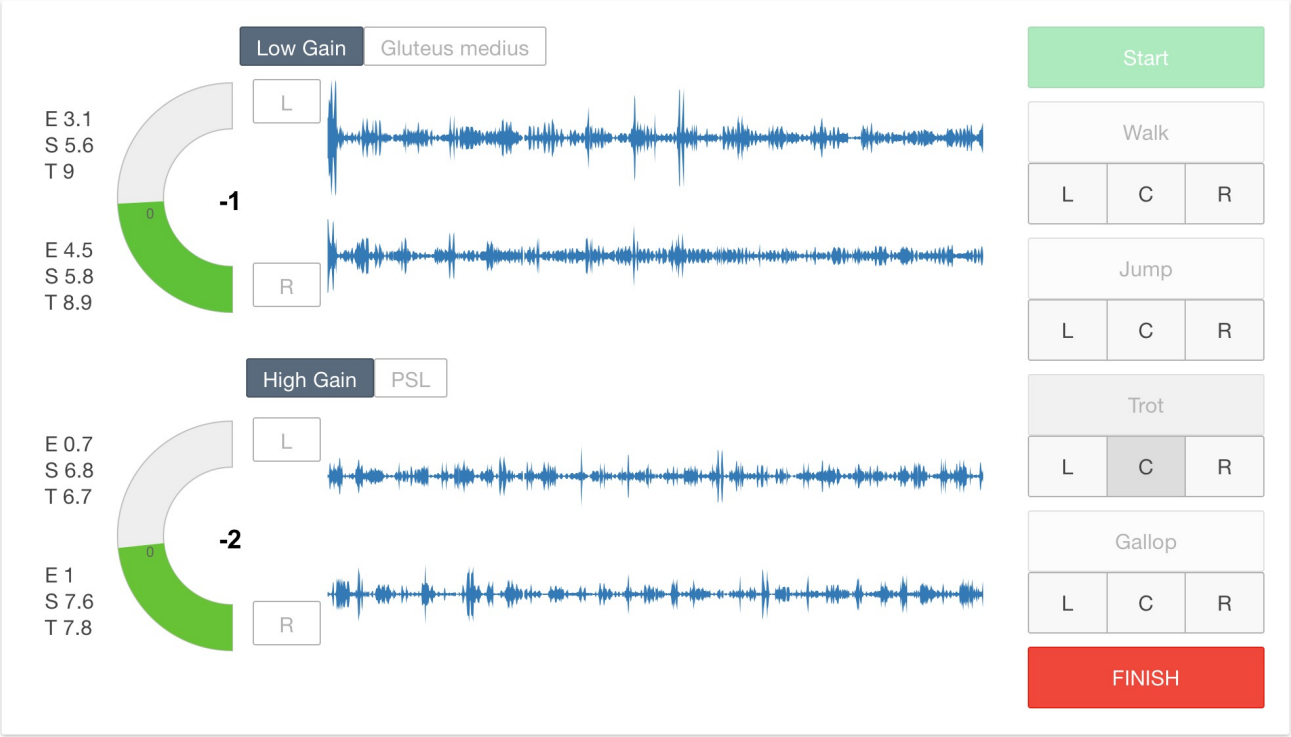
Info Fact: Acoustic MyoGraphy signals are analyzed in real-time and presented as an E-score, S-score and T-score (see left-hand side of the inserted screen-shots). E – efficiency/coordination defines the level of training, a high score represents a very well-trained and energy efficient muscle contraction. S – spatial summation, measures the amplitude of the signal and represents the number of active muscle fibres. A high score represents a low amplitude and very few active fibres. T – temporal summation, defines the frequency of the recorded signal, where a high score denotes a low muscle fibre firing frequency (energy efficient). These 3 parameters are monitored and controlled by the motor cortex and define muscle performance.

Measurements were also taken from the hind limb PSL´s (see below). The CURO system has been developed to not only measure the pressure waves generated by muscles as they contract, it can also measure the ability of ligaments to absorb impact forces – thereby assessing their health and elastic functionality. In the figure below we see that Camel #1 has very high S-scores for the PSL´s, 6.8 for the left and 7.6 for the right hind limbs. These are very good scores. Values of 4 and less indicate damaged and swollen ligaments.



These recordings reveal that Camel #1 is physically fit in terms of muscle function, that he is symmetrical in the use of his muscles, and that both hind limb suspensory ligaments are fit and elastic. Vital information for anyone wishing to buy a Camel, or for those wishing to assess the effects of a recent training program, or indeed a period of rehabilitation.

Publications: Clin Physiol Funct Imaging (2017): 1-13 (doi: 10.1111/cpf.12417); Journal of Equine Veterinary Science (2018): 68, 73e80; Journal of Equine Veterinary Science (2018): 71, 21e26; SOJ Vet Sci (2017): 3(1), 1-6; Multidisciplinary Advances in Veterinary Science (2018): 1(6), 257-265; Open Veterinary Journal (2013): 3(2), 80-84; AJTCVM 2017: 12(1), 79-83.