About our Cardio Scores and Heart Capacity

EQUIX uses ultrasound to scan the left chamber of the heart. This is the output valve. We store several consistent beats of the heart and take measurements when the chamber is in the expanded state (diastolic) and then when the chamber contracts (systolic). From this we calculate Stroke Volume, or how much blood is being pumped per beat. We also measure the thickness of the heart wall muscling and observe and note the pace, timing, and function of the chamber.

The data derived from the ultrasound is computed with a set of body measurements. The resulting Ejection Fraction Score (EF Score) is based on the horse's size, sex, exact age, and level of fitness. The average EF Score for yearling colts is 6.6; for yearling fillies it is 6.4. Average, in this sense, is not "mediocre". It means that the oxygen delivery potential of the heart "fits" that particular horse. (The scale for two-year-olds and mature horses is slightly different.)

The majority of Thoroughbreds have average EF Scores, giving them adequate oxygen delivery for racing at most distances (based upon their own biomechanical structure). However, horses with above-average capacity increase their oxygen delivery potential for racing at distances over a mile, particularly colts. When excellent heart wall muscling, a naturally slow pace, and/or a heart block are present, these traits increase the athleticism of that particular heart.

Sprinters race well with average or even slightly below-average heart capacity, especially if excellent heart wall muscling is present. A sprinter's oxygen delivery needs begin right out of the starting gate when fast early fractions are often the key to winning short races. An average or smaller heart with strong walls has the timing and function to deliver oxygen quickly to the muscles.

For distance racing, where slightly slower fractions are posted, a larger heart's oxygen delivery potential really kicks in as the race progresses to a strong stretch drive. Greater oxygen delivery can stave off lactic acid buildup in fatiguing muscles more readily.

EQUIX uses the results of the biomechanics and heart capacity to make sure the structure and the cardio are in sync. A two-turn horse with a sprinter's heart is not a desirable combination. Or a sprinter with a very large heart will benefit from being warmed up quite a bit before his races or even breezes so that his heart is working at near maximum.

In addition to individual Cardio Reports, we include Cardio and EF Score results with all our biomechanical analyses – yearlings, two-year-olds, and broodmare reports.

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