

Body Composition of Thoroughbred Sprinters

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Human body composition

- Clear difference in body composition of sprinters and endurance runners
- Sprinting focuses on power, explosiveness and top speed
- Human sprinters exhibit a much larger muscle mass, more capable of high speed and rapid acceleration



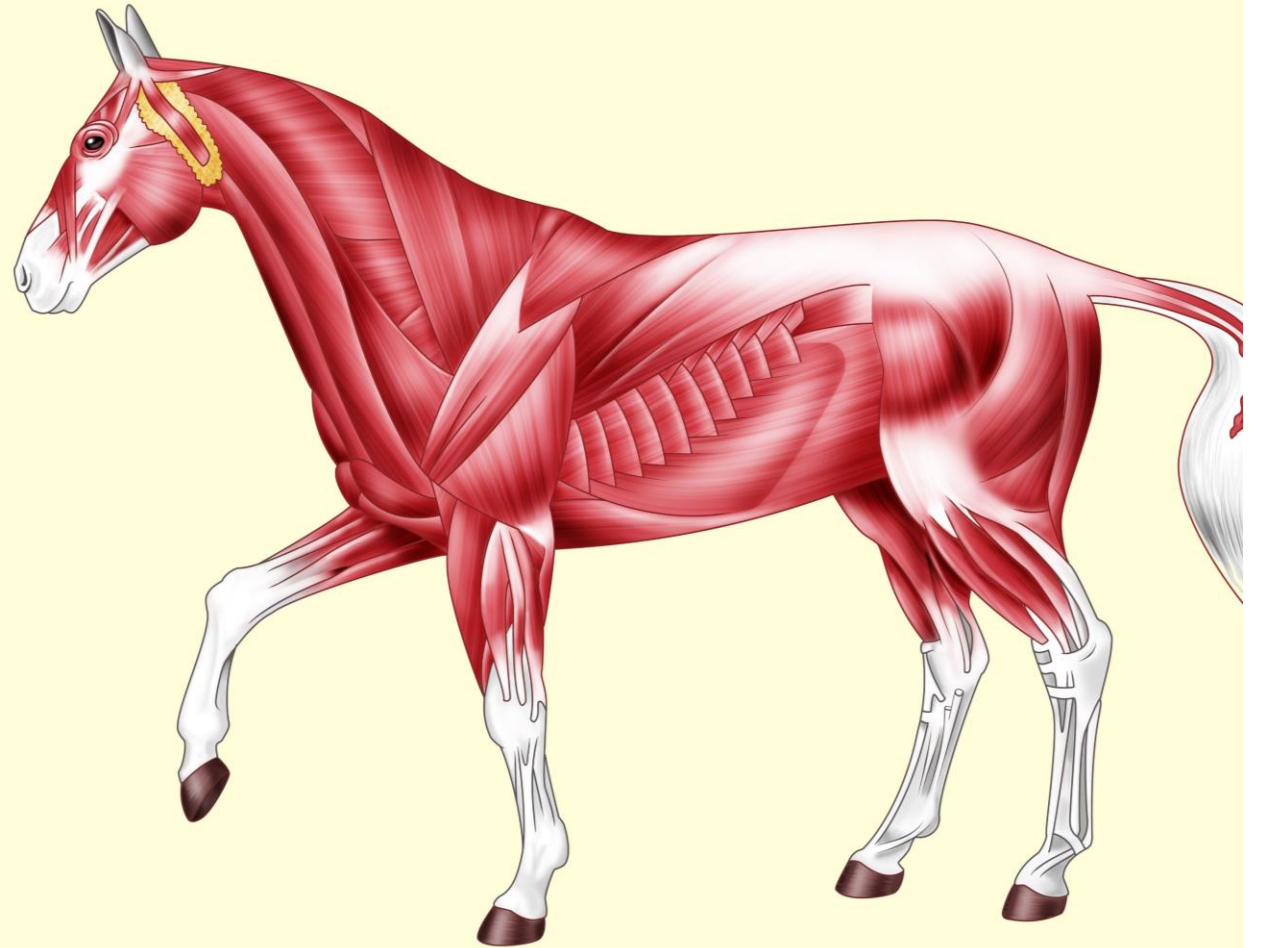
Thoroughbred Sprinters

- Researchers identified physical characteristics of sprinters:
 - Early maturing;
 - Higher body weight-to-withers height ratio;
 - “Greater definition in the chest and hind-quarter to generate an immense burst of power”



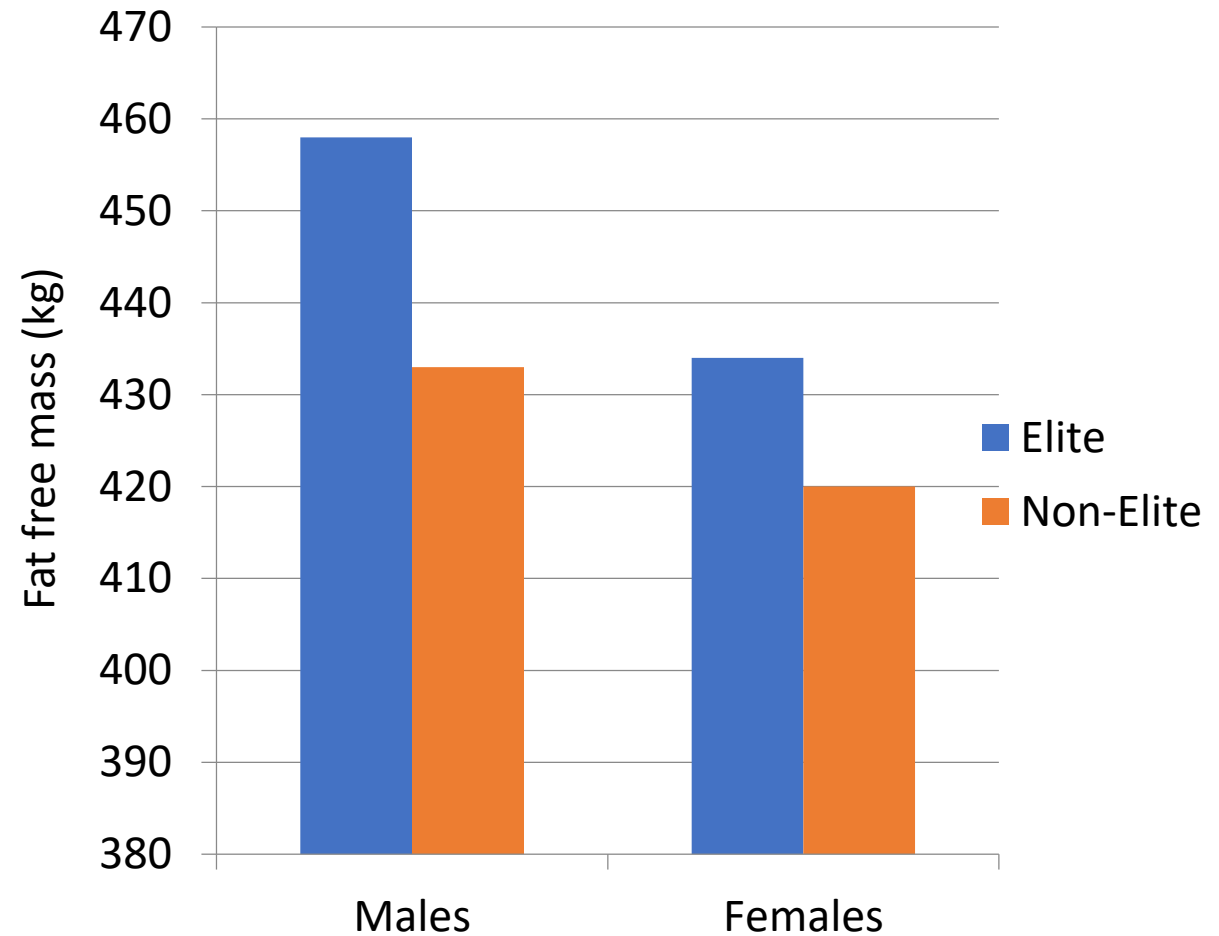
Fat Free Mass

- Calculated as bodyweight minus fat mass
- High fat free mass:
 - Indicative of large amount of muscle;
 - Considered beneficial for elite runners, whether they are sprinters or stayers



Previous studies

Correlation
between fat free
mass and racing
ability in both
Thoroughbreds
(Fonseca et al., 2013) and
Standardbreds (Kearns
et al., 2002)





Fat Free Mass and Distance?

Little data is available examining the difference in fat free mass between successful sprinters and longer distance runners

Preliminary study

- Sixteen thoroughbred runners who successfully won their races over:
 - Race distance \leq 1200m (6 horses)
 - Race distance $>$ 1200m (10 horses)
- Body fat and fat free mass was calculated using B-mode ultrasonography and previously published methods (Kane et al., 1987; Kearns et al., 2002)

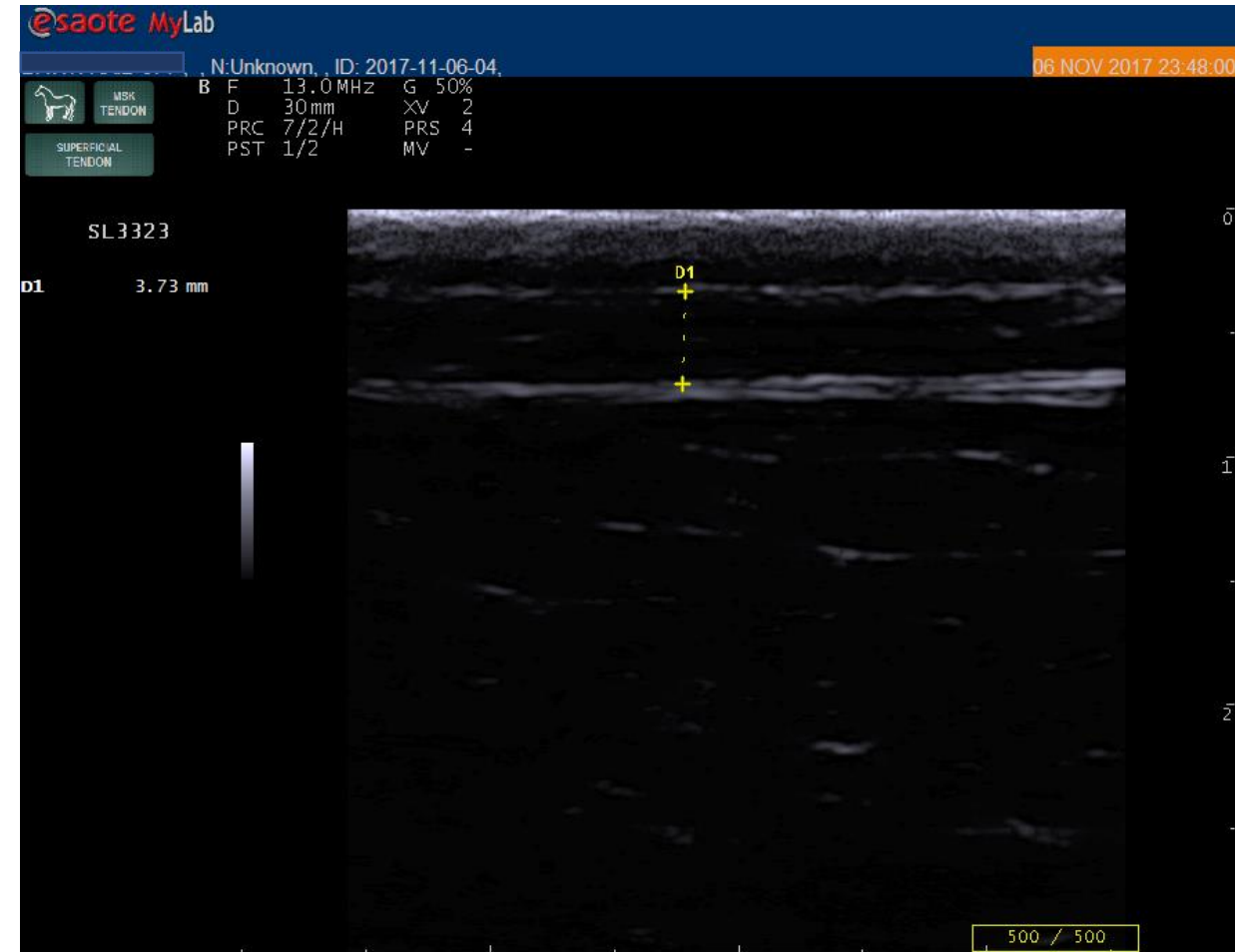


Results

| | Runners ≤ 1200m | Runners > 1200m |
|-----------------------|--------------------|--------------------|
| Number | 6 | 10 |
| Average bodyweight | 517kg ^a | 493kg ^a |
| Average fat free mass | 495kg ^b | 472kg ^b |

^aP = 0.09; ^bP = 0.07;

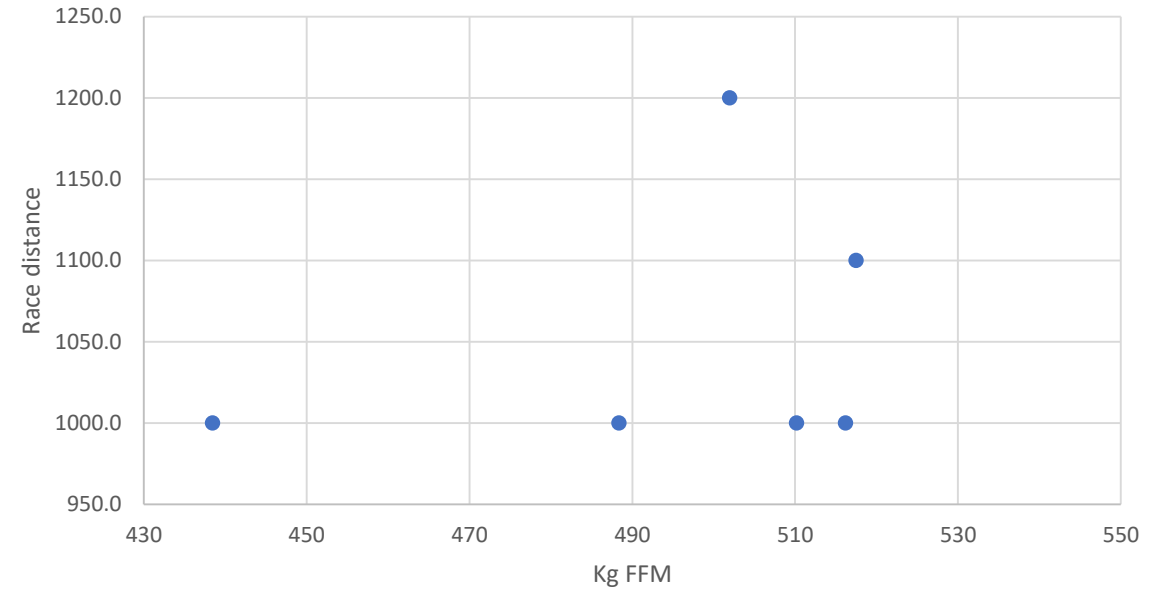
On average, there was more than 20kg difference in bodyweight and fat free mass in sprinters compared to longer distance runners



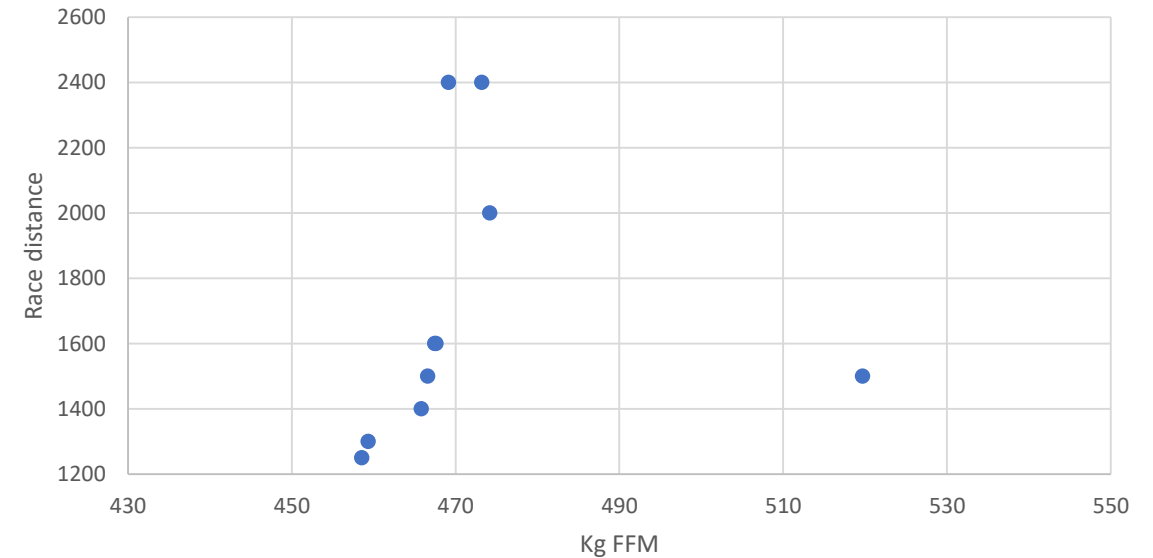
Individual data

Showing a trend for increasing fat free mass in sprinters compared to longer distance runners

FFM of individual runners $\leq 1200\text{m}$



FFM of individual runners $> 1200\text{m}$



Summary

- Data limited, however:
 - Supports previous work associating body weight and race distance; and
 - Depicts a trend for increasing fat free mass to be associated with shorter race distance
- Supports the use of ultrasonography as a practical means of estimating fat free mass in horses
- Further work required to determine if fat free mass could be predictive of optimal race distance for an individual

