

## Estimating weight

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Estimating a horse's weight is important for calculating its ration, adjusting deworming treatment and generally monitoring its health. However, it is not always easy to access a suitable scale. Here are some reliable ways to estimate a horse's weight.

by **Pauline Doligez, Laetitia MARNAY-LE MASNE** | 05.02.2018 |

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Technical level 



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### Why estimate a horse's weight?

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Whether in a stud farm or stable, it is important to know the live weight (LV) of a horse in order to:

- Establish its ration: a very large proportion of the recommended food intake depends on the live weight of the animal.

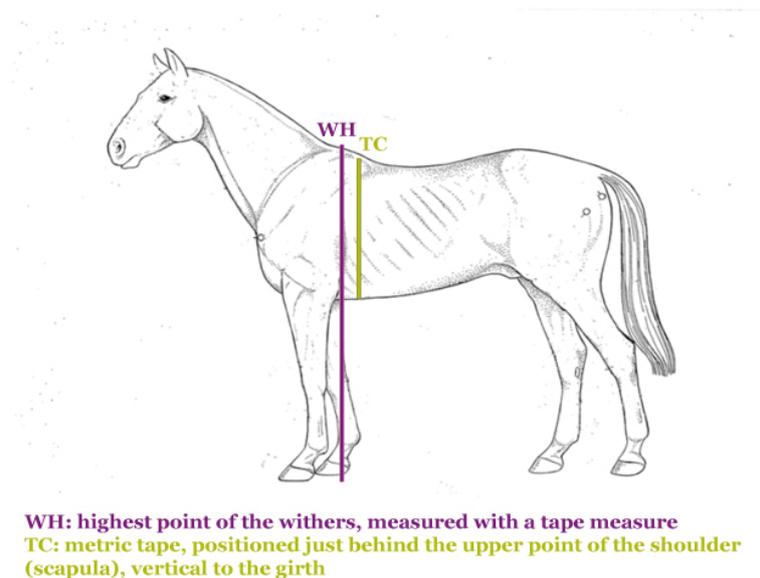
- Monitor its growth
- Monitor its general health
- Adjust doses of drug treatments, including antiparasitic drugs

If there is no scale available in the facility, a visual, empirical and often false estimate (except for real experts) is sometimes made.

There are, however, body weight formulae that allow the horse's weight to be assessed more accurately. From simple-to-take measurements such as:

- Height at withers (WH)
- Thoracic circumference (TC)

To take these measures, make sure you keep the horse straight (neck in the extension of the body) and square (the four limbs flat on the ground). For safety reasons, both handlers should always stand on the same side of the horse.



*Measurements and lengths used in simple body weight formulae*

## Body weight formulae

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### For the sport horse

Based on Martin-Rosset - 1990, a working sports horse or one maintaining its weight:

- $LW \text{ (in kg)} = 3 \text{ WH} + 4.3 \text{ TC} - 785$  (to within +/- 25kg)

## For thoroughbred brood mares

According to Blanchard et al - 2005

- Thoroughbred brood mare:  $LW \text{ (in kg)} = 2.3 \text{ WH} + 3.19 \text{ TC} - 428$
- French trotter brood mare:  $LW \text{ (in kg)} = 4.42 \text{ WH} + 3.76 \text{ TC} - 849$
- Selle Français brood mare:  $LW \text{ (in kg)} = 0.64 \text{ WH} + 5.78 \text{ TC} - 633$

According to Martin-Rosset - Inra 2012:

- Saddle and racing brood mares:  
 $LW \text{ (in kg)} = 2.6 \text{ WH} + 5.2 \text{ TC} - 855$  (to within +/- 25kg)

## For draft horses

According to Martin-Rosset - 1990, mare and stallion

- $LW \text{ (in kg)} = 7.3 \text{ TC} - 800$  (to within +/- 25kg)

## For ponies

According to G. Duchamp and E Barrey - Inra 2012, for any type of pony over 1m tall

- $LW \text{ (in kg)} = 3.56 \text{ WH} + 3.65 \text{ TC} - 714.66$  (to within +/- 21kg)

## For growing foals

During growth, chest circumference and body weight change in the same proportion. The height at withers increases differently, so the formula (INRA) calculates the weight of the growing blood foal without the height at withers.

- $LW \text{ (in kg)} = 4.5 - 370 \text{ TC}$  (TC is expressed in cm)

A study carried out in Lower Normandy on Selle Français, Trotteur Français and Thoroughbred horses also makes it possible to estimate the weight to within 20 kg. It also takes into account the age of the animal in the parameters, and formulae differentiate between the sex of the animal.

- For males:  $LW \text{ (in kg)} = 0.20 A + 1.72 \text{ WH} + 2.15 \text{ TC} - 327$
- For females:  $LW \text{ (in kg)} = 0.21 A + 1.85 \text{ WH} + 2.01 \text{ TC} - 330.2$

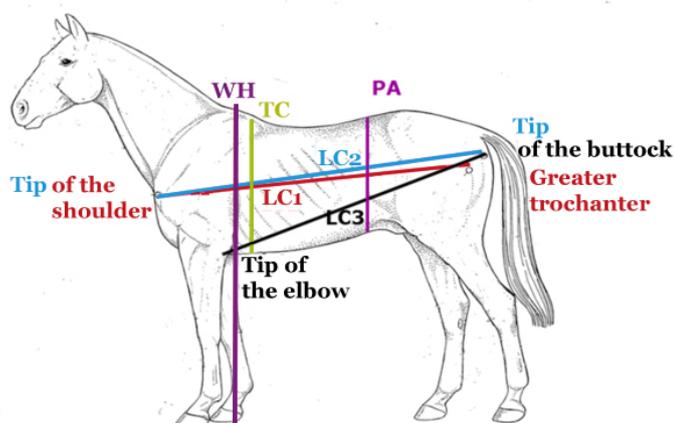
*A = age in days, TC and WH in cm*

Estimating the weight allows the breeder to understand the growth of the animal and to adjust the ration according to their objectives.

The nutritional requirements of the foal depend on the animal's live weight, weight gain, composition (mainly lipid content) and stage of development.

## Comparison of several formulae for adult saddle horses

In 2013, a comparison of different height/weight formulae listed in the scientific literature was carried out on 162 adult horses of various breeds. The formulae were compared to the actual weight of the horses as weighed on the scale.



Scientific References	Formulae for all types of horses (thoroughbred) in inches (in) or centimetres (cm)	Mean and standard deviation (in kg) between the weight estimated on the scale and the weight recorded by the formula, study on 162 horses (Marnay <i>et al</i> 2014)
Hapgood 2002	$LW (lb) = TC^{1.64} (in) \times WH^{0.95} (in) \times LC2^{0.40} (in) / 278$	28+/-31
Milner et hewitt 1969	$LW (kg) = TC^2 (cm) \times LC1 (cm) / 10815$	29+/-23
Carroll et Huntington 1988	$LW (kg) = (TC^2 (cm) \times LC2 (cm)) / Y$ Y = 12 265 if NEC score <3    Y = 11 706 if NEC score ≤3	30+/-25
Crevat (Marcenac & Aublet 1964)	$LW (kg) = 80 \times TC^3 (m)$	33+/-27
Martin-Rosset 1990	$LW (kg) = (4,3 \times TC) + (3 \times WH) - 785$	34+/-25
Esminger 1977	$LW (kg) = (TC^2 (cm) \times LC3 (cm)) / 10815 + 22.7$	54+/-32
Jones <i>et al.</i> 1989	$LW (kg) = PA^{1.78} (cm) \times LC3^{0.97} (cm) / 3011$	97+/-36

## How to take measurements. Focus in photos



Manual measuring device  
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Abdominal circumference  
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Thoracic circumference  
© J. Ketterle



LC1 : Tip of the shoulder to greater trochanter  
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LC2 : Tip of the shoulder to tip of the hip  
© L. Marnay-Le Masne



LC3 : Tip of elbow to tip of buttock  
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Some measures require anatomical elements to be correctly identified and the measurements must be very precise, at the risk of significant deviations, such as different body lengths (LC1, LC2 and LC3 that pass over the belly). Other measures are easier to take, such as height at withers (WH) and thoracic circumference (TC)

The formulae by Hapgood, Milner & Hewitt and Carroll proved to be the most closely correlated to the actual weight of the horses.

Be careful, however, as the Hapgood formula is calculated in inches. These three formulae use measurements of LC1 and LC2 which are more difficult to gauge.

The formulae by Crevat and Martin Rosset are perhaps less precise but appear to be faster and easier to estimate (WH and TC measurements).

Jones' formula proved to be the least accurate for the horses that were studied.

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