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Chronic Progressive Lymphedema in Draught horses need for a systematic, standardised data collection

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CABG
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Belgian Draught horse

- Coldblooded, large horse breed
  ..ploughing, pulling heavy loads
- Living heritage

- Since 1950's mainly bred for shows and contests
- Heavy limbs and extended featherings

- Small (effective) population size
  - Currently 400-500 registered births/year
  - N_e = 40 (2021)

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Chronic progressive lymphedema (CPL)

- Systemic (?) disease, chronic
- Swelling, nodules and skin folds
- No cure and often early euthanasia
- Very high prevalence (> 60%)
- Also seen in other breeds (Ardenner, Friesian, …) and other species (sheep, Alpaca, ..)

Mild

Severe

Scoring (1) the severity of CPL

Vlaams Diergeneeskundig Tijdschrift, 2014, 83 Original article 119

Chronic progressive lymphedema in the Belgian draft horse in Belgium: clinical phenotyping, prevalence and risk factor analysis

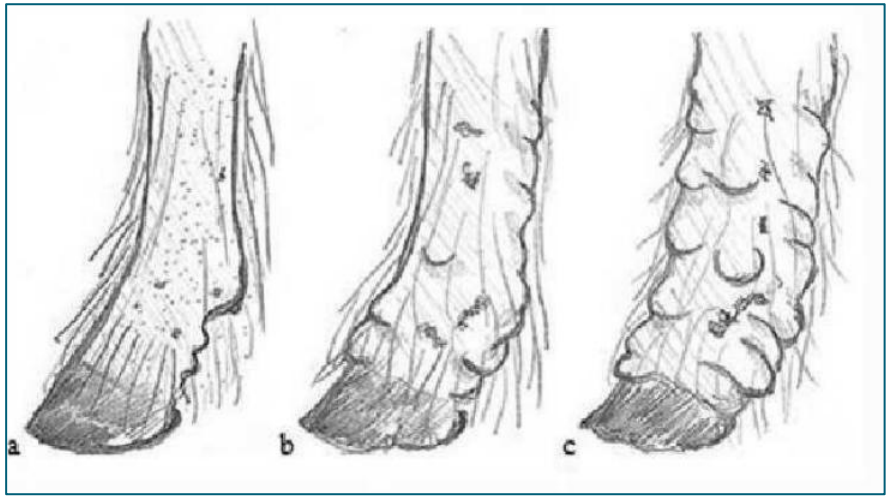
Chronisch progressief lymfoedeem bij het Belgisch trekpaard in België: klinische fenotypering, prevalentie en analyse van risicofactoren

[1]K. De Keyser, [1]S. Janssens, [1]L.M. Peeters, [2]F. Gasthuys, [2]M. Oosterlinck, [1]N. Buys

Table 1. Overview of CPL-associated lower-limb lesions in draught horses, categorizing affected limbs based on the severity of lesions and the dimensions of the affected region.

Severity	CPL	Skin surface and hairs	Swelling and deformation
Mild Below fetlock	A	Hairs are supple	Normal limb diameter*
		Slight skin thickening	Normal limb diameter
		Scaling	Soft, compressible swelling
		Hyperkeratosis	1-2 SF (P/PL)
	B	Hairs supple (Hock: hairs upright)	
		Moderate skin thickening	Normal limb diameter
		Hyperkeratosis, scaling	Moderate hard, diffuse swelling
Moderate Until fetlock	C	Wounds, ulcera	>2 SF and NOD (D/P/PL)
		Hairs less supple (Hock: hairs upright + exudate)	
		Severe skin thickening	Increased limb diameter
		Hyperkeratosis, scaling	Hard, diffuse swelling
		Wounds, ulcera, exudate	SF and NOD (D/P/PL)
Severe Above fetlock	D	Greasy skin + bad odour	Mechanical impairment
		Hairs rough + broken	
		Hock: hairs upright + exudate + wound	
		Severe skin thickening	Increased limb diameter
		Hyperkeratosis, scaling	Hard, diffuse swelling
		Wounds, ulcera, exudate	SF and NOD surrounding limb
Extreme Above fetlock	E	Greasy skin + bad odour	Severe mechanical impairment
		Hairs rough + broken	General loss of condition
		Hock: hairs upright + exudate + wound	'Final stage'

SF = skin folds, NOD = nodules, D = dorsal, P = palmar, PL = plantar. * A normal limb diameter ranges from 25 to 30 cm for forelimbs (measured directly below the carpus) and from 33 to 38 cm for hind limbs (measured directly under the hock) (De Cock et al., 2003).



+

At veterinary inspection of stallions
Approx. 20-30 stallions annually

Also radiographs of all limbs

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Radiographs of breeding stallions

Counting folds of each limb (dorsal, palmar/plantar)
=> 8 counts/stallion

The studbook scheme (2)

Derived from the “De Keyser (2014)” scheme

6 categories, AA, A+, A-, B+, B-, C ;

applied on the stallion selection shows and mare contests;

performed by (the same) two judges (veterinarians).

Motivation is to avoid D and E scores ☺

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De Keyser et al. (2014) Chronic progressive lymphedema in the Belgian draft horse in Belgium: clinical phenotyping, prevalence and risk factor analysis. Vlaams Diergeneeskundig Tijdschrift, 83.

A grid for research (2025)

Chronic Progressive Lymphedema in Belgian Draft Horses: Understanding and Managing a Challenging Disease

by Marieke Brys [1,*], Edwin Claerebout [2] and Koen Chiers [1]

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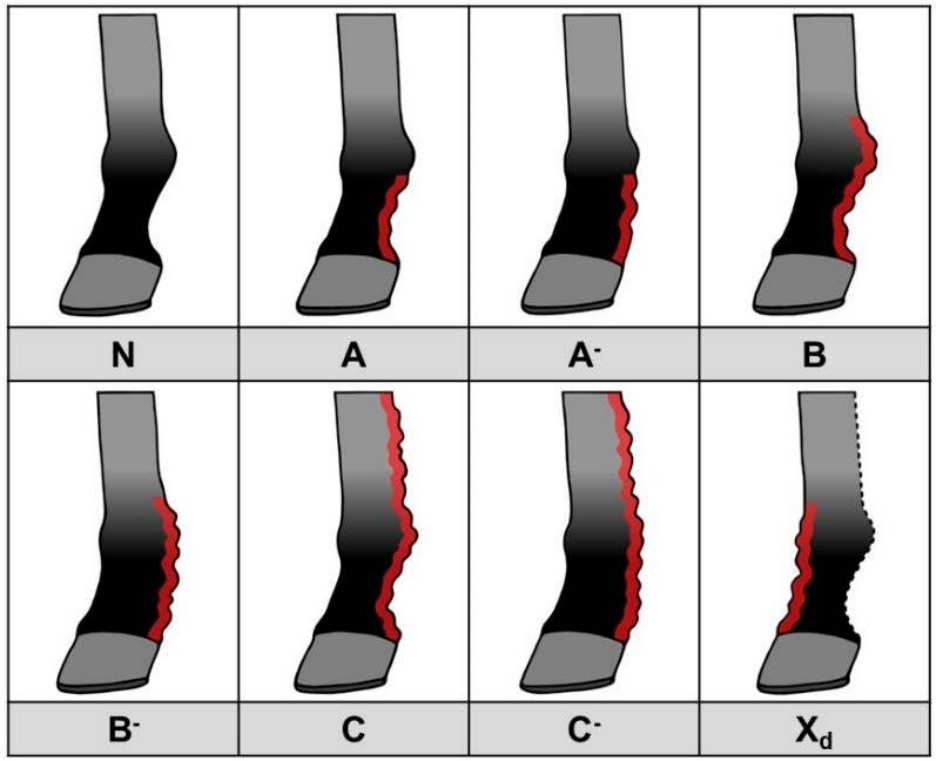
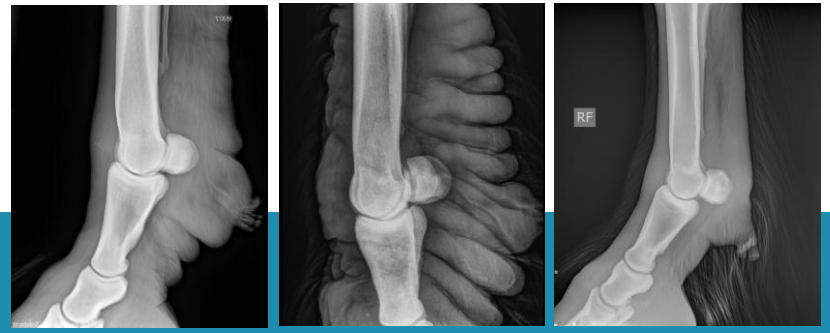
Categories



- Takes into account **only the primary features of CPL**. Lesions that may be related to secondary infections, such as wounds, exudate, and rough and broken hairs, can be assessed separately.
- Describes both the **location** (distal, proximal, palmar/plantar or dorsal), as well as the **dimension** (depth) of the present skinfolds.
- Is based on palpation of the distal limbs, but **can also be applied when assessing radiographic images**, as the same parameters can be evaluated.



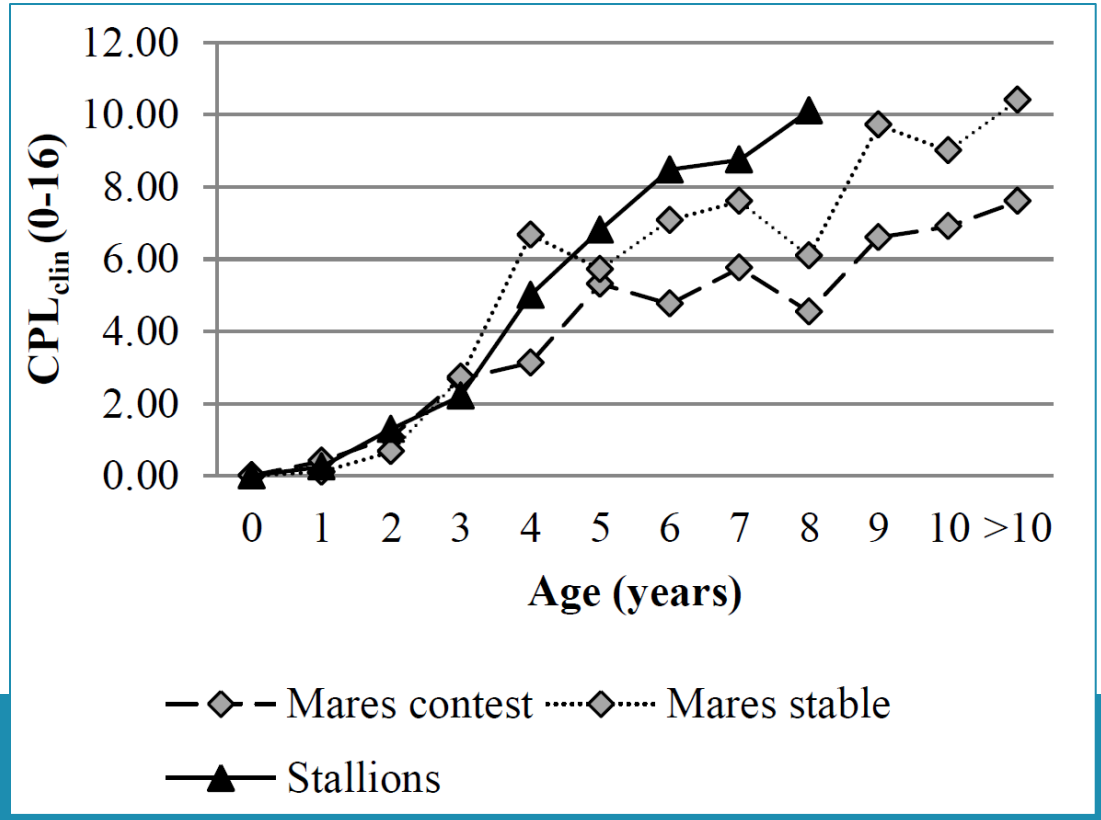
Validation of a novel scoring system for chronic progressive lymphoedema in Belgian draught horses
https://doi.org/10.1111/evj.70049

Are these scores useful for breeding?

- Is CPL heritable ?
- How to combine scoring grids?
- Utility of skinfolds obtained by Xray

Research indicates that severity of CPL is heritable

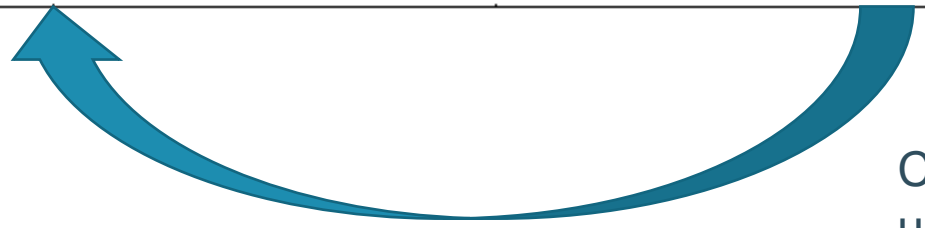
- Wallraf (2003) 0.22 (ranged between 0.17 and 0.52)
  In some breeds the number of horses was very low.
- De Keyser et al. (2014) range between 0.11 and 0.26 (older horses only)
- François et al. (2018): 0.14
- Influence of age, sex,
  coat color,
  moment of examination,
  body type (gaskin length),
  environment/breeder,



No one-to-one relationship between grids

Table 15: Number of observations per CPL score per dataset.

CPL scores '2016-2021' (n=977)		CPL scores '2008-2011' (n=1041)	
AA	110	**AA**	367
A+	348	**A**	336
A-	282	**B**	188
B+	193	**C**	133
B-	40	**D**	17
C+	4		



Convert categories to numbers using a Gamma function

Combining the data

- Heritability amounts to 0.42 – 0.46
- Close to the estimates of Sievers & Distl (2024) in the Rhenish German Draught horse, using also genomics heritability between 0.49 – 0.60

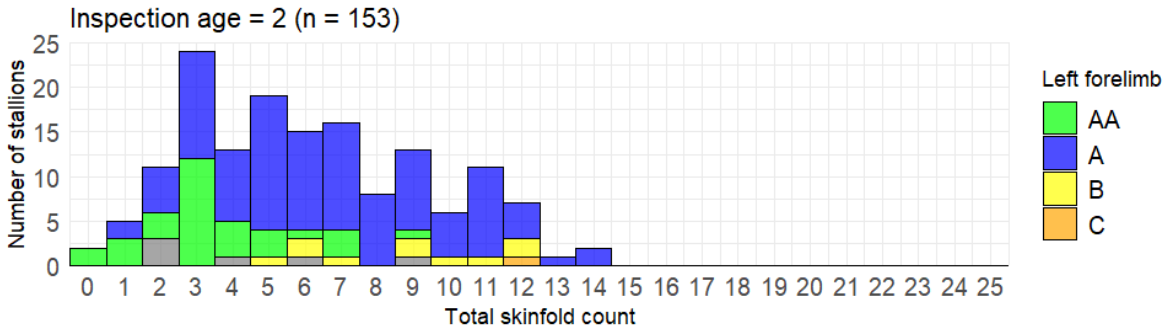
Genetic correlations of CPL score with

	Pedigree	Genomics
Cannon bone circum	0.53 - 0.83	0.87
Height withers	0.34 - 0.56	0.79
Skinfold Tickness	0.24 - 0.52	0.78

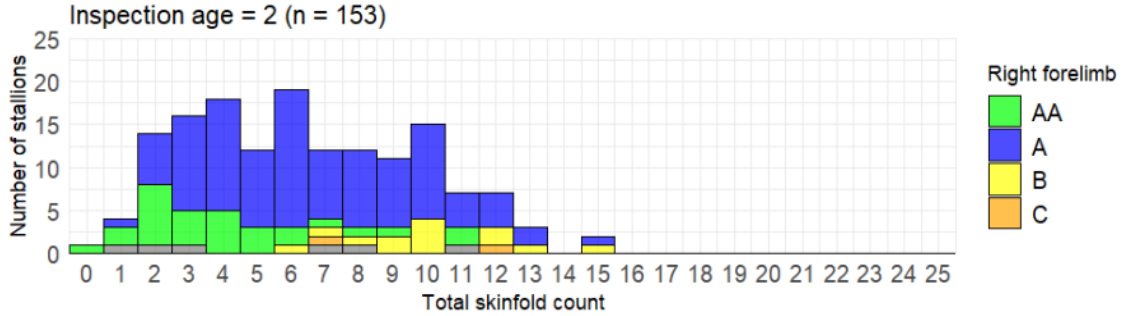
	Left Front	Right Front	Left Hind	Right Hind
Mean	6.4	6.7	8.6	8.7
SD	3.8	3.8	3.8	3.7

Skinfold count versus palpation score

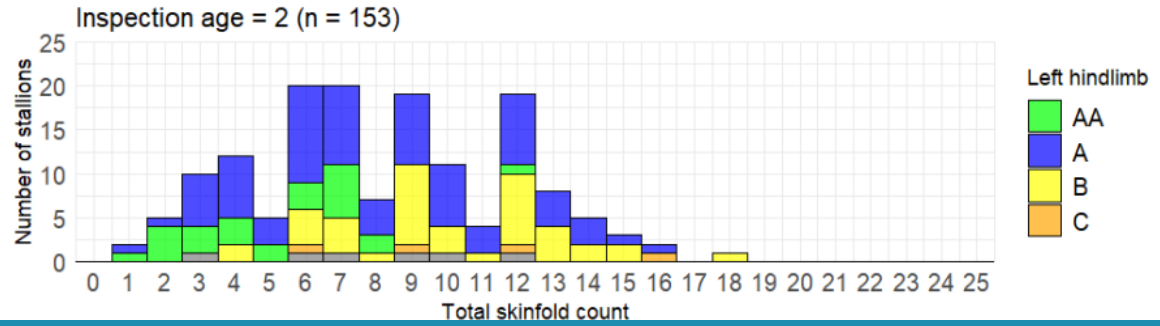
Left front



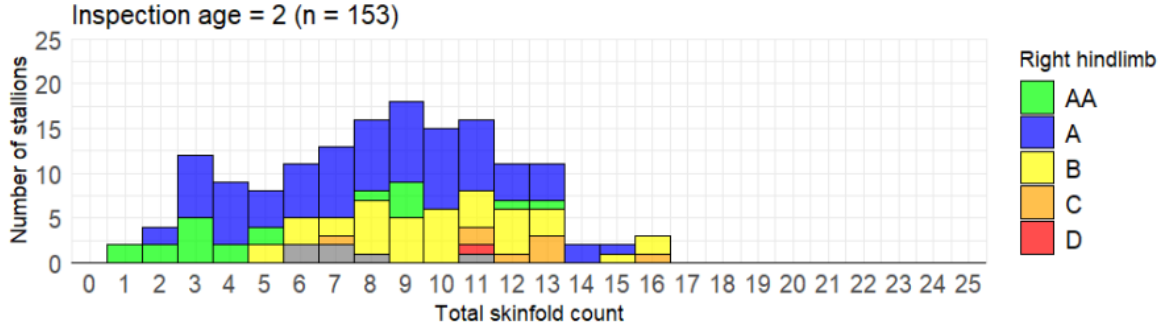
Right front



Left hind

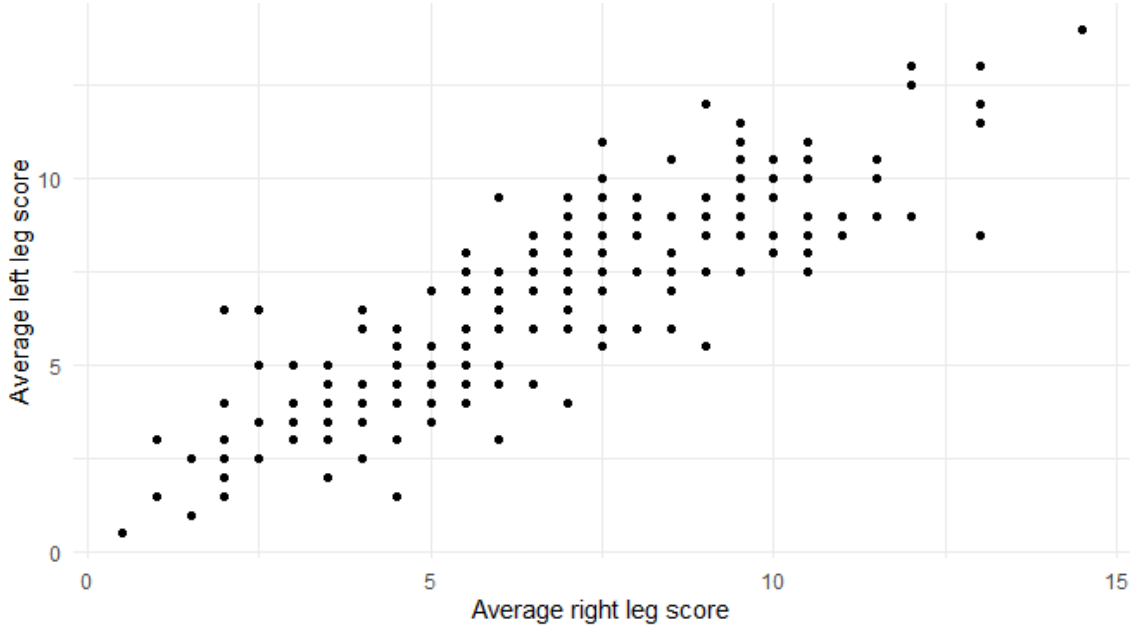


Right hind

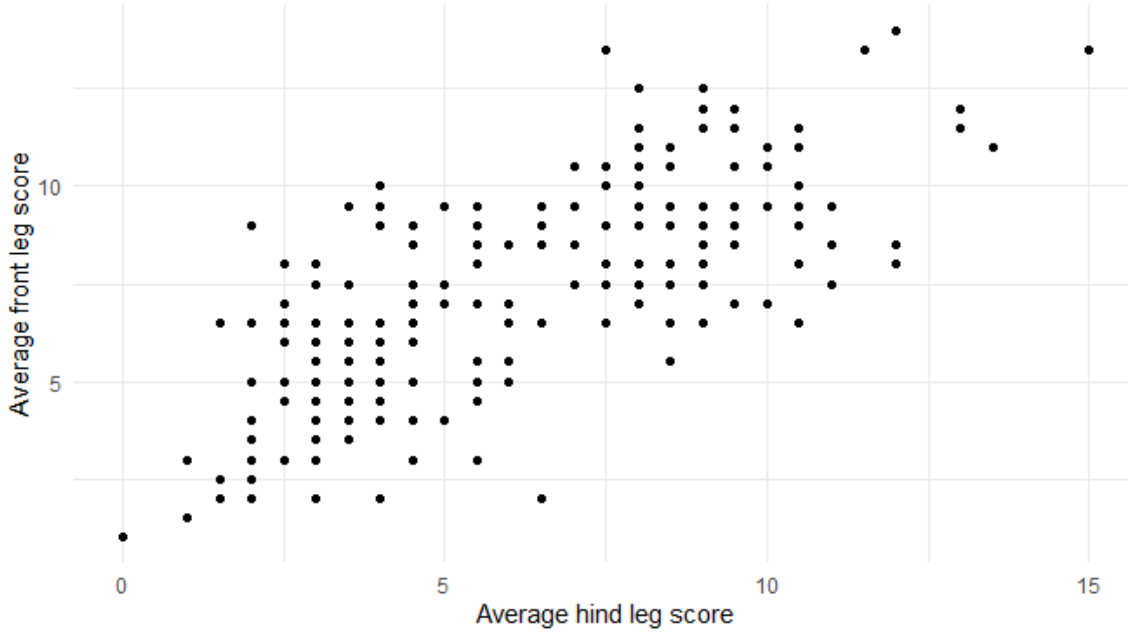


Skinfold count: differences between legs

Left versus Right



Front versus Hind



Updated h^2 estimates for CPL

- Single trait model based on palpation score
  - CPL score ~ age_sex(f) + colour(f) + $year_{examination}$(r)
  - 1735 records on 806 horses, total pedigree: 3236 horses
  - h^2 = 0.55
  - c^2_{year} = 0.06

- Dual trait model: CPL score & skinfold count
  - Convergence issues due to limited horses with skinfold records (only stallions)

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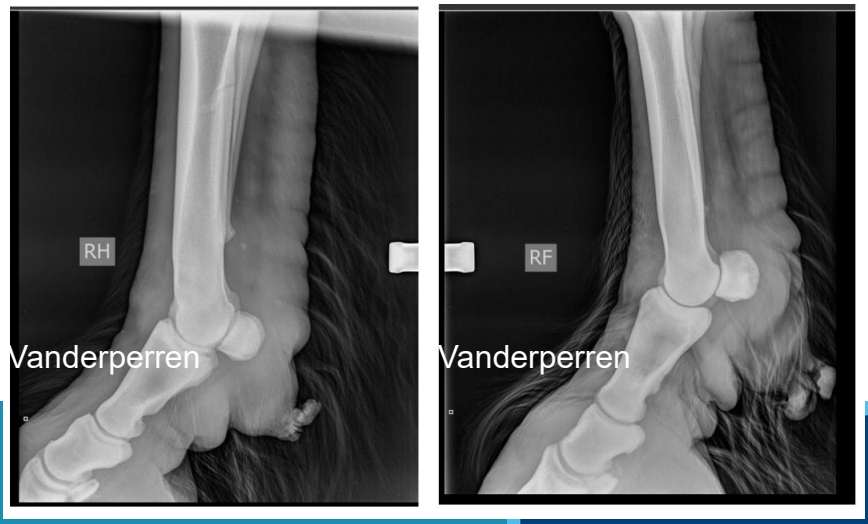
Take home message

- Skin folds are complementary to “classical” scoring systems that use by palpation
- Differences between different legs (front vs hind & left vs right)
- Earlier detection than palpation, although “just counting” is also a simplification
- CPL moderately to highly heritable



What brings the future

- Concertation with Netherlands and Germany
  => use a common scheme for scoring + genomics
  (more powerful analysis)

- What is the significance of mite infections?
  => new research (Marieke Brys)

  => all Draught horses suffer from mite infections which may induce/contribute to CPL

› Vet Res Commun. 2025 Mar 5;49(3):129. doi: 10.1007/s11259-025-10695-y.

High prevalence of Chorioptes bovis: an important factor in chronic progressive lymphedema in Belgian draft horses

M Brys [1], E Claerebout [2], V Saey [3], K Chiers [3]

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Belgian Draught Horse Studbook

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