



Genetic variation for shoulder ulcers in crossbred sows

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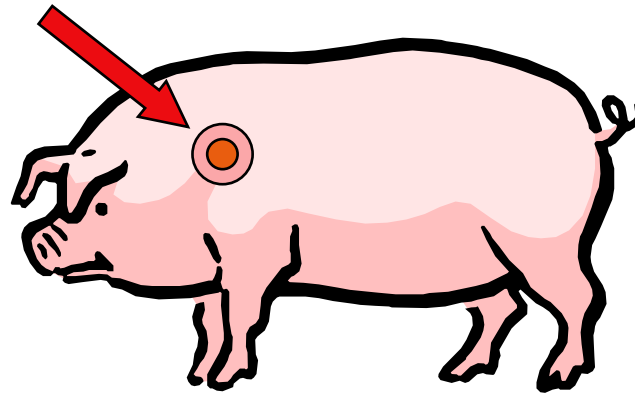
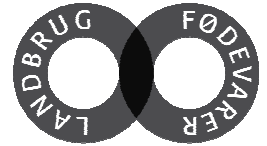
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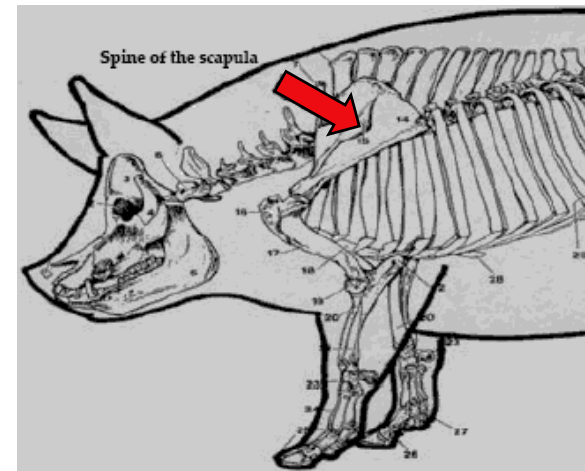


Shoulder ulcers in sows

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- Health
- Animal welfare
- Performance
- Labour intensive
- Longevity



Causes

Management

Body condition

Production

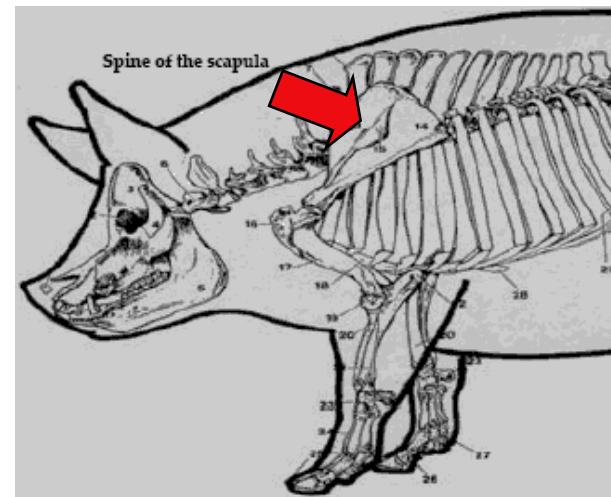
Environment

Stable

Flooring

Ventilation

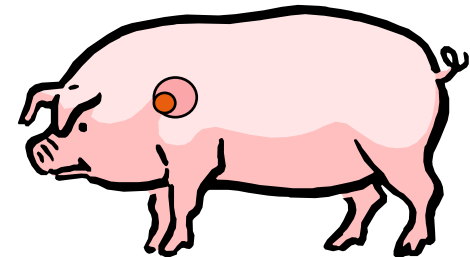
Genetics



Aim

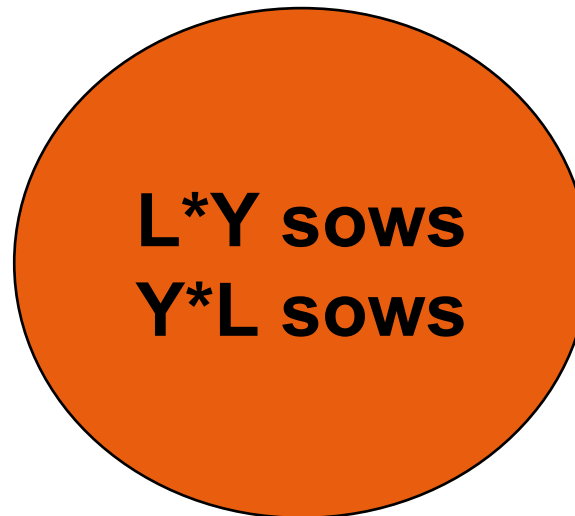
Estimate the genetic variation for shoulder ulcers in crossbred sows:

- Incidence of shoulder ulcers
- Size of shoulder ulcers



Pedigree structure using crossbred sows

**Genetic
variation
sire line**



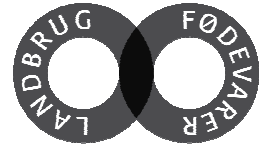
**Genetic
variation
dam line**

Breeds:
L: Landrace
Y: Yorkshire

centreres

Material

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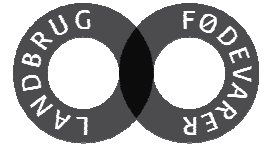


- 17 019 lactations
- 8 790 production sows (Landrace*Yorkshire)
- 77 308 recordings
- 9 production herds
- 1 800 sires
- 4 068 dams

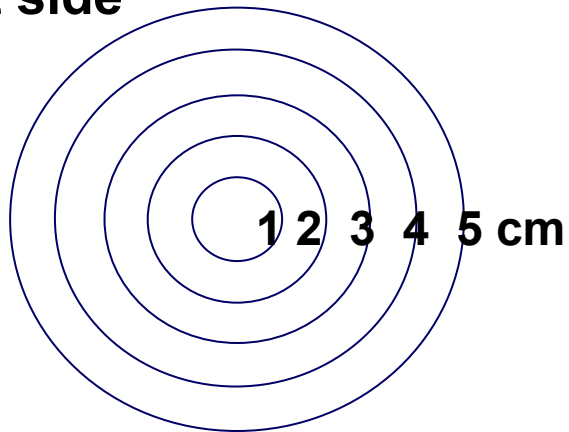


Registration of ulcers

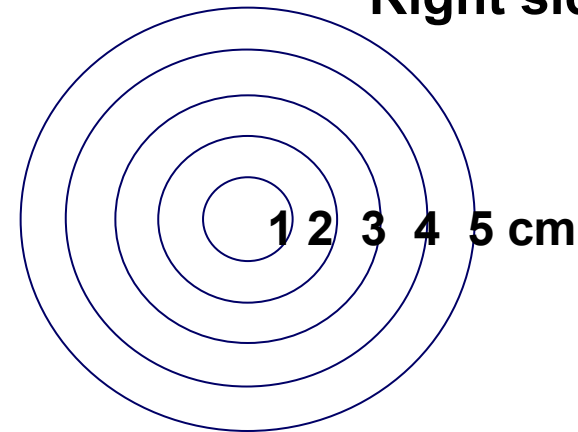
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Left side



Right side



- Size of ulcers were measured as the diameter on both sides

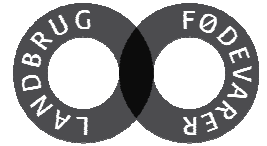
Traits analysed

Ulcer or not (0-1)

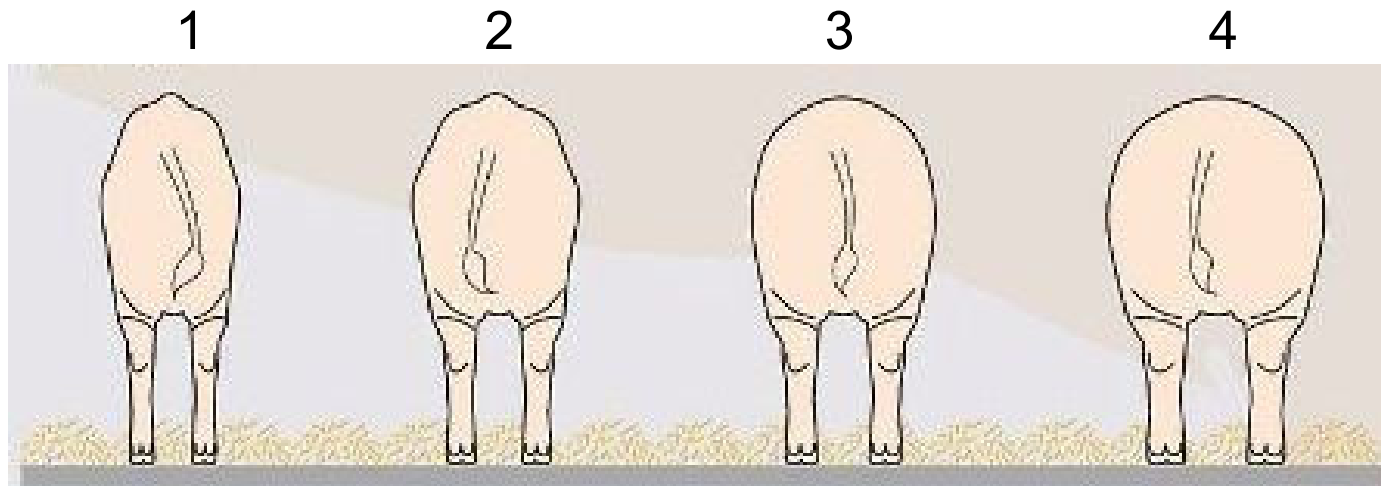
Maximum ulcer size/sow (cm)

Additional registrations

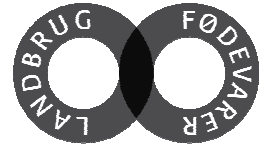
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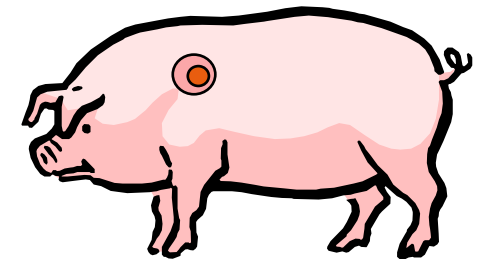
- **Date of farrowing**
- **Herd – stable**
- **Litter size**
- **Parity number**
- **Age of the sow**
- **Technician**
- **Body condition at every occasion - 4 levels**



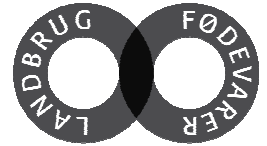
Statistical methods



- Mixed model with sire as random (SAS)
 - fixed effects
 - sire variance
- Animal model (VCE program)
 - calculation of genetic parameters
 - Ulcer as 0-1 trait (binomial)
 - Maximum ulcer size, for sows with ulcers

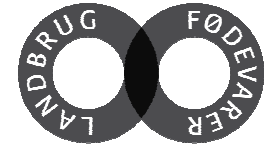


Results



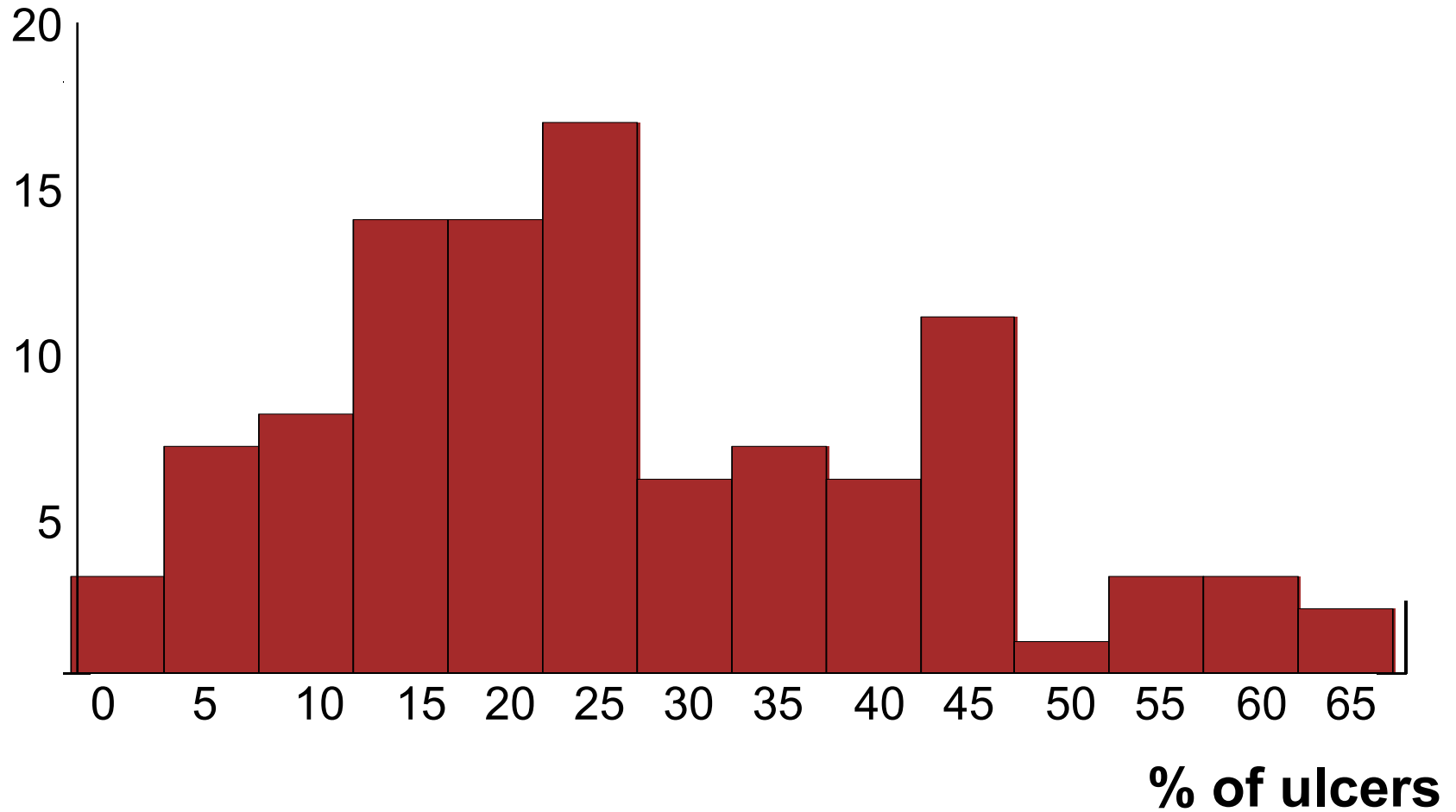
Frequency of ulcers

	Frequency of shoulder ulcers	
	Number	Mean
Lactation period, at least 1 ulcer	17019	0.18
Sows, at least 1 ulcer	8790	0.27



Variance between sires

Number of sires



Genetic variation

Heritabilities

	h^2	SE
Ulcer as 0-1 trait	0.18	0.017
Maximum ulcer size , only sows with ulcers	0.09	0.022

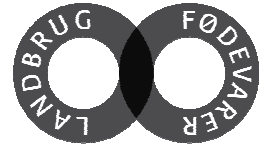
Environmental effects

•Herd	***
•Parity number	***
•Body condition	***
•No. of registrations	***
•Year – season	**
•Age of sow	**
•Breed of sire	*
•Litter size	n.s.
•Technician	n.s.

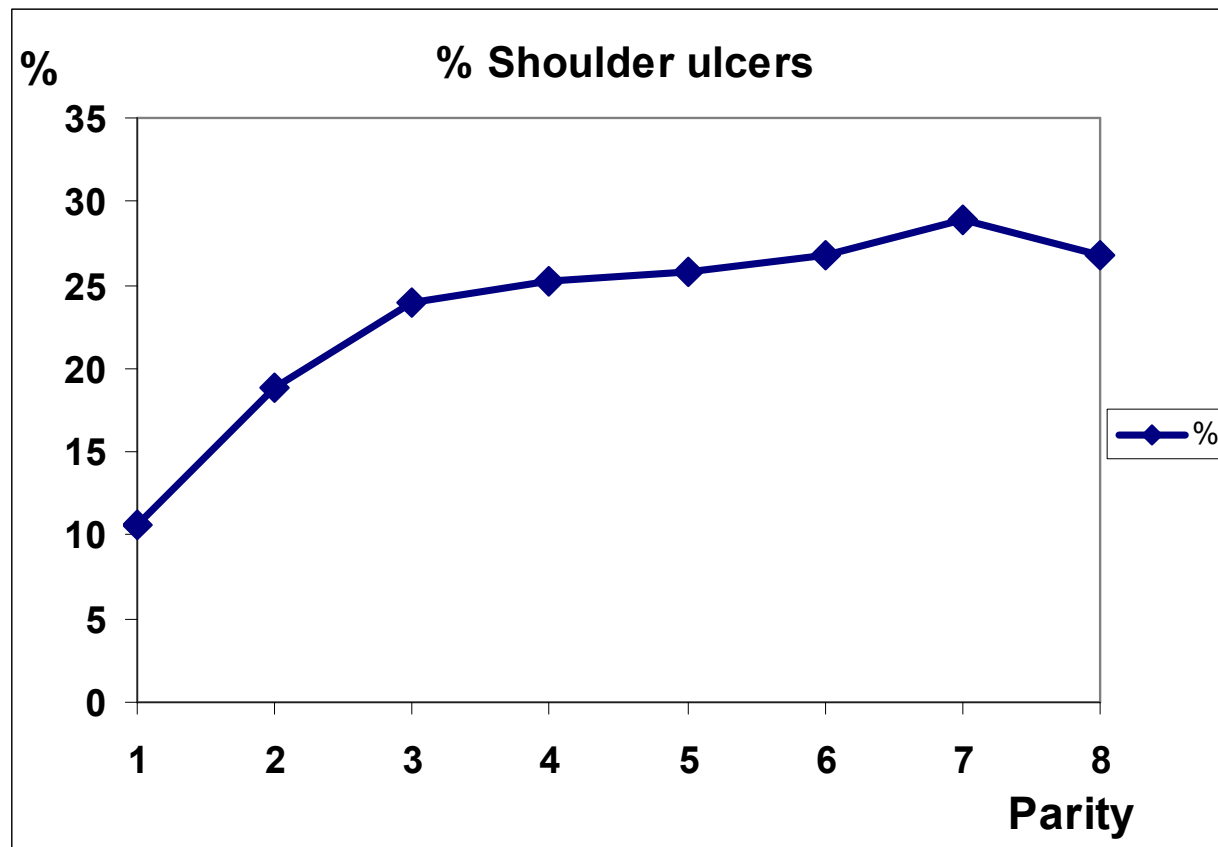


***: $p \leq 0,0001$ **: $0,0001 < p \leq 0,01$ *: $0,01 < p \leq 0,05$ n.s.: non significant

Parity

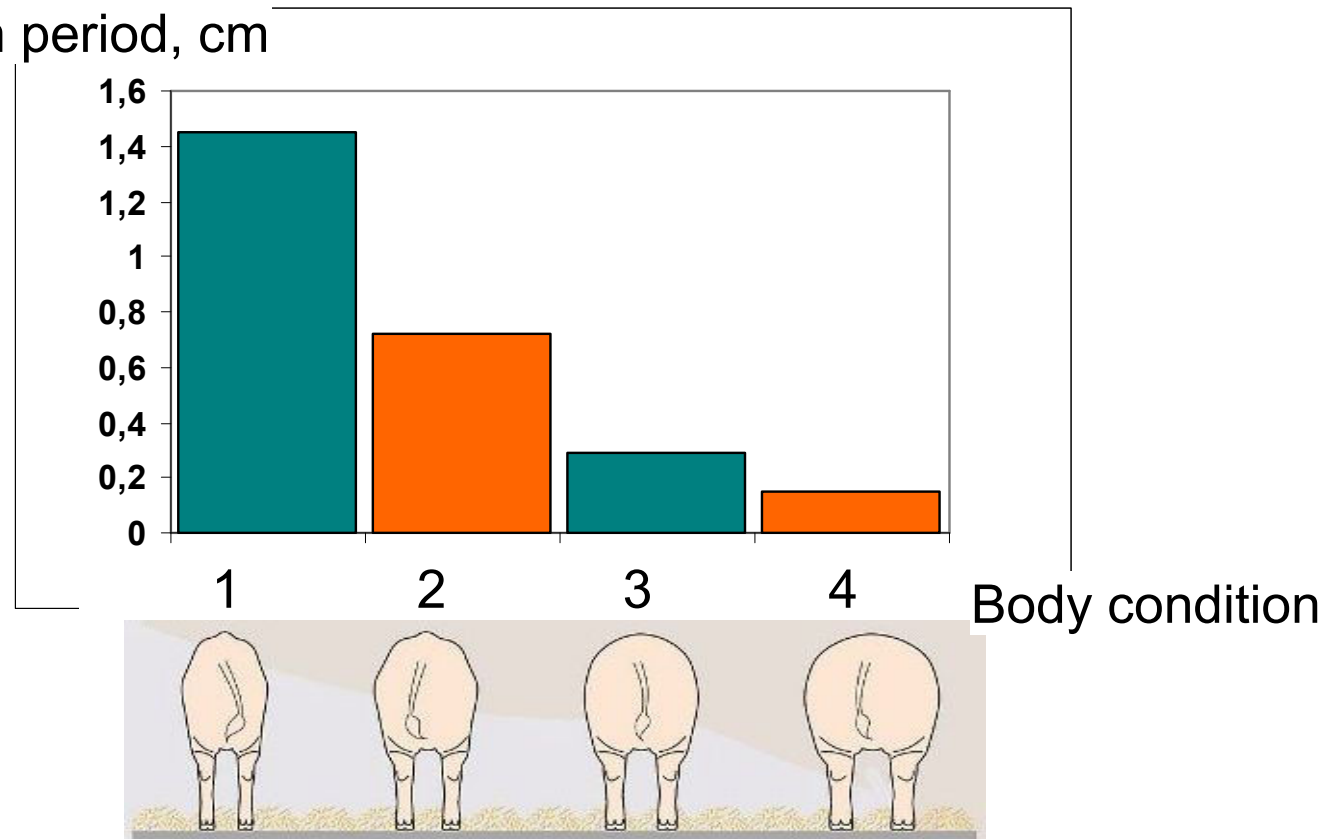


Frequency of shoulder ulcers



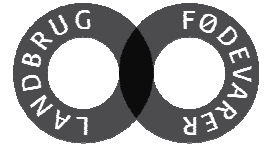
Larger ulcers in lean sows

Mean ulcer size per
lactation period, cm



Overall correlation : **-0.23**

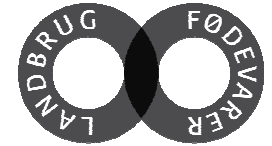
Discussion



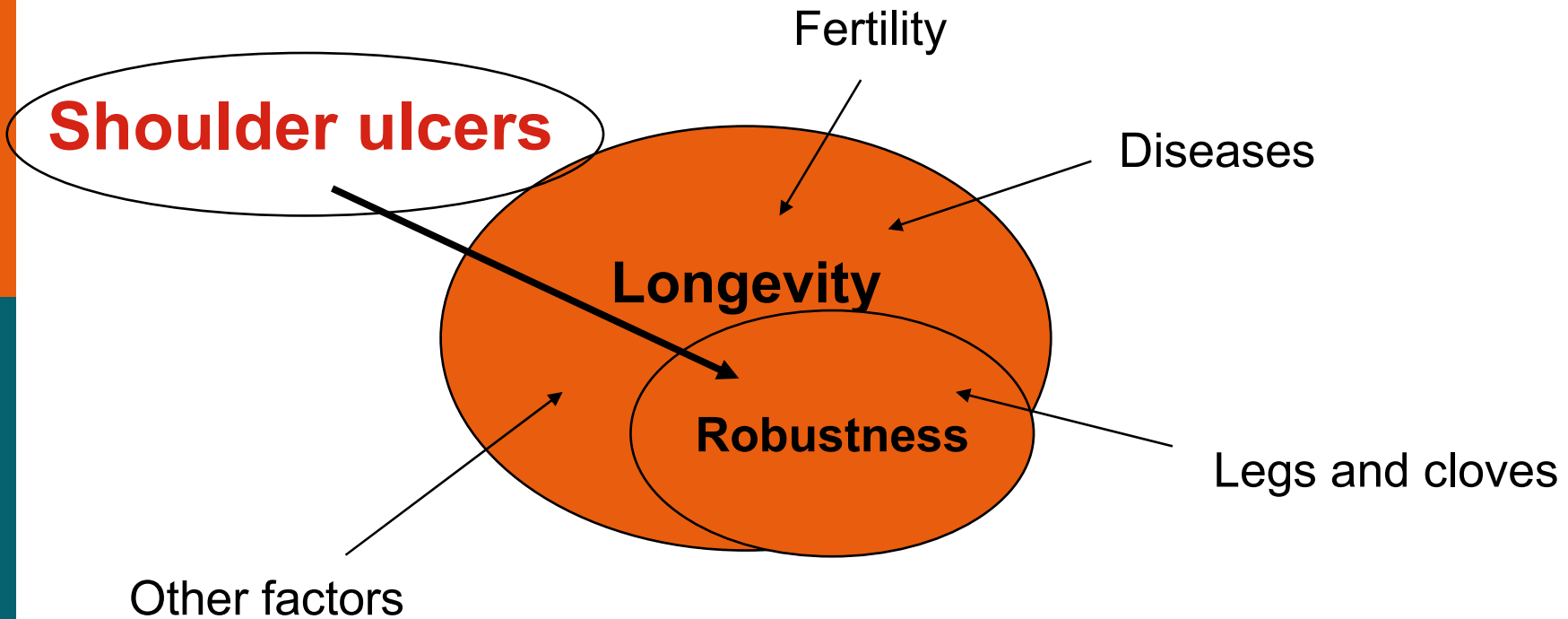
Breeding against ulcers:

- Heritable trait
- Labour-costly to record
- Many registrations per AI sire
- Low accuracy at time of selection
- Genomic selection

Future

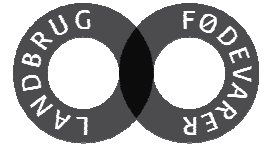


Longevity is an overall trait consisting of many sub-traits:



**Longevity as one trait
-defined as productive life time**

Summary



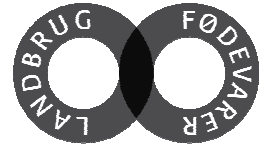
- **Low to moderate heritabilities**
- **Incidence of ulcers and size of ulcers are both heritable**

Incidence of ulcers: $h^2 = 0.18$

Size of shoulder ulcers: $h^2 = 0.09$

Conclusion

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Shoulder ulcers could be included in a breeding program - in an overall longevity trait

