KNOWLEDGE CENTRE FOR AGRICULTURE

Breeding in Denmark – registrations, indices and breeding scheme

International Limousin Congress 2012, Technical Meeting

Hotel Radisson, Denmark
Wednesday 4th July 2012

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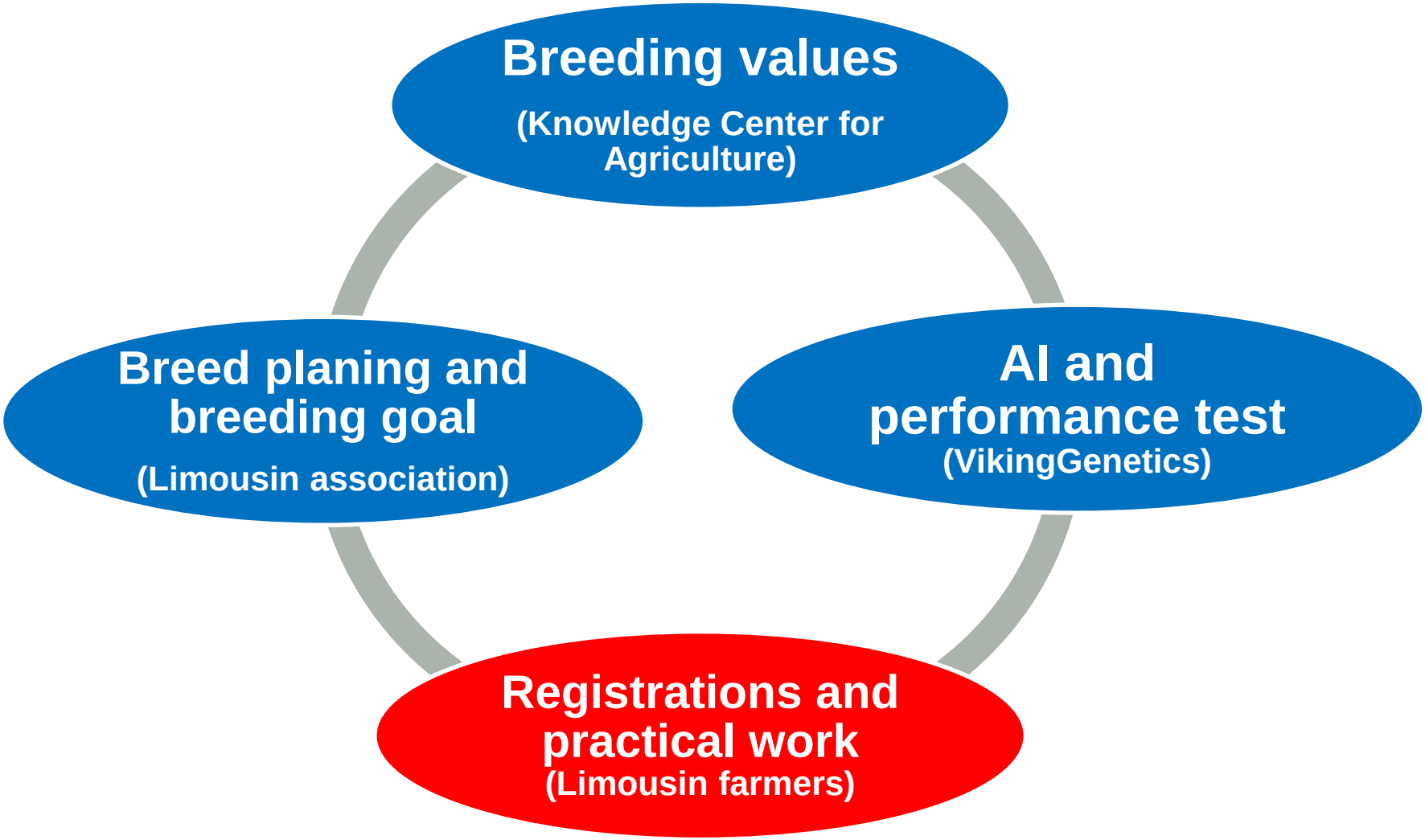
Aim of breeding work

Acheive a large genetic progress, that gives all users an economic revenue

Setup of breeding work



Characteristics of Danish Limousin

- **Population – 20.000 calves per year**
  - **60% with known sire, of which:**
    - **15% are sired by Danish AI bulls**
    - **3% are sired by foreign AI bulls**
- **Mostly small herds**
  - **50% of herds: 1-5 calves per year**
  - **90% of herds: 1-20 calves per year**
- **Some offspring/sire (across years)**
  - **50%: 1-25 calves per sire**
  - **90%: 1-110 calves per sire**
- **Some use in Dairy herds (5.000 calves per year)**

Breeding scheme

Top females are mated to sires of sons

Selection of elite sires and sires of sons

Performance test of Young bull calves
- Growth, slaughter quality, feed efficiency

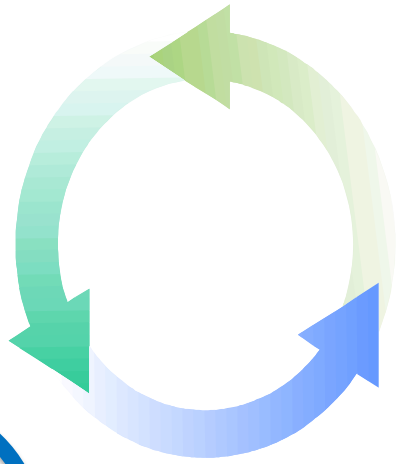
Field test of young sires
- Fertility, calving, growth, slaughter quality, conformation, total merit

Selection of top cows - - or future elite bull calves

- Criteria is total merit index
- Screening lists are made available for breed society 4 times a year

Breeding scheme

Top females are mated to sires of sons



Performance test of young bull calves
- Growth, slaughter quality, feed efficiency

Performance test of bull calves

Registrations

Weight

Feed intake

LD area measured by ultrasound

Performance test of beef bulls

Advantages and disadvantages

Advantages

- Test under standardized environment → higher heritabilities
- Unique registrations – feed intake and LD area

Disadvantages

- Expensive → limited number of bull calves

Performance test of beef bulls

Genetic evaluation

- **Traits in genetic evaluation**
  - **Growth rate 7.5-12 month**
  - **LD area**
  - **Feed efficiency**
- **Publication of results to owners and breed association**

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Traits registred on the farm

Weaning weigth (200 days)

Birth weigth

Yearling weigth (365 days)

Calving ease
Purebred/ dairy crosses

Calving interval

Survival at birth
Purebred/ dairy crosses

Traits registred on the farm continued

Classification of muscle

Classification of body

Classification of feet and legs

Traits registred at the performance testing station

Body gain in test period

Area of L.D.

Weigth at 7.5 months

Traits registred at the slaugtherhouse

Carcass classification (EUROP)
Purebred/ dairy crosses

Carcass weigth
Purebred/ dairy crosses

Only certified slaughterhouses

Pedigree information

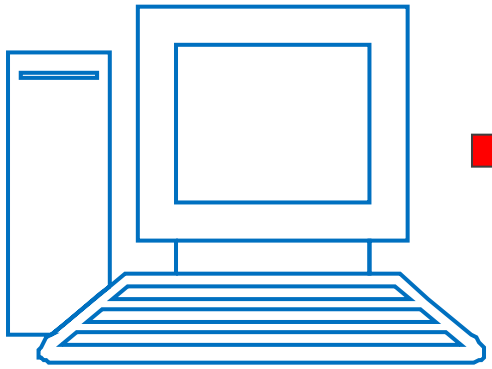
Service periods for private bulls

Identification of calf and parents

AI services

Pedigree information includes original identification for imported animal/parents

From data to breeding value

Data* →  → Breeding values

Genetic parameters
Pedigree
Environmental effects

*All data are stored in one central database

Genetic models

- Multi trait animal model
- Single trait animal model

Inclusion of genetic groups

Heritabilities

Trait	Heritability
LD, Performance test	0.45
Growth, Performance test	0.40
EUROP, classification	0.30
Weaning weight	0.27
Yearling weight	0.27
Calving ease, direct	0.10
Still birth, direct	0.08
Calving interval	0.05

28 traits in genetic evaluation

Traits in breeding goal

- Traits are combined into different indicies

Information traits

- Used to give more accurate estimates for traits in breeding goal

Indices related to production

- ”Calf ability to grow” (Growth)

  (Yearling weight, net growth rate and growth on performance test)

- EUROP classification (Slaughter quality)

  (Classification on purebred)

Indices related to function

- ”Calf ability to be born” (Birth)

  (Still birth, survival at 200 days, calving ease - purebred)

- ”Cow ability to calve” (Calving)

  (Still birth, survival at 200 days, calving ease - purebred)

- ”Cow ability to take care of calf” (Milk)

  (yearling weight, net growth rate - purebred)

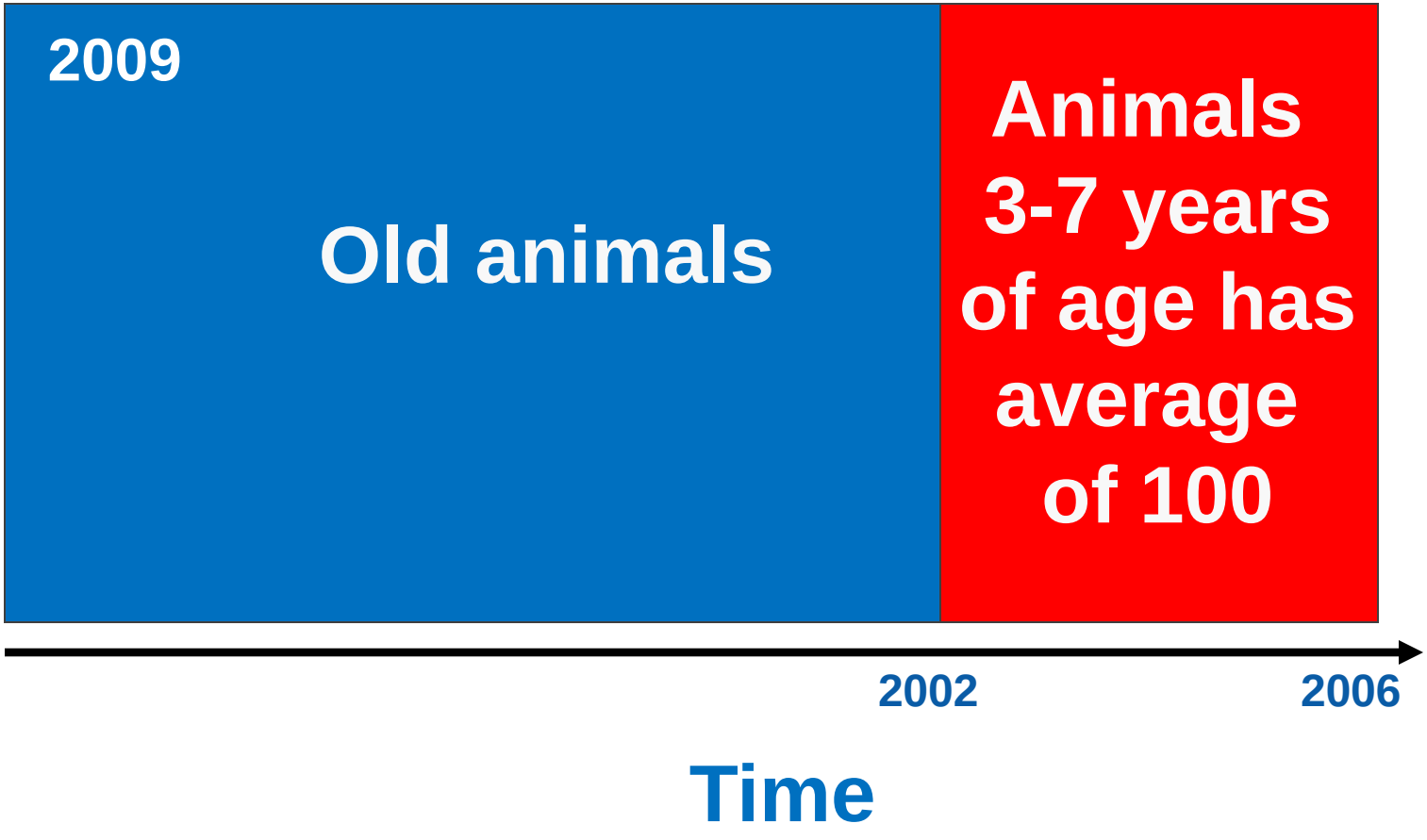
- ”Cow ability to get pregnant (Fertility)

  (calving interval)

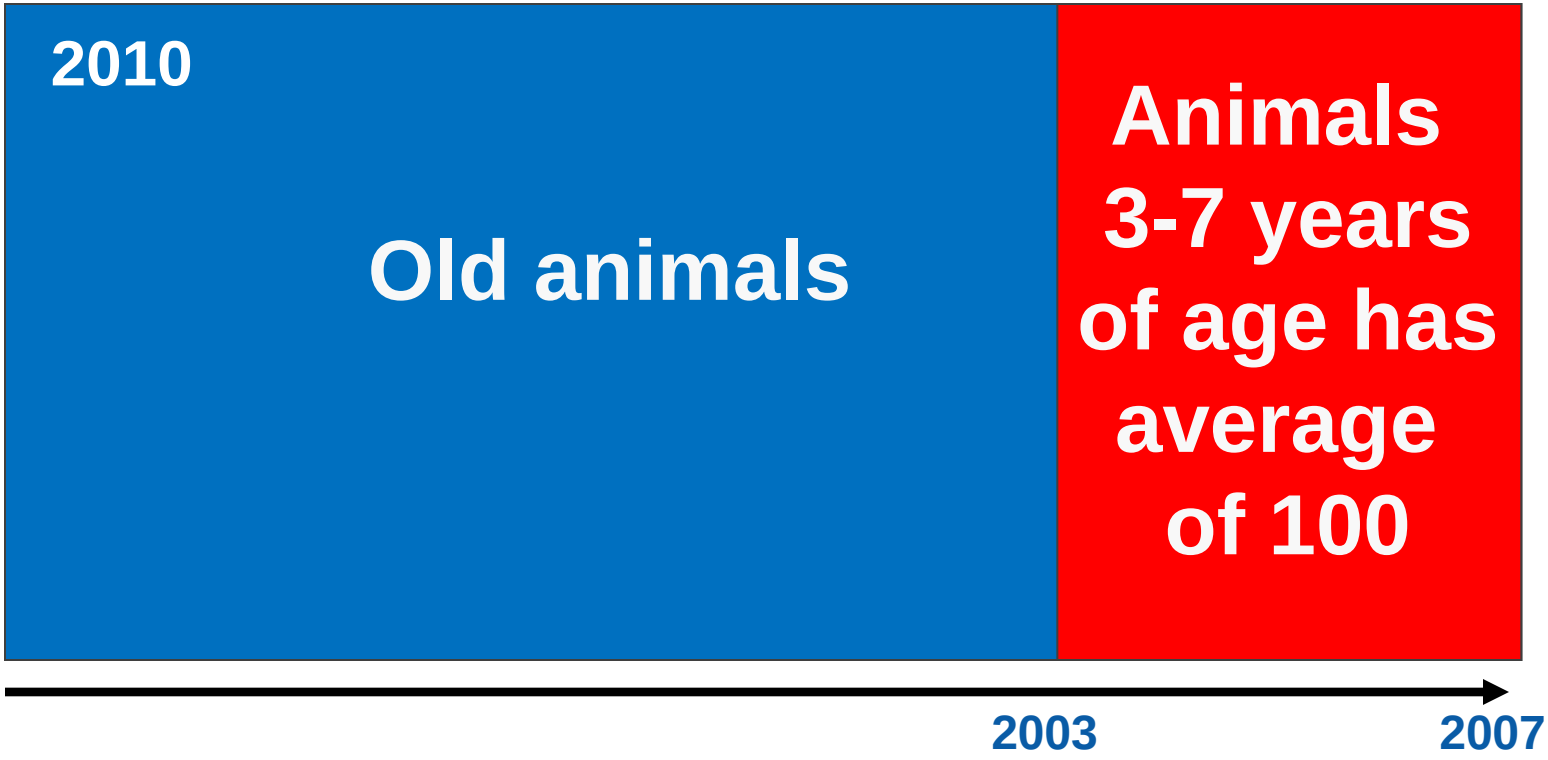
Indices for conformation

- Body conformation
  (Overall body conformation)
- Feet and leg conformation
  (Overall feet&leg conformation)
- Muscle conformation
  (Overall muscling conformation)
- Overall conformation
  (Overall body conformation, overall feet&leg conformation, overall muscling conformation)

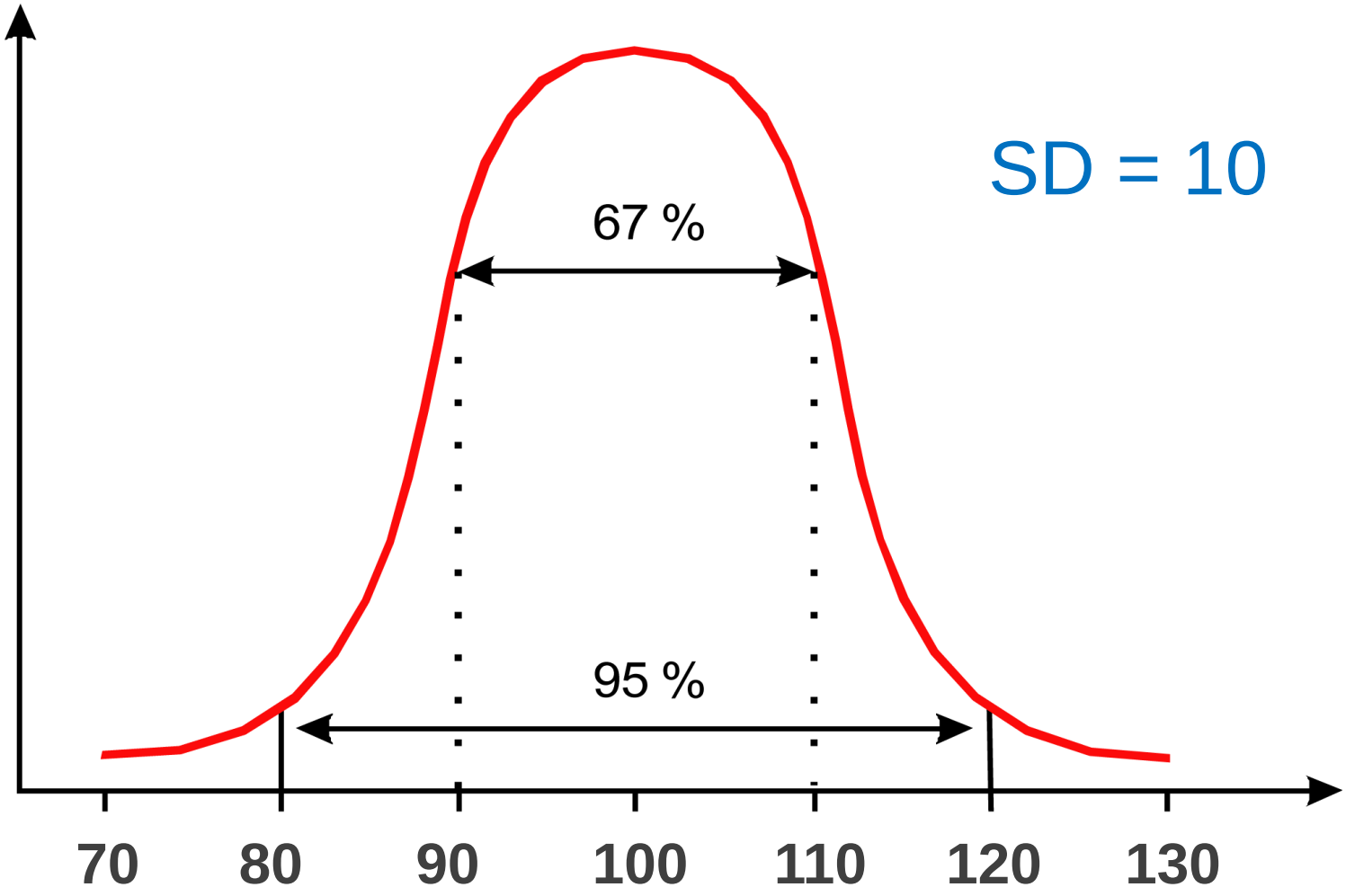
Indices in Denmark



Indices in Denmark



Indices in Denmark



How farmers use indices!

- Present population always have average 100
- Index above 110 - among 17% best
- Index above 120 - among 3% best
- Index above 130 - among 1% best

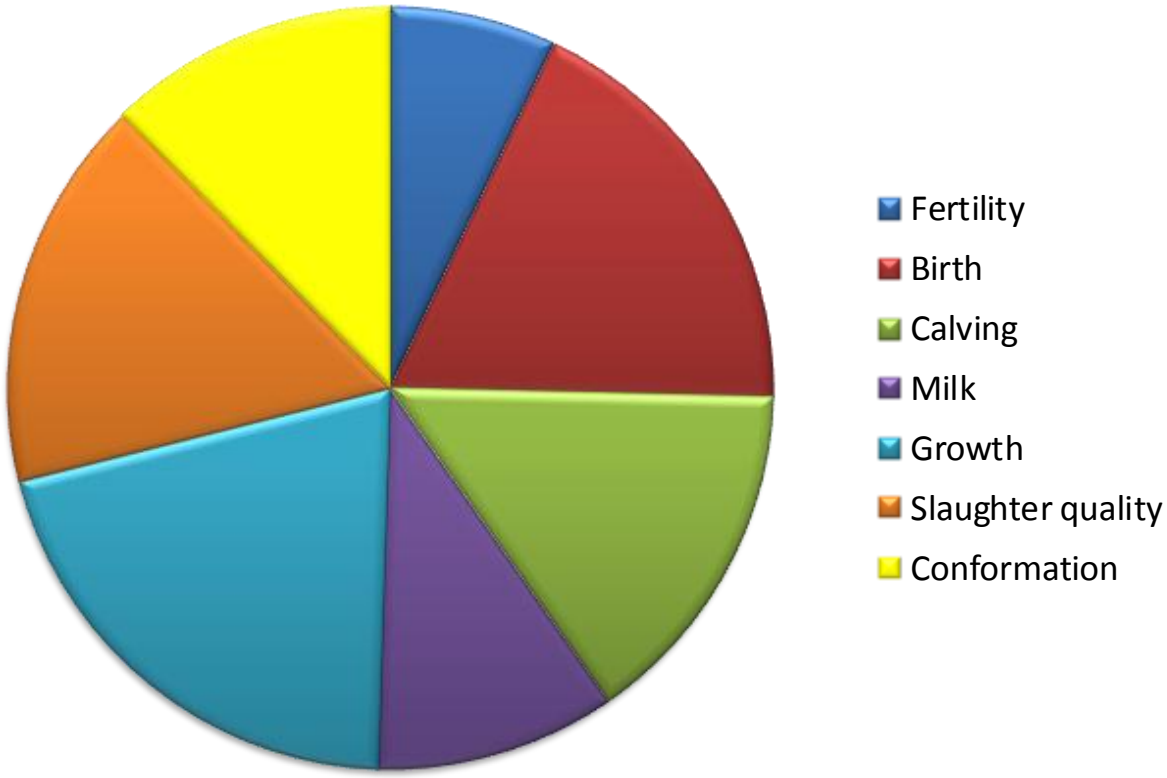
What bull give best economy?

Bulls	Bull A	Bull B
Fertility	95	110
Calving	100	110
Birth	80	120
Milk	95	130
Conformation	100	100
Growth	140	105
Slaughter quality	135	110

Total merit index

”The indicies are weighed together on the basis of a set of economic weigths. Weigths are based on economical and political considerations”

Composition of S-index for Limousin



Bull B gives best economy!

Bulls	Bull A	Bull B
Fertility	95	110
Calving	100	110
Birth	80	120
Milk	95	130
Conformation	100	100
Growth	140	110
Slaughter quality	135	115
S-index	120	128

Genetic trend for Limousin

Indices	Annual progress (index units)
Total merit/Conformation	1.5
Growth/Birth	1.0
Milk/Carcass quality	0.5
Calving/Fertility	0

From 2005-2012

Publication

- Four routine evaluation per year
- Indexes and total merit available for farmers and breed associations (printouts, files or web)

Breeding scheme

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Selection of top sires

- Decision done by breed association
  - S-index
  - Inbreeding
- Selected sires used for semen production
- Availability for farmers - VikingGenetics

Interbeef – international cooperation for beef

- Subgroup under ICAR
- Parallel to Interbull for dairy breeds
- International comparison of bulls based on raw data
- Nordic countries, France, Ireland, United Kingdom, South Africa, Spain, Czech Republic
- Started in 2008

Thank you for your attention!

Hope you all will have a good International Congress in Denmark