Elimination of Genetic Defects

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Things to discuss

- Genetic defects in dairy cattle
- Handling genetic defects in the breeding schemes
- Elimination
Genetic defects in the dairy breeds

- Holstein
  - CVM
  - BLAD
  - BY
  - (HH1, HH2, HH3)

- VikingRed
  - Shrimp gene (not lethal)
  - Spinal Muscular Antrophy (Liggekalv) - Brown Swiss
  - Spinal Dysmyelination (Medfødt lammelse) - Brown Swiss
  - (BH1) Brown Swiss

- Jersey
  - (JH1)
Types of defects

• Lethal versus “not lethal” defects
  • Most attention on lethal defects as they have both economic and ethical perspectives

• Lethal defects can also be divided into defects where:
  • A defective calf is born after normal pregnancy
  • The defective homozygotes will be aborted in early embryo stage
Handling in practice

• In Sweden we are not allowed to use carriers of lethal genetic defects

• In Denmark and Finland we have a controlled use of high-ranking carriers
  • Mainly to produce non-carrier sons for next generation
  • Try to avoid combination of carriers in mating
    • Have good tools in the mating programs
    • But not 100% safe as the defective gene can originate from ancestors far behind in the pedigree
Genetic defects in the breeding schemes

- All VikingGenetics bulls are tested for known genetic defects
  - Still not the recently detected haplotypes (HH1, HH2, HH3, BH1, JH1)

- VikingGenetics does not purchase any new carrier bulls of the known lethal defects
Elimination

- All known lethal defects will be eliminated over time
  - As no additional carriers are being purchased
  - The elimination will be most efficient in Sweden as no carriers are being used

- Future elimination strategy to discussion when we have more details regarding frequency of lethal genetic defects in the breeds

- More investigations regarding economic value of each defect
  - The financial consequences of short term elimination can be dramatic due to decreased genetic gain