Updating of NTM

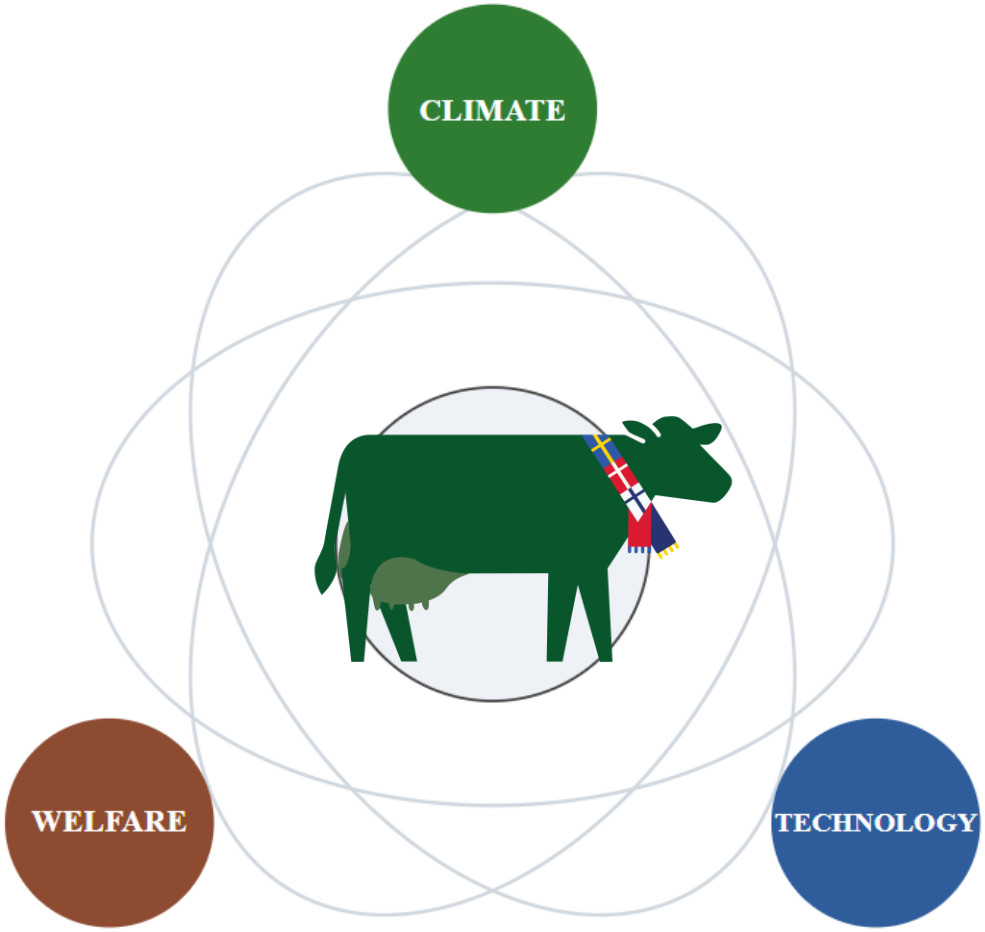
Future production circumstances – the next step

NAV communication

2026-04-21

Future cattle production – Nordic summary

Key drivers shaping future cattle production



Farm structure

- Fewer farms, but more cows per farm
- Higher investments needed on farms
- AMS share expected to increase
- Loose-housing / free-stall barns

- Some farms will be very big (e.g. 2,000 cows+)
- Some small, specialized farms, but most milk from large free-stall barns
- Strong regional differences are highlighted

Structural changes in cattle production

Use of sexed semen and beef semen

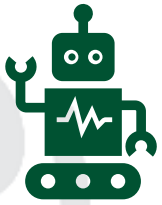
- **Sexed semen and beef semen both expected to increase**
- Proposal: 60% beef of the total number of inseminations.
  90% of dairy breed inseminations are X sorted.
- The share of embryos will increase, possibly including purebred beef embryos

Organic production

- Organic production expected to be unchanged or organic share may increase (depends on demand)

Technology & digitalisation

Digital Dairy Farming



More robots and automation

Sensors, cameras and AI

Individual cow-level data

- AI, sensors & imaging to track behavior, conformation, temperature & rumination
- AI-supported veterinary care & health apps enabling remote cow assessment (image-based, fewer vet visits)
- Ingestible sensors: early health alerts
- Smarter milking robots: e.g. improved teat handling
- Advanced milking analytics
- Automated robotic barn systems: feeding, manure handling, hoof trimming

Technology & digitalisation

Genetics & Smart Systems in Dairy Farming

- Gene technology, CRISPR
- Genetic markers to screen and exclude unsuitable bulls from breeding
- New embryo-based technologies
- Interconnected systems & AI integrating data and supporting decision-making

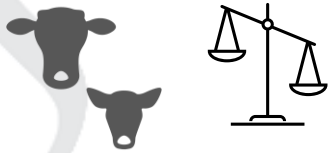
Regulation & license to produce

Nordic main picture:

- Stricter climate and environmental rules
- Higher animal welfare demands
- More reporting and documentation

Regulation & license to produce

Animal Welfare & Ethics



Stricter standards
- Grazing
- No tie-stall housing
- Polled animals

Natural behavior
- Cow–calf contact
- Mobility
- More space

Robust animals
- Healthy
- Long-living
- Minimal interventions

Control & safety
- Monitoring
- Transport rules
- Biosecurity

Regulation & license to produce

Climate, Environment & Resources

Tighter regulation of
- Methane
- Nutrients
- Biodiversity

Efficient use of resources
- Pressure for forage-based production
- Higher resource efficiency

Limits on resource use
- Irrigation
- Restrictions on water and inputs
- Regional differences

Documentation & responsibility
- Increased sustainability reporting
- Emission accountability

Regulation & license to produce

Farm structure & Preparedness

EU policies shaping
- Farm structure
- Land use

Security of supply
- Food security
- Self-sufficiency

Impact on:
- Farm expansion
- Generational transfer
- New farmers

Regulation & license to produce

Animal health & treatments

Stricter rules
- Antibiotic use
- Treatments

New diseases
- Higher biosecurity requirements
- Regional differences

Digital health tools
- Growth in AI-supported veterinary care
- Remote diagnostics

Regulation & license to produce

Reproduction & Technology

Updated regulations on reproductive technologies

Increased use of monitoring and sensors

Data integration and precision farming

Technology driving better decisions

New traits

Health, Survival & Robustness

- Disease resistance, robustness & resilience
- Cow mortality / cow survival
- Heat / cold stress tolerance
- Calf health, colostrum quality

Climate & Adaptation

- Methane reduction & climate impact
- Ability to adapt to changing environments

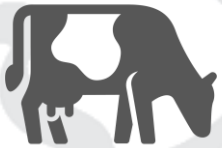
Ability to cope & recover

New traits

Production, Function & Behavior

- Milk solids (more and specific)
- Temperament (robot, handling, herd)
- Ability to function in robotic systems
- Milkability & flow rate (”box time”)
- Udder leakage (improved recording needed)

New traits



Efficiency & Sustainability

- Feed & forage efficiency
- Protein efficiency
- Water efficiency
- Sustainability & grazing-related traits

Emerging & Advanced Traits

- Weight development over lactation & body size optimization
- Meat quality (marbling)
- Genetic diversity, epigenetics, & future breeding methods

Traits that are not directly priced in the economic model today

- Polledness
- Milk proteins: β-casein (A2A2) & κ-casein (BB)
- Methane emissions (country differences)
- Body size (optimal frame – avoid too large/small animals)
- Genetic defects
- Coat color
- Genetic diversity
- Low stress levels & behavioral traits

Thanks for listening!

Questions?