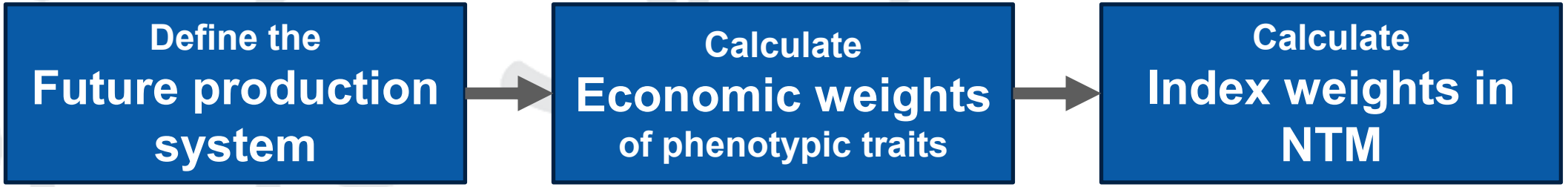
NTM revision 2028
The future production system
- inputs and adjustments

Julie Clasen

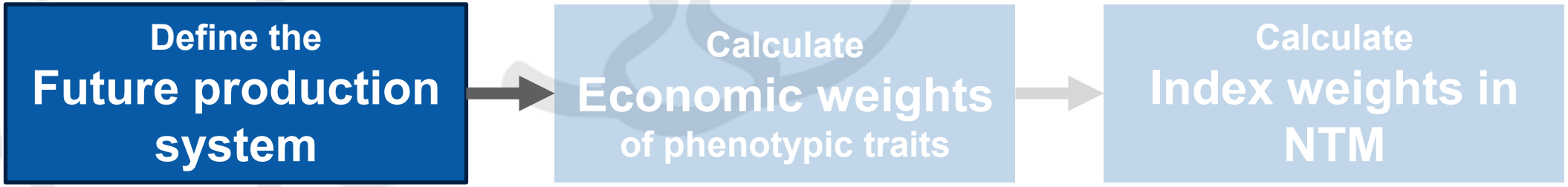
NAV NTM Revision Webinar: Future Production
Follow-up and Next steps

17 November 2026

Technical framework of the NTM update



Technical framework of the NTM update



Why do we need to define a future production system?

→ *To make sure the weighing of the traits in NTM (i.e. the breeding goal) lead to cows that are economically suitable for that system*

Technical framework of the NTM update

Define the Future production system → **Calculate Economic weights of phenotypic traits** → **Calculate Index weights in NTM**

Spring 2026:
Gather input from breed organizations and elected representatives within breeds

Summer 2026:
Compile all input and make a proposal for the definition of the future production system (sent out **August 2026**)

Fall 2026:
Receive feedback from breed organizations and elected representatives within breeds (incl. **today's webinar**)

End of 2026:

Final approval from the NAV board

Input from stakeholders (9 topics)



Herd size



Organic production



Technology and automation



Feeding scheme



Sexed – and beef semen



Genotyping



Monogenetic traits



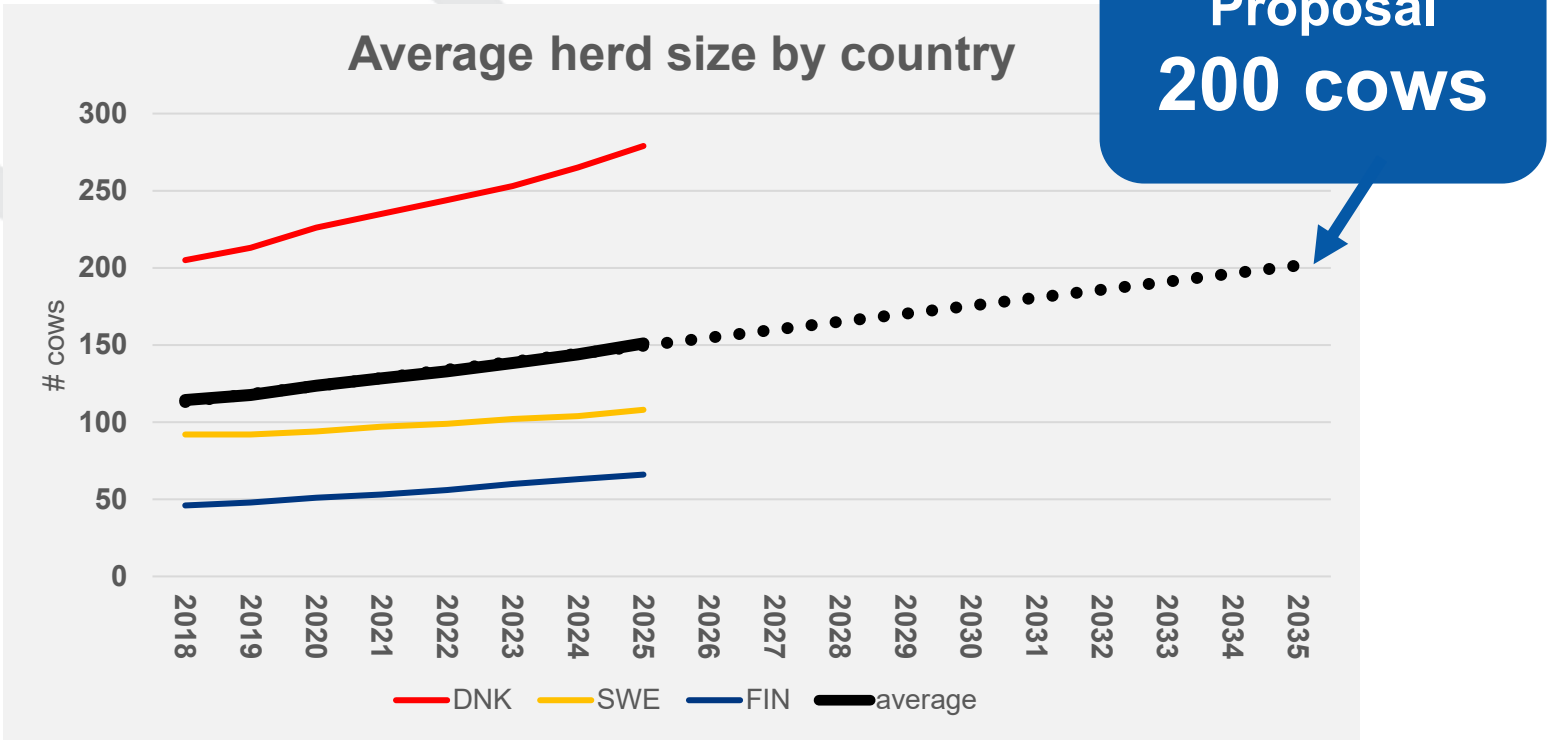
Climate and environment



Animal welfare and health

Herd size

- Larger herds
  - Especially in DNK



Organic production

- **Probably not increasing much**

Proposal
15% organic production
Same as in NTM 2018

Actual organic distribution in NTM 2018:
HOL and RDC: 0%
Jersey: 30%

- **Stable proportion of organic milk production between 2016 and 2024 (EU statistics)**
  - **DNK ~11%**
  - **SWE ~12%**
  - **FIN ~2.5%**

Technology and automation

- More technology, automation, AI, data…
  - Breeding level, cow level, farm level, sector level…

- Increased % of cows in AMS between 2018 and 2025
  - DNK: 20% → 29%
  - SWE: 40% → 54%
  - FIN: 32% → 62%

Proposal

Technology and automation



Marginal labor costs are reduced because of automation



The frequency of severe diseases is reduced because of early detection



Cost of poor fertility is reduced through better detection of heat and **higher conception rates** due to better timing of insemination



Feed efficiency is increased through better feed intake measurements and precision feeding technology



Milk production increases with more automated milking systems, where cows are milked more frequently

Feeding scheme

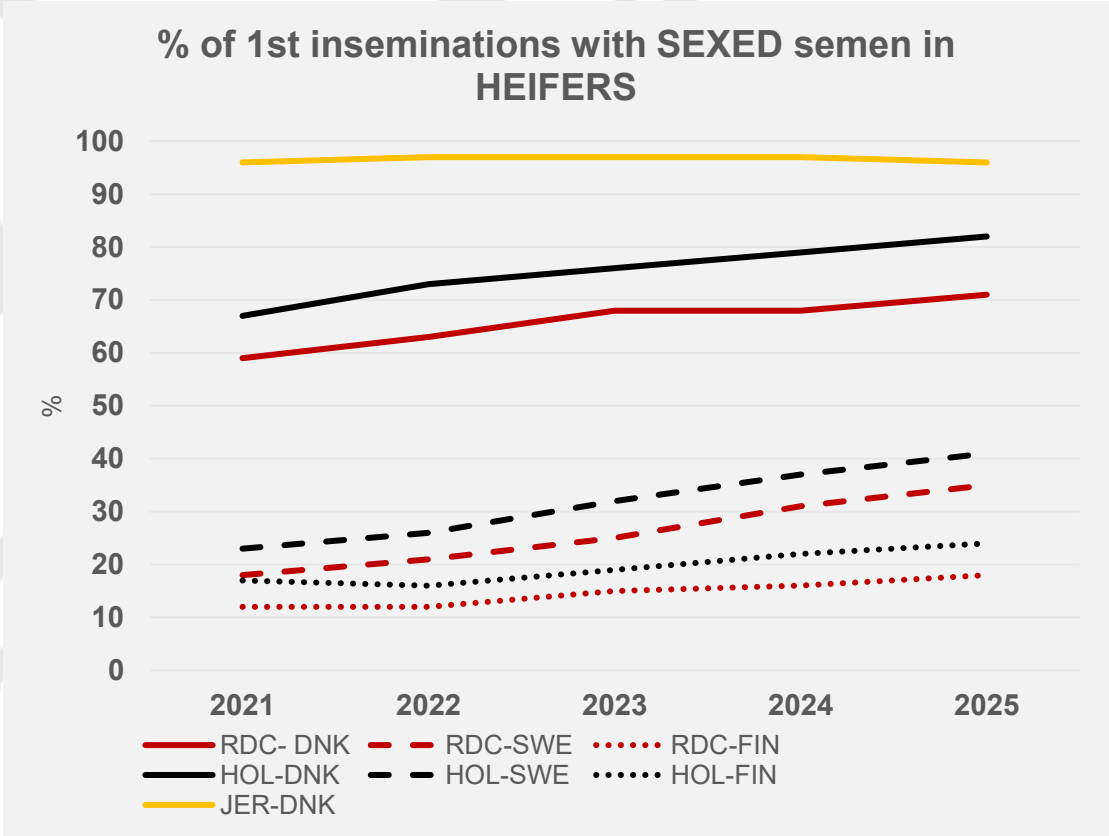
- **General focus on grazing and grass-based roughage**

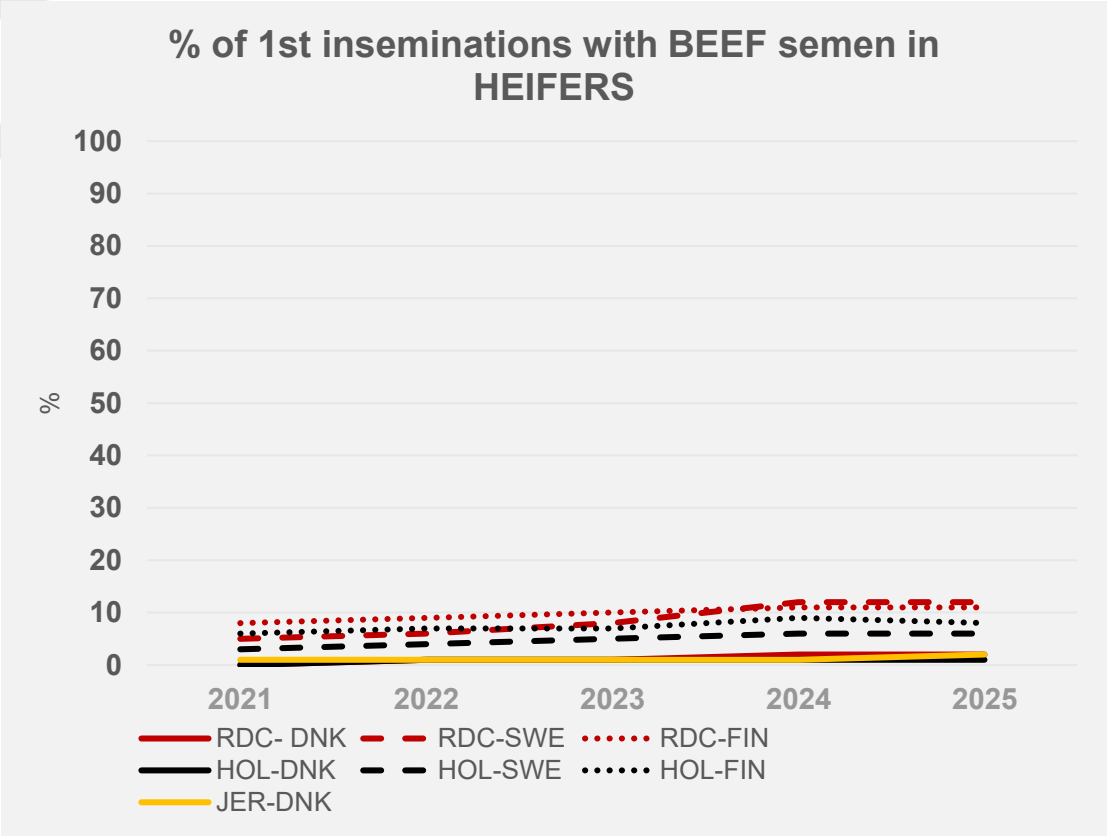
Predictions from feed experts:

- **Sweden:** (no changes according to experts)
  - Feedback: slightly less pasture and more roughage
- **Finland:** slightly lower proportion of roughage and grazing (conv.)
- **Denmark:** much more grass silage and less maize silage

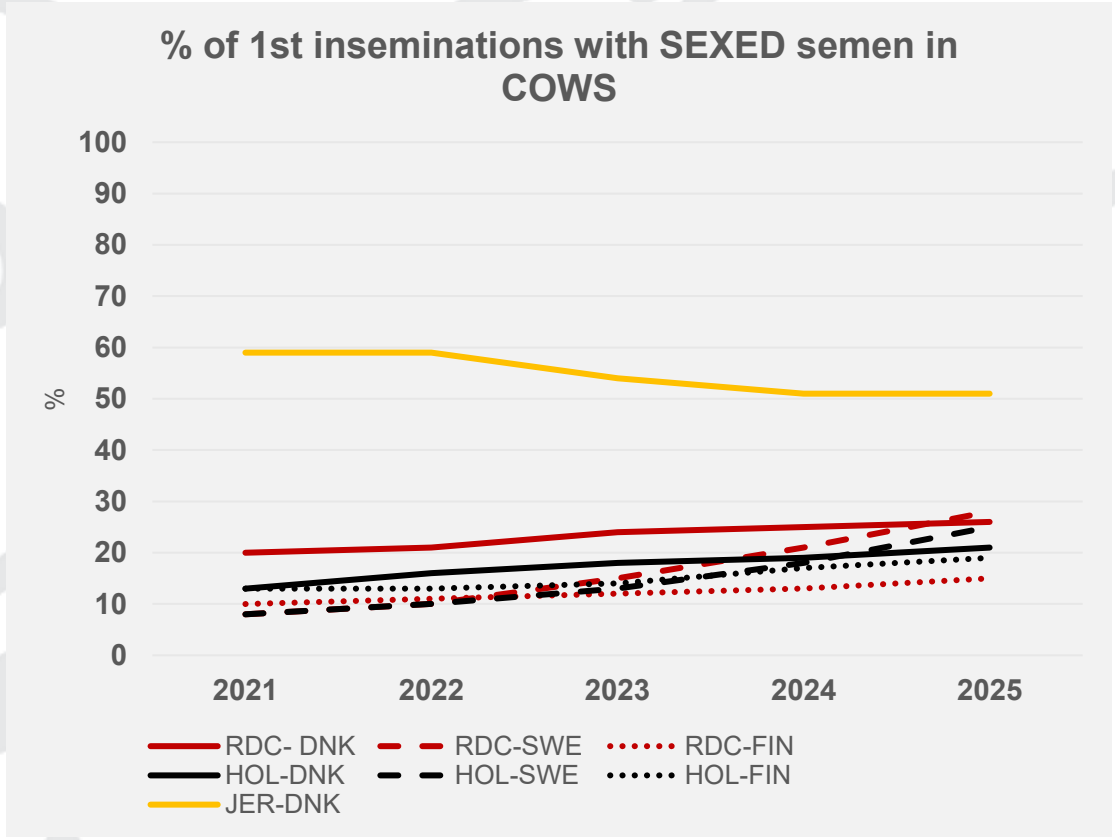
Proposal

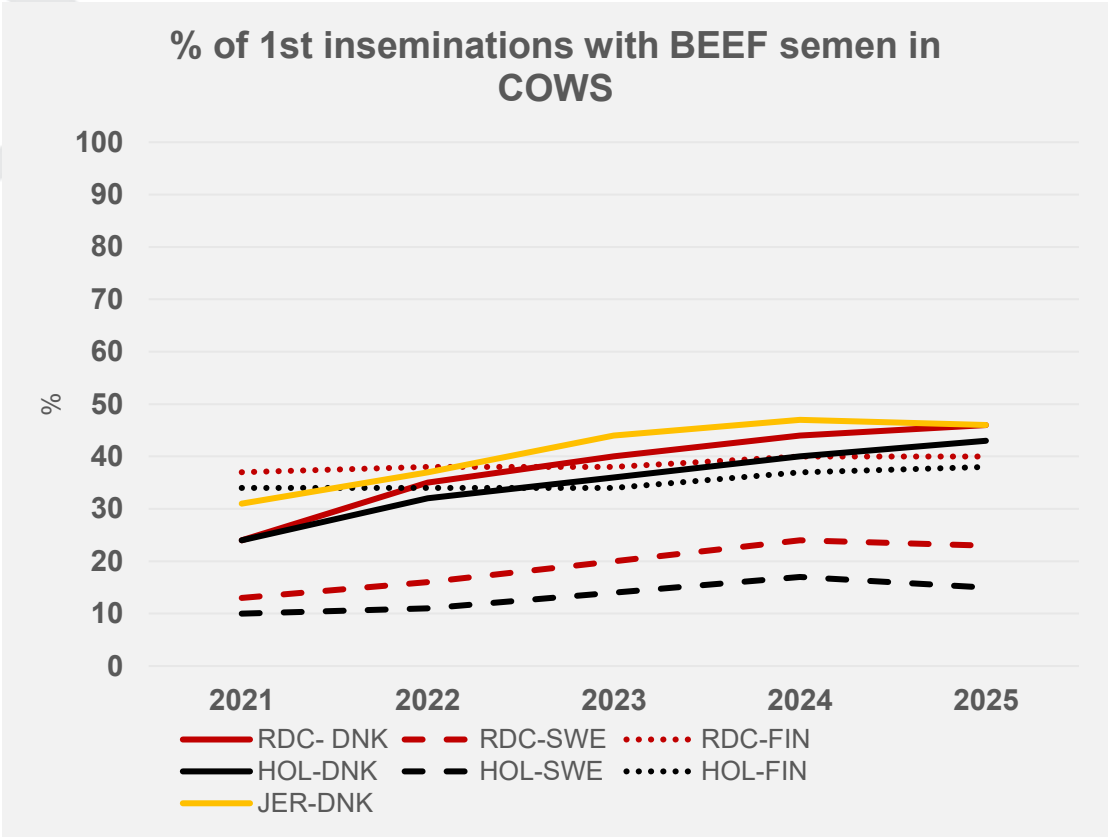
Sexed – and beef semen





Sexed – and beef semen

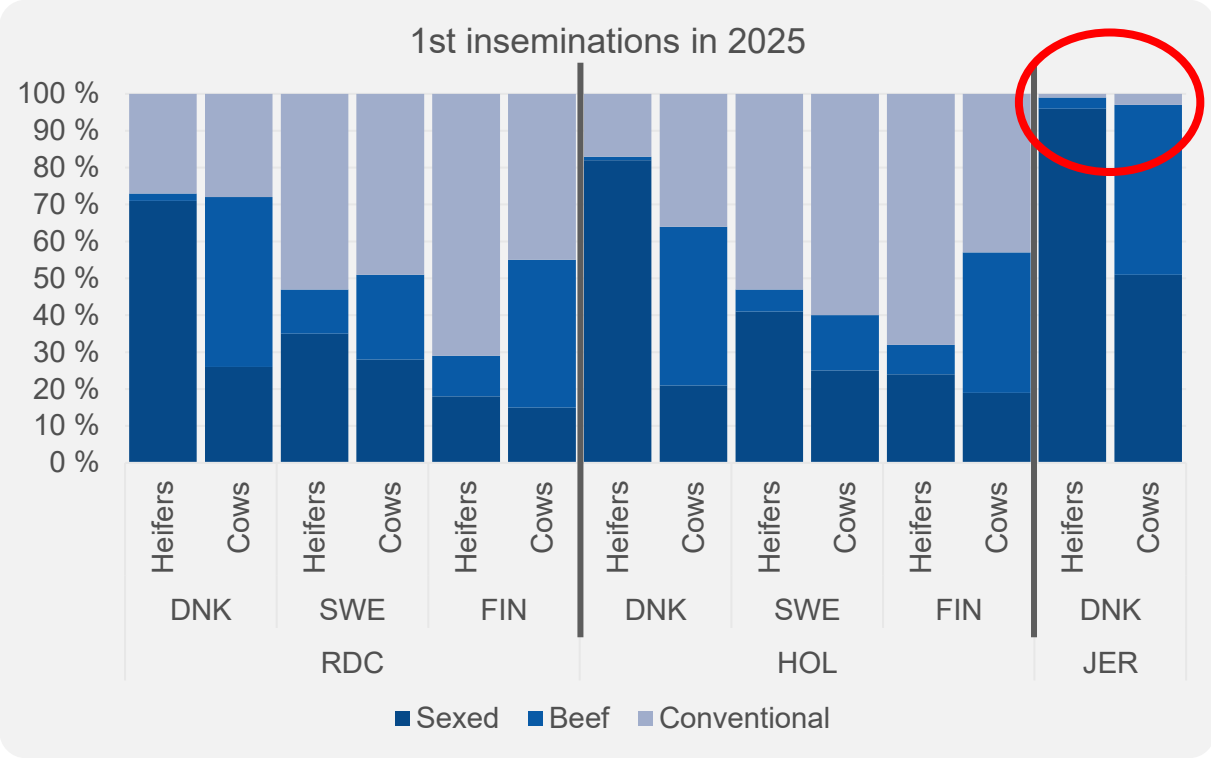




Proposal

Sexed – and beef semen

- Maximize the use of sexed – and beef semen
- Maintain herd replacement
  - 32% replacement rate (NTM 2018)
- Little use of conventional dairy semen
  - Jersey 0%

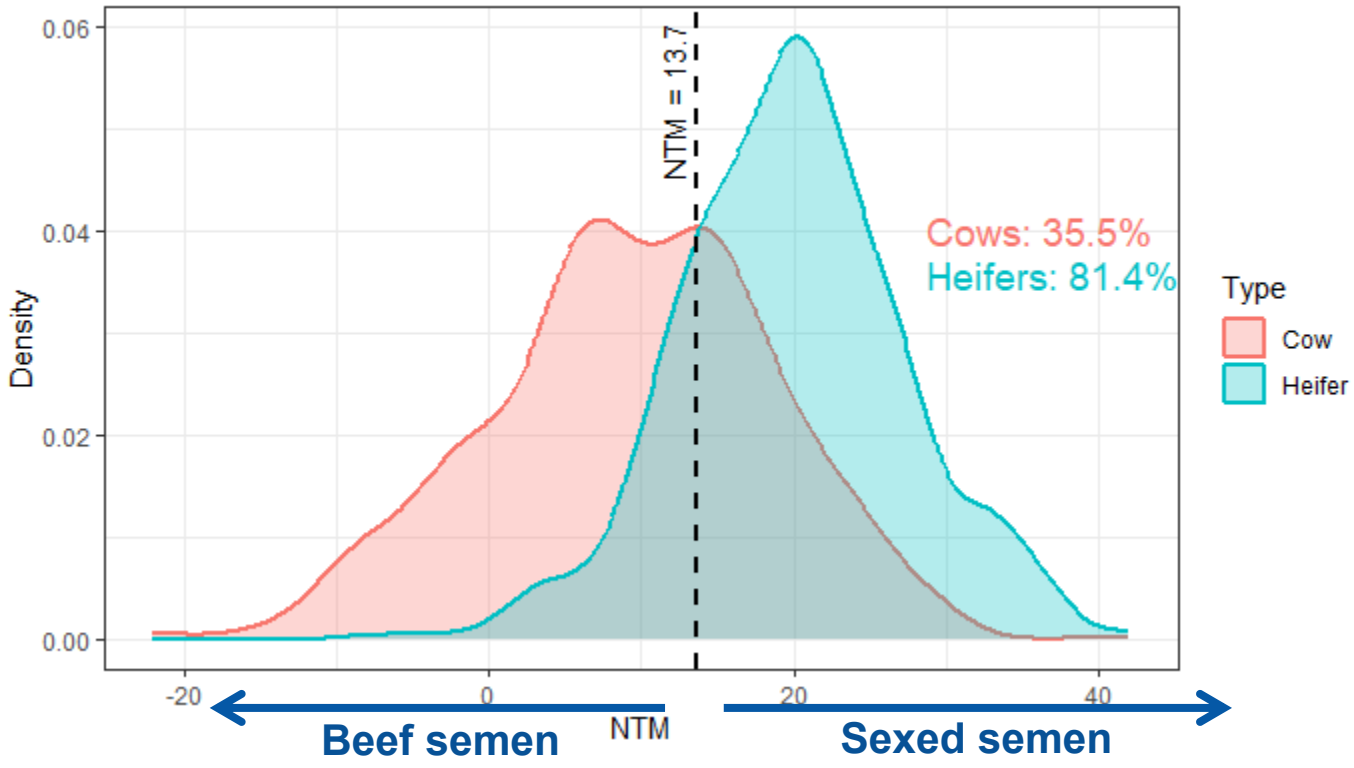


Proposal

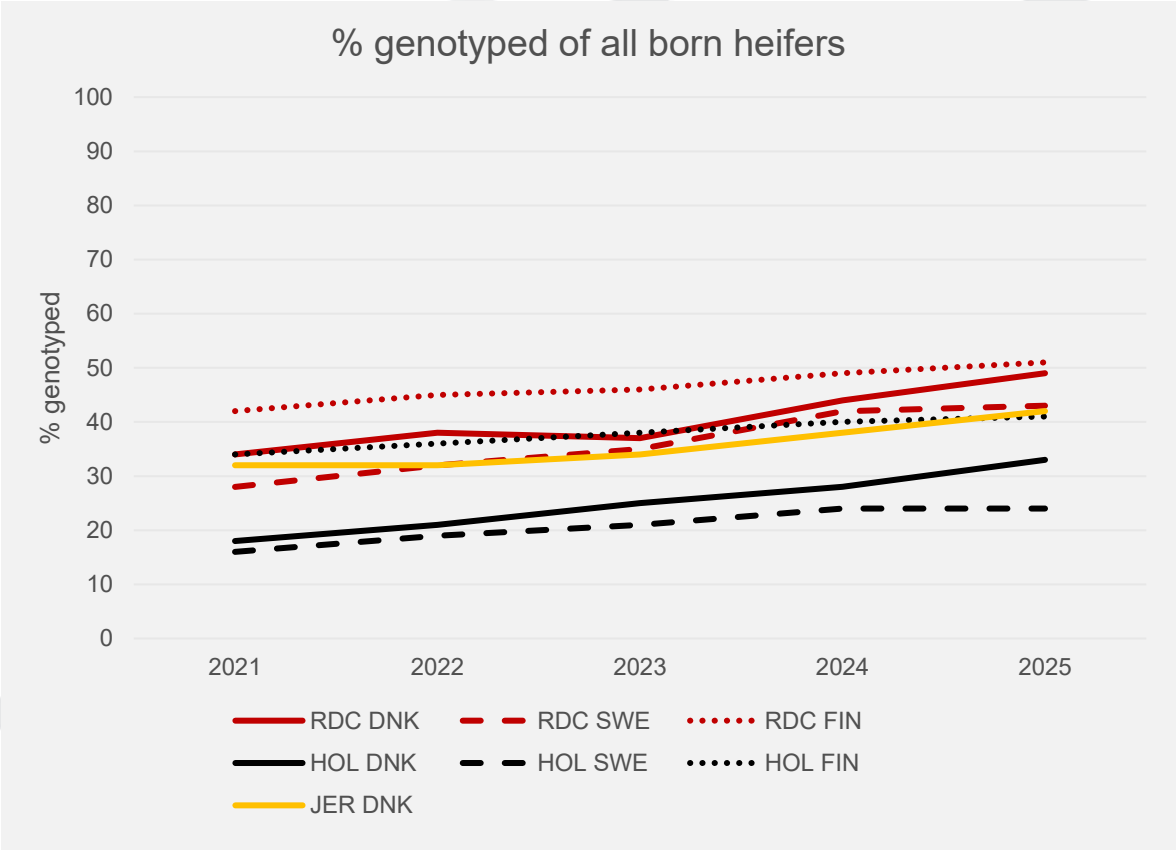
Sexed – and beef semen

- **Maximize - and optimize - the use of sexed – and beef semen**
- **Reflect selection of the genetically best females**
  - **Sexed semen in cows**
  - **Beef semen in heifers**
  - **Sexed beef semen in cows**

Example of the NTM distribution in cows and heifers in a large Danish Holstein herd



Genotyping



Proposal

90%

of all born heifers are genotyped

Feedback:
Sweden proposes 75% for Holstein

Genotyping – how to include it?

Included as a cost





From 2027, Arla rewards 0.08€/kg FPCM to farmers where ≥70% of 1st parity cows are genotyped

Monogenetic traits

- Mainly polledness, A2A2, beta-casein, and coat color were discussed

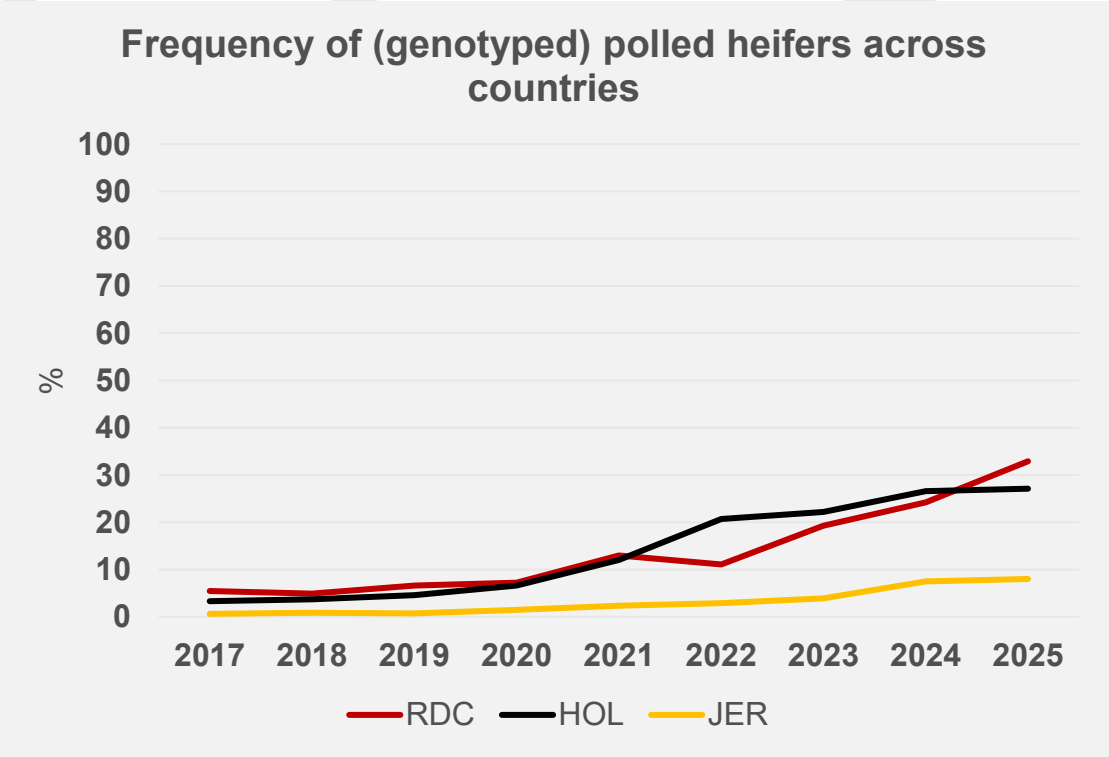
Monogenetic traits

- Mainly **polledness**, A2A2, beta-casein, and coat color were discussed

Economic and political* (and societal?) importance

*By 2031 dehorning will no longer be practised in organic farms in Denmark

Polledness



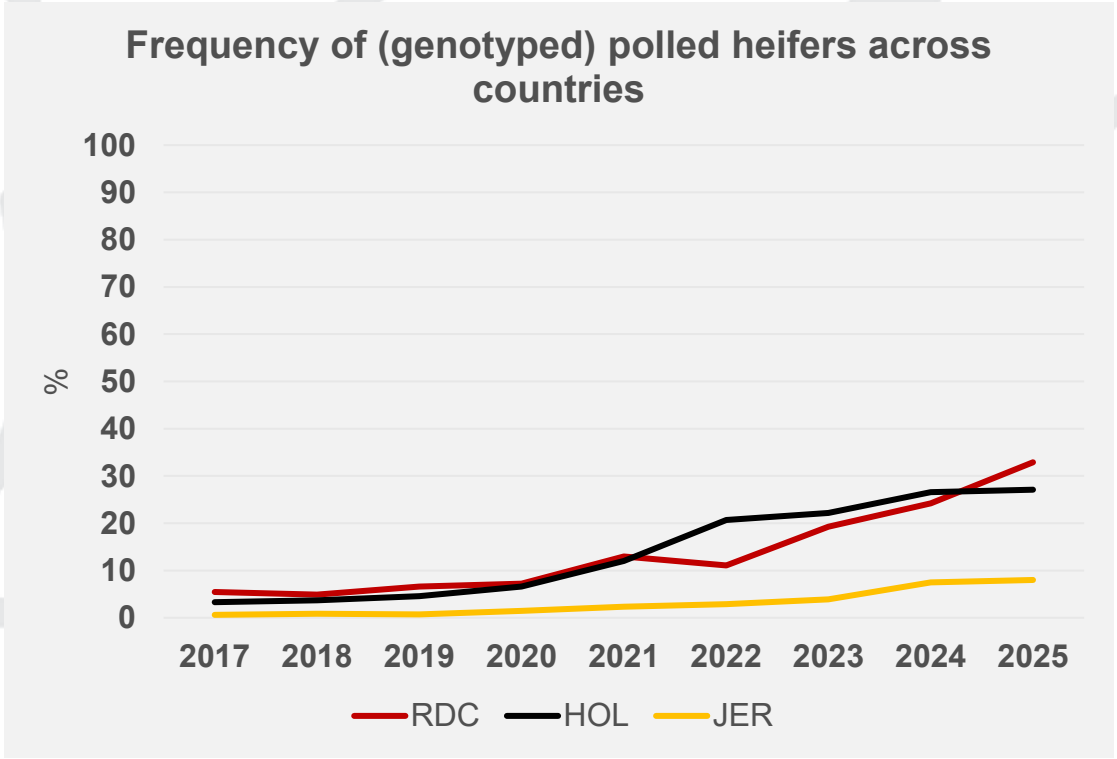
Proposal

50%

Polled dairy calves

Feedback:
Sweden suggests 60%
Danish Jersey has an ambition of 100%

Polledness (beef x dairy)
– Sweden and Finland only



~30% polled dairy cows
x
~90% polled beef bulls*

≈ 85% polled beef x dairy calves

Proposal

Feedback:
Sweden suggests 95%

*Based on beef bulls born between 2018 and 2025 being “Carrier, P” (heterozygote) or “Carrier, PP” (homozygote) for the Polled genetic trait. https://nordic.mloy.fi/NAVBeef/ (Beef x Dairy)

Polledness – how to include it?

- **Include a cost of dehorning**

- **Consider adding polledness as a trait in NTM?**
  - Not-so-straight forward…
  - **We are looking into it! ☺**
  - Opportunity to include more monogenetic traits in the future

Climate and environment

Increasing importance in all three countries

No economical support from financial stakeholders on the genetic impact on climate and environmental effects

Proposal

Breeding for NTM[1] or improving health, fertility, and longevity[2] indirectly reduces methane emissions!

[1]**Voergaard et. al (2024)**, Higher NTM leads to less methane, https://nordicebv.info/wp-content/uploads/2024/02/Higher-NTM-give-less-methane.pdf
[2]**Clasen et al. (2024)**, Effects of herd management decisions on dairy cow longevity, farm profitability, and emissions of enteric methane – a simulation study of milk and beef production, Journal of Dairy Science, https://www.sciencedirect.com/science/article/pii/S1751731123003683

Animal welfare and health

Increasing societal demand from improved health and welfare

Cow resilience and mortality not used in breeding evaluations
– will not be included in this process of NTM

More focus on the current health and welfare traits + polledness

Proposal

NEW ADDITIONS TO THE PROPOSAL

In comparison to the current NTM (2018 edition)

About slaughter calves

- Distinguish beef x dairy heifers from bulls



- More Danish dairy bulls and B x D bulls slaughtered < 12 months (85-95%*)
  - In 2018, 50% was considered slaughtered < 10 months



- B x D heifers slaughtered > 12 months
  - Used for grazing in nature preservation

NAV *based on data on calves slaughtered in 2025 used in NBDI evaluation

Include incentive pricing models





Danish Crown



?????

Updated feed intake predictions

- From SFU to Norfor system
- Implement economic calculations on Saved Feed in the NTM model
  - Before it was an ”add-on”

Summary – and time for comments/questions

Larger herds – and few organic herds

Improved management on reproduction, health and production due to technology and automation

More grass and roughage in feeding schemes

Maximized and optimized use of sexed – and beef semen

Include genotyping

Include polledness

More focus on current welfare and health traits

No direct economic values on climate and environmental effects

More specified calculations on bull - and beef x dairy calves

Include incentive pricing models

Update feed intake predicitions and include Saved Feed in the NTM model

SENSITIVITY ANALYSES

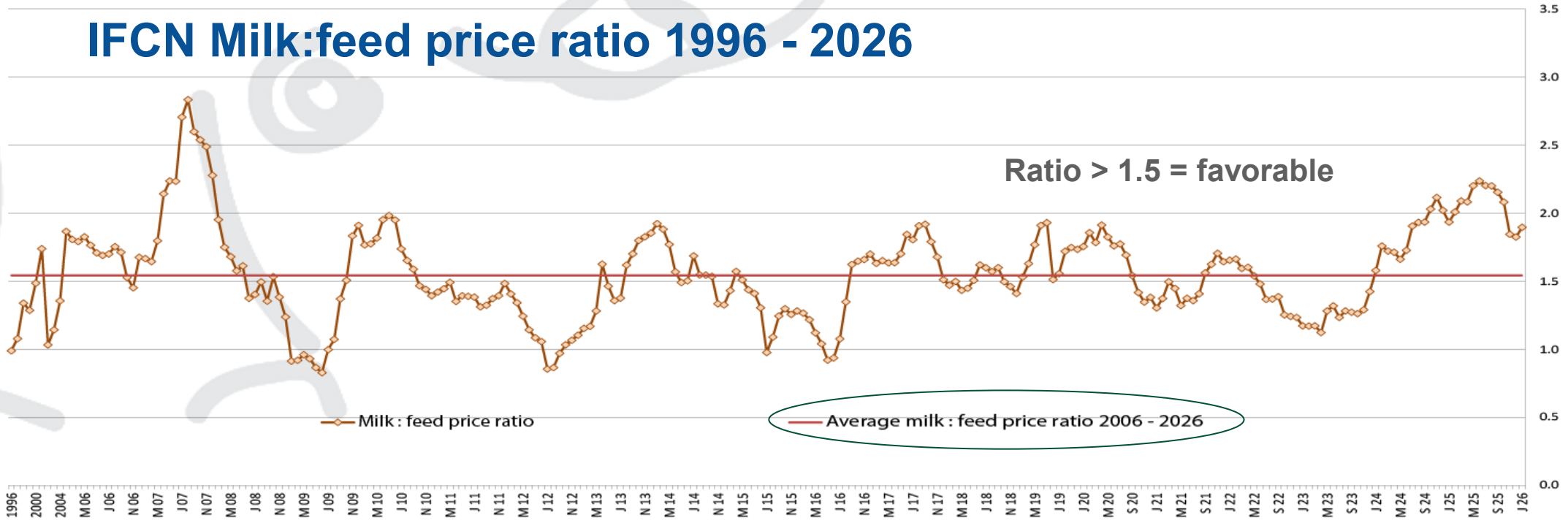
Suggestions for NTM 2028

What is a sensitivity analysis?

- How sensitive are the economic values to changes in the assumptions?
- Tells us about the robustness of the long term breeding goal
- Dramatic changes can be caused by:
  - New national (or EU) rules and legislation
  - Sudden market changes due to war, natural disasters, extreme weather conditions, epidemic disease outbreak etc.



The economy is fluctuating, but stable in the long term



https://ifcndairy.org/about-us/ifcn-dairy-research-network-method/

Sensitivity analyses made in 2018
- economic assumptions*

- **Milk price (+/- 10%):** milk production, fertility and longevity
- **Feed price (+/- 10%):** growth, calving, fertility and young stock survival
- **Beef price (+/- 10%):** growth, calving, fertility and young stock survival

Saved feed was not included, but will be, and might be affected in new analyses

- **Vet. costs (+/- 10%):** none (<10% health traits)
- **Labor costs (+/- 10%):** conformation traits

2028: also include sensitivity on the cost of genotyping and dehorning

*Traits where the sensitivity analysis changed the economic value by 10% or more (some differences between breeds)

Sensitivity analyses made in 2018
- biological and management assumptions*

- **Proportion of sexed semen:** none (<10% growth, calving, youngstock survival)
  - **2028:** Different breeding scheme setup – should consider a different type of sensitivity analysis, e.g. on using conventional semen, sexed beef semen, etc?
- **Replacement rate:** calving, fertility, youngstock survival
  - **2028:** Could do the same type of analysis
- **Health agreement schemes:** none (<10% health traits)
  - **2028:** Exclude it…?
- **Killing of Jersey bull calves:** growth, calving, fertility, longevity, youngstock survival
  - **2028:** Exclude it. We are already almost avoiding bull calves by not considering any conventional semen. Also killing them is not allowed anymore.

*Traits where the sensitivity analysis changed the economic value by 10% or more (some differences between breeds)

Sensitivity analyses – additional in 2028
- biological and management assumptions

- Proportion of polled calves
- Proportion of genotyped heifers
- …?

- There is still time to decide ☺

Any comments or questions?