Brush up NTM questions from May 2022 - focus saved feed, sexed semen and beef semen

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Nordic Total Merit Index

Brush up

- Replacement rate
- Use of sexed semen(SS)
- Use of beef semen(BS)

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NTM

Replacement rate

- Replacement rate is essential for the possibilities to use beef semen in a dairy herd. When NTM was reviewed in 2018 it was assumed that future replacement rate would be 32%.

Conclusions from group work 19.5.2022

- RDC and HOL still think a replacement rate of 32% is a relevant future goal.
- Jersey has a replacement rate close to 32% today and would like to get the effect of lower replacement rate (25% and 30%) on NTM analyzed.

Suggested NAV action

- ***Analyze effect of lower replacement rate (25% and 30%) for Jersey***

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The use of sexed dairy and beef semen in the future

Assumption behind current NTM is that:

- 23% of all inseminations are done with sexed dairy semen,
- 35% with conventional dairy semen,
- 42% with conventional beef semen,
- 0% with sexed beef semen

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Why is it beneficial to beef semen

- X sexed dairy semen
  - Replacement heifer from genetically best dam – economic effect genetic improved replacement heifers
- Beef semen used on dairy cows
  - Slaughter value BXD offspring higher than pure dairy bull calves

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BXD offspring versus pure dairy bull calves

	DNK*	SWE*	FIN*
Extra sales price bull calf BXD	+ 650 DKK	+500-800 SEK	+80-100 euro
Extra sales price heifer calf BXD	+250 DKK	+250-500 SEK	+40-50 euro
Extra beef prices BXD	+2 DKK/kg	+1,5 SEK	+0.13 euro pr kg
Extra daily gain BXD	Gross gain +100 g/day; Net gain +90 g/day		
Kg dry matter per kg gain	+ 10%		

*national information

In all countries:

- BXD live calves are paid extra
- Euro classification higher – higher payment per kilo
- Additional extra daily gain – faster growth

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Extra value BXD offspring versus pure dairy bull calves

- Total value can be increased further by use of Y-sexed beef semen, depending on costs for Y-sexed semen and reproduction results

Future use of Y-sexed beef semen should be considered in NTM upgrades

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Production of surplus heifers for export

- Intense use of X-sexed dairy semen
  - Surplus of heifers for export
  - Export markets are very sensitive
  - Might be beneficial for single farmers but not a safe and realistic approach for the whole sector.

Should not be considered in NTM upgrades

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Conclusions from group work 19.5.22

HOL, RDC and JER: Use of beef semen on heifers might increase slightly in SWE and FIN (mainly Angus and Herford semen), so far not practice in DK

Jersey use already more sexed dairy semen and sexed beef semen than assumed in current NTM – Jersey future expectation is that nearly all used semen is sexed dairy or sexed beef semen.

RDC and HOL expect future use of male sexed beef semen to increase in DK and SWE, but not in FIN because current beef pricing system does not support it (do not match with information about calf prices)

Suggested NAV action

Analyze the effect in NTM of a significant use of sexed beef semen (e.g., 25%, 50% or 100% of the used beef semen)

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Which traits in NTM are affected by use of SS and BS?

- Dairy beef production traits: Growth and Form
- Female fertility (for sexed semen and beef semen leads to lower conception)
- Calvings traits – survival and calving ease
- Youngs stock survival

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Group work to revisit the following questions

- Future replacement rate
  - 32% HOL and RDC (as behind current NTM)
  - 32% JER (current NTM) – look at alternative 25% and 30%
- Use of beef semen

- Used of sexed semen
  - Dairy heifers

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Assumptions on use of Replacement rate, SS and BS in 2018 TMI-model, %

	Across breeds	Comments
Replacement rate	32	Jersey ↓
Pct sexed dairy semen in heifers 1st ins.	>90%	
Pct sexed dairy semen in cows 1st ins.	10%	
Pct conventional beef semen in heifer	0%	?
Pct conventional beef semen in cows	42%	
Pct male sexed beef semen in cows	0%	To consider future

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Saved feed

Important to consider due to:

- **Feed costs**
- **Climate impact**

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Saved feed

$$EBV_{Saved\ feed} = EBV_{Maintenance} + EBV_{Metabolic\ efficiency}$$

- **Maintenance:**
  - **Metabolic body weight - live weight of cows from practice**
- **Metabolic efficiency:**
  - **Feed intake – data from CFIT herds and research herds**

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Saved feed

$$EBV_{Saved\ feed} = EBV_{Maintenance} + EBV_{Metabolic\ efficiency}$$

- The economic value of a saved unit of dry matter is the same whether the value is saved from maintenance or metabolic eff.
- EBV maintenance is more reliable than EBV metabolic due to significant larger amount of data

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Maintenance - today

Goal trait:

- Live weight (scale and tape measurements)

Indicator traits:

- Stature
- Body depth
- Chest width

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Maintenance – end of 2023

Goal trait:

- Live weight (scale and tape measurements)

- **Indicator traits**
  - Stature
  - ~~Body depth~~
  - ~~Chest width~~
  - Carcass weight

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Maintenance

- Larger cows require more energy for maintenance
- EBV maintenance is highest for cows with lowest weight
- Stature, Body depth, and Chest width are all positively correlated to body weight
- EBV maintenance is negatively correlated to Stature, Body depth, and Chest width – the negative correlation to Body depth, and Chest width will be slighter lower when the two traits no longer are used as indicator traits

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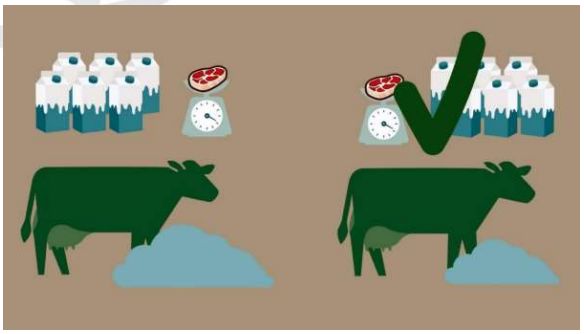
Metabolic efficiency

- Same milk production and weight of cows
- The cow on the right eats less feed and is more efficient
- *Investigations ongoing to improve the definition of the trait*



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Metabolic efficiency
Data in genetic evaluation, NOV22

	HOL	RDC	Jersey
Cfit	2896	2116	1657
Nordic Research farm	1227	769	-
International research farm	1581	-	-

Quality of CFIT same as research farm data
h^2 about 15% as expected

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Economic weights for saved feed

	HOL	RDC	JER
Proposed in 2020	0.18	0.23	0.18
Decided in 2020	0.08	0.13	0.18

NTM analyses conducted for RDC and HOL with current and proposed weights – see handouts

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Saved feed

$$EBV_{Saved\ feed} = EBV_{Maintenance} + EBV_{Metabolic\ efficiency}$$

- The assumption about the size of the genetic standard deviation of maintenance and metabolic eff. is important when combing the two EBVs in Saved feed
- The genetic standard deviation is estimated with some uncertainty for metabolic eff. due to amount of data
- The effect of assuming twice as high genetic SD on Metabolic eff. has been analyzed (a wish from both RDC and Holstein to see the effect)

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Saved feed analyses for all 3 breeds

$$EBV_{Saved\ feed} = EBV_{Maintenance} + 2x\ EBV_{Metabolic\ efficiency}$$

- Overall picture the same, but Saved Feed is slightly less correlated to body traits (see handouts)