Breeding for Cow–Calf -Contact Systems

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ANAFIBJ Cremona, Lombardia region

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ANAFIBJ in numbers

- 3 Herdbooks (Holstein, Brown Swiss and Jersey)
- ≈ **10.000** members
- **> 1.100.000 registered cows**
- ≈ **800.000** young stock

- 27 employes
- 6 bianconero magazine /year
- 70 breeding values
- 49 runs/year

Records processed (2023)	Numbers
Pedigree data-records	20,863,419
Cow lactation records	32,822,933
Evalutaiotn Scoring records	11,287,374
Cows changing herds	2,769,903
Grade animals	15,851,240
Managment herd registration	58,379
Cow's Insemination records	69,991,452
Genealogical Certificate	5,142

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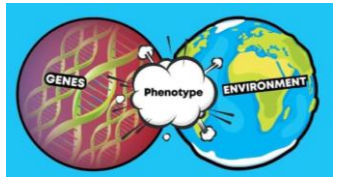
State of the art

- **Conventional System** → Artificial rearing
  - Calf separated from dam immediately after birth
  - Calf fed milk from a bucket
  - Increasing public & scientific concern about welfare

- **Shift in Interest** → Growing attention toward Cow–Calf Contact (CCC) systems:
  - Dam-calf contact
  - Foster-cow contact
  - Other hybrid systems

Genetic Progress?

PHENOTYPE = GENOTYPE + ENVIROMENT + GENOTYPE*ENVIROMENT



GENETIC PROGRESS IN PERMANENT

Genetic gains are cumulative and irreversible — once favorable genes are incorporated into a population through selection, the improvement remains in future generations (unless actively selected against).

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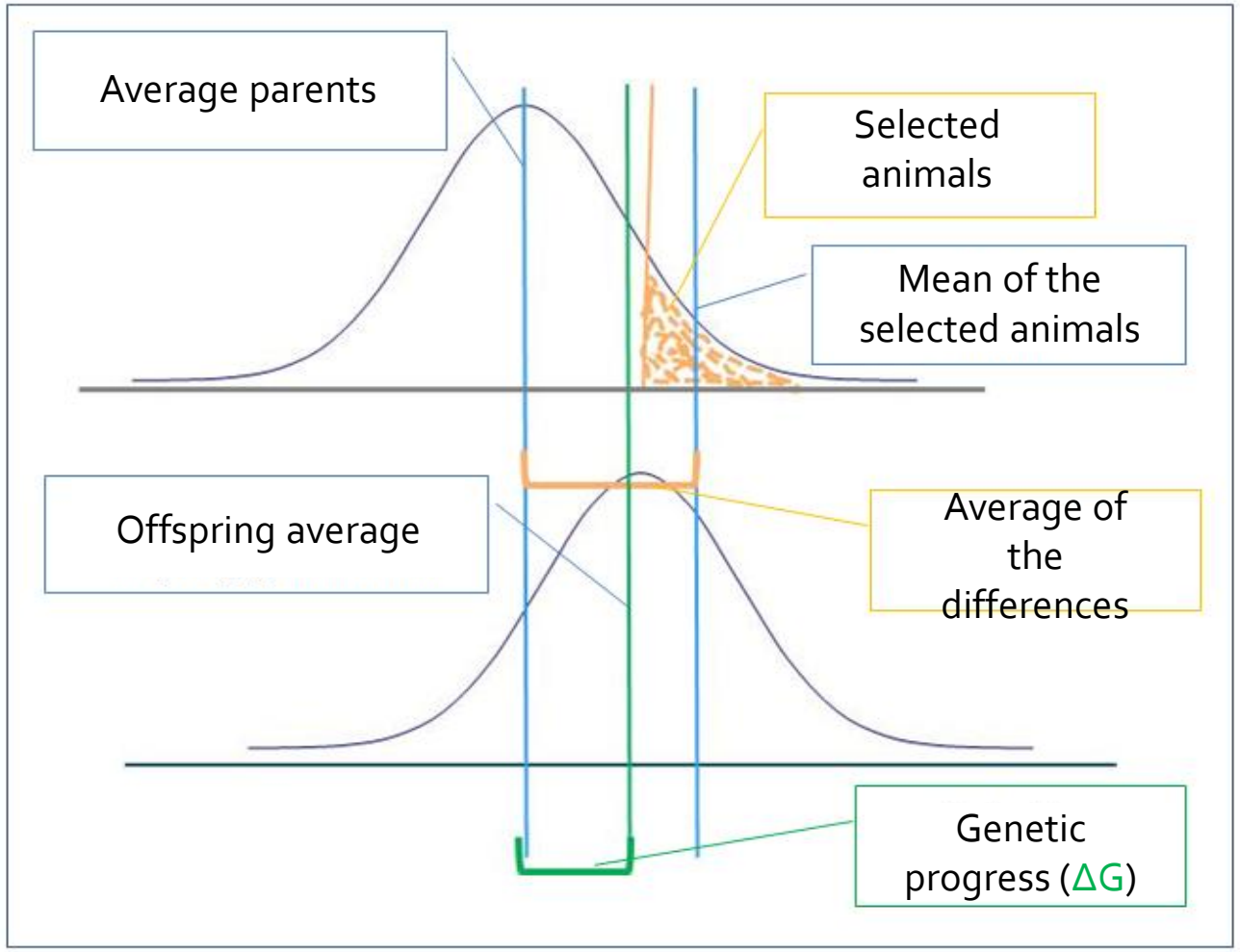
Genetic Progress

Increase in the average genetic value from one generation to the next (ΔG)



Change in the population mean

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A matter of fact

The genetic improvement of dairy cattle has achieved excellent performance levels.

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Genetic Progress

The "success" in achieving high performance is based on

1. **PHENOTYPE + PEDIGREE (historically)**
2. **Genomic Selection has been applied for the past 10 years**

This approach relies on **breeding values** and the **additive polygenic inheritance of autosomal genes** in the breeding nucleus (Mendelian segregation).

Cow Calf Contact system (CCC)

- Growing interest from society and industry
- Calves stay with dams longer; extended suckling
- Management varies by level of contact and suckling
- Promotes natural behaviors: Research mainly focuses on **behavior** and **welfare**
- CCC systems it is expected to affect the **metabolism, health** and **fertility** of both **cows** and **calves**

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CCC system and Breeding

While CCC primarily concerns **calf rearing**, it indirectly affects breeding because:

1. Healthy, well-fed calves grow better → better **heifers for future breeding**.
2. Stress-free early life can improve **reproductive performance** later.
3. Genetic selection is not changed, but the **overall productivity of the herd can improve** due to healthier replacements.

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Genetic progress *vs* management system

1. **Genetic progress** (high production, better breeding values) primarily comes from **selection based on breeding values, genomic selection, and controlled mating**.

2. **Cow-Calf Contact (CCC)** doesn't change the genetics itself-it's a **management system** that affects how calves grow and develop.

CCC alone won't "create" faster genetic progress, but it can **support it indirectly**.

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How CCC can support genetic progress

CCC effect	Impact on genetics / breeding
Better **early growth** and **health**	**Heifers reach puberty earlier** → they can enter the breeding program on schedule → **genetic selection is fully expressed**
Stress reduction	**Lower disease incidence** → fewer losses → more animals available to select from the top genetics
Stronger, more resilient replacements	**Maximizes the potential of high-genetic-merit animals**, especially for **fertility** and **longevity**

Challenges / Considerations

- **CCC** may require **more space, labor, and careful monitoring**, which could limit the number of animals in the nucleus if resources are tight.

- **Milk production** monitoring for selection purposes can be more complex in CCC systems if calves are suckling instead of being separated.

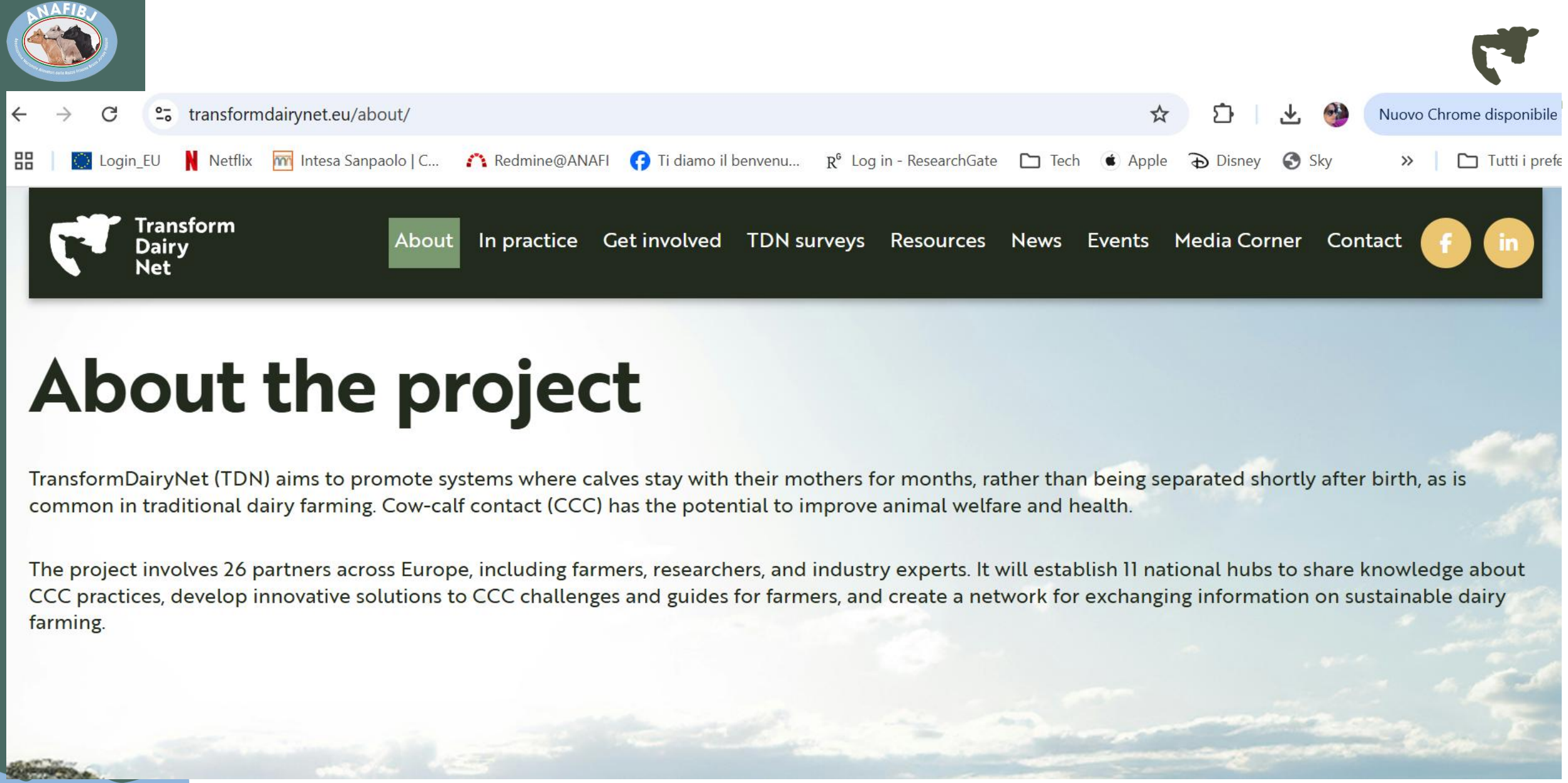
Considerations

- **Progress achieved via genomic selection and breeding values is still possible under a Cow-Calf Contact system**

- It requires **careful management** to ensure that top-genetic animals are properly measured, mated, and retained.

- CCC supports productivity and fertility, which helps realize genetic potential, but it does **not replace the need for selection**.

Issue	Pros	Cons	Example / Breeding Impact
Calf growth	Better weight gain due to natural suckling; improved immunity	Requires more labor to manage cows and calves together	• Calves grow faster • heifers reach puberty earlier • ready for breeding sooner
Stress & health	Reduced stress, fewer illnesses	Higher risk of disease transmission from cow to calf; more monitoring needed	• Stress-free calves • healthier replacements • fewer losses in breeding herd
Reproductive performance of future heifers	Better ovarian development; higher conception rates	Potential for delayed weaning of next calf if cow's recovery is slow	• Heifers more fertile • fewer inseminations needed • improved lifetime productivity
Labor & management	Natural behavior reduces behavioral problems; more natural weaning	Increased workload, need for more space, and careful monitoring	Farm may need more staff or facilities, but calves are stronger for breeding
Genetic productivity	Maintains genetic potential by supporting healthy growth	No direct improvement to genetics; may complicate selective breeding if not managed	• Well-grown heifers express genetic potential fully • better milk yield and longevity



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TDN Survey – Breeding companies

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Thanks for sharing Dr. Anina Vogt

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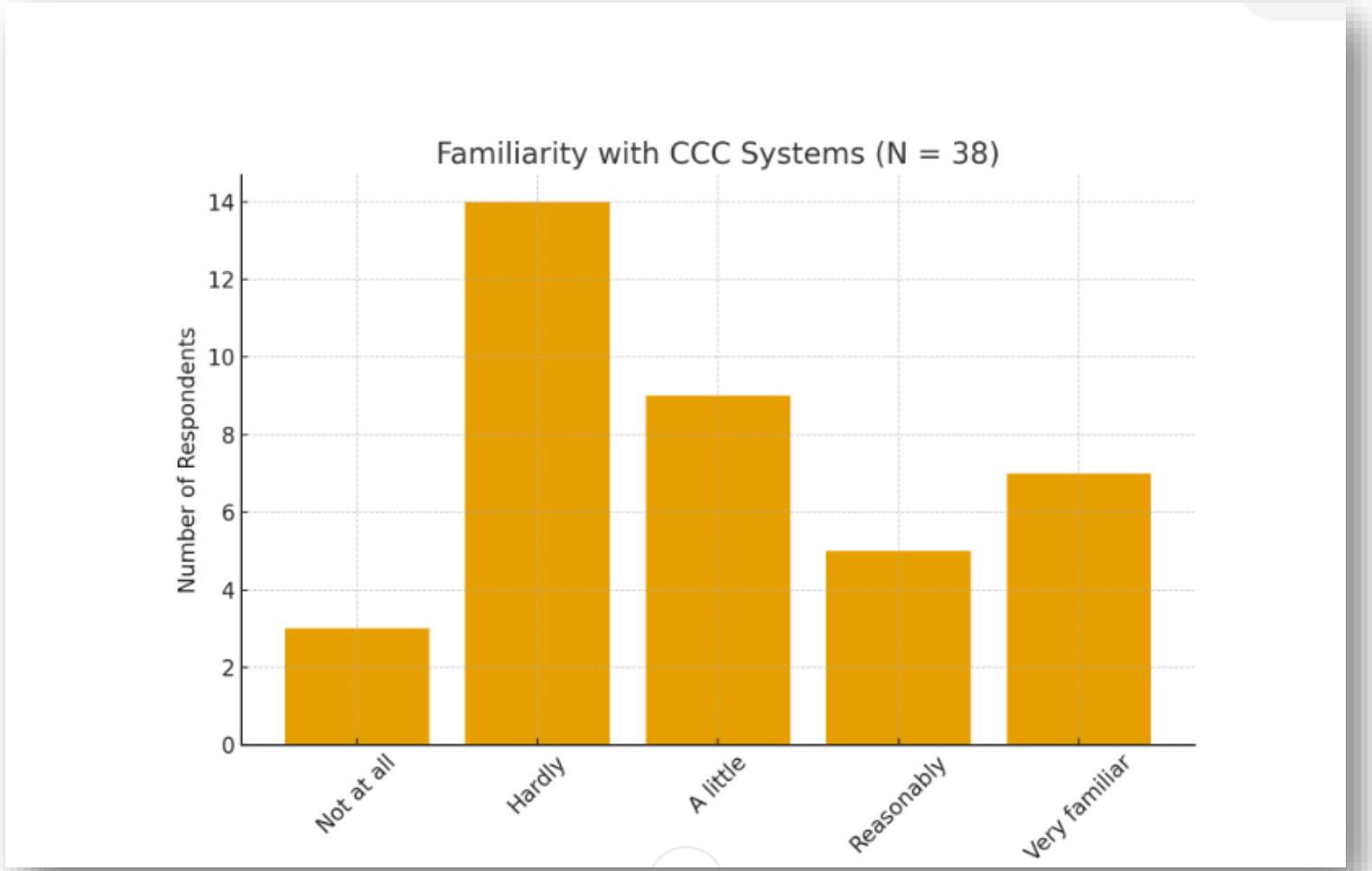
Familiarity Levels with CCC



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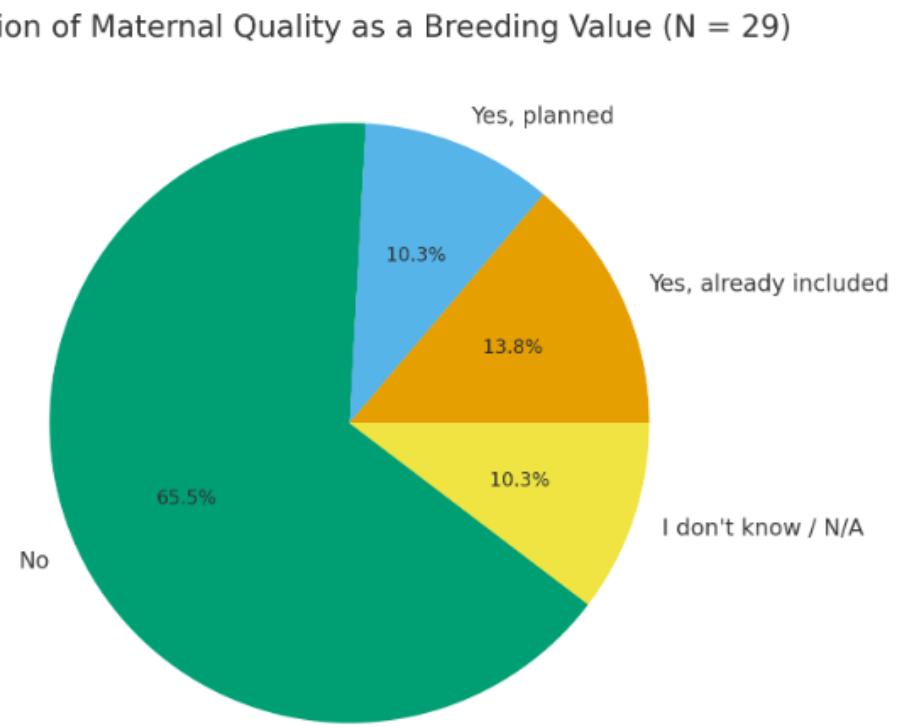
Maternal effect in the breeding value in addition to calving ease?



Key challenges identified

CHALLENGE CATEGORY	SPECIFIC CHALLENGE
Data Collection & Recording	• Lack of standardized large-scale recording systems for maternal behavior; • Uncertainty about which data are collected, how, and by whom; no phenotypic data available; • Insufficient data recording
Milk Performance & Production	• Milk yield and composition (fat%, protein%) hard to assess due to calf access; • interference with milk performance recording systems; • daughters not subjected to routine production checks (milk quantity, quality, udder morphology)
Environmental & Management Variability	• Variability in CCC systems (duration of cow-calf contact, own mother *vs.* foster cows) complicates adjustment for environmental factors
Resource & Data Limitations	• Expectation of insufficient data to calculate additional breeding values; • concerns about milkyield measurements and reliability of existing data

Key Aspects identified

Aspect to Consider Differently	Practical Consideration for CCC Systems
NEW TRAITS/ EBV	**CCC farms** may require **breeding values** tailored to **maternal behavior, calf nursing ability,** and other **cow-calf interaction traits.**
FERTILITY	**High fertility sires help ensure smooth reproductive performanc**e in systems where cow-calf bonding and natural suckling extend postpartum intervals.
CALVING EASE	**Minimizes intervention** and supports successful cow-calf bonding immediately after birth.
MILK PRODUCTION	Farms practicing CCC may prioritize moderate milk yield to balance calf consumption and cow condition; very high-yielding genetics may be less suitable.
MATERNALE BEHAVIOUR	Sires with daughters showing good maternal instincts improve calf survival and ease of management in CCC setups.
TEAT SIZE & PLACEMENT	**Optimal teat placement** and **teat size support efficient** calf suckling and **reduce udder health issues while calves are nursing.**

CCC Additional Service Challenges

Challenge Category	Specific Challenge / Example
Performance Testing	• Difficulty obtaining reliable cow performance data; • Milk yield and components affected by calf access; • Assessing udder exterior and conformation is harder.
Breeding Value System Limitations	• Existing breeding value systems calibrated for high milk production may not fit CCC farm priorities; • Adapting values for CCC-specific production and management is challenging.
Market / Service Demand	Lower expected demand for semen and breeding services from CCC farms may reduce economic incentives for specific CCC-focused breeding efforts.

Thanks for your attention!

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