Transition Management

Index: a new tool to assess the transition period success

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Introduction

Birth

Calving
Housing: space, stall organization.
Change in temperature, humidity, heat, cold, air quality.
Hormonal changes.

Change of group or pen.
Overpopulation, group size.
Exposure to mycotoxins.
Metabolic issues.
Changes in feeding time or routine.
Acidosis.
High milk production.

PRODUCTION • METABOLIC RATE • IMMUNE SYSTEM

Net energy for lactation (Mcal/day)

Day relative to calving

Feed intake
Milk production
Energy Requirement
Energy Balance
Transition Cow Index™

- Developed by Dr. Nordlund (2006)
- Using data from 4,000 hers enrolled to DHI Wisconsin

Since 2006, several improvements in management, nutrition, genetics...

An American index may not reflect the intricacies of the Canadian dairy industry...
Objective

Our objective was to create an index to assess the transition period of dairy cows using the Canadian data and benchmark current practices.
Connor McDavid
Plays for Oilers since 2015

Stats

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<th>Pos</th>
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Historical data
Calculate how we expect him to play in the next season

Calculate his performance now

Current preseason result
Connor McDavid
Plays for Oilers since 2015

**Historical data**

He always played well – so we expect him to play well this season

**Current preseason result**

If his preseason is **good** – it means he had a good preparation, and he will perform according to expected.

If his preseason is **bad** – it means he had a poor preparation, and he will perform worst than expected.
Methodology

Animal info + historical data + calving month: to calculate estimated milk production

First DHI yield and components + calving month: 305d-projection

\[ +TMI = TMI -TMI \]
Development of TMI

Data:
- 1.6 M DHI cow records
- 2017-2020
- All provinces in Canada
- Lactations 1 to 7
- 8 Breeds
- 3 Milking systems

Models:
- Separate for primiparous and multiparous cows
- Mixed-effect linear regression in R (lme4 package)
Key components of TMI

1. Breed
2. Lactation number (**2 to 7**) 
3. Lactation start reason
4. DIM at 1st test 
5. Milk yield 1st test 
6. Calving Month
7. Milking frequency
8. Milking pattern
9. EBV’s (Milk, fat, protein) 
10. BHB at 1st test
11. SCS at 1st test
12. Previous lactation start reason
13. Previous lactation DIM
14. Previous peak DIM 
15. Previous peak milk yield
16. Previous linear score
17. Previous 305d milk
18. Days dry
19. Age at calving → Primiparous

New in TMI
Strong correlation between TCI and TMI
Cow level – descriptive analysis

$Lactation number$

Transition Mngt Index
By Lactation group

Averages: 25 -34 -55 -27

Percent cows below zero
By lactation group

48% 50% 50% 49%

Relative metrics analysis demonstrated that, apart from breed, no variable exhibited greater importance for Lact 1.
Results

Herd level – descriptive analysis

Milking system

Averages:
- PARLOUR: 53%
- PIPELINE: 51%
- ROBOT: 44%

Milk yield comparison:
- PARLOUR: -100
- PIPELINE: -54
- ROBOT: 39
Results

Herd performance

Top 20% of herds:
✓ Low % of negative cows
✓ Greater milk and components
✓ Higher production at peak
✓ Greater milk revenue
Results

Dashboard

- Objectively monitor the transition period overtime
- Check indicators of udder health, energy status, ruminal health, dry period...
- Benchmark the current program and assess the success of different measures
Conclusion

• The Transition Management Index serves as an objective tool to assess transition period practices.

• TMI is correlated with metrics of herd performance

• TMI and its dashboard will guide producers and advisors to better assess the farm operation, identify opportunities for improvement, and facilitate decision-making.
Acknowledgements

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Thank You