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# BARRIERS TO RECORDING CALF HEALTH DATA ON DAIRY FARMS IN ONTARIO

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# BACKGROUND

- Minimizing dairy calf illness maximizes future production
- Preweaning morbidities result in
  - Reduced growth rate
  - Delayed pregnancy
  - Reduced first lactation milk yield

(Soberon et al. 2012. *J. Dairy Sci.* 95:783-793)  
(Abuelo et al. 2021. *J. Dairy Sci.* 104:7008-7017)  
(Aghakeshmiri et al. 2017. *Vet. Res. Commun.* 41:107-112)  
(Dunn et al. 2018. *J. Dairy Sci.* 101:5404-5410)

## BACKGROUND

- Antimicrobial use is an increasing public concern
- Canadian dairy producers frequently treat sick calves with antimicrobials:
  - 74% to treat diarrhea
  - 96% to treat respiratory disease

# BACKGROUND

- Complete and accurate calf health records can allow for
  - Accurate understanding of extent and nature of antimicrobial use
  - Data analytics for management changes leading to decreased morbidity and antimicrobial use

## BACKGROUND

- Only 15% of dairy farms in Ontario had accessible calf health records through DHI
- Only 50% of Canadian dairy farms had complete calf health records in a format that could be analyzed

(Hyland. 2022. *MS Thesis*. University of Guelph)  
(Uyama et al. 2022. *J. Dairy Sci.* 105:9084-9097)

## OBJECTIVE & HYPOTHESES

- Investigate the barriers to complete and accurate recording of calf health events on Ontario dairy farms
- Producers are not motivated to record illness and treatment events because:
  - 1) Calf health records are not analyzed
  - 2) Drug withdrawal times are not a motivating factor

## STUDY DESIGN

- Electronic survey was distributed by veterinarians to their clients
  - Farm demographics
  - Current illness and treatment recording practices
  - Calf health data analysis practices
- No sample size calculation - based on convenience and willingness of veterinary clinics to distribute
- Multiple choice and open-ended text
- 88 eligible responses for analysis

# RESULTS



19% recorded all calf illness events



43% recorded all antimicrobial treatments



38% recorded all anti-inflammatory treatments



13% recorded all supportive therapies

(Edwards et al. *In review. J. Dairy Sci. Commun.*)

## RESULTS

When asked about the frequency of receiving actionable recommendations based on calf health records...

**48% of farmers reported seldom or never**

## RESULTS:

## ANTIMICROBIAL TREATMENTS\*

- Farmers were 3.45 times more likely to record all antimicrobial treatments if they used a **computer software system** compared to those that did not ( $P = 0.02$ )
- Farmers that kept calf health records **in the calf barn** tended to be 3.11 times more likely to record all antimicrobial treatments ( $P = 0.06$ )

\*Results of the multivariable model available in Table 1  
(Edwards et al. *In review. J. Dairy Sci. Commun.*)

RESULTS:

ANTI-  
INFLAMMATORY  
TREATMENTS

- Farmers that recorded using a **paper booklet** tended to be less likely to record all anti-inflammatory treatments (OR = 0.40, 95% CI: 0.14-1.10,  $P = 0.08$ )

(Edwards et al. *In review. J. Dairy Sci. Commun.*)

## RESULTS:

## SUPPORTIVE THERAPIES\*

- **Non-family employees** were 6.08 times more likely than owners to record all supportive therapy treatments ( $P = 0.03$ )
- For **every additional 10 milking cows**, producers tended to be 10.10 times more likely to record all supportive therapies ( $P = 0.07$ )

\*Results of the multivariable model available in Table 2  
(Edwards et al. *In review. J. Dairy Sci. Commun.*)

RESULTS:

LOCATION OF  
RECORDS

- Only 26% of farmers kept their calf health records in the calf barn

(Edwards et al. *In review. J. Dairy Sci. Commun.*)

## RESULTS:

### LOCATION OF RECORDS

- Farmers who kept their calf health records **in the calf barn** were less likely to report that illnesses are not recorded due to time constraints (5% vs. 36% if records were elsewhere)
  - $\chi^2 = 7.15, df 1, P < 0.01$
- Farmers who kept their calf health records **in the calf barn** were less likely to report that an illness was not recorded because the calf health records are not analyzed (10% vs. 34% if records were elsewhere)
  - $\chi^2 = 4.42, df 1, P = 0.04$

## RESULTS:

## RECORDING METHOD

- The majority of farmers (54%) used paper booklets for calf health records
- Farmers who recorded calf treatments in a **paper booklet** were more likely not to record treatments because the records are not analyzed than those who used other means of recording
  - 44% for paper records vs. 21% for other systems
  - $\chi^2 = 4.05$ , df 1,  $P = 0.04$

RESULTS:

IMPROVING  
CALF HEALTH  
RECORDS

- Suggestions for improving recording compliance:
  - Mobile app (n = 21/69; 31%)
  - Easy-to-use system (n = 21/69; 31%)

(Edwards et al. *In review. J. Dairy Sci. Commun.*)

# CONCLUSIONS

- Calf health record completeness was associated with:
  - Computer software records
  - Records located in close proximity to calves
  - Analysis and feedback of records
  - Non-family employees
  - Larger farm sizes

(Edwards et al. *In review. J. Dairy Sci. Commun.*)

# CALF HEALTH PROGRAMS

- Computer software records
  - Excel spreadsheets
  - DC305
  - Mobile software
    - Vetlogix
- Records in close proximity to calves
  - Facilitate how data is recorded
- Analysis and feedback of records
  - Reporting back to the client

# CALF HEALTH PROGRAMS

## **Strengths and Areas for Improvement**

### Strengths

#### **1) Improved Average Daily Gain**

Average daily gain was improved in Q4 at 1.70 lb/d compared to 1.62 lb/d in Q3 and 1.58lb/d in Q2. Additionally, this is improved from 2021 Q4 where ADG was 1.63 lb/d. Additionally, 42% of calves in Q4 reached the target of 1.76 lb/d or greater, which was increased from Q3 and Q2 where only 23% and 24% of calves reached the target, respectively. Excellent work!

#### **2) Excellent Passive Transfer Status**

Your average total protein for Q4 was 6.56 g/dL, which is increased from Q3 and 2021 Q4 which averaged 6.46 g/dL and 5.96 g/dL, respectively. This quarter there were 70% of calves in the top category, which is the highest your calves have ever achieved (compared to Q3 where there were 59%, your previous high score). There were also only 4% of calves calves in the bottom category, which is excellent. This was an excellent quarter for total proteins! Brix was excellent (25%) and volume of colostrum in the first 24 hours is almost 8 L, both factors which contribute to excellent serum total proteins.

#### **3) Low Mortality Rates**

There were 0% of calves that died in Q4, which is the same as Q3 and improved compared to 2021 Q4 where 1% of calves died and 2020 Q4 where 4% of calves died.

#### **4) Excellent Lung Scores**

There were 1% of calves that had a lung score of 3 or greater in Q4, which is decreased from 2% in Q3 and 3% from 2021 Q4. Excellent work!

### Areas for Improvement

#### **1) High Proportion of Pneumonia Treatments**

There are still a high proportion of calves treated for pneumonia at least once (73%) with many being treated multiple times (68%). Excellent lung scores suggest that treatment is effective. However, some potential ways to decrease pneumonia rates are:

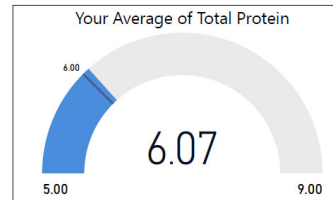
1. Ensure that bedding is not dusty. Straw has some dustiness (although less dusty than wood products) but dustiness can be minimized by ensuring long chop lengths and applying it into the stall near the ground rather than throwing it in, which can release dust into the air.
2. Nasalgen 3-PMH at birth would help protect against both viral and bacterial pneumonia. Once PMH was previously used with limited success, as it was given at 14 days of age and only covered bacterial pneumonia.

# CALF HEALTH PROGRAMS

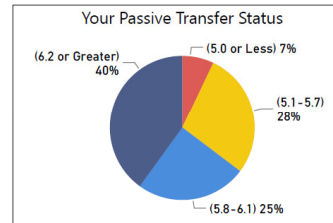
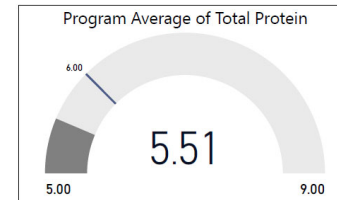
## Serum Total Protein Analysis

Measuring blood serum total proteins provides an indication of how well the colostrum management program is working on farm. Total proteins are highly correlated with the amount of antibodies received from colostrum.

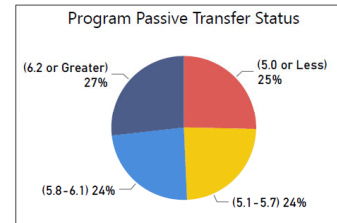
The 2020 updated goals are to have more than 40% of calves with 6.2 or greater, 30% of calves with 5.8-6.1, 20% of calves with 5.1-5.7, and less than 10% of calves with 5.0 or less.



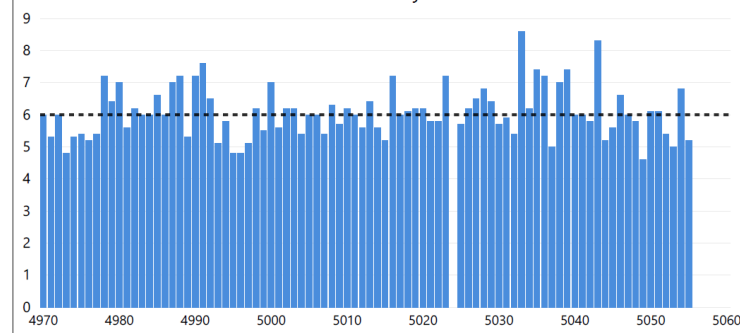
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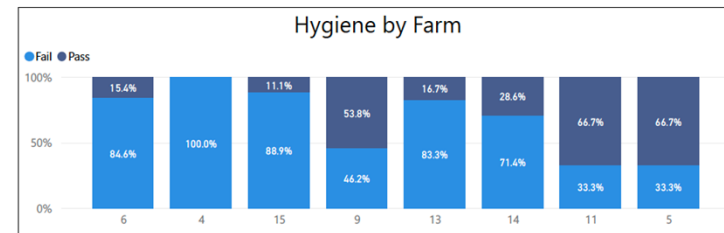
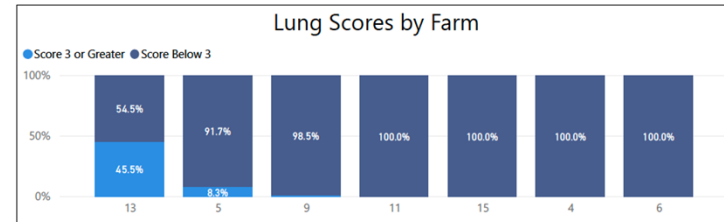
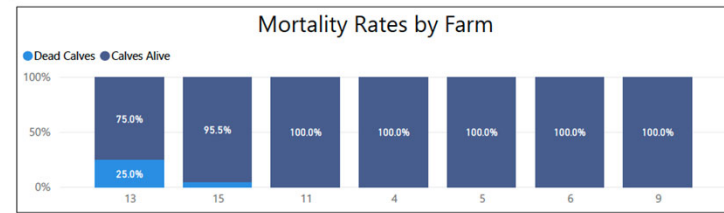
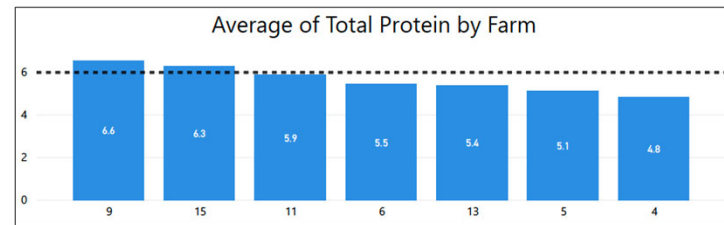


Total Protein by Calf ID



# CALF HEALTH PROGRAMS

## Farm Benchmarking



# CALF HEALTH PROGRAMS

## Total Cost Benefit Analysis

The following is a cost-benefit analysis for each year as compared to your baseline year and accounts for program cost.

Year	2020	2021	2022
Total Enrolled Heifers	Baseline year	332	349
Program Expense		\$8,300	\$8,725
YoY Mortality Savings		\$1,000	\$2,750
YoY Scours Savings		\$6,648	\$7,044
YoY Lung Score Savings		\$4,806	\$5,772
Total Savings/Program Value Delivered			<b>\$4,154</b>

THANK YOU TO  
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**TABLE I. RESULTS FROM A MULTIVARIABLE LOGISTIC REGRESSION MODEL EVALUATING THE ODDS OF RECORDING 100% OF ANTIMICROBIAL TREATMENTS ADMINISTERED TO CALVES**

<b>Variable</b>	<b>Description</b>	<b>Odds Ratio (OR)</b>	<b>OR 95% CI</b>	<b>P value</b>
Location of records	Other	Ref		
	Calf barn	3.11	0.95-10.15	0.06
Method of recording	Other	Ref		
	Computer software	3.45	1.18-10.14	0.02

(Edwards et al. *In review. J. Dairy Sci. Commun.*)

**TABLE 2. RESULTS FROM A MULTIVARIABLE LOGISTIC REGRESSION MODEL EVALUATING THE ODDS OF RECORDING 100% OF SUPPORTIVE THERAPY TREATMENTS ADMINISTERED TO CALVES**

<b>Variable</b>	<b>Description</b>	<b>Odds Ratio (OR)</b>	<b>OR 95% CI</b>	<b>P value</b>
Role of respondent	Owner	Ref		
	Non-family employee	6.08	1.18-31.22	0.03
	Family member other than owner	2.76	0.45-17.10	0.28
Number of milking cows	Every 1 cow increase	1.01	1.00-1.02	0.07

(Edwards et al. *In review. J. Dairy Sci. Commun.*)