HIPRA

one step ahead
of mastitis

KPIs and FOLLOW UP SERVICE

Marc Tomàs

HIPRA

Introduction

Clinical Mastitis

Subclinical Mastitis

ROI

Conclusions

Why?

Field vets and farmers feel overwhelmed by the huge amount of data they manage:

DHI

Animal ID	Born	Last calvin	Last lactation nun	Expected c	Control dates	Kg Milk	Fat%	Protein%	SCC	Kg ECM
4804603176	27.12.13	16.03.20	5							
4804603176					01.11.17		0	0		0
4804603176					27.11.19		0	0		0
4804603176					04.03.20		0	0		0
4804603176					17.07.19	57	3	3,4	453	50
4804603176					19.08.16	39,8	2,55	3,37	52	32,6
4804603176					06.02.19		0	0		0
4804603176					12.08.20	32,3	5,93	4,17	5653	41,4

Milking machine

Culling

Register of mastitis

Cultures

Treatments

		2. lactation	27-05-2021
4806007418	Dry cow antibiotic treatment	2. lactation	27-05-2021
4806007867	Dry cow antibiotic treatment	1. lactation	27-05-2021
4806006618	Dry cow antibiotic treatment	3.+ lactation	19-05-2021
4806006653	Dry cow antibiotic treatment	3.+ lactation	19-05-2021
4806007189	Dry cow antibiotic treatment	2. lactation	19-05-2021
4806007202	Dry cow antibiotic treatment	2. lactation	19-05-2021
4806007385	Dry cow antibiotic treatment	2. lactation	19-05-2021
4806007415	Dry cow antibiotic treatment	2. lactation	19-05-2021
4806007715	Dry cow antibiotic treatment	1. lactation	19-05-2021
4806007759	Dry cow antibiotic treatment	1. lactation	19-05-2021
4806007769	Dry cow antibiotic treatment	1. lactation	19-05-2021
4806006946	Dry cow antibiotic treatment	3.+ lactation	12-05-2021
5325702597	Dry cow antibiotic treatment	3.+ lactation	12-05-2021
5325702686	Dry cow antibiotic treatment	3.+ lactation	12-05-2021

Animal number	Cultured bacteria/treatment	Lactation number	Date
4806006525	CNS	3.+ lactation	01-03-2021
4806006525	Streptokok dysgalactia	3.+ lactation	01-03-2021
4806007130	CNS	2. lactation	01-03-2021
4806007130	Staph. Aureus	2. lactation	01-03-2021
4806007181	CNS	2. lactation	01-03-2021
4806007181	Strept. Uberis	2. lactation	01-03-2021
4806007726	CNS	1. lactation	01-03-2021
4806007726	Staph. Aureus	1. lactation	01-03-2021
4806007726	Streptokok agalactia - gr. B. strep-tokokker	1. lactation	01-03-2021
4806007384	Klebsiella	2. lactation	27-02-2021
4806007384	Streptokok agalactia - gr. B. strep-tokokker	2. lactation	27-02-2021
4806007516	Staph. Aureus	1. lactation	18-02-2021

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How?

Indicators of clinical mastitis

CM rate

↓ 30% (ideal ↓ 20%)

- DIM
- Number of lactation
- Severity

Mild: > 90 %

CM rate (New cases)

↓ 25%

- DIM
  - ≤ 30 DIM
  - > 30 DIM

↓ 8%

Cure rate

↑ 50%

Recurrency

↓ 20% (ideal ↓ 10%)

Clinical mastitis rate (CM)

Objective: < 30% (ideal < 20%)

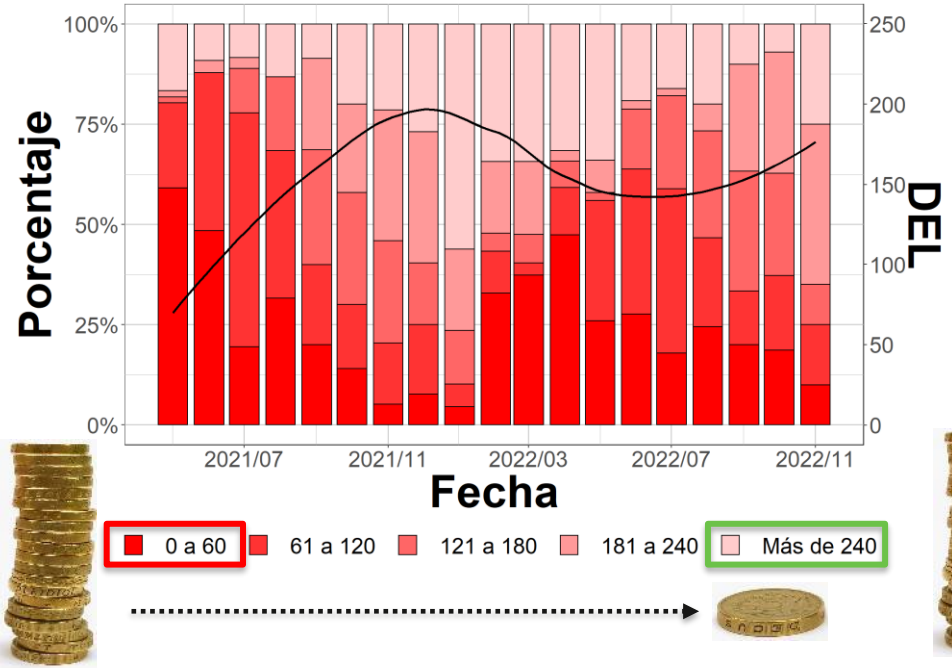
$$\frac{Num.\ of\ clínical\ mastitis\ cases}{Num\ of\ cows}$$

12th months contemporary trial in South Africa

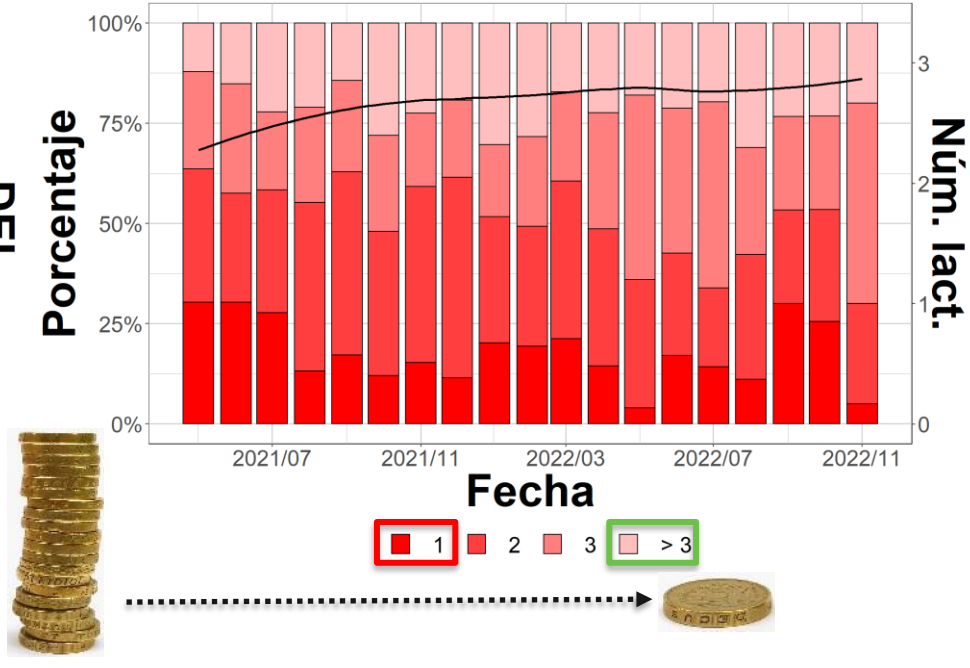
	UBAC®	CONTROL	Difference
Animals from Feb 2022	587	596	
Clinical mastitis (rate)	**186 (31.7%)**	**263 (44.1%)**	↓ **28.1%**
Number of cows with mastitis	128(21.8%)	185 (31%)	↓ 29.7%
Uberis cases (rate)	**52 (8.7%)**	**92 (15.4%)**	↓ **43.5%**
Number of cows with mastitis (Uberis)	46 (7.8%)	80 (13.4%)	↓ 41.8%

Distribution of CM cases: DIM and Number of lactation

DIM

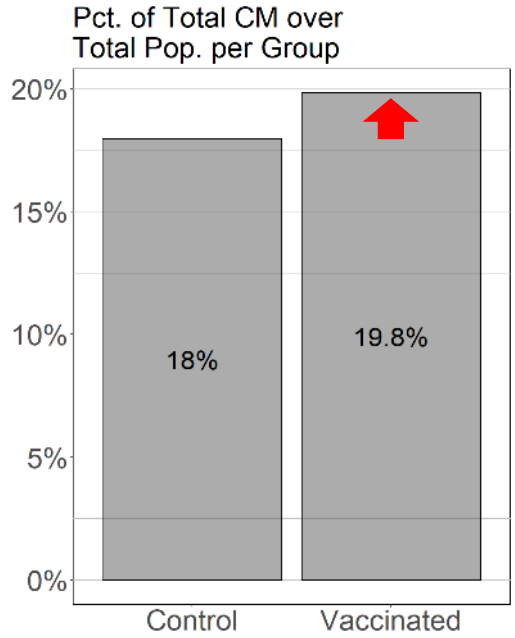


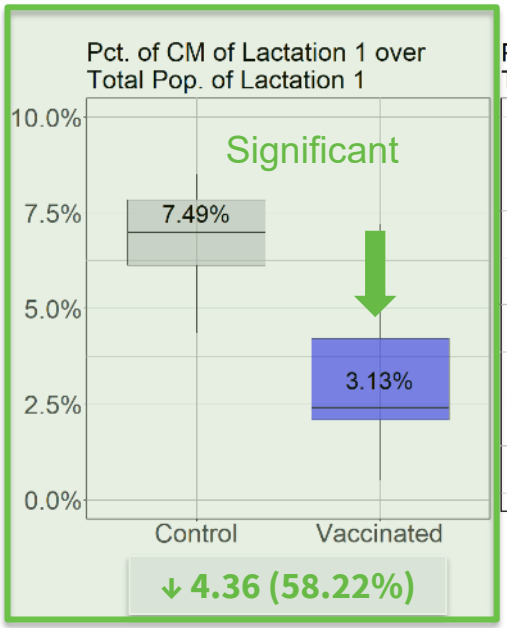
Number of lactation

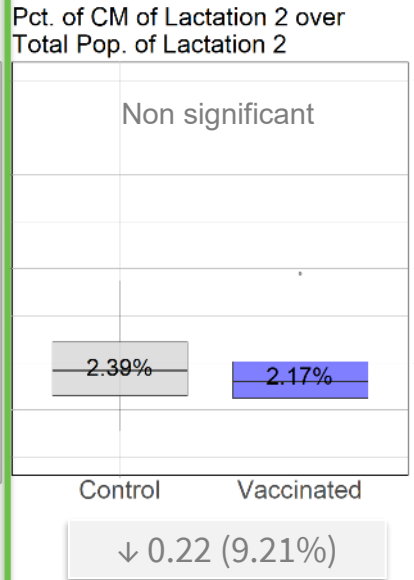


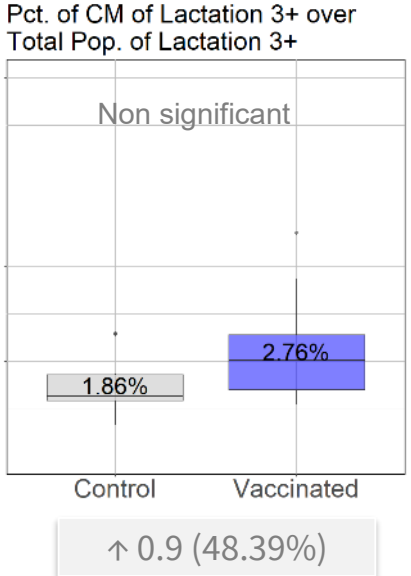
Distribution of CM cases: heifers/multiparous

Different health behaviour in heifers and multiparous

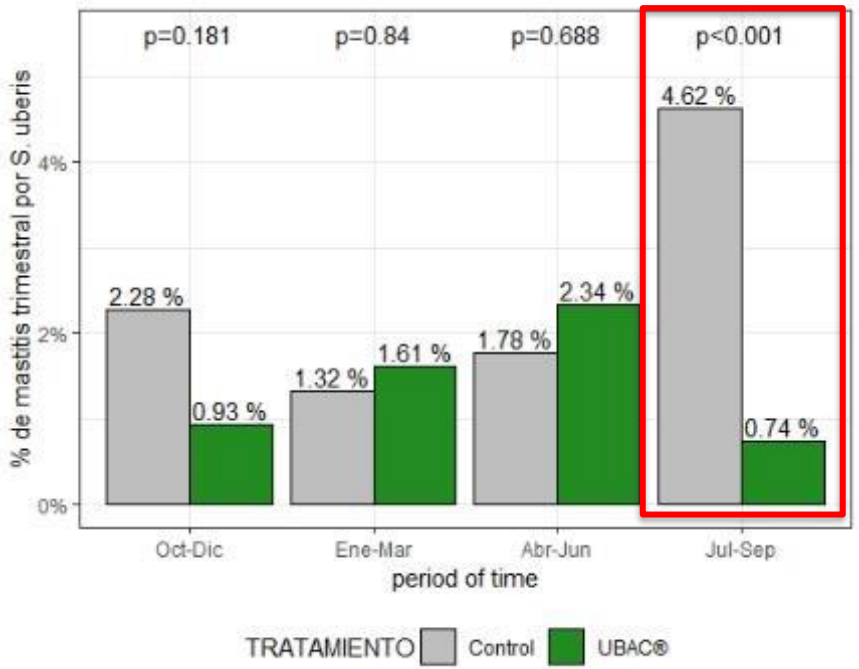


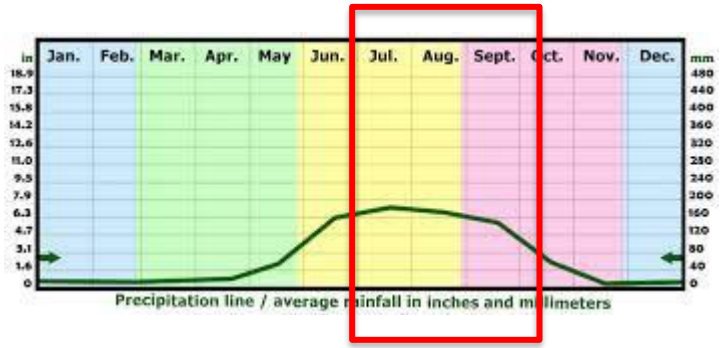






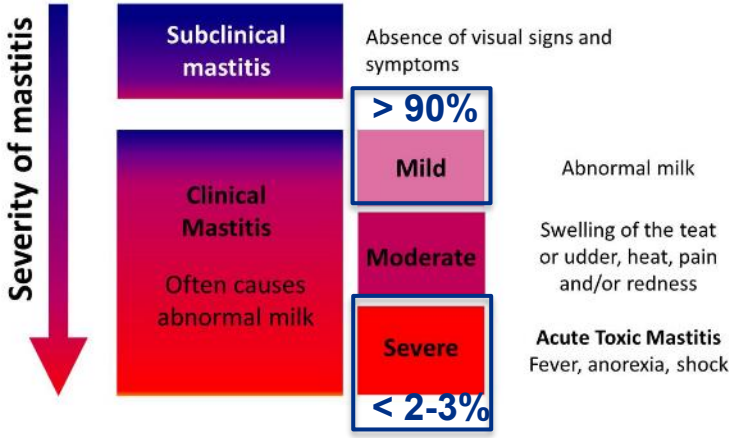
Seasonality

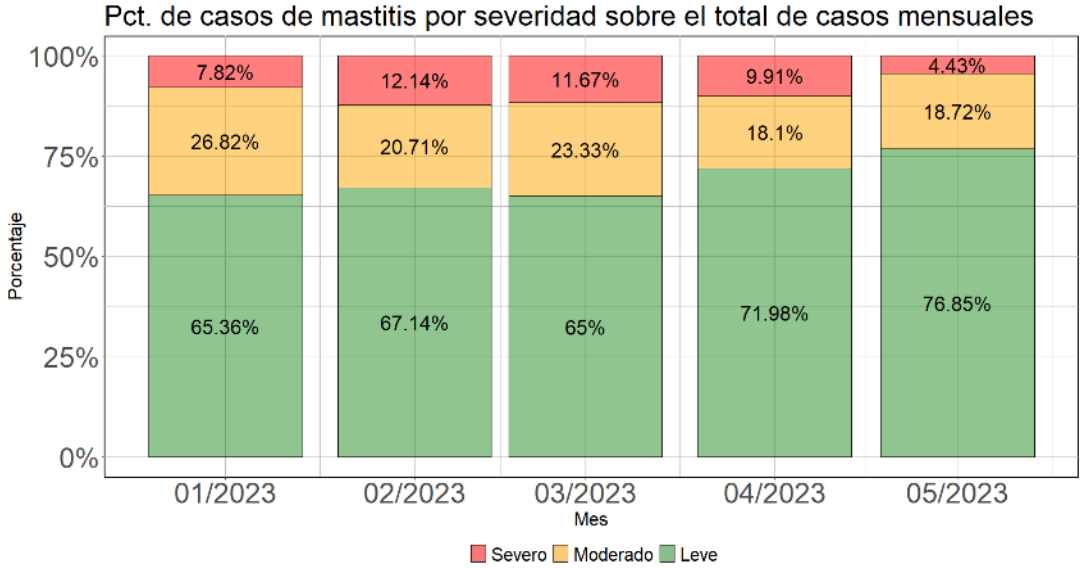




Severity

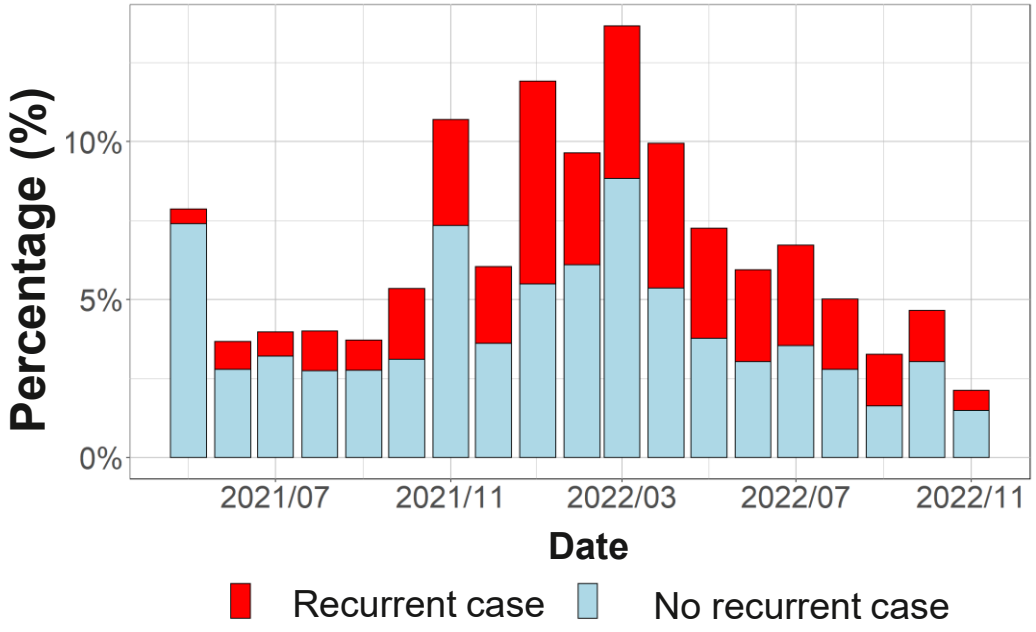
Mastitis Infections





Recurrence

Objective: < 20% (ideal < 10%)



Quarter	MC (monthly)	% recurrence
2021 Q2	5.66%	12%
2021 Q3	3.9%	25.69%
2021 Q4	7.35%	36.32%
2022 Q1	11.71%	42.18%
2022 Q2	7.71%	47.4%
2022 Q3	4.92%	46.97%
2022 Q4	3.37%	33.33%

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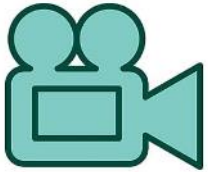
Subclinical mastitis

Static indicators

- ✓ **Prevalence**
  - **Heifers:** > 150.000 cell/ml
  - **Multiparous:** > 200.000 cell/ml
- ✓ **Estimated bSCC**



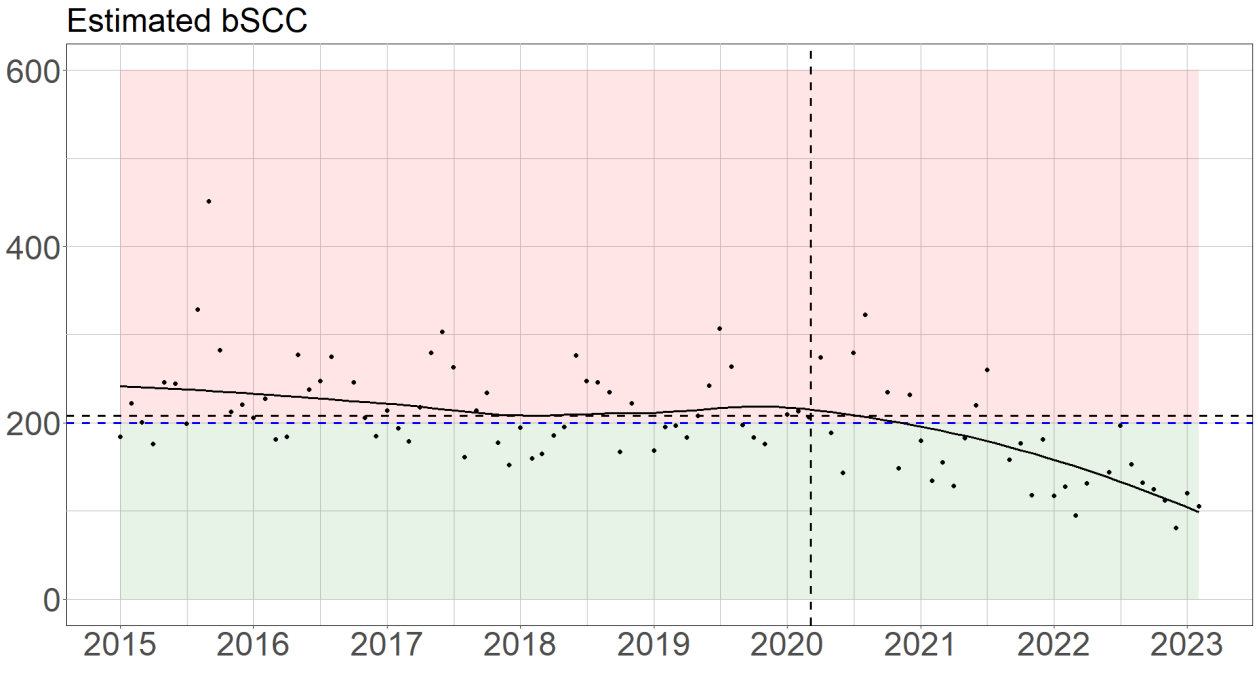
Dynamic indicators

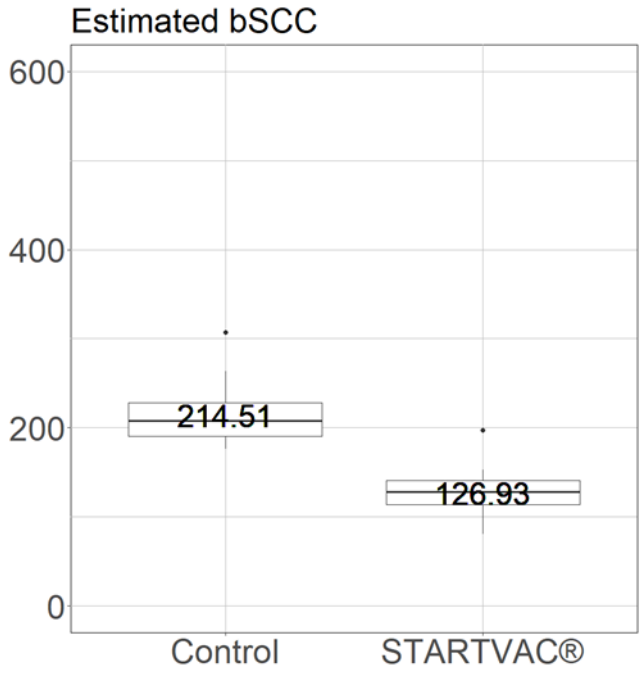
- ✓ **% New infections (dry off)**
- ✓ **% Chronic**
- ✓ **% Cured (dry off)**
- ✓ **% Healed**
- ✓ **% Cured rate**
- ✓ **% Cows with low chances of cure (aLCC)**

Estimate bSCC

$$\text{Estimated bSCC} = \frac{\sum Milk\ yield\ x\ iSCC}{\sum Milk\ yield}$$

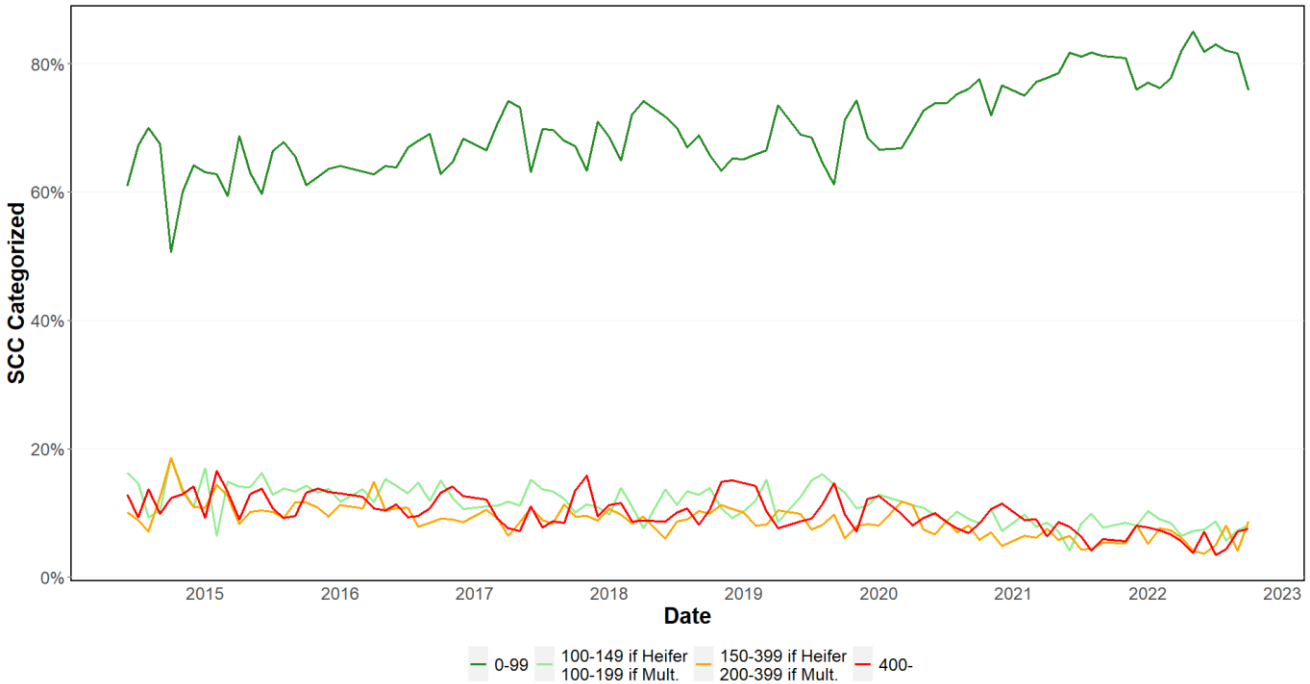
Results are not biased by **DISCARDED MILK!!!**

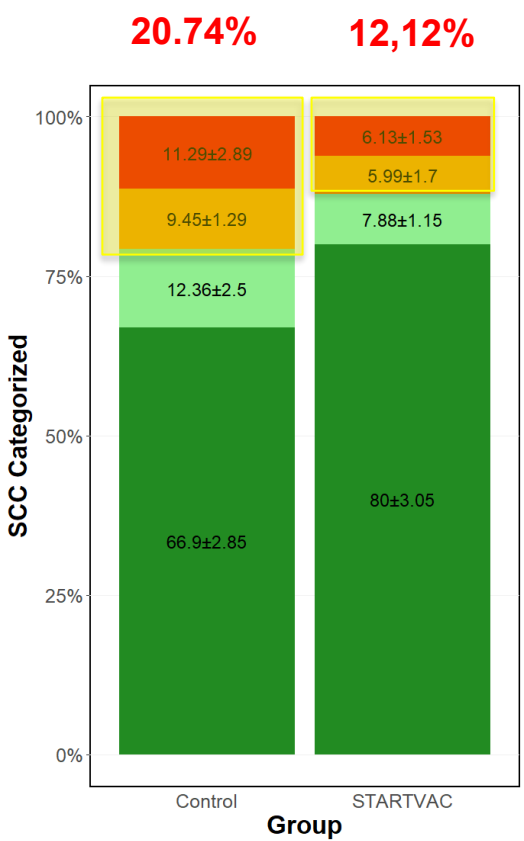




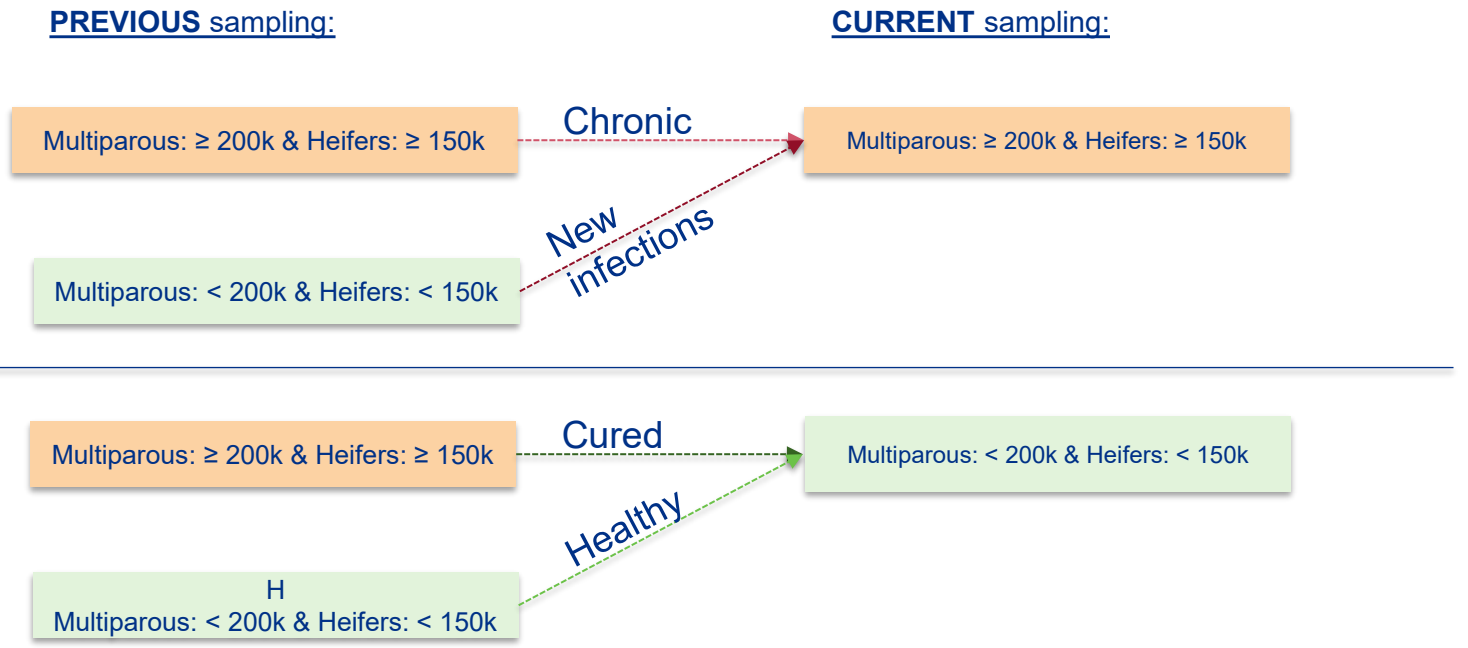
Prevalence

↓ 20%

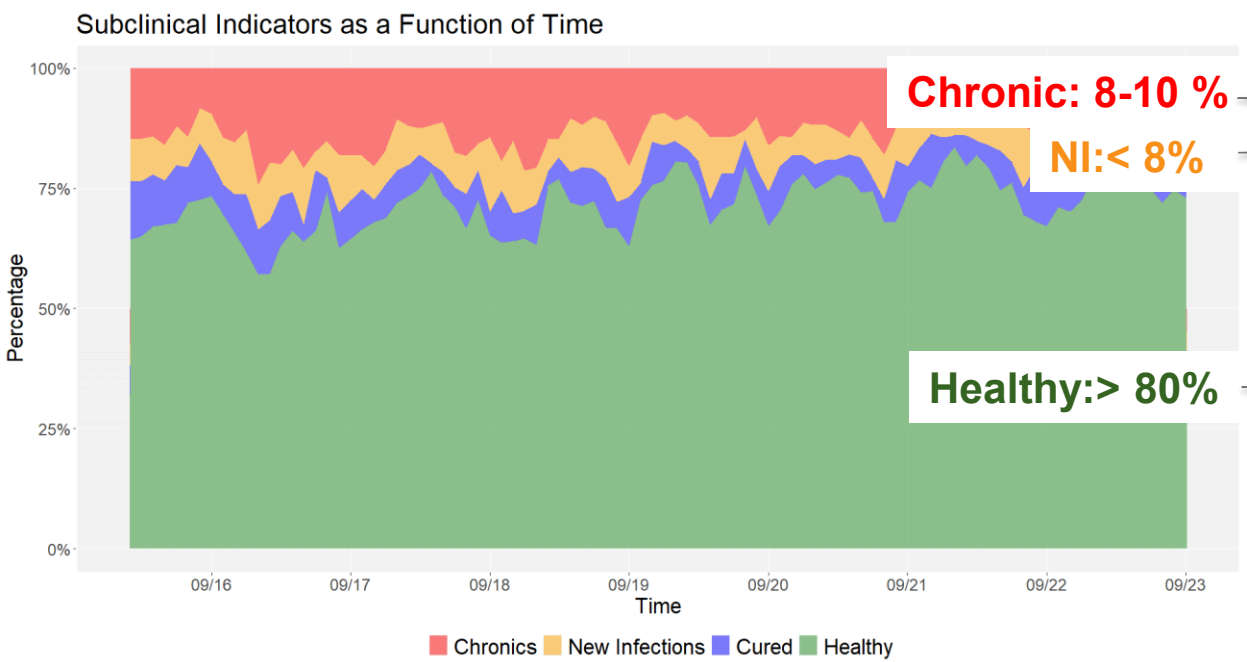


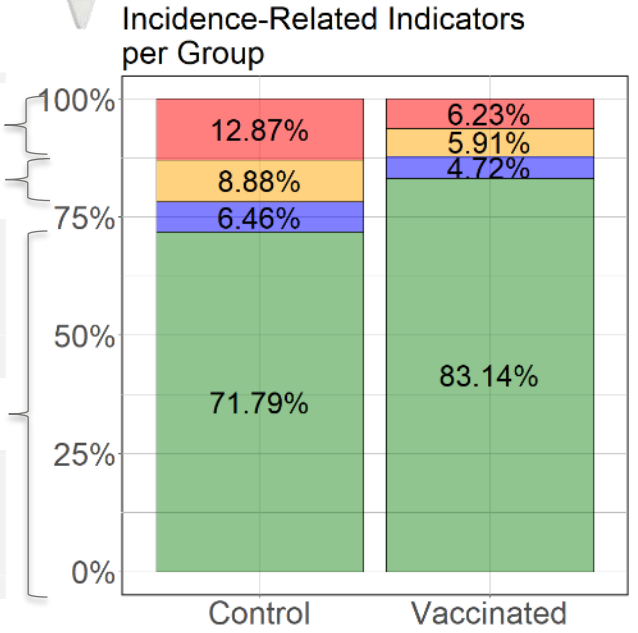


Infection dynamics



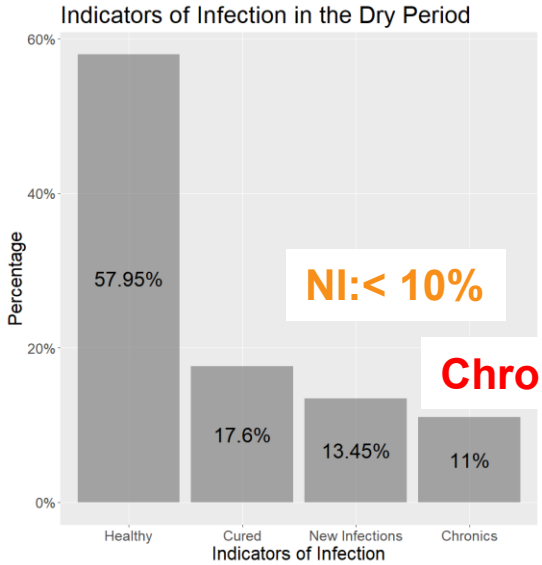
Infection dynamics





Other indicators

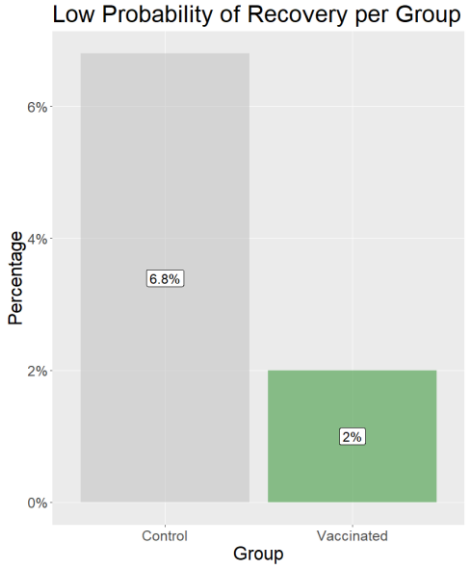
Chronic and NI in dry off



NI:< 10%

Chronic: <10 %

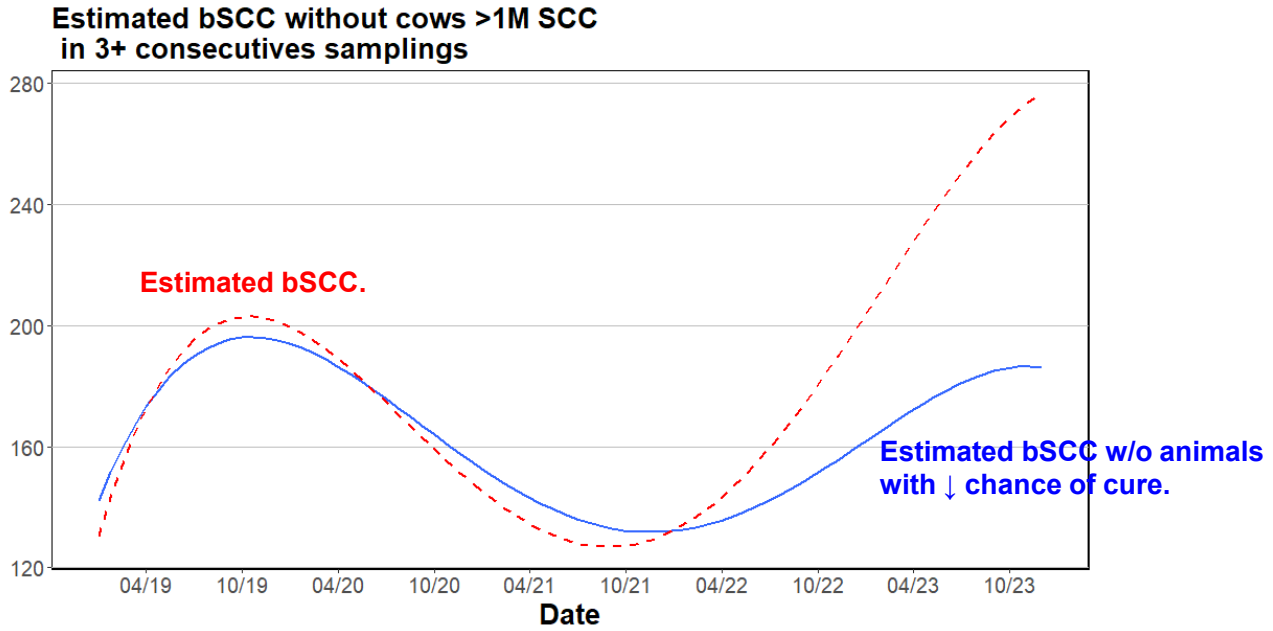
% Cows with low chances of cure (aLCC)



>700 cell/ml → **>700** → **>700**

Other indicators

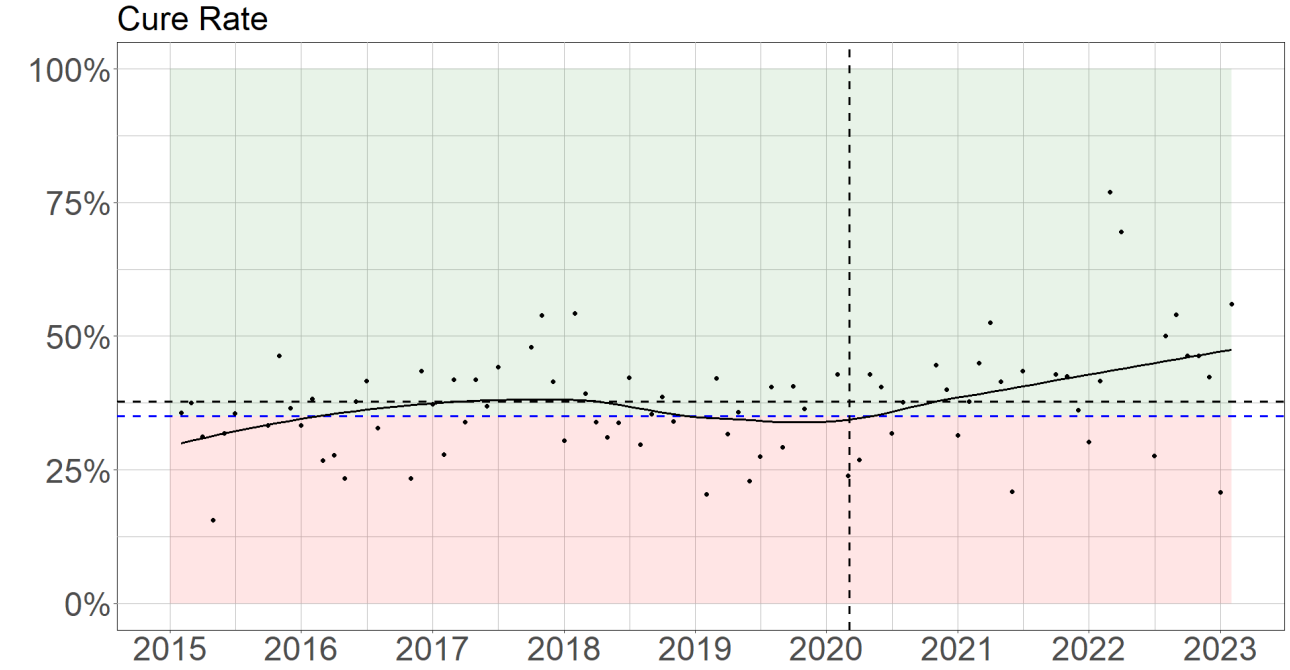
Estimation of the bSCC in different scenarios

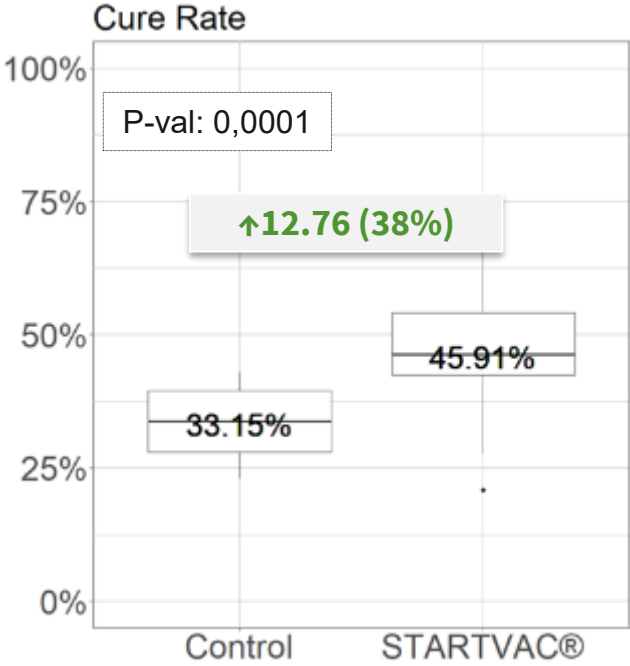


Cure rate

$$\text{Cure rate} = \frac{Cured\ cows}{(Cured\ cows + chronic\ cows)}$$

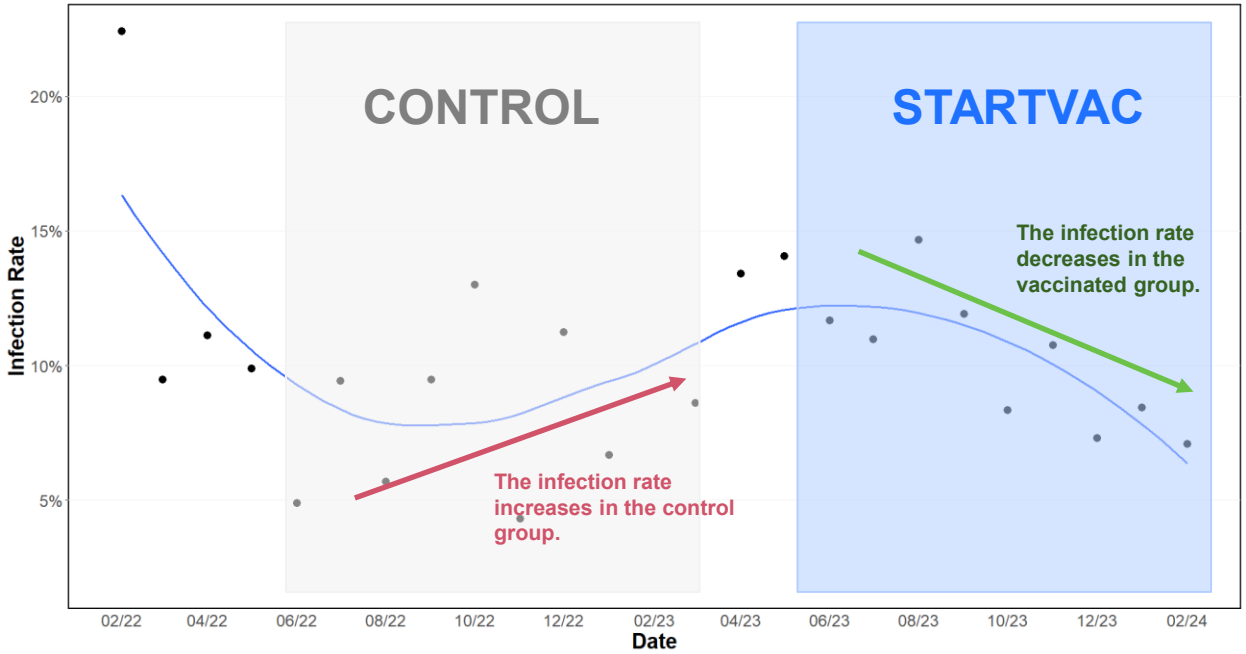
↑35%





Infection rate

$$\text{Infection rate} = \frac{New\ infections}{New\ infections + Healthy}$$



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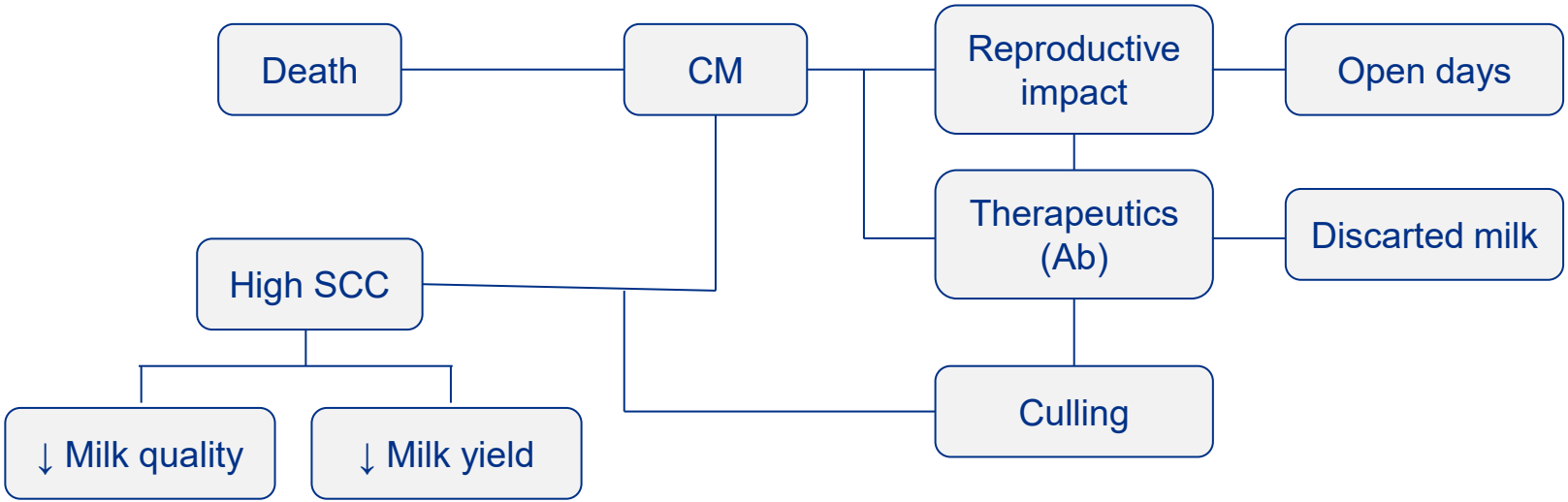
Economic impact of Mastitis



Economic impact of Mastitis

ADDITIONAL COSTS

- Open days
- Therapeutics (Ab)

REDUCED REVENUE

- Death
- Culling
- ↓ Milk quality
- ↓ Milk yield
- Discarted milk

Economic impact of Mastitis

ADDITIONAL COSTS

- Open days
- Therapeutics (Ab)

REDUCED REVENUE

- Death
- Culling
- ↓ Milk income

1Schrick et al. 2001; 2Rollin et al. 2015

Is Mastitis vaccination cost-effective in Peter's farm?

ADDITIONAL COSTS

4 doses x 7 € x 1,25 (heifers)= **35 €**

REDUCED REVENUE

REDUCED COSTS

- Therapeutics (Ab)

ADDITIONAL REVENUE

- Culling
- Discarted milk
- ↓ Milk quality
- ↓ Milk yield
- Deaths

Prices: *milk = 0,45€/kg, mastitis treatment = 10,33€, dead cow = 1500€, cull = 400€, STARTVAC® = 7 €/dose*

Is Mastitis vaccination cost-effective in Peter's farm?

REDUCED COSTS

Therapeutics (Ab)

207 vs 80 → $\frac{127 \; x \; 10{,}33 \; €}{350 \text{ cows}}$ = **3,75 €**

Withdrawal period:
6 days

ADITIONAL REVENUE

Culling

21 vs 11 → $\frac{10 \; x \; 400 \; €}{350 \text{ cows}}$ = **11,43 €**

↓ Milk quality

+11170 € → $\frac{11170 \; €}{350 \text{ cows}}$ = **31,9 €**

Deaths

3 vs 0 → $\frac{3 \; x \; 1500 \; €}{350 \text{ cows}}$ = **12,86 €**

Discarted milk

52061 kg vs 22230 kg → $\frac{29830 \; x \; 0{,}45 \; €}{350\text{cows}}$ = **38,35 €**

↓ Milk yield

+265 kg/cow → $265 \; x \; 0{,}45€$ = **119,25 €**

Prices: *milk = 0,45€/kg, mastitis treatment = 10,33€, dead cow = 1500€, cull = 400€, STARTVAC® = 7 €/dose*

Is Mastitis vaccination cost-effective in Peter's farm?

TOTAL COST

4,3 doses x 7 € x 1,25 (heifers)= **35 €**

35€

TOTAL BENEFIT

207 vs 80 → $\frac{127\ x\ 10{,}33\ €}{350\ cows}$ = **3,75 €**

3 vs 0 → $\frac{3\ x\ 1500\ €}{350\ cows}$ = **12,86 €**

21 vs 11 → $\frac{10\ x\ 400\ €}{350\ cows}$ = **11,43 €**

+265 kg/cow → $265\ x\ 0{,}45€$ = **119,25 €**

52061 kg vs 22230 kg → $\frac{29830\ x\ 0{,}45\ €}{350 cows}$ = **38,35 €**

+12270 € → $\frac{11170\ €}{350\ cows}$ = **31,9 €**

217,54€

Prices: *milk = 0,45€/kg, mastitis treatment = 10,33€, dead cow = 1500€, cull = 400€, STARTVAC® = 7 €/dose*

Is Mastitis vaccination cost-effective in Peter's farm?

Economic returns associated with **Mastitis Vaccination**

TOTAL BENEFIT	-	TOTAL COST
217,54€		35€

182,54 €/cow/year

Prices: *milk = 0,45€/kg, mastitis treatment = 10,33€, dead cow = 1500€, cull = 400€, STARTVAC® = 7 €/dose*

Is Mastitis vaccination cost-effective in Peter's farm?

TOTAL BENEFIT - **TOTAL COST** **= INVESTMENTS**

$$\frac{\textbf{182,54 €/cow/year}}{\textbf{35 €}} = \textbf{1: 5,22}$$

Prices: *milk = 0,45€/kg, mastitis treatment = 10,33€, dead cow = 1500€, cull = 400€, STARTVAC® = 7 €/dose*

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Summary

CLINICAL MASTITIS

Clinical mastitis rate	<30%
Incidence	<25%
New CM (<30 DIM)	< 8%
New CM (>30 DIM)	<17%
Recurrency rate CM	> 60%
Cure rate	>50%
Severity	>90% mild

SUBCLINICAL MASTITIS

New infections	8%
Chronic	8-10%
Healthy	> 80%
Cured	> % NI
Cure rate	> 35%
New infections risk	< 10%
Prevalence	< 20%
NI (dry off)	<10%
Chronic (dry off)	<10%

HIPRA

Building Immunity
for a Healthier World