Failure of Clinical Cure in Dairy Cows Diagnosed with Metritis is Associated with Reduced Reproductive and Productive Performance

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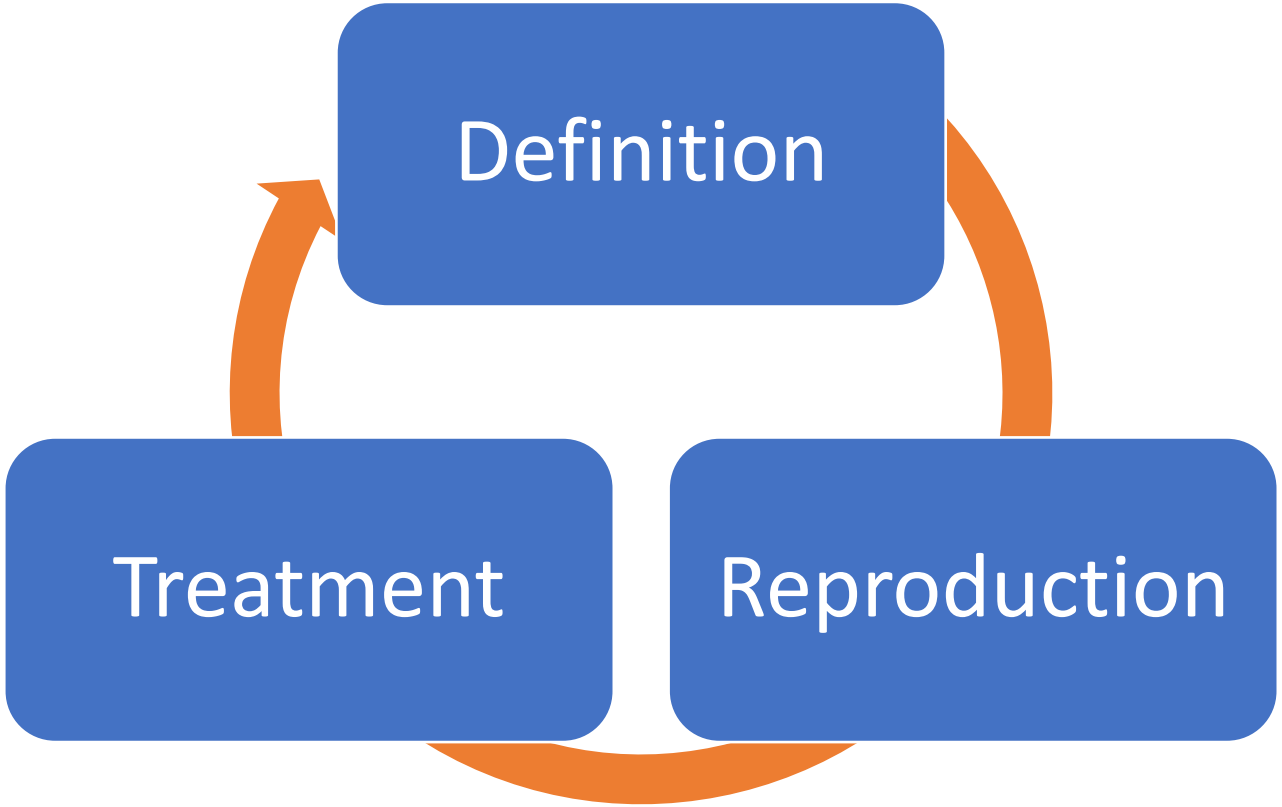
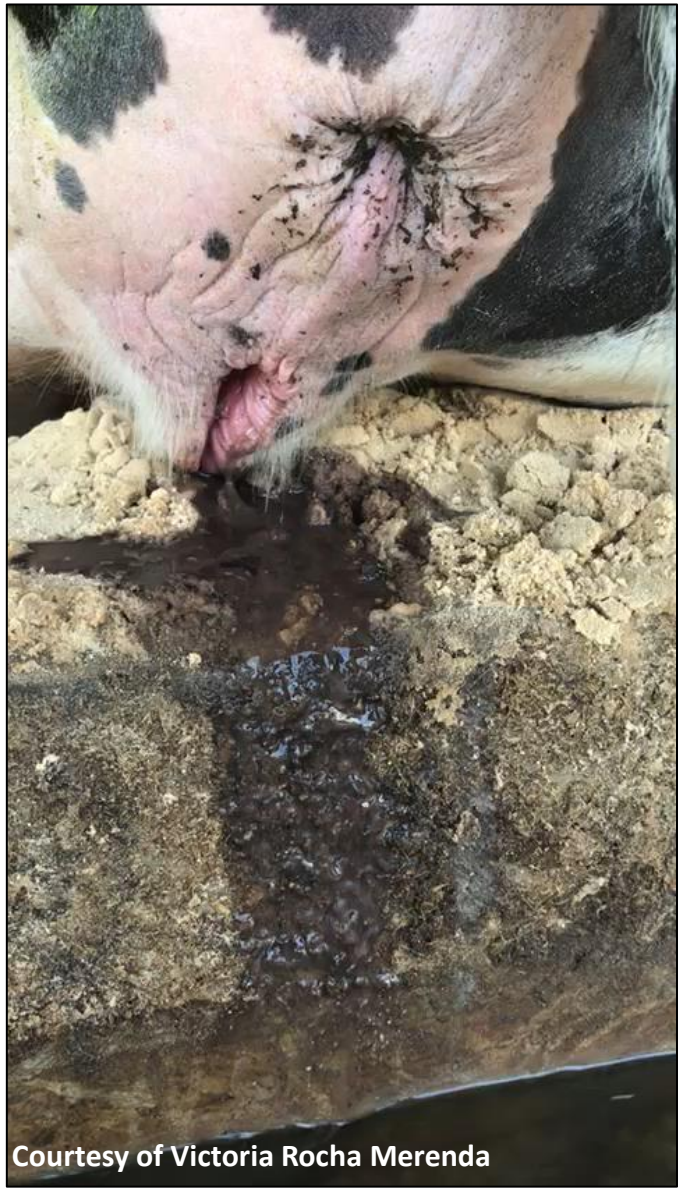
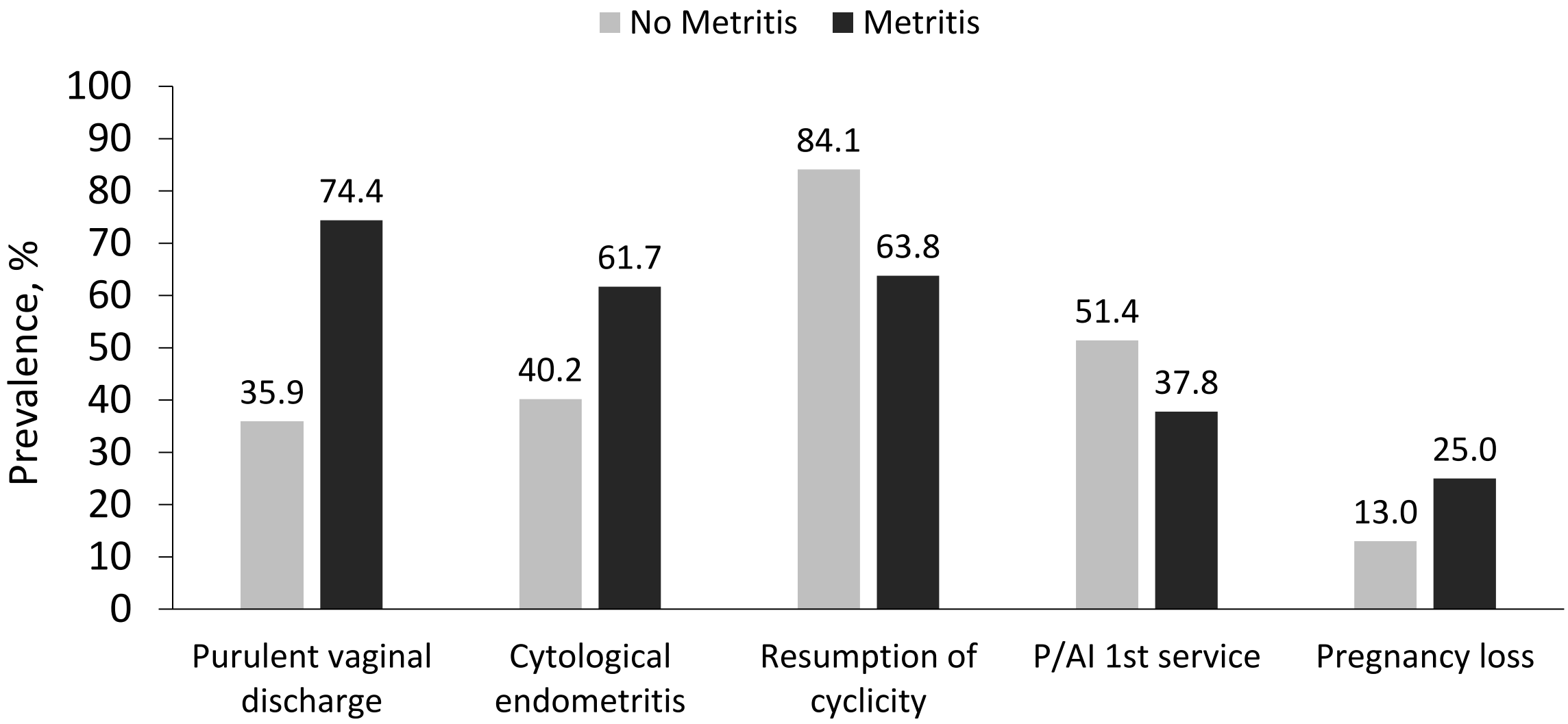
Metritis in Dairy Cattle




Courtesy of Victoria Rocha Merenda

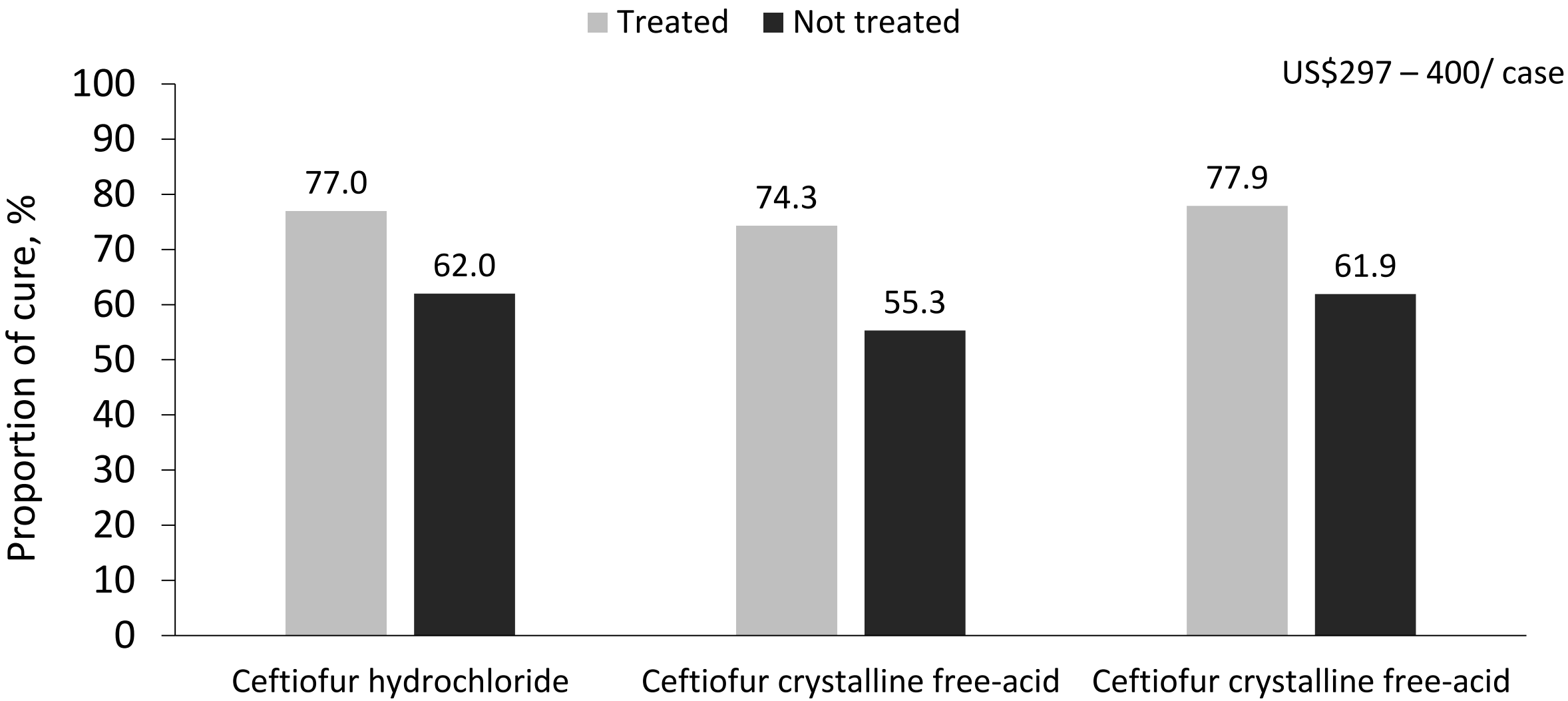
Sheldon et al. (2006) Therio. 65: 1516-30

Metritis in Dairy Cattle



Merenda et al.. (accepted) J. Dairy Sci.; Santos et al. (2010) Soc. Reprod. Fertil. Suppli. 67: 387-403; Ribeiro et al. (2016) J. Dairy Sci. 99: 2201- 20

Metritis in Dairy Cattle



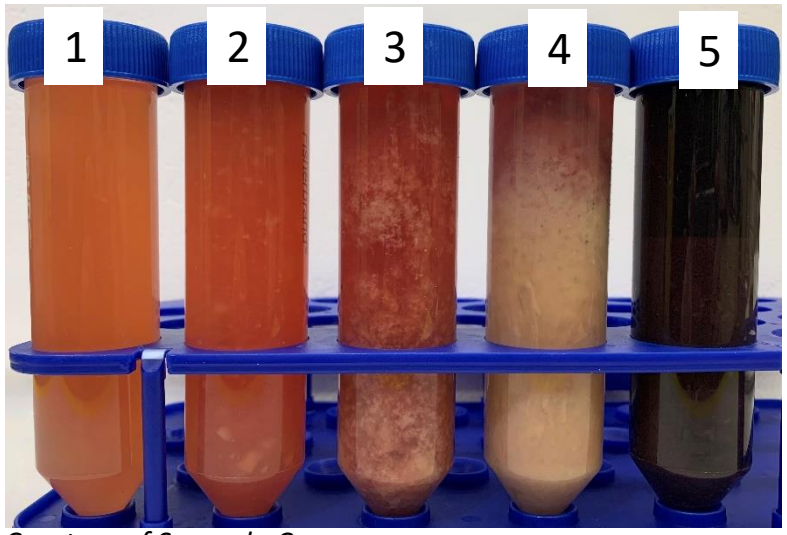
Chenault et al. (2004) JAVMA. 224: 1634-39; McLaughlin et al. (2012) J. Dairy Sci. 95: 4363-71; Oliveira et al. (2020) J. Dairy Sci. 103: 7377-91; Lima et al (2019) J. Dairy Sci. 102:7345-58

Objectives and Hypothesis

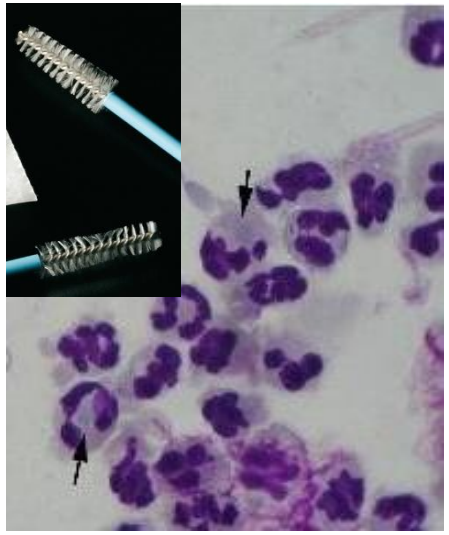
- Objectives were to evaluate uterine health, resumption of estrous cyclicity, reproductive and productive outcomes associated with clinical cure failure of metritis.

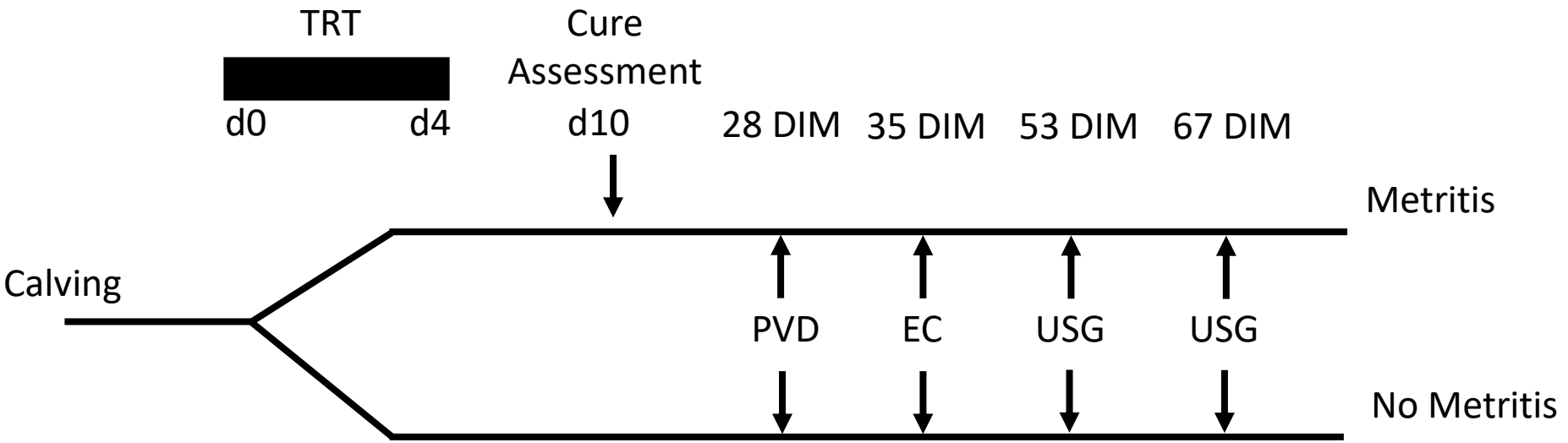
- Hypothesis was that cows that achieve clinical cure at 10 d after completion of treatment have better reproductive and productive performance compared to animals with clinical cure failure.

Materials and Methods



Courtesy of Segundo Casaro

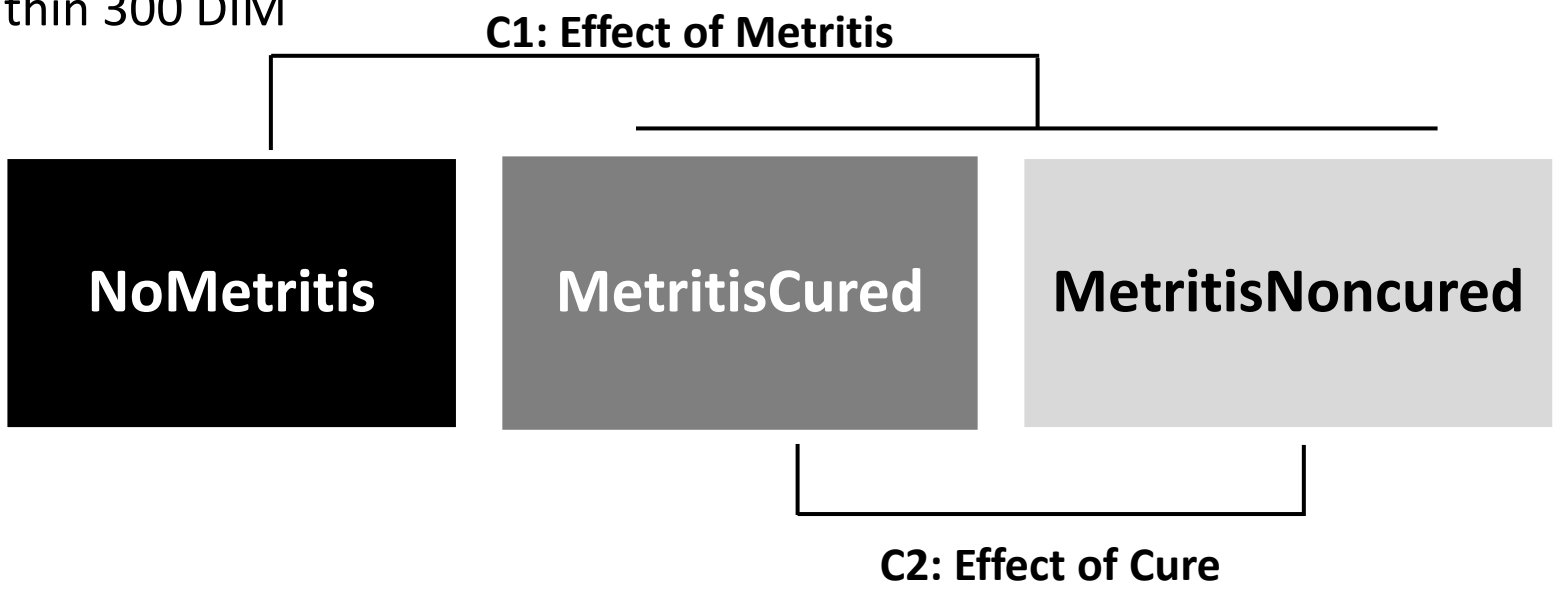




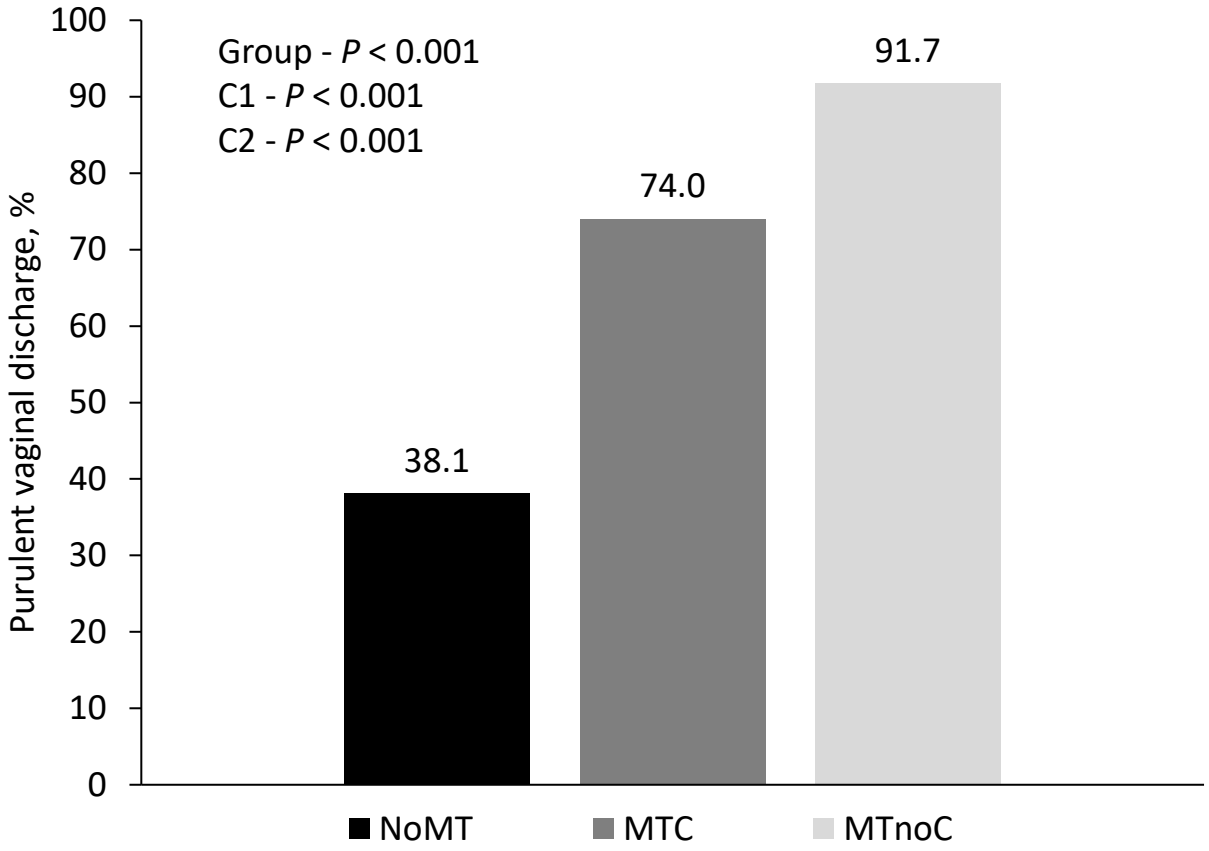
Group	n
NoMetritis	1,194
MetritisCured	1,111
MetritisNoncured	299

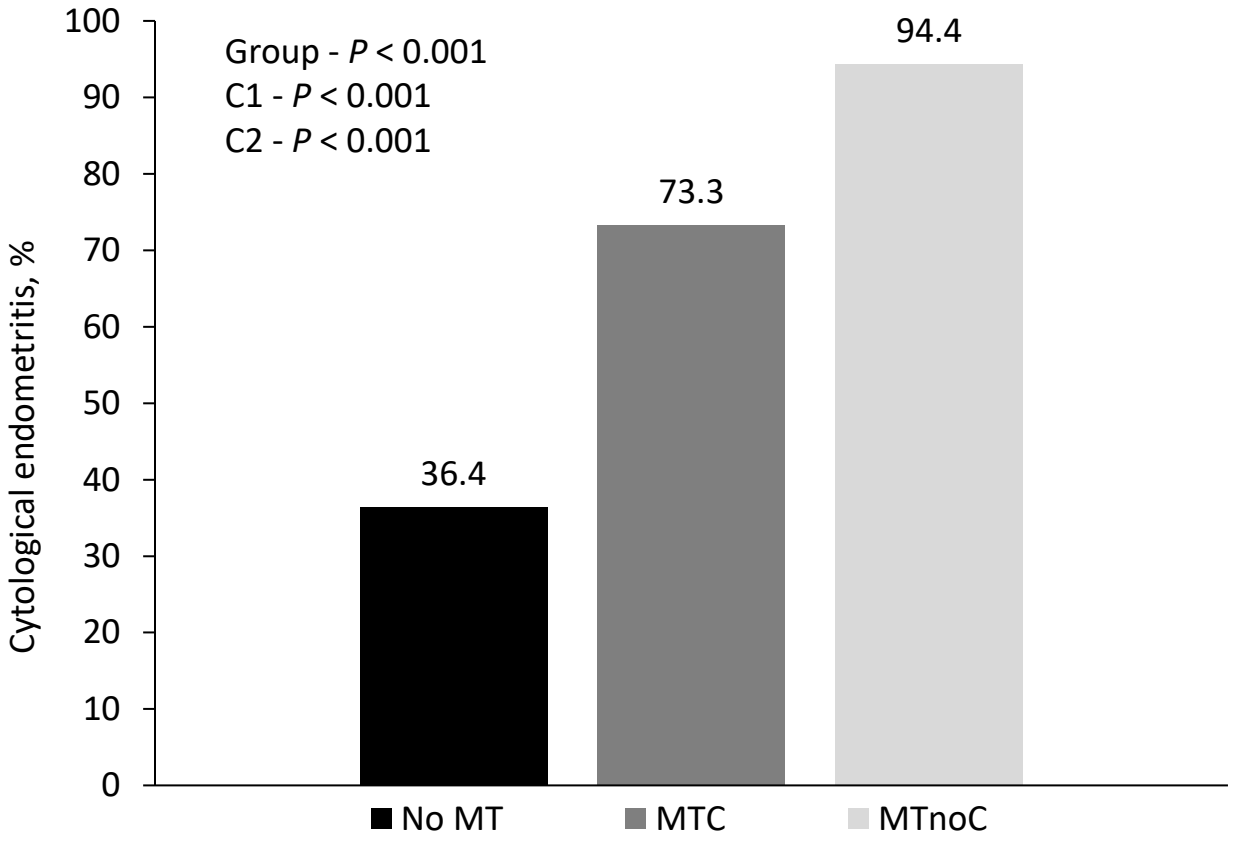
Statistical Analysis

- Logistic Regression
  - Development of purulent vaginal discharge (PVD) and cytological endometritis (CE)
  - Resumption of cyclicity
  - Risk of receiving first AI
  - Pregnancy per AI
  - Pregnancy loss
- Cox's Proportional Hazard and Kaplan-Meier Survival Curves
  - Hazard and time of pregnancy within 300 DIM
- ANOVA repeated measures
  - Milk yield
- Fixed effect – Cure and Study

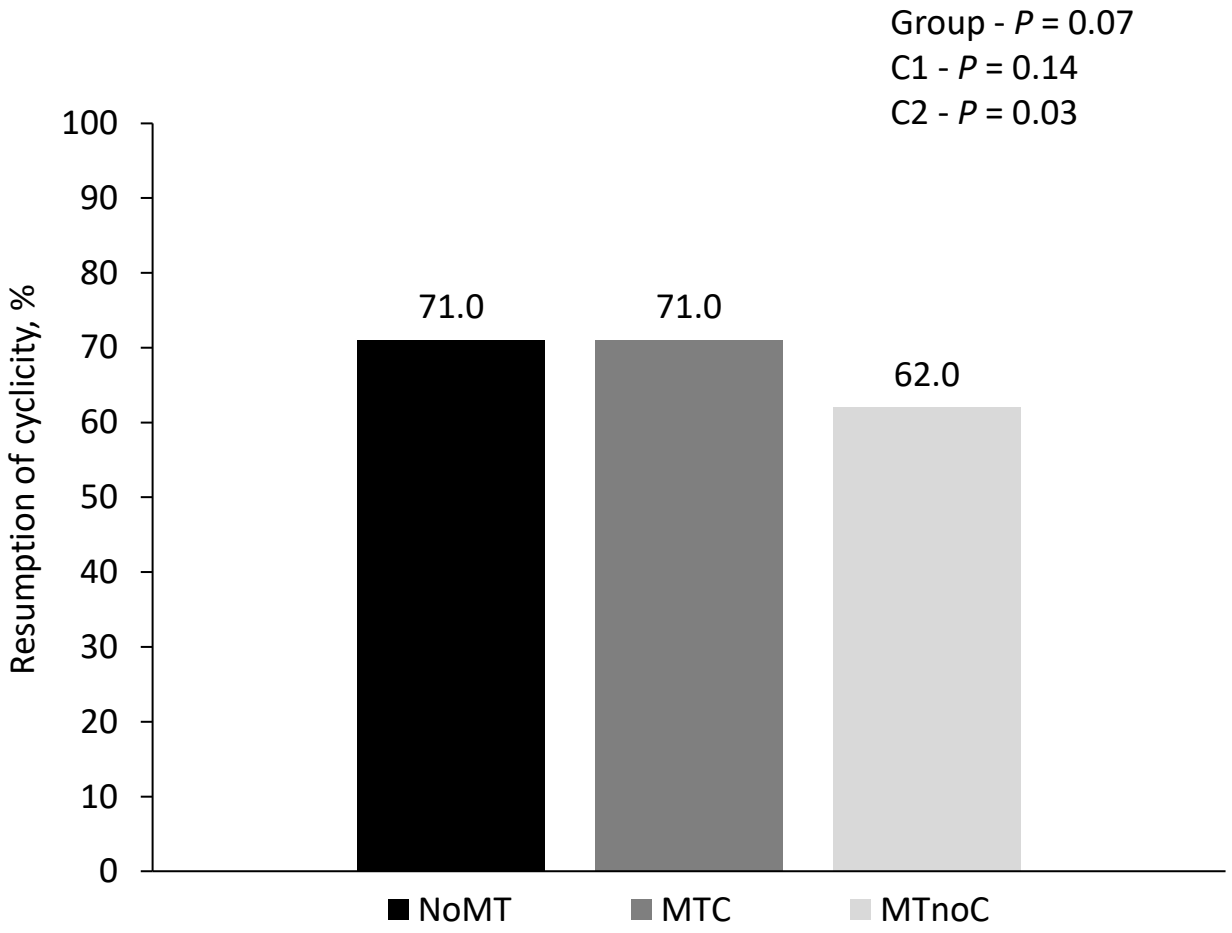


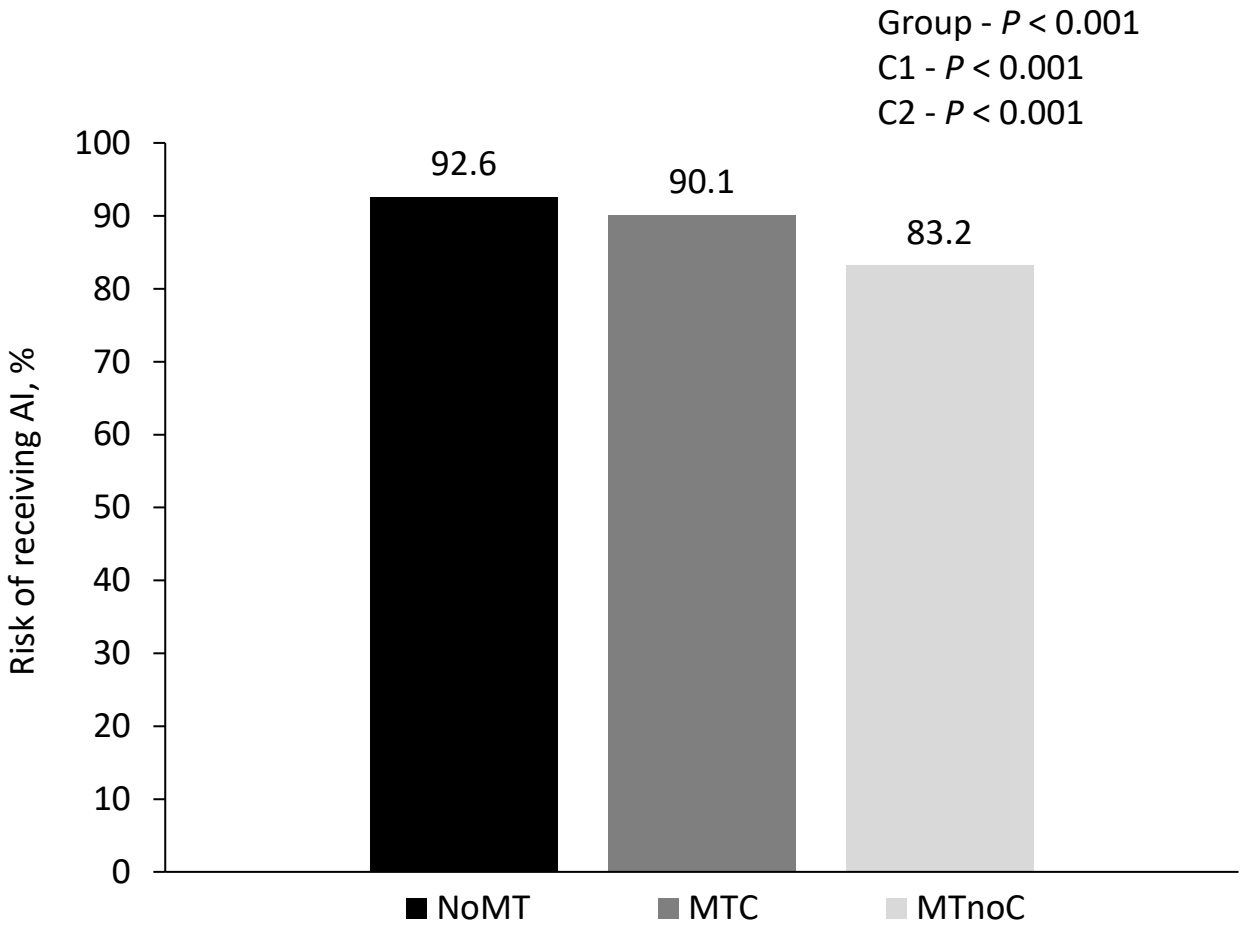
Results


Purulent vaginal discharge, %
100
90
80
70
60
50
40
30
20
10
0
Group - P < 0.001
C1 - P < 0.001
C2 - P < 0.001
38.1
74.0
91.7
NoMT
MTC
MTnoC

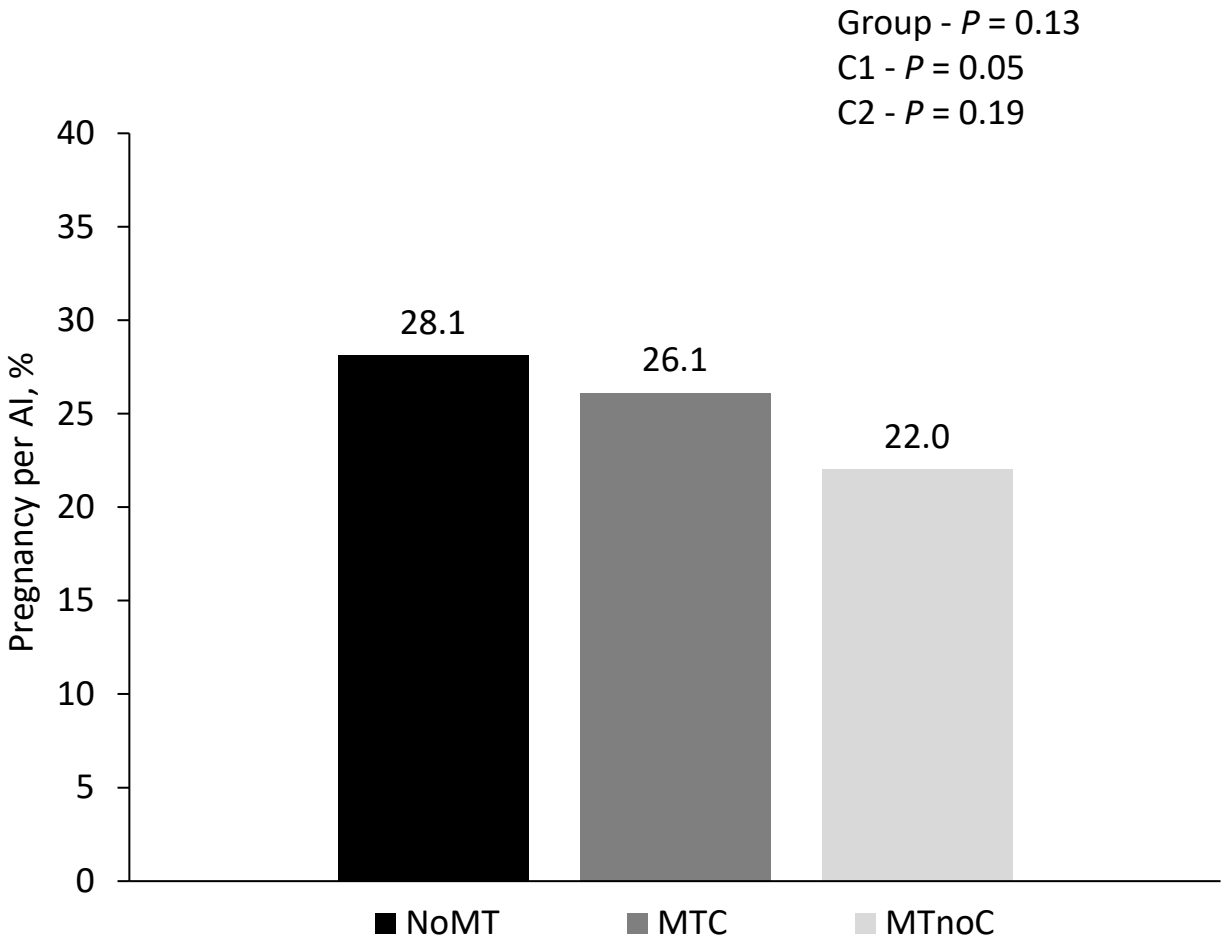

Cytological endometritis, %
100
90
80
70
60
50
40
30
20
10
0
Group - P < 0.001
C1 - P < 0.001
C2 - P < 0.001
36.4
73.3
94.4
No MT
MTC
MTnoC

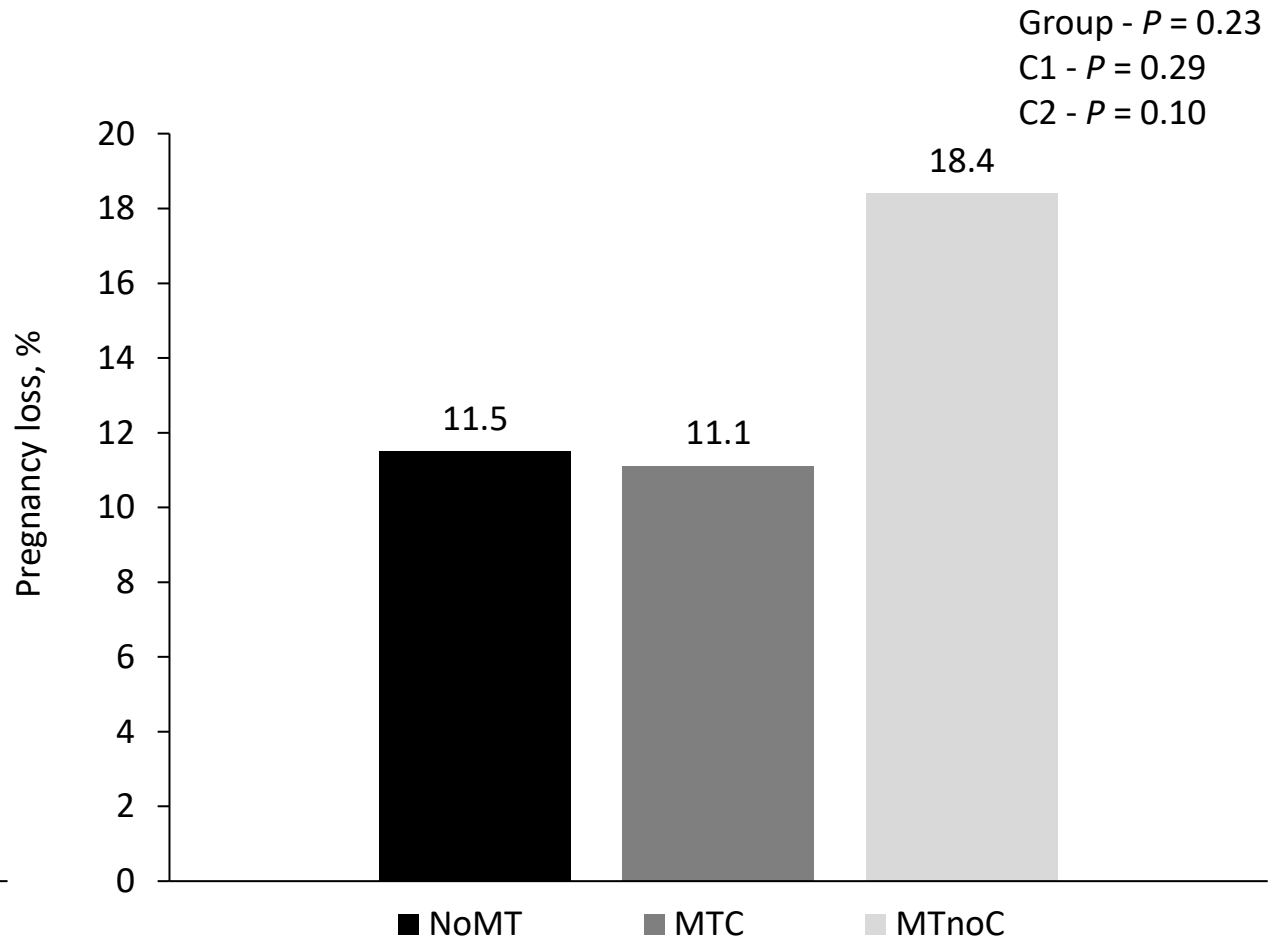
Results


Group - P = 0.07
C1 - P = 0.14
C2 - P = 0.03
Resumption of cyclicity, %
100
90
80
70
60
50
40
30
20
10
0
71.0
71.0
62.0
NoMT
MTC
MTnoC

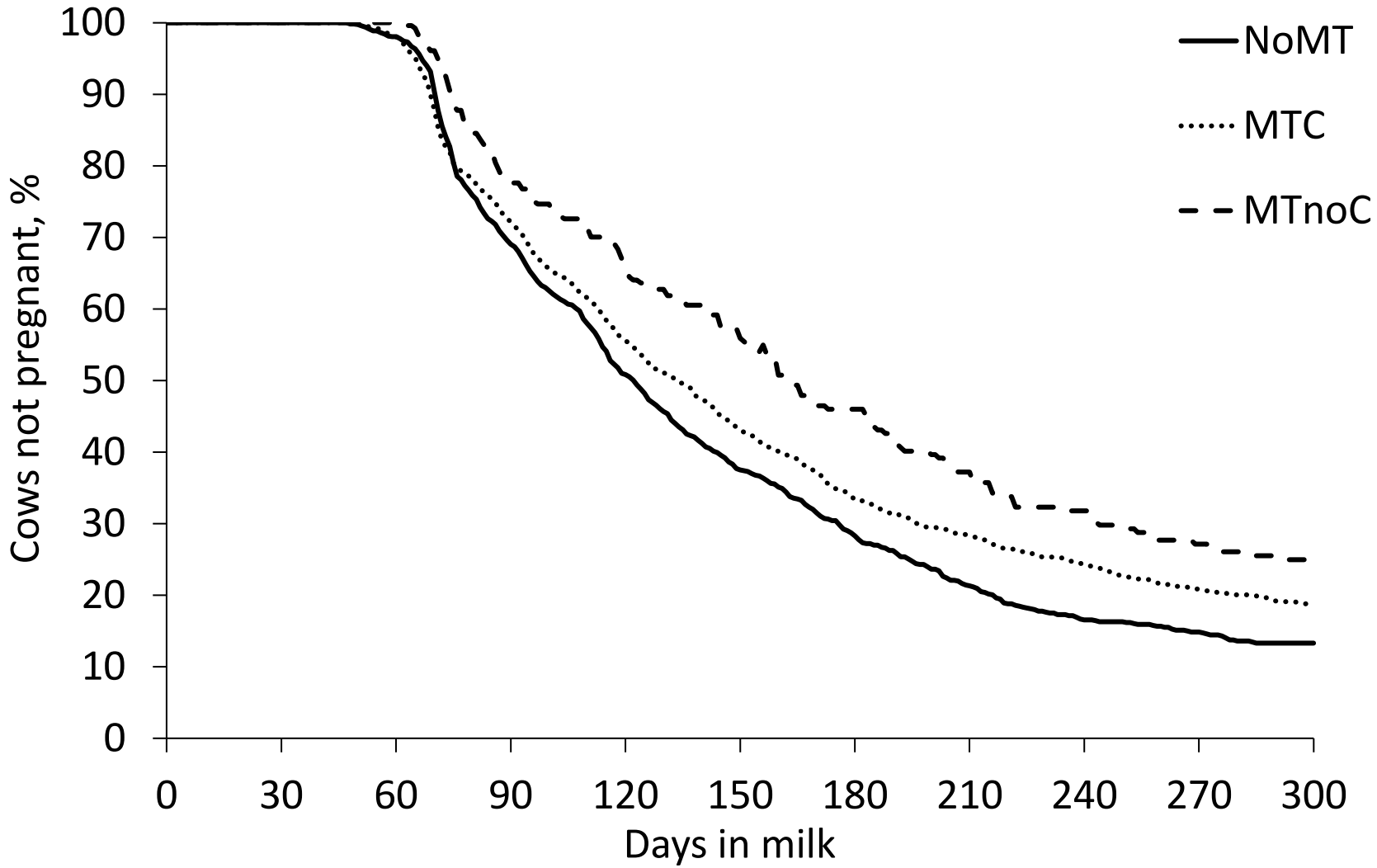

Group - P < 0.001
C1 - P < 0.001
C2 - P < 0.001
Risk of receiving AI, %
100
90
80
70
60
50
40
30
20
10
0
92.6
90.1
83.2
NoMT
MTC
MTnoC

Results


Group - P = 0.13
C1 - P = 0.05
C2 - P = 0.19
Pregnancy per AI, %
40
35
30
25
20
15
10
5
0
28.1
26.1
22.0
NoMT
MTC
MTnoC


Group - P = 0.23
C1 - P = 0.29
C2 - P = 0.10
Pregnancy loss, %
20
18
16
14
12
10
8
6
4
2
0
11.5
11.1
18.4
NoMT
MTC
MTnoC

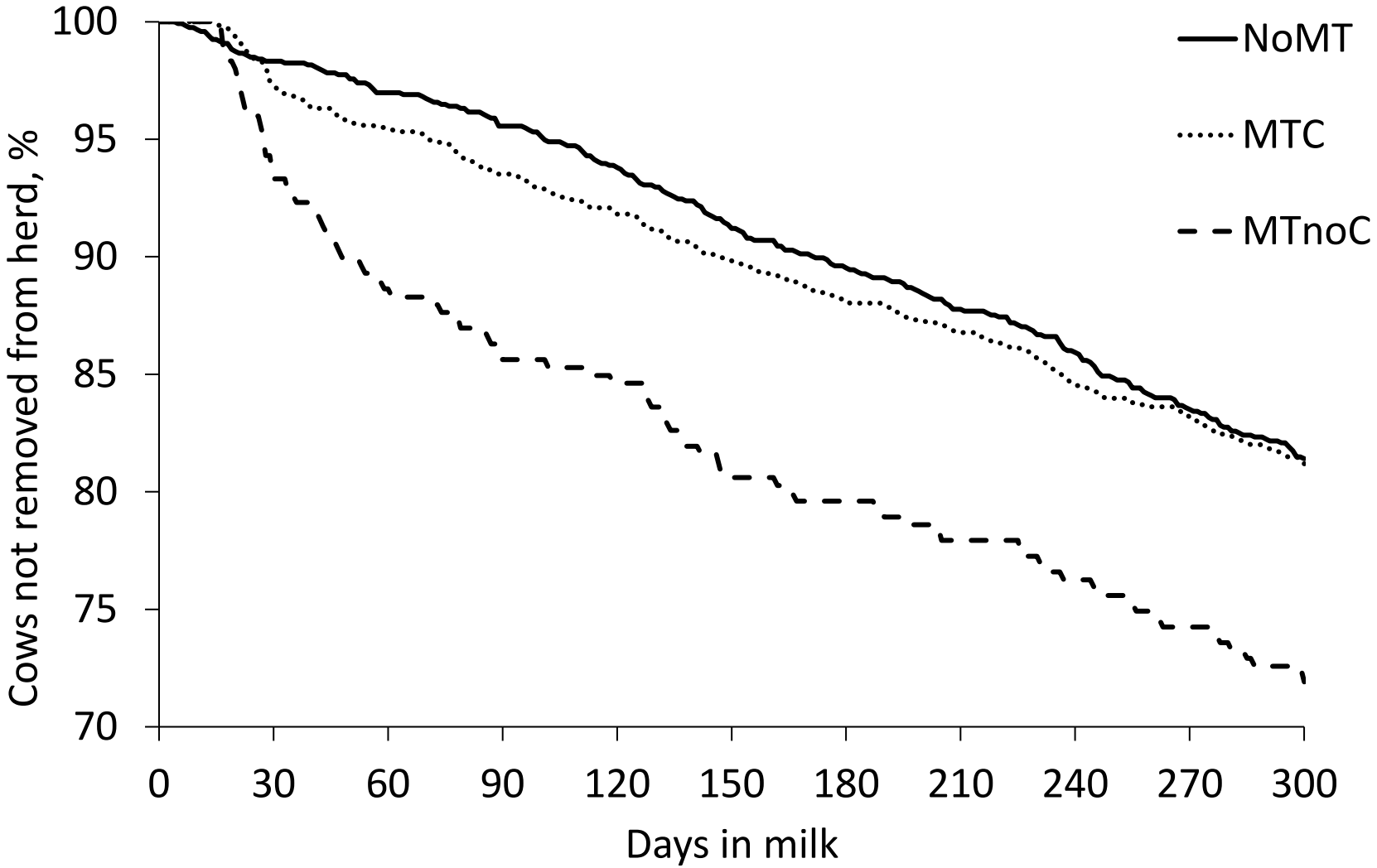
Results



Group	AHR	Mean
NoMT	Ref.	148 ± 2
MTC	0.80, 0.72 – 0.88	160 ± 3
MTnoC	0.63, 0.53 – 0.74	178 ± 6

Pregnancy within 300 DIM	
Cure Status	< 0.001
Effect of Metritis	< 0.001
Effect of Cure	< 0.001

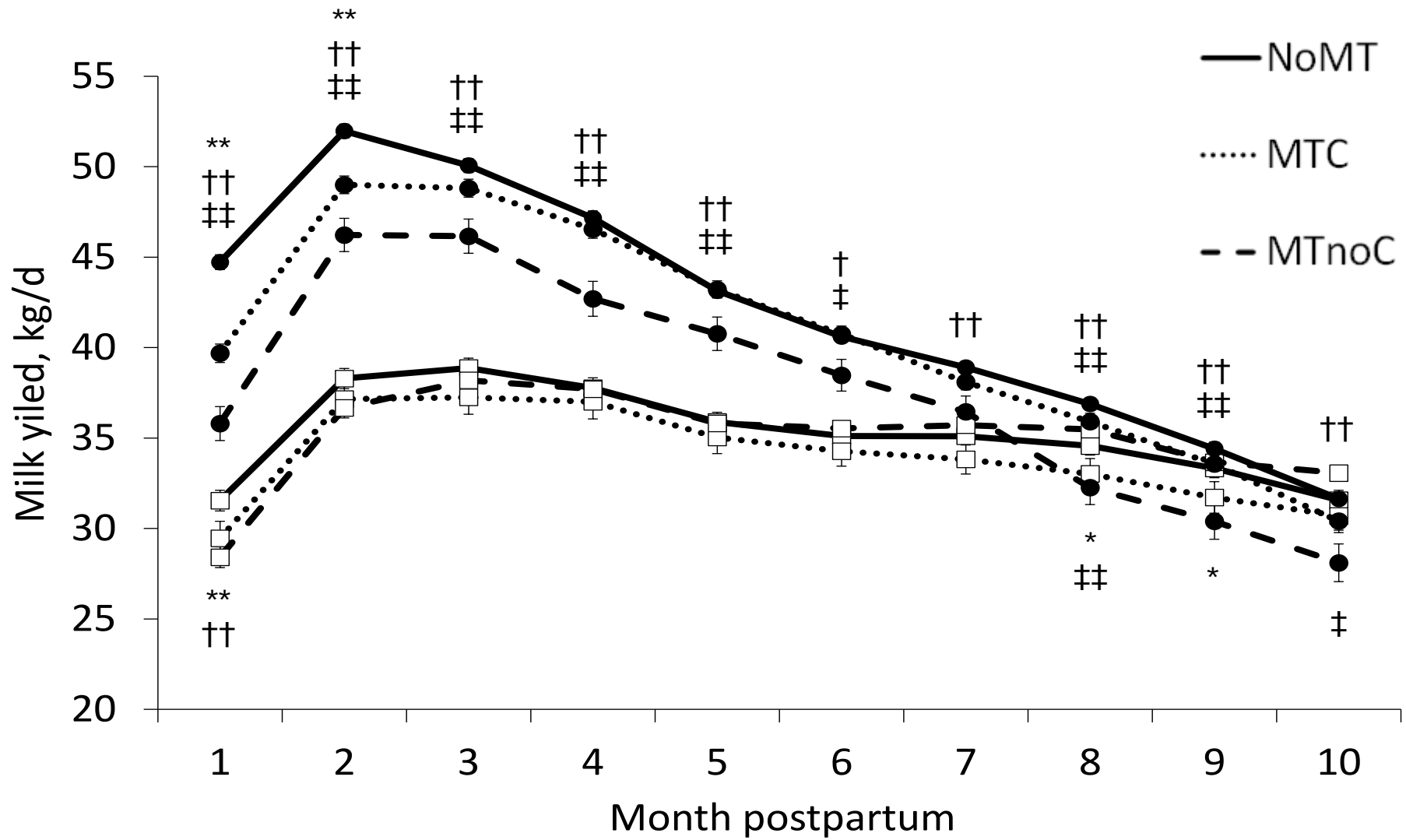
Results



Group	Mean, %
NoMT	15.4
MTC	17.4
MTnoC	26.3

Left herd within 300 DIM	
Cure Status	< 0.001
Effect of Metritis	< 0.001
Effect of Cure	< 0.001

Results



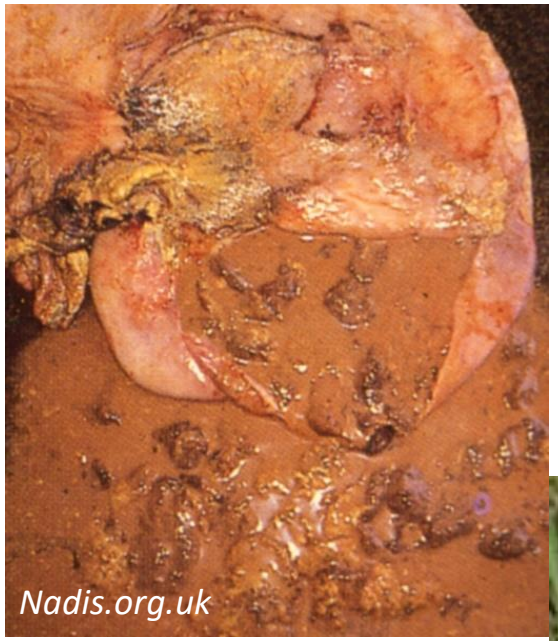
$P \leq 0.05$; ** NoMT vs. MTC, †† NoMT vs. MTnoC, ‡‡ MTC vs. MTnoC

$P \leq 0.10$; * NoMT vs. MTC, † NoMT vs. MTnoC, ‡ MTC vs. MTnoC

Results

Risk factor	Cure failure, % (n)	AOR (95% CI)	*P*-value
Calving season			
Fall	13.4 (417)	Reference	0.08
Winter	22.5 (511)	1.59 (1.05-2.42)	
Spring	25.3 (316)	1.79 (1.07-2.99)	
Summer	28.9 (166)	2.06 (1.16-3.63)	
RFM			
No	17.6 (1,068)	Reference	< 0.001
Yes	32.5 (342)	2.14 (1.60-2.85)	
Fever on d 0			
No	17.9 (878)	Reference	< 0.001
Yes	26.7 (532)	1.69 (1.29-2.20)	

Conclusion



- Retained fetal membranes and occurrence of fever at diagnosis of metritis were associated with greater likelihood of clinical cure failure.
- Failure of clinical cure of metritis was associated with impaired uterine health, decreased risk of estrous resumption, reduced subsequent fertility, increased risk of culling and reduced milk yield.
- This study highlights the need for further investigation focused on unveiling factors associated with clinical cure of metritis, and development of optimized treatment protocols.

Acknowledgements

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