UNIVERSITÀ DEGLI STUDI DI NAPOLI FEDERICO II

OVUD Ospedale Veterinario Universitario Didattico

Dipartimento Medicina Veterinaria Produzioni Animali

EFFECT OF BENZATHINE CLOXACILLIN IN DAIRY WATER BUFFALO AT DRY-OFF: PRELIMINARY RESULTS

Guccione J, D' Andrea L, Pesce A, Toni F, Borriello G, Salzano C, Diuccio F, Pascale M, Ciaramella P

SICliMVet Società Italiana di Clinica Medica Veterinaria

S.I.S.Vet

LXXXIII Congresso SISVET, 19-22/06/2019 Olbia

Introduction

Mastitis is one of the most expensive pathologies for the farmer and the dairy food chain [a]

[a]Guccione 2016, 2017, 2018

S. aureus is one of the most common contagious bacteria causing mastitis in Mediterranean buffaloes (MB)

J. Dairy Sci. 97:7606–7613
http://dx.doi.org/10.3168/jds.2014-8455

Clinical outcomes and molecular genotyping of *Staphylococcus aureus* isolated from milk samples of dairy primiparous Mediterranean buffaloes (*Bubalus bubalis*)

J. Guccione,*[1] A. Cosandey,† A. Pesce,‡ A. Di Loria,§ M. Pascale,# D. Piantedosi,* A. Steiner,‖ H. U. Graber,†[2] and P. Ciaramella*[2]

In-herd prevalence up to 55% of the milking animals

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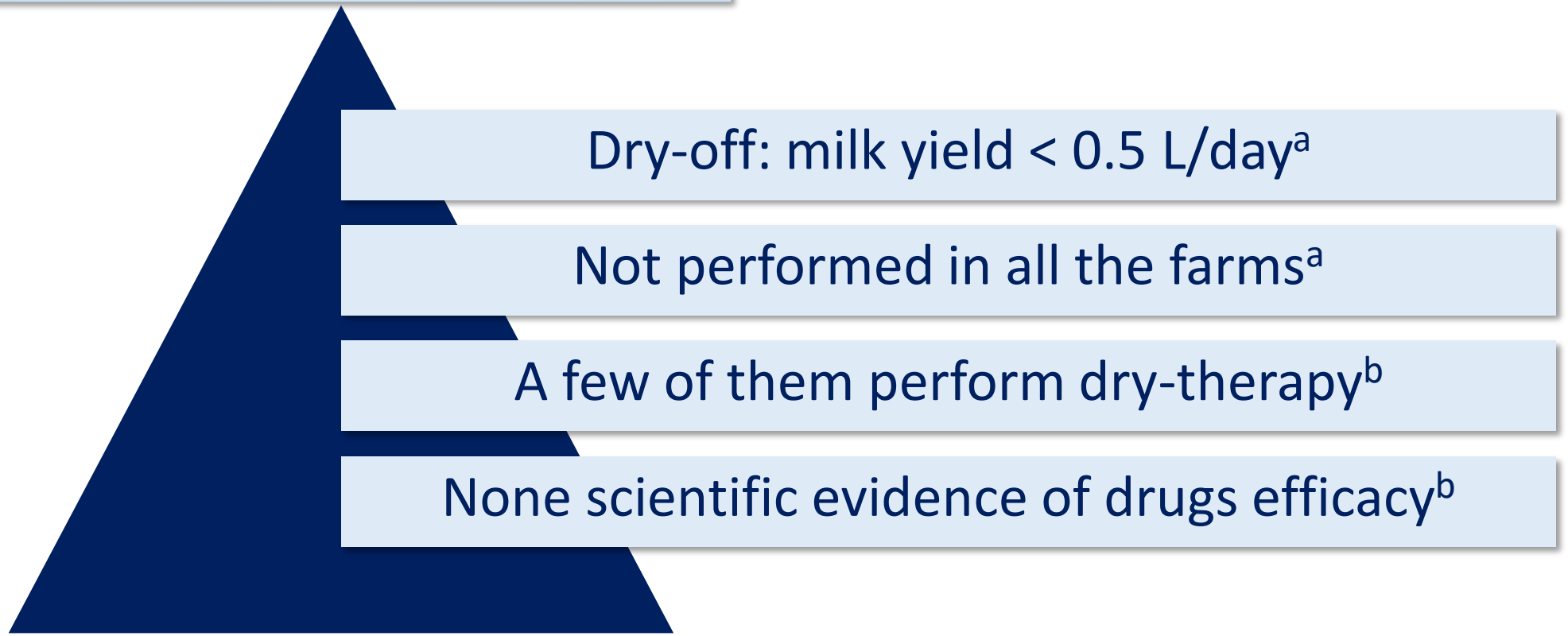
The udder status under the clincal point of view[a]

Status	Values SCC (Cells/ml)	Microbiological status	Clinical signs
Healthy	SCC ≤ 200'000	Negative	Absent
Infected	SCC ≤ 200'000	**Positive**	Absent
Mastitis-grade1 (SCM)	SCC > 200'000	**Positive**	Absent
Mastitis-grade2 (CM)	SCC > 200'000	**Positive**	**Present (Udder)**
Mastitis-grade3 (CM)	SCC > 200'000	**Positive**	**Present (general state)**

[a] Tripaldi et al., 2010, Guccione et al., 2014; Guccione et al., 2017

Dry-off and dry period in MB



[a] Guccione et al., 2014; Guccione et al., 2017

Benzathine cloxacillin

Semi-synthetic penicillin

Intramammary administrated

Kietzmann *et al. BMC Veterinary Research* 2010, **6**:46
http://www.biomedcentral.com/1746-6148/6/46

BMC Veterinary Research

RESEARCH ARTICLE Open Access

Tissue distribution of cloxacillin after intramammary administration in the isolated perfused bovine udder

Manfred Kietzmann[1*], Frank Niedorf[1], Jacques Gossellin[2]

Benzathine cloxacillin

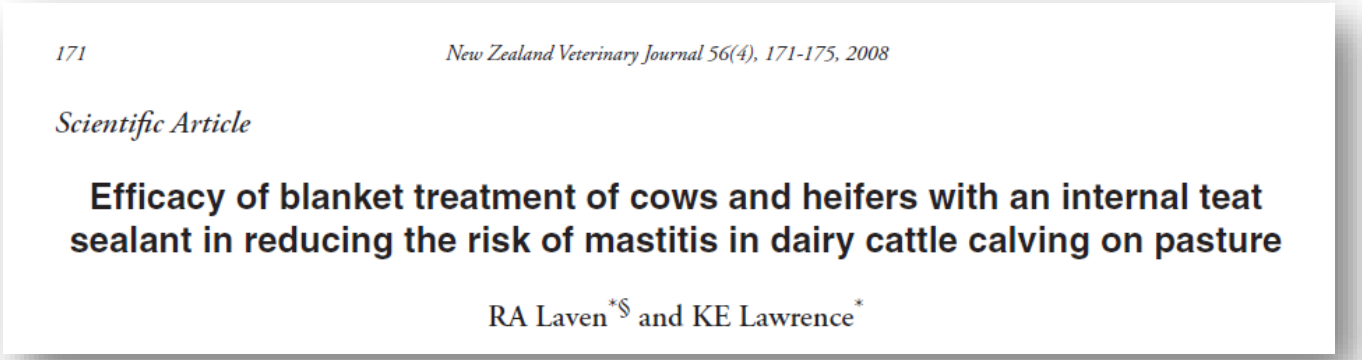
- Bactericidal action against Gram + microorganisms

Farm Animals

Update on dry cow therapy 1. antibiotic v non-antibiotic approaches

Andrew Biggs

- Selective and blanket treatment at dry-off



New Zealand Veterinary Journal 56(4), 171-175, 2008

Scientific Article

Efficacy of blanket treatment of cows and heifers with an internal teat sealant in reducing the risk of mastitis in dairy cattle calving on pasture

RA Laven*§ and KE Lawrence*

Benzathine cloxacillin

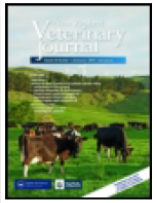
- Alone or associated with teat sealant

J. Dairy Sci. 93:4582–4591
doi:10.3168/jds.2009-2956

The use of an internal teat sealant in combination with cloxacillin dry cow therapy for the prevention of clinical and subclinical mastitis in seasonal calving dairy cows

D. J. Runciman,*[1] J. Malmo,* and M. Deighton†

- Reduction of mastitis in fresh animals and increase of milk quality



Taylor & Francis

New Zealand Veterinary Journal

ISSN: 0048-0169 (Print) 1176-0710 (Online) Journal homepage: http://www.tandfonline.com/loi/tnzv20

A comparison of the effect of short-acting and long-acting cloxacillin-based dry-cow therapy on somatic cell counts after calving in cows also given internal teat sealants

L. K. Whitfield & R. A. Laven

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The aims of the study was:

To evaluate the **clinical efficacy against *S. aureus* infections** of an intramammary administration of benzathine cloxacillin in buffaloes at dry-off

Matherial and methods

Matherials and methods

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Farm selection

- Chosed from a group of 8 randomly selected
- South Italy and monthly monitored
- BTMSCC 9 months, September 2016 - May 2017

Selected Farm

- **Herd:** approximately **400 dairy MB**
- **Proportion of MB > 200^3 SCC:** 39.8 % (9-month average)
- **Proportion of MB with chronic infection:** 22,2 % (9-month average)
- **Average SCC:** 256^3 (9-month average)
- **Bulk tank milk analysis**: out of n°9 samplings, n°7 positive for *S. aureus*

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Animals enrolment

40 pluriparous MB randomly chosen

N° 160 quarters in total:

- 80 as treatment group (TG)
- 80 as control group (CG)

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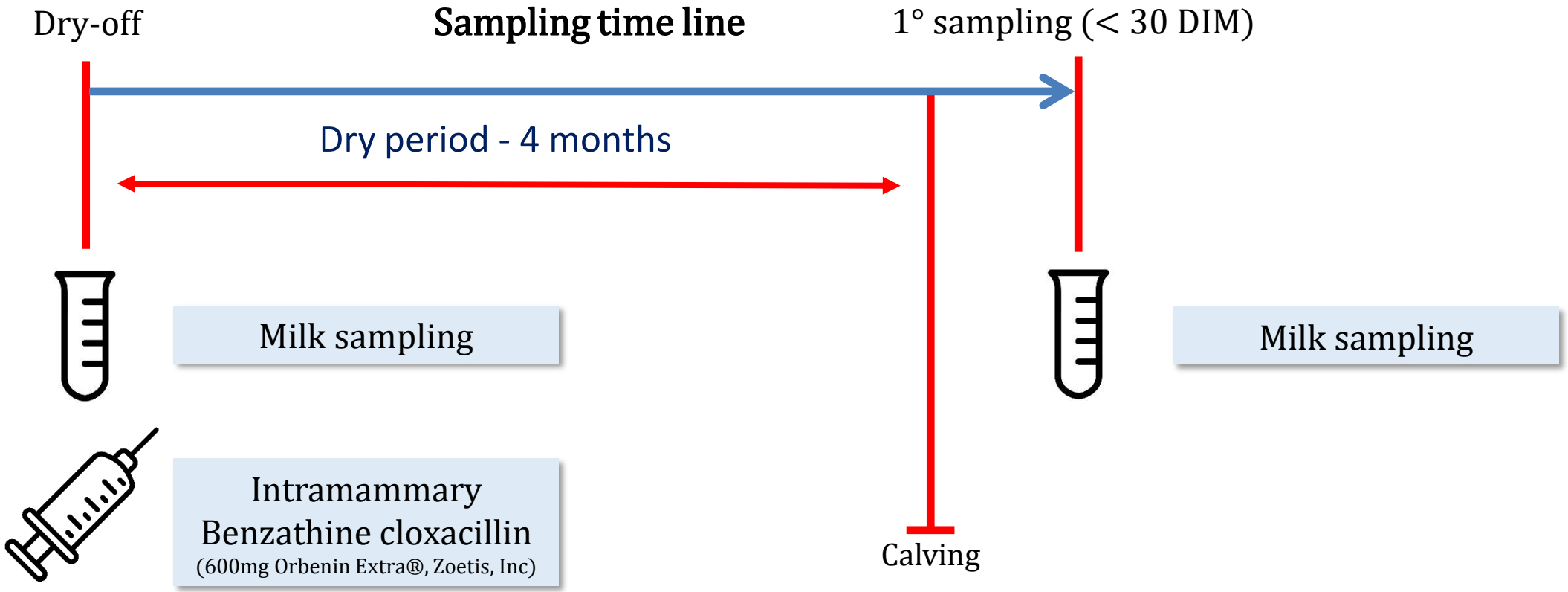
Sampling for each buffalo



- **Herd Management:** buffaloes dry-off period is approximately 4-months long

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Sampling for each buffalo

- **Assessment of udder health status**

  - Quarter milk sampling[a]
  - Cooled (4°C), and brought to the lab. within 1 h
  - Bacteriological milk culture (BMC)
  - Somatic cell count (SCC)

- **Daily milk yield recordings**

[a] NMC, 2017

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Statistical Analysis

- Standard descriptive statistics and normality was assessed using Shapiro Wilk tests [a]
- Data are expressed as absolute numbers, percentages [a]
- The variables were compared using histograms and or non-parametric test (χ^2 -test, Fisher test) [a]
- ***P***robabilities < 0.05 were considered significant

Mastitis monitoring indexes

- Prevalence of animals/quarters with IMI, SCM and CM due to *S. aureus*
- Fresh calver infection rate
- Dry period new infection rate
- Dry period cure rate
- Failure to cure rate

[a] SPSS software package, Version 17.0, Chicago, IL, U.S.A.

Results

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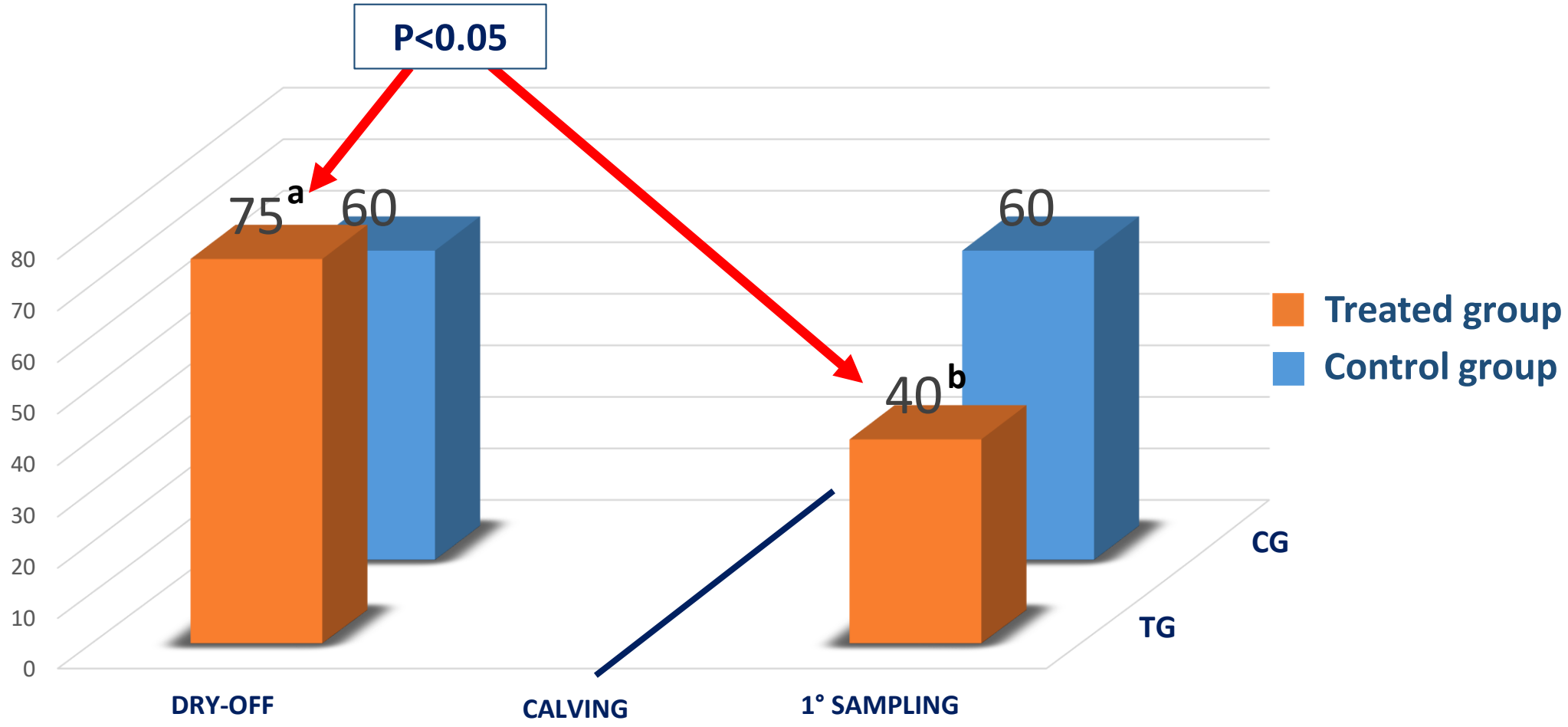
Prevalence of positive animals for *S. aureus* (%)



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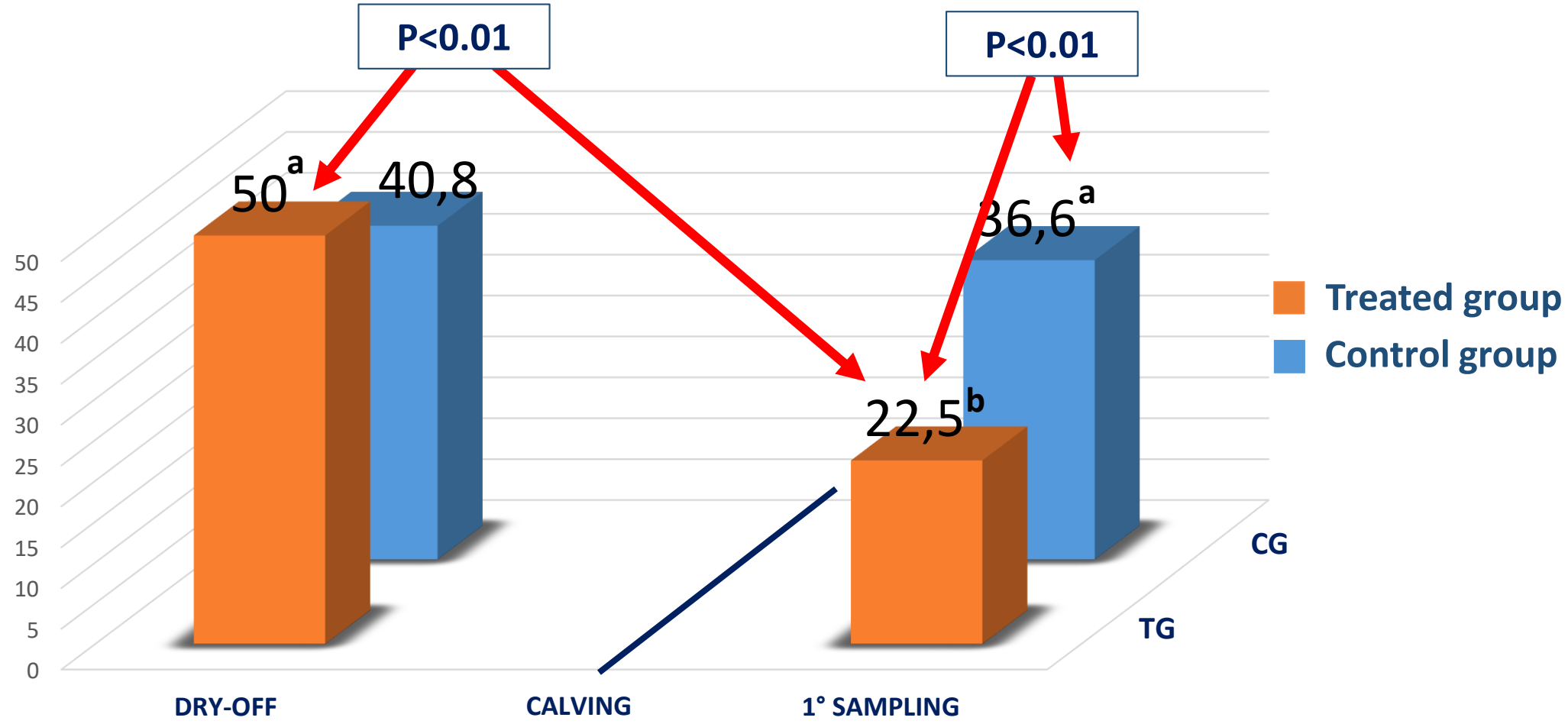
Prevalence of positive quarters for *S. aureus* (%)



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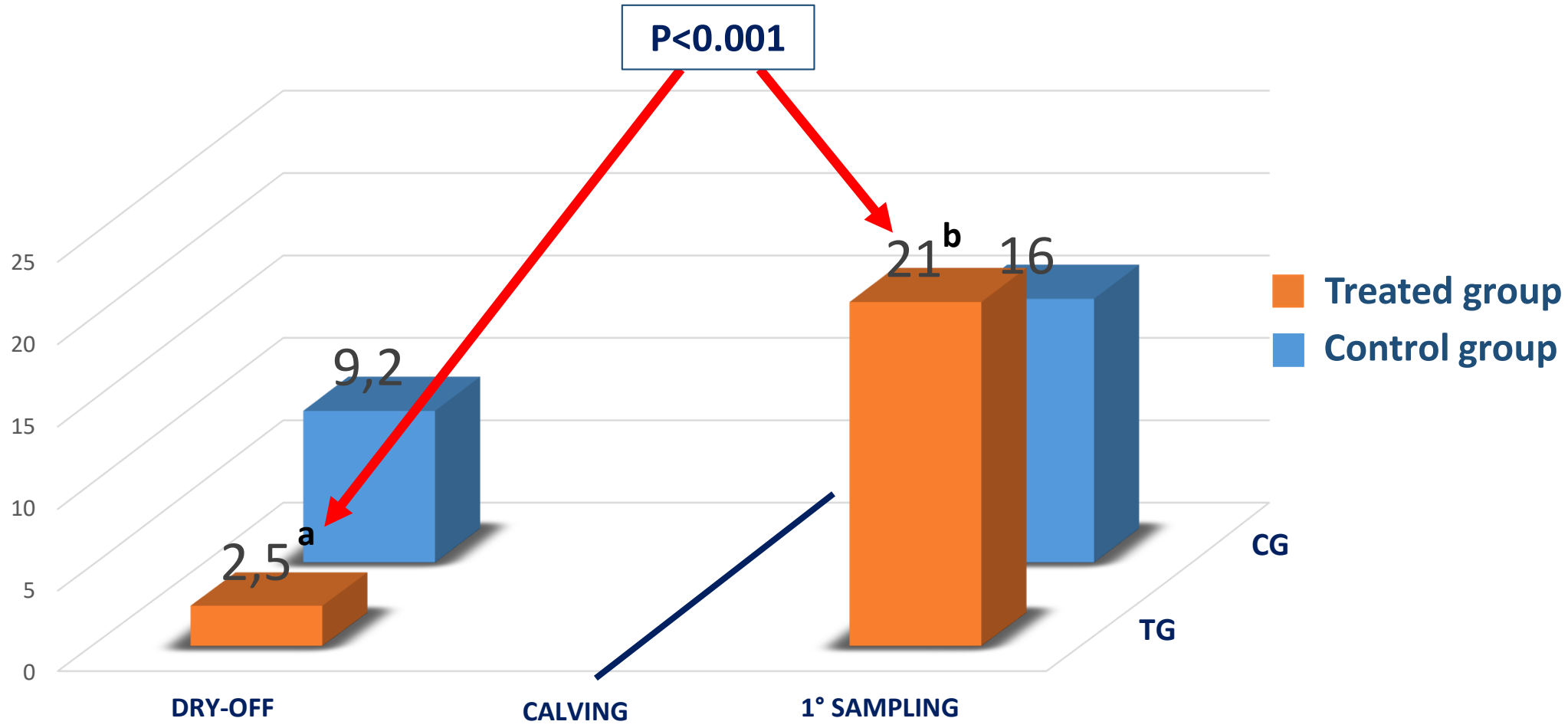
Prevalence of intramammary infections due to *S. aureus* (%)



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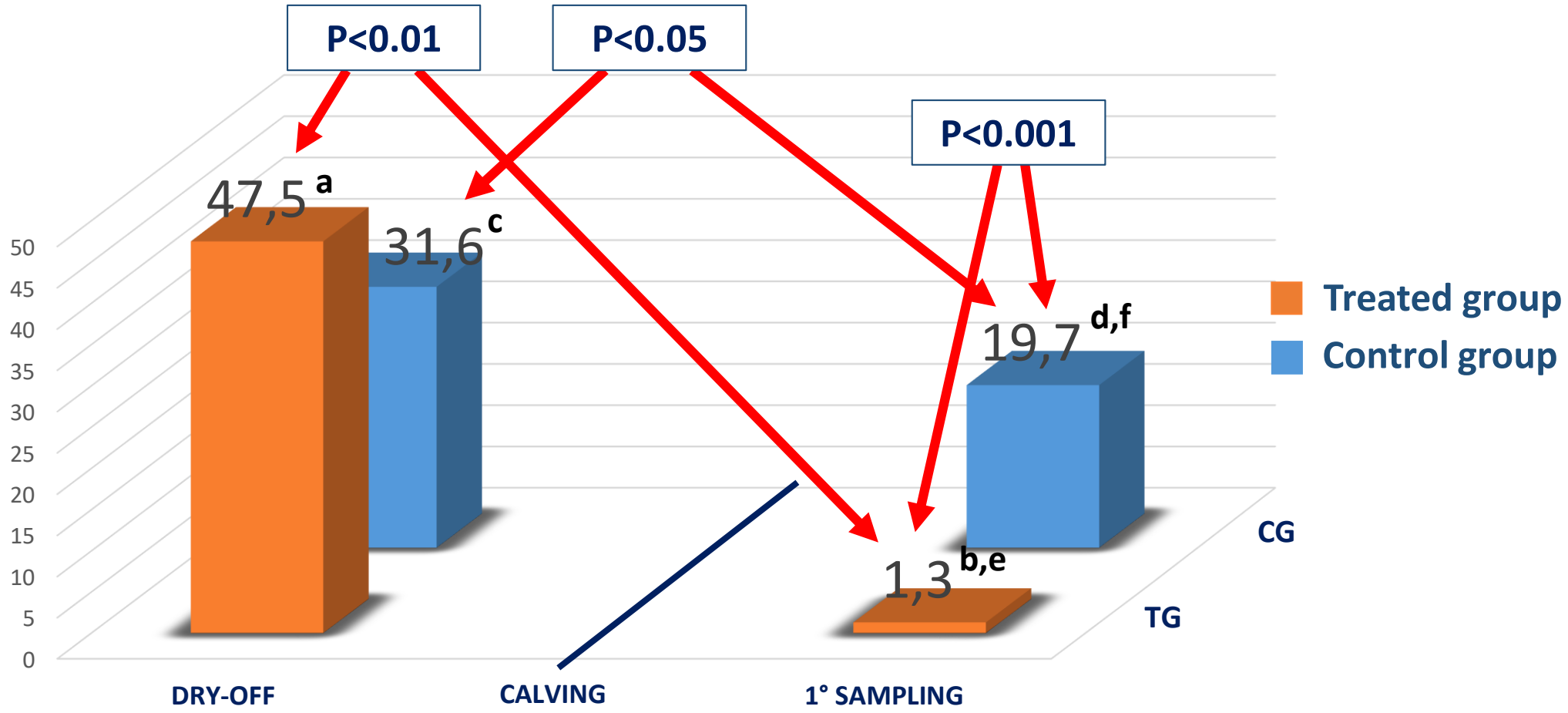
Prevalence of subclinical mastitis due to *S. aureus* (%)



- CLINICAL MASTITIS : NO CM WERE RECORDED AT EACH SAMPLING TIME

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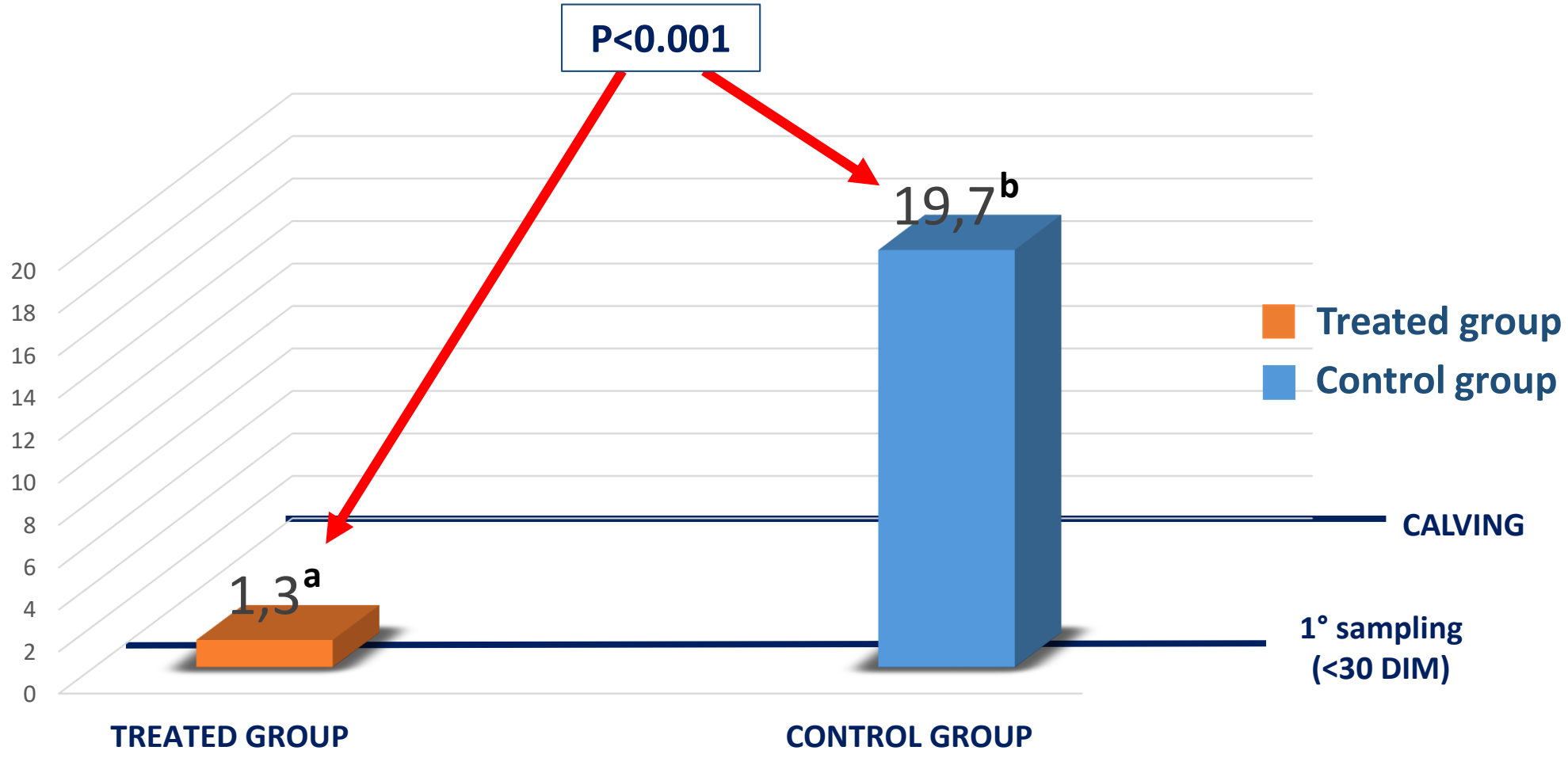
Fresh calver infection rate for *S. aureus* (%)

(>200k at 1° sampling)



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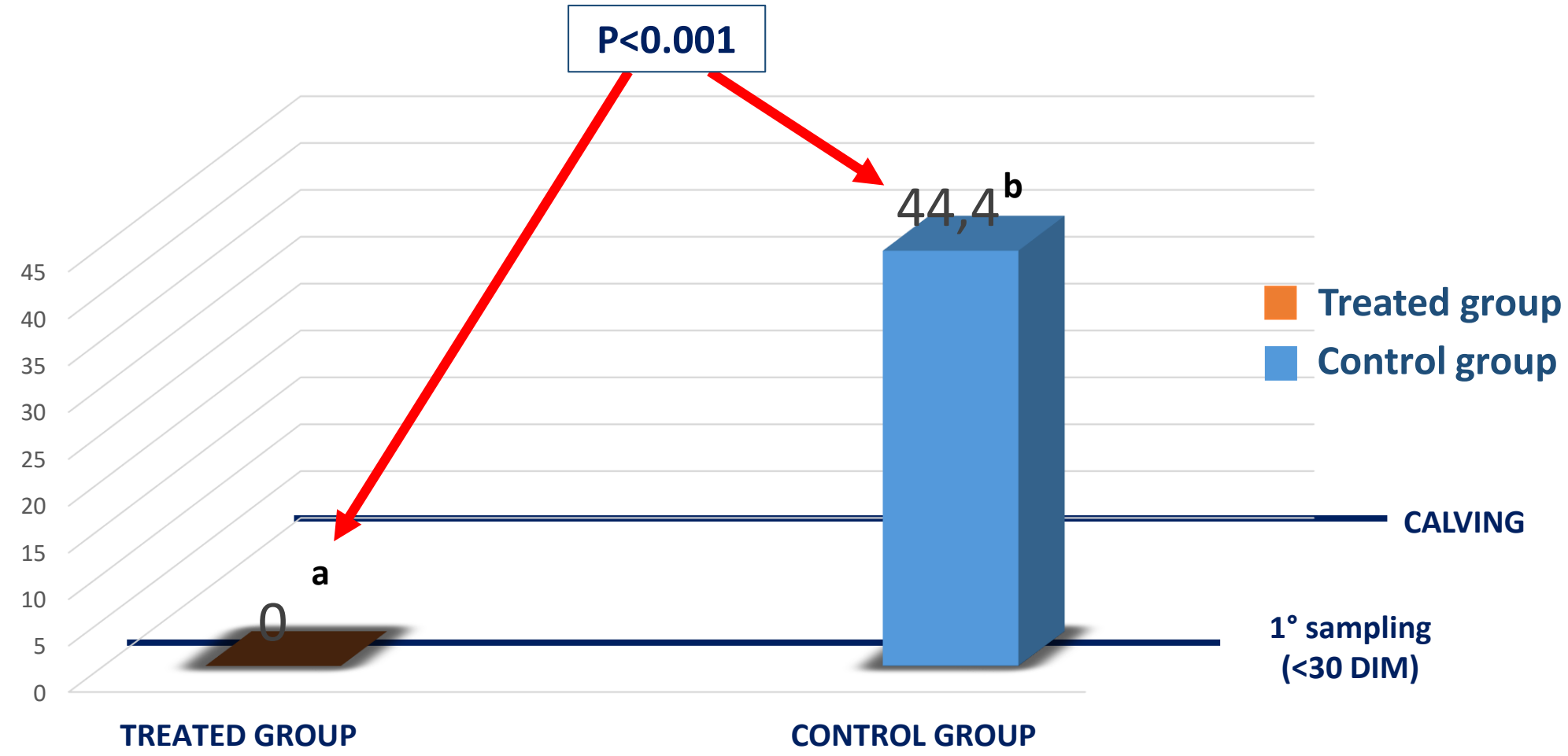
Dry period new infection rate for *S. aureus* (%)

(<200k at dry-off→>200k at 1° sampling)



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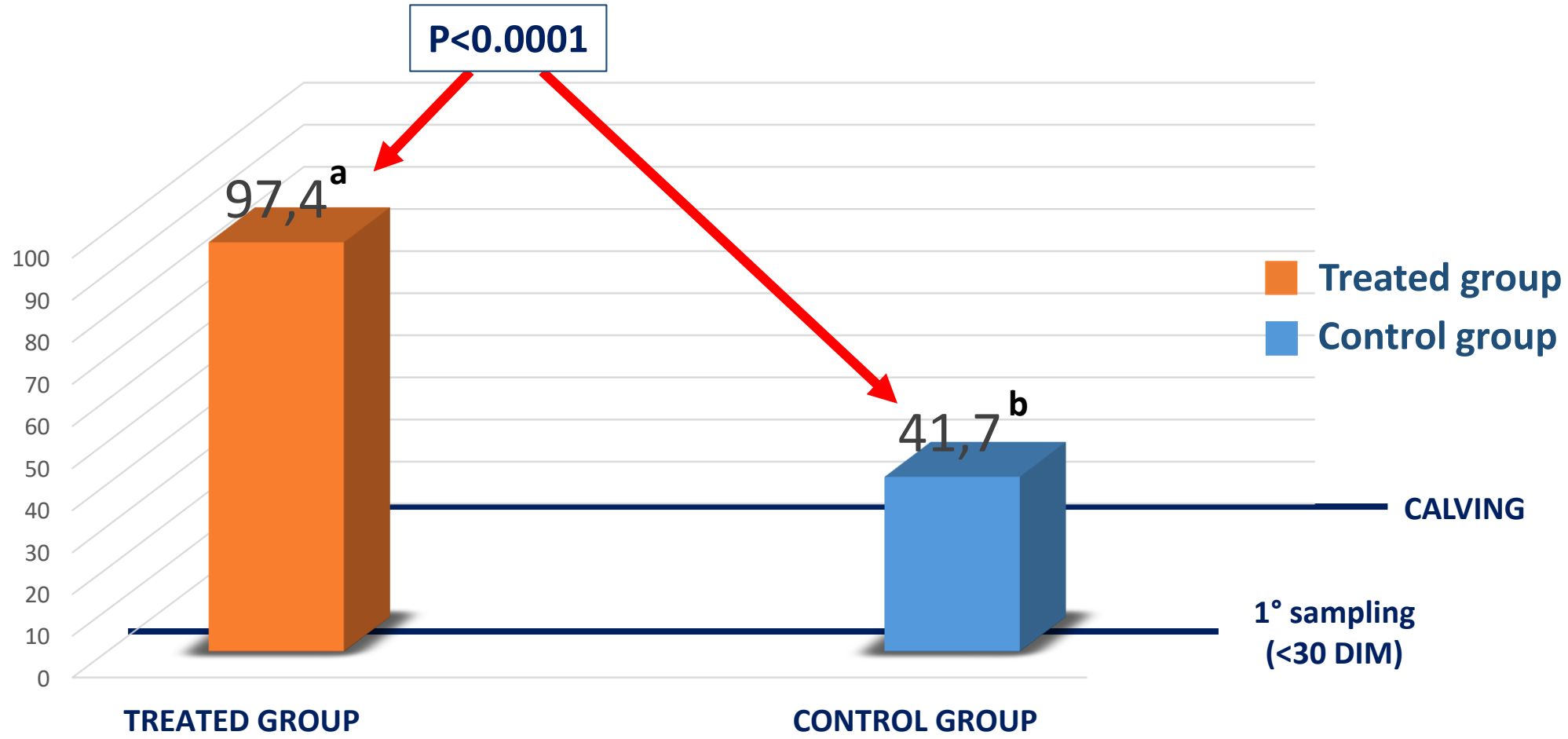
Dry period cure rate for *S. aureus* (%)

(>200k at dry-off→<200k at 1° sampling)



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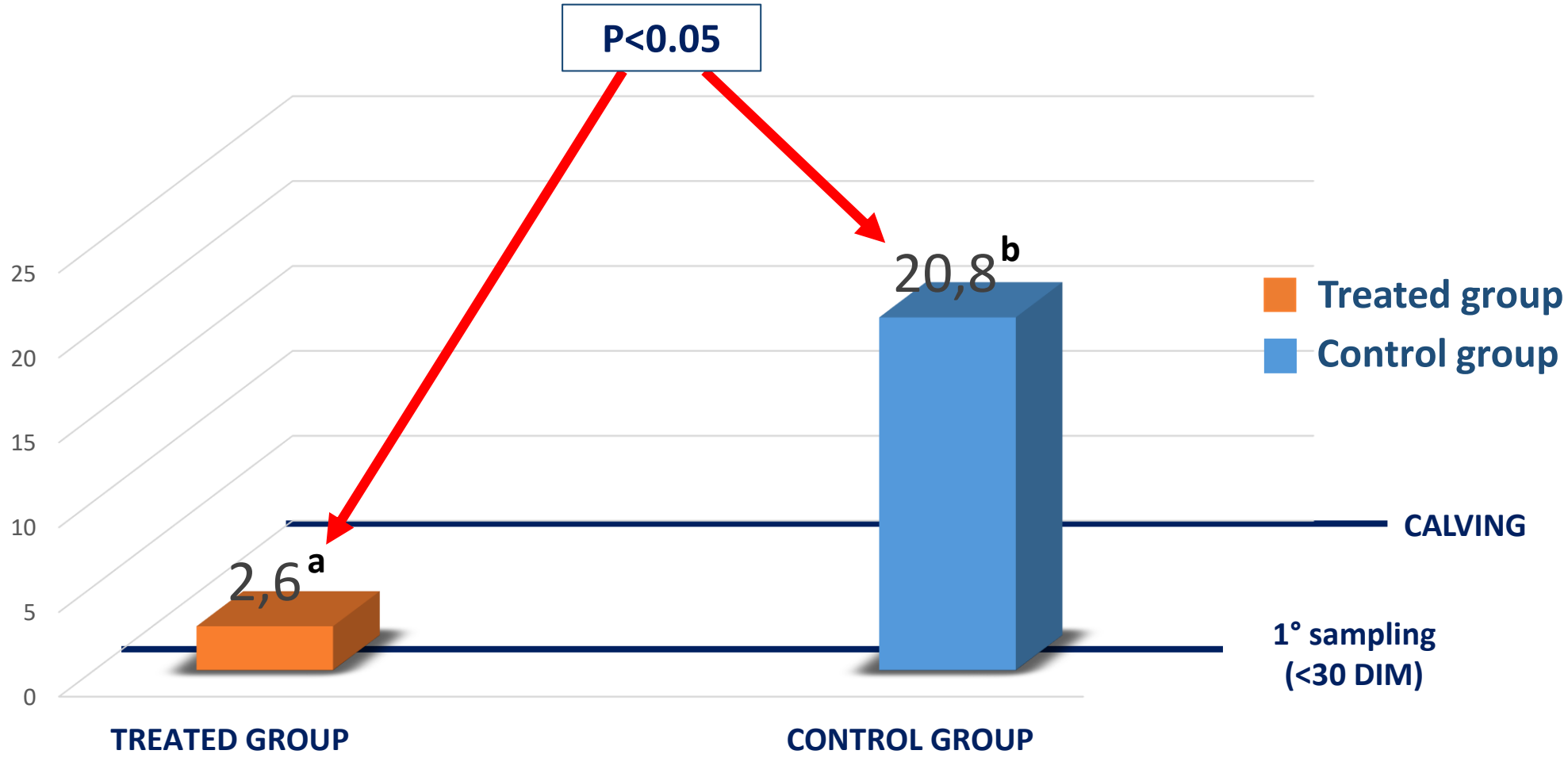
Failure to cure rate for *S. aureus* (%)

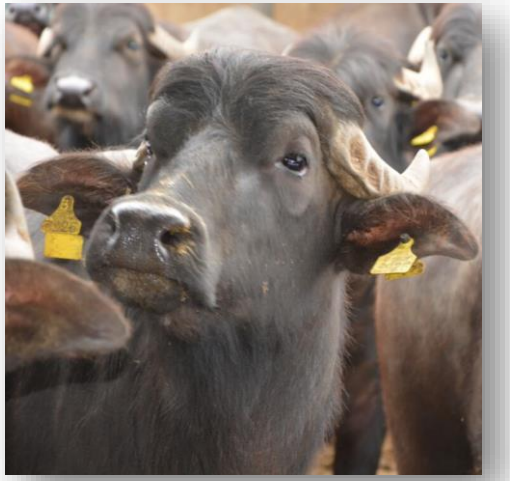
(>200k at dry-off→>200k at 1° sampling)



Discussion and conclusion

Discussion and conclusion

The effects of benzathine cloxacillin against in-udder *S. aureus* infections were investigated for the first time in MB



As in cows[a], overall the antibiotic seems to show encouragging resuts, neverthless a different length of the dry period

[a] Kietzmann et al. 2010, Rouncinman et al. 2010

Discussion and conclusion

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As in cow[a], it shows a potential efficacy in fresh MB

- ↓ Prevalence of positive quarters in fresh MB
- ↓ Rates of mastitis (SCM within 1° sampling)
- ↑ dry period cure rate efficacy

Poor effects on IMI after calving

[a] Biggs, 2017, Laven et al. 2008

Discussion and conclusion

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As in cows [a],
the use may be hypothesized :

as support to improve the dry period management in MB's farm affected by high SCC due to *S. aureus*

Herd management: use associated with complete herd management programs for mastitis due to contagious pathogens

[a] Biggs, 2017, Whitfield et al. 2017

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Further data analysis:

- Effects on milk yield
- Effects on farm's incomes
- Effects on other Gram+ bacteria

Further investigation:

- To verify the efficacy on an entire herd!
- To evaluate a combined use with teat sealant!
- To assess the clinical efficacy during selective treatment!

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Thank you
for your attention!

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