11° SEMINARIO Internacional de Leche Colanta
26 y 27 de junio de 2024

Impacto de la salud de la ubre

Marcos Veiga

Universidade de São Paulo, Brasil

Agenda

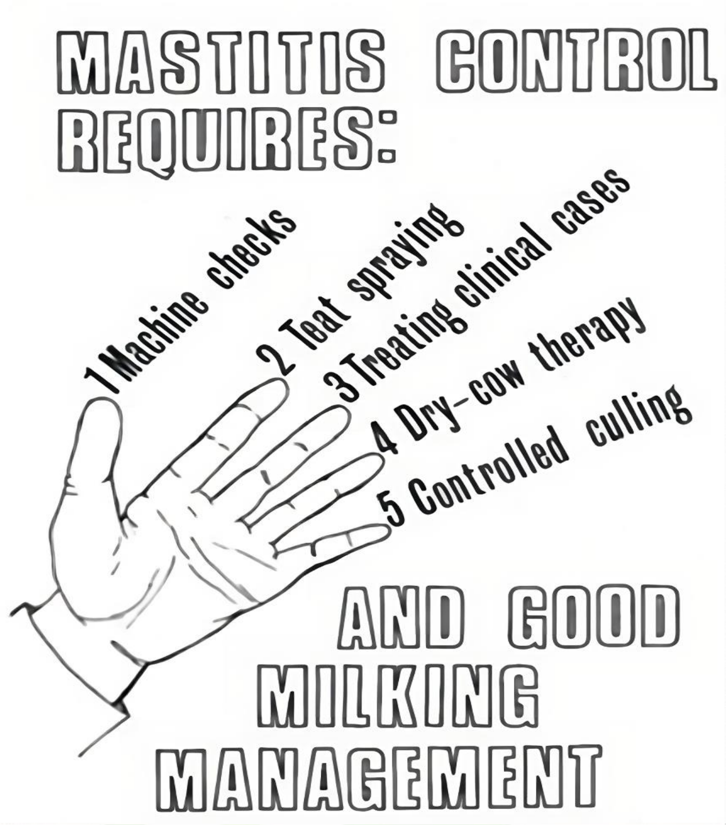
1 ¿La mastitis sigue siendo una preocupación?

2 Mastitis y rentabilidad.

3 Herramientas para el control de la mastitis.

¿La mastitis sigue siendo una preocupación?

El control de la mastitis evoluciona con los desafíos



New Zealand leaflet (MAF, 1974)

NMC

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¿La mastitis sigue siendo una preocupación?

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1970-Programa de 5 puntos:

Control de la mastitis contagiosa.

Baja restricción en el uso de antibióticos.

Hoy: Genética, medio ambiente, intensificación.

Cambio en el perfil de los agentes causales.

Nuevas herramientas: prevención, inmunidad, diagnóstico.

Alta restricción del uso de antibióticos.

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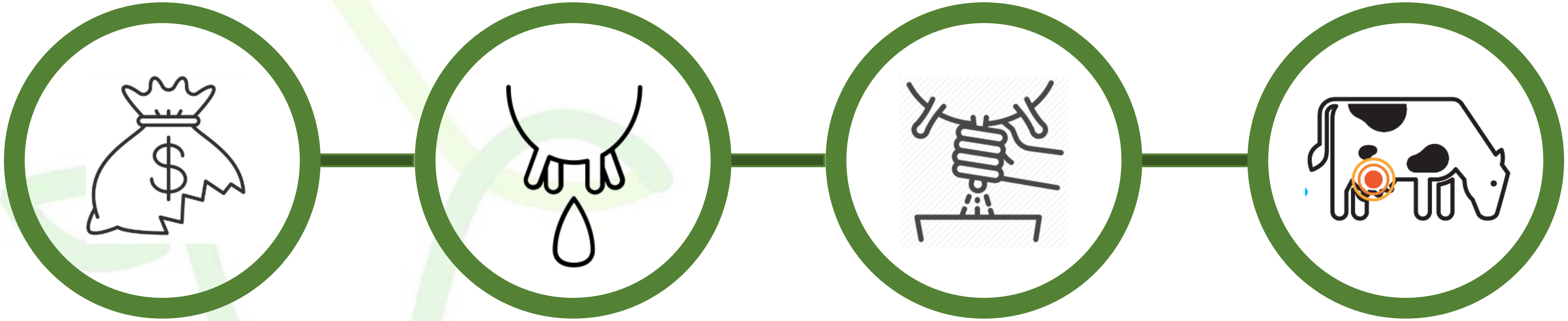
Los costos de la mastitis involucran a varios sectores de la granja



Precio de la leche

Mastitis subclínica

1-3 L/vaca/d

70% costos

Mastitis clínica

Descarte de leche.

Medicinas.

Muerte/descarte

Descarte prematuro.

Reproducción.

Los costos de la mastitis son subestimados por los productores

1.78 productores evaluados. Costo real de la mastitis clínica: 210 € Percepción del productor: 78 €

2. El 72% subestimó los costos de la mastitis clínica y subclínica.

3. La falta de percepción disminuye el incentivo para el control.

Journal of Dairy Research (2008) **75** 113–120. © *Proprietors of Journal of Dairy Research 2008*
doi:10.1017/S0022029907002932 *First published online 29 January 2008 Printed in the United Kingdom*

Costs of mastitis: facts and perception

Kirsten Huijps[1]*, Theo JGM Lam[2] and Henk Hogeveen[1,3]

[1] Department of Farm Animal Health, Utrecht University, Utrecht, The Netherlands
[2] Dutch Udder Health Centre, Deventer, The Netherlands
[3] Chair Group Business Economics, Wageningen University, Wageningen, The Netherlands

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A model to calculate the economic losses of mastitis on an average Dutch dairy farm was developed and used as base for a tool for farmers and advisors to calculate farm-specific economic losses of mastitis. The economic losses of a clinical case in a default situation were calculated as €210, varying from €164 to €235 depending on the month of lactation. The total economic losses of mastitis (subclinical and clinical) per cow present in a default situation varied between €65 and €182/cow per year depending on the bulk tank somatic cell count. The tool was used to measure perception of the total economic losses of mastitis on the farm and the farmers' assessment of the cost factors of mastitis on 78 dairy farms, of which 64 were used for further analyses. Most farmers (72%) expected their economic losses to be lower than those revealed by our calculation made with their farm information. Underestimating the economic losses of mastitis can be regarded as a general problem in the dairy sector. The average economic losses assessed by the farmers were €78/cow per year, but a large variation was given, €17–198/cow per year. Although the average assessment of the farmers of the different cost factors is close to the default value, there is much variation. To improve the adoption rate of advice and lower the incidence of mastitis, it is important to show the farmers the economic losses of mastitis on their farm. The tool described in this paper can play a role in that process.

Huijps et al., 2008.

El costo de la mastitis puede ser directo o indirecto

- **Directo:** desembolso/gasto por enfermedad.
  - Tratamiento.
- **Indirecto:** pérdida de beneficios o potencial sin explotar.
  - Pérdidas en la producción de leche.

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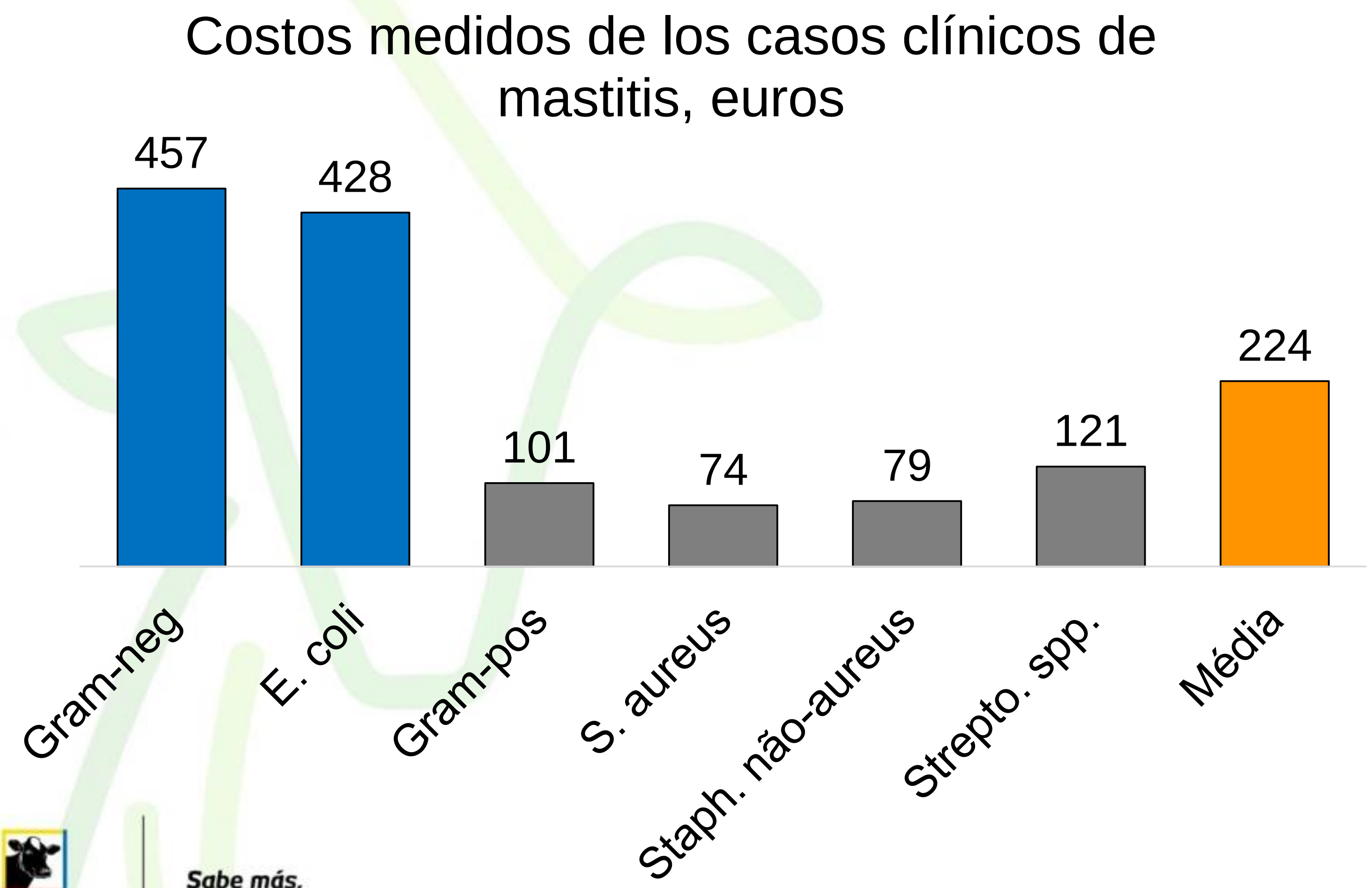
Variable principal en el coste de la mastitis clínica: agente causal



Raibosson et al., 2020

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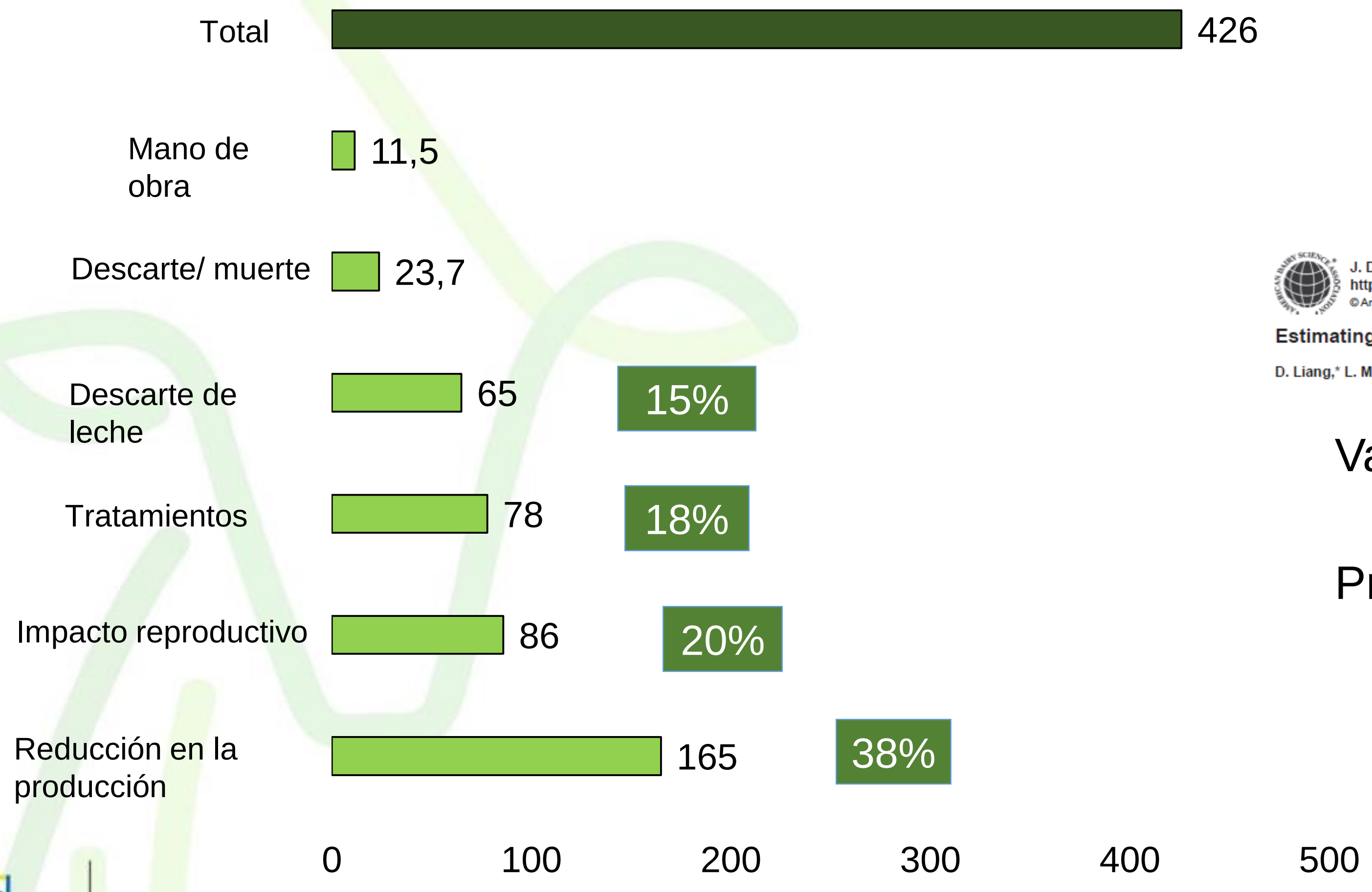
Impacto económico de la mastitis clínica: 61-97 € vaca/año

(Hogeveen et al, 2011)



J. Dairy Sci. 100:1472–1486
https://doi.org/10.3168/jds.2016-11565
© American Dairy Science Association®, 2017.

Estimating US dairy clinical disease costs with a stochastic simulation model

D. Liang,* L. M. Arnold,† C. J. Stowe,‡ R. J. Harmon,* and J. M. Bewley*[1]

Vacas adultas/US$$/426 caso

Primíparas: US$ 325,76 caso

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Impacto económico de la mastitis clínica (US$)

6240

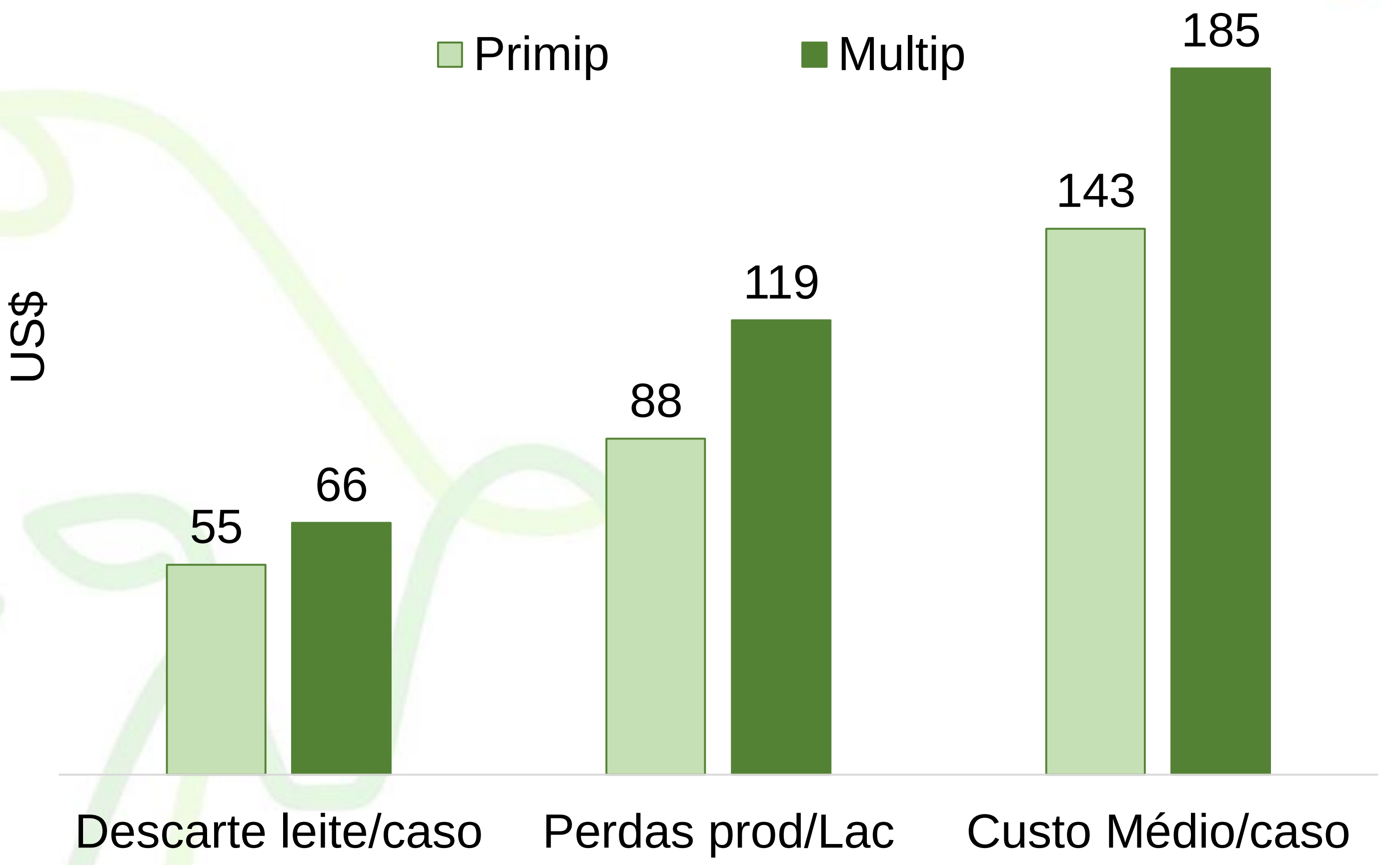
19

Incidencia MC:

casos/100 vacas/mes

7.8

Richardet, et al. *Arch. Med. Vet*. 2016.



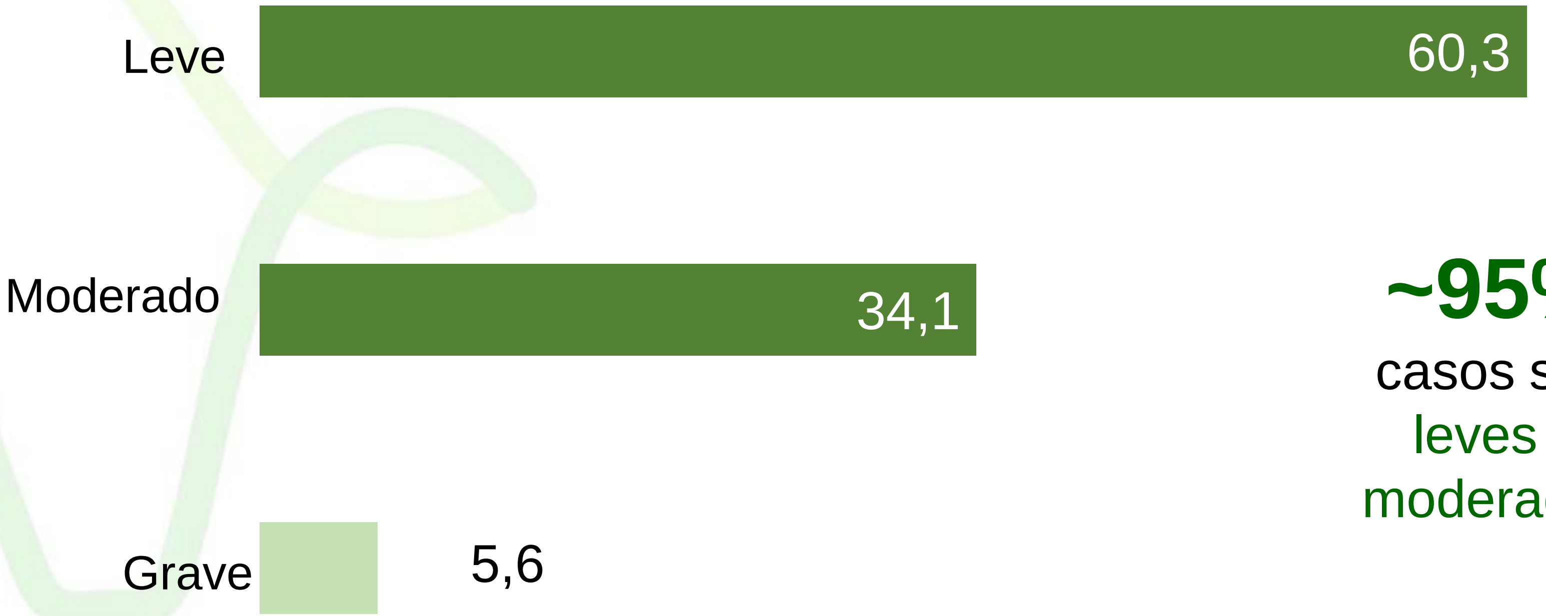
10% de las vacas en lactancia tienen mastitis clínica/mes, pero solo 5,6% son graves.

20

4390/mes

5957 casos

Distribución de la gravedad de los casos clínicos

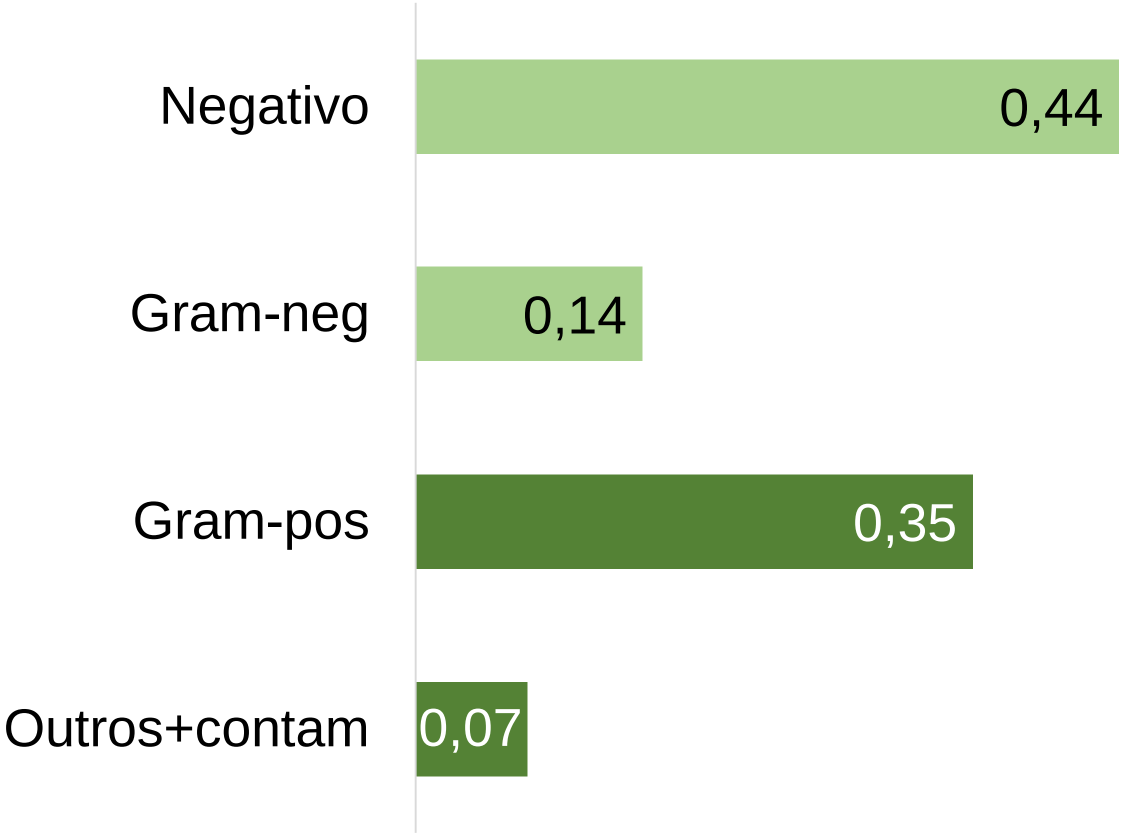


~95% casos son leves y moderados

Tomazi et al. (2018)

Alrededor de 50% de los casos de mastitis clínica son negativos o causados por bacterias Gram-negativas.

Causas de la mastitis clínica, n=4212



58%
de los casos no tienen necesitad de tratamiento inmediato.

Tomazi, et al 2018


J. Dairy Sci. 106:1267–1286
https://doi.org/10.3168/jds.2022-22271

Selective treatment of nonsevere clinical mastitis does not adversely affect cure, somatic cell count, milk yield, recurrence, or culling: A systematic review and meta-analysis

Ellen de Jong,[1,2] Lien Creytens,[3] Sarne De Vliegher,[3] Kayley D. McCubbin,[1,2] Mya Baptiste,[1] Alexander A. Leung,[4] David Speksnijder,[5,6] Simon Dufour,[2,7] John R. Middleton,[8] Pamela L. Ruegg,[9] Theo J. G. M. Lam,[10,11] David F. Kelton,[2,12] Scott McDougall,[13,14] Sandra M. Godden,[15] Alfonso Lago,[16] Päivi J. Rajala-Schultz,[17] Karin Orsel,[1] Volker Krömker,[18] John P. Kastelic,[1] and Herman W. Barkema[1,2,4]*
[1]Faculty of Veterinary Medicine, University of Calgary, Calgary, Alberta, T2N 4N1 Canada
[2]Mastitis Network, St-Hyacinthe, Quebec, J25 2M2 Canada
[3]M-team and Mastitis and Milk Quality Research Unit, Department of Internal Medicine, Reproduction and Population Medicine, Faculty of Veterinary Medicine, Ghent University, Merelbeke, 9820 Belgium
[4]Departments of Medicine and Community Health Science, Cumming School of Medicine, University of Calgary, Calgary, Alberta, T2N 4N1 Canada
[5]Department of Infectious Diseases and Immunology, Faculty of Veterinary Medicine, Utrecht University, Utrecht, 3508 TD, the Netherlands
[6]University Farm Animal Practice, Harmelen, 3481 LZ, the Netherlands
[7]Department of Pathology and Microbiology, Faculté de Médecine Vétérinaire, Université de Montréal, Saint-Hyacinthe, Quebec, J2S 2M2 Canada
[8]Department of Veterinary Medicine and Surgery, College of Veterinary Medicine, University of Missouri, Columbia 65211
[9]Department of Large Animal Clinical Sciences, College of Veterinary Medicine, Michigan State University, East Lansing 48824
[10]Department Population Health Sciences, Faculty of Veterinary Medicine, Utrecht University, Utrecht, 3584 CL, the Netherlands
[11]GD Animal Health, Deventer, 7400 AA, the Netherlands
[12]Department of Population Medicine, Ontario Veterinary College, University of Guelph, Guelph, ON N1G 2W1 Canada
[13]Cognosco, Anexa, Morrinsville, 3340 New Zealand
[14]School of Veterinary Science, Massey University, Palmerston North, 4442 New Zealand
[15]Department of Veterinary Population Medicine, University of Minnesota, St. Paul 55108
[16]DairyExperts Inc., Tulare, CA 93274
[17]Department of Production Animal Medicine, Faculty of Veterinary Medicine, University of Helsinki, 00014 Finland
[18]Section for Animal Production, Nutrition and Health, Department of Veterinary and Animal Sciences, University of Copenhagen, 1870 Frederiksberg, Denmark

ABSTRACT

Treatment of clinical mastitis (CM) contributes to antimicrobial use on dairy farms. Selective treatment of CM based on bacterial diagnosis can reduce antimicrobial use, as not all cases of CM will benefit from antimicrobial treatment, e.g., mild and moderate gram-negative infections. However, impacts of selective CM treatment on udder health and culling are not fully understood. A systematic search identified 13 studies that compared selective versus blanket CM treatment protocols. Reported outcomes were synthesized with random-effects models and presented as risk ratios or mean differences. Selective CM treatment protocol was not inferior to blanket CM treatment protocol for the outcome bacteriological cure. Noninferiority margins could not be established for the outcomes clinical cure, new intramammary infection, somatic cell count, milk yield, recurrence, or culling. However, no differences were detected between selective and blanket CM treatment protocols using traditional analyses, apart from a not clinically relevant increase in interval from treatment to clinical cure (0.4 d) in the selective group and higher proportion of clinical cure at 14 d in the selective group. The latter occurred in studies co-administering nonsteroidal anti-inflammatories only in the selective group. Bias could not be ruled out in most studies due to suboptimal randomization, although this would likely only affect subjective outcomes such as clinical cure. Hence, findings were supported by a high or moderate certainty of evidence for all outcome measures except clinical cure. In conclusion, this review supported the assertion that a selective CM treatment protocol can be adopted without adversely influencing bacteriological and clinical cure, somatic cell count, milk yield, and incidence of recurrence or culling.

Key words: antimicrobial stewardship, clinical mastitis, rapid diagnostic test, bacteriological cure, noninferiority

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*Corresponding author: barkema@ucalgary.ca

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- Se puede adoptar una terapia selectiva para el tratamiento de la mastitis clínica, sin causar daños en relación con la curación bacteriológica y clínica, el recuento de células somáticas, la producción de leche, las nuevas infecciones y el descarte.

De Jong, et al, 2023.

J. Dairy Sci. 106:3761–3778
https://doi.org/10.3168/jds.2022-22826

Invited review: Selective treatment of clinical mastitis in dairy cattle

Ellen de Jong,[1,2,3] Kayley D. McCubbin,[1,2,3] David Speksnijder,[4,5] Simon Dufour,[3,6] John R. Middleton,[7] Pamela L. Ruegg,[8] Theo J. G. M. Lam,[9] David F. Kelton,[3,10] Scott McDougall,[11,12] Sandra M. Godden,[13] Alfonso Lago,[14] Päivi J. Rajala-Schultz,[15] Karin Orsel,[1] Sarne De Vliegher,[16] Volker Krömker,[17] Diego B. Nobrega,[1,2] John P. Kastelic,[1] and Herman W. Barkema[1,2,3]*

[1]Faculty of Veterinary Medicine, University of Calgary, Calgary, AB, Canada T2N 4N1
[2]One Health at UCalgary, University of Calgary, AB, Canada T2N 4N1
[3]Mastitis Network, Saint-Hyacinthe, QC, Canada J25 2M2
[4]Department of Infectious Diseases and Immunology, Faculty of Veterinary Medicine, Utrecht University, 3584 CL Utrecht, the Netherlands
[5]University Animal Health Clinic ULP, 3481 LZ Harmelen, the Netherlands
[6]Department of Pathology and Microbiology, Faculté de Médecine Vétérinaire, Université de Montréal, Saint-Hyacinthe, QC, Canada J2S 2M2
[7]Department of Veterinary Medicine and Surgery, College of Veterinary Medicine, University of Missouri, Columbia 65211
[8]Department of Large Animal Clinical Sciences, College of Veterinary Medicine, Michigan State University, East Lansing 48824
[9]Department Population Health Sciences, Faculty of Veterinary Medicine, Utrecht University, 3584 CL Utrecht, the Netherlands; GD Animal Health, 7400 AA Deventer, the Netherlands
[10]Department of Population Medicine, Ontario Veterinary College, University of Guelph, Guelph, ON, Canada N1G 2W1
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[14]DairyExperts Inc., Tulare, CA 93274
[15]Department of Production Animal Medicine, Faculty of Veterinary Medicine, 00014 University of Helsinki, Finland
[16]M-team and Mastitis and Milk Quality Research Unit, Department of Internal Medicine, Reproduction and Population Health, Faculty of Veterinary Medicine, Ghent University, 9820 Merelbeke, Belgium
[17]Section for Animal Production, Nutrition and Health, Department of Veterinary and Animal Sciences, University of Copenhagen, 1870 Frederiksberg, Denmark

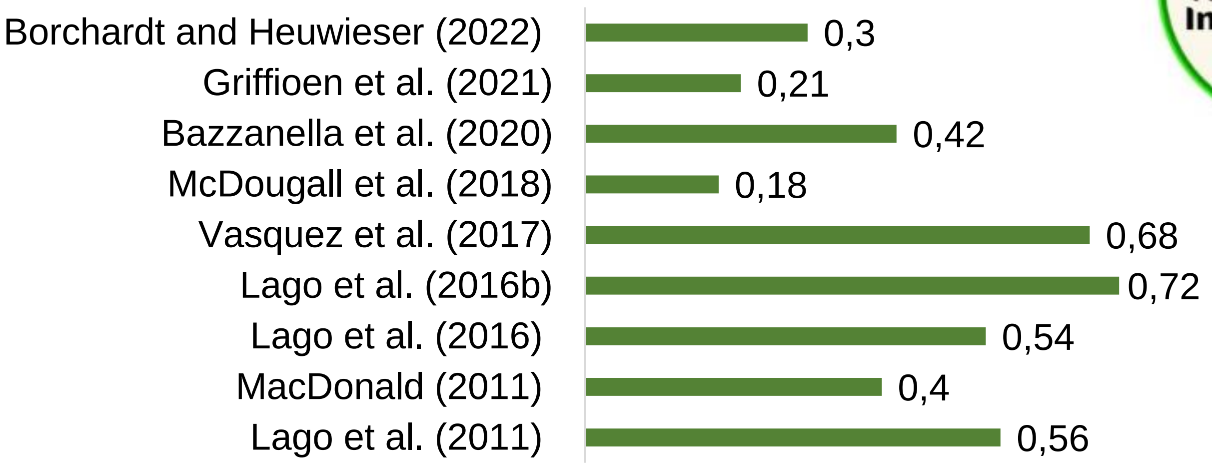
ABSTRACT

Treatment of clinical mastitis (CM) and use of antimicrobials for dry cow therapy are responsible for the majority of animal-defined daily doses of antimicrobial use (AMU) on dairy farms. However, advancements made in the last decade have enabled excluding nonsevere CM cases from antimicrobial treatment that have a high probability of cure without antimicrobials (no bacterial causes or gram-negative, excluding *Klebsiella* spp.) and cases with a low bacteriological cure rate (chronic cases). These advancements include availability of rapid diagnostic tests and improved udder health management practices, which reduced the incidence and infection pressure of contagious CM pathogens. This review informed an evidence-based protocol for selective CM treatment decisions based on a combination of rapid diagnostic test results, review of somatic cell count and CM records, and elucidated consequences in terms of udder health, AMU, and farm economics. Relatively fast identification of the causative agent is the most important factor in selective CM treatment detrimental udder health consequences (e.g., reduced clinical or bacteriological cures, increased somatic cell count, increased culling rate, or increased recurrence of CM later in lactation) after initiating selective CM treatment protocols using on-farm testing. The magnitude of AMU reduction following a selective CM treatment protocol implementation depended on the causal pathogen distribution and protocol characteristics. Uptake of selective treatment of nonsevere CM cases differs across regions and is dependent on management systems and adoption of udder health programs. No economic losses or animal welfare issues are expected when adopting a selective versus blanket CM treatment protocol. Therefore, selective CM treatment of nonsevere cases can be a practical tool to aid AMU reduction on dairy farms.
Key words: antimicrobial use, dairy cattle, clinical mastitis, selective treatment, rapid diagnostic tests

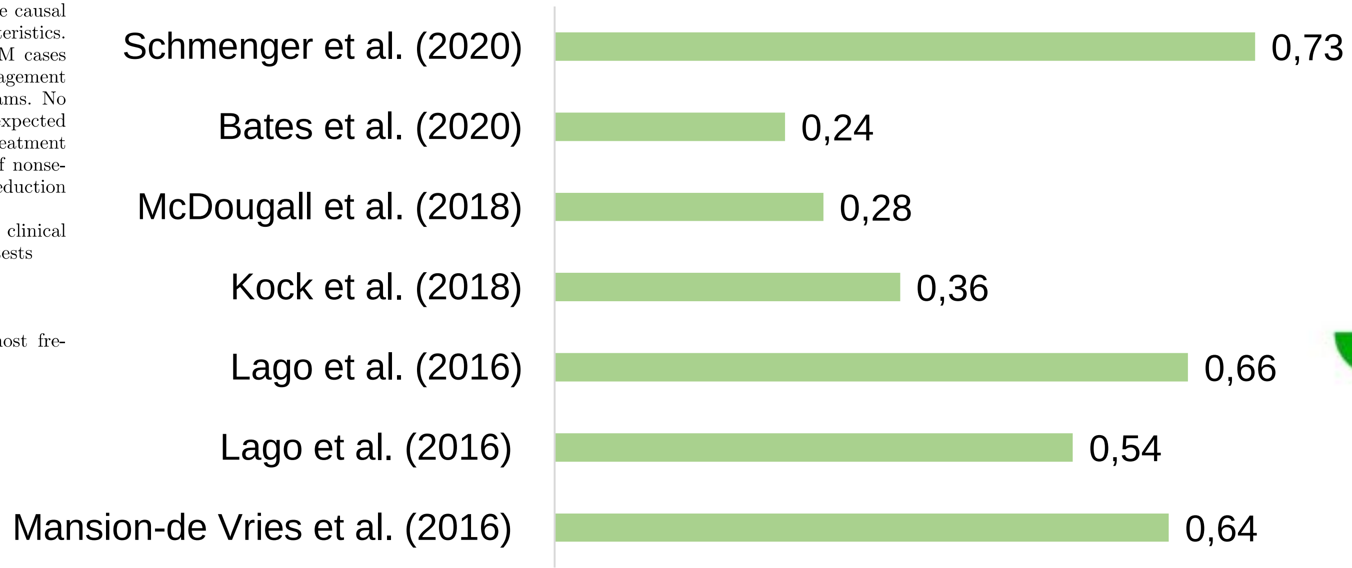
INTRODUCTION

In the dairy industry, antimicrobials are most fre-

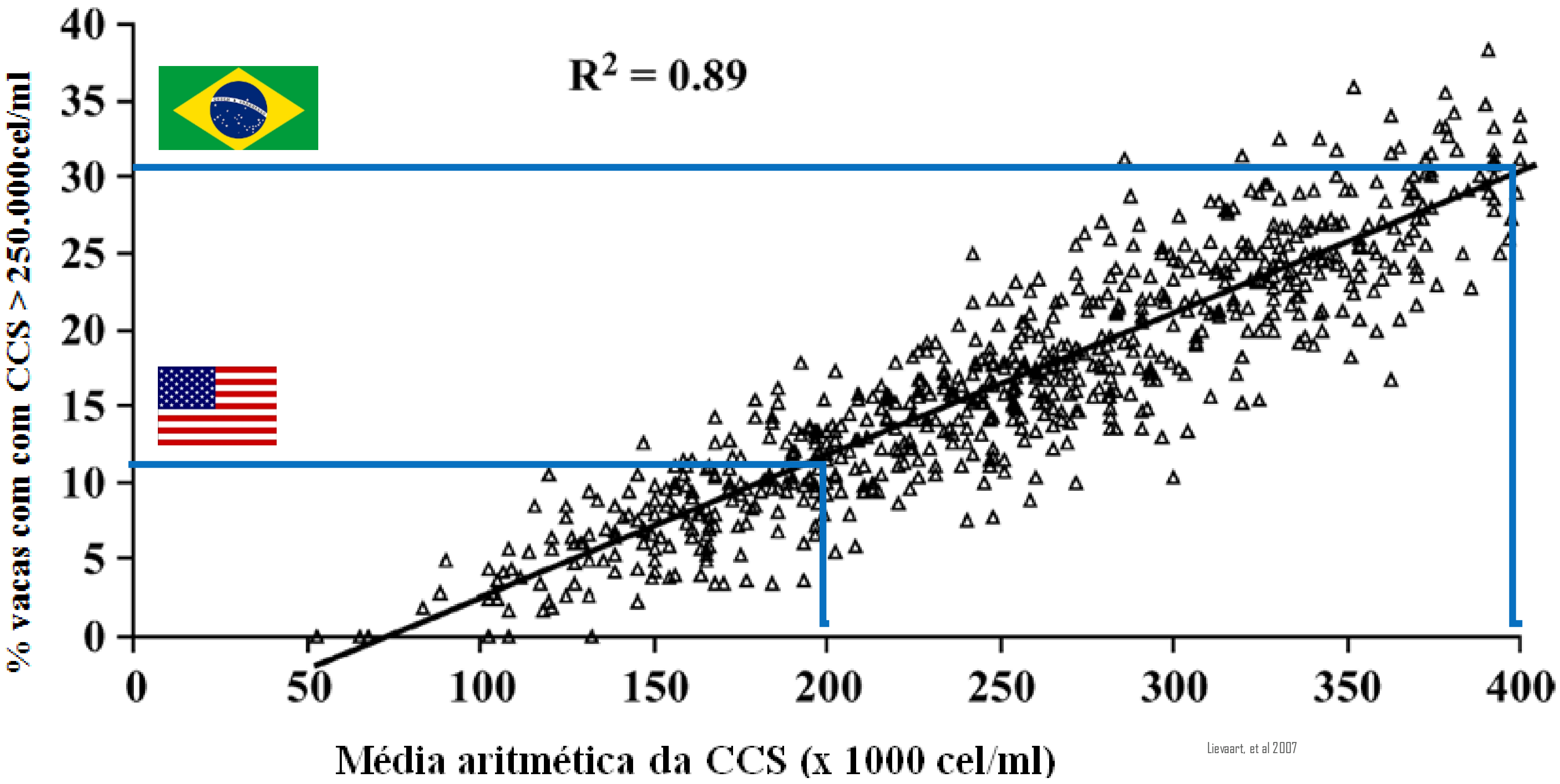
% reducción de casos clínicos tratados
(promedio 9 estudios = 44,5%)



% reducción de pomos intramamários/caso clínico
(promédio 7 estudios= 49,3%)



% de vacas con mastitis subclínica (>250 mil células/ml) según media aritmética individual de RCS



Lievaart, et al 2007

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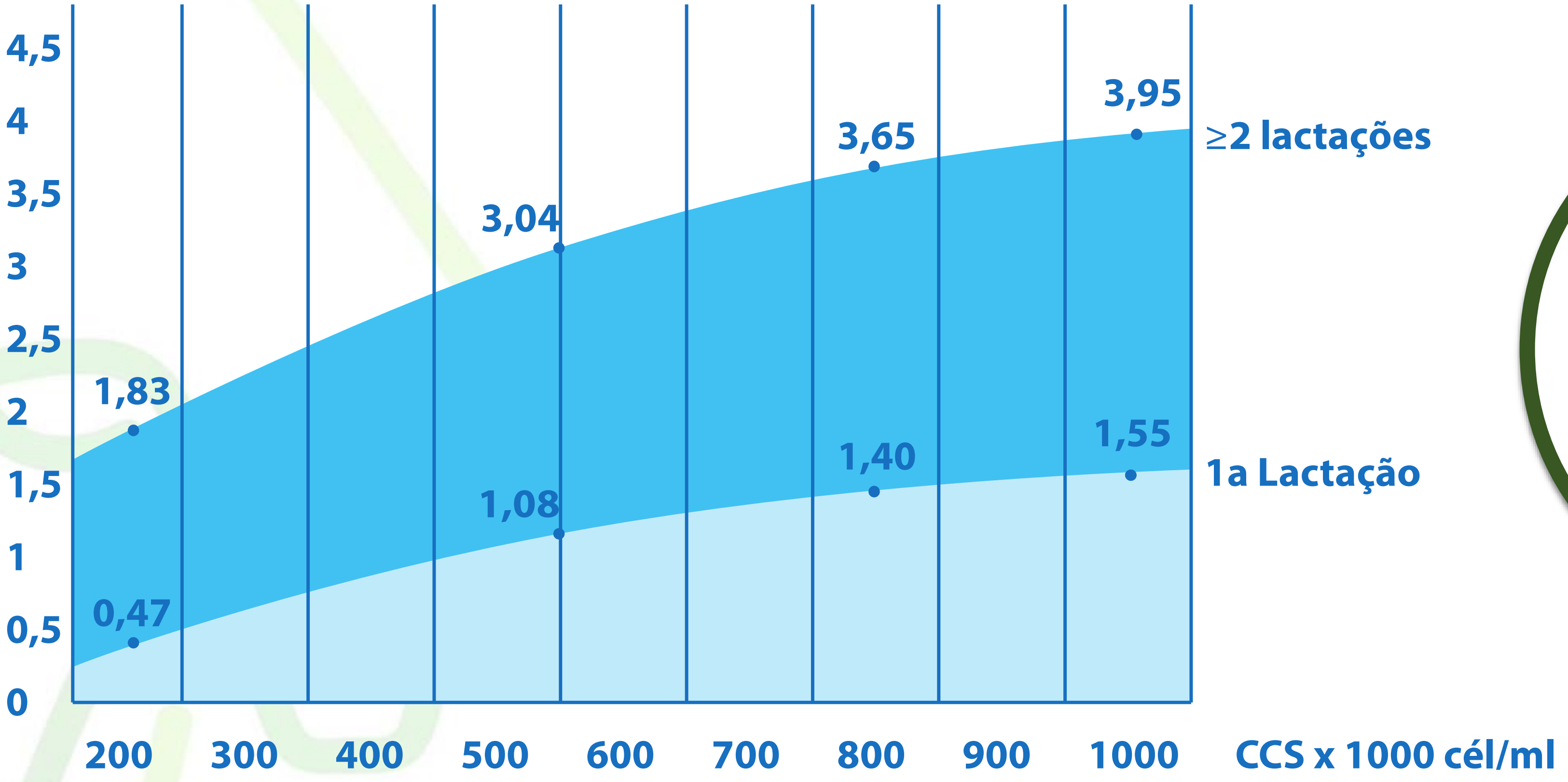
Un alto nivel de RCS reduce la producción de vacas (kg/d)



Gonçalves et al., 2018

1-3

Kg/vaca/día

251 32k 253k 2011-2016

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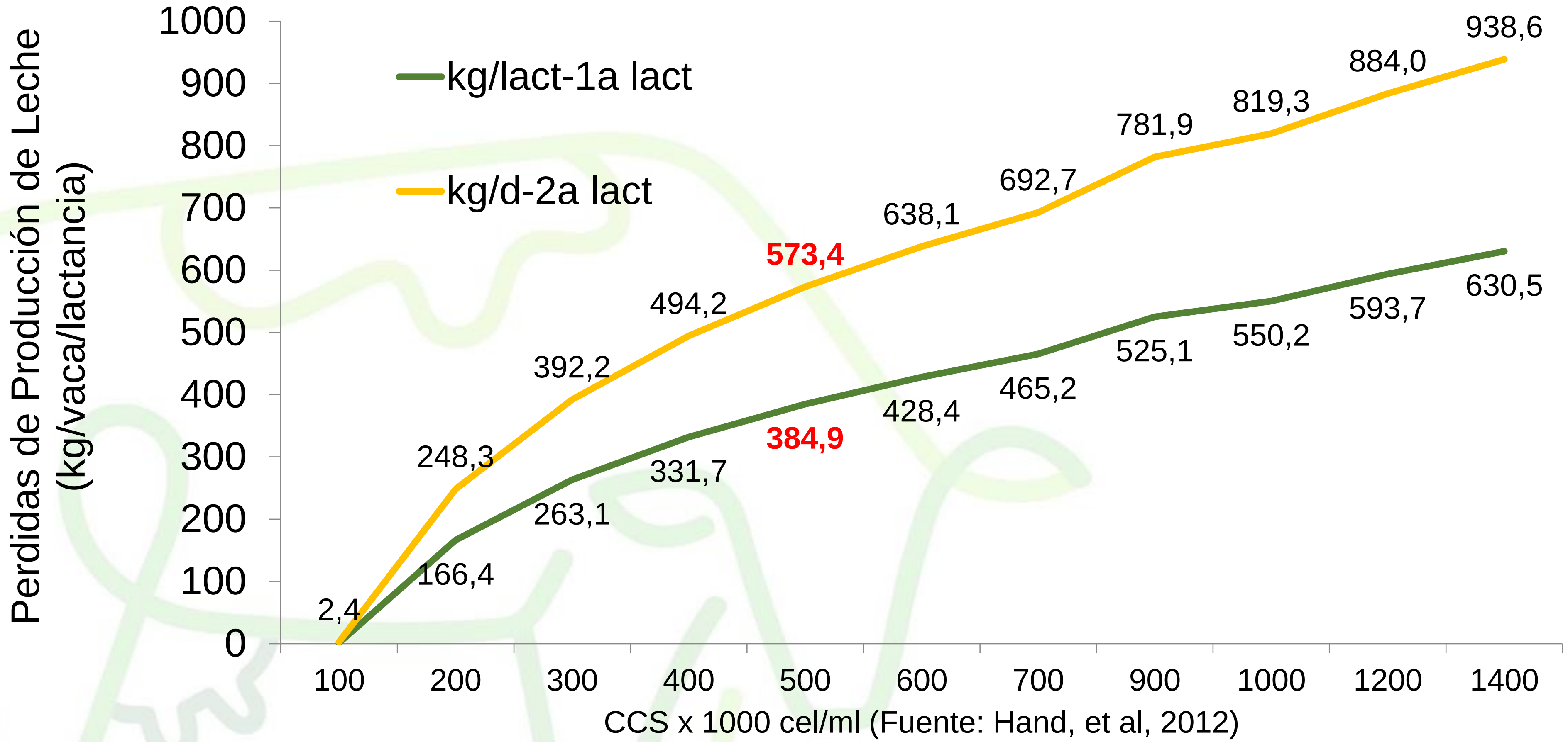
RCS alto: se reduce de 400 a 600 kg/vaca/lac



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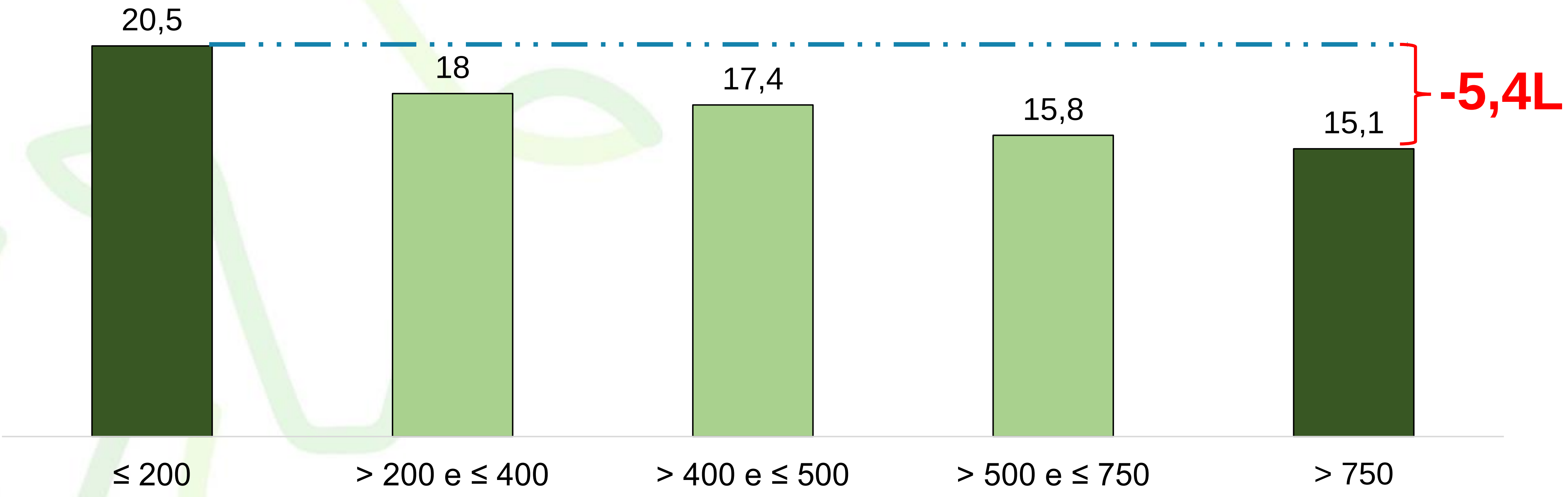
Los rebaños con bajo RCS producen +5 L/d que aquellos con RCS SCC

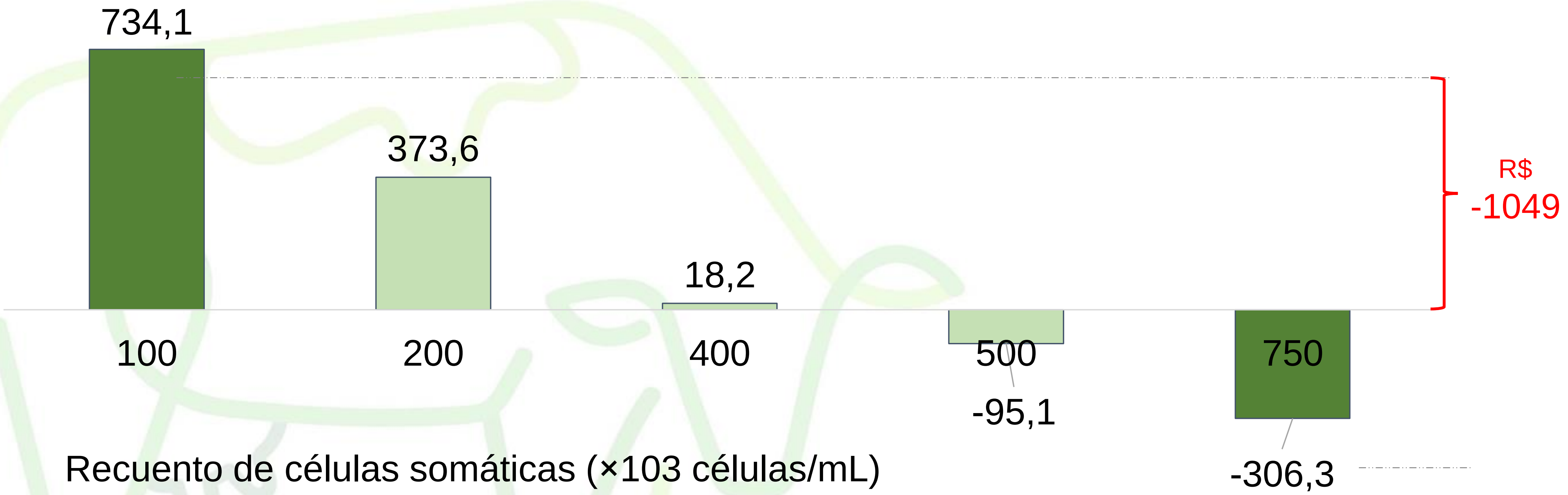
2015 a 2017; 543 explotaciones; 5 regiones de MG.
82 vacas en producción; 1521 L/día, 17 L/vaca/d.



Gonçalves et al. (2020)

Ganancia más baja (-1049 R$/vaca/año): granjas con altos RCS

2015 a 2017; 543 explotaciones; 5 regiones de MG.
82 vacas en producción; 1521 L/día, 17 L/vaca/d.



Gonçalves et al. (2020)

Relación entre el Recuento de Células Somáticas (RCS) y la calidad de la leche

1. Cambio en la composición de la leche.
2. Vida útil más corta.
3. Indicativo del riesgo de residuos de ATB.
4. Barrera sanitaria para el comercio internacional.

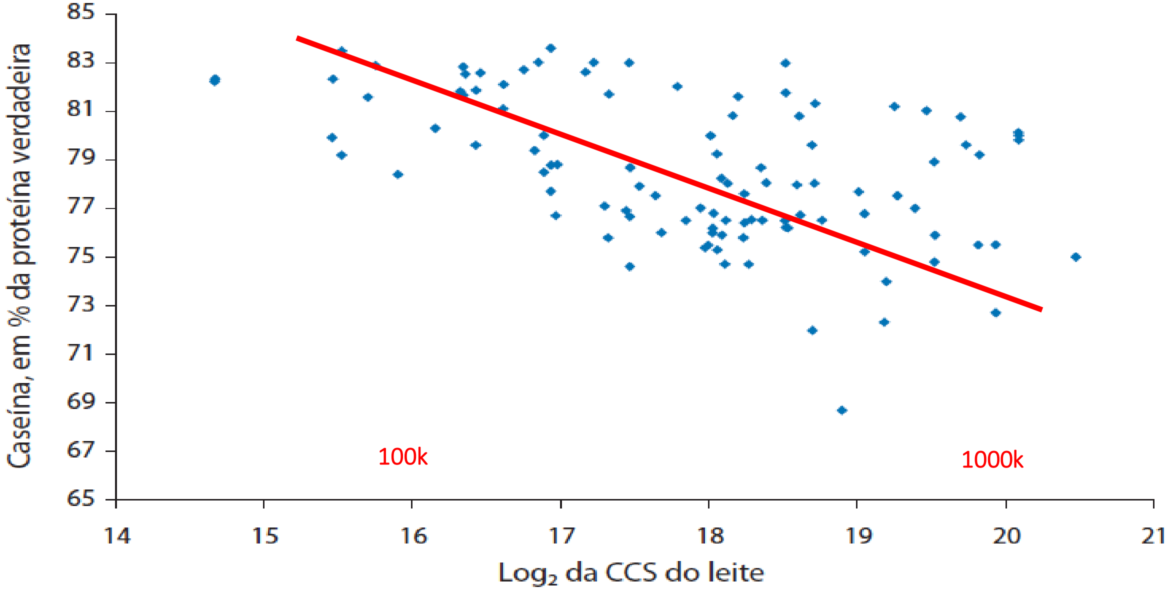
¿Por qué cambia la calidad de la leche cuando la vaca tiene mastitis?

- Aumento del RCS: las células sanguíneas migran a la leche.
- Reducción de la síntesis de componentes.
- Células somáticas: las enzimas degradan las proteínas y las grasas.
- Paso de la sangre a la leche: Sodio (Na), Cloro (Cl), inmunoglobulinas, enzimas.

Sabe más, Sabe a campo

RCS y composición de la leche, proteína

- Poca variación en la proteína total.
- Caseína (menor rendimiento).
- Proteínas de suero de leche.
- Reducción de caseína (% prot verd).
- - 2% (Ma et al., 2000).
- - 9% (Mazal et al., 2007).
- Aumento de la actividad proteolítica de la proteólisis de la leche.



Geary et al. 2013.

RCS y composición de la leche, proteína

- Enzimas proteolíticas.
- Plasmina.
- Principal enzima proteolítica de la leche.
- Acción proteolítica: antes del ordeño y después del procesamiento.
- Resistente al calor (pasteurización y UHT).
- Degradación de la caseína: aumento de la coagulación.

RCS y composición de la leche, grasa

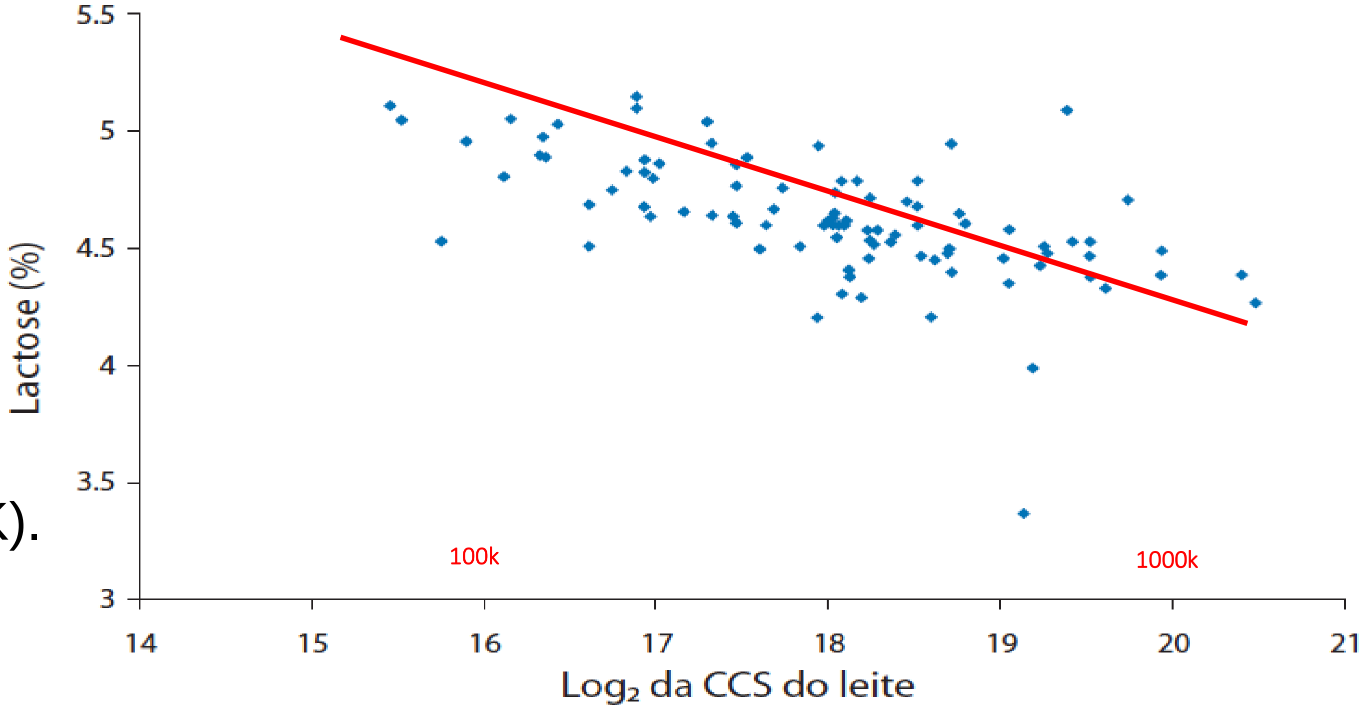
Generalmente: reducción de la concentración total.

Aumento de ácidos grasos libres.

Aumento de la actividad lipolítica.

RCS y composición de la leche, lactosa y minerales

- **Lactosa:** ↓
  - Menos acidificación.
- **Minerales:**
  - ↑ Sodio (Na) y Cloro (Cl).
  - ↓ Calcio (Ca) y Potasio (K).
- pH de la leche: ↑



Geary et al. 2013.

Efecto del recuento de células somáticas (RCS) en las propiedades de la leche

- Menor rendimiento de productos a base de proteínas: caseína.

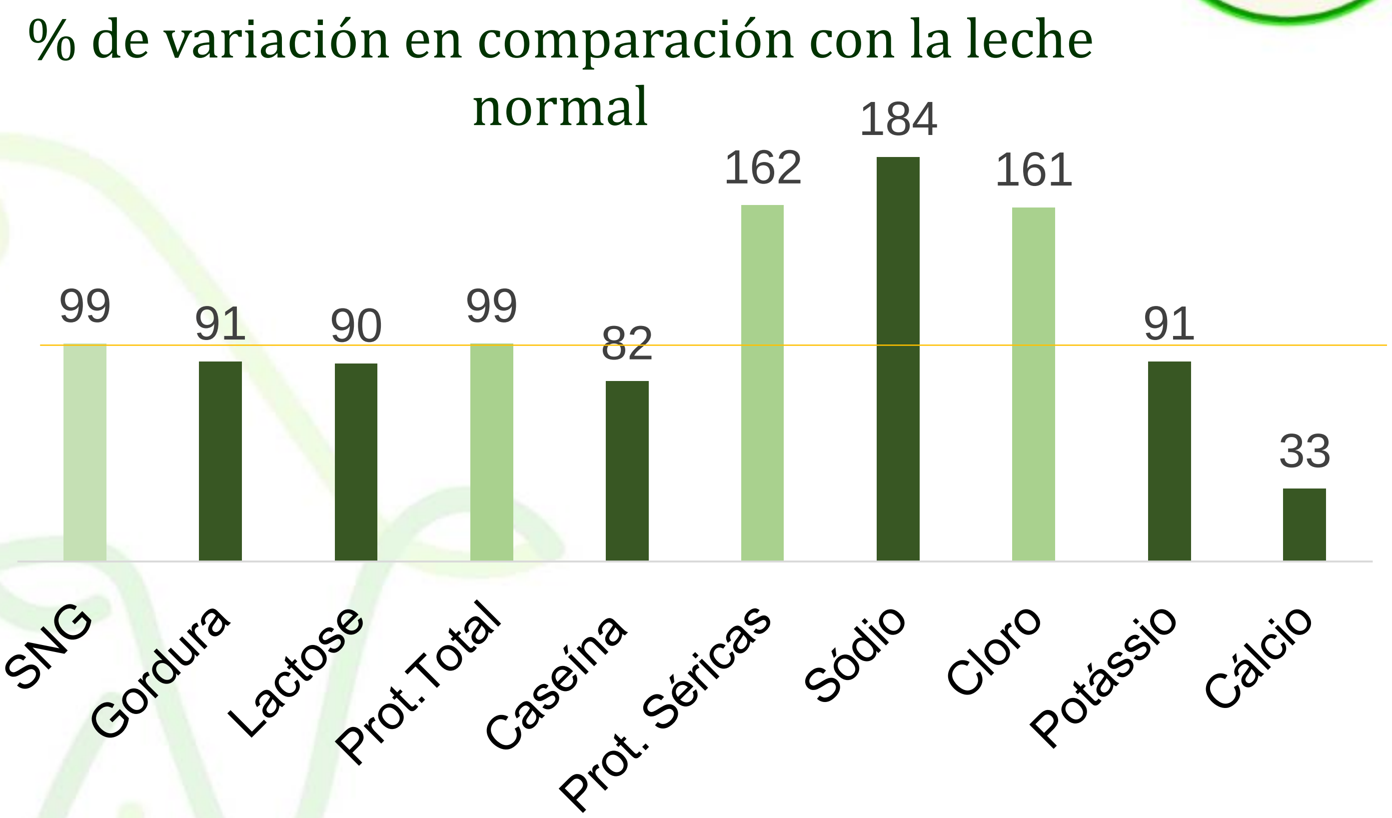
- Inhibición de cultivos lácticos (factores antimicrobianos).

- Defectos sensoriales (rancio y amargo): enzimas proteolíticas y lipolíticas.

- Mayor tiempo de coagulación y menor sinéresis de coágulos en la elaboración de quesos: sabor húmedo, más suave y rancio.

Cuanto mayor sea el RCS del tanque, menor será el contenido de caseína, lactosa, grasa... y reducir el rendimiento.

Componente	Leche Bajo RCS	Leche Alto RCS
Sol. não-grasos	8,9	8,8
Grasa	**3,5**	**3,2**
Lactosa	**4,9**	**4,4**
Proteína Total	3,6	3,6
Caseína Total	**2,8**	**2,3**
Proteína Séricas	**0,8**	**1,3**
Sódio	0,057	0,105
Cloro	0,091	0,147
Potássio	0,173	0,157
Cálcio	0,12	0,04



Schalibaum, NMC Annual Meeting, 2001

Control de la mastitis en tres pasos

1 ¿Cuál es la situación actual de la mastitis?

2 ¿Cuáles son las causas y cuándo se presentan los casos de mastitis?

3 Establecer prioridades según la granja

1 Diagnóstico de la situación

1. Clínica.
2. Subclínica.
3. RCS tanque.

2 Causas

1. Cultivo microbiológico.
2. Cuándo (tiempo de lactancia).
3. Casos: nuevos/crónicos.

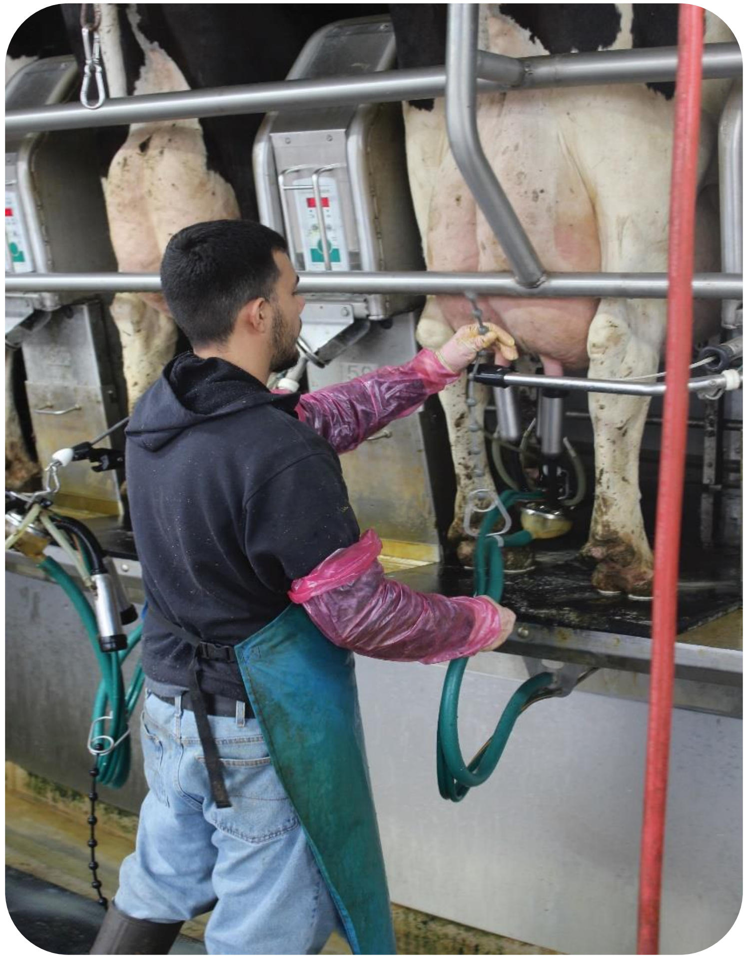
3 Plan de acción

1. Contagiosa.
2. Ambiental.

1. Clínica.
2. Subclínica.

La mastitis contagiosa se transmite entre vacas durante el ordeño

1. Staph. Aureus.
2. Strep. Agalactiae.
3. Coryneb. bovis.
4. Mycoplasma bovis.



Control de la mastitis contagiosa

Reducir las nuevas infecciones durante el ordeño

1. Rutina de ordeño: guantes; post-inmersión.
2. Mantenimiento de equipos de ordeño.
3. Segregación de vacas infectadas.
4. Tratamiento de vacas secas.
5. Descartar vacas con mastitis crónica.
6. Tratamiento en lactancia *Strep. Agalactiae.*
7. Vacunación: *S. aureus.*

Mastitis ambiental:
transmitida por contaminación de pezones

“Estreptococos ambientales”

Str. uberis, Str. dysgalactiae
Enterococcus, Lactococcus

Coliformes

Escherichia coli,
Klebsiella spp.

Estafilococos no-aureus ?

Control de la mastitis ambiental

Reducir la contaminación de los pezones antes del ordeño y aumentar la inmunidad.

1. Higiene/manejo de ambiente.
2. Pre-inmersión – pezones limpios y secos.
3. Sellador de pezones.
4. Vacunación: J5 (E. coli), Strep. Uberis.

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¡Muchas gracias!

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