Introduction. Ruminal acidosis – more questions than answers?

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No of cows in Poland: 2 037 279

No of cows recorded: 806 245 (~40%)

No of recorded herds: 18 066

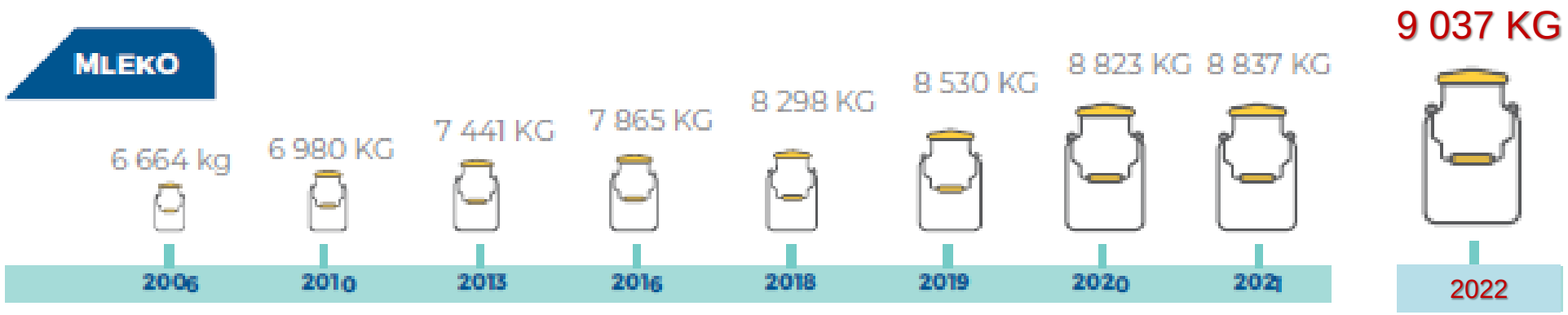
Average herd size: 44 cows

Average milk yield of recorded cows: 9 037 kg

Average milk yield of all cows: 7 425 kg

2022-12-31

X – labs for milk analysis



PFHBiPM, 2023

Risk of SARA

Ruminal acidosis
SARA

Ruminal acidosis

Acute

Acumulation of lactic acid

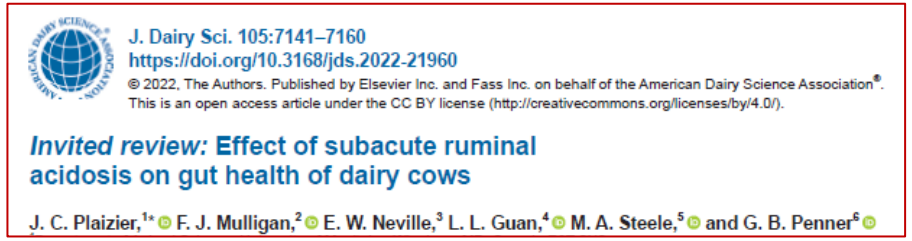
pH < 5,0 (5,2)

Subacute (SARA)

Acumulation of short-chain fatty acids (VFA)

pH < 5,6 (5,8)

- Well-known
  - Subacute ruminal acidosis (SARA) is considered a common digestive disorder in high-yielding dairy cows that affects their production, health and welfare (Plaizier et al., 2022)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Invited review: Effect of subacute ruminal acidosis on gut health of dairy cows

J. C. Plaizier,[1*] F. J. Mulligan,[2] E. W. Neville,[3] L. L. Guan,[4] M. A. Steele,[5] and G. B. Penner[6]


J. Dairy Sci. 106:3155–3175
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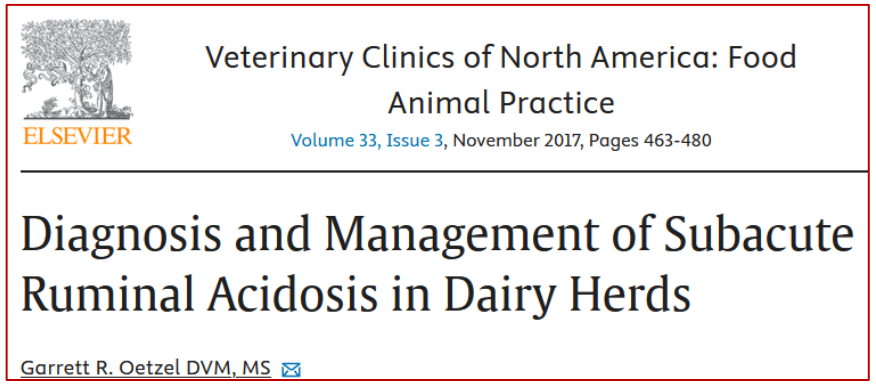
Characterizing ruminal acidosis risk: A multiherd, multicountry study

H. M. Golder,[1,2] S. J. LeBlanc,[3] T. Duffield,[3] H. A. Rossow,[4] R. Bogdanich,[5] L. Hernandez,[6] E. Block,[7] J. Rehberger,[7] A. H. Smith,[7] J. Thomson,[8] and I. J. Lean[1,2*]


J. Dairy Sci. 105:6379–6404
https://doi.org/10.3168/jds.2021-20576

Invited review: Sensor technologies for real-time monitoring of the rumen environment

Chan Su Han,[1*] Upinder Kaur,[2*] Huiwen Bai,[2*] Barbara Roqueto dos Reis,[3] Robin White,[3†] Robert A. Nawrocki,[2] Richard M. Voyles,[2] Min Gyu Kang,[1†] and Shashank Priya[1]


ELSEVIER
Veterinary Clinics of North America: Food Animal Practice
Volume 33, Issue 3, November 2017, Pages 463-480

Diagnosis and Management of Subacute Ruminal Acidosis in Dairy Herds

Garrett R. Oetzel DVM, MS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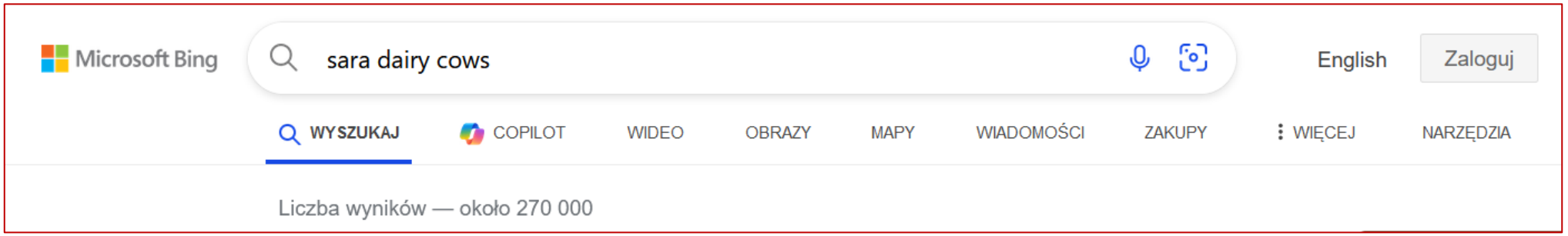
Animal Feed Science and Technology
126 (2006) 215–236
ANIMAL FEED SCIENCE AND TECHNOLOGY
www.elsevier.com/locate/anifeedsci

Review

Understanding and preventing subacute ruminal acidosis in dairy herds: A review☆

K. Marie Krause, Garrett R. Oetzel*

- Well-known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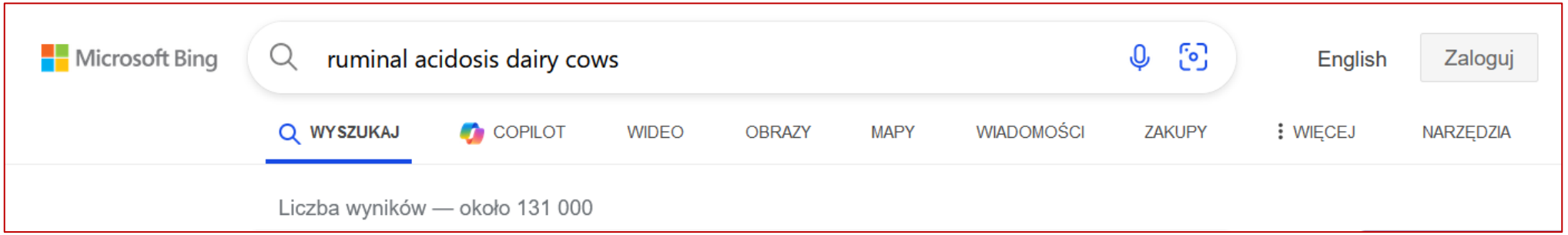
NARZĘDZIA
Liczba wyników — około 270 000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NARZĘDZIA
Liczba wyników — około 131 000

- Highly prevalent

Garret et al., 1997	19% in early lactation 26% in mid lactation	USA
Oetzel et al., 1999	20,1% in early and peak lactation	USA
Morgante et al., 2007	33%	Italy
Kleen et al., 2009	13,8%	The Netherlands
Kleen et al., 2013	20%	Germany
Tajik et al., 2009	27,6%	Iran
Stefańska et al., 2016	14%	Poland

But…

- Prevalence of SARA depends on the methodology
  - Rumenocentesis or stomach tube or boluses
  - Collection time after feeding
  - Threshold values for ruminal pH

Kraj	N stad badanych	Prewalencja	Uwagi
Polska	13	13.6 %	pH ≤ 5.5
		20.0%	pH ≤ 5.6
		35.7%	pH ≤ 5.8

Kowalski et al., unpublished

But…

- Well-known???

  - It has become evident that the symptoms of SARA are not solely caused by depressed ruminal pH, and that the size of the pH depression required to cause these symptoms varies among cows… (Plaizier et al., 2022)
  -
  - It is difficult to diagnose subacute ruminal acidosis in dairy herds. There is no definitive herd test; instead, information about herd performance, clinical signs, and measured ruminal pH must be integrated….. (Oetzel, 2017)

- Well-known ???
  - Do we have the agreement on the etiology and symptoms?

(Plaizier et al., 2022)

  - Do we have the agreement on the definition?

- Well-known ???

  - Do we have the agreement on the diagnosis of the cow and monitoring of the herd?
    - for SARA: pH < 5,6 or 5,8 or …?
    - how many hours with low pH?
    - when after feeding?
    - only rumenocentesis?
    - only ruminal pH? other biomarkers?
    - herd vs individual cow?

- Well-known ???

  - new technologies in diagnosis and monitoring (boluses, AI)?

    - have they been scientifically (objectively) validated?

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Animal (2020), **14:S1,** pp s176–s186 © The Animal Consortium 2020
doi:10.1017/S1751731119003112

animal

Review: Rumen sensors: data and interpretation for key rumen metabolic processes

J. Dijkstra[1†], S. van Gastelen[2], K. Dieho[3], K. Nichols[1] and A. Bannink[2]

The Veterinary Journal 243 (2019) 26–32

Contents lists available at ScienceDirect

The Veterinary Journal

journal homepage: www.elsevier.com/locate/tvjl

Evaluation of reticuloruminal pH measurements from individual cattle: Sampling strategies for the assessment of herd status

Nicholas N. Jonsson[a,b,*], Joachim L. Kleen[c], R. John Wallace[d], Ivan Andonovic[e], Craig Michie[e], Marianne Farish[f], Malcolm Mitchell[f], Carol-Anne Duthie[f], Dan B. Jensen[g], Matthew J. Denwood[g]

- Risk factors
  - Dietary and Management

    - Grain overfeeding and/or low fiber diets
    - Sorting against long particles

    - Poor welfare
    - Poor feed bunk and/or feeding station management

Consequences of SARA

Decreased milk yield, lower milk fat% and yield

Decreased BCS
Ketosis

Decreased nutrient supply

Decreased DM Intake

Decreased digestibility

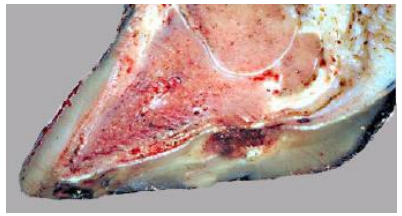
SARA

Health

Leaky gut

Decreased fecal consistency

Lameness



Inflammation

Excessive excretion of nutrients (including minerals)

Liver ulcers, infections of kidneys, heart

Environmental pollution

Too early culling

- SARA affects intestinal health, not only ruminal?
  - Effect on the microbiota of the GIT?
  - Leaky gut?
  - Systemic inflammation?

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J. Dairy Sci. 104
https://doi.org/10.3168/jds.2021-20330

Invited review: **The influence of immune activation on transition cow health and performance—A critical evaluation of traditional dogmas**

E. A. Horst, S. K. Kvidera, and L. H. Baumgard*
Department of Animal Science, Iowa State University, Ames 50011

- Ruminal acidosis in calves

  - A real problem?

  - Do we program the calves to be more susceptible to SARA in their mature life?

(Górka et al., in progress)

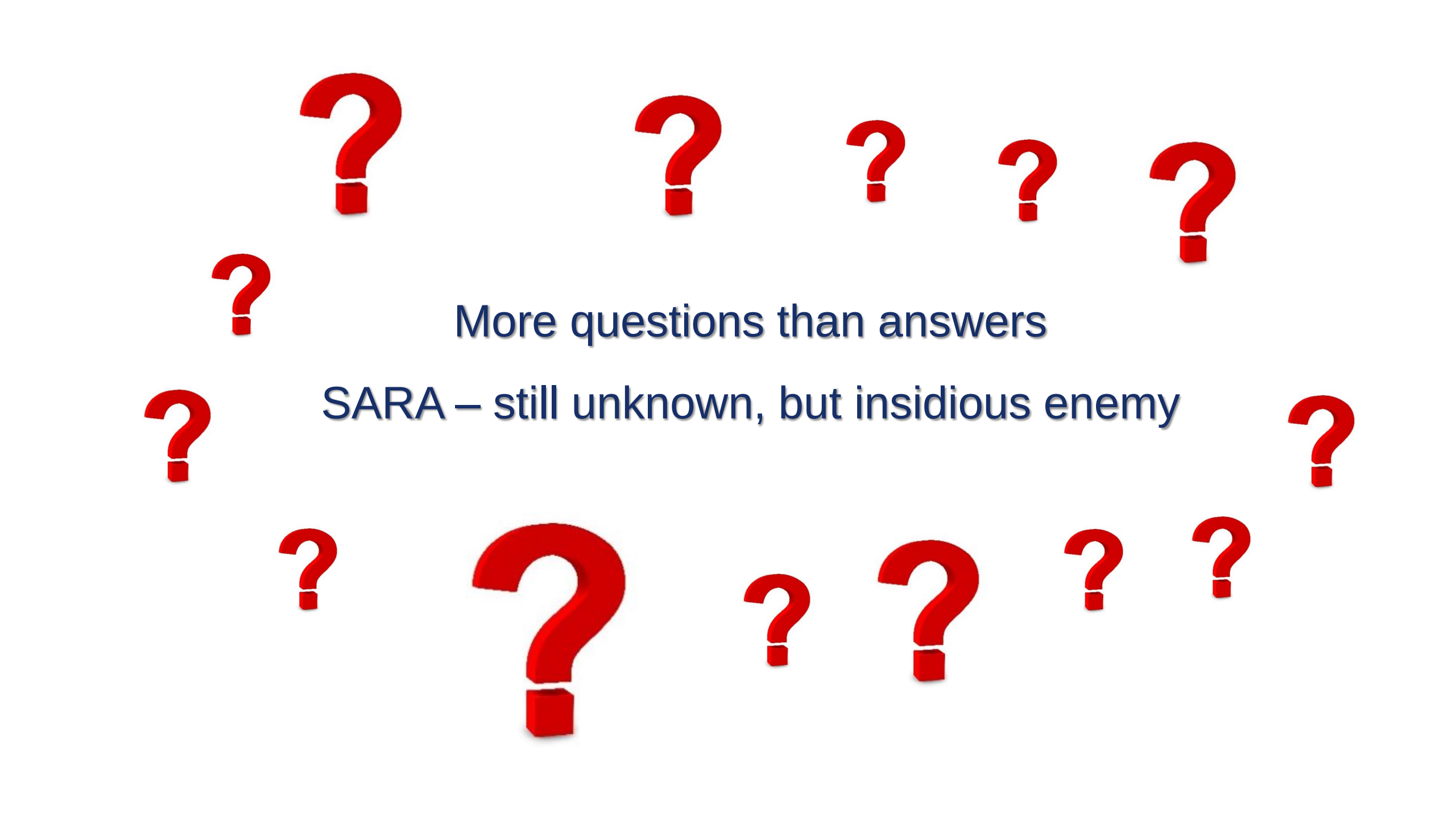
- Practical recommendations

J. Dairy Sci. 101:872–888
https://doi.org/10.3168/jds.2017-13191

Invited review: **Practical feeding management recommendations to mitigate the risk of subacute ruminal acidosis in dairy cattle**

E. Humer,* R. M. Petri,* J. R. Aschenbach,† B. J. Bradford,‡ G. B. Penner,§ M. Tafaj,# K.-H. Südekum,‖ and Q. Zebeli*[1]

- But… there are still so many questions



More questions than answers

SARA – still unknown, but insidious enemy

Thanks for your attention !