Selective Dry Cow Therapy

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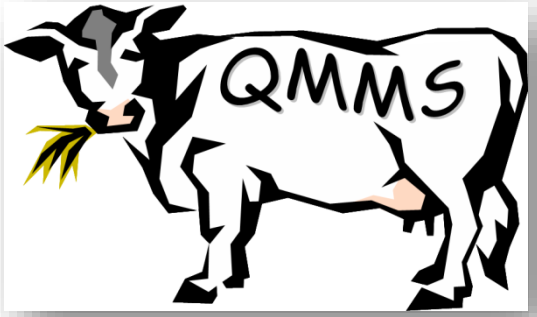

What is ‘selective’ dry cow therapy?

Selective Dry Cow Therapy

- Selecting *different* dry cow therapy products for *different* cows at drying-off....
- ...dependant on likely **infection status**
- ...and **aim** of therapy
- Could mean a *different* dry cow antibiotic in infected cows...?
- **Should mean using an internal teat sealant *without* dry cow antibiotic in uninfected cows...**

Why take a ‘selective’ approach to dry cow therapy?

Reasons to Use a 'Selective' Approach

- A *rational* decision! Why administer antibiotic dry cow therapy in an uninfected cow?
  - Government targets of 50mg/kg for antibiotic use in livestock...(O'Neill report 2016)
- Internal teat sealants are significantly *better* at reducing new infections during the dry period
- Welfare of the cow!
  - Using dry cow antibiotic in low SCC cows *increases* the risk of coliform mastitis in the next lactation
- Reduce the risk of bulk tank residue failures

Evidence: Internal Teat Sealants

J. Dairy Sci. 85:551–561

Management Practices Associated with the Inc
of Clinical Mastitis

H. W. BARK
M. L. BE

ABSTRACT

Risk factors for the incidence rate of clinical masti-
tis were studied in 274 Dutch dairy herds. Variables
that were associated with resistance to disease wer
the feeding, housing, and milking machine factor
Variables that were as
combined hour

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The use of
teat sealar

Cow, Farm, and
that Determine

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The dr
being th
infection (IMI)
highest susceptibility to new
in the dry period is controlled with antibiotic
therapy. The aim of this randomized control trial was
to investigate different dry cow therapy regimens by
stratifying cows by likely infection status at drying off in

J Dairy Sci. 2013 Sep 18. pii: S0022-0302(13)00635-8. doi: 10.3168/jds.2013-6544. [Epub ahead of print]

The effect of internal teat sealant products (Teatseal and Orbeseal) on intramammary infection, clinical mastitis, and somatic cell counts in lactating dairy cows: A meta-analysis.

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Abstract

The objective of this study was to assess the efficacy of internal teat sealant products containing bismuth subnitrate (Teatseal and Orbeseal; Pfizer Animal Health, West Ryde, Australia) when used alone, or in the presence of antibiotic dry cow therapy (ADCT), before or at drying off on the incidence of new intramammary infections (IMI), clinical mastitis, and milk somatic cell count (SCC) during lactation. The literature search identified 18 English-language publications on the use of Teatseal in dairy cattle. A total of 12 studies with 17 subtrials or comparisons including 13 positive control subtrials (internal teat sealant and ADCT vs. ADCT) and 4 negative control subtrials (internal teat sealant vs. untreated) examining IMI were included in the analysis. Internal teat sealants, alone or in the presence of ADCT, reduced the risk of acquiring new IMI after calving by 25% [risk ratio (RR) = 0.75; 95% confidence interval (CI): 0.67 to 0.83]. Internal teat sealants reduced the risk of IMI by 73% compared with untreated cows (RR = 0.27; 95% CI: 0.13 to 0.55). The results of both meta-analyses of IMI, with positive and negative controls, were heterogeneous [I^2 (a statistic that describes the proportion of total variation in study effect estimates that is due to heterogeneity) = 65.4 and 92.1%]. No farm or cow factors studied significantly contributed to the heterogeneity of the results. A total of 16 studies (21 subtrials), including 14 positive control subtrials and 7 negative control subtrials, examining clinical mastitis were included in the analysis. Internal teat sealants alone and in the presence of ADCT reduced the risk of clinical mastitis after calving in lactating cows by 29% (RR = 0.71; 95% CI: 0.62 to 0.82), and 48% (RR = 0.52; 95% CI: 0.37 to 0.75), respectively. The results of the meta-analysis on clinical mastitis with positive controls were homogenous (I^2 = 33.6%), whereas the results of studies with negative controls were heterogeneous (I^2 = 60.4%). No farm or cow factors studied that had sufficient data to evaluate significantly contributed to the heterogeneity of the results. The estimated linear score (LS) of milk SCC after calving in published studies (n = 3) and for studies that provided raw data (n = 2), was significantly lower for cattle treated with internal teat sealants and ADCT in 3 studies than for cattle treated with internal teat sealants only. The estimated LS of pooled raw data of 3 studies from 32 herds showed that the LS of cows treated with internal teat sealant and ADCT was not significantly different than those treated with ADCT only. This study found that the application of internal teat sealants in the presence of ADCT or the use of internal teat sealants alone at dry off significantly reduced the incidence of IMI and clinical mastitis in lactating dairy cows compared with respective control groups. Further studies are needed to investigate the effect of internal teat sealants on postpartum milk SCC in lactating dairy cows.

KEYWORDS: Teatseal, antibiotic dry cow therapy, mastitis, meta-analysis

with other dry cow therapy products, and teat sealant.
A meta-analysis relative risk (RR) was calculated per
intervention and pathogen group when enough stud-
ies were available from the 33 selected studies. Results
of the meta-analyses were examined using publication

optimize protection (Parkinson et al., 2000). Emerging
antibiotic bacterial resistance, combined with economic
incentives, led to selective DCT (**SDCT**) based on cow
characteristics, such as SCC approaching dry off or
clinical IMI history (Morris et al., 1978), or both.

Evidence: Internal Teat Sealants

- Studies around the world highlight effectiveness of internal teat sealants
  - Reduce risk of a new infection by about 25%
- A study of 52 herds in the UK showed those herds that took a 'selective' approach were significantly less likely to calve down a cow that developed clinical mastitis in the 1st 30 days of the next lactation

Green and others (2007) Cow, farm, and management factors during the dry period that determine the rate of clinical mastitis after calving. Journal of Dairy Science ***90****(8): 3764-76*

Evidence: Welfare of the Cow

- What happens if we use antibiotic dry cow therapy *and* internal teat sealant...
- In *infected* cows at drying-off?
  - Significantly increases the odds of quarters being free of a major pathogen at calving
- In *uninfected cows* at drying off?
  - **Significantly increases the odds of quarters acquiring a case of *coliform mastitis* in the next lactation...**

*Bradley and others (2010) The use of a cephalonium containing dry cow therapy and an internal teat sealant, both alone and in combination. Journal of Dairy Science **93**(4): 1566-77.*

How do I know if a cow is likely to be UNinfected?

"How do I know if cows are 'uninfected' at drying off?"

- Which test(s) do I use?
- California Mastitis Test?
- Bacteriology at drying-off?
- **Somatic cell count (SCC)…**

- THERE IS NO PERFECT METHOD…. but product selection can **only** practically be made on the basis of *individual cow SCC's*

Underlying Principles

- In the **high SCC herd** (>200,000 cells/ml)
  - Want higher *sensitivity*
  - Optimise *treatment* as the priority is cure
  - Consider 100,000-150,000 cells/ml
- In the **low SCC herd** (<150,000 cells/ml)
  - Want higher *specificity*
  - Optimise prophylaxis as the priority is *prevention*
  - Consider 200,000-250,000 cells/ml

An Example Drying-Of List

						Cell Count History					
L.No	Served	PD	Dry	Due	CM Date	15/09/15	13/10/15	12/11/15	Inf. Status	Sug. Treatment	Notes
2	05/04/15	+	14/11/15	13/01/16		132	76	65	Uninfected	Select for Prevention	
2	08/04/15	+	17/11/15	16/01/16		164	94	114	Recovered	Select for Prevention	
2	11/04/15	+	20/11/15	19/01/16		22	17	50	Recovered	Select for Prevention	
2	11/04/15	+	20/11/15	19/01/16		127	31	70	Uninfected	Select for Prevention	
2	13/04/15	+	22/11/15	21/01/16	20/08/15	123	427	98	Uncertain	Select for Cure	
1	13/04/15	+	22/11/15	21/01/16		31	25	63	Uninfected	Select for Prevention	
2	14/04/15	+	23/11/15	22/01/16		66	67	153	Recovered	Select for Prevention	
5	16/04/15	+	25/11/15	24/01/16		133	186	493	New (Milk)	Select for Cure	
4	17/04/15	+	26/11/15	25/01/16	08/07/15	598	1444	572	Chronic	Select for Cure	
1	17/04/15	+	26/11/15	25/01/16		14	19	31	Uninfected	Select for Prevention	
7	20/04/15	+	29/11/15	28/01/16		172	234	299	Chronic	Select for Cure	
2	22/04/15	+	01/12/15	30/01/16		687	560	284	Chronic	Select for Cure	
1	24/04/15	+	03/12/15	01/02/16	03/08/15	141	127	79	Recovered	Select for Prevention	
3	24/04/15	+	03/12/15	01/02/16		71	198	149	Uninfected	Select for Prevention	
1	24/04/15	+	03/12/15	01/02/16		24	31	95	Recovered	Select for Prevention	
5	24/04/15	+	03/12/15	01/02/16		82	101	138	Uninfected	Select for Prevention	
5	25/04/15	+	04/12/15	02/02/16		755	177	199	Uncertain	Select for Cure	
2	26/04/15	+	05/12/15	03/02/16		176	119	101	Recovered	Select for Prevention	
1	01/05/15	+	10/12/15	08/02/16		49	36	65	Recovered	Select for Prevention	
1	01/05/15	+	10/12/15	08/02/16		27	17	253	New (Milk)	Select for Cure	
1	01/05/15	+	10/12/15	08/02/16		16	18	83	Uninfected	Select for Prevention	

Infusing dry cow therapy in an aseptic manner

The Importance of an Aseptic Infusion Technique for Dry Cow Therapy

- Irrespective of choice of dry cow therapy, we MUST administer products in an aseptic manner to reduce the risk of introducing infection
- Even with antibiotic...
- ***Especially*** **without antibiotic...**

MUST...administer dry cow therapy as in the parlour as a separate task

MUST...apply licensed pre-milking teat disinfection with 20-30s contact

MUST...wipe dry with clean towel

MUST...scrub the teat & teat end with cotton wool soaked in surgical spirit

MUST...infuse dry cow therapy in *reverse order* of cleaning teats

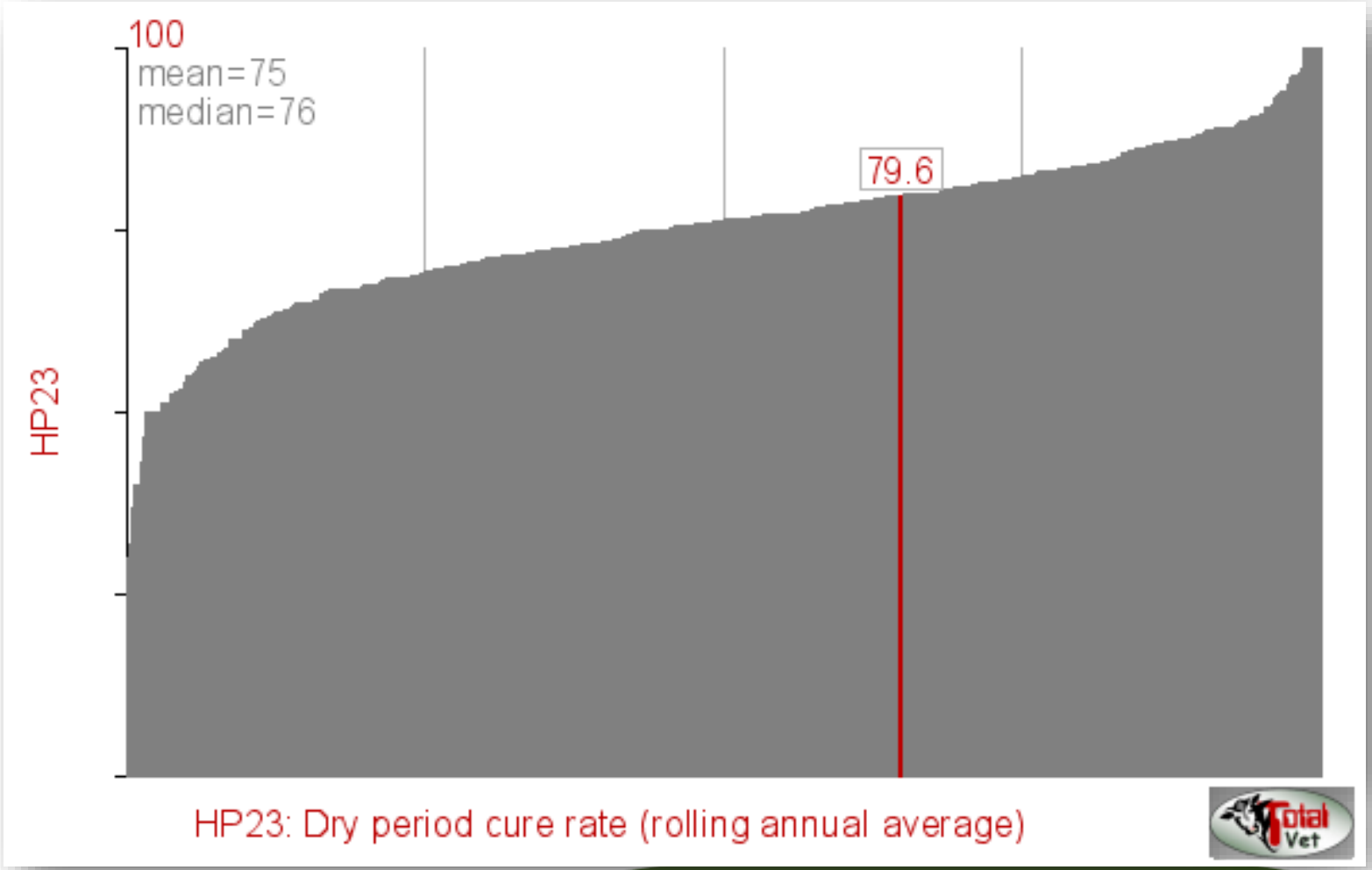
- Clean teats *furthest away* from you...and then *closest* to you

- Administer tubes to teats *closest* to you...and then *furthest away* from you

MUST...apply licensed post-milking teat disinfectant and allow cows to stand for 30 mins on clean loafing area

Monitoring the outcome of (selective) dry cow therapy

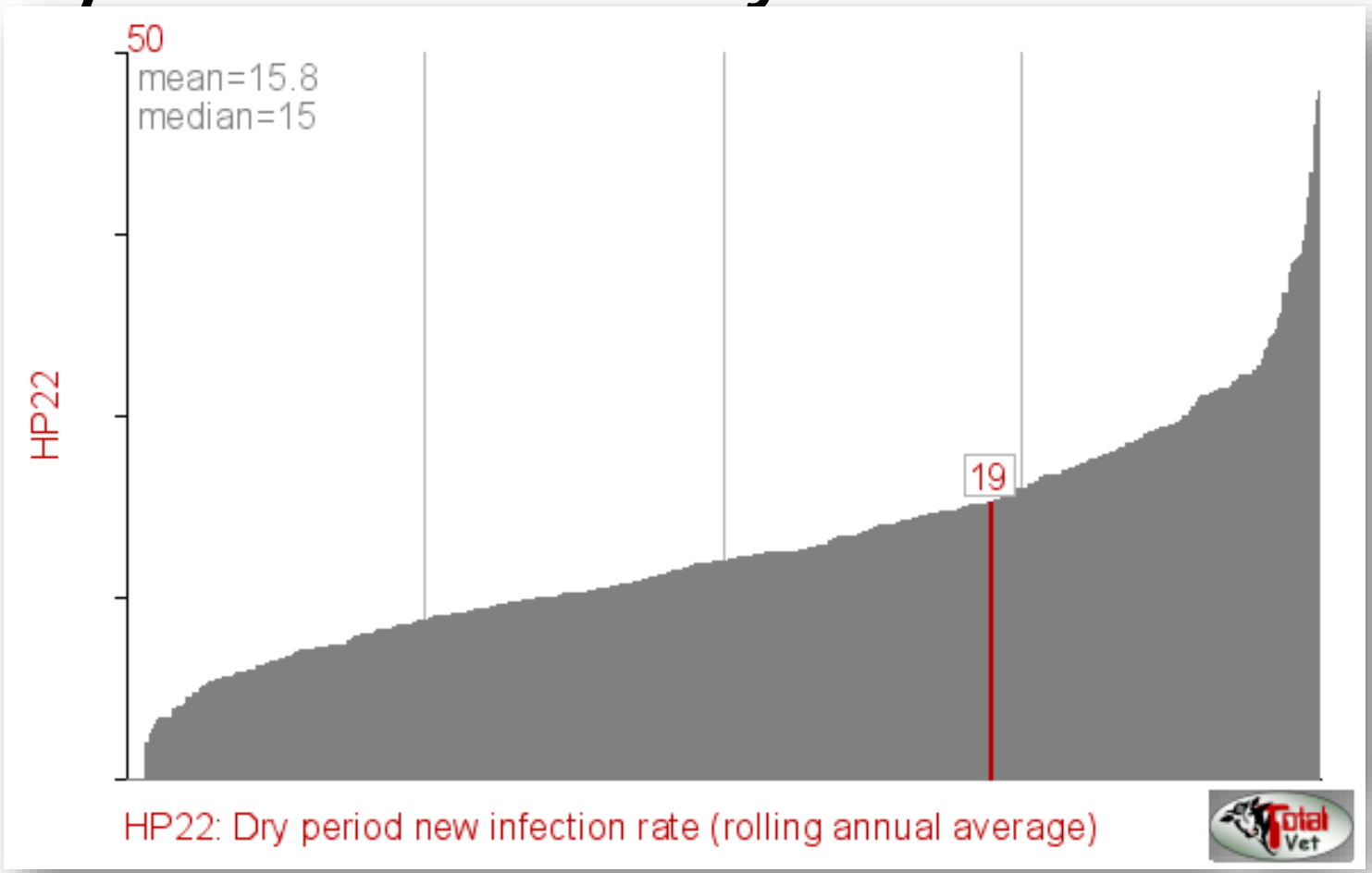
Dry Period *Cure* Rates...



The Importance of Dry Period Cure...and Re-Infection Pressure

- Why so much variation in 'apparent' cure rates across the dry period?
- These herds are all using antibiotic dry cow therapy...
- Are the dry cow antibiotic tubes 'working'?
- **Or is this caused be *re-infection* from the dry cow environment?**

Dry Period *New Infection* Rates...



Dry Period Cure and New Infection

- In herds with POOR 'apparent' cure rate, the *new infection rate* is likely to be increased
- This is important...
- Reducing new infection pressure from the ENVIRONMENT during the dry period:
  - In *uninfected* cows we are trying to protect
  - In *infected cows* we are trying to cure
- **Dry cow therapy is only *part* of the answer!**

Acknowledgements

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- Dr Chris Hudson BVSc PhD DCHP MRCVS

- www.qmms.co.uk
- http://nottingham.ac.uk/research/groups/dairy-herd-health-group/mastitis.aspx