



Pathogen based treatment – Prudent use of antimicrobials

**Dairy Practices Council
Portland 2019**

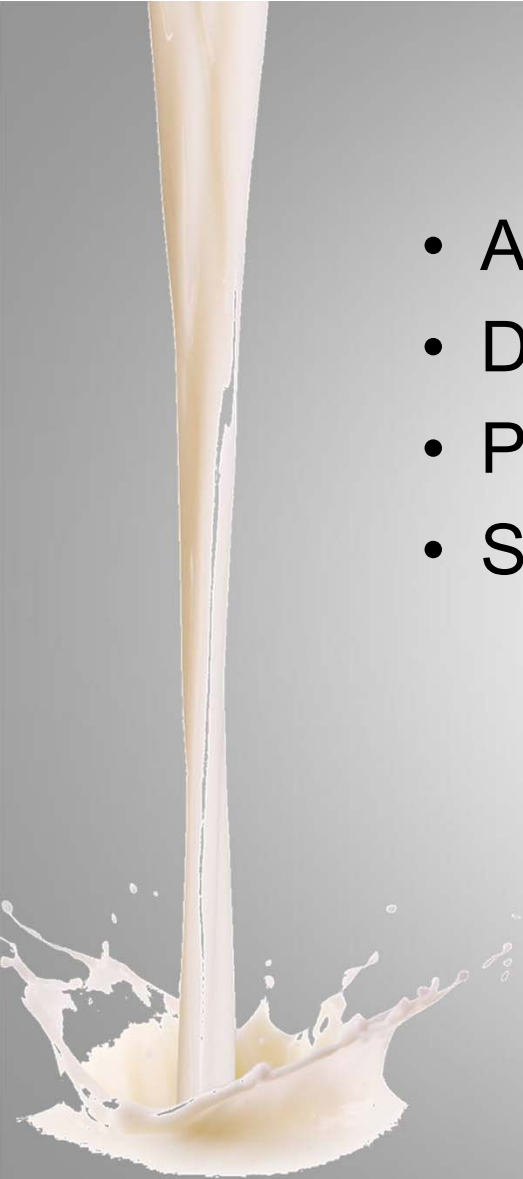
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Overview

- Antimicrobial use in humans and animals
- Dairy farm antimicrobial usage
- Pathogen based treatment (PBT)
- Selective dry cow therapy



The role of antimicrobials in human and animal medicine

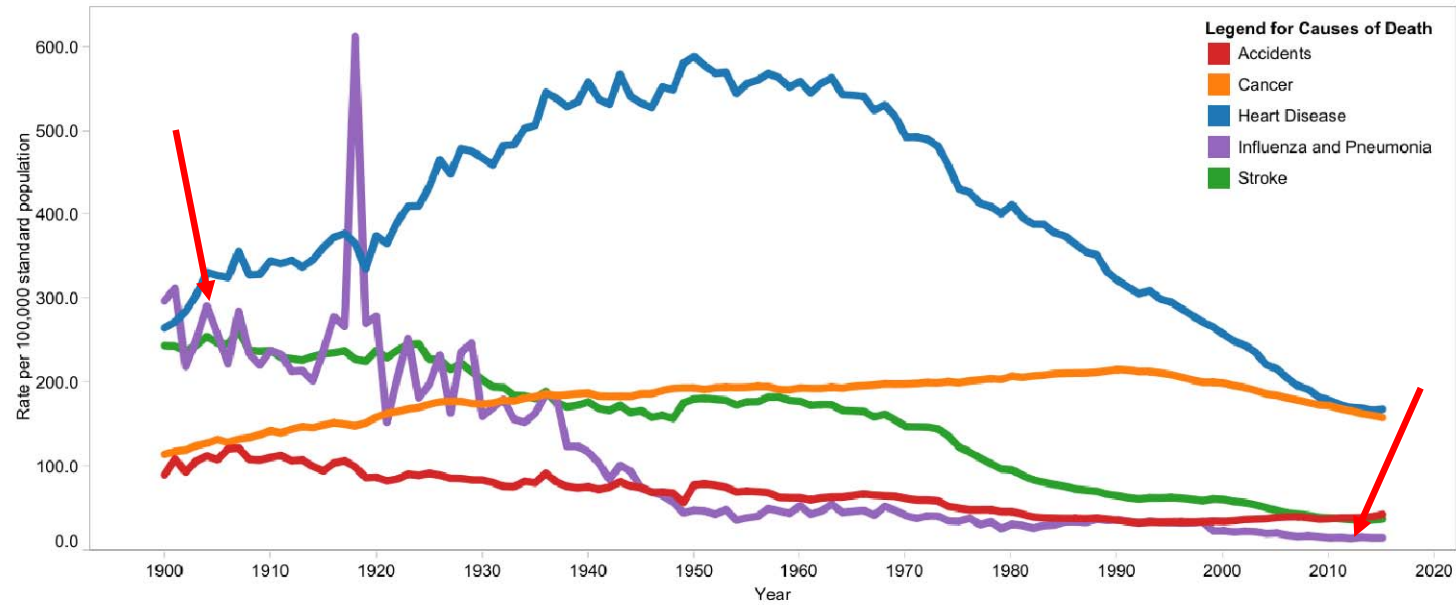
- Antimicrobials – medicine that inhibits the growth of or destroys microorganisms
 - Some antimicrobials specifically target bacterial cells
 - Human cells have a plasma membrane but lack a peptidoglycan cell wall structure
 - Beta-lactams selectively target bacteria with a peptidoglycan layer with no negative impact on human cells
- Antimicrobials have and continue to save millions of lives
- Antimicrobials improve human health
- Lifespan
 - 1930 – 60 years
 - 2016 – 78 years
- Use of antimicrobials in animal medicine
 - Lower mortality rate
 - Lower morbidity rate
 - Lower disease rates – increased risk of another disease when sick

What were the major killer of humans in the 1930?

What are the major killers of humans today?

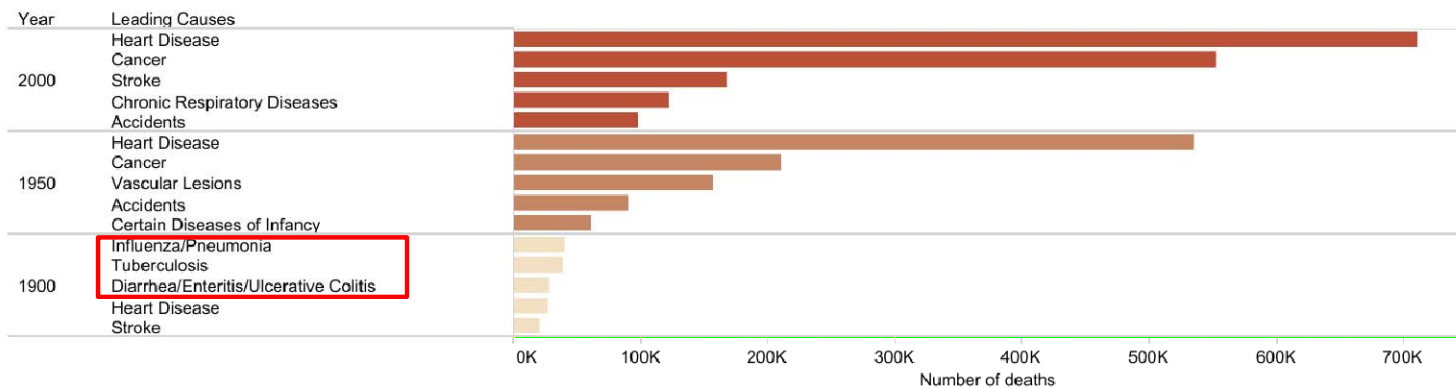


Age-adjusted Death Rates† for Selected Major Causes of Death: United States, 1900–2015‡‡‡



Main causes of death in 1900's was from diseases caused by bacteria. Today bacterial deaths are very few compared to other diseases

Five Leading Causes of Death: United States, 1900, 1950, and 2000





So what's the problem...?

- Concern from public health, food safety, and regulatory about the use of antimicrobials in food-producing animals leading to antimicrobial resistance
- This is not new
 - In 1987 three out of five consumers viewed antimicrobial use in poultry and livestock as a “serious health hazard”
 - Historical data from 1937 to 1991 shows that food safety was the number one topic of discussion among consumers as it related to food
 - Food safety was of greater concern than excess consumption of a food product, pesticides residues in food, animal hormones and unsafe practices used to treat cattle
- The discussion is not that different today
 - **Need to educate on prudent and therapeutic use not reduction**



History of antimicrobials in feed

- 1951 FDA approves antimicrobials for use in animal feed based on studies showing it helps chickens, pigs and livestock **improve weight gain**
- 1969 A committee of government experts in the U.K. concludes that the use of antimicrobials in animals has contributed to antimicrobial resistance in humans
- 1970 A U.S. task force, including scientists from the FDA and other agencies, recommends some antimicrobials used in humans be banned from use in animals
- 1977 The FDA proposes a **ban on the use of penicillin and tetracycline in animal feed**, unless pharmaceutical makers can show the practice is not a danger to humans
- 1980 FDA-commissioned report by the National Academy of Sciences finds little scientific data on antimicrobial resistance caused by feeding drugs to animals
- 1997 World Health Organization recommends **antimicrobials used in humans should not be used to promote growth in animals.**
- 1999 The European Union issues a **ban on using popular human antimicrobials in animals for growth promotion** due to risks to humans
- 2003 U.S. Institute of Medicine issues a report on the **rise in dangerous bacteria, or superbugs**. The group's recommendations include **banning use of antimicrobials for growth promotion in animals.**
- January 2012 The FDA orders limits on cephalosporin antimicrobials given to animals. The drugs are used to treat pneumonia and other diseases in humans.
- April 2012 The FDA outlines plans to **phase out non-medical uses of more than 200 antimicrobials in animals** over three years.
- 2015 FDA implements animal drug regulations regarding veterinary feed directive (VFD) drugs. FDA's current VFD regulation established requirements relating to the distribution and use of VFD drugs and animal feeds containing such drugs. This amendment is intended to improve the efficiency of FDA's VFD program while protecting human and animal health.
- January 2017 stricter federal rules regulate how medically important antibiotics—medications that are important for treating human disease—can be administered to animals in feed and drinking water.
 - All medically important antibiotics to be used in feed or water for food animal species require a Veterinary Feed Directive (VFD) or a prescription



USDA Dairy 2014

- 90% of operations use intramammary antimicrobials
 - 87% of cows with mastitis treated with intramammary
 - 21% of cows affected with mastitis during lactation
 - 93% of cows are dry treated with an antimicrobial
- Not focusing on use of antimicrobials in non-lactating animals during this presentation
 - But.....
- Prudent and therapeutic use discussion



- 60% of AMU in dairy is related to mastitis (MAST and dry cow)...
- Limited number of approved intramammary antimicrobials

| Product | Antibiotic | Bactericidal Bacteriostatic | Spectrum | Dosage | Milk Withholding | Slaughter Withdrawal | Product Indications |
|---|--------------------------|--------------------------------|----------|---|---------------------|-------------------------|--|
| Boehringer Ingelheim Vetmedica, Inc. | | | | | | | |
| ToDAY® | Cephapirin Sodium | cidal | Broad | 1 syringe repeat in 12 hours | 96 hours | 4 days | Treatment of mastitis in lactating cows caused by susceptible strains of <i>Streptococcus agalactiae</i> and <i>Staphylococcus aureus</i> including strains resistant to penicillin. |
| *PolyMast™ (R) | Hetacillin Potassium | cidal | Broad | 1 syringe repeat in 24 hours up to 3 days | 72 hours | 10 days | Treatment of acute, chronic or subclinical bovine mastitis in lactating cows caused by susceptible strains of <i>Streptococcus agalactiae</i> , <i>Streptococcus dysgalactiae</i> , <i>Staphylococcus aureus</i> and <i>Escherichia coli</i> . |
| Zoetis | | | | | | | |
| Pirsue® (R) | Pirlimycin Hydrochloride | static | Narrow | 1 syringe repeat in 24 hours x 2 days 1 syringe repeat in 24 hours for > 2 days (up to 8 days) | 36 hours | 9 days 21 days | Treatment of clinical and subclinical mastitis in lactating dairy cattle against <i>Staphylococcus aureus</i> and <i>Streptococcus agalactiae</i> , <i>Streptococcus dysgalactiae</i> and <i>Streptococcus uberis</i> . |
| Spectramast® LC (R) | Ceftiofur Hydrochloride | cidal | Broad | 1 syringe repeat in 24 hours x 8 days | 72 hours | 2 days | Treatment of clinical mastitis in lactating dairy cattle associated with coagulase- negative staphylococci, <i>Streptococcus dysgalactiae</i> , and <i>Escherichia coli</i> . |
| Merck | | | | | | | |
| Amoxi-Mast® (R) | Amoxicillin | cidal | Broad | 1 syringe repeat in 12 hours for three treatments | 60 hours | 12 days | Treatment of subclinical mastitis in lactating cows due to <i>Streptococcus agalactiae</i> and penicillin-sensitive <i>Staphylococcus aureus</i> . |
| Dariclox® (R) | Sodium Cloxacillin | cidal | Narrow | 1 syringe repeat in 12 hours for three treatments | 48 hours | 10 days | Treatment of bovine mastitis in lactating cows due to <i>Streptococcus agalactiae</i> and nonpenicillinase-producing <i>Staphylococcus aureus</i> . |

2/3 of that 60% is for Dry Cow Therapy

| Product | Antibiotic | Bactericidal Bacteriostatic | Spectrum | Dosage | After Minimum Dry Period | Dry Period | Slaughter Withdrawal | Product Indications |
|---|--|--------------------------------|----------|-------------------------------------|-----------------------------|---------------|-------------------------|--|
| Boehringer Ingelheim Vetmedica, Inc. | | | | | | | | |
| ToMORROW® | Cephapirin Benzathine | cidal | Broad | 1 syringe per quarter at dry off | 72 hours | 30 days | 42 days | Treatment of mastitis in dry cows, when caused by <i>Streptococcus agalactiae</i> and <i>Staphylococcus aureus</i> , including penicillin- resistant strains. |
| Dry-Clox® (R) | Cloxacillin Benzathine | cidal | Narrow | 1 syringe per quarter at dry off | 0 | 30 days | 30 days | Treatment of mastitis in dry cows when caused by <i>Streptococcus agalactiae</i> and <i>Staphylococcus aureus</i> including penicillin- resistant strains. |
| Zoetis | | | | | | | | |
| Albadry Plus® | Penicillin G, Procaine and Novobiocin Sodium | cidal | Broad | 1 syringe per quarter at dry off | 72 hours | 30 days | 30 days | Treatment of subclinical mastitis in dry cows caused by susceptible strains of <i>Staphylococcus aureus</i> and <i>Streptococcus agalactiae</i> . |
| Spectramast® DC (R) | Ceftiofur Hydrochloride | cidal | Broad | 1 syringe per quarter at dry off | 0 | 30 days | 16 days | Treatment of subclinical mastitis in dairy cattle at the time of dry off associated with <i>Staphylococcus aureus</i> , <i>Streptococcus dysgalactiae</i> and <i>Streptococcus uberis</i> . |
| Merck | | | | | | | | |
| Orbenin®-DC (R) | Benzathine Cloxacillin | cidal | Narrow | 1 syringe per quarter at dry off | 0 | 28 days | 28 days | Treatment and prophylaxis of mastitis in dry cows due to <i>Staphylococcus aureus</i> and <i>Streptococcus agalactiae</i> . |
| WG Critical Care | | | | | | | | |
| Quartermaster® (R) | Penicillin- Dihydrostreptomycin | cidal | Broad | 1 syringe per quarter at dry off | 96 hours | 42 days | 60 days | Reduce the frequency of existing infection and to prevent new infections with <i>Staphylococcus aureus</i> in dry cows. |

Shouldn't be a complicated
discussion...

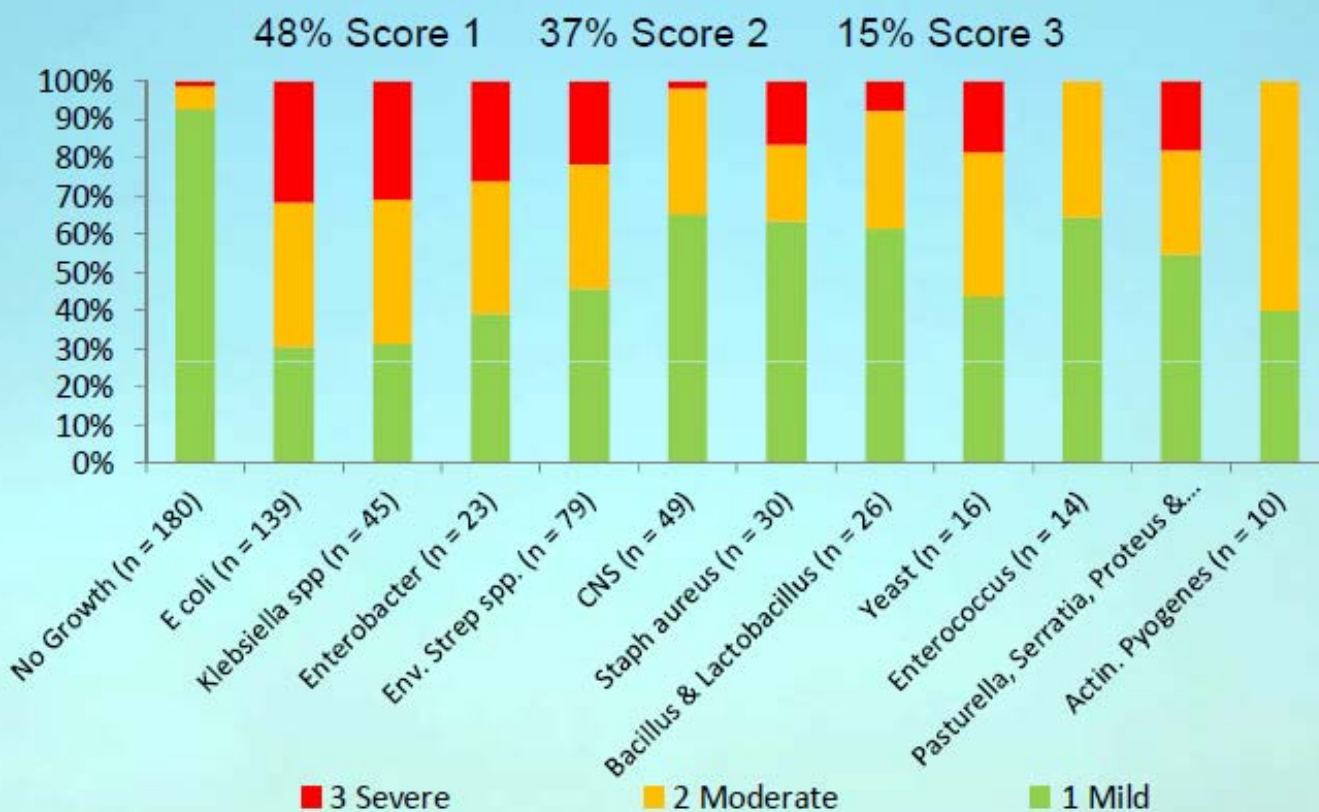
Mastitis

- Define mastitis
 - **Inflammation** of the mammary tissue
 - Abnormal milk, swelling, warmth to the touch, sensitive to touch
 - Mastitis is indicated by inflammation or abnormal milk, etc. and that is why we have milk samples that culture negative
 - The organism may have been evacuated from the mammary gland by the time we see abnormal milk and collect a milk sample
 - Inflammation caused by response of immune system to invading organism or localized trauma
 - Not infection but inflammation
 - Why is the distinction important?
 - We cant treat inflammation with antibiotics
 - Cows will have clinical signs of mastitis for 4 - 5 days
 - Independent of treatment



Almost All the Cases Are Mild

(622 cases from 52 farms)

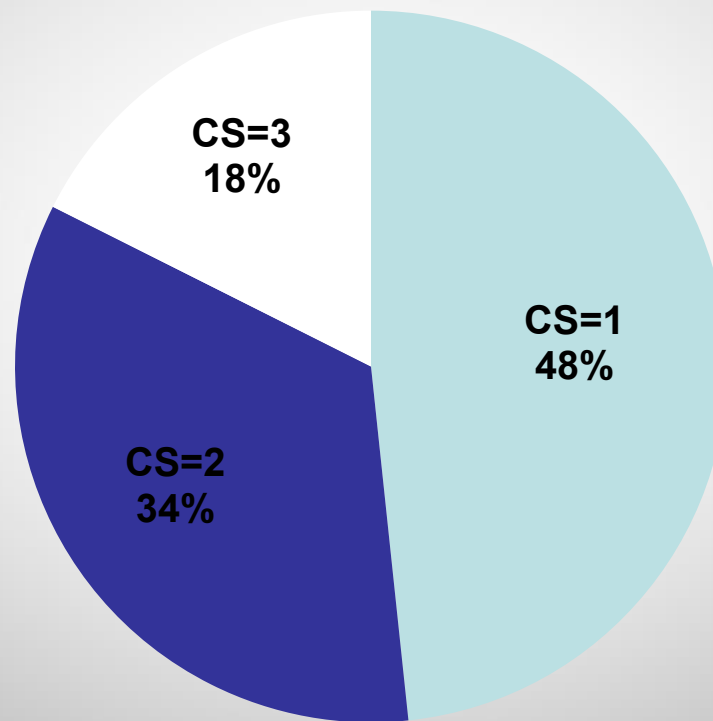




Severity Score Distribution

Clinical Mastitis on 6 NYS dairies 2016

n=716



Vasquez et al.



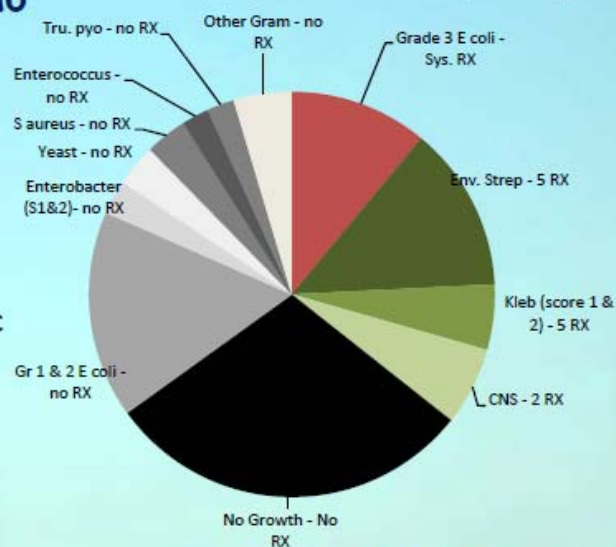
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Judicious Antibiotic Usage

- Do not administer antibiotics to cows who will not benefit

- Chronic Staph aureus
- Mycoplasma bovis
- Multiple infected quarters
- Damaged teats
- Other serious metabolic disease
- Repeated previous treatment failures
- Long history of chronically high SCC

Rec. Treatment by Etiology
690 Cases (52 WI Dairy Farm)



Oliveira & Ruegg, submitted J Dairy Science

< 40% of mastitis cases require treatment if we use cure rate as an outcome



J. Dairy Sci. 96:7538–7549
<http://dx.doi.org/10.3168/jds.2012-6078>
© American Dairy Science Association®, 2013.

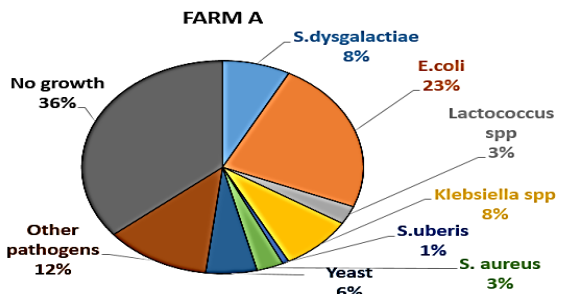
Characterization of clinical mastitis occurring in cows on 50 large dairy herds in Wisconsin

L. Oliveira,¹ C. Hulland, and P. L. Ruegg
Department of Dairy Science, University of Wisconsin, Madison 53706

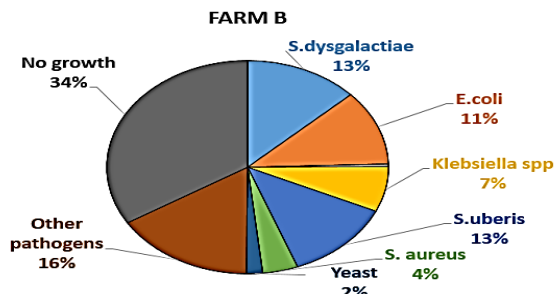


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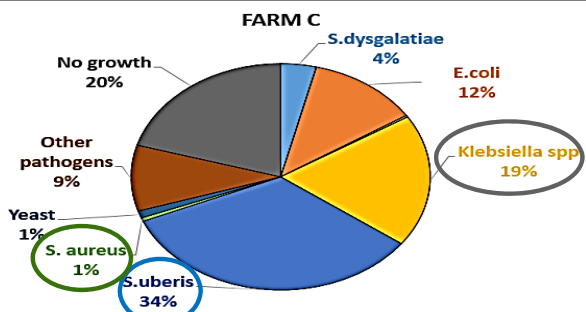
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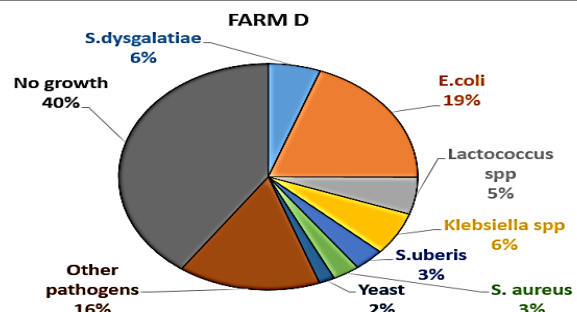
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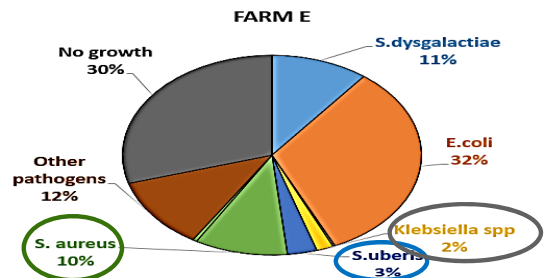
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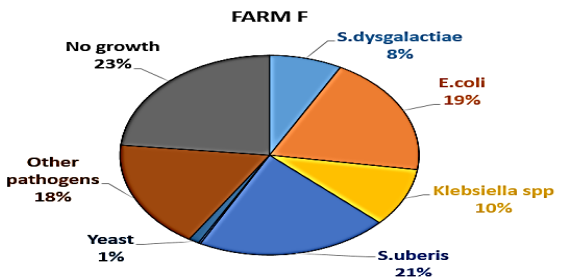
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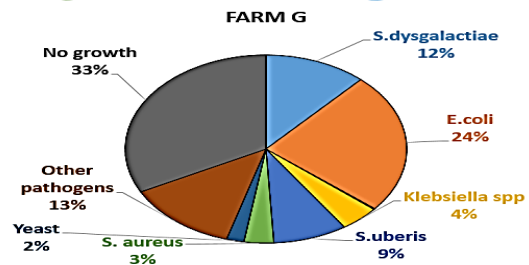
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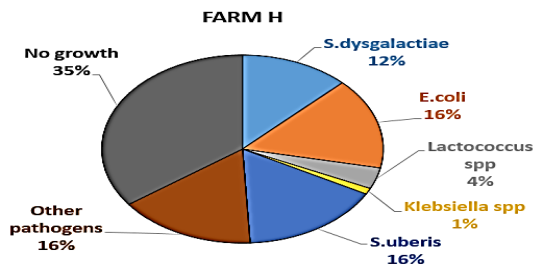
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4.0



1.2



Monthly mastitis incidence risk of 4.8%

Treatable: Streps

Non-treatable: Gram-negative Staph aureus CNS No growth Lactococcus?

9 – 38% treatable

Alanis et al.



Pathogen Based Treatment Decisions for Clinical Mastitis

- How could delaying treatment of mastitis by 24 – 48 hours be beneficial to milk quality and clinical outcome?
 - Not all cases should/need to be treated!
 - ~85% of cases are mild or moderate
 - Delaying treatment ~ 24 hours doesn't change outcome
 - Don't need systemic treatment
 - ~15% of cases should be treated immediately and systemically





Design Summary

Randomize cows into two groups:

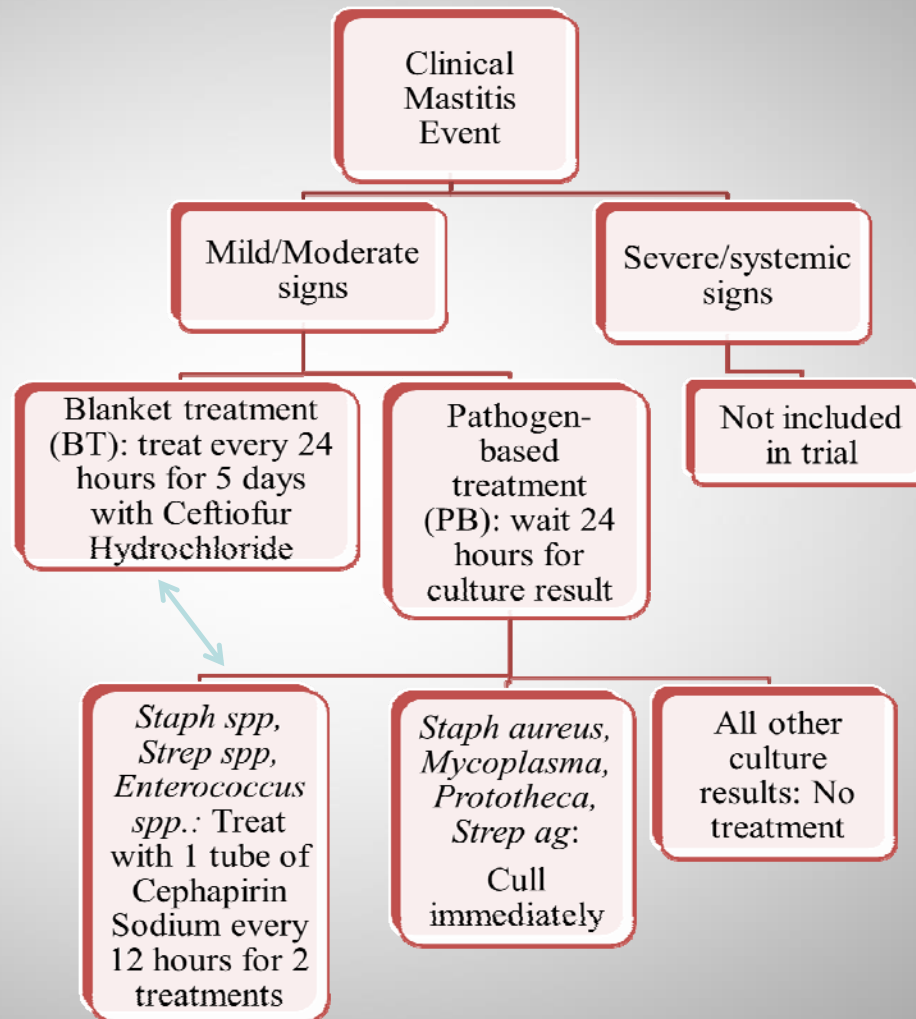
1. Treat **all** cows with mild/moderate mastitis with 5 days of Spectramast (BT)
 - a. Cull *Myco*, *Staph aureus*, *Prototheca*

1. Treat **some** cows based on pathogen ID (ToDay or NOT) after 24 hours (PB)
 - a. Treat *Streps*, CNS *Staphs* with Today 2x
 - b. Cull *Myco*, *Staph aureus*, *Prototheca*
 - c. *Not treat others*

2. *Cows with CS=3 given systemic therapy and not included in analysis*



Materials and Methods



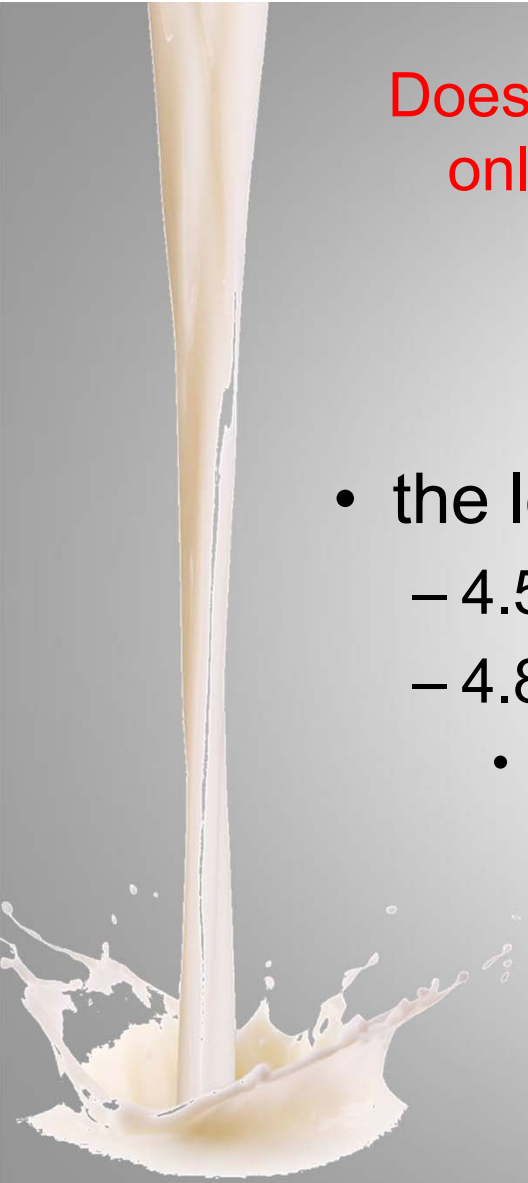


1. Compare treatment “success”

- a. Next test-day LS
- b. Next test-day milk production
- c. Duration of clinical mastitis signs
- d. Risk of being sold/dead at 30 and 60 d after event
- e. Time out of tank

2. Determine risk of chronic *E. coli* in untreated cows compared to treated cows



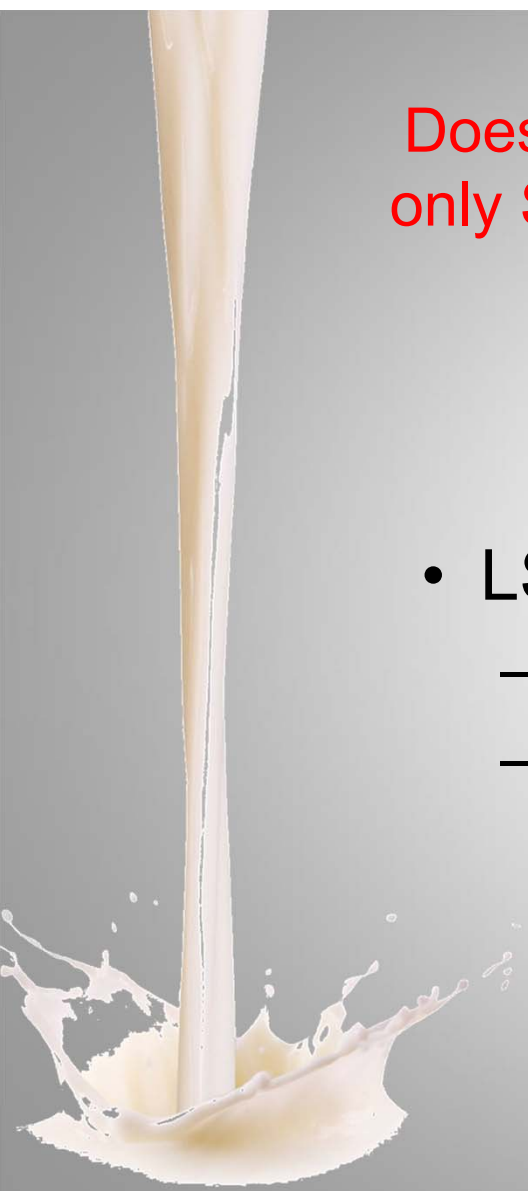


Does waiting >24 hours for pathogen ID and then treating only Streps and Staphs with Today 2x v. treating with Spectramast 5x change:

- the length of clinical mastitis signs? – **NO**
 - 4.5d in 24 hr (PB)
 - 4.8d in Spectramast (BT)
 - P= 0.12



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Does waiting ~24 hours for pathogen ID and then treating only Streps and CNS Staphs with Today 2x v. treating with Spectramast 5x change:

- LS at next test day – **NO**
 - 4.3 in 24 hour group (PB)
 - 4.3 in Spectramast group (BT)
 - P= 0.70



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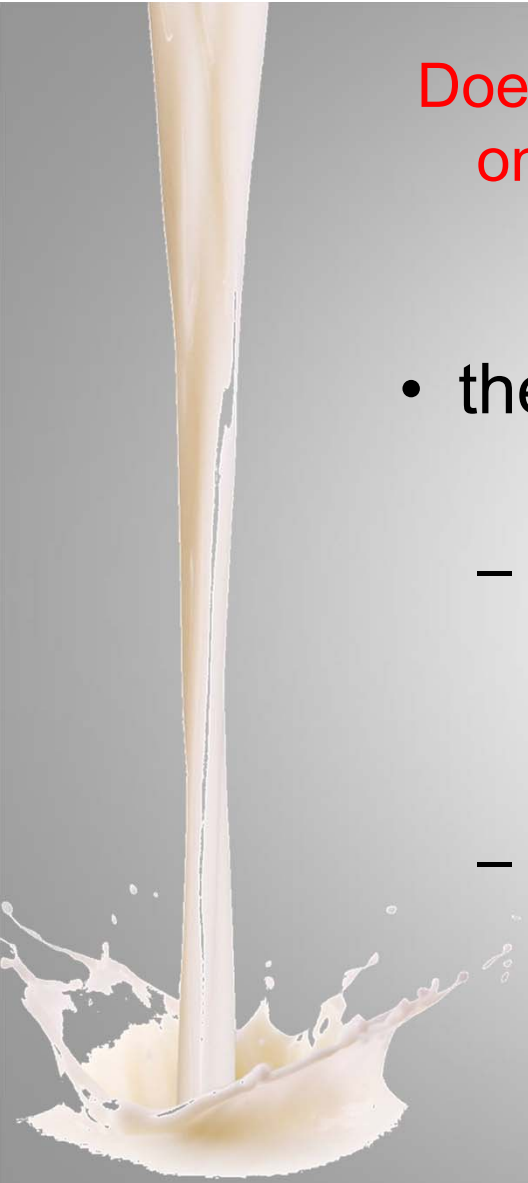


Does waiting ~24 hours for pathogen ID and then treating only Streps and CNS Staphs with Today 2x v. treating with Spectramast 5x change:

- Milk Production at next test day – **NO**
 - 77.8 lbs in 24 hr group (PB)
 - 76.3 in Spectramast group (BT)
 - P= 0.42



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Does waiting >24 hours for pathogen ID and then treating only Streps and Staphs with Today 2x v. treating with Spectramast 5x change:

- the risk of being sold/dead - **NO**
 - Survival at 30d
 - OR = 1.6 (95% CI:0.7-3.7) for remaining if in PB
 - 3.7% PB v. 5.8 BT
 - P=0.31
 - Survival at 60d
 - OR = 1.4 (95% CI:0.7-2.5) for remaining if in PB
 - 9.3% PB v. 11.1% BT
 - P=0.53



Descriptive Results

- 725 cases of clinical mastitis
 - 16% had CS=3 (n=114)
 - 37 cows culled and excluded for Staph aureus or Mycoplasma
 - 85 others excluded for other diseases, protocol errors, etc.
- 246 Pathogen Based / 243 Blanket Therapy
 - PB: 167 = no treatment; 79 ToDay 2x
 - BT: 243 = Spectramast 5x

| <u>Pathogen</u> | <u>PB (%)</u> | <u>BT (%)</u> |
|-----------------|---------------|---------------|
| No growth | 26 | 21 |
| NSO | 7 | 7 |
| CNS | 2 | 3 |
| Strep spp. | 31 | 33 |
| Gram negative | 34 | 33 |
| Yeast | 0.4 | 2 |
| T. pyogenes | 0.4 | 0.8 |
| Other | 0 | 0.8 |



PBT Summary

- 3 less days of milk withhold
 - No differences in:
 - Days to clinical cure
 - Post MAST milk yield
 - Post MAST LS
 - Risk of cull in 1-2mo following MAST
- Over 65% of mild/moderate mastitis will NOT be treated with antimicrobials if this protocol is employed
- Every farm has different mastitis causing organisms
- \$25,000 in economic benefit to the farm / 1,000 cows when using PBT vs. blanket treatment
 - 5% Mastitis incidence rate
 - \$15/cwt



| Assumptions | |
|-------------------------------------|----------|
| On Farm Labor Rate/Hour | \$ 15.00 |
| Per Tube Cost-Spectramast | \$ 3.80 |
| Per Tube Cost- ToDAY | \$ 3.10 |
| Milk Price/cwt | \$ 15.00 |
| Daily Production (lbs)-Mastitis Cow | 60 |
| Clinical Mastitis Incidence/Month | 5% |
| Culture Based Therapy | |
| IMM Treatment Rate | 35% |
| No IMM Treatment Rate | 65% |

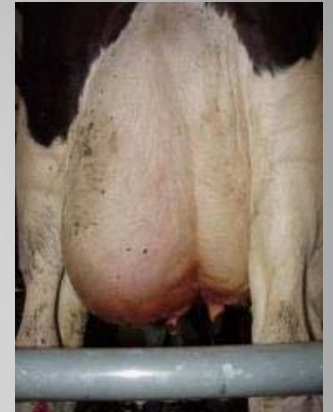
Economics: Milk \$15/cwt

| Per Cow Estimates | Blanket Therapy | | Culture Based Therapy | |
|--|------------------|-----------------|-----------------------|--|
| Materials and Labor | | IMM Therapy | No Treat | |
| Antibiotic Cost | \$ 19.00 | \$ 6.20 | \$ - | |
| Labor Cost | \$ 7.50 | \$ 3.75 | \$ 1.25 | |
| Culture Cost | \$ - | \$ 6.00 | \$ 6.00 | |
| Total | \$ 26.50 | \$ 15.95 | \$ 7.25 | |
| Lost Milk Income | | | | |
| Days of Nonesaleable Milk | 8.8 | 5.8 | 5.8 | |
| Total Lost Milk | 528 | 348 | 348 | |
| Lost Income | \$ 79.20 | \$ 52.20 | \$ 52.20 | |
| Direct Cost per Case | \$ 105.70 | \$ 68.15 | \$ 59.45 | |
| Calculations Projected to 1000 Cows | | | | |
| Clinical Cases Treated per Year | 600 | 210 | 390 | |
| Total Costs / 12 Months | \$ 63,420 | \$ 14,311.50 | \$ 23,185.50 | |
| Total Cost / Treatment Strategy | \$ 63,420 | | \$ 37,497 | |
| Difference | | | \$ 25,923 | |

Table By: Michael Capel and Daryl Nydam; adapted by Rick Watters

Pathogen based treatment

- Cow(s) gets mastitis
- Milk sample collected
- Events entered into farm management software
- Plate sample on-farm or sample picked up by reference lab
- Pathogen results reported 18 - 24 hours after plating and incubation
- Protocol driven treatment/automated treatment assignment in DC305



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| Events | Items1 | Items2 | TestDays | PrevLacts | Lactation | | |
|----------|---------|----------|-----------|-----------|-----------|------|----------|
| ID | 6893 | CWVAL | 0 | CSEX | MSA | RPRO | OK/OPEN |
| PEN | 1 | PGVAL | 0 | 305ME | 28440 | DSLH | 0 |
| LACT | 3 | PSCC | 0 | PMILK | 0 | DCC | 0 |
| DIM | 31 | SCC | 174 | MILK | 122 | DUE | - |
| 01/10/15 | FRESH | | Bull Live | | 01/23/15 | MAST | NOT0RF.1 |
| 01/12/15 | MOVE | F008T010 | | | 01/23/15 | MOVE | F010T001 |
| 01/12/15 | MAST | SLC4RF. | | | 01/28/15 | VACC | J5VAC |
| 01/18/15 | MOVE | F010T008 | | | 02/04/15 | VACC | FRSVAC |
| 01/22/15 | CULTURE | LABA/RF | | | | | |

When Cow Entered

| Events | Items1 | Items2 | TestDays | PrevLacts | Lactation | | |
|----------|---------|----------|-----------|-----------|-----------|------|----------|
| ID | 6893 | CWVAL | 0 | CSEX | MSA | RPRO | OK/OPEN |
| PEN | 1 | PGVAL | 0 | 305ME | 28440 | DSLH | 0 |
| LACT | 3 | PSCC | 0 | PMILK | 0 | DCC | 0 |
| DIM | 31 | SCC | 174 | MILK | 122 | DUE | - |
| 01/10/15 | FRESH | | Bull Live | | 01/23/15 | MAST | NOT0RF.1 |
| 01/12/15 | MOVE | F008T010 | | | 01/23/15 | MOVE | F010T001 |
| 01/12/15 | MAST | SLC4RF. | | | 01/28/15 | VACC | J5VAC |
| 01/18/15 | MOVE | F010T008 | | | 02/04/15 | VACC | FRSVAC |
| 01/22/15 | CULTURE | L/RF | | | | | |

When Sample at Lab

| Events | Items1 | Items2 | TestDays | PrevLacts | Lactation | | |
|----------|---------|----------|-----------|-----------|-----------|------|----------|
| ID | 6893 | CWVAL | 0 | CSEX | MSA | RPRO | OK/OPEN |
| PEN | 1 | PGVAL | 0 | 305ME | 28440 | DSLH | 0 |
| LACT | 3 | PSCC | 0 | PMILK | 0 | DCC | 0 |
| DIM | 31 | SCC | 174 | MILK | 122 | DUE | - |
| 01/10/15 | FRESH | | Bull Live | | 01/23/15 | MAST | NOT0RF.1 |
| 01/12/15 | MOVE | F008T010 | | | 01/23/15 | MOVE | F010T001 |
| 01/12/15 | MAST | SLC4RF. | | | 01/28/15 | VACC | J5VAC |
| 01/18/15 | MOVE | F010T008 | | | 02/04/15 | VACC | FRSVAC |
| 01/22/15 | CULTURE | N/RF | | | | | |

24 Hour Results



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Review MAST treatment protocols - DVM

- When was the last time that you reviewed your MAST treatment protocols?
- How many farms have a MAST no treat protocol?

Farm:
Pathogen
Based Dairy
Vet: Dr. T.
Date:

Clinical Mastitis Cow

Move to Hospital Pen (Pen 11)
Take culture of affected quarter for clinical mastitis cow
Use STRIP command (clinical quarters)
Treat systemically as needed (Use SYSMAST event and protocols)
Wait for culture result before intramammary treatment

- MAST Protocols needed (DC 305 #)
- Spectramast 1X for 3 days (#14)
 - Spectramast 1X for 5 days (#22)
 - Pirsue 1X for 7 days (#54)
 - No treat for 5 days (#7)

If 24 hr culture result is C, D, F, G, or S

Treat with Spectramast in affected quarter once daily for 3 days (Protocol #14)

If 24 hr culture result is U

Treat with Spectramast in affected quarter once daily for 5 days (Protocol #22)

If 24 hr culture result is R

If cow is Lactation 1 or 2 then Treat with Pirsue in affected quarter once daily for 7 days. (Protocol #54) If Lact 3 or greater then No Treat MAST event (Protocol #7)

If culture result is A, M, or H

Check meat withholding date and cull cow??? (No Treat MAST event, Protocol #7)

Any other culture result

No intramammary treatment (No Treat MAST event, Protocol #7)

All clinical mastitis quarter samples and high SCC cow quarter samples will get an individual aerobic and pooled mycoplasma culture (V). All fresh cow composite samples will be pooled for mycoplasma (P).
Fresh Cow composite samples are entered into DC 305 using CULTURE command

* If multiple high CMT quarters, sample each quarter individually and enter as two separate culture events.



Pathogen based treatment at QMPS

- > 100,000 cows in NY state on PBT
 - Where was this number 5 or 10 years ago?
 - Where will this number be 5 or 10 years from now?
 - Approximately 35% of cows managed with On-farm culture
- NY state most likely has the highest adoption rate of PBT than any other state given the ability of QMPS to promote the program state wide
- NY State Dairy Statistics
 - ~ 4,000 farms
 - ~ 623,000 cows





Dry cow therapy

- 2014 NAHMS, USDA survey indicated that 93% of cows undergo dry treatment
 - 9.39 million dairy cows in US – 2017
 - 4 tubes/cow
 - Blanket treatment of all cows to control contagious mastitis
 - 35,000,000 dry tubes
- What about selective dry cow therapy?
 - Does every quarter of every cow need to be treated with intramammary antimicrobials at dry off?



Selective dry cow therapy (SDCT)

- Articles in press over past couple of years on SDCT
- Since 2012 no preventive antimicrobials allowed in Netherlands
 - Bulk tank SCC 170,000 country wide
 - Reduced antimicrobial usage by 28%
- New Zealand Veterinary Association states by 2020 only cows with an existing intramammary infection at dry off can be treated
- Strep ag and Staph aureus smaller issue today
- From 70 – 95% of cows are culture negative at dry off



SDCT

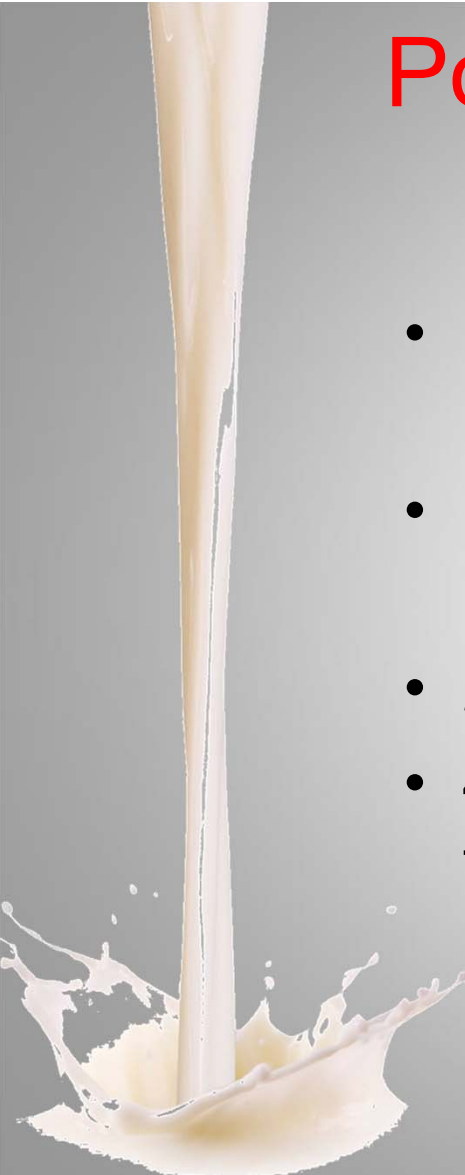
- An approach abolishing the dry treatment of all animals is not suggested
 - There are animals that will benefit from intramammary antimicrobials and these animals should be dry treated
- How do we identify which animals to treat and not treat at dry off?
 - Quarter level culture
 - Treat quarters that were culture positive
 - Reduced antimicrobial usage by 28%
 - Patel, Gordon et al 2017
 - SCC data
 - SCC < 200,000 cells/ml on last three tests no treat
 - 53% of cows low risk
 - » Rajala-Schultz/Ruegg
 - Use of on-farm data and test day
 - <200,000 cells/ml at last test
 - Average of last three test days < 200,000 cells/ml
 - ≤ 1 clinical case of mastitis during lactation
 - No current symptoms of mastitis
 - No mastitis in last 30 days
 - 64% of cows low risk
 - » Vasquez et al. 2018



SDCT

- Slow adoption of SDCT
- Farms are working closely with veterinarians
 - Superior milk quality should be achieved prior to taking on SDCT
 - Using multiple criteria to determine if cow is eligible for no treat may be beneficial
 - Error on the side of treating a few more versus not treating cows that should be treated





Potential antimicrobial reduction with prudent methods

- 30 – 65% no treat with PBT
 - Stop treating negatives to full implementation of PBT
- 50 – 65% no treat with SDCT
 - Use farm records to determine who to treat and not treat
- 20% of dairy operation antimicrobial use for mastitis
- 40% of dairy operation antimicrobial use for dry treatment
 - Potential to reduce antimicrobial usage by 30 – 50 %
 - Not reduction but prudent use



What if...?

- What would happen if antimicrobials were banned for use in food-producing animals?
 - Inhumane? - YES
 - We don't want to find out
- What can we do to promote prudent or efficacious use of antimicrobials in the dairy industry and the food-producing animal industries?



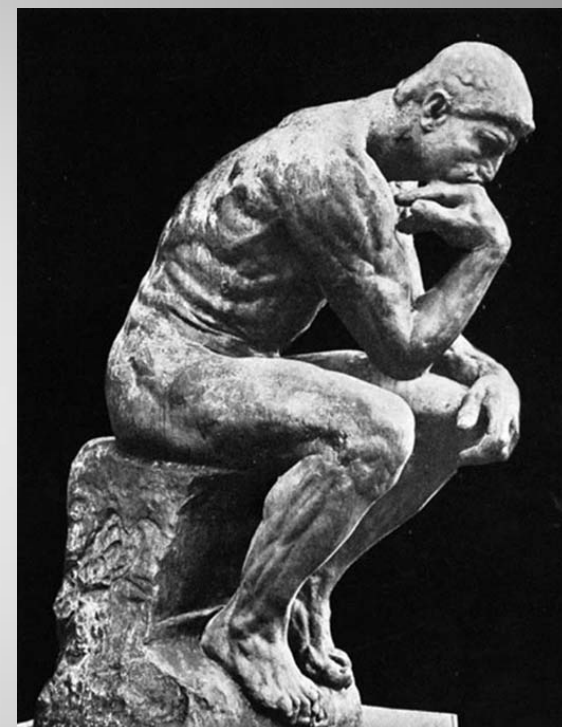
Maryland SB471

- Prohibiting the administration of a medically important antimicrobial drug in feed or water to cattle, swine, or poultry unless ordered by a licensed veterinarian through a certain prescription or a veterinary feed directive; exempting dairy cattle on a farm operation with a herd size of fewer than 300 dairy cattle; requiring the Department of Agriculture, by January 1, 2021, to adopt regulations prohibiting the routine administration of a medically important antimicrobial drug to dairy cattle entering a dry cycle except in certain cases; etc.
 - blanket dry cow treatment will be banned under this new legislation for dairy farms with over 300 head of cattle beginning January 1, 2021.



Discussion

- Antimicrobials are necessary for humane treatment of animals
- Two pronged **science based** approach to **prudent** use of antimicrobials
 - PBT
 - SDCT
- Pathogen based treatment
 - No increase in SCC, New and Chronic Infection rates at farms using PBT
 - No increase in chronic MAST at farms using PBT
- Internationally antimicrobial usage has decreased with no negative impact on animal health



Quality Milk
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