

14th ANNUAL NORTHEAST OHIO REGIONAL DAIRY CONFERENCE



“The Hows & Whys of Quality Milk”

Speakers - Dr. Pamela Ruegg & Ken Vorgert

February 20, 2013

Buckeye Event Center
Dalton, Ohio



**Presented by the Dairy Veterinarians of the
Killbuck Valley Veterinary Medical Association**



Killbuck Valley Veterinary Medical Association

President: William Yost, D.V.M.

Treasurer: Carlton Schlatter, D.V.M.

The Killbuck Valley Veterinary Medical Association is an association of veterinarians in private practice, teaching, research, and industry in the geographic area surrounding the path of Killbuck Creek. The association is affiliated with the Ohio Veterinary Medical Association at the state level, and includes veterinarians primarily in OVMA District 8; we also include some veterinarians from District 7 to the north and District 4 to the west.

The purposes of the Killbuck Valley VMA are to provide professional continuing education to our membership, provide a conduit for the membership to communicate with the OVMA, and provide public service as needed to our geographic area and local communities as our professional expertise allows.

Our annual dairy producer meeting is made possible with the generous support of local businesses and is a public service of our group, recognizing the importance of the dairy industry in our local geographic area as well as the state of Ohio in general. By our continued support of this type of educational meeting for Ohio dairy industry personnel, we of the KVVMA are striving to maintain and expand this important industry, insure the continued production of dairy products of the highest quality, and improve and protect the well-being of the dairy cow herself.

We welcome you to our 2013 meeting. We hope you find the meeting educational and stimulating.

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**February 20, 2013
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Dalton, Ohio**

“The Hows & Whys of Quality Milk”

SCHEDULE

9:00-9:55 AM	Registration, Continental Breakfast, Visit Exhibits
9:55-10:00 AM	Welcome, Opening Remarks, Introductions - William Yost, D.V.M./ KVVMA President
10:00-10:45 AM	Dr. Pamela Ruegg - <i>“Making great milk - strategies for keeping your bulk tank low”</i>
10:45-11:15 AM	Break & Visit Exhibits
11:15-12:00 PM	Dr. Pamela Ruegg - <i>“The great milk discussion continues...”</i>
12:00-1:15 PM	Lunch (provided) & Visit Exhibits
1:15-1:30 PM	Scott Higgins - <i>“Dairy Promotion Check-Off update”</i>
1:30-2:15 PM	Ken Vorgert - <i>“Somatic cells and the effect on dairy products”</i>
2:15-2:45 PM	Break & Visit Exhibits
2:45-3:30 PM	Dr. Pamela Ruegg - <i>“Managing people and cows to minimize mastitis”</i>
3:30 PM	Adjourn

SPEAKERS

Dr. Pamela Ruegg

Dr. Pamela Ruegg is a professor and extension milk quality specialist in the Dept. of Dairy Science at the University of Wisconsin, Madison. She received her undergraduate degree and D.V.M. from Michigan State University and completed a residency in Food Animal Herd Health and Reproductive Management and Masters of Preventive Veterinary Medicine from the University of California - Davis.

Dr. Ruegg is active in a number of industry organizations and is a past-president of the National Mastitis Council. Her extension program is focused on developing programs that help farmers maintain healthy cows, and improving milk quality and safety on dairy farms. She maintains a popular milk quality website, <http://milkquality.wisc.edu> with a goal of providing practical tools and resources to help farmers, consultants and veterinarians.

Among many of the awards she has received, the Wisconsin Veterinary Medical Association named her the Wisconsin Veterinarian of the Year in 2005. Dr. Ruegg enjoys consulting on complex animal health issues on dairy farms and is a frequent speaker at dairy and veterinary conferences in the U.S. and internationally.

Mr. Ken Vorgert

Ken Vorgert has been Chief, Dairy Grading Branch for the USDA since May 2008. He grew up in small towns in central Minnesota where his father managed dairy plants. In 1976, Mr. Vorgert earned a B.S. in Biology with a minor in Chemistry from the University of Minnesota.

He served as a USDA fee and resident grader working in butter, dry milk powder and cheese plants. Mr. Vorgert has worked as field supervisor, assistant National Field Director, National Director for USDA, Agricultural Marketing Service, Dairy Grading Branch.

Mr. Vorgert is currently the USDA Representative on the National Conference on Interstate Milk Shipments (NCIMS) Executive Board and the Board of Directors for 3A Sanitary Standards Inc.

Ken has served as an expert judge in both World and the United States Cheese Contests.

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The veterinarians of the Killbuck Valley Veterinary Medical Association would like
to thank all of our sponsors for their continued support of this educational
effort for the dairy industry. A strong dairy industry is a tremendous asset
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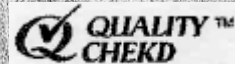
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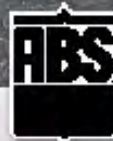
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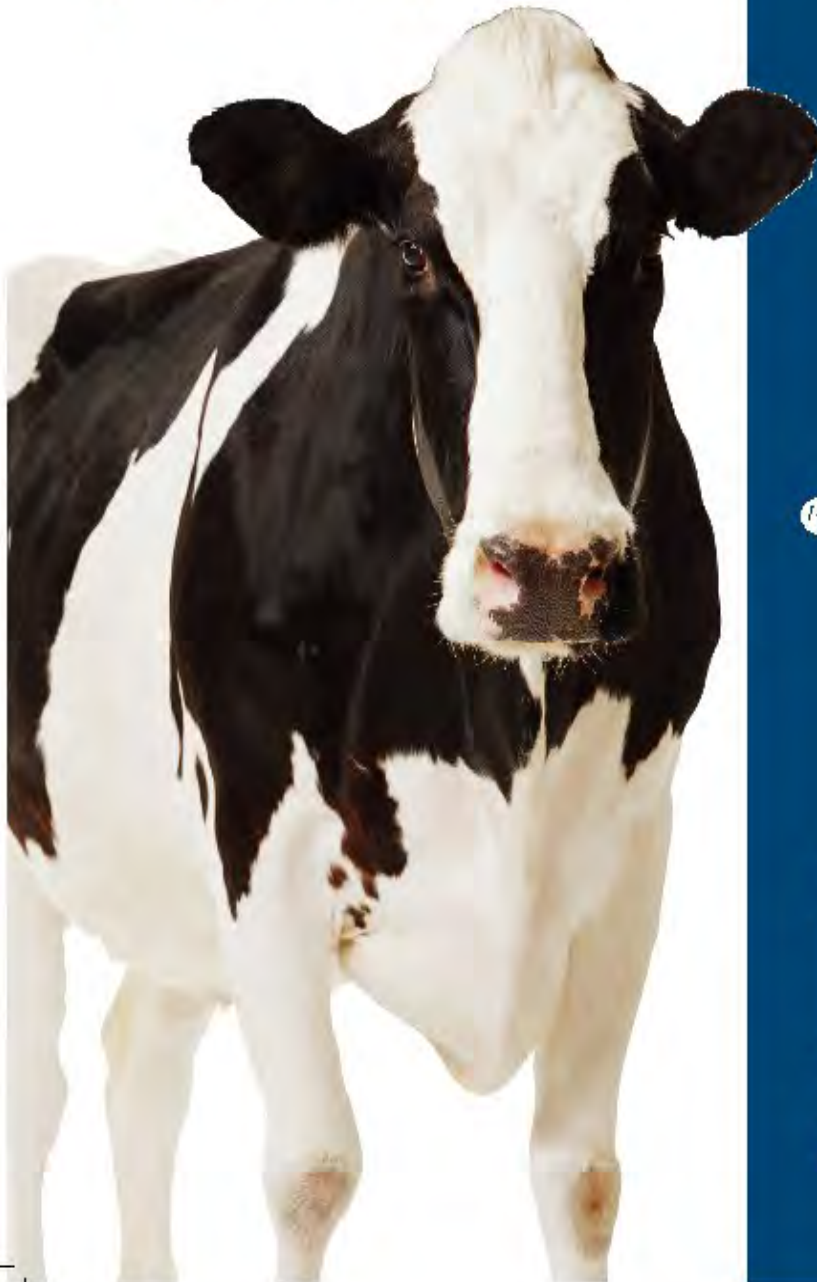
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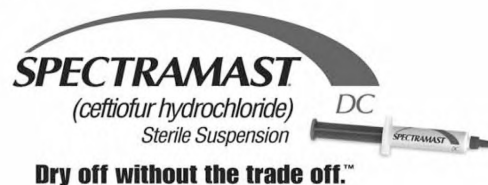


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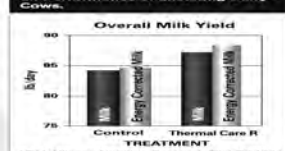
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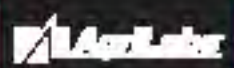
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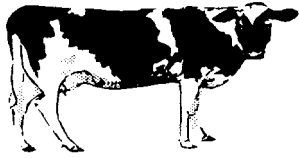
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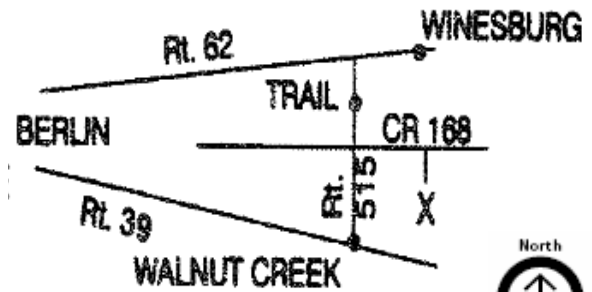


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Making Great Milk – How to Keep your Bulk tank SCC Low




Pamela Ruegg, DVM, MPVM
University of Wisconsin

Understanding & Managing Somatic Cell Counts in Milk



What is Mastitis?

- Bacterial infection of the udder
- 99% occurs when bacterial exposure at teat end exceeds ability of immune defenses of cow
- Subclinical mastitis
 - Milk appears normal but contains excessive numbers of inflammatory cells
 - This milk can be sold for human consumption
- Clinical mastitis
 - Visual abnormalities of milk
 - Cannot be sold for human consumption



Somatic Cells in Milk Indicate the Presence of Cows with Subclinical Mastitis Infections



There is no way to know how many cows are infected without performing an individual cow SCC test



Somatic Cells are NOT Affected by:

- Breed
- Milk yield
 - Unless <15 lbs/day
- Stage of lactation
 - Unless there are more infected cows in later lactation
- Nutritional management
 - Unless diet results in very loose feces and dirtier cows
- Other cow diseases



Somatic Cell Count Are Affected by

- Management practices that expose teats to bacteria that cause mastitis
 - In **milk** that came from infected udders of cows
 - Exposure to contagious bacteria
 - In the **environment** that the cow lives in
 - Exposure to environmental bacteria



Somatic Cells in Milk

- SCC composed of white blood cells & occasional dead epithelial cells
- Macrophages are predominant cell in uninfected gland
 - Provide surveillance & initiate inflammatory response
- 90% of SCC in infected gland are neutrophils

Distribution of Cells in Normal Milk

How Somatic Cells Get into Milk

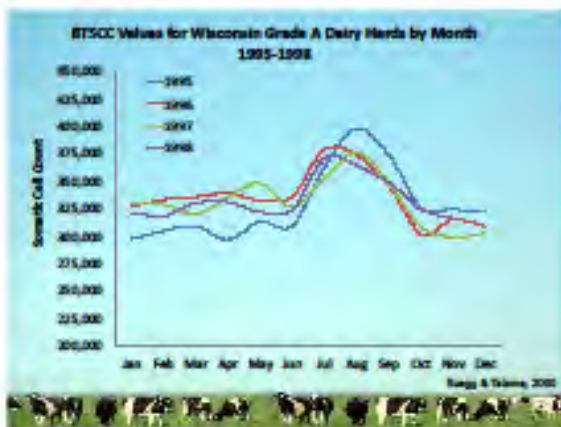
Adapted from Smith & Murray, *Art. Cells, Impl. Tissue, 2002*

SCC and Product Quality

- Injury to secretory cells reduces synthesis of lactose, fat & protein
- Increased permeability of cell membranes allows leakage of blood components into milk
- Reduced shelf life

Somatic Cell Count (x1000)





Bulk Tank versus Individual Cow SCC

- BTSCC measures the combined SCC of milk put in the tank
- Easily manipulated
 - Withholding of quarters
 - Detection of clinicals
 - Use or lack of use of foremilk
- Individual cow SCC values are **REQUIRED** for solving herd mastitis problems

Evaluating Herd Problems Prevalence of Infection

Cow	SCC (x1000)	Milk (lbs)	WT.SCC Average
1	100	50	5000
2	100	50	5000
3	100	50	5000
4	100	50	5000
5	100	50	5000
6	100	50	5000
7	100	50	5000
8	100	50	5000
9	100	50	5000
10	3000	150	45000

Estimated BTSCC = 465,000,000 = 465 (x1000) cells/ml

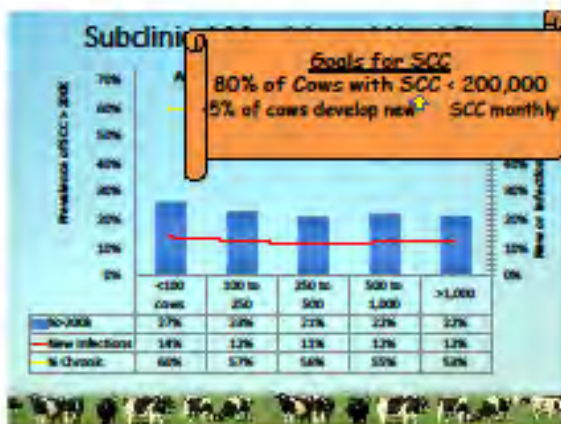
BTSCC = 825,000
Prevalence of Infection is 10%

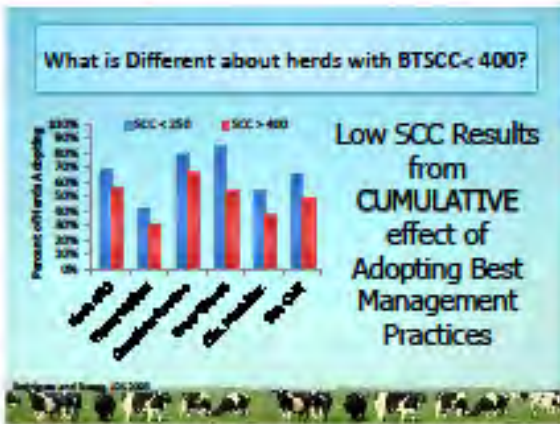
Evaluating Herd Problems Prevalence of Infection

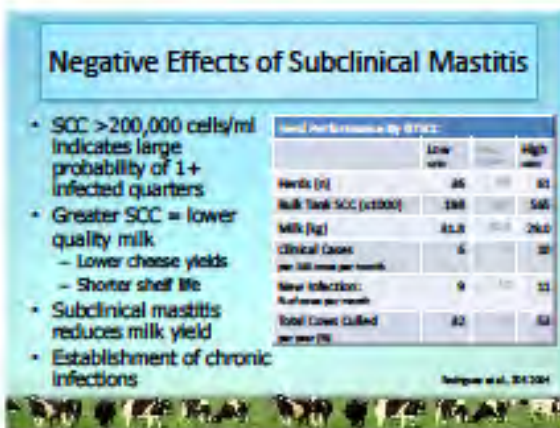
Cow	SCC (x1000)	Milk (lbs)	WT.SCC Average
1	300	50	25,000
2	300	50	25,000
3	300	50	25,000
4	300	50	25,000
5	300	50	25,000
6	300	50	25,000
7	300	50	25,000
8	300	50	25,000
9	300	50	25,000
10	100	150	15,000

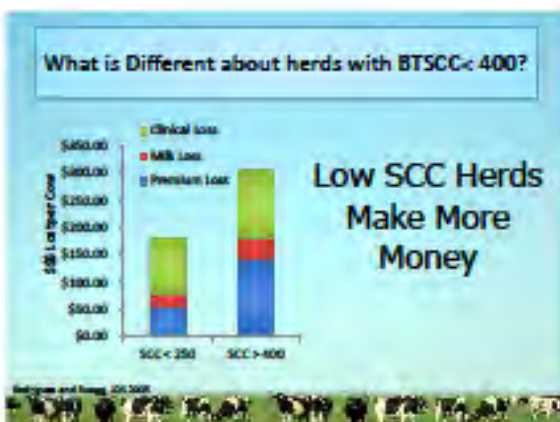
Estimated BTSCC = 240,000,000 = 240 (x1000) cells/ml

BTSCC = 400,000
Prevalence of Infection is 80%









SCC of Milk from Healthy Udders is Low and Consistent

- SCC from uninfected quarters or cows is usually <200,000 cells/ml
- Many cows have SCC <100,000 cells/ml
 - Especially 1st lactation heifers
- Survey of 4,213 bact. negative quarters
 - SCC of 29,000 cells/ml

Cows with SCC >200,000 cells/ml have 1 or more quarters with subclinical mastitis
Heifers should be <100,000

Somatic Cell Count DHIA Thresholds

- Individual cow SCC values are comingled milk from all 4 quarters
- The SCC of a cow with a SINGLE infected quarter may be quite low
 - Causes variation in SCC values

Identification of Subclinical Infections

A history of SCC is more informative than data from 1 or 2 test days

Healthy
New Infection

Mastitis Cannot be Managed without Individual SCC Values for Cows

Causes of Subclinical Mastitis

- Almost any pathogen can cause mastitis
- Ability to cause subclinical mastitis often occurs because of host-adaptation of the bacteria
- Most cases are Gram positive bacteria
- Major pathogens cause greater SCC

Source: B. Nisbet, unpublished

Subclinical Mastitis is Usually Caused by Gram Positive Bacteria

Bacteria From 40 Herds with SCC >250,000; 5672 samples

- Cultured >5600 milk samples from 40 herds with BTSCC >250,000 cells/ml
- Only 1% were Gram negative

Pat B. Nisbet, SDS 2007

Contagious versus Environmental Mastitis

Contagious Mastitis

- Reservoirs: udders
- Exposure is often during milking
- Can be almost completely eradicated


Environmental Mastitis

- Reservoirs: environment
- Exposure is often between milkings
- Cannot be eradicated

Consistently High BTSCC usually indicates Presence of Contagious Pathogens

- Greatest Bulk Tank SCC is usually caused by presence of cows infected with
 - Staph aureus
 - Strep ag
 - Mycoplasma bovis
- Obtained 4 bulk milk samples from each of 126 herds
 - 1 sample every 2 weeks for 2 months
- S aureus & SCC
 - No detections: 253,000
 - 1 of 4 BTM +/-: 244,000
 - 2 of 4 BTM +/-: 327,000
 - 3 of 4 BTM +/-: 361,000
 - 4 of 4 BTM +/-: 488,000

Jeyaro, et al., JDS 2008



Key Contagious Mastitis Control Practices

1. **Effective teat dipping**
 1. 97% of farms dip but many do not dip effectively
2. **Dry cow therapy of all quarters of all cows**
 - To treat subclinical infections present at dry off
3. **Appropriate treatment of clinical cases**
 - Record all cases
 - Monitor outcomes
4. **Culling chronically infected cows**
5. **Regular milking machine maintenance**
 1. Stable teat end vacuum



Reducing BTSCC is Based on Finding Infected Cows and Making Decisions about their Futures



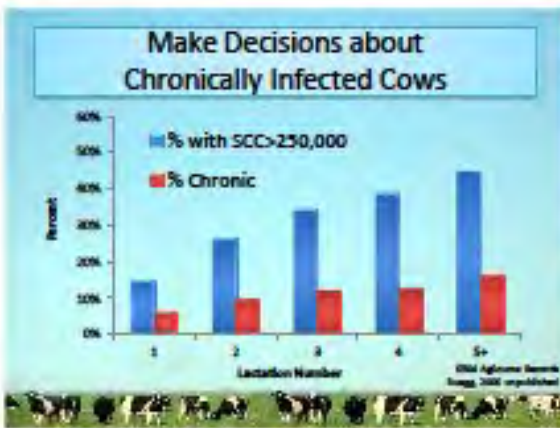
Actions to Reduce BTSCC

1. Identify all infected cows

- Must have individual cow

Chronic Cows List - List of Tests & SCC, 2011											
Cow No.	Year	Parity	Age	Parity	Parity	Parity	Parity	Parity	Parity	Parity	Parity
80	2011	1	1	1	1	1	1	1	1	1	1
81	2011	1	1	1	1	1	1	1	1	1	1
82	2011	1	1	1	1	1	1	1	1	1	1
83	2011	1	1	1	1	1	1	1	1	1	1
84	2011	1	1	1	1	1	1	1	1	1	1
85	2011	1	1	1	1	1	1	1	1	1	1
86	2011	1	1	1	1	1	1	1	1	1	1
87	2011	1	1	1	1	1	1	1	1	1	1
88	2011	1	1	1	1	1	1	1	1	1	1
89	2011	1	1	1	1	1	1	1	1	1	1
90	2011	1	1	1	1	1	1	1	1	1	1
91	2011	1	1	1	1	1	1	1	1	1	1
92	2011	1	1	1	1	1	1	1	1	1	1
93	2011	1	1	1	1	1	1	1	1	1	1
94	2011	1	1	1	1	1	1	1	1	1	1
95	2011	1	1	1	1	1	1	1	1	1	1
96	2011	1	1	1	1	1	1	1	1	1	1
97	2011	1	1	1	1	1	1	1	1	1	1
98	2011	1	1	1	1	1	1	1	1	1	1
99	2011	1	1	1	1	1	1	1	1	1	1
100	2011	1	1	1	1	1	1	1	1	1	1

- longer period
- Gram negative
- shorter period





Treatment of Subclinical Mastitis



- It is almost NEVER cost effective to solve subclinical mastitis problems through treatment during lactation
- EXCEPT for Streptococcus agalactia



Segregation of Chronically Infected Cows

- Spread occurs when healthy udders contact infected milk from chronically infected quarters
- Separate healthy cows from infected cows
 - or use of separate milking equipment
- Must use SCC values to identify infected cows and milk lost



Permanent Dry Off of Selected Quarters

- Chronically infected quarters can be permanently dried off
- Reduced shedding of bacteria from infected glands
 - Decrease exposure and new infection rate
- Reduces shedding of SCC into saleable milk
- Requires veterinary supervision
 - Extralabel drug usage



Isolation of Infected Quarters

- Principle is to reduce cross-contamination of equipment and to reduce SCC of bulk tank milk
- "Quarter Milker" allow collection and discard of high SCC milk from infected quarters
- Quarter milkers do NOT:
 - Cure mastitis
 - Cannot be used to keep antibiotics out of bulk tank
 - Antibiotics spread throughout the whole udder and contaminate all milk
- Must be washed and dried after each milking





Quarter Milking

- A band aid
- Useful to manage bulk tank SCC for short term
 - While implementing long term preventive strategies
- Can be risky
 - Keep infected cows in herd
- Quarter milk
 - Cows with chronic long term infections that are very high producers
 - Mild clinicals that have failed to respond to treatment
 - Single quarter subclinical



Actions to Reduce Bulk Tank SCC

2. Record all clinical cases in Cow Record

- Keep them out of the bulk tank
- Low clinical rate & high BTSCC tells you clinicals are not being detected
- Keep clinical mastitis records for each cow



Actions to Improve BTSCC
3. Cull Some cows

- *Mycoplasma bovis* infection
- Chronic *Staph aureus* infections
- Multiple quarters with recurrent infections
- Cows with more than 3 clinical cases
- Teat end damage
- Older cows with history of chronic mastitis



Actions to Improve BTSCC
4. Identify the points of exposure



Each farm needs a Milk Quality Plan



- It is always more cost effective to prevent mastitis than to treat mastitis
- The development of a chronic cow is an indication of failure
 - Prevention
 - Detection
 - Treatment



Typical Strategy for Reducing BTSCC

- Perform **bulk tank cultures** to look for
 - Staph aureus
 - Strep ag
 - Mycoplasma bovis
- Review monthly **individual cow SCC**
 - ID all cows with SCC > 200,000 cells/ml
 - ID cows with chronically high SCC
- **Culture 1/4 samples** obtained from CMT+ quarters of cows with SCC > 200,000
 - At least 25 cows
- **Review clinical mastitis records**
 - ID chronic cows
- **Make a milk quality plan** based on the data





Solving Mastitis Problems

- Technically easy
 - Keep bacteria away from teats
- Find the infected cows
 - Decide what to do with them
 - Treat them or EMT them
- Determine why they get infected
 - What is the source of infection
 - Other cows or environment?
- Decide how to stop new infections
 - What management changes need to occur?



Solving Herd SCC Problems is Hard to Do Alone

- Identify a farm management team of advisors to help solve the problem
- Have a monthly meeting of the advisors to focus specifically on SCC
- Develop
 - Goals for SCC
 - Actions & ways to assess the actions
 - Responsibilities for each team member
 - Target Dates to complete the actions
 - Times to meet to evaluate progress



- Bulk tank somatic cell count limits will be falling
- Herds can achieve improved BTSCC by adopting recommended best management practices
- Key to Improved BTSCC is to
 - Know which cows are infected with subclinical mastitis
 - Prevent new infections
 - Work with a team to implement change





THANKS!

NOTES

Somatic Cells and Their Effect on Dairy Products

Kilbuck Valley Veterinary Medical
Association, Dalton, GA
February 29, 2013





- Production
- Quality
- Marketing



Production

- Cheese making
 - Coagulation time
 - Yield



Production

- 1,000,000 Pounds of milk a day
- Current cheese price about \$2
- Current yield 95,000 lbs. of cheese per day
- Lower SCC count under 100,000
- Increase yield to about 96,000 lbs. per day
- Increased return \$2,000 per day



Quality

- Fluid Milk
 - Shelf life extensions
- Cheese
 - Flavor development
 - Body defects



Quality

- Butter and Cream Cheese
 - Flavor
- Cottage Cheese and Yogurt
 - Flavor
 - Functional characteristics
 - Reduced yields
- Nonfat dry milk
 - Functional characteristics



Marketing

- International Certification



Marketing

- Certification services are provided to assist in the export of dairy and related products
- The Dairy Grading and Standards Branches of AMS work with other government agencies and dairy trade associations to resolve issues and provide a frame work that will open foreign markets to U.S. dairy products



Marketing

- In 2012 the Dairy Grading Branch issued 26,500 certificates to over 100 countries
- U.S. exports in 2011
 - 70% of lactose
 - 8% of butter
 - 67% of dry whey
 - 49% of nonfat dry milk
 - 4.7% of cheese



EU Export Certification

EU REQUIREMENTS

- 400,000 Somatic cells
- 100,000 Bacteria

US REQUIREMENTS

- 750,000 Somatic cells
- Grade A Milk - 100,000 Bacteria
- Grade B Milk - 500,000 Bacteria



EU Export Certification

- New requirements began on January 1, 2012
- The new compliance program applies only to companies that are manufacturing products for export to the EU
- Program provide a level of flexibility (derogation) for farms that exceed the EU requirements.



EU Export Certification

- Grade B farms must be tested at least 2 times a month for Standard Plate Count (SPC)
- Rolling mean over a two month period
- Rolling mean must be in compliance with EU requirements (100,000 cells per ml)



EU Export Certification

- All farms must be tested once a month for Somatic Cell Count (SCC)
- Rolling mean over a three month period
- Rolling mean must be in compliance with EU requirements



EU Export Certification

- Milk supplier must provide a Certificate of Conformance (COC) to allow AMS to link the raw milk to the finished product.
- Milk supplier must notify AMS when milk in products that are certified for export to the EU exceeds EU requirements.



EU Export Certification


Month	Months for which the milk must be used for SCC	Amount of milk that must be used for SCC	Notes
April 2013	Jan, Feb, Mar	> 500,000	Milk used for export in Apr. (4th month)
May	Feb, Mar, Apr	> 500,000	Milk used for export in May (5th month)
June	Mar, Apr, May	> 500,000	Milk used for export in June (6th month)
July	Apr, May, Jun	> 500,000	Milk used for export in July. Milk suppliers must complete registration, obtain certification or export derogation.



EU Export Certification

- Derogation - A deviation under special circumstances
- Seasonal Derogation - Farm is normally in compliance but due to seasonal circumstances goes out of compliance
- Milk supplier must make request
- Approval process may take up to 5 days





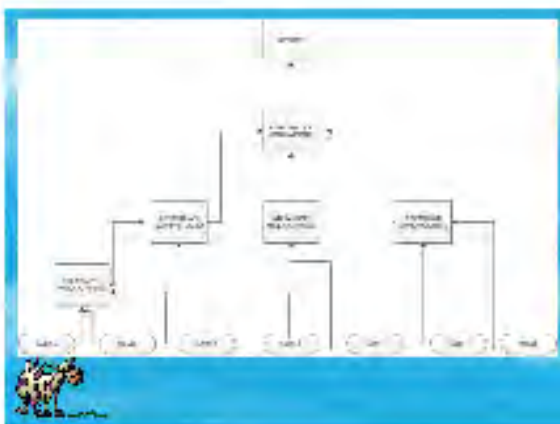
The screenshot shows a software interface with a table. The table has columns for 'Date', 'Milk Volume', and 'Milk Quality'. There are several rows of data, some with red bars indicating values. The interface also includes some text and buttons at the bottom.



EU Export Certification

- Fees and follow-up
 - For each derogation AMS will charge an administrative fee of 2 hours (Current hourly rate is \$68 for a total of \$136)
 - Records review
 - Each year AMS reviews each exporter and sends the milk products back to the raw milk.






Marketing



- Exports
 - Quality
- Domestically
 - Markets







The... believe there's a cow in the milk.



- Ken Vorgert
- Ken.Vorgert@ams.usda.gov
- Phone: 630-437-5037
- Cell: 630-204-0297



AMS Dairy Website

[http://www.ams.usda.gov/
AMSV1.0/DairyLandingPage](http://www.ams.usda.gov/AMSV1.0/DairyLandingPage)





NOTES





What is Mastitis?

- Bacterial infection of the udder
- 99% occur when bacterial exposure at teat end exceeds ability of immune defenses of cow



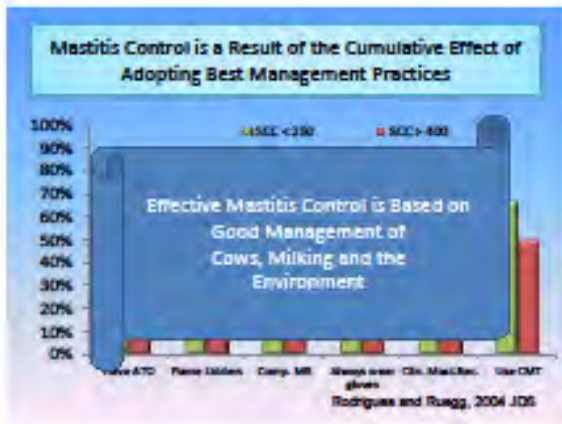
Contagious versus Environmental Mastitis

Contagious Mastitis

Environmental Mastitis

- Reservoir is udders
- Exposure is often during milking
- Can be almost completely eradicated

- Reservoir is environment
- Exposure is often at teat end during milking
- Cannot be eradicated



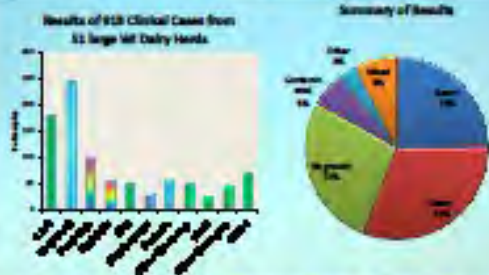
- ### Improving Milk Quality Requires Managerial Skills
- Assess the current situation
 - Develop goals for mastitis
 - Implement & measure actions
 - Assign responsibility
 - Determine results
 - Identify next steps
- Managing for milk quality requires
 - Records
 - Data
 - Regular planned time for managing
 - We must have effective monitoring systems in order to effectively manage mastitis
-



Monitoring Udder Health

- What is the current status?
 - How much mastitis is occurring?
 - Clinical mastitis
 - Subclinical mastitis
- Monitoring preventive strategies
 - Does cow housing result in clean, dry teats?
 - Is the Milking process effective?

Environmental Pathogens Cause Most Cases of Clinical Mastitis on Many Farms





Management Questions

- What is the incidence (rate of new cases) of clinical mastitis?
- What proportion of cases are severe (severity score ≥ 2)?
- What are the most common bacteria that are causing clinical mastitis?
- What are the current treatment protocols?
- How many days is milk discarded as a result of treatment?
- How many cases:
 - a) require changes to the original treatment protocol
 - b) experience recurrence of the case within the same lactation?
- What percent of lactating cows are being milked on less than 4 quarters?
- What percent of cows that experience clinical mastitis are culled in the same lactation or die?

Suggested Indices for Monitoring Clinical Mastitis

- Qualifying Statements
 - Most accurate assessments are at the \ddagger level
 - Farms don't make most decisions at the \ddagger level
 - Monitoring at the COW level is easier
 - often more associated with actual farm decision making
 - Appropriate time period will vary depending on herd size
- The most useful data is data that will be used for decision

Key Performance Indicators

Indicator	Calculation (numerator/denominator)	Goal
Incidence rate	Number 1 st cases/average # cows	<25 cases/300 cows/year
Proportion cases with treatment changes	Number cases with initial protocol changes or supplements/cases detected	<20% of cases
Proportion of cases that are recurrent	Number 2 nd cases (after 30 days)/number of 1 st cases	<10% of cases
Proportion of cases scored 3 (severe)	Number of score 3/number of total cases	5-20% of all cases
Proportion of cases that result in death	Number of mastitis cases that die/total number cases	2%
Proportion of cows with >1 quarter affected	Number of cases with 2+ quarters/total number of cases	<20%
Number of days milk discarded per case	Sum number of discard days/total number of cases	Depends on IR protocol
Percent of herd milking with >4 quarters	Number cows milking with >4 quarters/number of lactating cows	<5%


Monitoring & Managing Subclinical Mastitis

- Many mastitis pathogens remain subclinical for long periods of time
- Clinical episodes are the tip of the mastitis iceberg
- The prevalence of subclinical mastitis is a function of:
 - New Infections**
 - Characterized current situation
 - Duration of Infection**
 - Influenced by treatment, culling and spontaneous

Developed mastitis after October 2010

	YES	NO	
High SCC in October	188 (4.7%)	372	460
NO	204 (3.8%)	3443	3647
	452	3444	3896 Cows

Pariza & Pongrácz, 4th Int'l Conf. on Mastitis, 2011



Management Questions for Subclinical Mastitis

- What is the prevalence of cows with subclinical mastitis?
- What is the incidence of subclinical mastitis?
- What are the most common bacteria recovered from cows with SCC values >200,000 cells/ml?
- What proportion of subclinical cases are chronic (persist more than 2 months)?
- What is the prevalence of subclinical mastitis by days in milk and parity?
- What proportion of cows have subclinical mastitis at the first DHIA test (first month in calving)?



Key Performance Indicators

Indicator	Calculation <small>(numerator/denominator)</small>	Goal
Prevalence (proportion of currently affected)	Number of cows with SCC>200,000 cells/ml/number of cows with SCC	<15% of lactating cows
Incidence (new infections)	Number of cows with SCC>200,000cells/ml for the first time in the time period/number of cows with SCC below 200,000 in previous time period	<5% if determined based on 1 st SCC>200k in the lactation up to 8% if based on month to month changes in SCC
Prevalence at 1 st DHIA test	Number of cows with SCC>200,000 cells/ml at 1 st monthly test/number of cows with 1 st SCC tests	<5% of 1 st lactation <10% of lactation 2+
Prevalence at last DHIA test before dry off	Number of cows with SCC>200,000 cells/ml at last test before dry off/number of cows with last DHIA test	<10% of cows with last test date SCC

Managing Milking

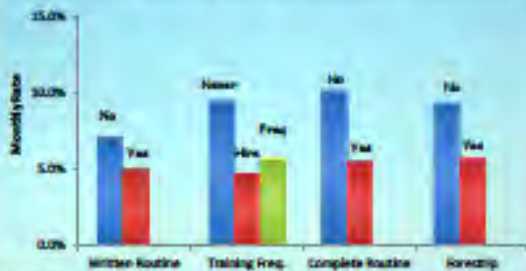


Milking Technicians Must Be Trained

- Data from 101 WI farms
 - 377 cows per herd
 - SCC = 335,000 cells/ml
- High adoption of best management practices
 - 89% milkers always wear gloves
 - 97% always postdip
 - 98% always predip
 - 89% always forestrip
- Training was rare
 - Frequent: 22%
 - At hiring: 49%
 - Never: 29%
- Only 41% had written milking routine
- WI stall barns (n = 78)
 - 86 cows per herd
 - 54% never train milkers



Influence of Training & Routine Monthly Rate of Clinical Mastitis



Essential Aspects of Milking Routines

- Predipping**
 - Reduces bacterial exposure 5-6X
- Forestripping**
 - Only method to find mild clinical mastitis
- Adequate drying of teats**
 - One dry towel per cow
- Timely Attachment**
 - 1-2 minutes after stimulation
- Effective post-milking teat disinfection**
 - 75% of teat skin covered with GOOD commercial teat dip



Measuring Milking Performance

Item	Indicator	Suggested goal
Milking Machine	Average claw vacuum	45-42 kPa
	Maximum claw vacuum fluctuation	< 20 kPa
	Average milk flow	2.5-4.0 kg/min
	Use of manual mode of milking (when automatic detachers are used)	< 5% of milking
Milking Personnel	% of phase of the pulsation cycle	At least 150-200 ms
	Pre-milking teat dip contact time	30 seconds before dry off
	Prep-leg time (time from stimulation to milking unit attachment)	60 to 120 seconds
	Milking unit attachment time	4 to 8 minutes (depending on milk production)
	% of teats with at least 75% coverage with pre-milking teat dip	> 90%

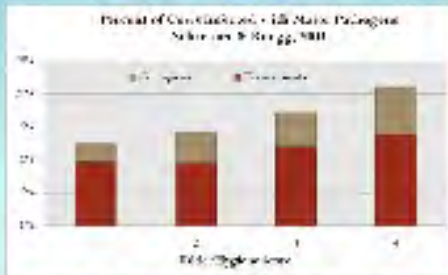
Assessing the Environment

- Animal cleanliness is related to a number of factors
 - Size of animal
 - Conformation
 - Udder & legs
 - Fit to stall
 - Fear of humans
- The most critical areas to keep clean are the udder & lower legs

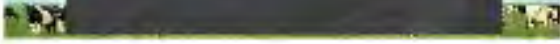




Relationship between Udder Hygiene and Intramammary Infection



Managing the Environment



Some Problems Seem Obvious

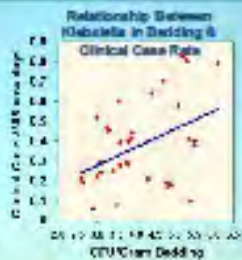


Some Problems are Not Obvious



Exposure to Bacteria in Bedding

- Housing & bedding are the usual source of exposure to environmental bacteria
- Organic bedding
 - more moisture
 - more Gram neg. bacteria
- Rate of clinical mastitis is associated with number of cfu of Gram neg. bacteria



Hogan et al., 1999, JDS 72:250-258



Housing



Freeman et al., J Dairy Sci 2007, 90: 848-852







Factors Influencing Exposure to Mastitis Pathogens

- Housing, handling & nutritional management
- Animal size & conformation
- Premilking cow preparation



Solving Mastitis Problems

- Technically easy
 - Keep bacteria away from teats
- Find the infected cows
 - Decide what to do with them
 - Treat them or EAT them
- Determine why they get infected
 - What is the source of infection
 - Other cows or environment?
- Decide how to stop new infections
 - What management changes need to occur?



Milk Quality Herd Plan

- Each manager should
 - identify a milk quality management team
 - Schedule monthly meetings
- At each meeting
 - Define goals
 - Identify actions to meet goals
 - Select KPI that are relevant to the goals
 - Define time periods to complete tasks
 - Review progress



Take Back to the Barn

- Mastitis should be easy to control
 - Keep Bacteria Away from Teats
- Control of Mastitis is a Result of the Cumulative Effect of many decisions
- Keep cow teats clean
- Reduce exposure to bacteria in housing areas
- Train personnel regularly to
 - Use a complete milking routine & handle cows gently



NOTES

14th Annual Northeast Ohio Regional Dairy Conference

EVALUATION

Please respond by marking numbers 1 through 5 according to the following scale:

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
The Buckeye Event Center is a good venue in which to hold this event.	1	2	3	4	5
The meal was very good.	1	2	3	4	5
The meal was served quickly.	1	2	3	4	5
There is sufficient room for viewing the exhibits.	1	2	3	4	5
There is adequate time allowed for viewing the exhibits.	1	2	3	4	5
There is too much time allowed for viewing the exhibits.	1	2	3	4	5
Dr. Ruegg's presentation was informative and useful.	1	2	3	4	5
Dr. Ruegg's presentation was practical and easy to understand.	1	2	3	4	5
Mr. Vorgert's presentation was informative and useful.	1	2	3	4	5
Mr. Vorgert's presentation was practical and easy to understand.	1	2	3	4	5
I learned at least one new concept today that I will use on my farm.	1	2	3	4	5
I prefer to have two primary speakers for this event.	1	2	3	4	5
I prefer to have only one primary speaker for this event.	1	2	3	4	5

What comments do you have about Buckeye Event Center? _____

What comments do you have about the catering service? _____

What comments do you have about the speakers? _____

Please list any speakers or topics you would you like to see addressed at future meetings: _____

Please list any suggestions you may have for improving this conference: _____

Have you visited our website at www.neodairyconference.org? YES NO

Please check this line if you are an exhibitor.

The members of the Killbuck Valley Veterinary Medical Association thank you for your participation.

