

PRODUCING QUALITY MILK

KESECA VETERINARY CLINIC - SPRING MEETING

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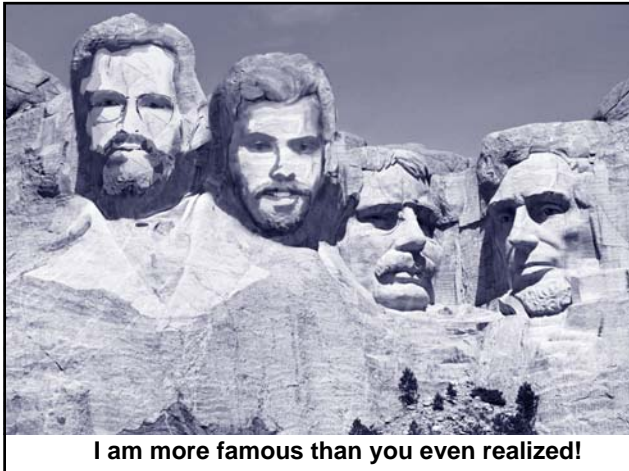
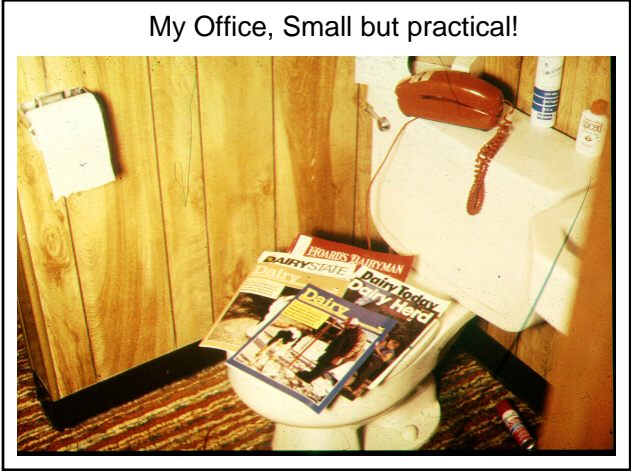
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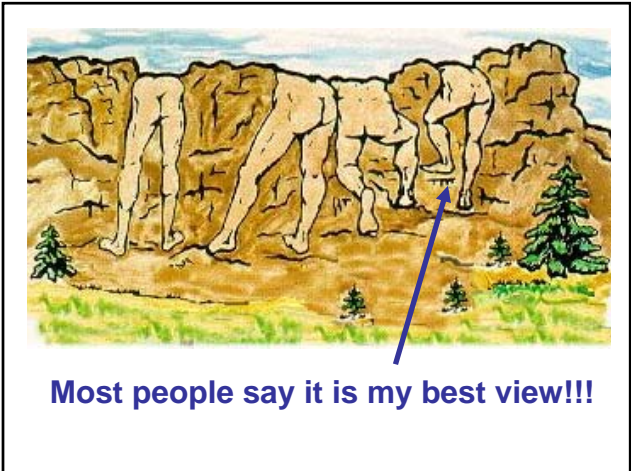
The Udder Doctor

Work on milk quality
in 26 countries and 45 states

Work on herds ranging from
20 cows to over 22,000 cows



I am more famous than you even realized!



Most people say it is my best view!!!



SUNDAY AFTERNOON ON THE DAIRY



Dairy Farmers on Packer Game Day

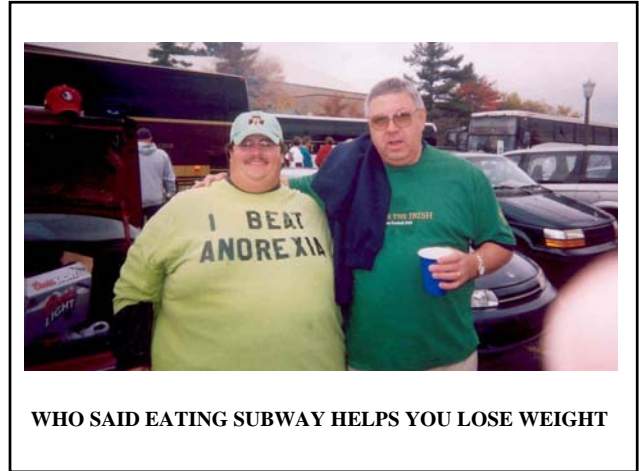
New Symbol for Choking

Old Symbol



New Symbol





WHO SAID EATING SUBWAY HELPS YOU LOSE WEIGHT

The Dairy Industry Is Changing Rapidly

**You Need to Change to
Stay Competitive**

**Those with quality milk
will be competitive!**

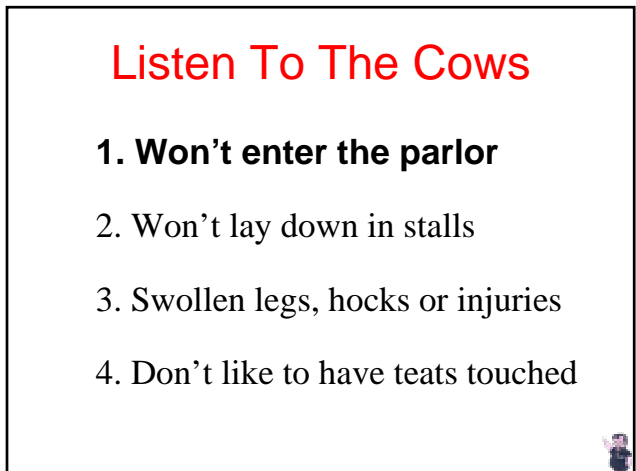
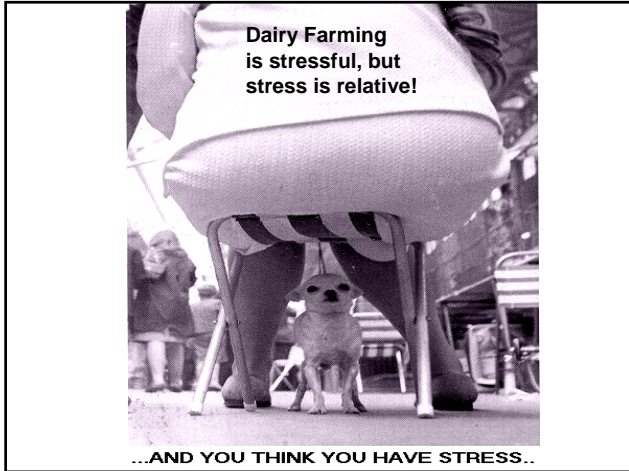


DAIRY FARMING:

**Where else can you work
20 hours a day, 7 days a
week, 365 days a year and
still not make money**

**Milking cows can be
extremely stressful.**







Why Low SCC Is So Important!!

**NOT
EVERY BODY
NEEDS
MILK**



“The dairy industry will either have to keep up with the changing definition of **QUALITY** and ultimately get ahead of it, or get stomped by the stampede of public opinion.”



Dr. Rick Bennett
University of California

Reality

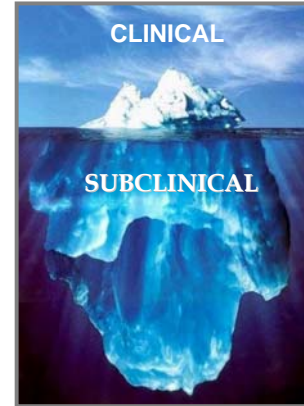
Mean or Average SCC

Countries	cells/ml
Switzerland	112,000
Norway	125,000
Finland	129,000
U.K.	160,000
N.Z.	180,000
West Germany	195,000
Sweden	200,000
Denmark	247,000
East Germany	276,000
Ireland	300,000
Japan	300,000
U.S.	350,000
Israel	382,000



* K.L. Smith, OSU

Clinical Mastitis



It is the subclinical mastitis that robs you blind!

BEST DEFINITION OF MASTITIS :

A DISEASE OF MAN



TRANSMITTED TO

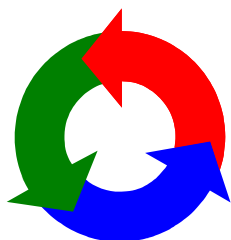


THE COW

Milk Quality:
A World Wide Issue



**Quality is a
Continuous
Improvement
Process**



**QUALITY MILK
IS IMPORTANT
TO ALL FARMS
REGARDLESS OF
HERD SIZE!**

Herd SCC

**Every herd is
capable of producing milk
with an SCC in the bulk tank
less than 150,000**

**Size doesn't matter,
attitude does!!**

REMEMBER

**THE QUALITY OF
THE MILK CAN NOT
BE IMPROVED
ONCE IT LEAVES
THE COW!!!**

What's Happening to SCC's*

U.S. Somatic Cell Counts are getting worse based on 7000 herds with 60 months data

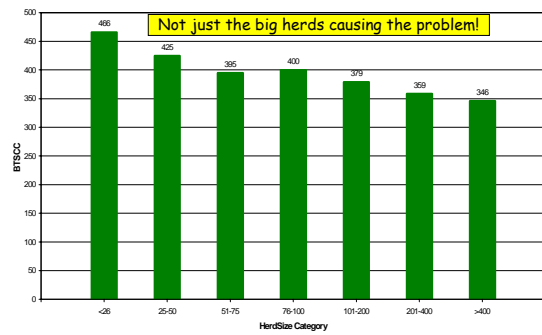
Ott calculates U.S. producers could gain \$1/cwt if they reduced their SCC's below 200,000

- 90% from increased production
- 10% from increased premiums

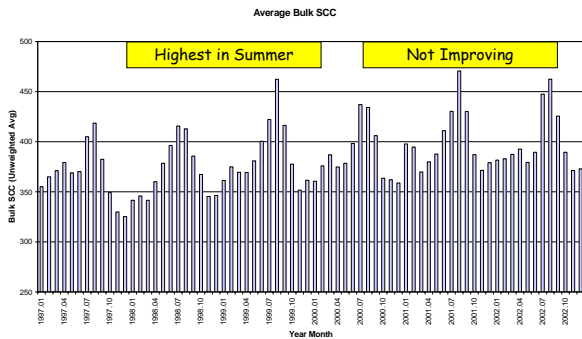
*From Dairy Today's E-Report of February 8, 2002, quoting USDA economist Stephen Ott



DHIA Test Day Averages Bulk Tank SCC by Herd Size - 2002



DHIA SCC Trends Six Years of Bulk Tank Somatic Cell Counts



When It Comes to
Discussions of Milk Quality
and Udder Health -

Is there too much emphasis
on Somatic Cell Counts?



Somatic Cell Counts

- ☞ Certainly the higher the Somatic Cell Count is the lower the expected milk production from the cow (herd)
- ☞ Somatic Cell Counts are a response to damage in the udder (most often caused by bacteria)
- ☞ High S.C.C. follow infection
 - i.e. after the cause
- ☞ More enlighten discussions of mastitis control include cause of infection

Mastitis Economics

**Estimated loss is \$184
per cow per year!**

**That's \$1.7 billion
in USA per year!**

Mastitis Economics

Source of Loss	Loss per cow
Reduced production	\$ 121.00
Discarded milk	\$ 10.45
Replacement Cost	\$ 47.73
Extra Labor	\$ 1.14
Treatment	\$ 7.36
Veterinary Service	\$ 2.72

Mastitis Economics SCC or Linear Score

**Each time SCC or LS is
doubled, there is a decrease in
milk production.**

**220 lbs./year on 1st lactation
440 lbs./year on older cows**

Mastitis Economics

Estimated infection and production loss

Bulk Tank SCC	% qtrs infected	% milk loss
200	6%	2%
500	16%	6%
1000	32%	18%
1500	48%	29%



Economics Of Mastitis Control

Income from field study:

Production per cow (1050 lbs x \$0.12)	\$ + 126.00
Clinical mastitis reduced 40% (\$107 x 40%)	\$ + 42.80
TOTAL RETURN	\$ + 168.80

Annual control costs (cow/year)

Teat Dip	\$ - 10.00
Paper Towels	\$ - 10.00
Dry Cow Treatment	\$ - 5.00
TOTAL COST:	\$ - 25.00

NET RETURN PER COW PER YEAR: \$ + 143.80



GRAPH FOR UDDER HEALTH

Average Milk Loss Per Cow Per Day	Somatic Cell Count (X1000)	Linear Score	Graph your monthly somatic cell from your bulk tank provided to you by your milk plant. If you use DHI/somatic cell count, graph your herd's average count also.
7.5 Lbs.	1600 1400 1200 1000 801	7	<p style="text-align: center;">ILLEGAL TROUBLE WARNING AVERAGE ABOVE AVG EXCELLENT SUPERIOR</p>
6.0 Lbs.	600 401	6	
4.5 Lbs.	400 300 201	5	
3.0 Lbs.	200 150 101	4	
1.5 Lbs.	100 75 51	3	
0.0 Lbs.	50 25 10	2 1	
			Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.



TOTAL HERD MANAGEMENT SERVICES



Linear Score:
Best Indicator of Milk Loss and Economics

Somatic Cell Count:
Best Indicator of Mastitis



Linear Score

Cells	Linear
143,000	3.2
297,000	3.2
186,000	3.4
555,000	3.4
297,000	4.0
804,000	4.0

Linear Score

Herd One

SCC = 297,000 **LS = 4.0**

Herd Two

SCC = 555,000 **LS = 3.4**

Which is the Better Herd?

Linear Score Goal

Change in linear score should be less than 1 throughout entire lactation.

ie: If early lactation average is 2.5, late lactation average should be no greater than 3.5

Utilize DHIA SCC Records

Identify Problem Cows:

- * Chronic Cows
- * Environmental Cows
- * Fresh Cow Mastitis

Utilize Dairy Comp 305 SCC Records To Make Proper Decisions

	PRVLG 4.0		
	110	81	191
NEW	11%	8%	19%
CHRONICS			
LGSCC: 4.0	-----		
UNINFECTED	692	84	776
	72%	9%	81%
	=====		
	802	165	967
	83%	17%	100%

Utilize DHIA SCC Records

HIGH SOMATIC CELL COWS					
MR	LAST	LAST	AGE	% OF	
NO.	DATE	SCC	MO	HERD	
20	26	477	7	4087	18
38	26	467	7	2080	12
39	26	448	8	1887	10
47	26	328	2	2528	8
8	26	328	4	1550	6
19	26	318	3	1388	4
30	26	308	2	888	4
31	26	308	6	1364	3
32	26	308	6	1008	3
33	26	308	6	878	3
35	26	308	2	598	2
36	26	308	6	448	2
10	26	308	8	920	1
10	26	308	8	448	1
10	26	308	8	448	1
44	26	308	8	448	1
44	26	308	8	361	1
44	26	308	8	345	1
37	26	308	2	321	1
41	26	308	6	259	1
42	26	308	8	259	1
42	26	308	8	259	1
34	26	308	2	221	1
34	26	308	2	221	1

Not a herd problem, but a few cows with problems. Use CMT paddle and fine tune

Top 5 SCC cows are 55% total herd SCC

Somatic Cell Counts

15% of the Cows Usually Contribute 65% of the Total Herd Somatic Cell Count

Fine Tune Herd SCC

➡ CMT Paddle



➡ Quarter Milker



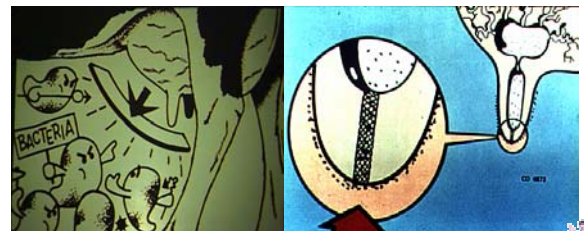
See Immediate Results

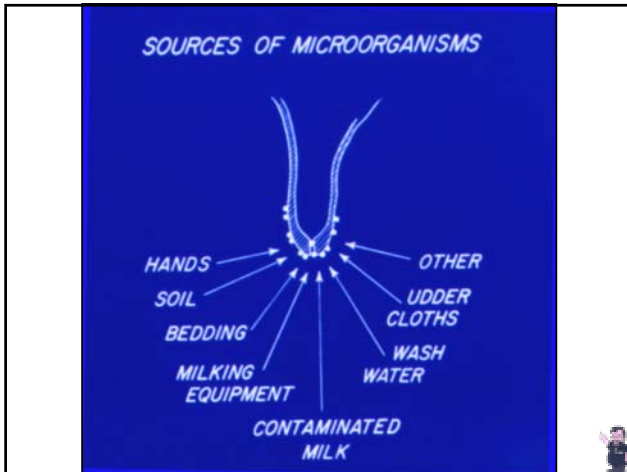


**Somatic Cell Counts
are not Overemphasized!**

**Specific bacterial identification
and epidemiology are
underemphasized!!!**

**The probability of mastitis increases
with increasing germ loads on the teat
ends**





Bacteria Causing Mastitis

- ☞ Gram-positive: Staph. aureus, Staph. species, Streps, Arcanobacterium, etc.
- ☞ Gram-negative: Coliforms (Klebsiella, E. coli, Enterobacter, Pseudomonas, etc.)
- ☞ Mycoplasma

Two Main Bacteria Groups

Gram-positive



Gram-negative



Identifying the Agent(s)

- ☞ Bulk tank culture
 - excellent herd monitoring tool for contagious agents (if performed properly).
 - not always a good predictor of the number of infected quarters within the herd (Staph. aureus and mycoplasma).
 - good monitoring tool for environmental mastitis exposure (if handled properly).
 - Should be performed at least monthly on most herds

**Milk Sample Reflects only
Cows/Quarters Milked into
Tank**

**Shows what was on teat
skin prior to unit attachment**

**Shows what cows are either
exposed to or infected with!**

**Routine Bulk Tank Culturing
and Interpretation**

**Uses mixed culture
microbiology and SCC's to
monitor trends in milk quality
and herd mastitis epidemiology**

**Systematic Bulk Milk
Evaluations Give Insight Into**

- ↻ **Types of mastitis in a herd**
- ↻ **Levels of mastitis in a herd**
- ↻ **Milker practices**
- ↻ **Effectiveness of equipment wash-up**

Bulk Tank Testing Reliability

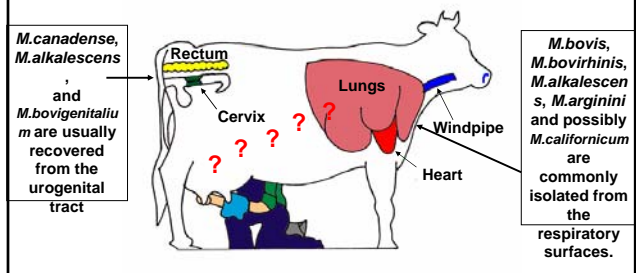
<u>Organism</u>	<u>Single Sample</u>	<u>Three Day Sample</u>
Strep. Ag	70.6%	97.3%
Staph. aureus	59.1%	93.1%
Mycoplasma	33%	70%

Mycoplasma Mastitis in Dairy Herds

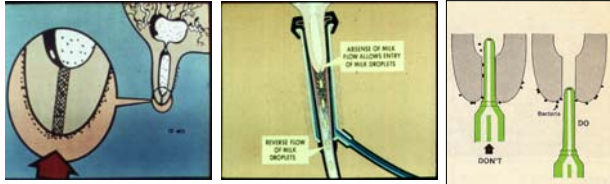
A positive culture for Mycoplasma does not mean she has an udder infection!

Relevant Mycoplasma Epidemiology

Mycoplasma mastitis strains are in every herd



How Mycoplasma gets into teat



?? Occasionally may get to udder via blood??

Milking Fresh Cows



What happens when Mycoplasma enters udder

Variable depending on:

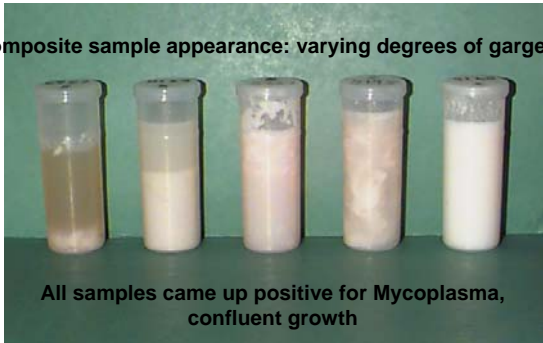
- Strain of Mycoplasma
- Immune status/history
- Level of stress on cow

Outcome varies with cows, herds, seasons

- Some cows go through a short period of abnormal milk, appear to recover
 - Contagious early, 10 to 20 days
 - Contagious later when stressed or calve
- Some cows develop grossly enlarged udders with little or no production
 - Go to beef
 - Become 3 teaters

Typical clinical Mycoplasma secretion

Composite sample appearance: varying degrees of garget



All samples came up positive for Mycoplasma, confluent growth

Typical complaints about Mycoplasma

- ☞ Cow not sick
- ☞ Udder enlarged, spongy, doesn't milk out
- ☞ Does not respond to treatment
- ☞ Spreads to multiple quarters
- ☞ Secretion watery, small, brownish, sandy clots

Unique features of Mycoplasma mastitis

- ☞ Organisms shed in extremely high numbers shortly after infection
- ☞ Totally untouched by antibiotics and can even grow in antibiotic solutions
- ☞ Cows typically stay on feed
- ☞ Can show up in other parts of body, herd

Herd epidemiology in immunologically naïve herds

- ☞ Can have respiratory signs spread through herd
- ☞ Arthritis and joint inflammation
- ☞ Calves fed infected milk can have respiratory condition, arthritis condition, and ear infections with head tilt

What bulk tank monitoring tells us

- ☞ One recently infected cow milked into 1000 cow silo makes it positive
- ☞ Mycoplasma shows up sooner or later in most bulk tanks, persists in problem herds
- ☞ Often no one is suspicious and tank is positive
- ☞ Inconsistent tank isolation common in herds with unmarked 3 teaters and careless milkers
- ☞ Enrichment media and pre-incubating not necessary

Hospital barns

- ☞ Concentrates many pathogens in a small area, i.e. Myco City
- ☞ Mycoplasma literally is in the air and paints all surfaces during an outbreak
- ☞ Hospital barn should not milk fresh cows, non-mastitis sick cows, and mastitis cows, unless extreme hygiene is practiced
- ☞ Need to separate hospital barns ideally

Effective cluster disinfection

- ☞ Commercial blackflush installations do not prevent Mycoplasma spread
- ☞ Internal surfaces must be rinsed clean and effectively sanitized
- ☞ External surface also must be sanitized

Disinfection requires proper germicide, proper pH, proper concentration, removal of soils, adequate contact time

Proper Intramammary Therapy

- ☞ Disposable single service prepared syringes
- ☞ No dilators (non sterile)
- ☞ No re-useable cannulas, forceps, slitters
- ☞ No udder grease
- ☞ Teat dip with 1% iodine
- ☞ Scrub teat end with 4x4 alcohol soaked gauze sponge

Culturing Considerations

- ☞ Know what type(s) of Mycoplasma
- ☞ Collect samples from dry teat ends after scrubbing teat ends with 70% alcohol
- ☞ Takes 3 days to grow for positive, 7 days before negative
- ☞ Requires skilled lab person for reliable results
- ☞ Special media, special incubation

Segregation vs. Culling

- ☞ Cull
 - when a few cows are involved and there is no place to separate
- ☞ Segregate
 - when prevalence rate is significant
 - when segregation facilities exist
- ☞ Beware
 - many Mycoplasma cows appear “normal” after 30 days

Culture Based Mastitis Approach

- ☞ Prevention and control measures will differ depending on pathogens
- ☞ Selection of therapy based on identification of the causative organism
- ☞ Requires a system to quickly and accurately obtain culture results

Take Home Message:

You cannot tell by the appearance of milk and cow what pathogens you are dealing with!

YOU ARE ONLY MAKING A GUESS

Treatment Culturing

- ⌚ Results in 24 hours or less
- ⌚ Treatment more effective
- ⌚ Save dollars

Vet Clinic Culturing

Fine Tunes Treatment Programs
Easy and Economical To Do
Treatments More Successful

- * Gram Positive (Treat quickly)
- * Gram Negative (Supportive)
- * No Antibiotic Therapy (Disaster)

Why Culture?

- ⌚ Reduce animal suffering
- ⌚ Get results more rapidly
- ⌚ Improve how clinical mastitis cases are handled
- ⌚ Implement control programs more rapidly
- ⌚ Reduce antimicrobial agent usage
- ⌚ Increase profits

Who Should Culture?

- ⌚ Any dairies
- ⌚ Those dairies who are experiencing 4-6 mastitis cases per week
- ⌚ Those who have a commitment to culturing clinical mastitis cases, recording results and willingness to make changes
- ⌚ Those dairies who would do enough to feel confident in results interpretation
- ⌚ Monitor milkers – premilking cow prep

Summary

- ↻ Culture of mastitis cases is feasible
- ↻ Culturing may reduce antimicrobial use by 20%-80%
- ↻ Does reduce animal suffering
- ↻ May be used to monitor pre-milking cow preparation

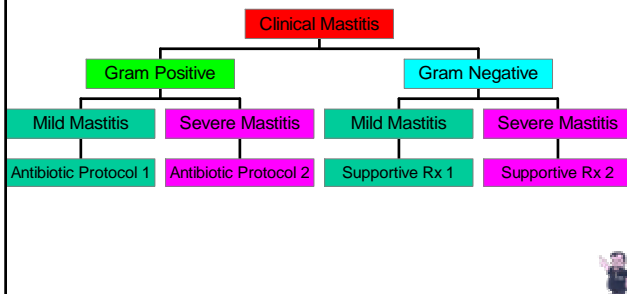
Mastitis Treatments

Research is very clear, gram negative bacteria do not need antibiotic treatment

SUPPORTIVE THERAPY IS CRITICAL

Gram positive bacteria do need therapy early!!!

TREATMENT DECISION TREE



MASTITIS THERAPY

- ↻ From commercial tubes to squeeze jets
- ↻ From antibiotics to no antibiotics
- ↻ From selection of drugs not detected by local milk plant
- ↻ Are we ignoring our responsibility to the dairy industry

TREATMENT DECISIONS

- ⌚ Not an alternative to prevention
- ⌚ A necessary evil for certain bacteria
- ⌚ Must select and use all drugs properly

TREATMENT DECISIONS

- ⌚ Utilize Your Veterinarian's Expertise
 - Best money you will ever spend
- ⌚ Better First Choice Treatment Selection
- ⌚ Less Repeat Treatments
- ⌚ Know which treatment works best

TREATMENT DECISIONS

- ⌚ New infection or repeat infection
- ⌚ Chronic cow
- ⌚ Type of Bacteria
- ⌚ Do Not Treat This Cow
 - If she blows, she goes!

TREATMENT DURATION

- ⌚ Minimum Three Days
- ⌚ Five Days
- ⌚ Seven Days
- ⌚ Until all signs gone

TREATMENT DECISIONS

- ☞ Must know bacteria type
Gram positive or Gram negative
- ☞ Mild or Severe
- ☞ Which treatment To Use
- ☞ Record the Data

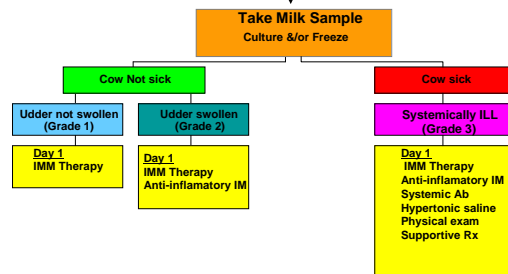
Clinical Mastitis Grading System

- ☞ **Grade 1**
 – Mild (milk only - clots & flakes)
- ☞ **Grade 2**
 – Moderate (milk & udder)
- ☞ **Grade 3**
 – Severe (milk, udder & cow-systemic)

Relative Occurrence of Types of Mastitis

Grade 3 Severe	10%
Grade 2 Moderate	20%
Grade 1 Mild	70%

Clinical Mastitis



Design one or two treatment protocols per grade of mastitis

TREATMENT DECISIONS

- ↻ When to use antibiotics
- ↻ Effective Treatment Records
- ↻ Monitoring Treatment Success
- ↻ Records and Cow Identification

TREATMENT DECISIONS

- ↻ Who is capable of administrating treatments
- ↻ Are there treatment protocols (How too?)
- ↻ Would once a day treatments work better?
- ↻ What is correct for 3X dairies??



Alcohol pads are not a good choice for cleaning teats prior to treatment



Pre-Moistened Towels



- ↻ Use to clean teats prior to treating for mastitis
- ↻ Use to clean teats prior to dry treatment
- ↻ Use to clean teats prior to culturing
- ↻ Use to clean gloves after milking infected cows

On Farm Culturing



So where is the best place to start to improve milk quality?

Implement the Mastitis Triangle

- ≈ Great Milking Procedures
- ≈ Clean, Dry, and Comfortable
- ≈ Proper Functioning Equipment

Biggest Challenge in Mastitis Control

Fine Tune Milking Practices



This Presentation Covers
The Milking Routine,
HOWEVER

**TO PRODUCE QUALITY MILK
DON'T FORGET YOU**

MUST HAVE A PROPER FUNCTIONING MILKING MACHINE

AND

MUST KEEP COWS IN A CLEAN AND DRY ENVIRONMENT

Milking Routines:

Important to:

Tie Stall/Stanchion Barns
Parlors
Flat Barn Parlors

Consistent Milking Routine (Stanchion/Tie Stall)

☞ Step One

–Strip and Predip next
cow to be milked, leave

☞ Step Two

–Return with unit, then dry
and apply unit to cow

TIMING BIGGEST ISSUE!!

Consistent Milking Routine (Stanchion/Tie Stall)

☞ Timing too long

–Most common

–Prep next cow after unit attachment of previous cow

☞ Proper timing

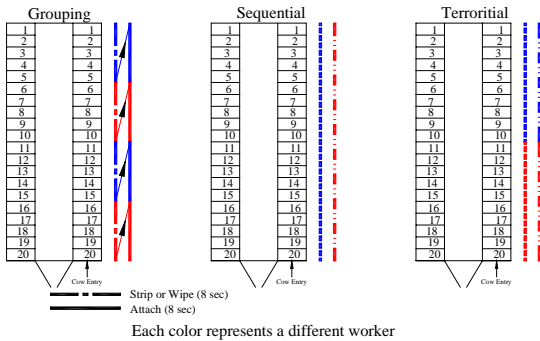
–When cow milking almost done, then strip and predip next cow.



Parlor Milking Routines:

1. **Territorial:** each milker performs all procedures within his/her territory.
2. **Sequential:** each milker performs one procedure(s) on all cows.
3. **Group:** Territorial with one milker working in two or more territories.

Different Milking Routines



SEQUENTIAL ROUTINE

Each person has their own task to do on each side of parlor

- ☞ Usually see at least two people in the parlor
- ☞ Very Difficult to control timing



Sequential At It's BEST!!

Consistent Milking Routine (Parlor)

☞ Territorial

- Most Consistent Timing
- Fastest Milking
- Best Quality

Consistent Milking Routine (Parlor)

☞ Step One

- Strip and Predip
group of 3-8 cows

☞ Step Two

- Dry and Apply
group of 3-8 cows

Parlor Performance Goal

The goal is to have all units attached to all cows within 4 to 5 minutes after the entrance gate opens.

Routines Change

The longer the employees are working at the dairy,

The faster they become.

Making proper adjustments for their experience is important



Consistent Milking Routine (Flat Barn Parlor)

Step One

- Predip cow and strip
5 squirts per teat

Step Two

- Dry each teat for 5
seconds, then gently
apply unit



Consistent Milking Routine (Rotary Parlor)

First Person

- Strip teats and Predip

Second Person

- Dry teats and apply unit

Third Person

- Monitor units and post dip



Rotary Parlors



Define people positions

Dairy with Mastitis Problem Take A Good History

- ☞ Do you strip teats yes
- ☞ Do you predip yes
- ☞ Do you dry teats yes
- ☞ Do you teat dip yes
- ☞ Do you dry cow treat yes

Farm doing everything they should,
so why do they have a mastitis problem??



Biggest Challenge for Success

**To know the difference
between
normal and abnormal.**



Goals of Milking: “Milk Cows”

- * **Quickly as Possible**
- * **Completely as Possible**
- * **Gently as Possible**



Milking Practices Results in:

- ☛ Faster Milking
- ☛ More Milk Production
- ☛ Better Milk Quality



“Milkability”

The Goal is to Attach a Machine to a Clean, Dry, Well Stimulated Teat!

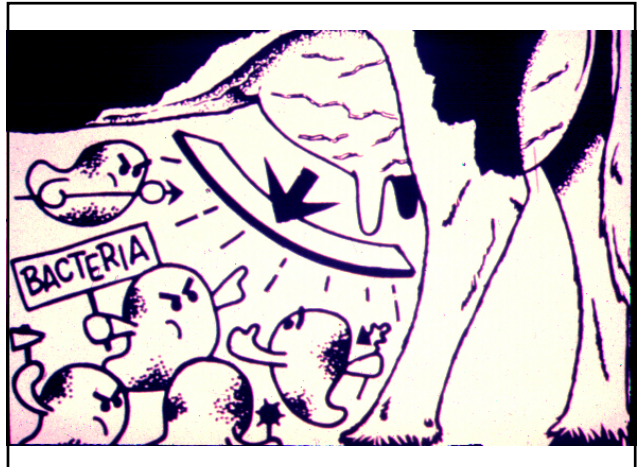
Poor Advice

Is as worthless as a parachute that opens on the second bounce!

Milking Management



Maximize oxytocin release by employing procedures that give clean, dry, and stimulated teats



Gloves Decrease Risk



All milkers must wear gloves



Gloves

I Tried Them And Saw No Results



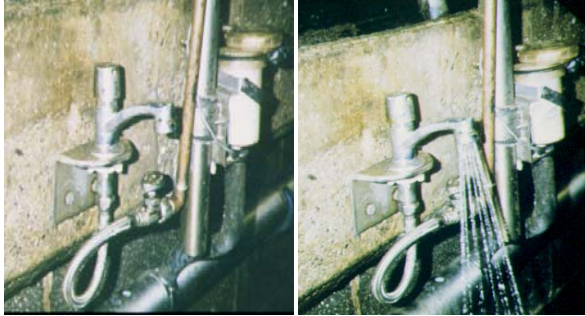
Cleaning Gloves



Cleaning Gloves



Spring Automatic Faucets



Proper Lag Time

The single biggest factor to rapid and complete milk outs.

GOAL = 90+ SECONDS

(Fore Strip to Unit Attachment)

Proper Lag Time

60 seconds was considered the "Old" gold standard!

Latest data shows longer is much better than too short

Benefits Of Proper Lag Time

**REMEMBER, REGARDLESS OF
YOUR HERD SIZE**

**PROPER LAG TIME YIELDS AN
EXTRA \$90 TO \$150 PER COW
PER YEAR OF ACTUAL PROFIT!!**



Properly foremilked cows will have consistent milk letdown



- ☞ Teats will “plump up”
- ☞ Good milk flow after machine attachment
- ☞ 90 secs



Fore-Stripping

- * Strongest Signal to Let Down Milk
- * Remove Worst Quality Milk
- * Earlier Mastitis Detection
- * Faster Milking
- * More Milk Production
- * Decrease New Infections



NEW STUDY SHOWS STRIPPING HELPS!

- * Cows not stripped:
 - Flow rate average 5.0 lb/min
 - Average milk time 5.6 minutes
- * Cows stripped:
 - Flow rate average 6.0 lb/min
 - Average milk time 4.6 minutes



FORE STRIPPING

Define the number of strips on each teat!

Minimum of 2 actual squirts of milk, NOT just the motion of stripping!

FORE STRIPPING

Either Strip then predip

OR

Predip then Strip

The Choice Is Yours!

FORE STRIPPING

If teats are stripped first, more organic matter is removed.

If teats are stripped after predip, too much predip may be removed so less bacteria killed.

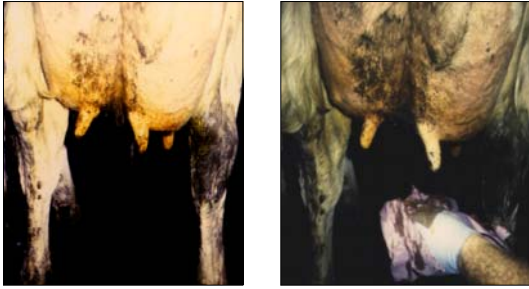
Pre-Dipping

- ☞ Softens soils
- ☞ Reduces bacteria on teats
- ☞ Requires contact time
- ☞ Must be wiped off



>75% of dairies pre-disinfect

Pre-dip is the best way to remove soil from teats



**Milking Procedure
Successful Predipping**

- * Complete coverage
- * 20 to 30 seconds contact time



Wet Towels



- ⌘ If cows **extremely** clean and **no contagious bacteria** in herd, they can work.
- ⌘ Very difficult to dry a teat with a damp cloth
- ⌘ Short cuts in prep leads to more problems
- ⌘ Not economical to use
- ⌘ Been great for my business economics

Alternative Pre-Dipping Teat Foamers

- * Excellent Cleaning
- * Great Stimulation
- * See Cleaner Milk Filters immediately

Alternative Pre-dippers Teat Foamers



Alternative Pre-dippers Power Scrubbers



Best Ways to Reduce Bacteria on Teats Compared to No Udder Prep

Dry Towel Only	-4%
Wet Towel Only	-40%
Wet Towel + Udder Sanitizer	-40%
Wet Towel and Manual Dry	-77%
Wet Towel, Udder Sanitizer, and Manual Dry	-80%
Predip and Manual Dry	-85%

Source: Cornell University

**Udder Prep
Best You Can Do Is
Reduce Bacteria By
85%**

1,000,000 Bacteria At Start

100,000 Bacteria At Start



150,000 After Cleaning

15,000 After Cleaning

Toweling

Proper

- removes water
- removes soil



Improper

- redistributes filth
- can spread pathogens



**Proper use of towels + or \approx
one towel per cow**





Drying Teats

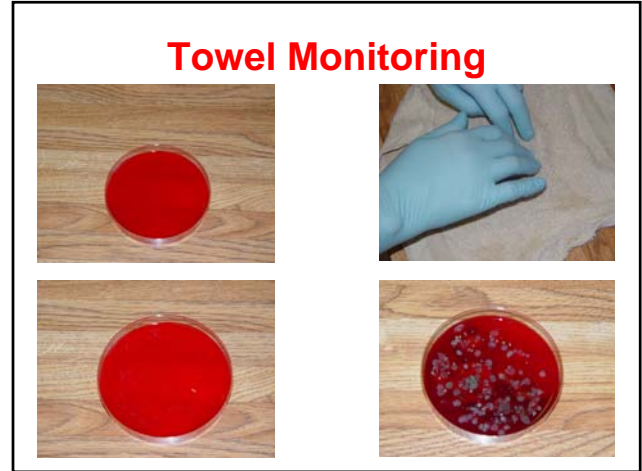
- * Every Drop of Water That Goes on the Udder Must Come Off
- * Bacteria Can't Walk, but They Can Swim
- * Once Teats are Wiped Dry, Keep Your Hands Off!
- * Number One Step for Reducing Bacteria Numbers on Teats

Drying Teats

☞ IT IS EXTREMELY DIFFICULT TO GET A TEAT DRY WITH A DAMP CLOTH

☞ REMEMBER, THE DRYING CLOTH WILL REMOVE THE MOST BACTERIA FROM THE TEAT





Drying Teats

☞ Making the physical pass across the teat ends has the biggest influence on milking speed and quality milk.

The drying removes the most bacteria from the cows teats.

The Secret is the Teat Ends

Clean Teat End



THE OLD GOLDEN RULE

**IF THE TEAT IS NOT CLEAN
ENOUGH TO GO IN YOUR
MOUTH, IT IS NOT CLEAN
ENOUGH FOR THE MACHINE
TO BE ATTACHED!!**



Improper Teat Drying



What About The Teat End??

Proper Teat Drying



Twist Method Gets The Teat End Clean!!

Teat Cleanliness Scoring System

Scoring System

- 1 No visible dirt or dip
- 2 Visible dip stain
- 3 Small amount of dirt or manure
- 4 Large amount of dirt or manure



Milking Routine Makes A BIG Difference

Bacteria	Normal Routine No Teat Ends	Normal Routine Clean Teat Ends
CONTAGIOUS		
Staph Aureus	2,400	1,650
ENVIRONMENTALS		
Strep Species	2,450	25
Coliforms	22,500	5

Utilize your bulk tank cultures because they are a source of information on how good your cow's teats are being cleaned. Bulk tank cultures definitely show inconsistency!

On Farm Milker Monitoring

- ☞ Set up line sampler
- ☞ Sampled after each shift
- ☞ Incubated and counted colonies –
- ☞ goal: <1000 colonies for non-ag streps
<100 coliforms

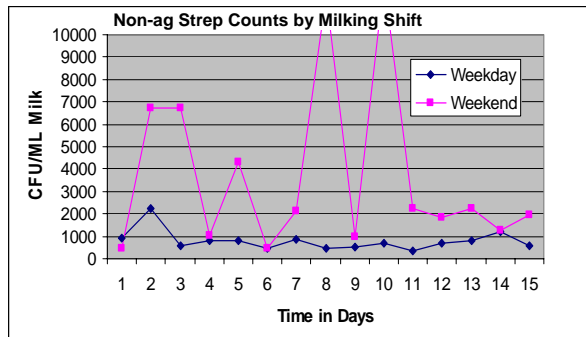
Environmental Bacteria Counts in Milk Line Samples

Date/Shift	Non-ag Streps cfu/ml	Coliforms cfu/ml
10/11/02		
Shift 1	1,340	860
Shift 2	600	140
Shift 3	550	250
10/12/02		
Shift 1	2,880	810
Shift 2	800	310
Shift 3	3,200	430
10/13/02		
Shift 1	1,668	450
Shift 2	850	153
Shift 3	960	235

Environmental Bacteria Counts in Milk Line Samples

Date/Shift	Non-ag Streps cfu/ml	Coliforms cfu/ml
10/14/02		
Shift 1	2,540	560
Shift 2	600	140
Shift 3	550	250
10/15/02		
Shift 1	880	420
Shift 2	650	150
Shift 3	520	130
10/16/02		
Shift 1	3,668	650
Shift 2	880	122
Shift 3	460	45

Environmental Bacteria in Bulk Tank Milk



Udder Prep **SUMMER SECRET**

* DRY WIPE TEATS
BEFORE PREDIPPING

GREATLY REDUCES
ORGANIC LOAD



Organic load reduces predip efficacy

UNIT ATTACHMENT

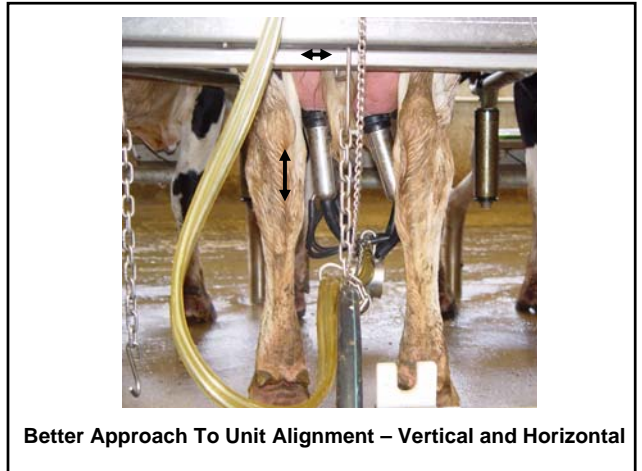
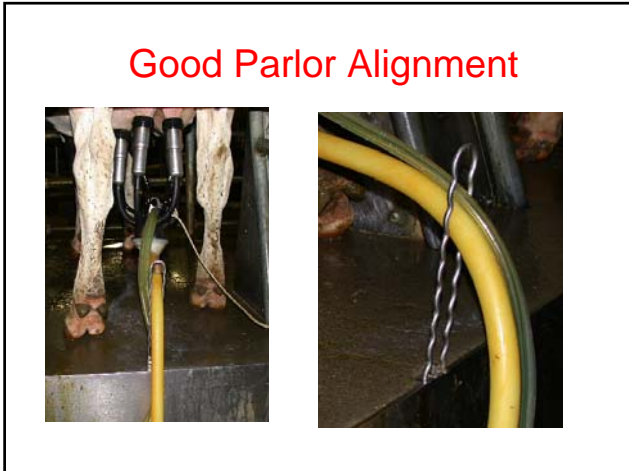
- ⌘ Minimal air leakage
- ⌘ Decrease environmental mastitis
- ⌘ Better let down

MUCH MORE IMPORTANT THAN
MOST PEOPLE REALIZE!

Adjust Milking Unit Properly



Adjust Unit So It Hangs Squarely
With a Slight Forward Pull



Better Approach To Unit Alignment – Vertical and Horizontal



Better Approach To Unit Alignment – Vertical and Horizontal

Poor Tie Stall Alignment



Unacceptable Unit Alignment

PROPER HOSE ALIGNMENT



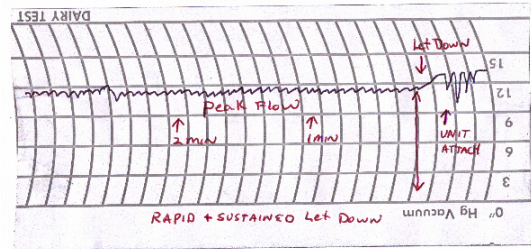
Keeping hoses together allows for better alignment

PROPERLY STIMULATED COWS



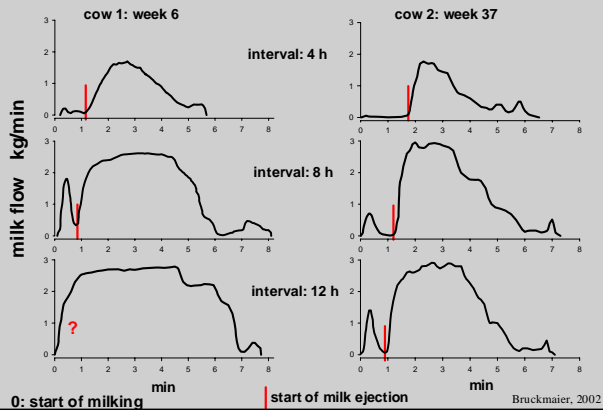
Excellent Let Down

Good Let Downs

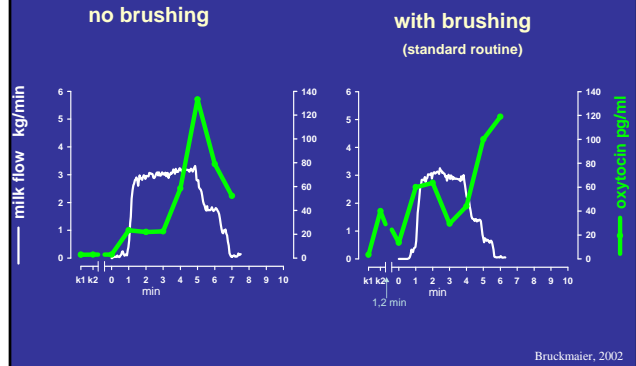


Good Prep Equals Faster Milking

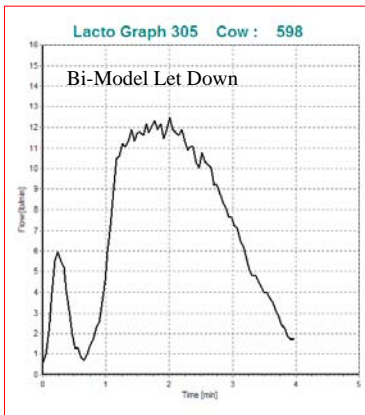
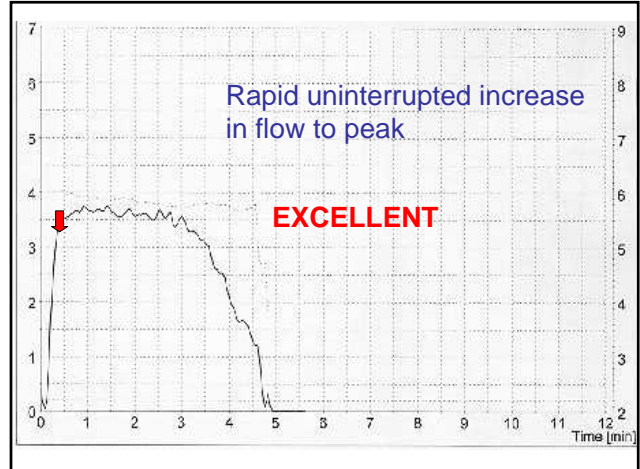
Start of milk ejection: effects of udder filling



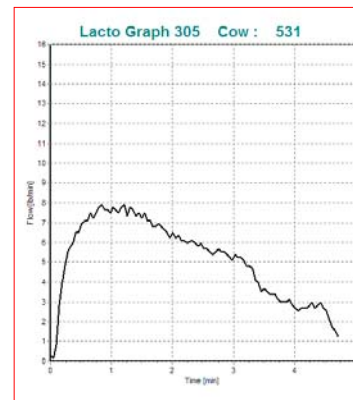
Oxytocin and milk flow during milking without and with udder cleaning (Leonardo)



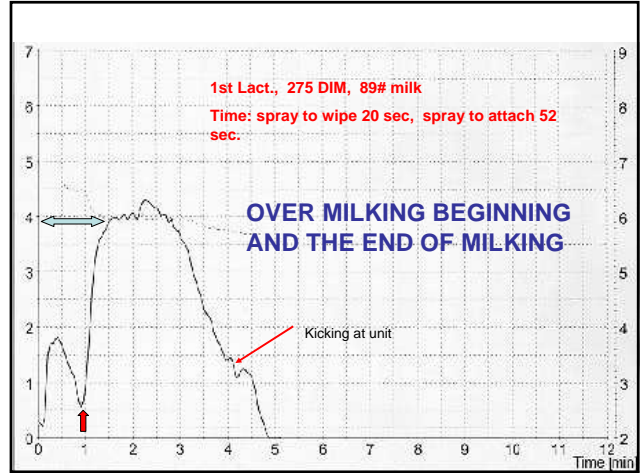
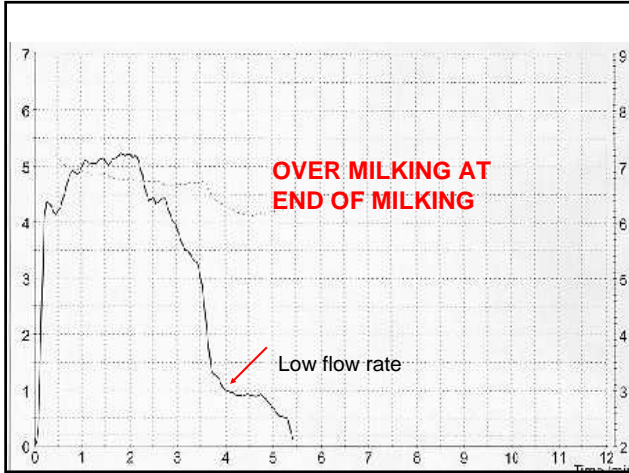
Lactocorder



Poor initial letdown with only cisternal dump.



Lower flow rate cow.



Lactocorder

It surprised many people to learn
 Than milking routine changes were
 Almost immediate to the cow's flow
 Rates. There is not a time to
 Adjust as we expected.

A great teaching tool.

Three Types of Dipping

- Predipping
- Postdipping
- Shitdipping

Ito/Japan

SHIT DIPPING



Is Not Effective!

Teat Dipping Rules

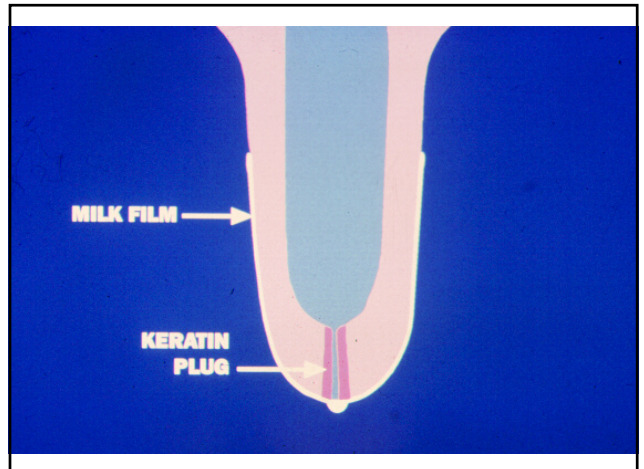
- 1 - Dip Teats, Don't Spray
- 2 - Clean Dipper and Fresh Dip
- 3 - Cover 90% of the Entire Teat
- 4 - Use an Approved Teat Dip



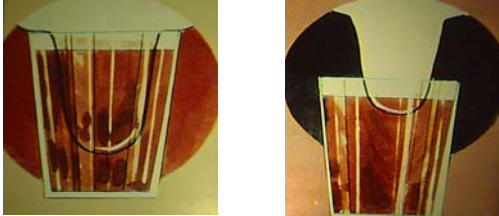


Teat Dipping

Primary Reason to Teat Dip is to Remove the Milk Film Left on the Teat After Milking With a Layer of Germicide



Post Dipping
Which is the proper way to teat dip ?



5.5% of dairies do no post milking disinfection

Teat Dipping
Splash Method



Teat Dipping
Splash and Splash Method



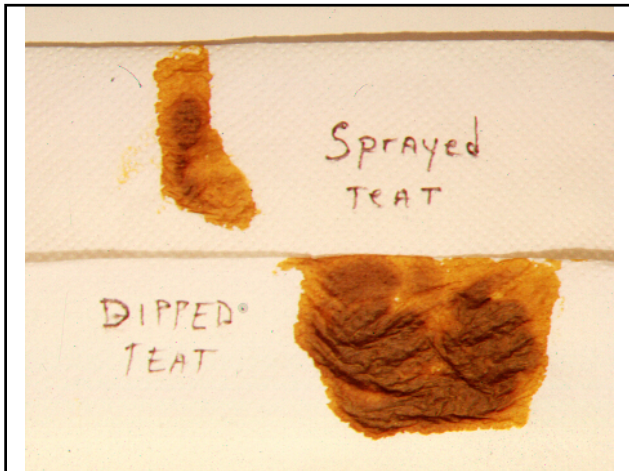
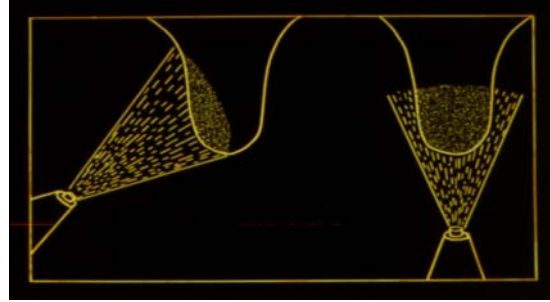
Teat Dipping
Squeeze Method



**Teat dipping is superior over
teat spraying**

**Dipping reduces usage &
results in better coverage of
teats.**

**Proper teat dip application
does not include spraying!**

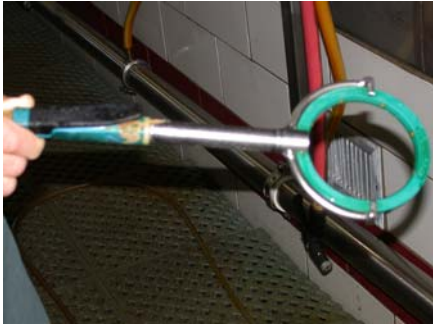


**Economics of
Dipping vs Spraying**



**If you dip teats, you can afford to
buy a quality teat dip on the savings
of dip use over spraying!**

New Sprayer System



Monitor the Results of Good Udder Prep



Milk Filter Scoring

Best results when done after each milking
by the people actually
milking the cows

1. Clean as new
2. Light brown, no garget
3. Medium brown, some garget
4. Medium brown, lot garget
5. Dark brown, lot garget



Might be some issues with teat cleaning??

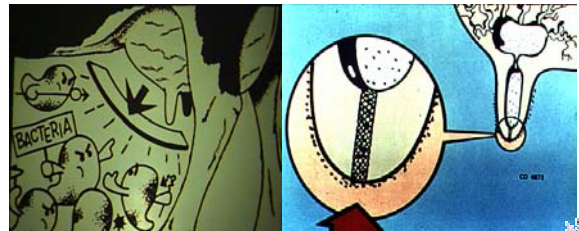
Milk Filter Scoring

Poor milk filter scores tells us:

1. Milkers not properly cleaning the cow's teat/teat ends.
2. Milkers not properly detecting abnormal milk.

The probability of mastitis increases with increasing germ loads on the teat ends

Full hygiene decreases the probability



Sanitize Units During Milking

- ☞ Use drop hose with detergent/sanitizer
- ☞ Backflush System
- ☞ Bucket with sanitizer
- ☞ After High SCC Animal
- ☞ After Animal with Abnormal Milk
- ☞ After Animal that has been treated

Sanitize Units During Milking



Keep Exterior Of Units Clean

- ☞ Use drop hose with detergent/sanitizer
- ☞ After each pen of cows MINIMUM
- ☞ Preferably after each side of parlor
- ☞ Reduces risk of new infections
 - Environmentals and Mycoplasma

CLEAN STILL MEANS QUALITY

Keep Exterior Of Units Clean



The Machine

System Cleaning does not only apply to the internal surface of a milking system, It also applies to the external surfaces as well. Both surfaces play a major role in bacteria counts and the level of environmental mastitis.



Front View Of Unit on Jettors



Back Side of Units on Jettors



Unit Cleaning



Reduces clean up time and water use by 25%

Dry Cow Treatment

**Most Effective Treatment
Best For Chronic Cows
Helps Heal Damaged
Tissue**

Dry Cow Treatment

Every Quarter Of
Every Cow
Without Exception!

Utilize Dairy SCC Records To Make Proper Decisions

		DRYLG			
		4.0			
	NEW	161	41	202	CHRONICS
		17%	4%	21%	
LOG1: 4.0	UNINFECTED	678	87	765	CURES
		70%	9%	79%	
		839	128	967	
		87%	13%	100%	

GOAL: LESS 10% HIGH AT CALVING!

Dry Cow Therapy Staph Aureus Chronic Cows:

- ☞ Intramuscular injections at dry off
 - 60-70cc LA-200 (split two injection sites)
- ☞ Double Dry Treatment
 - Two tubes at dry off **OR**
 - Two tubes given 7 days apart
- ☞ Extra Label – discuss with herd veterinarian

Heifer Mastitis Control

Primary Cause is Environmental
Streps and Staphs

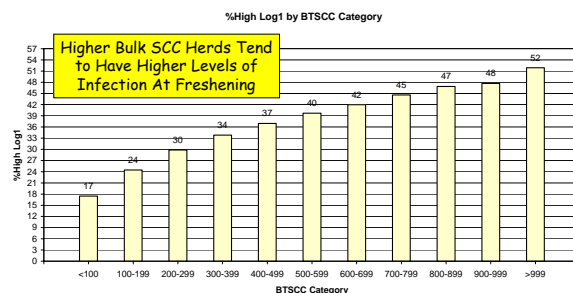
Staph Aureus is also common

Heifer Mastitis Control

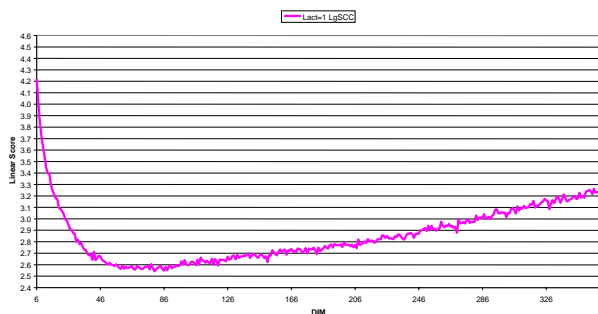
What is SCC at First Test?
Should be less than 4.0

Should have less than 15% of animals above 200,000 on first test after calving.

DHIA Test Day Averages First Test Day Linear Score SCC



DHIA DATA ON HEIFERS



First Test Linear Scores Or SCC

Heifers that calve with LS over 3.9 or SCC >200,000 give 1400 less pounds (640kg) of milk in the first lactation than heifers that calve with LS less than 4.0 or under 200,000 SCC

200,000+ heifer data set

Heifer Mastitis Control

“Dry Cow” Therapy Helps

Treat 50-60 Days Prior to Calving

Reduce New Infections by 40-50%

**5.5 lbs (2.5 kg) More Milk If
Treated**

**Reduced Infections After Calving
by 93%**

Heifer Mastitis Control

“Dry Cow” Therapy Helps

**If you survive the first animal,
You can think about doing more.**

**Very difficult to manage unless in
chute prior to calving.**

Proper Attitude



Heifer Mastitis Control

“Dry Cow” Therapy Helps

**After dry treatment, use internal
Teat sealant**

**After dry treatment, give injection
Of LA-200.**

Heifer Mastitis Control

Intramammary Therapy

Treat 7-14 Days Prior to Calving

Reduced New Infections

**More Milk When Treated
(>700 lbs (318kg) of milk)**

Dr. Oliver U of Tennessee

Heifer Mastitis Control

Intramammary Therapy

Much easier to manage

**Must use external teat sealant
after treatment.**

Excellent success on dairies

Teat Seals

External



Internal



EXTERNAL TEAT SEALS



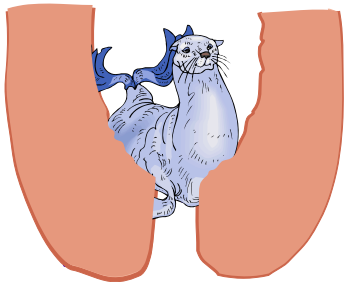


External Sealants Should Be Applied:

- ☞ After Dry Treating.
- ☞ When enter pre-fresh
- ☞ When enter calving pens

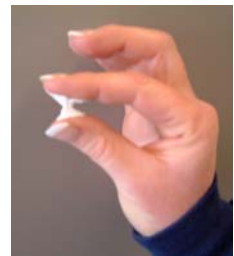


Internal Teat Seals



Orbeseal Internal Teat Sealant (Pfizer Animal Health)

- ☞ Bismuth subnitrate in a paraffin base:
65% w/w (2.6 g in 4g)
- ☞ No antimicrobial properties
- ☞ Inert dense viscous paste is infused into quarter after last milking at dry off



Orbeseal Teat Sealant (Pfizer Animal Health)

- ↳ Insoluble in milk
- ↳ Forms a physical barrier in teat cistern that persists throughout dry period => prevent entry of pathogens



Woolford et al., 1998

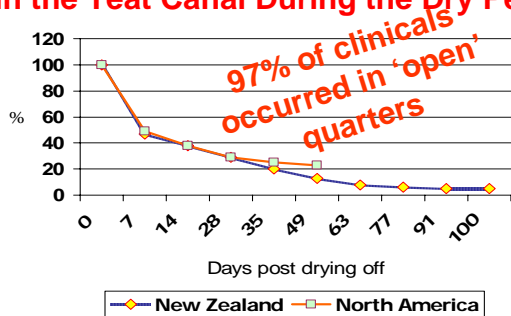
- ↳ Woolford et al., 1998
 - Of 19 quarters x-rayed, all had Orbeseal present in base of teat sinus at 100 days dry

Orbeseal Tips

- ↳ Never put syringes into bucket water
- ↳ Be sure to put entire tube into each qtr
- ↳ Air pocket is normal

Williamson et al 1995

Formation of the Keratin Plug in the Teat Canal During the Dry Period



Orbeseal Teat Sealant (Pfizer Animal Health)

- ↳ Most is stripped out at first milking
- ↳ May have some residual removed in subsequent milkings => see in milk sock or strip cup
- ↳ No safety or residue issues



Orbeseal

May be a source of cleaning problems if not milked out completely before using a milking machine

Summary of Results



• Quarters treated with Orbeseal and an antibiotic, as compared to quarters treated with antibiotic alone, were

• 19% lower in SCC at 6-8 DIM

• 30% less likely to develop a new IMI between dry off and calving

• 33% less likely to have a clinical event <60DIM

- 83% less likely to have a clinical mastitis due to an environmental Strep infection

Summary of Results



• Quarters treated with Orbeseal and an antibiotic, as compared to quarters treated with antibiotic alone, had a

• 19% reduction in SCC at 6-8 DIM

• 20% improvement in new IMI between dry off and 1- 3 DIM

• 26% improvement in clinical mastitis

- 83% less likely to have a clinical mastitis due to an environmental Strep infection

Summary of Minnesota Results

• Quarters treated with Orbeseal and an antibiotic, versus quarters treated with antibiotic alone, experienced....

- Lower LS
- 28% less likely to develop a new IMI during the dry period
- 29% less likely to have an IMI present at calving
- 28% less likely to experience a clinical mastitis event between dry off and 60 DIM

• Effects primarily mediated through prevention of new IMI:

- Major pathogens: Environmental *Streptococci* spp. (lower incidence new IMI, prevalence IMI, incidence of clinical mastitis)
- Minor pathogens: Strong trend toward lower incidence new IMI, and significantly lower prevalence of IMI.

Indiana

1. 107 cows between 15 and 45 DIM
2. Orbeseal – 9/51 17%
3. Control – 17/56 30%
4. 43% reduction in clinical cases

Wisconsin Prelim Data

		Herd A	Herd B	Herd C	Overall
	# Cows	79	270	202	551
New IMI at calving	Treated	11.9	6.8	8.0	8.0
	Control	29.9	8.7	20.4	16.4
	% decrease IMI	60	22	61	51
	P Value	0.002	0.173	<0.001	

Orbeseal in the US



☞ Used WITH a Dry Cow Antibiotic

☞ Why:

- More infected cows in the herds (Hi BTSCC)
- No easy way of differentiating uninfected cows at dry off
 - Less DHIA individual cow SCC data –
- Reduces the risk associated with poor infusion technique
- Simplicity at dry off

Other

☞ Safety

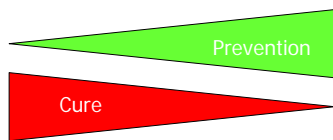
- no bismuth in blood after imm infusion
- bismuth not orally absorbed by humans
- has no effect on dairy starter cultures
- neonatal calves unaffected by 16g of bismuth

☞ Tolerance

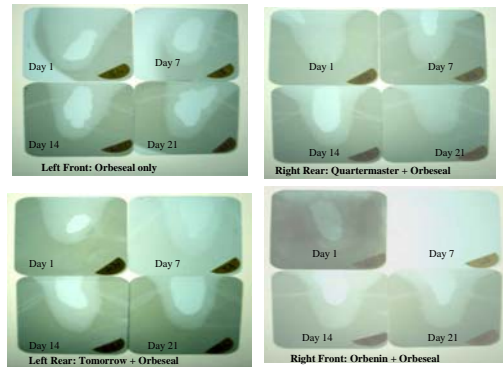
- 1x and 2x dose result in a small (<82,000) transient increase in SCC
- No impact on milk production

DCT and Orbeseal Synergy

- | | |
|---|---|
| <ul style="list-style-type: none"> ⌚ <u>Dry Cow Antibiotics</u> ⌚ Treats G+ IMI ⌚ Antibiotic ⌚ Persists <3 weeks | <ul style="list-style-type: none"> ⌚ <u>Orbeseal</u> ⌚ Prevents new G+/G- IMI ⌚ Physical Barrier ⌚ Persists for >100days |
|---|---|



Compatibility with DCT



Conclusion



- ⌚ Orbeseal teat sealant is very promising as a management tool to prevent new intramammary infections during the dry period
- ⌚ Potential economic benefits to re:
 - Reduced SCC => SCC premiums
 - Reduced subclinical mastitis => milk yield
 - Reduced incidence of clinical mastitis and associated costs
 - Premature culling and death associated with clinical and subclinical mastitis

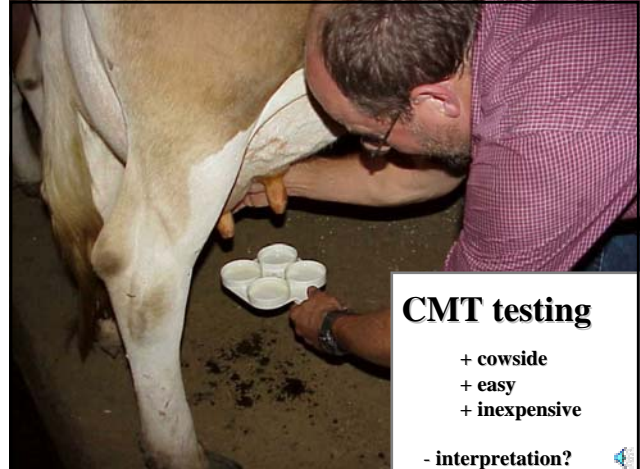
Conclusion

- ⌚ Orbeseal supported by considerable research
- ⌚ Novel, unique product
- ⌚ Prevent new infections - *naturally*

Fresh Start Program

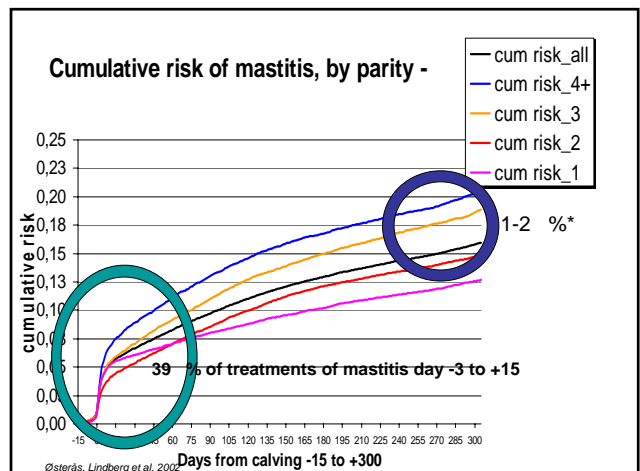
Check every fresh animal with CMT paddle at day 2-3 after calving.

If CMT score is 2 or greater (gels), treat for 3 days with lactating tubes or culture the positive cows and treat gram positive



FRESH START

- Why "Fresh Start"?
 - Dry cow products only protecting early dry period
 - High percentage of gram (+) bacteria at calving – especially environmental streps
 - Greater than 50% of clinical cases in first 100 days were present at calving
 - Alternative to pre-treating heifers before calving
 - Treatment during normal milk discard period



Fresh Start Program Results

- *Less clinical mastitis during lactation
- *More milk production
- *Lower SCC
- *Excellent way to deal with heifers
- *Over all improved milk quality

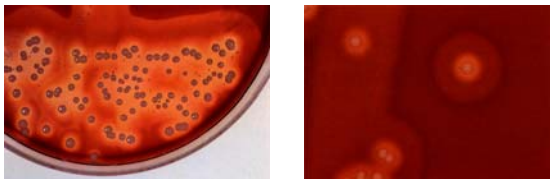
Contagious Organisms

- ⌚ *Strep. ag.**
- ⌚ *Staph. aureus*
- ⌚ *Mycoplasma**



- * Bulk milk is an excellent screening tool for herd monitoring

Staphylococcus aureus



- ⌚ Partial hemolysis (beta zone)
- ⌚ Complete hemolysis (alpha zone)
- ⌚ Partial and complete hemolysis

Staph. aureus Culturing

- ⌚ Shed in relatively low numbers
- ⌚ False negatives 30% of time
- ⌚ Freezing, thawing, pre-incubation gives highest recovery of organism
- ⌚ Chronic cases high SCC, not so with recent infections

Staph. aureus Culturing

- ☞ On the teat skin
- ☞ In teat end
- ☞ In the udder

Must evaluate each positive animal carefully!!
CULTURES ARE ONLY ONE PIECE
OF THE REAL PUZZLE!

Staph. aureus Bulk Tank Culturing

- ☞ Need 3 to 5 days of samples co-mingled and run as one sample
- ☞ Number of colonies IS NOT reflection of number of positive cows in herd
- ☞ Excellent way to monitor status of herd
- ☞ Common to see positive culture in winter months when skin is damaged

Staph aureus Clinical Disease Insidious

- ☞ Mild, occasional clots
- ☞ Clots and mammary inflammation increase
- ☞ Chronic and progressive
- ☞ Unresponsive to therapy
 - a) resistant to many antibiotics
 - b) walled off in scar tissue
 - c) leucotoxic

Reservoir of Infection

- ☞ Milk from udders of infected cows
- ☞ Human infections?

Once A Staph. aureus Cow, Always A Staph. aureus Cow

- ⌘ True if chronic cows with scar tissue
- ⌘ New infections can be cured in both cows and heifers
- ⌘ Animals without scar tissue should be treated

Staph aureus Eradication?

- ⌘ Possible
- ⌘ Takes a huge commitment
- ⌘ A never ending process
- ⌘ Monitoring is critical

Improving Milking Performance

- o Most dairies have interest here
- o Huge impact on each dairy
- o Improves milk quality too

Milk Out Times Faster the Better!

25 Pounds (11kg)/Milking
Milk Out 3.5 Minutes or Less
Add 0.5 Minute per additional
10 Pounds (4.5 kg) /milking

Milking Duration

Goals

If 2X: Less than 5 minutes

If 3X: Less than 4.5 minutes

Milking Performance

Three Areas to Concentrate

1. Milking Routine
2. Average Claw Vacuum at Peak Milk Flow
3. ATO Settings

Higher Claw Vacuum

EQUALS

Faster Milking

Within Reason!!

Proper Claw Vacuum

Whatever Line Vacuum it Takes to Provide 11.5 to 12.5 Inches at the Claw During Peak Flow

The Closer to 12-12.5 the Better!

REMEMBER

If Higher Vacuums Are to Be Used,
There Are Two Critical Points:

1. Good Milking Routine
2. Proper Take Off Settings

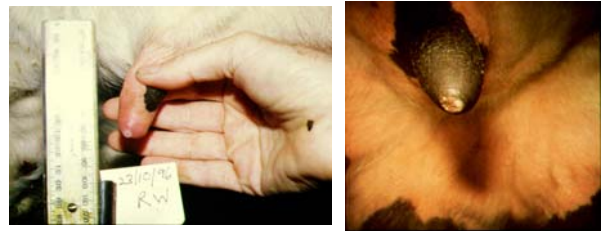
The mastitis new infection
rate is directly related to

- Teat end and teat skin condition
- Teat sanitation prior to unit attachment

Many treated cows have bad teat end health!



The Machine



There Is No Doubt in My Mind That the
Two Main Reasons for Teat End Lesions
Are Low Claw Vacuums and Long
Machine On-Times

Over Milking

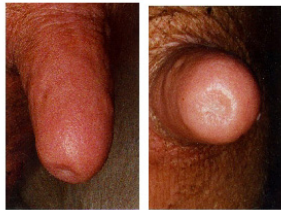


Tender and Red teats when machine comes off is classic sign of over milking!!

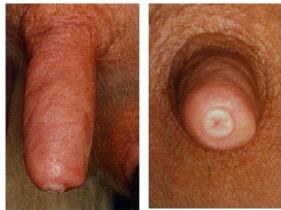
Over Milking



Hyperkeratosis is classic sign of over milking or long duration!!



1. None



2. Smooth Rings



3. Rough Rings



4. Very Rough Rings

Healing Damaged Teats



Predip and Post Dip with Chlorus Dioxide
Products for 5 to 6 weeks
(4XLA, Valiant Pre/Post, BiSept)

Teat End Health

The Secret to Success:
STOP OVER MILKING!!

Minimize the time the
cow's teat is in high vacuum
low flow.

At start and at end of milking

"F S K"

↪ Flinching

↪ Stepping

↪ Kicking

Over Milking Causes
Pain To The Cows!

Shit Sleeve Index

Much Easier To
Understand

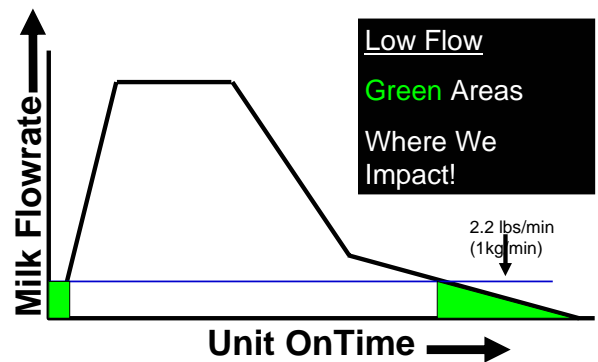
The Machine



Common signs of milking cows too dry is excess stepping and kicking, abnormal teat ends, and sore teats to the touch. Are these familiar problems at your client's operations?



Individual Cow Milk Flow Pattern



Automatic Take Off Settings

- Goal is to shorten machine on time
- Reduce delay setting
- Raise end of milk threshold

** Make all changes slowly and make sure milk routine is acceptable



The Machine

Take Off Settings

- 1. End of Milk Delay (in seconds)**
- 2. End of Milk Setting (in lbs/gms.)**



The Machine

End of Milk Delay:

The Time It Takes to Shut the Vacuum Off Once the Cow Reaches the End of Milk Threshold

Many Set at 10, 15, or 30 Seconds

Goal: 1-2 seconds preferred



The Machine



Make all changes slowly. Cut the delay setting in half each week until you reach your desired setting.

Be sure to monitor the results each time the setting is changed.



The Machine

End of Milk Threshold:

The Level of Milk Flow In Which The Machine Shuts Off

Many Set at 0.4 pounds or Less

Goal:

Milk as quickly and completely as possible



The Machine

End of Milk Threshold:

The Level of Milk Flow In Which The Machine Shuts Off

Many Systems are based on resistance settings

Factory settings usually around 1600 ohms (Floats)

Goal:

Many set lower than 600 ohms



The Machine



Make All Changes Slowly. Raise the End of Milk Setting 0.1 lb.\Week or 50-100 ohm\week Until You Reach Desired Setting

Be sure to monitor the results each time the setting is changed.



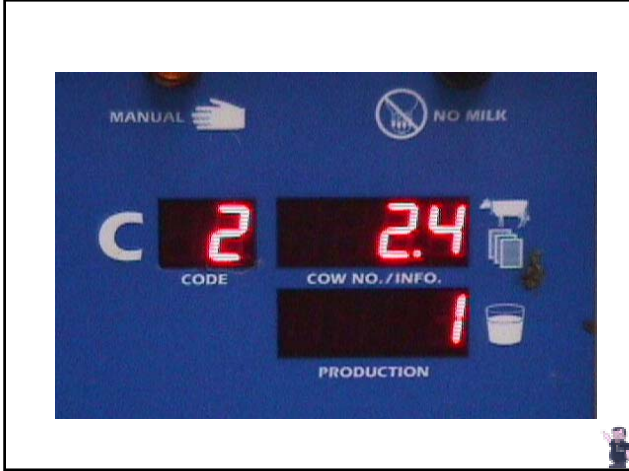
The Machine



When you get to the upper limits, you may want to wait longer between changes. (monthly)

Again, be sure to monitor the results each time the setting is changed.





The Machine

Milk Outs

How do you measure milk outs?

Use a plastic measuring cup from
the kitchen to the barn!

Do 5 to 10 animals

The Machine

Milk Outs

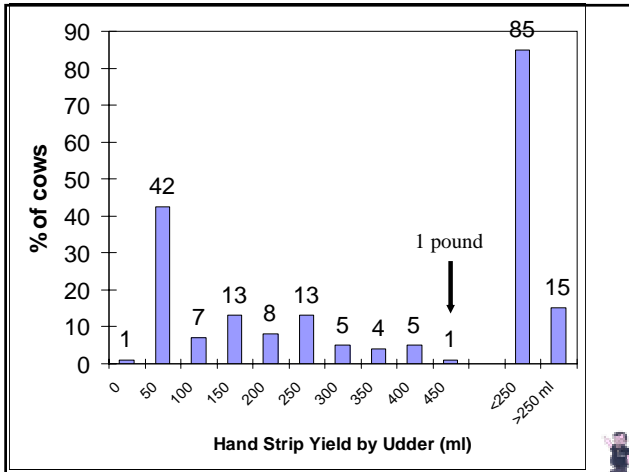
When do you measure milk outs?

Immediately after the machine comes
off the cow

The Machine



If You Are Not Sure, Do Strip Yields. If
There Is Less Than 250 ml of Milk Evenly
Divided in the Udder, the Cow Is
Completely Milked



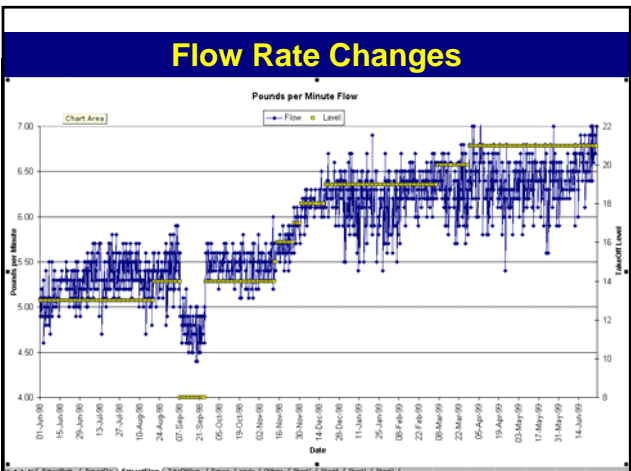
- ## Recommendations
- ☞ Hand stripping recommendations:
- Quick hand strip immediately after unit removal (<1 min)
 - Cleanly milked = <100 ml/quarter
 - Less than 20% of quarters with >100ml milk
 - Less than 500 ml evenly divided in whole udder when machine comes off
 - Most use 250 ml as acceptable level

The Machine

Milk Outs

Doing strip yields will teach you
and the farmer a lot about the milking
of cows.

Improper alignment is very obvious.



Faster Milking

Actual 3X Herds
90 Pound (40kg) or Greater
Milk/Day
Goal: Less than 4.5 minutes

Machine On Times:
3.8 to 4.3 minutes per milking

The Results

Four Changes Made

1. Improve milking procedures
2. Raise claw vacuum
3. Shorten end of milk delay time
4. Increase end of milk flow setting

REAL RESULTS 3200 Cow Dairy

	Before	After
Duration	5.5	4.1
Filling Time	5 secs	4 secs
Turns	4.7	6.3
Clinical Cases	15-20	5-6

This dairy can now milk 1000 more cows in 24 hours!

Automatic Take Offs
Are A Great Investment
For Any Farm

IF PROPERLY
ADJUSTED

**Automatic Take Offs
Are A Great Investment
For Any Farm
IF TRUSTED!**

Bring Consistency and
Calm to Milking

**MILKING EQUIPMENT
Automatic Detachers**



**Automatic Take Offs
For Tie Stall Barns**

Vacuum Drop

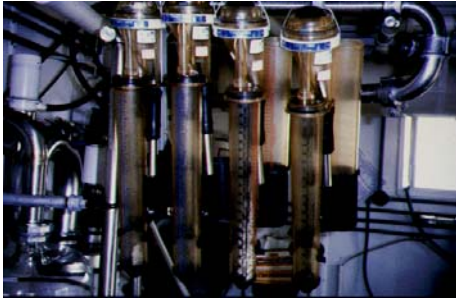
Need system vacuum at least
1 inch higher with ATO than
without ATO to have the same
claw vacuum

**Automatic Take Offs
For Tie Stall Barns**

Milk Slower

Because of vacuum drop,
many farms take longer to
milk with ATO's than they did
without!!

DHIA Testing A Problem?



Do you raise your system vacuum?

Automatic Take Offs

Lot's Of Positive Changes

It may be time to upgrade your system for faster milking!

Automatic Take Offs

Lot's Of Positive Changes

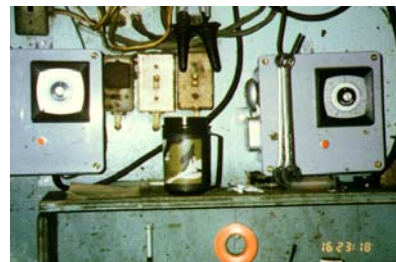


HFC



Float Sensor

Timed Milking



You determine maximum milk times!

Timed Milking



You determine maximum milk times!



Timed Milking



You determine maximum milk times!



Cow Flow Impact

(Before Milking)

- ☞ Crowd Gate
- ☞ Cleaner Cows
 - Udder Flaming
 - Tail Docking
 - Proper Stall Maintenance
 - Proper Alley Cleaning



Poor Cow Flow

- ☞ Cows wait for you
- ☞ Trained to enter when you go into holding area to get them
- ☞ Cows are creatures of habit (good or bad)



Good Cow Flow

- ☞ Keep Out Of Holding Area
- ☞ Let Crowd Gate Do The Work, (Use Bell Or Buzzer)
- ☞ Teach Them To Come In On Their Own, Don't Force Them In



CROWD GATE



Typical crowd gate “pushes” cows in parlor!



CROWD GATE



This is the way a crowd gate should work!

Crowd Gate Management



Special timer switch



Coated Cable in parlor

Crowd Gate Management



Total crowd gate control from any location in the parlor. Increase cow flow 10-20%. Train cows to move on bell, not the movement of the crowd gate.

Crowd Gate Management



Controlled Electricity Is Necessary

MILKING EQUIPMENT
The Most Important Machine
On The Dairy Farm

The most used and abused machine on the dairy farm.

Scheduled service is critical.

Milk time evaluation is a must!



MILKING EQUIPMENT
The Most Important Machine
On The Dairy Farm

Does not come with life warranty

The reason most quality milk programs fail.

If the machine is the cause, all programs will fail until it is fixed!






Having the Best
Milking Equipment

Is of Little Value if Milking
Habits and Environment
are Marginal



The Most Important
Three Components Are:

-  Regulator
-  Pulsation
-  Inflation



Milking Equipment Testing

Having an independent person testing milking equipment yields the best results for the dairy farmer.

YOUR VETERINARIAN IS A PERFECT CHOICE



Regulator

The “General” of the Entire Milking System

The Most Important Functioning Component



Regulator

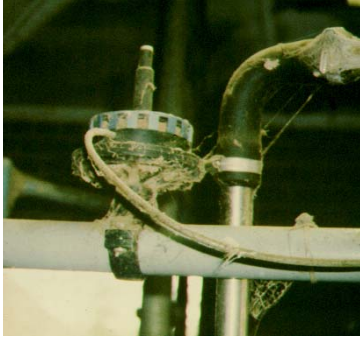
1. Job is to maintain stable vacuum on the system
2. Highest sensitivity if sensor located close to sanitary trap
3. Servo type regulator best



Filtered Air for Regulators



Poor Regulator Maintenance



Inflations

The Only Component
of the Milking System
to Actually Touch the
Cow

Inflations

1. Don't over use
-Milking vs Washings
2. Select correct type
3. Silicone vs Rubber
4. Generic vs
Manufacture

Inflations



Pulsation

Test Function of all
pulsators
By Making Graphs

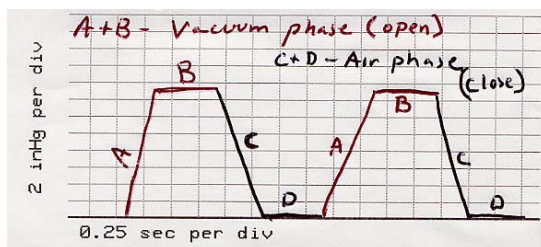
Results Are Not Reliable
Without a Graph to
Evaluate

Pulsation

When inflation is open,
milk will flow

When the inflation is closed,
milk will not flow AND
The teat end is massaged

Pulsation Graphs



Pulsation: Open and Closed NOT Milk and Rest!!!

Pulsation

D phase critical to teat end
health and total udder health

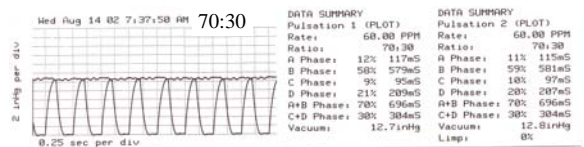
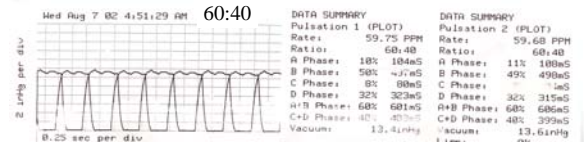
Need minimum of
20% or 200 milliseconds

Pulsation

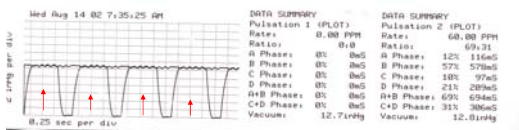
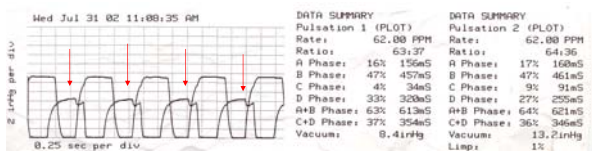
Alternating Pulsation Gives a Positive Edge to Best Cows

Have Pulsation System Checked Regularly (Minimum 1X year)

Pulsation Graphs



Pulsation Graphs



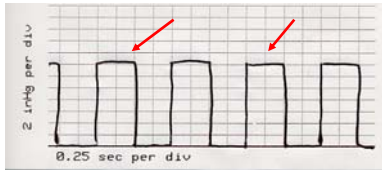
↑ ↓ What's Wrong?

Pulsation Graphs



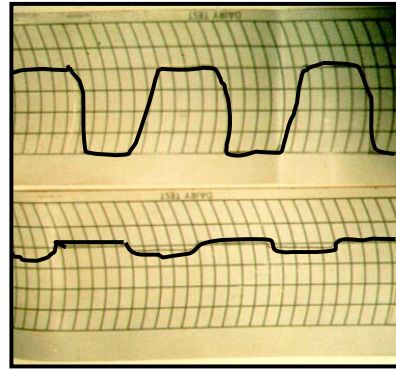
○ What's wrong?

Pulsation Graphs



What's wrong?

Poor Pulsator Function



Poor Pulsation Function



Malfunctioning Pulsation

Can Cause Trauma to Teat Ends
Can Cause Behavioral Change

Milking System Air Flow Analysis

**Use NMC Protocol
ASAE Standards**



Recovery Test

- ✓ Return in 3 Seconds or Less
- ✓ Should See Less Than 0.5 Inches (2 kPa) of Override



System Evaluation Unit Fall Off Test

**One Fall Off for 32 Units
Two Fall Offs for Over 32 Units**

**Do Unit Fall Off On Opposite Side as
Where Vacuum is Measured**

**Should See Less Than 0.6 Inches
(2 kPa) Drop at Receiver Vacuum**



System Evaluation Unit Fall Off Test

**One fall off per person milking
may be a better option especially
in small parlors**



**System Evaluation
Unit Fall Off Test
ER=1860 liters, 16mm Milk Hose**

One Teat Cup Off = 720 liters (57%)
Second Teat Cup Off = 360 liters (29%)
Third Teat Cup Off = 120 liters (10%)
Fourth Teat Cup Off = 60 liters (4%)



**System Evaluation
Effective Reserve**

Need 40 cfm (1200 liters) plus
1 cfm (30 liters) per milking unit

Systems now sized on effective
reserve and not pump capacity

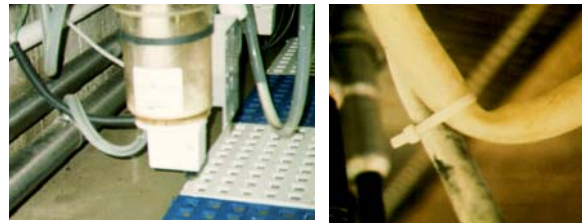


Restrictions In Milk Flow

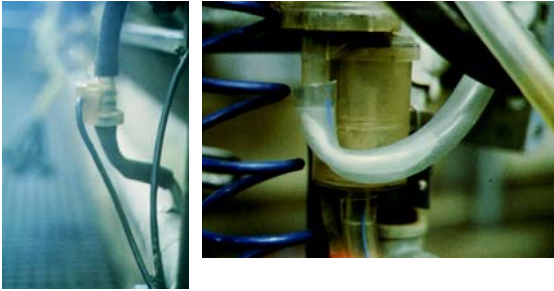
- ⌘ Must Be Avoided
- ⌘ Cause Slower Milking
- ⌘ Cause More Fluctuation
- ⌘ Increase Risk Of Mastitis
 - Especially Staph Aureus
 - Environmentals



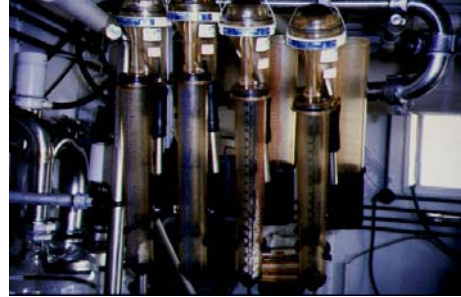
Milk Flow Restrictions



Poor Rubber Condition



DHIA Testing A Problem?



Do you raise your system vacuum?

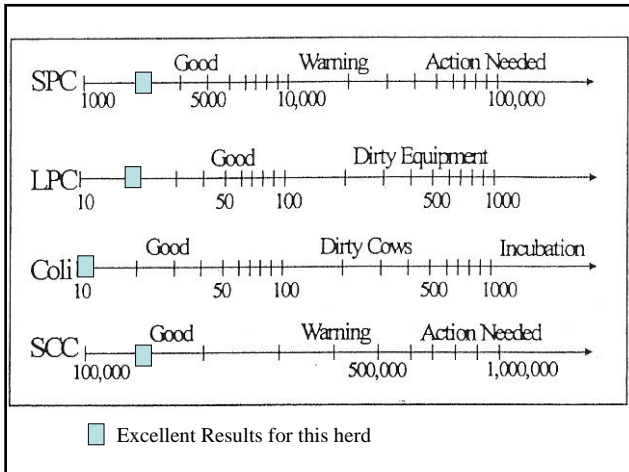
Common Source Of Fresh Cow Mastitis



Restrictive Bucket Lids

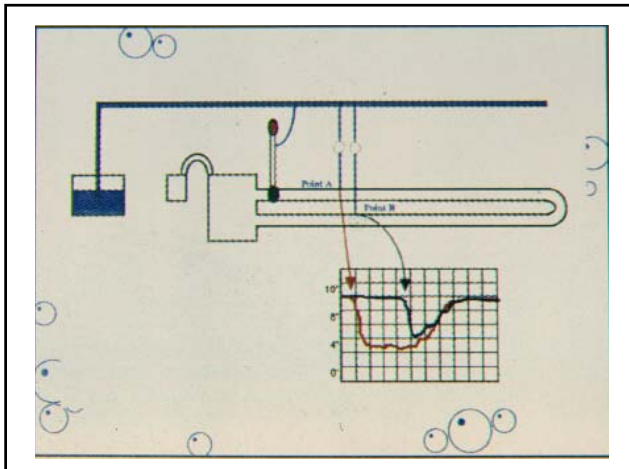
System Cleaning

A very important part of
Quality Milk



What Are We Cleaning

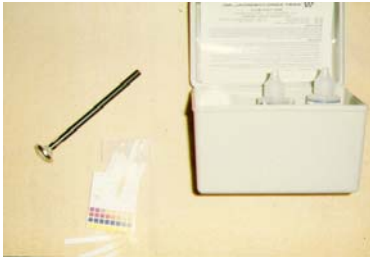
- 1) Milk Sugar - Soluble in Warm Water
- 2) Butterfat - Soluble in Alkaline Detergent
- 3) Protein - Soluble in Chlorine
- 4) Salt & Water Mineral - Soluble in Acid



Slug Evaluation



Measure pH To Check The Proper Dilutions of Chlorinated Alkaline Cleaners or Acid



The Most Successful Milk Quality and Udder Health Programs

- 1) Keep cows clean, dry, and comfortable
- 2) Utilize full hygiene programs
- 3) Use both somatic cell testing and culturing as monitors
- 4) Know the pathogens they are dealing with
- 5) Know the epidemiologic control methods for the pathogens they find

Milk Quality Programs

- ☞ Opportunity to Work with Veterinarian to improve your milk quality
- ☞ More complete system of measurement and evaluation

Milk Quality Program Goals

- ☞ More “clean cows”
- ☞ More saleable milk

REMEMBER

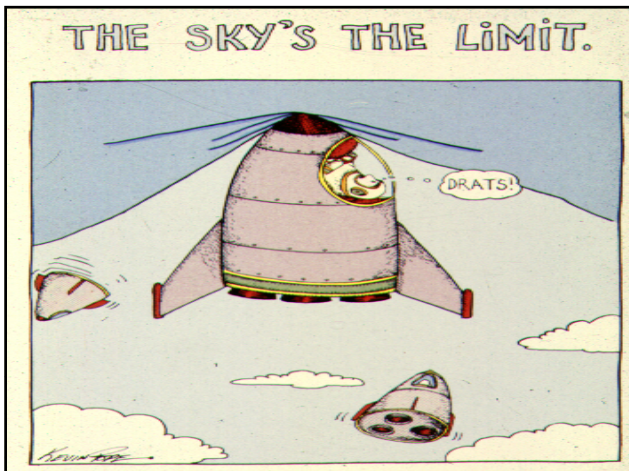
Your Local Veterinarian is
the source of your quality
milk information

USE THEM!!



**If you always do what
You have always done**

**You always get what
you always got!**



Sometimes ... when you cry ... no one sees your
tears ...

Sometimes...when you are worried....no one sees
your pain...

Sometimes ... when you are happy ... no one sees
your smile ...

But fart just one time...



