MAKING QUALITY MILK

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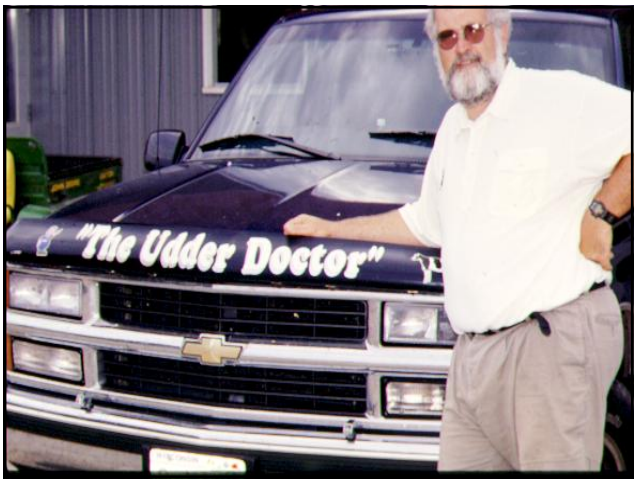
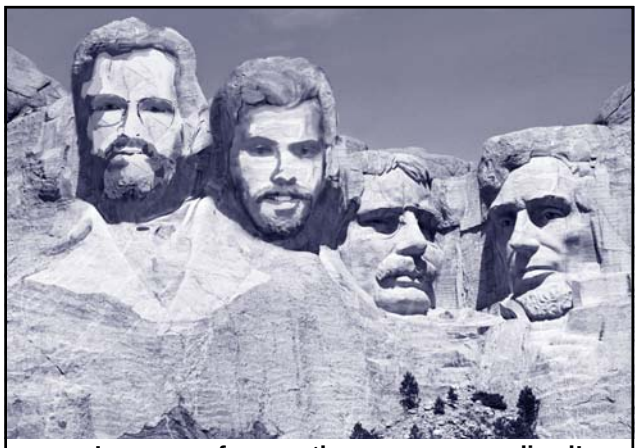


The Udder Doctor

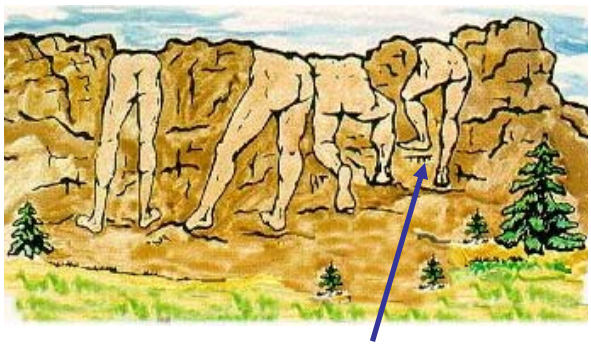
Work on milk quality
in 26 countries and 45 states

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

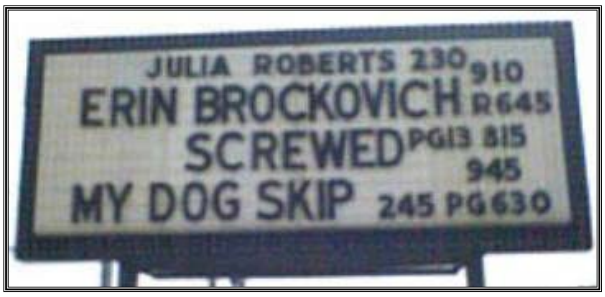
My Office, Small but practical!



I am more famous than you even realized!



Most people say it is my best view!!!



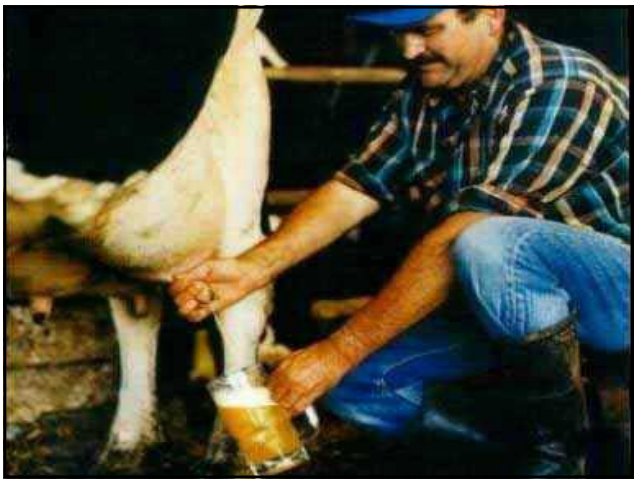
SUNDAY AFTERNOON ON THE DAIRY

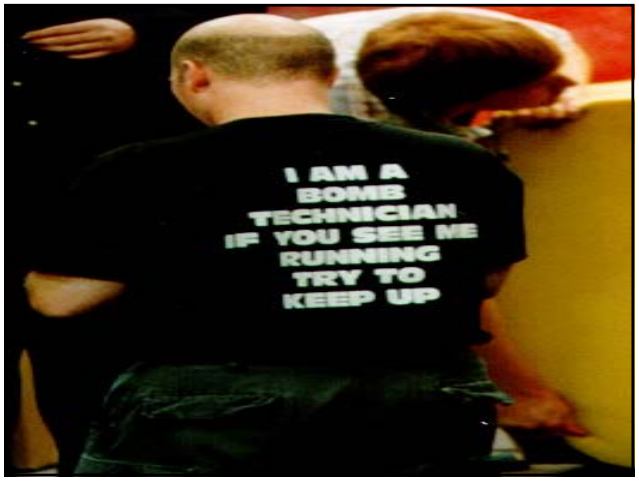
Dairy Farmers on Packer Game Day

New Symbol for Choking

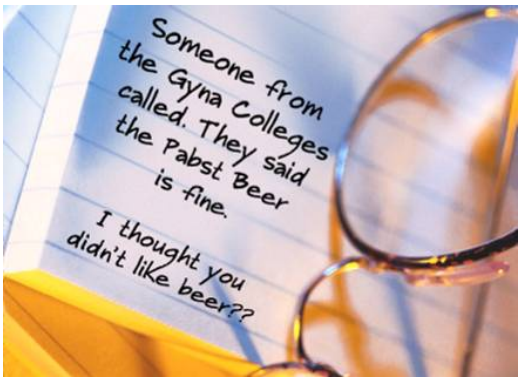
Old Symbol

New Symbol

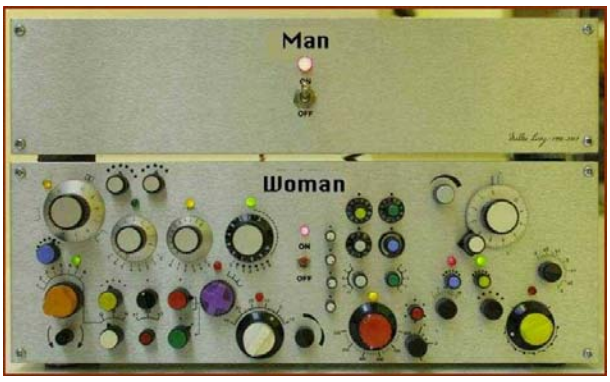




Why Men Should
NEVER
Take Messages
for Their Wives!!

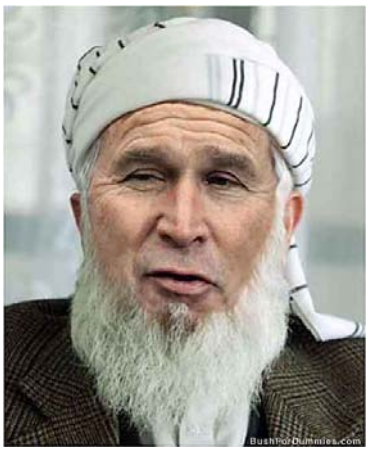


The Difference Between Men and Women



WHO SAID EATING SUBWAY HELPS YOU LOSE WEIGHT

What If the USA Lost the War in Iraq???



The Dairy Industry Is Changing Rapidly

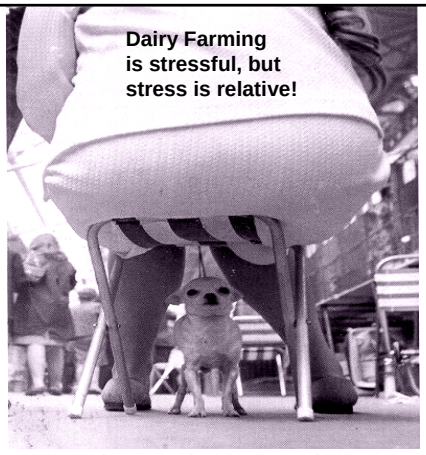
You Need to Change to Stay Competitive

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.



...AND YOU THINK YOU HAVE STRESS..

The Quality of Milk is Determined at the Dairy

LISTEN TO THE COW!

They always tell the truth or the real story!!

Listen To The Cows

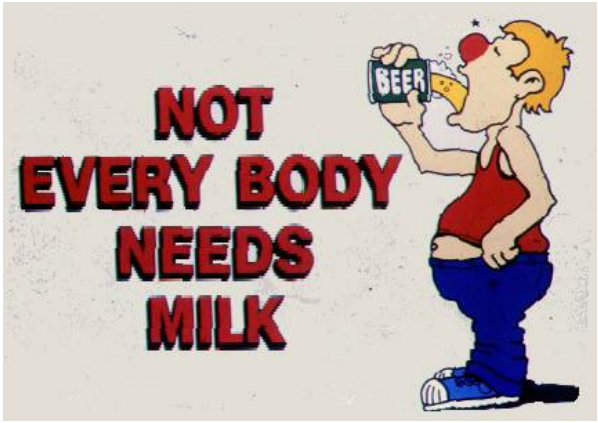
1. Won't enter the parlor

2. Won't lay down in stalls

3. Swollen legs, hocks or injuries

4. Don't like to have teats touched

Why Low SCC Is So Important!!



"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

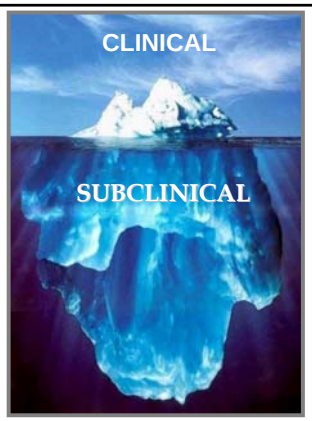
Reality

Mean or Average SCC

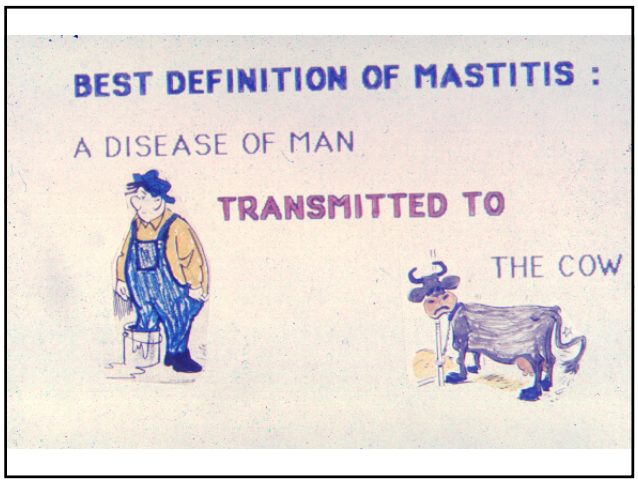
Countries	cells/ml
Switzerland	112,000
Norway	125,000
Finland	129,000
U.K.	160,000
N.Z.	180,000
West Germany	195,000
Sweden	200,000
Denmark	247,000
East Germany	276,000
Ireland	300,000
Japan	300,000
U.S.	350,000
Israel	382,000

* K.L. Smith, OSU

Clinical Mastitis



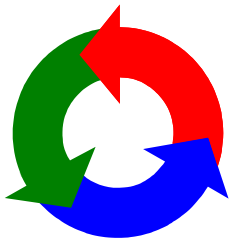
It is the subclinical mastitis that robs you blind!



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!!!

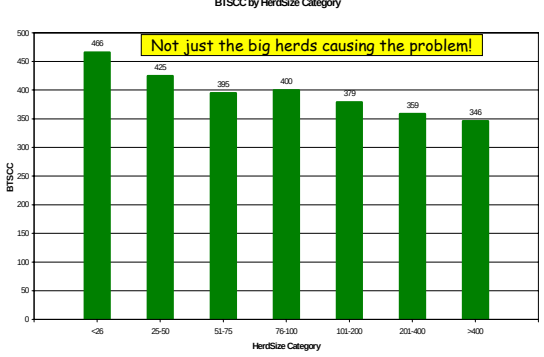
What's Happening to SCC's*

- **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**

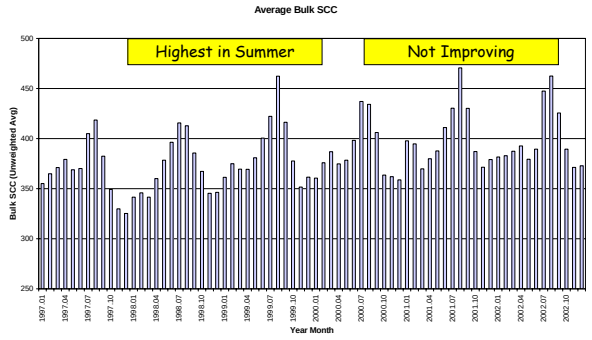
DHIA Test Day Averages

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?

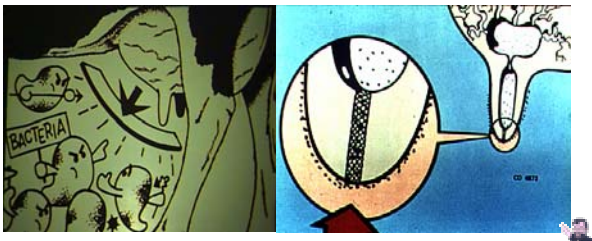
Somatic Cell Counts

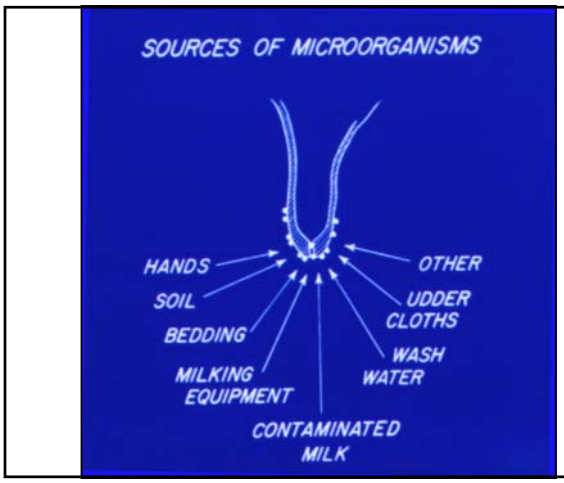
- **Certainly the higher the Somatic Cell Count is the lower the expected milk production from the cow (herd)**
- **Somatic Cell Counts are a response to damage in the udder (most often caused by bacteria)**
- **High S.C.C. follow infection**
  - **i.e. after the cause**
- **More enlighten discussions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

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





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)

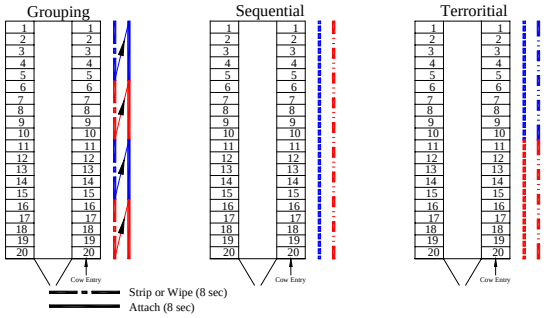
- Timing too long
  - –Most common
  - –Prep next cow after unit attachment of previous cow
- Proper timing
  - –When cow milking almost done, then strip and predip next cow.

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



Each color represents a different worker

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

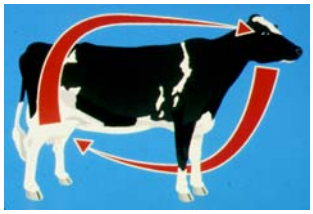
“Milkability”

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

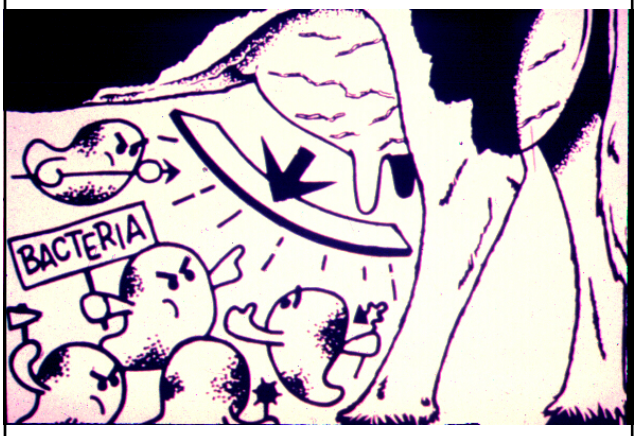
Poor Advice

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.

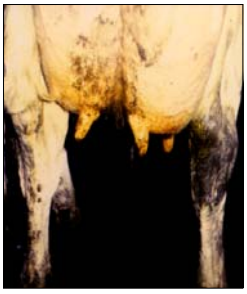
If teats are stripped after predip, too much predip may be removed so less bacteria killed.

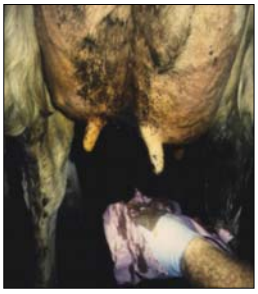
Pre-Dipping

- **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

Alterative 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

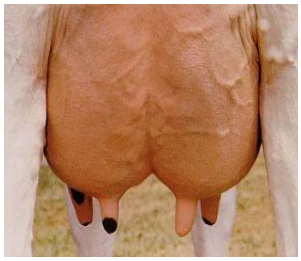
Udder Prep

Best You Can Do Is Reduce Bacteria By 85%

1,000,000 Bacteria At Start

150,000 After Cleaning

100,000 Bacteria At Start



15,000 After Cleaning

Toweling

- **Proper**
  - **- removes water**
  - **- removes soil**
- **Improper**
  - **-redistributes filth**
  - **-can spread pathogens**

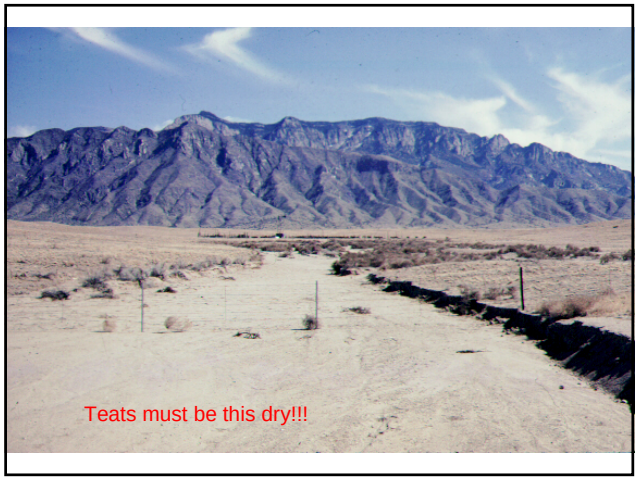
Proper use of towels + or ≈ one towel per cow

Drying Teats

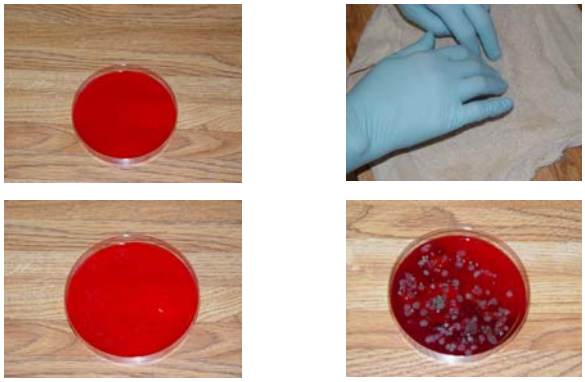
* **Every Drop of Water That Goes on the Udder Must Come Off**
* **Bacteria Can't Walk, but They Can Swim**
* **Once Teats are Wiped Dry, Keep Your Hands Off!**
* **Number One Step for Reducing Bacteria Numbers on Teats**

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



Towel Monitoring



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

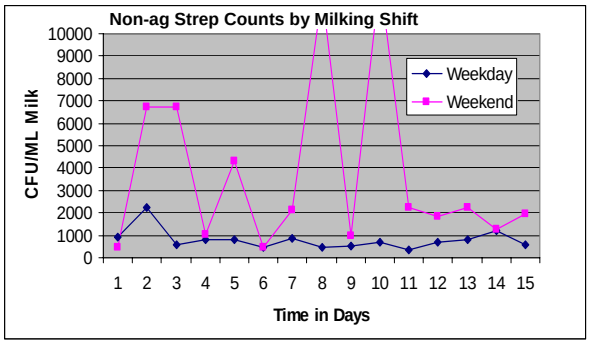
Environmental Bacteria Counts in Milk Line Samples

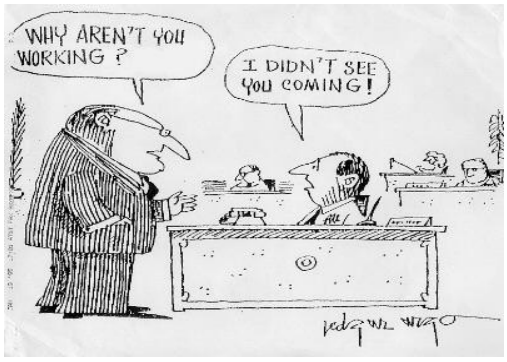
Date/Shift	Non-ag Streps cfu/ml	Coliforms cfu/ml
10/11/02		
Shift 1	1,340	860
Shift 2	600	140
Shift 3	550	250
10/12/02		
Shift 1	2,880	810
Shift 2	800	310
Shift 3	3,200	430
10/13/02		
Shift 1	1,668	450
Shift 2	850	153
Shift 3	960	235

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

Good Parlor Alignment

Better Approach To Unit Alignment – Vertical and Horizontal

Better Approach To Unit Alignment – Vertical and Horizontal

Poor Tie Stall Alignment

Unacceptable Unit Alignment

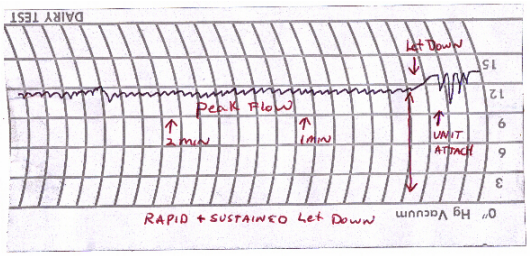
PROPER HOSE ALIGNMENT

Keeping hoses together allows for better alignment

PROPERLY STIMULATED COWS

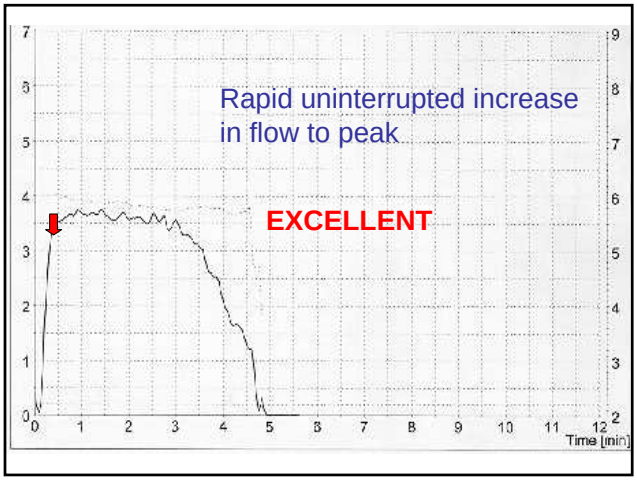
Excellent Let Down

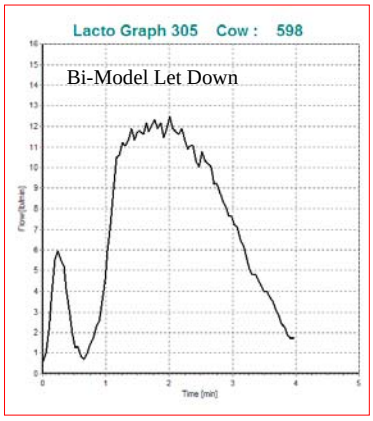
Good Let Downs



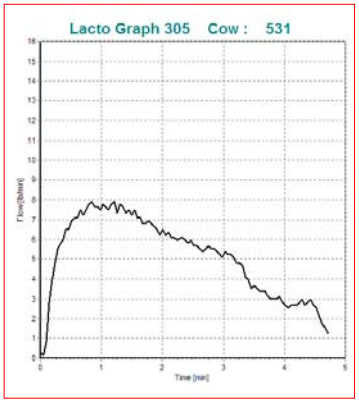
Good Prep Equals Faster Milking

Lactocorder

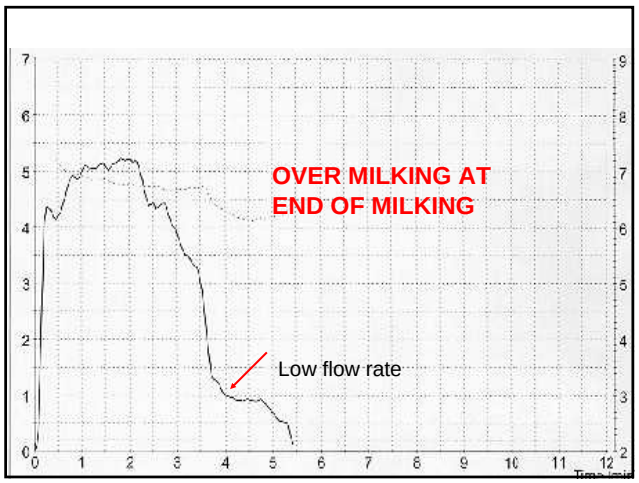


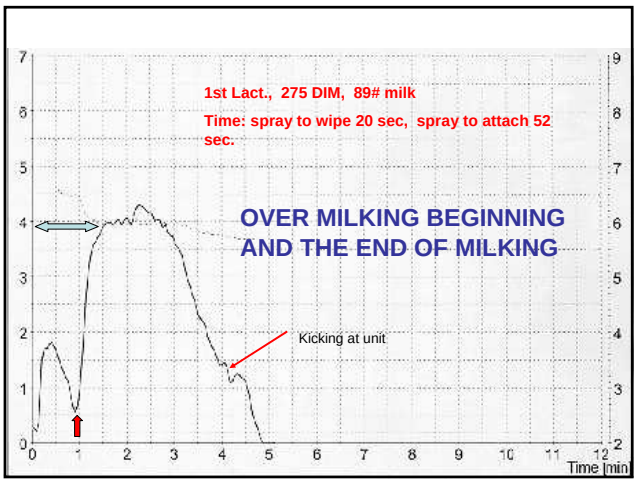


Poor initial letdown with only cisternal dump.



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!

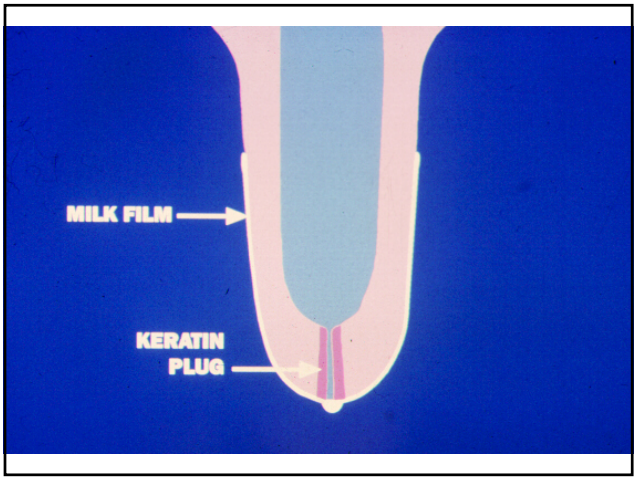
Teat Dipping Rules

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


PRE-GOLD

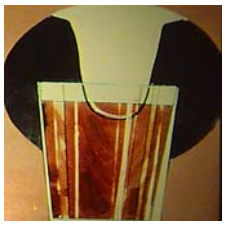
Teat Dipping

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

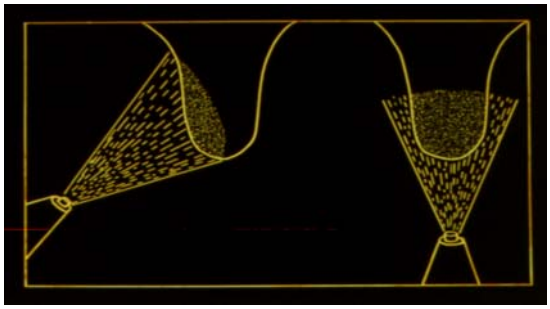
Teat Dipping

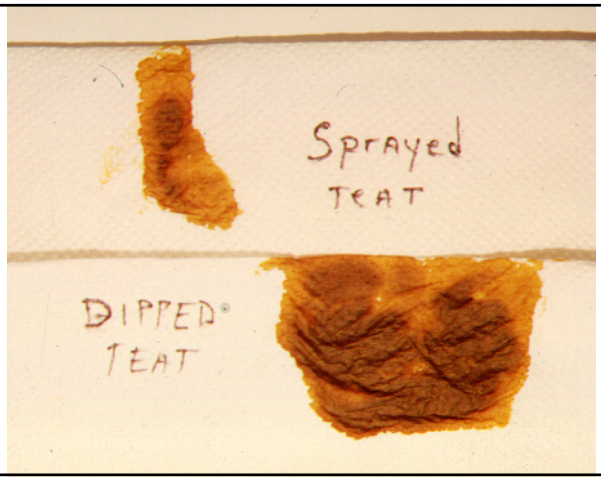
Squeeze Method

Teat dipping is superior over teat spraying

Dipping reduces usage & results in better coverage of teats.

Proper teat dip application does not include spraying!

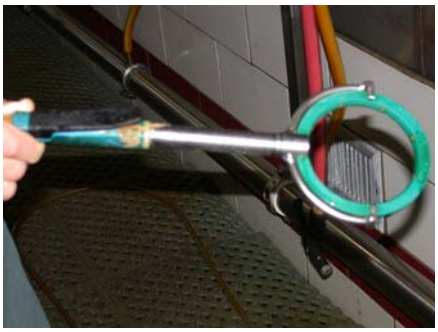




Economics of **Dipping vs Spraying**

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 gargot
3. Medium brown, some gargot
4. Medium brown, lot gargot
5. Dark brown, lot gargot

Might be some issues with teat cleaning??

Milk Filter Scoring

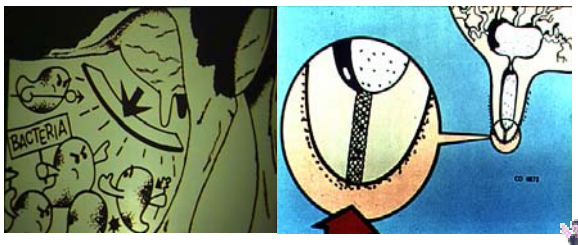
Poor milk filter scores tells us:

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
- Preferrably after each side of parlor
- Reduces risk of new infections
  - Environmentals and Mycoplasma

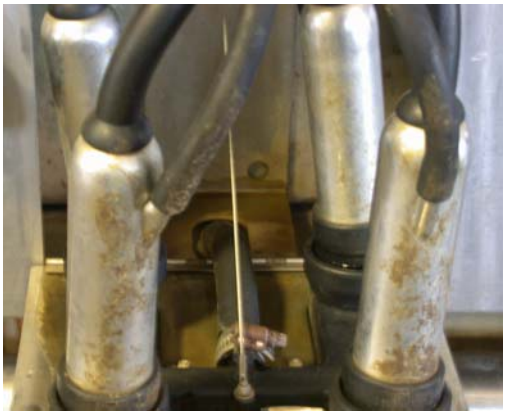
CLEAN STILL MEANS QUALITY

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 Jetters



Back Side of Units on Jetters

Unit Cleaning

Reduces clean up time and water use by 25%

Cows With Cleaner Udders Can Be Milked Faster!

Flaming Udders

Makes a Major Difference in Milk Quality and Parlor Performance

Flaming Udders

Flame Udders On Every Animal
When They Enter
The Pre-Fresh Group

Flame All Animals As Needed
During Lactation

The Super Torch

Parlor or Tie Stall Version

Stanchion Flaming

Parlor Flaming

Parlor Flaming

There's Always A New Way

Bad Place To Do Demonstration On Flaming!!

OOPS!!

Dry Period

Huge opportunity for all dairy farms

Data at least 30 years old

Data on low producing cows

Data on 2X Herds

*****

Dry Period

Where the next lactation is either enhanced or ruined.

It is time to take another look at how to manage this important group of animals

Dry Period

Biggest issue is animals giving too much milk at dry off.

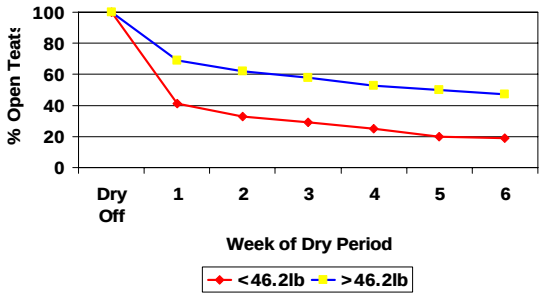
Common to see animals over 40 lbs at dry off.

Dry Period

Cows over 40 lbs of milk will have open teats for up to 80 days.

Open teats increase risk to new infections by 70%.

Impact of Production at Dry Off On Keratin Plug Formation



Production at dry off may be the biggest key in fresh cow mastitis!

Dry Period

Goal is to have less than 15% of the cows and heifers have an elevated SCC (>200,000) on first test.

Dry Period

Handling animals prior to dry off is nothing new. Dairy farms used to do it routinely.

This has become a forgotten practice on most dairy farms.

Dry Period

New approach to Days Dry

For years, a 60 day dry off was considered ideal. That was when cows were just cows.

Dry Period

42 Day Dry Period

- *** Four weeks far off**
- *** Two weeks close up**
- *** May be best option**

Dry Period

42 Day Dry Period

- *** Increase milking herd size**
- *** Decrease dry cow housing needs**
- *** Very successful**

Dry Period

28 Day Dry Period

- *** 1-2 weeks far off**
- *** 2-3 weeks close up**

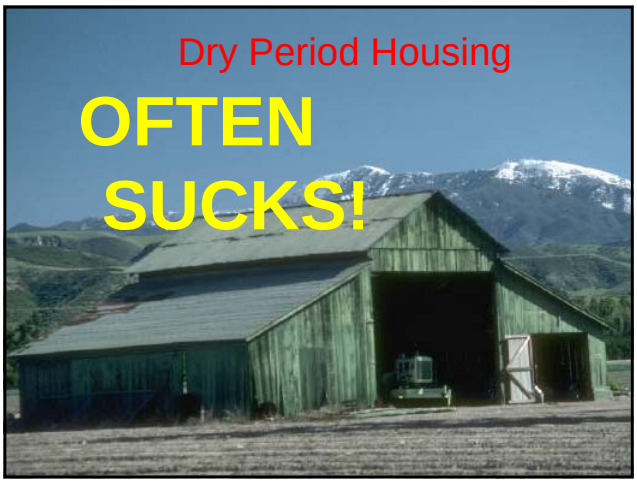
Short Dry Period 28 days

2004 University Idaho Study

- *** No difference in production**
- *** Colostrum Quality Same**
- *** No difference reproduction**
- *** BF same, Protein slightly higher**
- *** SCC no difference**

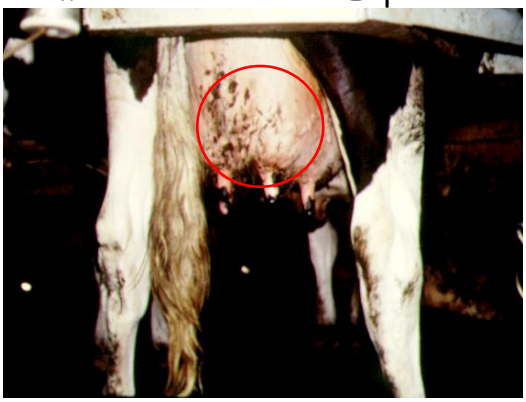
Effects of Mastitis on Milk Production

SCC AT DRY	SCC AT CALVING	Lost Production
Infected	Non-infected (cured)	11.3%
Infected	Infected (not cured)	33.2%
Non-Infected	Infected (new infection)	36.6%



Typical Dry Cow "Bedding Pack"

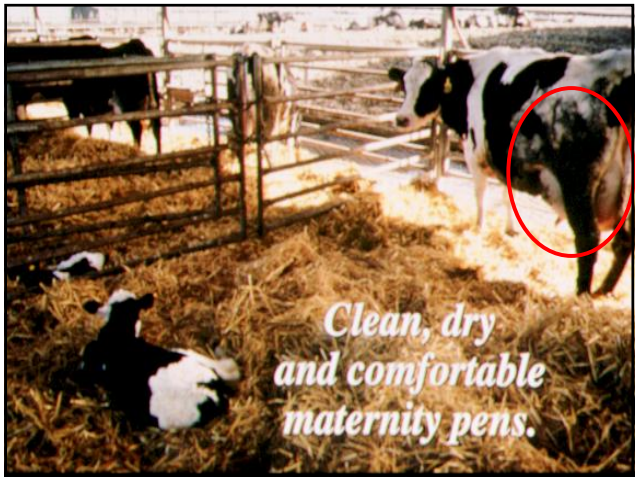
Contamination or Natural Exposure??



Pre-fresh Inoculation!!

Dry Cow Environment

Is there a better alternative?



Bedding Packs are Usually Manure Packs

- Do the knee drop test

Bedding Packs Require Lots Of Labor and Lots and Lots of Bedding

THIS IS NOT A BEDDING PACK, THIS IS A "SHIT" PACK!!!

Bedding Packs:

- 150 square feet per animal
- 16-17 square meter per animal
- Control bedding – remove pies

The Sooner Every Dairy Farm Understands There is a HUGE Difference Between Calving Pens and Pre-Fresh Packs,

The Better Their Milk Quality Will Be!

Calving Pens:

On less 2 hours prior to calving, off within 24 hours after calving.

All in and all out on bedding

UNDERSTANDING YOUR BEDDING

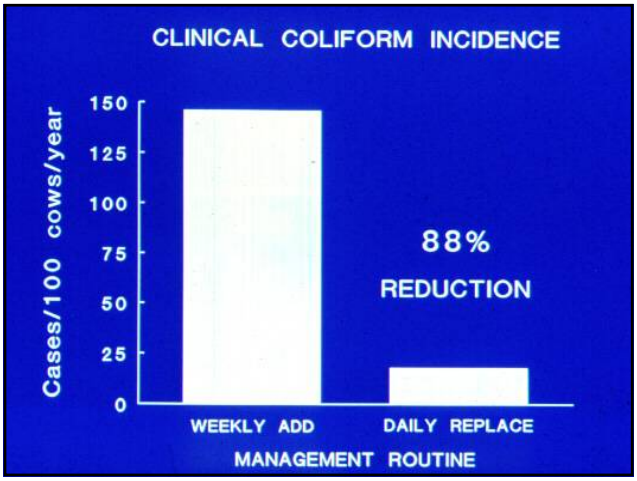
The more fines in the bedding,

The higher the bacteria numbers

As Bedding is Allowed to Build Up,

Environmental Bacteria Numbers Increase.

Changing Bedding Often is Best.



ADDING FRESH BEDDING TO OLD BEDDING IS LIKE ADDING GAS TO A SMOLDERING FIRE!

MIXING TWO BEDDINGS TOGETHER CREATES HIGHER BACTERIAL LOADS

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			
		161	41	202	
	NEW	17%	4%	21%	CHRONICS
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

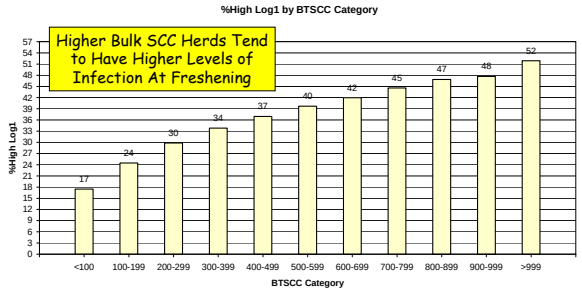
Staph Aureus is also common

Heifer Mastitis Control

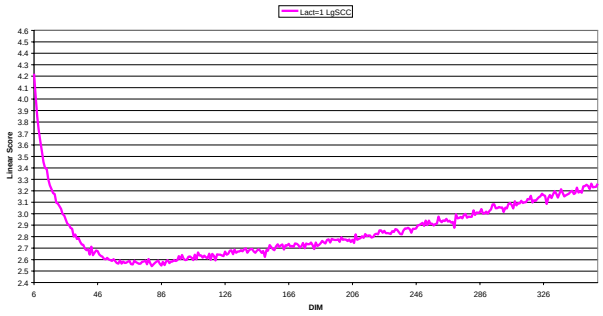
What is SCC at First Test? Should be less than 4.0

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**

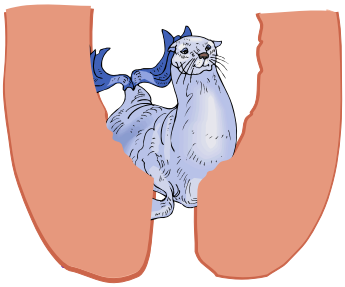
- **Internal**

EXTERNAL TEAT SEALS

External Sealants
Should Be Applied:

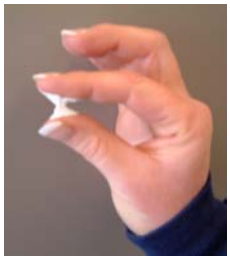
- After Dry Treating.
- When enter pre-fresh
- When enter calving pens

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**
  - **Of 19 quarters x-rayed, all had Orbeseal present in base of teat sinus at 100 days dry**

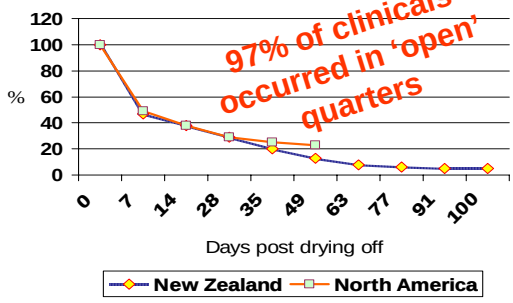
Woolford et al., 1998

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 MinnesotaResults

- 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

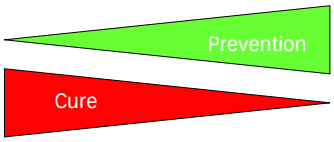
- Used WITH a Dry Cow Antibiotic
- Why:
  - More infected cows in the herds (Hi BTSCC)
  - No easy way of differentiating uninfected cows at dry off
    - Less DHIA individual cow SCC data –
  - Reduces the risk associated with poor infusion technique
  - Simplicity at dry off

Other

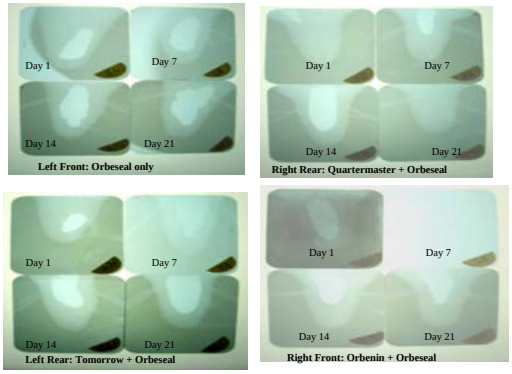
- Safety
  - no bismuth in blood after imm infusion
  - bismuth not orally absorbed by humans
  - has no effect on dairy starter cultures
  - neonatal calves unaffected by 16g of bismuth
- Tolerance
  - 1x and 2x dose result in a small (<82,000) transient increase in SCC
  - No impact on milk production

DCT and Orbeseal Synergy

Dry Cow Antibiotics	Orbeseal
Treats G+ IMI	Prevents new G+/G- IMI
Antibiotic	Physical Barrier
Persists <3 weeks	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**

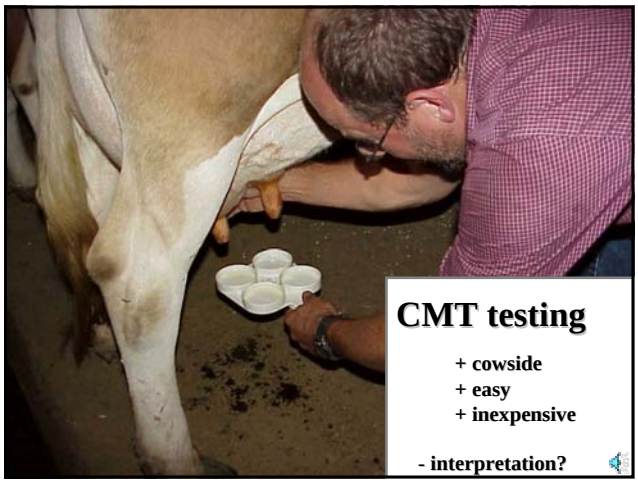
Conclusion

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

Fresh Start Program

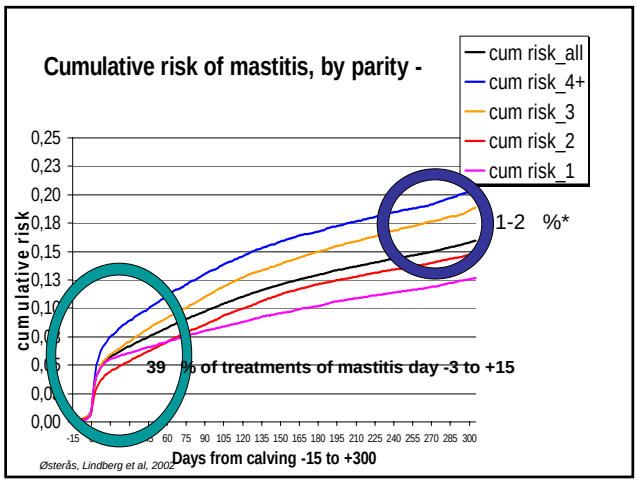
Check every fresh animal with CMT paddle at day 2-3 after calving.

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

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

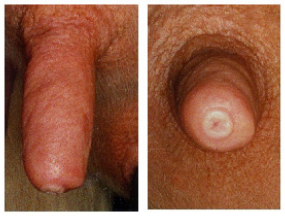
Over Milking

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!

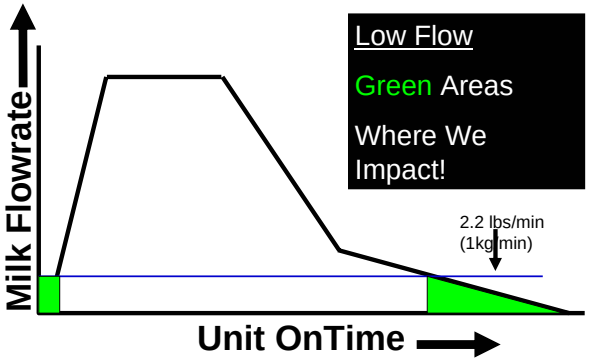
Shit Sleeve Index

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

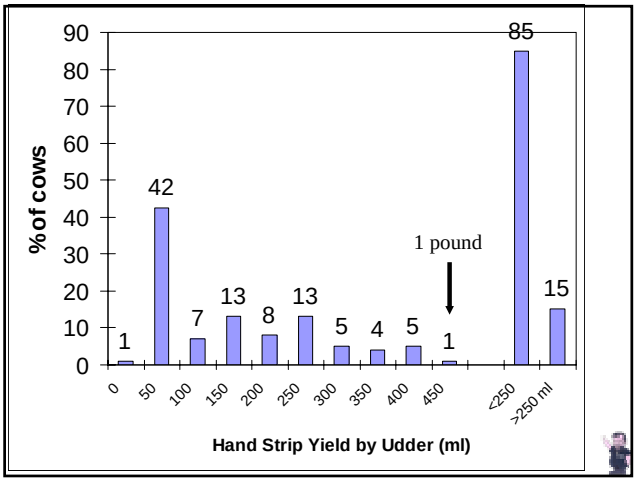
Milk Outs

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 >100mlmilk**
  - **Less than 500 ml evenly divided in whole udder when machine comes off**
    - **Most use 250 ml as acceptable level**

The Machine

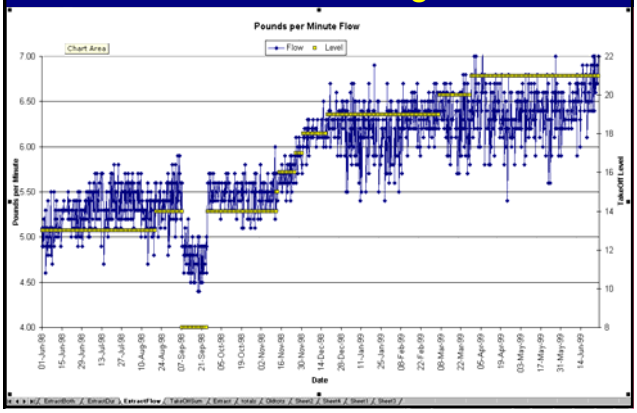
Milk Outs

Doing strip yields will teach you

and the farmer a lot about the milking of cows.

Improper alignment is very obvious.

Flow Rate Changes



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

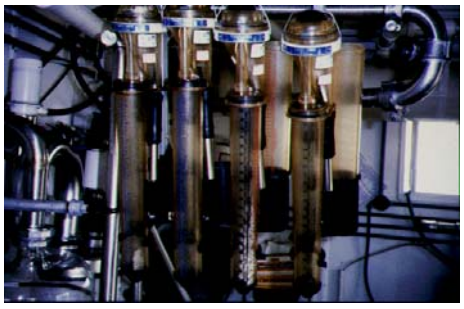
Need system vacuum at least 1 inch higher with ATO than without ATO to have the same claw vacuum

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

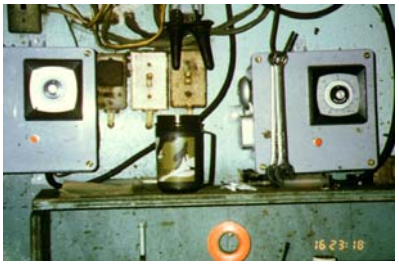
It may be time to upgrade your system for faster milking!

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!

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**

Q-MAX Program

- **Q-MAX is the key mastitis platform**
- **Opportunity to Work with Veterinarian to improve your milk quality**
- **More complete system of measurement and evaluation**

Q-MAX Goals

- More “clean cows”
- More saleable milk

Q-MAX Economics

- Spreadsheet to evaluate your dairy’s milk quality opportunity

REMEMBER

Your Local Veterinarian is the source of your quality milk information

USE THEM!!

Water is Wealth

Water is Wealth

Every New Facility Should Have Water Meters To Monitor Water Intakes!

Water Intake Meters:

An absolute must on every dairy farm.

Water is Wealth

Normal Daily Need Of Milk Cow

25-35 gallons/95-133 liters

(More if hot weather or cow is high producing)

Water Space

2 – 2.5 Inches Per Cow

Crossover Less Than 12 feet Limits Feed and Water Intake

Trough Space on Exit Lanes

24 inches of Water per Parlor Stall

Lack of Water Is A Key Reason for Low Milk Production

Lack of Water

Common Cause Poor Milk Production

Clean Water Supply

Poor Water Supply

Water At Parlor Exit Makes A Positive Difference

Water In Parlors Makes More Milk

New Water Cup Provides More Water To Cow

Water Cups Should Not Be On The Cow Side of Stall

Water is Wealth

Lack Of Water Pressure
A Major Problem In
Tie Stall/Stanchion Barns

Do Pressure Test Tonight

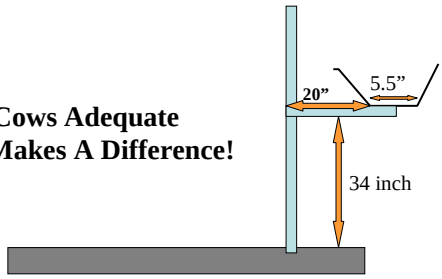
Improving Water Availability In Tie Stall Barns
PVC Pipe and Float A Low Cost Addition

Water Trough In Tie Stall Barns Increases Milk Production

5 Pound or 2.5 Kg Increase in Milk Production Each Day

Water is Wealth

Giving Cows Adequate Water Makes A Difference!



Water is Wealth

Water is Wealth

Water is Wealth

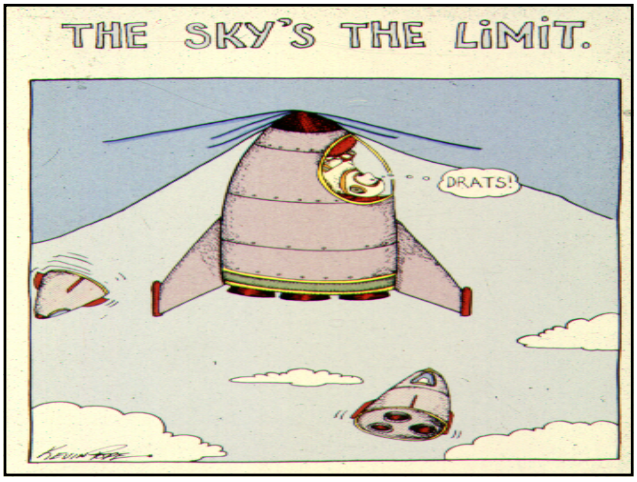
Poor Water Fountain

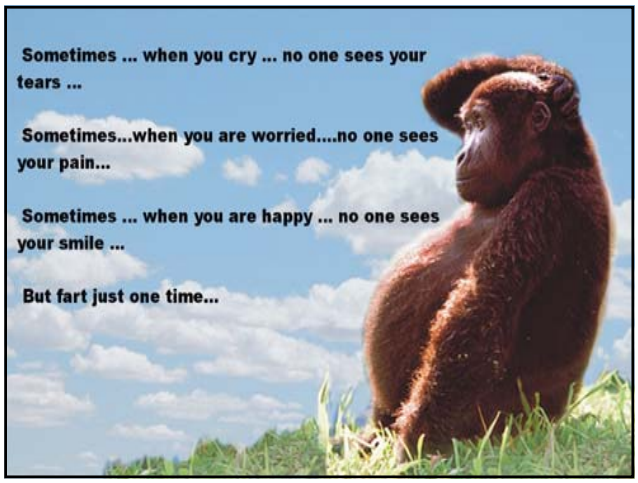
IMPROVING FORAGE QUALITY

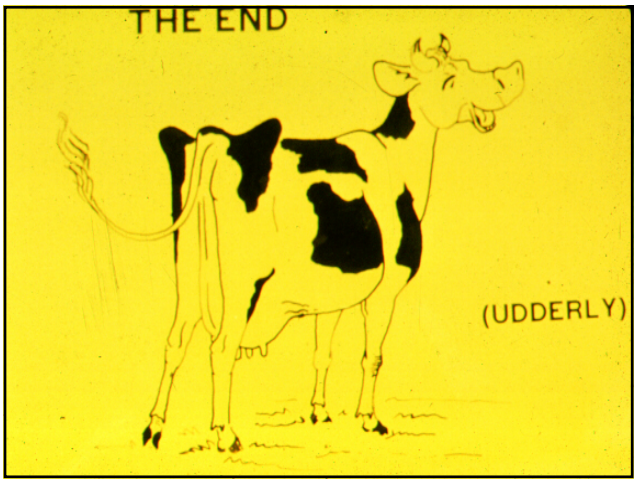
Plastic lining of bunkers will reduce spoilage and protect over all feed quality.

If you always do what
You have always done

You always get what
you always got!







THANK YOU FOR YOUR ATTENTION!

Tru-Blu Duster Ihm Gem (Record Production 2 year old)
2 yr 3 mo 365 days 61,030 lbs Milk 2,368# BF (3.9%) 1930# Pro (3.2%)

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

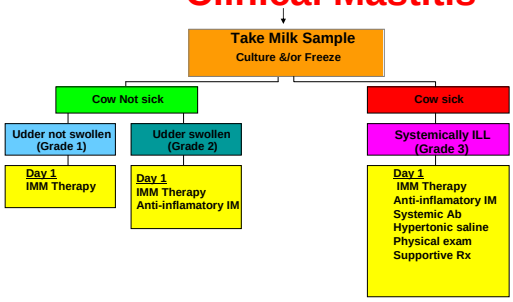
Clinical Mastitis
Grading System

- 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

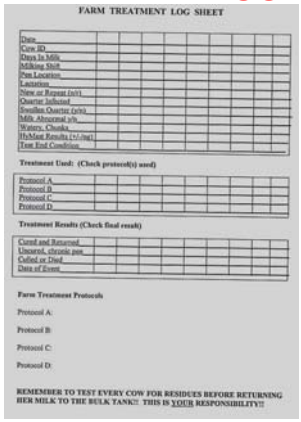
Pre-Moistened Towels

- 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

How Will Treatments Be Recorded?

- Clinical Mastitis Evaluation and Treatment Record
- Milk & Dairy Beef Quality Assurance Program
- Customized treatment records

TREATMENT RECORDS



FARM TREATMENT LOG SHEET

Date
Cow ID
Days In Milk
Milking Shift
Pen Location
Lactation
New or Repeat (n/r)
Quarter Infected
Swollen Quarter (y/n)
Milk Abnormal y/n
Watery, Chunks
HeMast Results (+/-/mg)
Test End Condition

Treatment Used: (Check protocol(s) used)

Protocol A
Protocol B
Protocol C
Protocol D

Treatment Results (Check final result)

Cured and Returned
Uncured, chronic poor
Culled or Died
Date of Event

Farm Treatment Protocols

Protocol A:

Protocol B:

Protocol C:

Protocol D:

REMEMBER TO TEST EVERY COW FOR RESIDUES BEFORE RETURNING HER MILK TO THE BULK TANK!! THIS IS YOUR RESPONSIBILITY!!

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

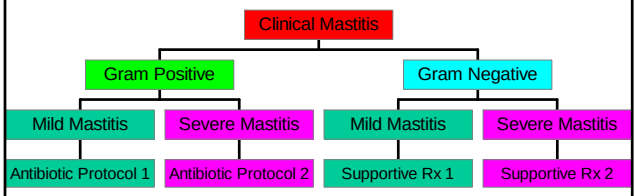
Mastitis Treatments

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

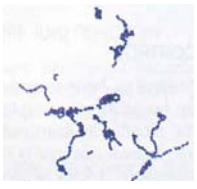


Bacteria Causing Mastitis

- **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

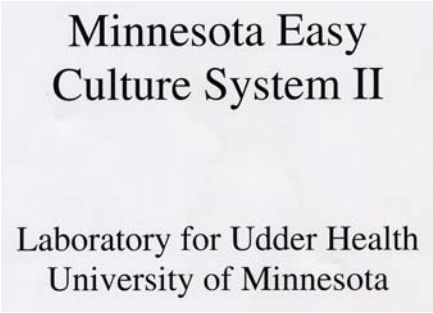
Identifying the Agent(s)

- **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**

Bulk Tank Testing Reliability

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

On Farm Culturing



Minnesota Easy Culture System II

- **Based on principal that a limited number of agents cause the majority of udder infections**
- **These bacteria can be grown with relative ease**
- **Media can be used to selectively allow the growth these agents**
- **Compare growth obtained to photographs to identify the bacteria**

Equipment Needed

- Dedicated space
- Incubator (Nasco)
- Person willing to do the work
- Data management system

On Farm Culturing

On Farm Culturing

On Farm Culturing

On Farm Culturing

On Farm Culturing

On Farm Culturing

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

Vet Clinic OR On Farm 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 On Farm 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**

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

Who Should Culture On Farm?

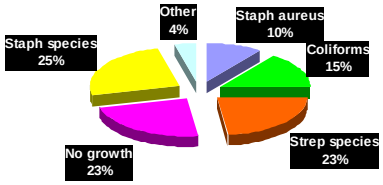
- **Any dairies**
- **Those dairies who are experiencing 4-6 mastitis cases per week**
- **Those who have a commitment to culturing clinical mastitis cases, recording results and willingness to make changes**
- **Those dairies who would do enough to feel confident in results interpretation**
- **Monitor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

Incubation Times for Common Mastitis Pathogens

Organism	Time
Streptococci	24 to 48 hours
Staphylococci	24 to 48 hours
Gram-negative bacteria	24 to 48 hours
Arcanobacterium	48-72 hours
Corynebacterium	48-72 hours
Yeasts	24 to 48 hours
Gram-positive bacilli	24 to 48 hours

Bacterial Isolates from 35,658 Individual Cow Cultures

60-85% of Mastitis/SCC Problem is Due to Environmental Pathogens



Minnesota Tri-Plate

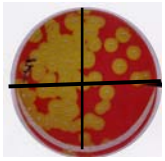
- Great on farm tool
- Economical, easy and quick
- Separate Gram positive from Gram negative bacteria
- Limited ID of bacteria

Dr. Russ Bey: 612-625-7053, 612-625-8111

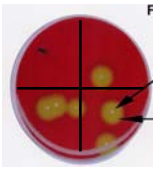
Minnesota Tri-Plate

Dr. Russ Bey: 612-625-7053, 612-625-8111

Economical Option



TKT Plate



Factor Plate

MacConkey Plate

Each plate can culture up to four cows.

Poor Man's Screen
MacConkey Plate

- **Very Low Cost**
- **Easy and quick**
- **Identifies only Gram negative bacteria**
- **If growth, don't use antibiotics**

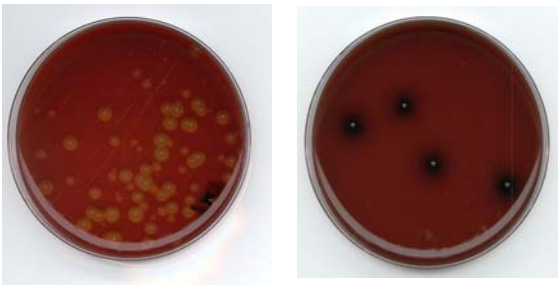
Poor Man's Screen
MacConkey Plate

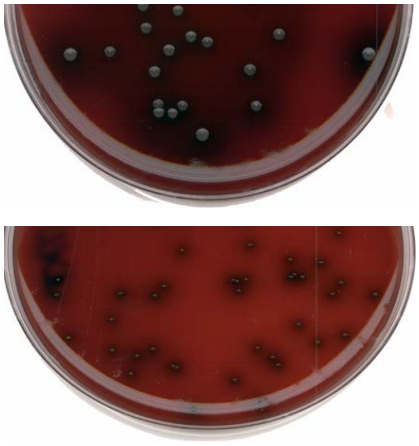
ONLY GROWS GRAM NEGATIVE BACTERIA
Up to four cows on one plate (less 25 cents per cow)

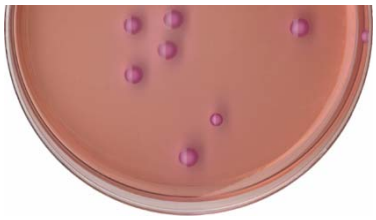
Staphylococcus species

Staphyloccus aureus

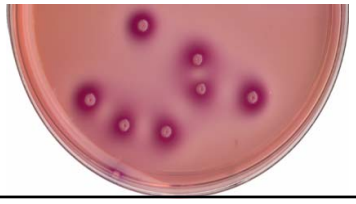
Plate Reading Strep. Growth Only







Klebsiella speccies



E.coli

Number of Mastitis Cases

- **Average 38 cows in hospital pen for mastitis per week on antibiotics**
  - **15 *E.coli* or *Klebsiella species***
  - **16 No growth**
  - **4 Enterococcus**
  - **3 *Staphylococcus aureus***

Number of Mastitis Cases

- **Two weeks later:**
  - **8 cows in the hospital pen for mastitis**
    - **5 *E.coli* or Klebsiella**
    - **2 No growth**
    - **1 Enterococcus**

On Farm Culture Evaluation

- **Dairy given plates and laboratory manual containing procedures and photographs of bacteria**
- **Cultured on farm, froze sample and submitted to Laboratory for Udder Health**
- **Bacteria isolated and identified using biochemical tests**
- **Dairy submitted their organism identification**

Accuracy of On Farm Culture

Organism	Vet on Staff	Farm manager + Vet 3x/wk	Limited trained tech (Vet on staff)	Summary
Staph. aureus	49/49 (100%)	80/90 (89%)	10/10 (100%)	139/139 (100%)
Staph. spp	77/78 (98%)	81/83 (96%)	83/83 (100%)	241/244 (99%)
Non-ag streps	80/80 (100%)	64/90 (71%)	91/94 (97%)	235/264 (89%)
Coliform	53/53 (100%)	80/90 (89%)	71/73 (97%)	204/216 (94%)
St. ag	5/5 (100%)			5/5 (100%)
No growth	10/10 (100%)	28/32 (88%)	57/60 (95%)	95/102 (93%)

Summary

- On farm culture of mastitis cases is feasible
- On farm culturing may reduce antimicrobial use by 20%-80%
- Does reduce animal suffering
- May be used to monitor pre-milking cow preparation