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This month's article:

Making Decisions Regarding the Balance Between Milk Quality, Udder Health ,and Parlor Throughput

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New Mexico State University Extension Dairy Website:
http://www/nmsu.edu/~dairy

The following videos are available for checkout from New Mexico State University. To obtain a video call Kathy Bustos, (505) 646-3326 or kbustos@nmsu.edu and the video will be sent in the mail, pending availability. There is only one copy of each video available, so we request that videos be returned within two weeks. Note that four of the videos contain an English and Spanish version.

1. The Milking School. Utah State University. Spanish and English. 30 minutes
2. Fitting and Showing Your Dairy Animal....A Winning Experience. Department of Dairy Science, University of Wisconsin. 20 minutes
3. Proper Milking Procedure. University of Florida. Spanish and English. 12 minutes
4. Milking Machine Maintenance. University of Florida. Spanish and English. 16 minutes
5. The Basics of Vacuum and Milking Systems. DHIA Services, 1991. 53 minutes
6. Understanding Dairy Cattle Behavior to Improve Handling and Production. Livestock Conservation Institute, 1992
7. Managing Milking/Ordenar Lecheria. Spanish and English. 1999. 33 minutes
8. Get Milk! Joining A Dairy Crew. University of New Hampshire, 1999. 45 minutes

Need to Calculate Production Costs?

University of Wisconsin dairy farm management specialist, Gary Frank, has developed a Excel spreadsheet to calculate variable cost of production and total cost of production. To access the spreadsheet, go to http://www.wisc.edu/dairy-profit, click on Decision Making Tools, then go to costcwt.xls.

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Making Decisions Regarding the Balance between Milk Quality, Udder Health, and Parlor Throughput

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Introduction

As today's dairy industry consolidates, cows are being milked more rapidly through larger milking parlors on larger dairies than ever before. Because milk is the primary commodity and source of income for producers, the harvesting of milk is the single most important job on any dairy. Producing high-quality milk to maximize yields and economic value requires effective parlor management, an enormous challenge for producers. Managing large parlors includes managing labor, milking equipment, as well as monitoring and evaluating parlor performance. Decisions concerning the milking center are some of the most complicated decisions a dairy producer has to make. Milking procedures, herd size, milking interval, the milk market, and the equity position of a producer influence these decisions. Producers will have to make the following decisions before they can select or develop management protocols for a milking parlor:

1. How many cows will be milked through the parlor?
2. What milking procedure will be used (minimal or full)?
3. If a full milking routine; how much contact time do you want (strips per teat)?
4. Which milking routine will be used (sequential, grouping, or territorial)?
5. Are you willing to train teams of milkers to operate large parlors?

This paper will discuss the factors to consider when developing, selecting, and implementing a milking procedure and/or routine.

Options for Milking Procedures and Routines in Parallel and Herringbone Parlors

Typical milking parlor terms:

Prep time–time taken to manually clean and dry the teat surface.

Contact time–the actual time spent manipulating/touching teats and is the source of stimulation for oxytocin release.

Prep-lag time-time between the beginning of teat preparation to the application of the milking machine.

Milking Procedures–the individual events (i.e. strip, pre-dip, wipe, attach) required to milk a single cow.

Milking Routines–define how an individual milker or a group of milkers carry out a given milking procedure (minimal or full) over multiple cows. In parallel and herringbone parlors; there are three predominant milking routines (grouping, sequential, and territorial).

Grouping Milking Routine–In a grouping routine the operator performs all the individual tasks of the milking procedure on 4-5 cows. Once they have completed a group of cows they move to the next group of available cows.

Sequential Milking Routine–Operators using a sequential routine split up the individual tasks of the milking procedure between operators and work as a team. Operators work as a team following each other performing their individual tasks.

Territorial Milking Routine–Milkers are assigned units on both sides of the parlor and only operate the units assigned to them. When a territorial routine is used milkers are not dependent on other milkers to perform specific tasks.

The two predominant milking procedures are minimal (strip or wipe and attach) and full (pre-dip, strip, wipe and attach). Milking procedures impact the number of cows per stall per hour in parallel, herringbone and rotary parlors. In large parallel and herringbone parlors cows per stall per hour were 5.2 when minimal milking procedures were used and 4.4 when full milking procedures were used. Cows per stall per hour declined from 5.8 to 5.3 when a minimal routine was used compared to a full routine in rotary parlors (Armstrong et al. 2001). In large parlors milking procedures have a dramatic impact on the number of units one operator can handle in parallel and herringbone parlors. In 1997, Smith et al. published guidelines for the number of units that one operator could handle using a minimal and a full milking procedure. When a full milking procedure was used a milker could operate 10 units per side and 17 units per side when using minimal milking procedures. These recommendations were based on allowing 4-6 seconds to strip a cow and attaching all the units on one side of the parlor within 4 minutes.

In recent years several milking management specialists have been recommending 2-3 squirts per teat (8-10 seconds) when stripping cows to increase stimulation and promote better milk letdown. Some of these management specialists believe that increasing the amount of stimulation reduces unit on times. At this time a strong data set supporting this theory does not exist. An AABP research update reported by Rapnicki, Stewart, and Johnson (2002) indicated that milk flow rate decreased when cows that had been previously stripped were no longer stripped. If this is implemented, producers will have to reduce the number of units one operator can manage per side (Table 1). The sequencing of the individual events of the milking procedure is critical. Rasmussen et al. (1992) reported an ideal prep-lag time of 1minute and 18 seconds. Prep-lag times of 1-1.5 minutes are generally accepted as optimal for all stages of lactation. Some of the advantages and disadvantages of minimal and full milking procedures are listed in Tables 2 and 3.

Table 1. Time (seconds) Required for Individual Events of the Milking Procedure.

Event	Procedure		
	Minimal*	Full	Full with 10 sec Contact Times
Strip	4-6	4-6	10
Pre-dip		6-8	6-8
Wipe	6-8	6-8	6-8
Attach	8-10	8-10	8-10
Total	12-18 seconds	24-32 seconds	30-36 seconds

*Strip or wipe and attach

Table 2. Advantages and Disadvantages of a Minimal Milking Routine.

Compromises teat skin sanitation
Successful when cows enter the milking parlor clean and dry
"Machine on-time" may be prolonged
Steady state throughput is increased.
Time required to milk the herd may be decreased (total milking time).
May require milkers to decide when extra cleaning of dirty teats is required
Can cause lower milk quality and higher mastitis when compared to "full hygiene"

Table 3. Advantages and Disadvantages of a Full Milking Procedure.

Maximizes teat sanitation and milk letdown
Use 4 separate procedures or can combine into two or three procedures
Use when maximum milk quality results are the goal
Minimizes "machine on-time"
Results in lower cow throughput or higher labor cost compared to "minimal" or "none"
Requires milker training to maximize results

Three predominant milking routines are used in parallel and herringbone parlors (sequential, grouping, and territorial). These milking routines are presented in Figure 1. The use of territorial routines will reduce throughput 20-30% when compared to sequential routines (Smith et al. 1997). Grouping routines seem to be an alternative to sequential routines without sacrificing throughput. Sequential and grouping routines are demonstrated in Figure 2. Both full and minimal milking procedures in rotary parlors are presented in Figure 3. Although it is difficult to determine the "Best" procedure and routine for every dairy, it is possibly more difficult to get employees to understand and follow the recommendations of management.

Rotary Parlors

Entry time (seconds/stall), number of empty stalls, number of cows which go around a second time, entry and exit stops and the size of the parlor (number of stalls) influence the performance of rotary parlors. The entry time will determine the maximum number of cows that can be milked per hour. For example if the entry time is 10 seconds, the maximum throughput will be 360 cows per hour (3600 seconds per hour / 10 seconds per stall = 360 cows per hour). This is referred to as theoretical throughput.

Theoretical throughput assumes that the parlor never stops, cows are milked out in 1 rotation and a new cow occupies every stall at entry. In reality, there are empty stalls, cows that go around a second time and times when the rotary table is stopped. Table 4 shows rotary parlor performance at different percentages of theoretical throughput. As the number of empty stalls, cows making a second trip around, and number of stops increases the percent of theoretical throughput is decreased.

Table 4. Rotary Parlor Performance (Cows per hour)

			% of Theoretical cows/hr		
Time (sec/stall)	100%	90%	80%	70%	60%
8	450	405	360	315	270
9	400	360	320	280	240
10	360	324	288	252	216
11	327	295	262	229	196
12	300	270	240	210	180
13	277	249	222	194	166
14	257	231	206	180	154
15	240	216	192	168	144
16	225	203	180	158	135

The number of stalls or size of the rotary parlor affects the available unit on time. Table 6 lists available unit on time for different sizes of rotary parlors at different rotation times. A rotary parlor must be large enough to allow approximately 90 percent of the cows to be milked out in one trip around the parlor.

Training and Motivating Employees

Since cows are milked by the employees in a dairy, employees are the most important resource of a dairy. Managers are responsible for employee training and development, and employees, in turn, are accountable to management. **Team Work** is defined by Webster as "*joint action by a group of people, in which individual interests are subordinated to group unity and efficiency*". **T**ogether **E**veryone **A**chieves **M**ore! To have a team working environment, it must be clear who makes up the team and what each member of the team's role is. The most effective way to identify team members and their role within the team is to have a flow chart of every job on the dairy (Figure 4).

A flow chart should clearly define the chain of command within the team, and, who is **accountable** for each and every member of the team. If a member of the team answers directly to more than one person, the chart organization should be re-visited.

The milking parlor is the heart and soul of any dairy. Harvesting quality milk requires more than just milkers in a parlor. Typically a shift supervisor or leader will be directly responsible for the milking during their shift. Cow pushers bring cows to the parlor to be milked and return them to their pens. In some parlors, cow pushers play a role in the milking routine used to milk the cows. Spreadsheets and other tools may be incorporated to monitor the daily activities in and surrounding the milking parlor.

The most important aspect to training and communicating effectively to employees are through **Standard Operating Procedures** (SOPs). SOPs provide a clear understanding of responsibilities of a specific job and they prepare employees to succeed. Each SOP should have a specific set of objectives associated with it. In other words, if the SOP is followed precisely, employees will be very successful, ultimately contributing to the overall success of the dairy farm. Designing jobs (with input from employees) to be effective yet simple thus allowing each employee doing the same job to perform equal amounts of work will minimize employee turnover and improve labor efficiency. Well designed SOPs **fit the person to the job, not the job to the person**. Standard operating procedures should be written (in the language of choice) and given to all employees prior to performing a job. It is also beneficial to have SOPs posted in plain site in each work area for everyone to see.

Other Considerations

What about forestripping every cow every milking? Some say "**No time to prep**" others say "**No time <u>not</u> to prep**". Currently the authors do not know of any published data that suggests additional forestripping speeds up parlor throughput. Stewart et al. (2002) reported a 10.2 to 15.6 second reduction in milking time per cow when automatic cluster removal settings were increased. Average milk flow per minute increased 0.11 to 0.42 lb/minute, and milk production was not negatively impacted. Thus suggesting that increasing automatic cluster remover settings represents an opportunity to increase parlor performance.

Although often a challenge for large dairies, **it is NECESSARY to forestrip milk from teats to detect clinical mastitis**. Some dairies have chosen to strip cows intermittently (once a week or as needed) with a herdsperson or lead milker. Others have chosen to forestrip two groups of cows per day, thus on a dairy with 10 pens, all cows would be forestripped at least once every five days. If 0.5% of a herd has clinical mastitis, and each case last 5 days, then only 0.1% of the herd will be diagnosed each day. Which means, in a herd with 1,000 cows milked 3 times per day it would be necessary to forestrip 12,000 teats to detect one new case of mastitis (W. Nelson Philpot, Ph.D., professor emeritus Louisiana State University, and President of Philpot and Associates International, Inc.).

By **identifying the mastitis causing microorganism**(s) your cows are infected with (by taking samples to a proven milk quality laboratory) you can improve prevention and treatment. In addition, laboratories can expose other problems such as cows not being sanitized properly during milking, cows being milked wet, poor maternity housing/bedding management, or heifers calving with mastitis. When taking milk samples from cows it is important to:1) minimize sample contamination during collection; 2) use a proven milk quality lab with an acceptable turn around time; 3) effectively communicating the information between employees and management; and

4) effectively utilizing the information to improve mastitis control and overall milk quality. Routine sampling of fresh cows and clinical cows in addition to bulk tank milk samples is warranted.

Monitor Parlor Performance

Everything revolves around the parlor. Because parlors are fixed assets, increasing their use increases profits. Milking cows 21 to 22 hours a day, depending on the time required for properly washing the system, makes the best use of this asset. Milking parlor performance has been evaluated by time and motion studies (Armstrong and Quick, 1986) to measure steady-state throughput (cows per hour). Steady state throughput does not include time for cleaning the milking system, maintenance of equipment, effects of group changing, and milking hospital strings. These efficiency measurement studies also allow us to look at the effect of different management variables on milking parlor performance. Some typical efficiency measurements are:

Cows per hour (CPH). The total number of cows milked in one hour.
Cows per labor hour (CPLH). CPH divided by the total number of milkers.
Milk per hour (MPH). The total amount of milk harvested in one hour.
Milk per labor hour (MPLH). MPH divided by total number of milkers.
Turns per hour (TPH). Also called parlor throughput. The number of times cows enter and exit a parlor in one hour.
Parlor throughput can be further broken down into several individual time measurements such as:

1. From exit of the previous group until the first cow is touched (only if forestripping before pre-dipping).
2. From exit of the previous group until the first cow is pre-dipped.
3. From pre-dipping to drying (check minimal "kill time").
4. From exit of the previous group until the first unit is attached
5. From exit of the previous group until all units are attached
6. From exit of the previous group until all units are detached
7. From when all units are detached until exit again

The authors believe the best way to evaluate the effectiveness of a procedure and routine used in the milking parlor is in the typical measurements of milk quality and udder health. **The results of a milking procedure are in the milk and the condition of the teats and teat-ends.** Although there are many ways to milk a cow, there are only a few readily accepted ways to measure udder health. If the above recommendations regarding employee management are followed, udder health should then be a factor of how an SOP is designed (**management & employees**) and carried out (**employees & management**). Since employees have considerable influence, the question of how to communicate and motivate them to high standards is a challenge.

Below are typical milk quality, udder health and general Clean In Place (CIP) sanitation measurements to consider when designing an incentive program (adopted from VanBaale et al. 2001).

Standard Plate Count (SPC). The SPC is the total quantity of viable bacteria in a millimeter (ml) of milk. The SPC is a reflection of the sanitation used in milking cows and the effectiveness of system cleaning. The production of high volumes of milk and the capacity to refrigerate milk quickly will assist in keeping the SPC low.
Employee Influence: The manner in which cows are prepared for milking.
Management Influence: The quality of water and the ability of the water heater to produce water of the appropriate temperature.

Laboratory Pasteurized Count. The LPC is a measure of bacteria that survive pasteurization. This group of bacteria has an influence on the flavor and shelf life of dairy products. The general sanitation of the CIP system and the condition of the rubber-ware can contribute to a high LPC.

Employee Influence: The manner in which cows are prepared for milking as well as attention to the condition of rubber goods and the wash-up.
Management Influence: The bacterial quality of the wash water and the choice of detergents and sanitizers.

Coliform Count (CC). The CC is a measure that reflects the extent of fecal bacteria exposure to milk. It may be direct, as in the case of milking dirty, wet cows, or it may be indirect, should coliform bacteria begin to multiply in the milking system.

Employee Influence: Employee hygienic practices have substantial control over the CC. The milking of clean and dry udders will limit exposure.
Management Influence: CC problems may be associated with a poor CIP system.

Preliminary Incubation (PI) Count. The PI count is a measure of bacteria that will grow well at refrigerator temperatures. The PI is controlled by strict cow sanitation and excellent system cleaning.

Employee Influence: Udder preparation and sanitation has a positive effect on the PI.
Management Influence: The efficacy of the CIP washing system.

Somatic Cell Counts (SCC). The somatic cell count on bulk tank milk and individual cow milk is a direct measure of the severity of mastitis (udder infection). The incidence and prevalence of the disease on the dairy is subject to a wide variety of factors. In general, the SCC reflects subclinical or nonvisible form of the disease.

Employee Influence: The manner in which the cows are milked can have a significant influence on the rate of new infections.
Management Influence: The condition of the cow bedding environment and the commingling of chronically infected cows with noninfected cows.

Clinical Mastitis. A proportion of mastitis infections become severe enough to become clinical. The clinical signs include changes in milk appearance and may include signs of disease in the animal as well. Milk from cows with clinical mastitis cannot legally be included in the commercial supply.

Employee Influence: Adequate teat dipping and thorough drying of the udder before applying the milking unit are practices that affect the rate of new infection.
Management Influence: Type of teat dip used, the condition of the cow bedding environment and the commingling of chronically infected cows with noninfected cows.

Teat and Teat-End Condition. The conditions of teats are a direct reflection of the cow's environment, teat dips being used, equipment settings, functionality, and up keep. In addition, the milking procedures and how well they are being followed impacts teat and teat-end condition.

Employee Influence: Adequately covering all of the teats, performing basic equipment checks and maintenance, and following a well designed milking procedure SOP to the letter.
Management Influence: Type of teat dip used, the condition of the cow bedding environment, implementing a well designed milk procedure and maintaining properly functioning equipment in the milking parlor.

If the above milk quality and udder health goals are being met, then the milking procedure and equipment being used is most likely acceptable. Additionally, teat condition and teat end scoring should be done on a regular basis to evaluate the health of the udder.

Regardless of the chosen routine and procedure it is critical to provide employees with regular feed back (daily or weekly) in the form of charts, graphs, or possibly report cards (Figure 5).

Conclusion

One procedure or routine will not meet the needs of all dairy producers. The true test of a milking procedure and routine is in the end results relative to milking quality, udder health, and parlor throughput. Productivity is determined by people, which includes the caliber of employees, their level of motivation, and the effectiveness of management. Managers must demonstrate interest in employees, meet with them regularly (at least weekly), provide feedback without attacking their ego (KPI report card), and be sensitive to cultural differences. A **TEAM** approach is critical to the success of an operation. Finally, clearly defined goals need to be established, monitored, evaluated, and re-evaluated.

Acknowledgements

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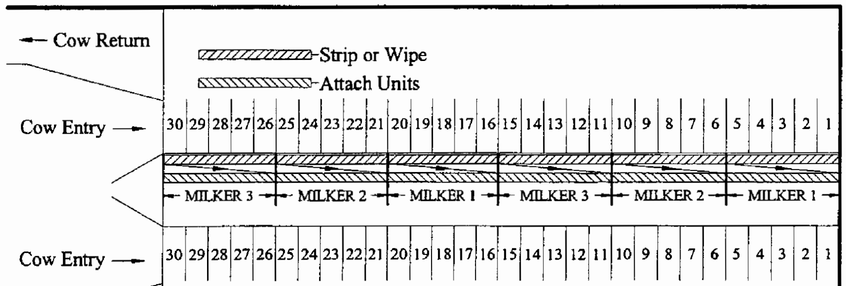
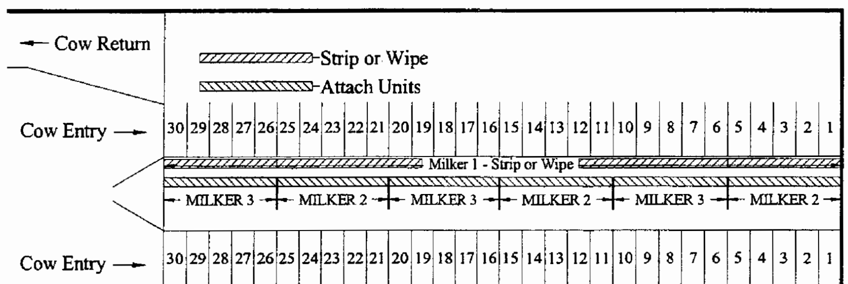
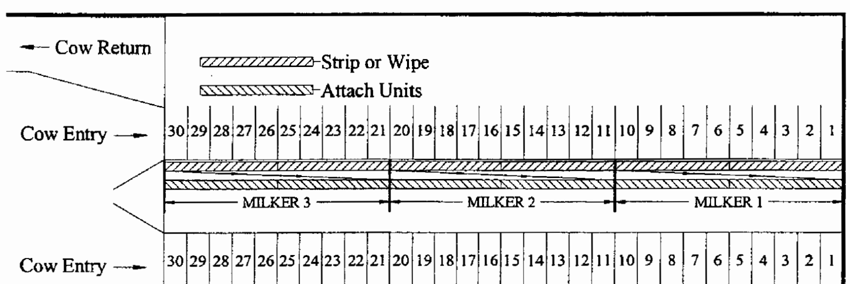
Figure 1. Different Milking Routines for Parallel and Herringbone Parlors



Minimal Routine - Grouping Routine
Double 30 Parallel Parlor (3 milkers)

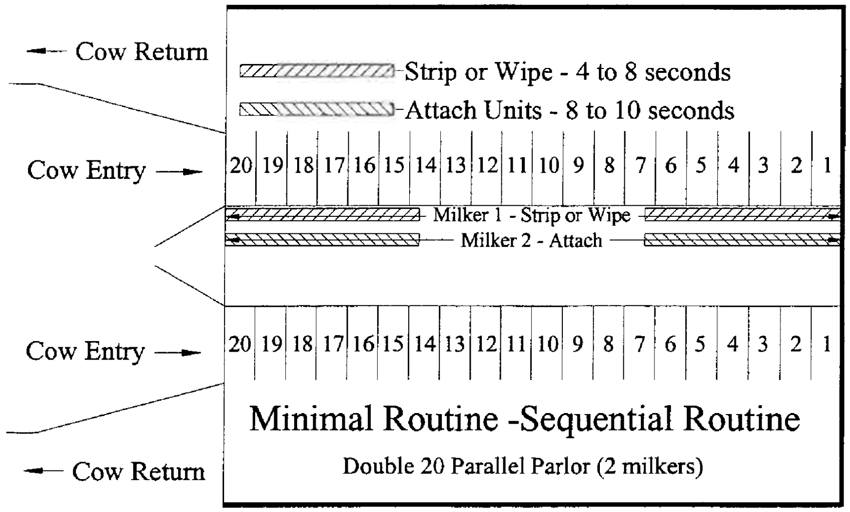


Minimal Routine - Sequential Routine
Double 30 Parallel Parlor (3 milkers)



Minimal Routine - Terroritial Routine
Double 30 Parallel Parlor (3 milkers)

Figure 2. Sequential Milking Routines for Double 20 Parallel Parlors Using Minimal or Full Milking Procedures



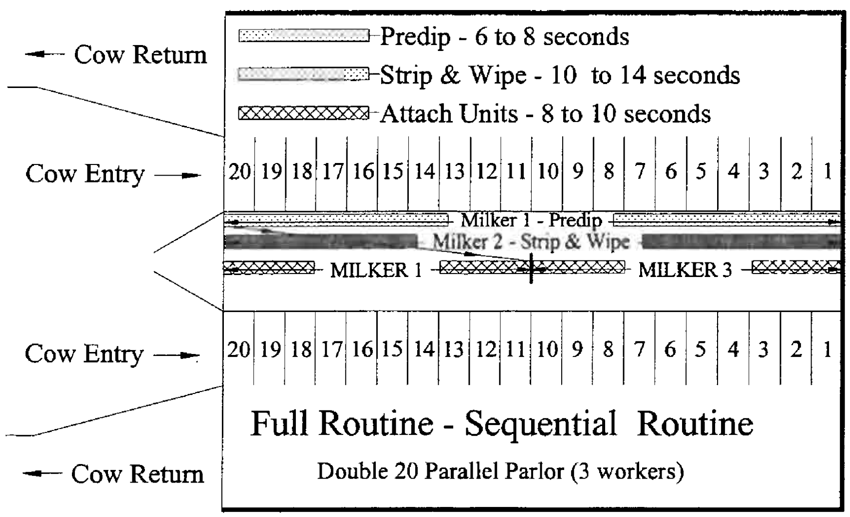
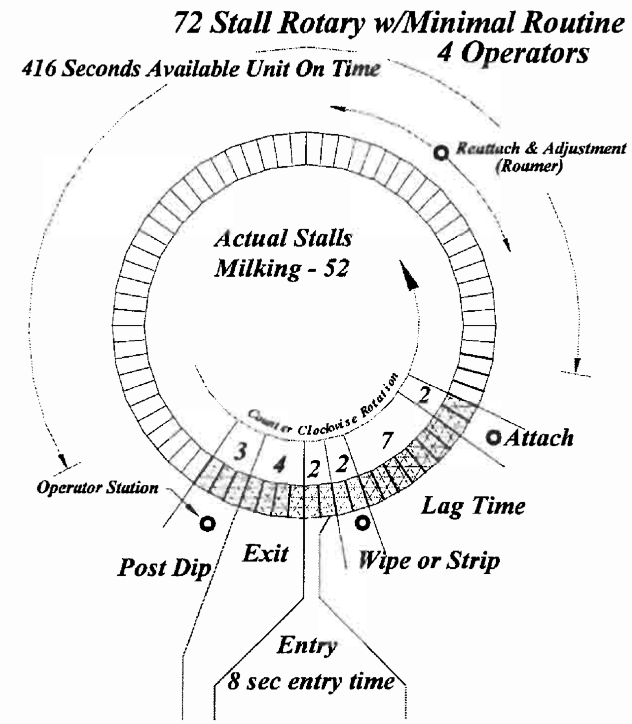


Figure 3. Minimal and Full Milking Procedures in Rotary Milking Parlors



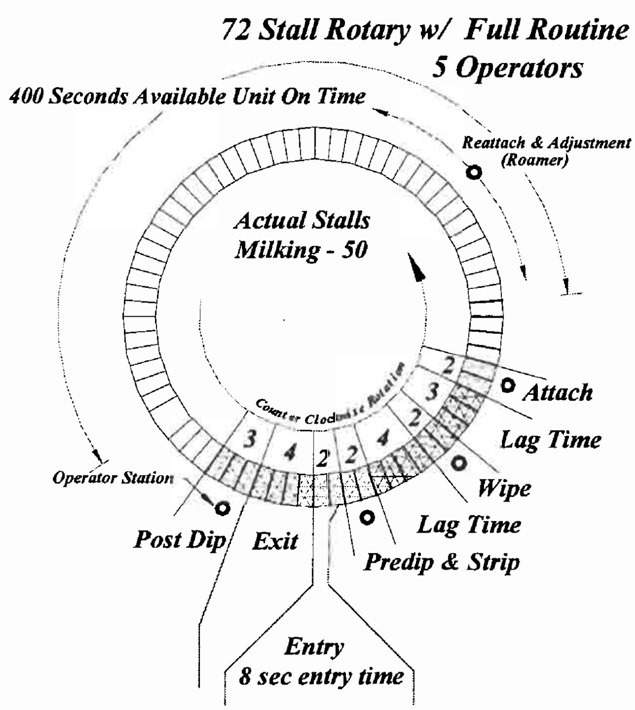


Figure 4. Flow Diagram for Stotz Dairy Buckeye, Arizona.

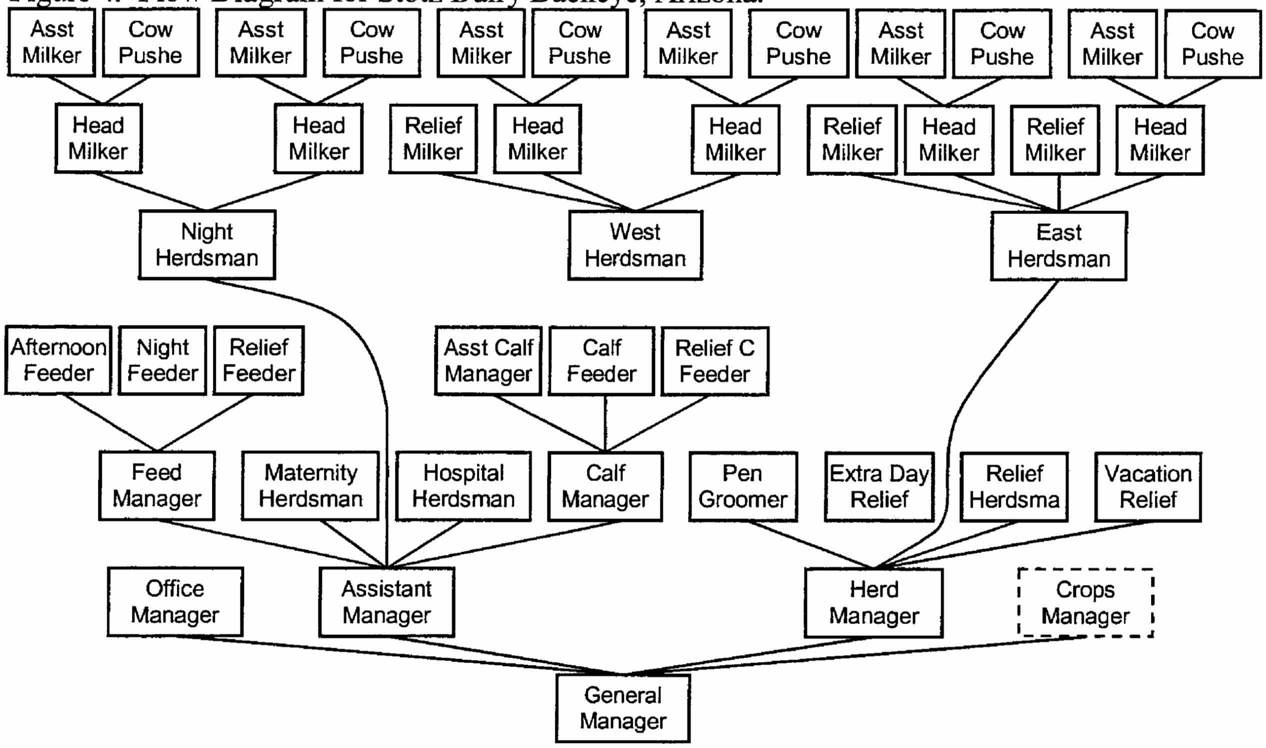
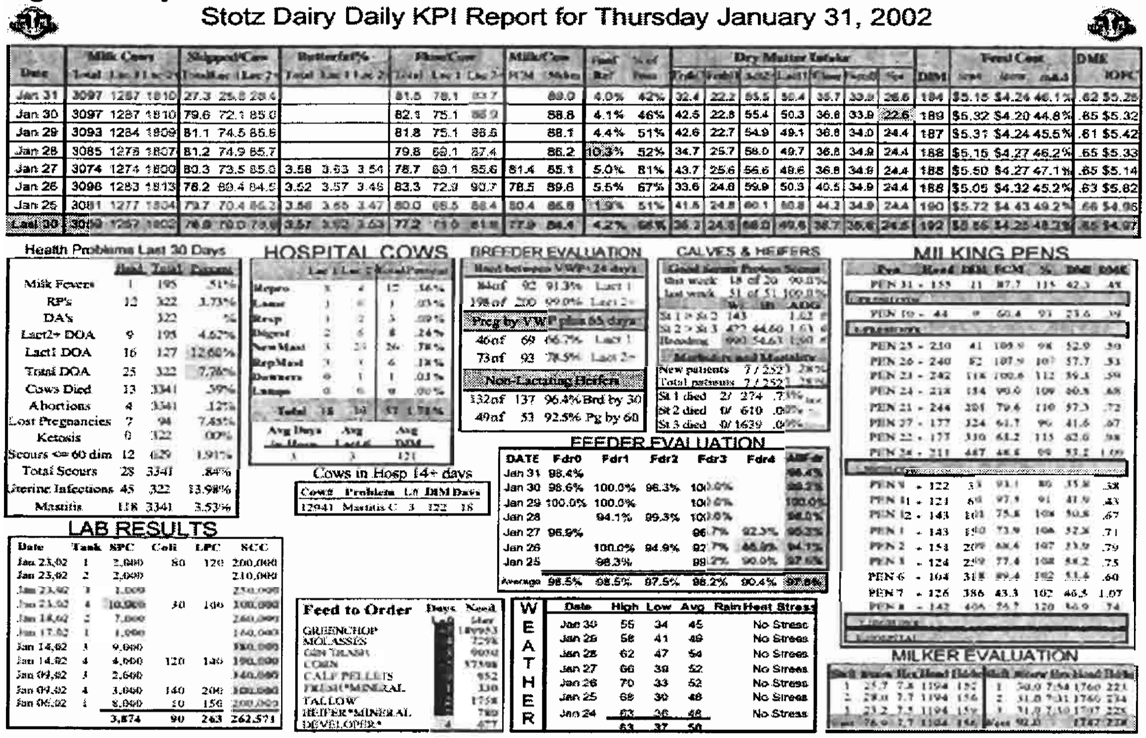


Figure 5. Key Performance Indicators.



Stotz Dairy Daily KPI Report for Thursday January 31, 2002

Date	Milk Cows Total	Lac 1	Lac 2+	Shipped/Cow Total	Lac 1	Lac 2+	Butterfat% Total	Lac 1	Lac 2+	[illegible]/Cow Total	Lac 1	Lac 2+	Milk/Cow FCM	[illegible]	[illegible]	% of [illegible]	Dry Matter Intake [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	DIM	Feed Cost [illegible]	[illegible]	[illegible]	DMI	IOFC
Jan 31	3097	1287	1810	27.3	25.8	28.4				81.5	78.1	83.7		89.0	4.0%	42%	32.4	22.2	55.5	50.4	35.7	33.9	26.6	184	$5.15	$4.24	46.1%	.62	$5.25
Jan 30	3097	1287	1810	79.6	72.1	85.0				82.1	75.1	88.9		88.8	4.1%	46%	42.5	22.8	55.4	50.3	36.8	33.9	22.6	189	$5.32	$4.20	44.8%	.85	$5.32
Jan 29	3093	1284	1809	81.1	74.5	85.6				81.8	75.1	88.6		88.1	4.4%	51%	42.6	22.7	54.9	49.1	36.8	34.0	24.4	187	$5.31	$4.24	45.5%	.81	$5.42
Jan 28	3085	1278	1807	81.2	74.9	85.7				79.8	69.1	87.4		86.2	10.3%	52%	34.7	25.7	58.0	49.7	36.8	34.8	24.4	188	$5.15	$4.27	46.2%	.65	$5.33
Jan 27	3074	1274	1800	80.3	73.5	85.0	3.58	3.63	3.54	78.7	69.1	85.6	81.4	85.1	5.0%	81%	43.7	25.6	56.6	48.6	36.8	34.8	24.4	188	$5.50	$4.27	47.1%	.65	$5.14
Jan 26	3096	1283	1813	78.2	69.4	84.5	3.52	3.57	3.46	83.3	72.9	90.7	78.5	89.6	5.5%	67%	33.6	24.8	59.9	50.3	40.5	34.9	24.4	188	$5.05	$4.32	45.2%	.63	$5.82
Jan 25	3081	1277	1804	79.7	70.4	86.2	3.56	3.65	3.47	80.0	69.5	88.4	80.4	86.8	11.9%	51%	41.5	24.8	60.1	50.8	44.2	34.9	24.4	190	$5.72	$4.43	49.2%	.66	$4.95
Last 30	3059	1257	1802	76.9	70.0	79.6	3.57	3.52	3.63	77.2	71.0	81.9	77.9	84.4	4.2%	68%	36.2	24.5	60.0	49.6	38.7	35.6	24.5	192	$5.56	$4.25	48.3%	.65	$4.97

Health Problems Last 30 Days

HOSPITAL COWS

BREEDER EVALUATION

CALVES & HEIFERS

MILKING PENS

LAB RESULTS

Cows in Hosp 14+ days

FEEDER EVALUATION

Feed to Order

WEATHER

MILKER EVALUATION

HIGH COW REPORT
JANUARY, 2004

MILK

Arizona Owner	Barn#	Age	Milk	New Mexico Owner	Barn #	Age	Milk
* Treger Holsteins, Inc.	1027	4-00	40,140	* Hide Away Dairy	2995	5-06	41,120
* Dazeisen Dairy, LLC	3918	4-01	36,760	* Providence Dairy	4357	4-03	39,540
* Mike Pylman Dairy	3721	6-06	36,580	* Providence Dairy	7791	5-00	38,670
* Stotz Dairy	8287	6-04	36,380	* Milagro Dairy	9107	4-03	38,420
* Mike Pylman Dairy	5343	5-01	36,140	* Providence Dairy	9549	3-00	37,420
* Stotz Dairy	14648	4-04	35,670	* Providence Dairy	8323	---	37,310
* Mike Pylman Dairy	5523	4-10	35,460	* Hide Away Dairy	3424	5-06	37,170
* Rio Blanco Dairy	2780	6-11	35,040	* Hide Away Dairy	3359	5-06	37,170
* Stotz Dairy	16185	3-02	34,840	* Providence Dairy	9875	2-11	36,960
* Rio Blanco Dairy	2760	6-10	34,700	* Providence Dairy	4154	4-07	36,940

FAT

* Del Rio Dairy	5217	9-08	1496	Pareo Dairy	1220	6-02	1536
* Mike Pylman Diary	3721	6-06	1414	Pareo Dairy	8986	5-05	1471
* Stotz Dairy	15459	3-09	1381	Pareo Dairy	1018	4-06	1458
* Stotz Dairy	8287	6-04	1367	* Milagro Dairy	9107	4-03	1440
* Caballero Farms	86	7-06	1359	Pareo Dairy	8742	7-00	1406
* Stotz Dairy	12535	6-00	1358	* Providence Dairy	4154	4-07	1389
* Dazeisen Dairy, LLC	4496	3-00	1356	* Hide-Away Dairy	4458	4-03	1366
* Shamrock Farm	U162	5-04	1343	* Hafliger Dairy	6450	5-06	1351
* Dazeisen Dairy, LLC	3399	5-10	1326	Pareo Dairy	8012	4-10	1347
* Southern Dairy	601	4-07	1313	Pareo Dairy	1307	7-07	1323

PROTEIN

* Shamrock Farm	E392	8-01	1292	* Milagro Dairy	9107	4-03	1250
* Mike Pylman Dairy	3721	6-06	1152	Pareo Dairy	8306	6-00	1175
* Southern Dairy, Inc.	601	4-07	1150	* Providence Dairy	9549	3-00	1170
* Southern Dairy, Inc.	593	5-10	1107	* New Direction Dairy	253	---	1125
* Stotz Dairy	8287	6-04	1042	* Milagro Dairy	8629	4-03	1119
* Mike Pylman Dairy	7458	2-11	1032	* Providence Dairy	3527	5-09	1115
* Stotz Dairy	14649	4-04	1025	* Providence Dairy	9574	3-00	1115
* Mike Pylman Dairy	6426	3-08	1023	S.A.S. Dairy	3316	6-03	1093
* Stotz Dairy	14648	4-04	995	* Milagro Dairy	9101	4-03	1089
* Stotz Dairy	16185	3-02	994	* Milagro Dairy	4556	5-06	1080

*all or part of lactation is 3X or 4X milking

ARIZONA – TOP 50% FOR F.C.M. [b]
JANUARY, 2004

OWNERS NAME	Number of Cows	MILK	FAT	3.5 FCM	R.R.
* Stotz Dairy West	2289	27,700	1004	28,252	49%
* Red River Dairy	4740	26,640	956	27,016	27%
* Triple G Dairy, Inc.	4245	24,965	929	25,854	38%
* Danzeisen Dairy, LLC	1340	25,306	904	25,596	37%
* Mike Pylman Dairy	3762	25,383	899	25,548	40%
* Treger Holsteins, Inc.	528	25,308	894	25,435	25%
University of Arizona Holsteins	160	25,113	879	25,107	28%
* Stotz Dairy East	1058	24,341	868	24,595	28%
* Wigwam Dairy	1384	24,000	860	24,318	42%
* Arizona Dairy Company	5952	23,630	823	23,318	38%
* Zimmerman Dairy	1157	23,012	827	23,356	30%
* Hillcrest Dairy	2379	23,342	783	22,786	43%
* Del Rio Holsteins	917	22,729	784	22,537	49%
* Dairyland Milk Company	2845	22,656	779	22,424	28%
* D C Dairy, LLC	1012	21,990	792	22,347	30%
Paul Rovey Dairy	405	21,884	787	22,220	40%
* Saddle Mountain Dairy	2304	22,811	740	21,859	34%
* Caballero Farms LLLP	1757	21,413	770	21,741	31%
* Butler Dairy	571	21,810	746	21,523	39%
Goldman Dairy	2077	21,358	749	21,376	36%
Shamrock Farm	7841	21,614	738	21,309	30%
* RG Dairy, LLC	1183	21,003	737	21,028	26%
Lunts Dairy	564	20,486	741	20,870	28%
Dutch View Dairy	1603	20,830	725	20,759	29%
* Del Rio Brown Swiss	158	20,125	719	20,357	50%

NEW MEXICO TOP 50% FOR F.C.M.[b]
JANUARY, 2004

OWNERS NAME	Number of Cows	MILK	FAT	3.5 FCM	R.R.
* Pareo Dairy #1	1423	26,543	943	26,769	33%
* Hide-Away Dairy	2120	26,566	910	26,244	27%
* New Direction Dairy	32	23,941	921	25,287	16%
* Tallmon Dairy	503	26,168	854	25,164	32%
Providence Dairy	2765	26,408	838	25,008	20%
* Pareo Dairy # 2	2980	24,181	889	24,872	20%
Ken Miller Dairy	392	24,483	862	24,565	25%
* Do-Rene Dairy	2298	24,506	848	24,348	36%
New Direction Dairy # 2	1903	23,332	859	24,018	27%
* Goff Dairy # 1	3891	23,700	844	23,934	36%
Wormont Holsteins	1391	22,721	830	23,284	33%
Butterfield Dairy	1621	22,678	828	23,333	21%
Price's Roswell Farm	2819	22,727	807	22,913	30%

[b] average milk and fat figure may be different from monthly herd summary; figures used are last day/month

ARIZONA AND NEW MEXICO HERD IMPROVEMENT SUMMARY FOR OFFICIAL HERDS TESTED JANUARY 2004

		ARIZONA	NEW MEXICO
1.	Number of herds	49	25
2.	Total cows in herd	64,912	45,612
3.	Average herd size	1325	1824
4.	Percent days in milk	88	86
5.	Average days in milk	204	202.8
6.	Average milk – all cows per day	59	61.4
7.	Average percent fat – all cows	3.6	3.6
8.	Total cows in milk	56,834	39,404
9.	Average daily milk for milking cows	67.8	71
10.	Average days in milk – 1st breeding	82	69
11.	Average days open	162	150
12.	Average calving interval	14	14
13.	Percent somatic cell – linear 0-4	90	81.9
14.	Percent somatic cell – linear 5-6	7	12.6
15.	Percent somatic cell – linear 7 & above	3	4.9
16.	Average previous days dry	62	63
17.	Percent cows leaving herd	36	28.5
		STATE AVERAGE	
	MILK	21,597	23,140
	Percent butterfat	4	3.55
	Percent Protein	3	3.01
	Pounds fat	777	821
	Pounds protein	633	700

THE UNIVERSITY OF
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COOPERATIVE EXTENSION

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