

Needle-less Injection and No Daily Herd Lockups. A significant leap forward in herd performance and animal care.

Dr. Don Niles

Notes:

Paper and PowerPoint Slides on following pages

Life with No Headlocks

Dr. Don Niles

Page's Family Businesses

I began my career as a dairy veterinarian in 1982. Since that time there have been fundamental changes regarding animal productivity in the US dairy industry. In 1982 most dairy farms, particularly in the Midwest, had less than 100 cows, a labor team made up of family members and minimal reliance on technology beyond the level of milking machines.

The typical modern dairy in the US would hardly be recognizable to those early clients. Farms are far larger, much more dependent on technology, and sophisticated in the use of that technology. Occasionally, we encounter technological systems that turn our previous management concepts upside down. For instance, as herds grew it was no longer feasible to keep cows confined to a particular stall for most of the day. This led to the introduction of parlor/free stall management systems. In these parlor systems, in order to handle animals needing attention, the use of self-locking head gates became a critical feature in cow management. They allowed dairies to lockup only selected cows one or more times daily so cows could be tail chalked for heat detection, bred, moved to a different pen, diverted to the foot trimmer, etc. In fact, as a dairy's system grew more sophisticated, the use of headlocks, and often the time cows spent in headlocks became very significant. Although we, as an industry, understood that ever longer lockup times (perhaps over two hours for the first cows returning from the parlor to their pen) were potentially deleterious to our cows, there was not a lot that we could do about it. In fact, the problem got worse as we tried to do more and more. One indicator of the lack of attention applied to this issue, is that we do not even have an industry standard to calculate "lock-up time". Should we measure from when the cow comes to her feet to go to the parlor or count only the time locked up, or something else? Biologically, if we wanted to measure the metabolic cost, it would seem to make sense to count the time the cows first stands up to go to the parlor to the time she is free to lay back down. My personal observation is that using those parameters will, in many cases, exceed two hours for cows in breeding pens. This does not allow for pen moves, dry up days and reproductive checks. Those days would typically be longer.

In an effort to try to minimize/eliminate the need for self-lockers on our dairies, consisting of approximately 11,000 cows, we have adopted a cow monitoring system (Alta Cow Watch). This system remotely monitors cud chewing, eating time and activity time. With this information we identify cows to be bred, and cows in need of help. This has allowed us to sort the animals to be inseminated or examined by using an automated sort gate, and leave the rest of the animals in the pen alone. We are also able to take care of all scheduled injections, both reproductive hormones and vaccines, by doing these treatments in the parlor while milking. We made a first attempt at doing this by using conventional automatic syringes and needles. We were not pleased with both the reactions the cows had to the needles, as well as the inconvenience of replacing bent or broken needles. To improve the process we switched all of our scheduled injections, both vaccines and hormones over to the Pulse Needle Free Injection System. This can be easily managed in both our

parallel milking parlors (neck injection) and our rotary parlor (rear leg injection). With the PULSE system there is far less reaction to the injection process and no further issues with broken needles.

The results we have seen in cow performance have been remarkable. Understanding this is an observational impression, not a controlled study, our production measuring system indicates that we gained, on average, approximately, 10 lbs of ECM per cow per day. The response we have seen has compelled us to make this a permanent change. Certainly, such a result, if repeatable on other dairies, will be of significance for the US dairy industry. My intention at this conference is to share what we are seeing, and hopefully inspire some properly controlled research. A significant and lasting gain in production, along with a decrease in stress to the animals would create an important opportunity for the US dairy industry to increase both profitability and public acceptance.

The purpose of this presentation is to provoke a discussion and hopefully stimulate properly designed studies, to determine the potentially deleterious effect of our industry's common practice of daily lockups.

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Two US Innovative Technologies That Transform Dairy Herd Management

Don Niles DVM
Pagel's Family Businesses

Two Herds - Different Systems

- ▶ Pagel's Ponderosa
 - ▶ 5500 cows
 - ▶ Started June 2019
- ▶ Dairy Dreams
 - ▶ 3000 cows Alta Cow Watch
 - ▶ Started March 2020

Goals for Activity Monitoring System

- ▶ Reduce Reliance on Timed AI
- ▶ More rapid detection of sick cows

Reproductive Program Prior to Activity System (Cows)

- ▶ Double Ovsynch for all fresh cows
- ▶ First breeding 67 days fresh
- ▶ Resynch prior to preg check
 - ▶ GPG beginning at 25 days bred
- ▶ Tail chalk with daily lockup
- ▶ Annual pregnancy rate 34%
- ▶ Annual heat detection rate 67%
- ▶ Palpated pregnancy rate 65%

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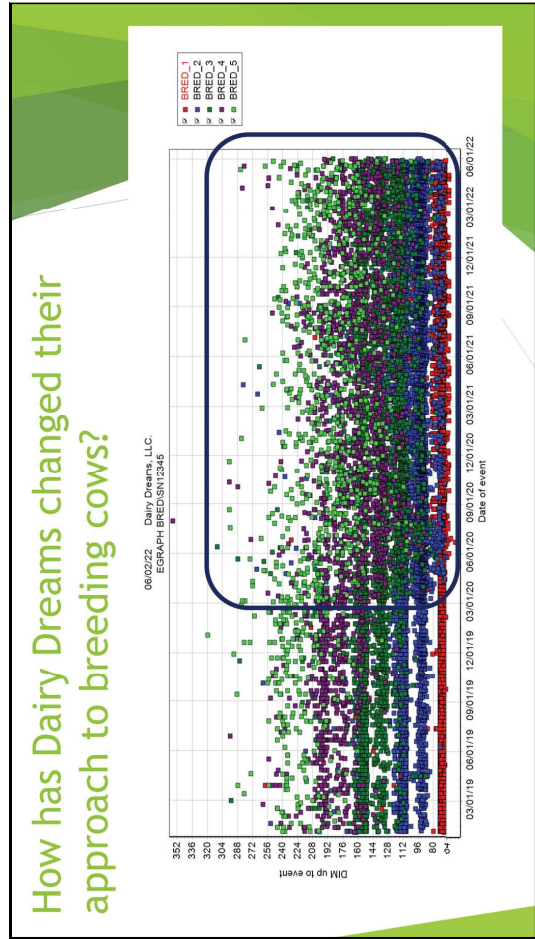
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21 day pregnancy risk 21 Wait Period 67

Date	Br Elig	Bred	Pct	Pg Elig	Preg	Pct Aborts
1/28/20	499	317	64	484	140	29
2/18/20	502	335	67	486	136	28
3/10/20	514	401	78	502	169	34
3/31/20	482	353	74	477	149	31
4/21/20	498	361	72	492	160	33
5/12/20	490	367	75	483	179	37
6/02/20	473	339	76	463	178	38
6/23/20	479	353	74	470	150	32
7/14/20	503	365	73	501	169	34
8/04/20	511	359	70	509	159	31
8/25/20	515	391	77	509	180	35
9/15/20	467	377	79	462	166	36
10/06/20	497	402	81	492	171	35
10/27/20	513	403	79	505	179	35
11/17/20	522	451	86	512	195	38
12/08/20	511	399	76	506	189	37
12/29/20	482	365	76	0	0	0
1/19/21	405	342	84	0	0	0
Total	7976	5953	75	7853	2669	34

Modified Reproductive System with Collars (Cows)

- ▶ Double Ovsynch for all first breedings, as prior
- ▶ Resynch needs dropped by 80% Most open cows are found and rebred prior to initiating resynch
- ▶ Use of tail chalk has been completely discontinued



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Sick Cow Identification Prior to System

- ▶ Individual daily milk weights in parlor
- ▶ Action list for cows dropping in milk- daily
- ▶ Fresh cow walkthrough
 - ▶ 1 hour daily
- ▶ Average number of dead cows/month
 - ▶ 11 dead/month 11

Modified Sick Cow Detection with System

- ▶ Many sick cows identified and treated 1-2 days prior to milk drop
- ▶ More rapid identification leads to earlier treatment or cull
- ▶ Number of dead or down cows dropped from 11 to 8 cows/month
- ▶ Note - cows previously only wore collars for about half of lactation



www.pulse-nfs.com info@pulse-nfs.com



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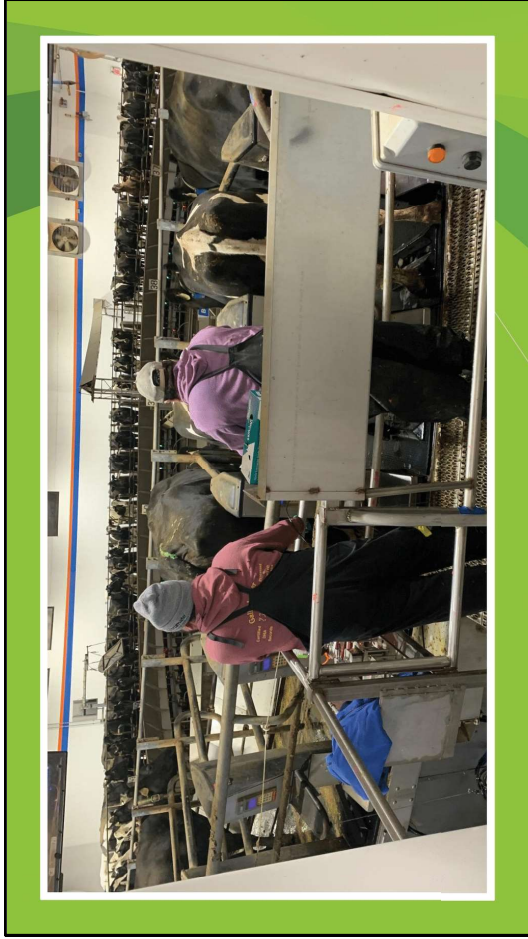
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How the Pulse Technology Works

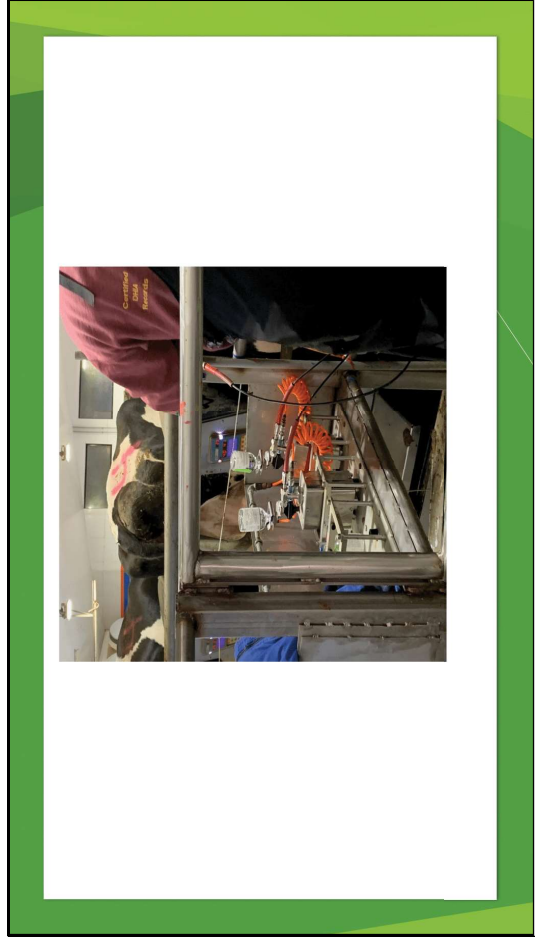
Liquid is placed under pressure and expelled through a small orifice. This creates a fine stream that penetrates the skin.

Injection force parameters control depth and dispersion, for repeatable results and less human error.

Pulse Technology

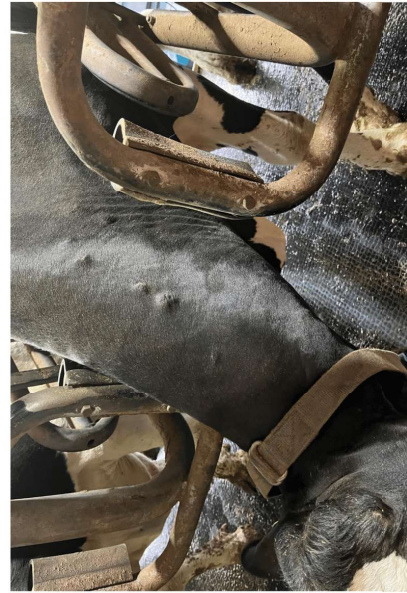
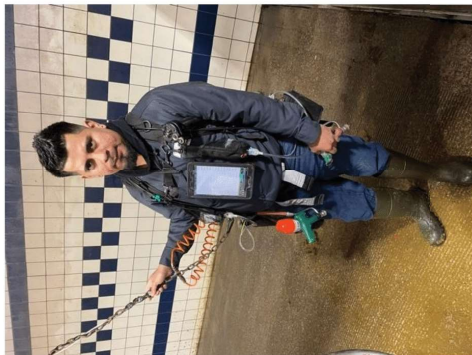


tall	ID	SEX	REGO	DIM	DSH	MILK	WUML	TASK1	TASK2
37	Y	36524	4	BRED	137	15	116	109	-
38	Y	42375	4	BRED	249	26	80	74	GRUH
39	Y	36768	4	FRESH	135	68	99	87	FR02
40	X	29719	4	BRED	127	0	131	114	-
42	X	***EMPTY SPALLS**							
43	X	***UNKNOWN RESPONDER***							
44	Y	30311	4	BRED	66	0	113	95	-
45	Y	39666	4	FRESH	20	0	97	94	GRUH
46	Y	659	4	FRESH	46	35	105	113	FR02
47	X	43870	4	BRED	103	26	87	79	GRUH
48	X	43870	4	BRED	103	26	87	79	GRUH
49	Y	31210	4	FRESH	50	0	116	105	GRUH
50	Y	37264	4	NO BRED	358	236	84	79	GRUH
51	Y	33009	4	FRESH	52	0	105	102	GRUH
52	X	519	4	OK/GR02	170	84	83	86	LTP4



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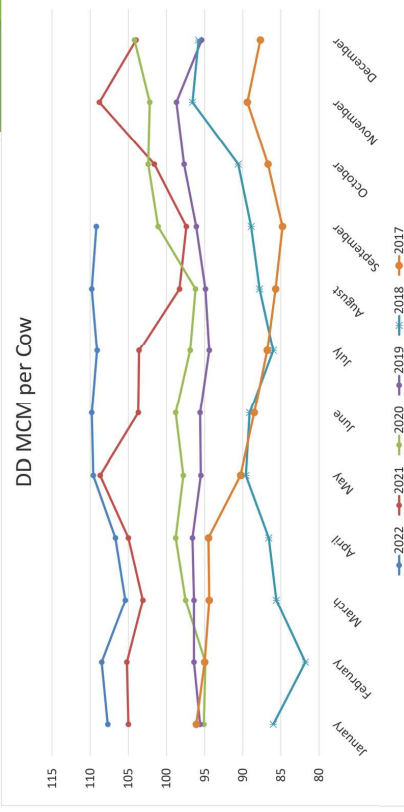
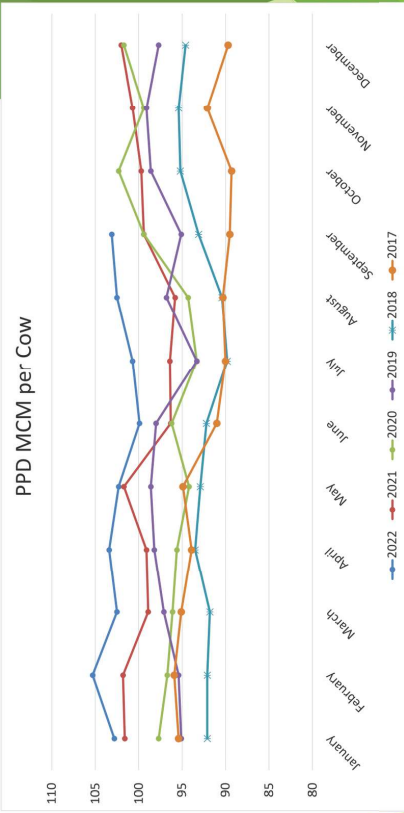
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Current Program (no herd chk)

- ▶ Breeding candidates auto-sorted for exam and breeding
- ▶ High attention cows auto-sorted for exam and treatment
- ▶ Cows receive scheduled injections (repro and vx) in parlor

Modified Reproductive Program with System (Heifers)

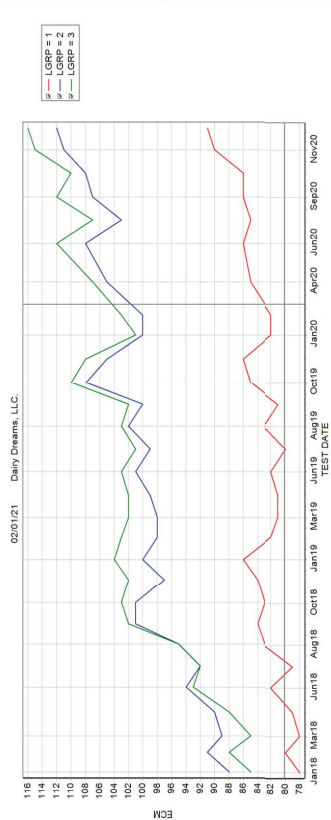
- ▶ No further need for tail chalk
- ▶ Management time has gone from 1.5 hours to 20 minutes/day
- ▶ Palpated pregnancy rate near 100%
- ▶ Re-implementation time is reduced for ET recipients by 21 days and \$72



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Did the new protocols have a noticeable effect on milk production?



- Why the Increase?
- ▶ Foot sole fatigue?
 - ▶ Metabolic demand?
 - ▶ Interference with normal behavior?

Energy (NEL) Requirements 2 Days Before Versus 2 Days After Calving

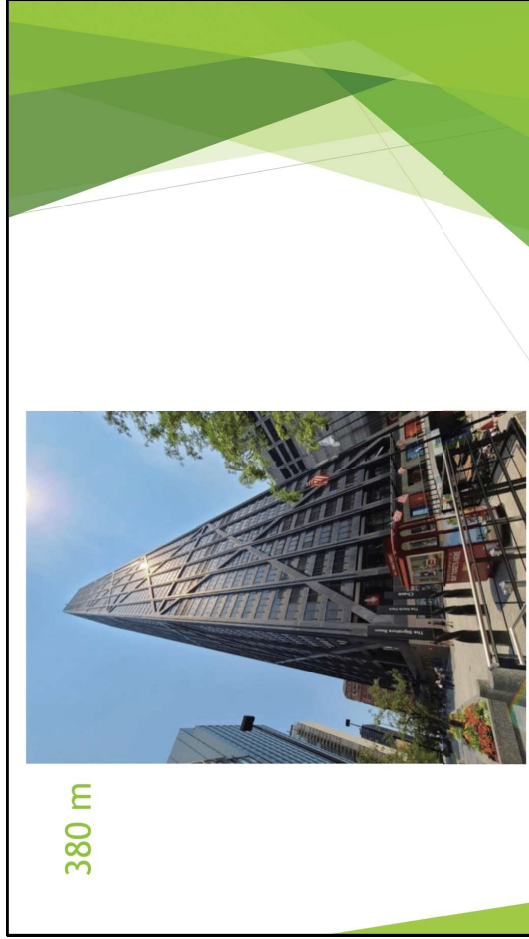
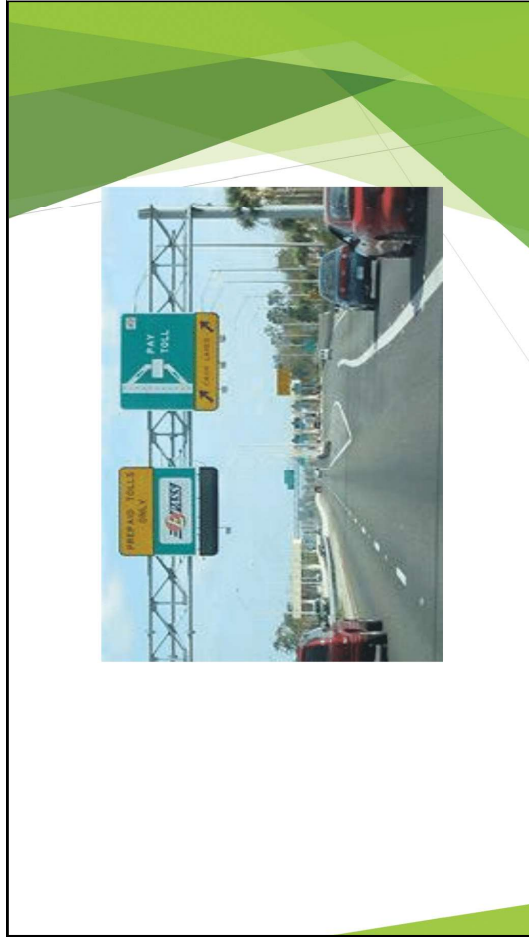
Function	725-kg Cow		575-kg Heifer	
	Pre	Post	Pre	Post
Maintenance	11.2	10.1	9.3	8.5
Pregnancy	3.3	---	2.8	---
Growth	---	---	1.9	1.7
Milk production	---	18.7	---	14.9
Total (Mcal)	14.5	28.8	14	25.1

Calculated from NRC (2001).
Assumes milk production of 25 kg/d for cow and 20 kg/d for heifer, each containing 4% fat.
Courtesy of J. K. Drackley, then stolen by JR Overton, further recycled by me



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Carbon Footprint Ramifications

- ▶ More milk/similar DMI
- ▶ Feed energy no longer used to support standing “work”

What is the correct way to determine “lock-up time”?

- Starts when first cow is back to pen?
- Starts when last cow back to pen?
- Starts when first cow locks?
- Starts when last cow locks?
- Stops when first cow released?
- Stops when last cow released?
- What about catch and release?
?????????

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My Two Best Days in Dairying

- ▶ “First best day”
 - ▶ John Pagel installed self locking stanchions
- ▶ “New best day”
 - ▶ Our dairies stopped using them