The value of health data to dairy farmers in the United States

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DRMS
DAIRY RECORDS MANAGEMENT SYSTEMS
www.drms.org

Recording health events in U.S.

- No mandated or structured system
- Mostly captured in on-farm herd management software
- Not aggregated in a central location
  - Typically for backup purposes
  - Farmers fear loss of confidentiality if data were delivered to government databases

DRMS

Dairy Records Management Systems

- 1 of 4 Dairy Records Processing Centers in U.S.
  - Edit and process DHIA records
  - Deliver management reports and data files
  - Software for on-farm, web and handhelds
- 19 dairy farmer cooperatives
- 38 labs
- 780 field technicians
- 14,000 herds
- 2.2m cows (49% of U.S. DHIA cows)

PCDART from DRMS

- User defined conditions and flexible input
- 4-character mnemonic and 12-character description

  KETO = ketosis

  MAST = mastitis
- Currently 3250 herds with 850K cows
- Currently 1100 herds using PocketDairy for cow-side entry

SOP for retained placenta

Severe: Depressed, off-feed, declining milk production, fever.

Contact veterinary staff for exam – follow instructions.

Intermediate: Bright and alert, eating well, milk production stable or increasing, fever.

Initiate antibiotic therapy. Excenel SQ

Mild: Bright and alert, no fever, eating well, milk production increasing, but cow has retained placenta.

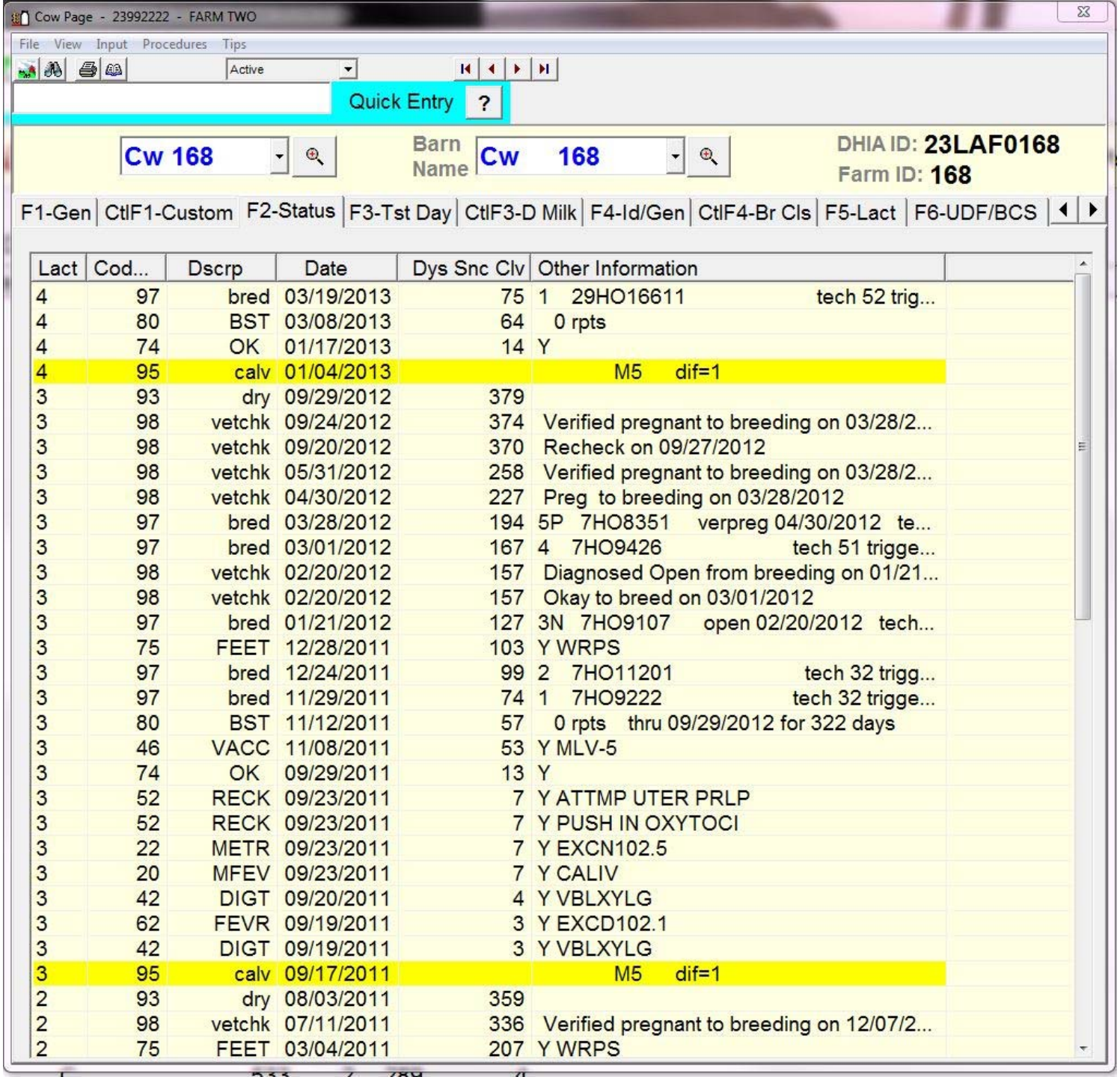
Initiate antibiotic therapy after 48 hours postp. Excede SQ-BOE, or Excenel SQ.

Continue to monitor cow for clinical signs.

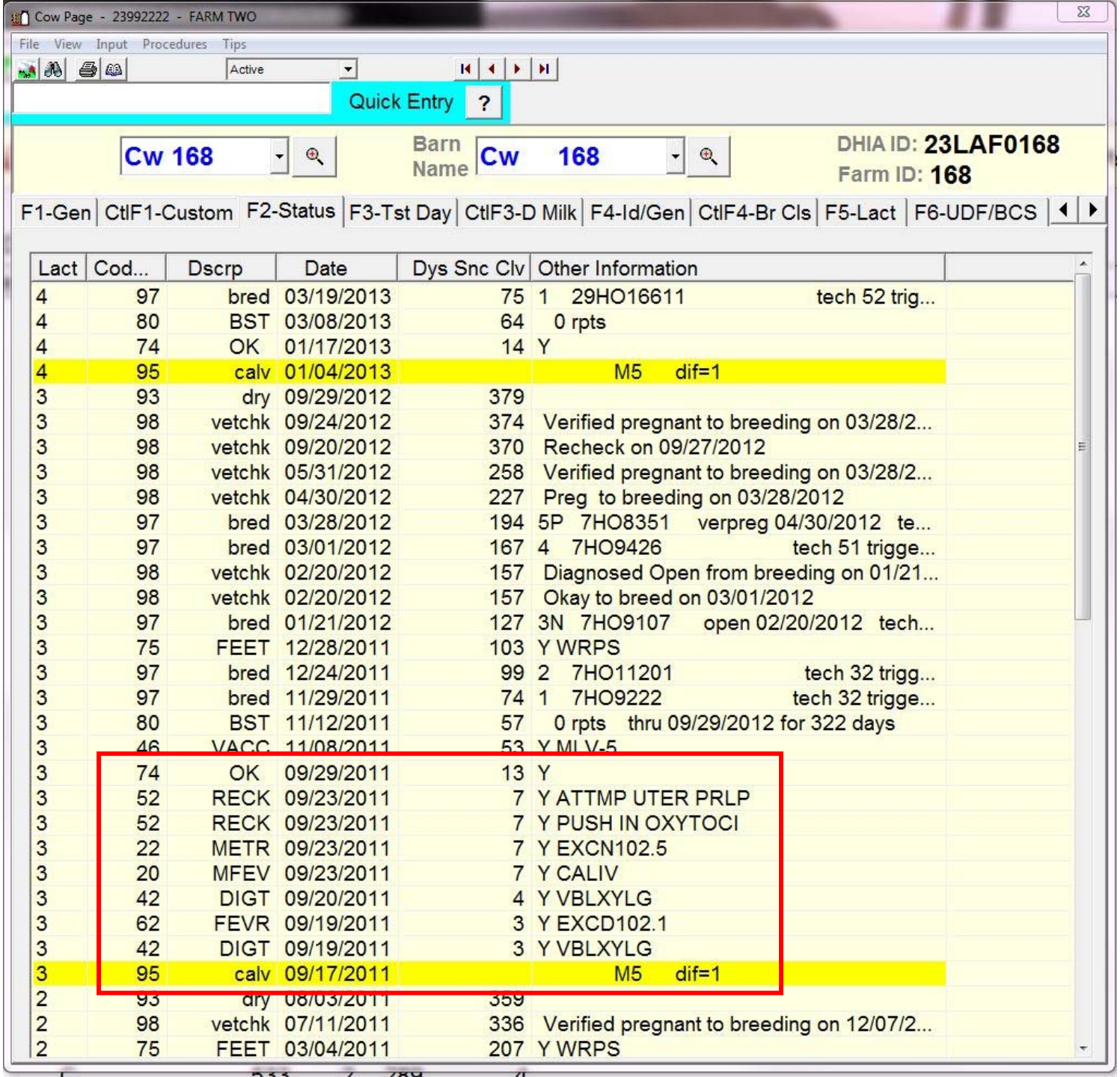
Mild and Intermediate: If placenta is still retained after 96 hours, vaginal area will be washed and gentle manual traction will be applied to remove placenta. Repeat as needed until placenta is removed.

On-farm applications of health data

- Day-to-day management of individuals
  - Cowpage
  - Action lists
- Assessments to:
  - Understand relationships with mgt conditions
  - Reduce impact on individual cows
  - Improve profitability
  - Improve cow comfort



Lact	Cod...	Dscrp	Date	Dys Snc Clv	Other Information
4	97	bred	03/19/2013	75	1 29HO16611 tech 52 trig...
4	80	BST	03/08/2013	64	0 rpts
4	74	OK	01/17/2013	14	Y
4	95	calv	01/04/2013		M5 dif=1
3	93	dry	09/29/2012	379	
3	98	vetchk	09/24/2012	374	Verified pregnant to breeding on 03/28/2...
3	98	vetchk	09/20/2012	370	Recheck on 09/27/2012
3	98	vetchk	05/31/2012	258	Verified pregnant to breeding on 03/28/2...
3	98	vetchk	04/30/2012	227	Preg to breeding on 03/28/2012
3	97	bred	03/28/2012	194	5P 7HO8351 verpreg 04/30/2012 te...
3	97	bred	03/01/2012	167	4 7HO9426 tech 51 trigge...
3	98	vetchk	02/20/2012	157	Diagnosed Open from breeding on 01/21...
3	98	vetchk	02/20/2012	157	Okay to breed on 03/01/2012
3	97	bred	01/21/2012	127	3N 7HO9107 open 02/20/2012 tech...
3	75	FEET	12/28/2011	103	Y WRPS
3	97	bred	12/24/2011	99	2 7HO11201 tech 32 trigg...
3	97	bred	11/29/2011	74	1 7HO9222 tech 32 trigge...
3	80	BST	11/12/2011	57	0 rpts thru 09/29/2012 for 322 days
3	46	VACC	11/08/2011	53	Y MLV-5
3	74	OK	09/29/2011	13	Y
3	52	RECK	09/23/2011	7	Y ATTMP UTER PRLP
3	52	RECK	09/23/2011	7	Y PUSH IN OXYTOCI
3	22	METR	09/23/2011	7	Y EXCN102.5
3	20	MFEV	09/23/2011	7	Y CALIV
3	42	DIGT	09/20/2011	4	Y VBLXYLG
3	62	FEVR	09/19/2011	3	Y EXCD102.1
3	42	DIGT	09/19/2011	3	Y VBLXYLG
3	95	calv	09/17/2011		M5 dif=1
2	93	dry	08/03/2011	359	
2	98	vetchk	07/11/2011	336	Verified pregnant to breeding on 12/07/2...
2	75	FEET	03/04/2011	207	Y WRPS



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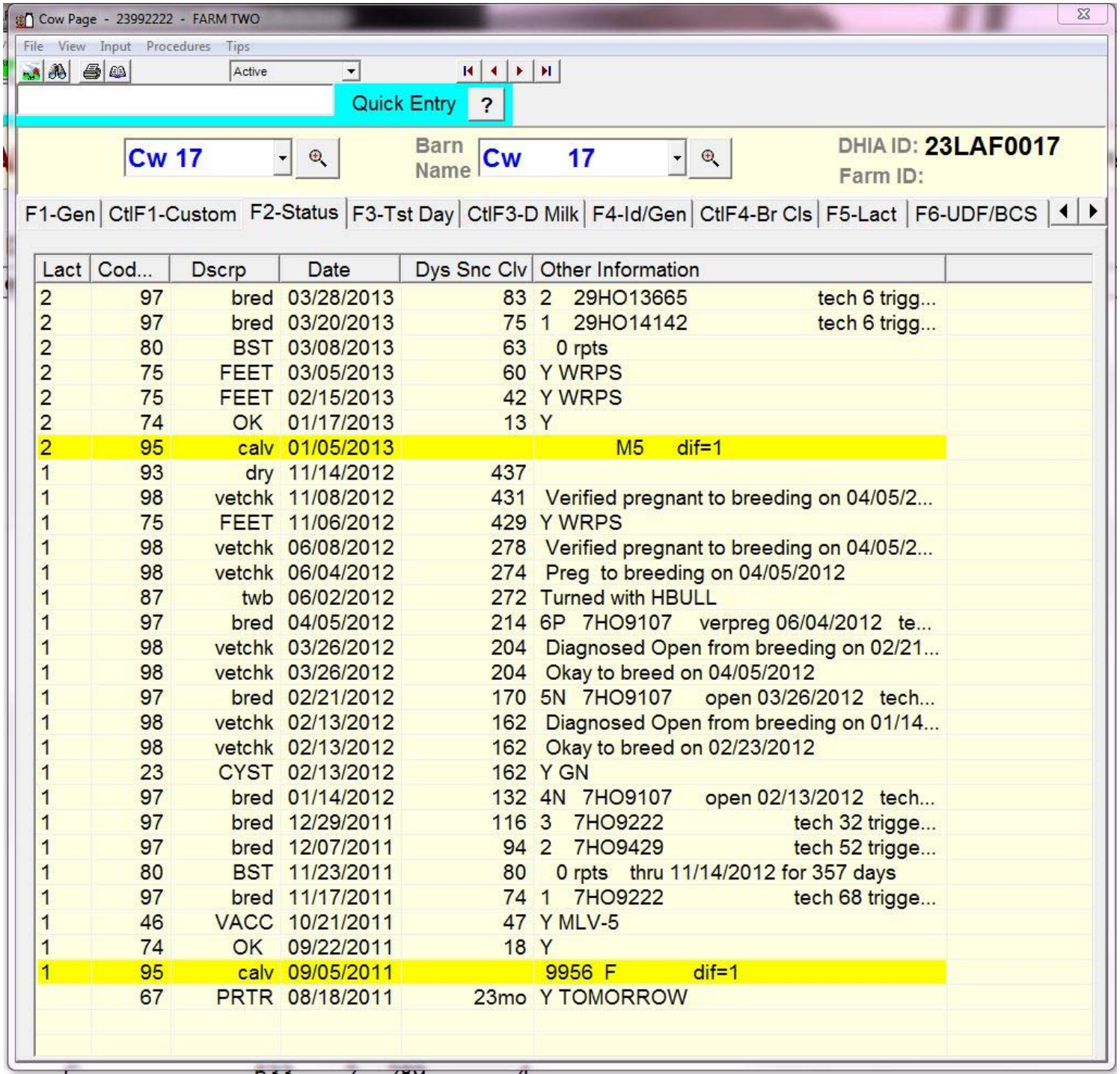
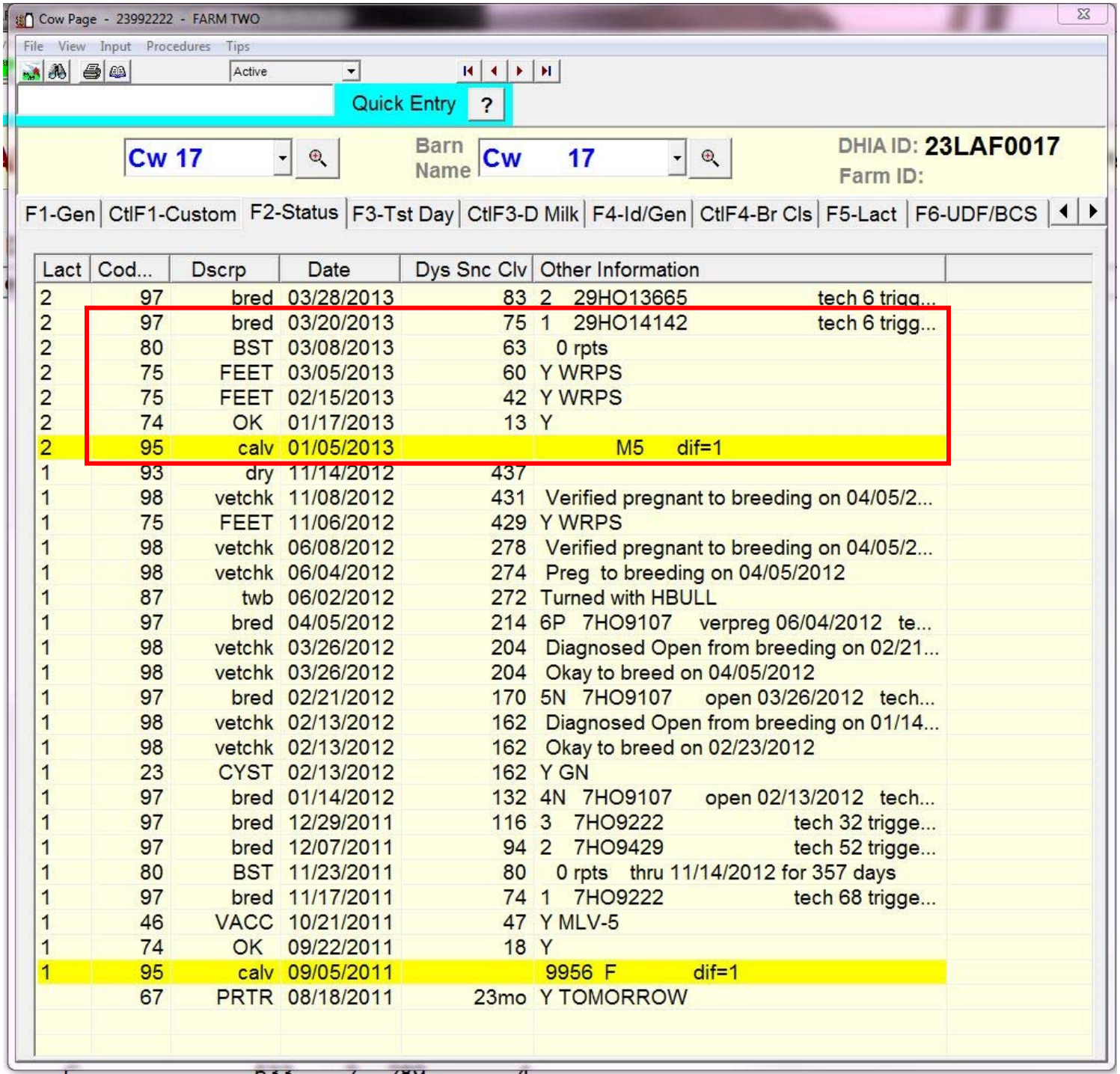


Lact	Cod...	Dscrp	Date	Dys Snc Clv	Other Information
2	97	bred	03/28/2013	83	2 29HO13665 tech 6 trigg...
2	97	bred	03/20/2013	75	1 29HO14142 tech 6 trigg...
2	80	BST	03/08/2013	63	0 rpts
2	75	FEET	03/05/2013	60	Y WRPS
2	75	FEET	02/15/2013	42	Y WRPS
2	74	OK	01/17/2013	13	Y
2	95	calv	01/05/2013		M5 dif=1
1	93	dry	11/14/2012	437	
1	98	vetchk	11/08/2012	431	Verified pregnant to breeding on 04/05/2...
1	75	FEET	11/06/2012	429	Y WRPS
1	98	vetchk	06/08/2012	278	Verified pregnant to breeding on 04/05/2...
1	98	vetchk	06/04/2012	274	Preg to breeding on 04/05/2012
1	87	twb	06/02/2012	272	Turned with HBULL
1	97	bred	04/05/2012	214	6P 7HO9107 verpreg 06/04/2012 te...
1	98	vetchk	03/26/2012	204	Diagnosed Open from breeding on 02/21...
1	98	vetchk	03/26/2012	204	Okay to breed on 04/05/2012
1	97	bred	02/21/2012	170	5N 7HO9107 open 03/26/2012 tech...
1	98	vetchk	02/13/2012	162	Diagnosed Open from breeding on 01/14...
1	98	vetchk	02/13/2012	162	Okay to breed on 02/23/2012
1	23	CYST	02/13/2012	162	Y GN
1	97	bred	01/14/2012	132	4N 7HO9107 open 02/13/2012 tech...
1	97	bred	12/29/2011	116	3 7HO9222 tech 32 trigge...
1	97	bred	12/07/2011	94	2 7HO9429 tech 52 trigge...
1	80	BST	11/23/2011	80	0 rpts thru 11/14/2012 for 357 days
1	97	bred	11/17/2011	74	1 7HO9222 tech 68 trigge...
1	46	VACC	10/21/2011	47	Y MLV-5
1	74	OK	09/22/2011	18	Y
1	95	calv	09/05/2011		9956 F dif=1
	67	PRTR	08/18/2011	23mo	Y TOMORROW



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74	OK	01/17/2013	13	Y
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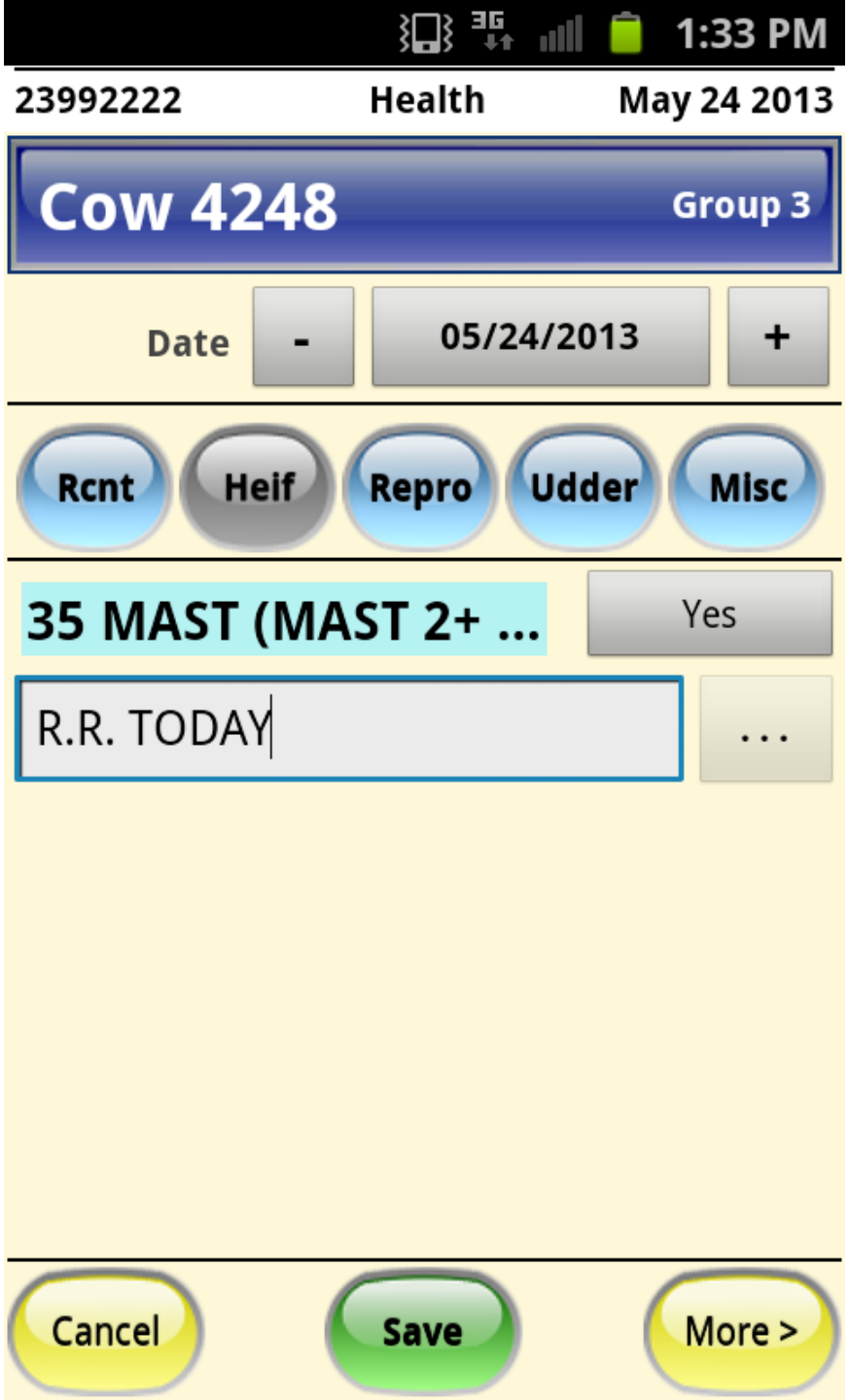
23992222 May 24 2013

Cow Page | Lists | Find | Input

Cow 17

BRED 2	ALTIMA	03/28/13
BRED 1	29HO14142	03/20/13
BST	---	03/08/13
FEET	WRPS	03/05/13
FEET	WRPS	02/15/13
OK	---	01/17/13
---	Most Recent Calv	01/05/13


1:33 PM
23992222
Health
May 24 2013
Cow 4248
Group 3
Date
-
05/24/2013
+
Rcnt
Heif
Repro
Udder
Misc
35 MAST (MAST 2+ ...
Yes
R.R. TODAY
...
Cancel
Save
More >

Assessments…

- Start at top-level perspective with overview
- Segmentation by lot, lactation #, stage of lactation, etc.
- Graphs
- Drilldown to individual cows

Activity Tracker: Frequency Table by DIM

File Print

Show Percentages to Number of Calvings

About

Event	Total	1-29	30-59	60-89	90-119	120-149	150-179	180-209	210-239	240-269	270-299	300-329	>= 330
FRESH	2700	2700	0	0	0	0	0	0	0	0	0	0	0
20 RP INITIAL	241	237	0	0	0	1	0	0	2	0	0	1	0
21 METRITIS	1015	1010	2	0	1	0	0	0	0	0	1	0	1
22 OXYTOCIN	1	1	0	0	0	0	0	0	0	0	0	0	0
24 UTERUS DRAIN	4	4	0	0	0	0	0	0	0	0	0	0	0
27 METRI SCORE	88	86	1	0	1	0	0	0	0	0	0	0	0
28 UT CONDITION	6070	0	128	170	1501	1630	953	614	401	262	200	101	110
29 UT ABNORMAL	570	2	25	60	76	60	71	58	45	40	38	45	50
30 STRIP QTR	88	12	5	10	11	9	8	6	8	2	3	6	8
36 BLIND QTR	13	2	1	0	0	0	1	2	1	0	0	0	6
37 DRY TEAT	1855	0	0	0	0	0	0	0	0	7	188	600	1060
38 TEAT INJURY	48	4	5	1	7	5	6	4	5	0	5	4	2
39 CULTURE	2	0	0	0	1	0	0	1	0	0	0	0	0
40 MILK FEVER	15	15	0	0	0	0	0	0	0	0	0	0	0
41 KETOSIS INIT	54	53	1	0	0	0	0	0	0	0	0	0	0
42 KETOSIS REPT	58	56	2	0	0	0	0	0	0	0	0	0	0
43 RESPIRATORY	79	26	0	11	2	0	5	1	17	4	0	3	10
44 FOOT TRIM	4176	378	108	112	274	624	252	201	179	197	355	519	977
45 INJURY	166	21	30	18	16	4	1	3	18	10	11	5	29
46 VACCINATION	35	33	0	0	0	0	0	0	0	0	0	0	2

21 METRITIS: 1-29 (Count = 1010; Cows = 447)

File Print Cow Page Assign Temp Group

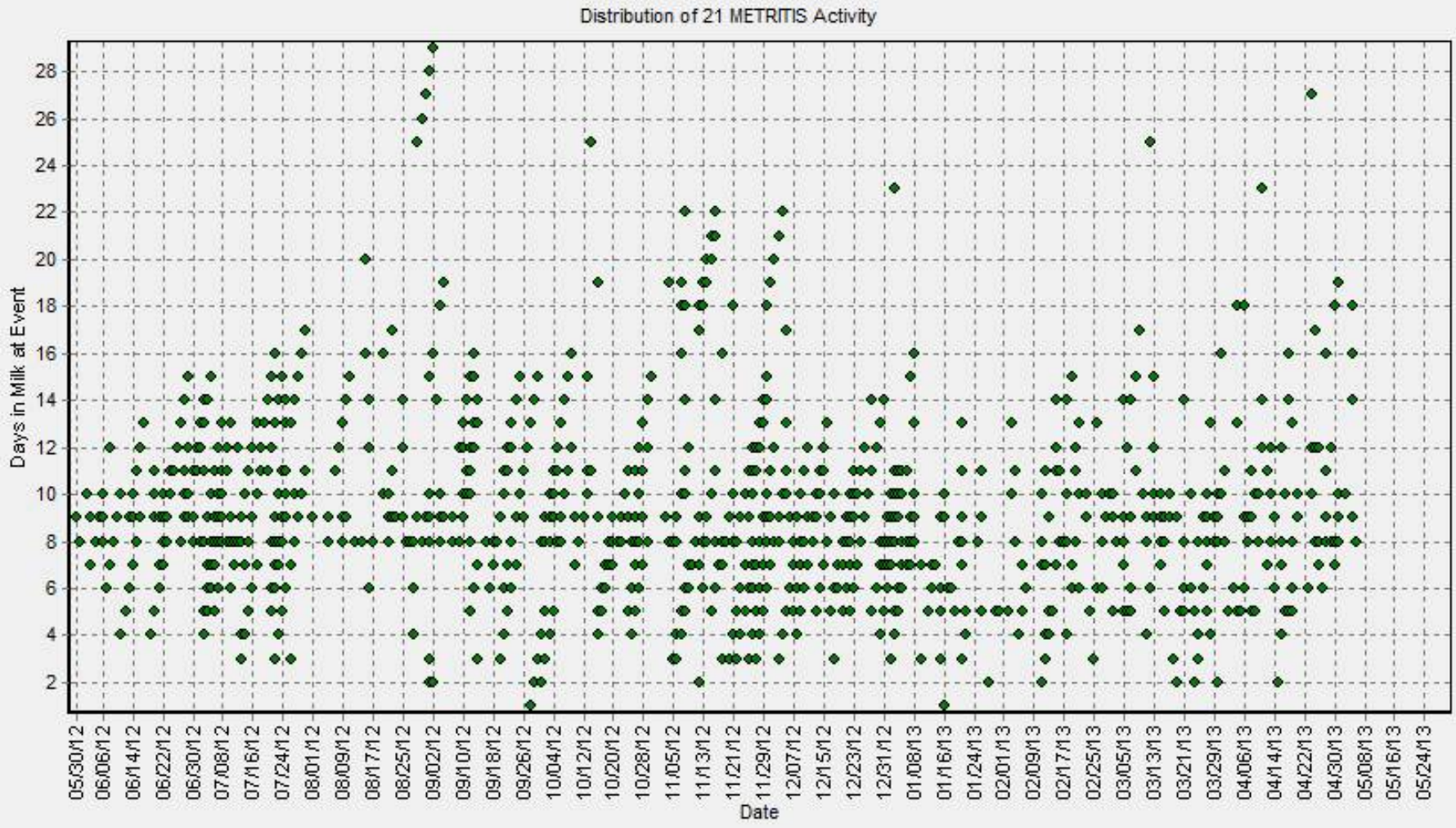
Index	Date	Lact	Evt DIM	Cur DIM	Evt DCC	Evt Repro	Cur Repro	Cur TD Milk	Evt Grp	Prev Evt Grp	Cur Grp	Count	Hlth Trmt	Remark
1062	07/10/2012	7	8	-	0			0.0	19	22	22	1	Y	G2 LHG
1115	10/25/2012	7	8	224	0		C	82.8	22	21	57	1	Y	POLY 30
1115	10/26/2012	7	9	224	0		C	82.8	22	21	57	2	Y	POLY 30
1115	10/27/2012	7	10	224	0		C	82.8	22	21	57	3	Y	POLY 30
1115	10/28/2012	7	11	224	0		C	82.8	22	21	57	4	Y	POLY 30
1115	10/29/2012	7	12	224	0		C	82.8	22	21	57	5	Y	POLY 30
1115	11/08/2012	7	22	224	0		C	82.8	21	19	57	6	Y	LHG
1649	09/04/2012	5	8	-	0		C	0.0	19	22	22	1	Y	G2 LHG
1857	12/30/2012	6	8	-	0			0.0	19	22	21	1	Y	G2 LHG
2064	10/13/2012	6	10	-	0			0.0	21	19	19	1	Y	G2 LHG
2335	10/02/2012	5	8	247	0		P	82.5	22	19	64	1	Y	POLY 34
2335	10/03/2012	5	9	247	0		P	82.5	22	19	64	2	Y	POLY 34
2335	10/04/2012	5	10	247	0		P	82.5	22	19	64	3	Y	POLY 34

☐ Show Barn Name

Close

21 METRITIS

File Print



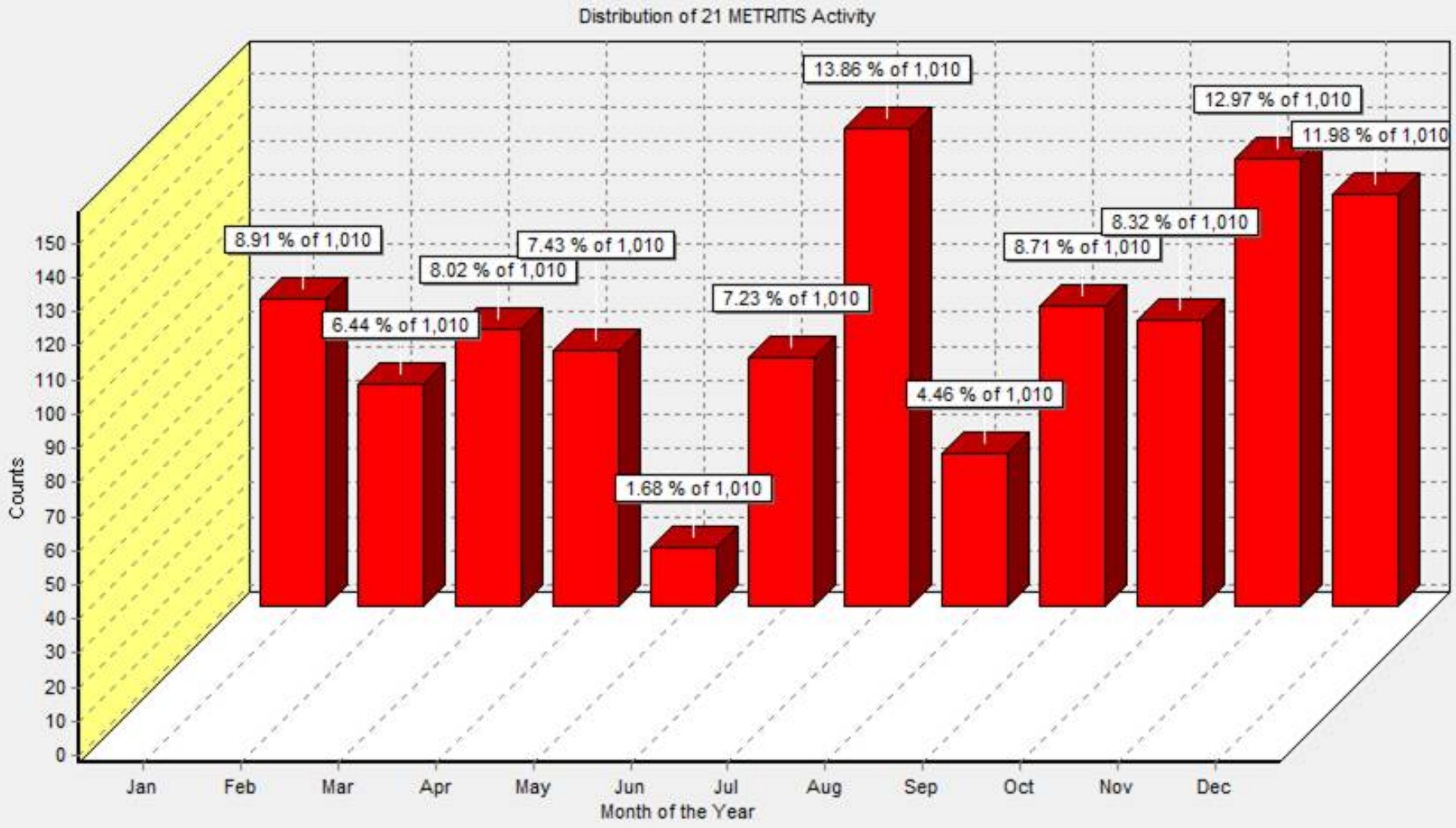
Label (None)

Close

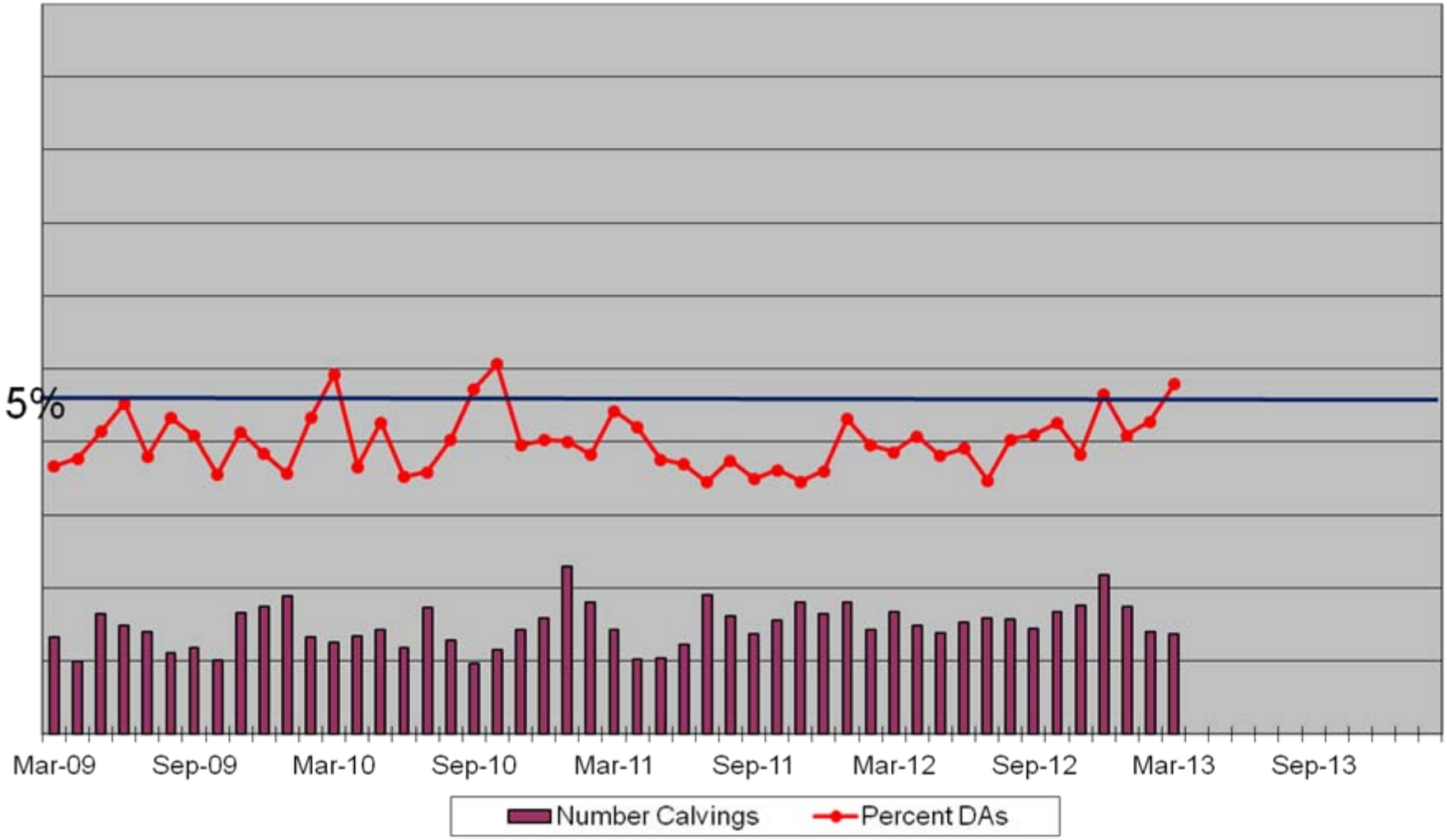
Cross hairs

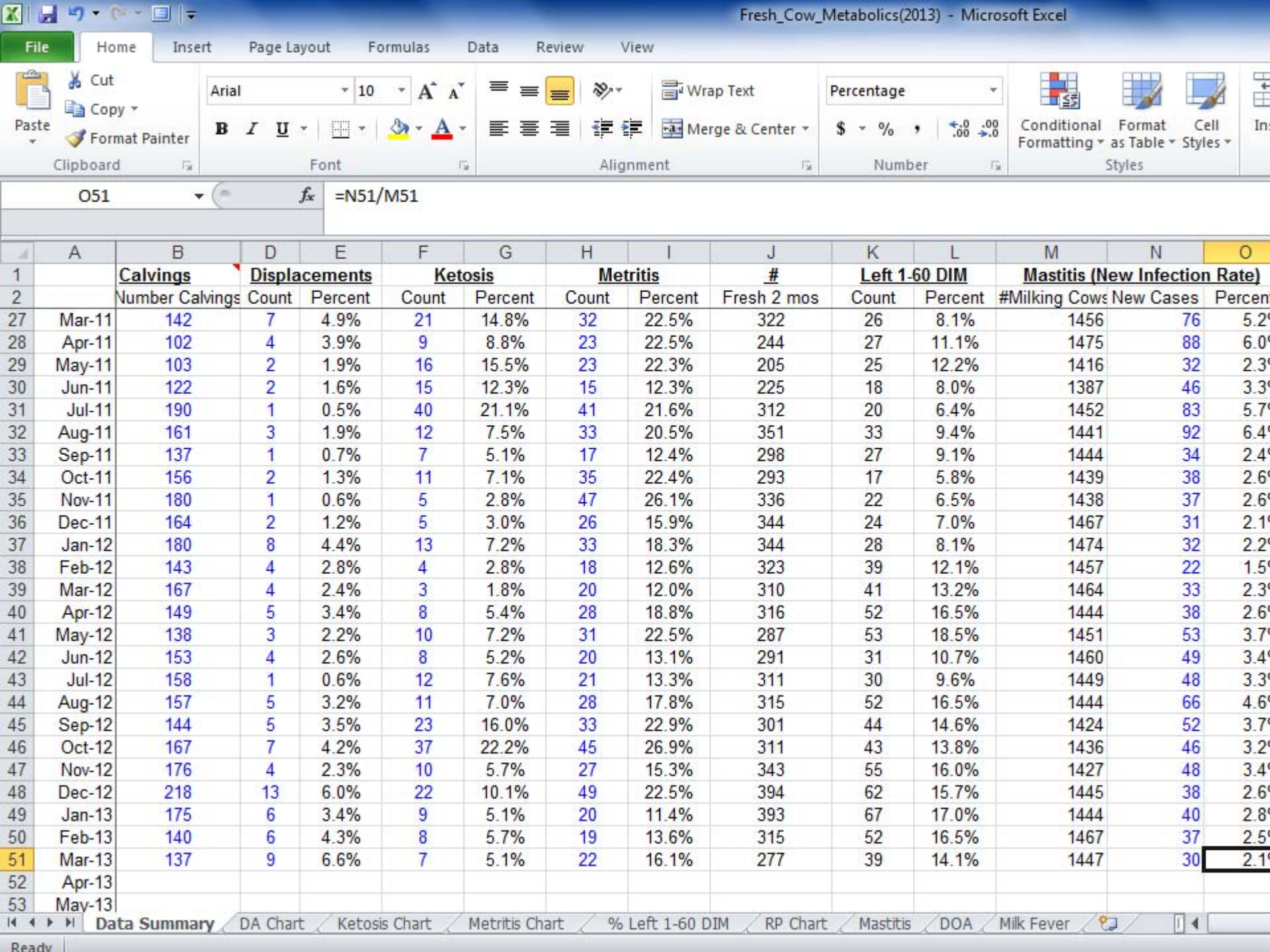
21 METRITIS

File Print



Displaced Abomasums





Fresh_Cow_Metabolics(2013) - Microsoft Excel

File Home Insert Page Layout Formulas Data Review View

Cut Copy Format Painter Paste Clipboard

Arial 10 Font

Wrap Text Merge & Center Alignment

Percentage Number

Conditional Formatting Format as Table Cell Styles Styles

O51 =N51/M51

	A	B	D	E	F	G	H	I	J	K	L	M	N	O
1		Calvings	Displacements		Ketosis		Metritis		#	Left 1-60 DIM		Mastitis (New Infection Rate)		
2		Number Calvings	Count	Percent	Count	Percent	Count	Percent	Fresh 2 mos	Count	Percent	#Milking Cows	New Cases	Percen
27	Mar-11	142	7	4.9%	21	14.8%	32	22.5%	322	26	8.1%	1456	76	5.2
28	Apr-11	102	4	3.9%	9	8.8%	23	22.5%	244	27	11.1%	1475	88	6.0
29	May-11	103	2	1.9%	16	15.5%	23	22.3%	205	25	12.2%	1416	32	2.3
30	Jun-11	122	2	1.6%	15	12.3%	15	12.3%	225	18	8.0%	1387	46	3.3
31	Jul-11	190	1	0.5%	40	21.1%	41	21.6%	312	20	6.4%	1452	83	5.7
32	Aug-11	161	3	1.9%	12	7.5%	33	20.5%	351	33	9.4%	1441	92	6.4
33	Sep-11	137	1	0.7%	7	5.1%	17	12.4%	298	27	9.1%	1444	34	2.4
34	Oct-11	156	2	1.3%	11	7.1%	35	22.4%	293	17	5.8%	1439	38	2.6
35	Nov-11	180	1	0.6%	5	2.8%	47	26.1%	336	22	6.5%	1438	37	2.6
36	Dec-11	164	2	1.2%	5	3.0%	26	15.9%	344	24	7.0%	1467	31	2.1
37	Jan-12	180	8	4.4%	13	7.2%	33	18.3%	344	28	8.1%	1474	32	2.2
38	Feb-12	143	4	2.8%	4	2.8%	18	12.6%	323	39	12.1%	1457	22	1.5
39	Mar-12	167	4	2.4%	3	1.8%	20	12.0%	310	41	13.2%	1464	33	2.3
40	Apr-12	149	5	3.4%	8	5.4%	28	18.8%	316	52	16.5%	1444	38	2.6
41	May-12	138	3	2.2%	10	7.2%	31	22.5%	287	53	18.5%	1451	53	3.7
42	Jun-12	153	4	2.6%	8	5.2%	20	13.1%	291	31	10.7%	1460	49	3.4
43	Jul-12	158	1	0.6%	12	7.6%	21	13.3%	311	30	9.6%	1449	48	3.3
44	Aug-12	157	5	3.2%	11	7.0%	28	17.8%	315	52	16.5%	1444	66	4.6
45	Sep-12	144	5	3.5%	23	16.0%	33	22.9%	301	44	14.6%	1424	52	3.7
46	Oct-12	167	7	4.2%	37	22.2%	45	26.9%	311	43	13.8%	1436	46	3.2
47	Nov-12	176	4	2.3%	10	5.7%	27	15.3%	343	55	16.0%	1427	48	3.4
48	Dec-12	218	13	6.0%	22	10.1%	49	22.5%	394	62	15.7%	1445	38	2.6
49	Jan-13	175	6	3.4%	9	5.1%	20	11.4%	393	67	17.0%	1444	40	2.8
50	Feb-13	140	6	4.3%	8	5.7%	19	13.6%	315	52	16.5%	1467	37	2.5
51	Mar-13	137	9	6.6%	7	5.1%	22	16.1%	277	39	14.1%	1447	30	2.1
52	Apr-13													
53	May-13													

Data Summary | DA Chart | Ketosis Chart | Metritis Chart | % Left 1-60 DIM | RP Chart | Mastitis | DOA | Milk Fever

Ready

Health data for Genetic Evaluation Program?

- PCDART data
- Calving dates from Jan 1, 2009 – Dec 31, 2011
- Completed lactations with parities 1 – 5
- Valid and complete identification

549,393	cows	89.8 %	Holstein
841,604	lactations	5.8 %	Jersey
1423	herds	3.1 %	Crossbred
42 of 48	states	1.2 %	Other

Translating… standardizing

LAME = lameness

**BDFT,BLCK,BLK,BLKF,BLOC,BLOK,F-RT,FEET,
FINJ,FOOT,FROT,FTAB,FTLG,FTR,FTRT,HOBB,
HOCK,HOOF,HROT,LAME,LEG,LEGS,ROT,
WRAP,LAME,LIMP,LAMN**

CYST = cystic ovary

**2CYS,CFLO,CFRO,CLO,CLO1,CLO2,CRO,CSTO,
CSTR,CY L,CY R,CY-L,CY-R,CYL,CYR,CTLN,
CYBO,CYEX,CYLO,CYLR,CYRO,CYRT,CYST,
CYSL,CYSR,CYST,CYVE,FCLU,LCST,LCY,LCYS**

Herd characteristics

Size (# cows)	# Herds	Cows	Milk	SCS	Preg rate	Died (%)	Serv Sire NM€
< 100	308	76	9,224	2.6	17	6.4	268
100 - 499	864	227	10,280	2.5	19	6.2	301
500 - 999	173	689	10,816	2.4	20	6.8	317
> 1000	78	1954	10,594	2.3	20	5.8	305
Total / Avg	1423	346	10,134	2.5	18	6.3	296

DRMS

Disease edits

4,659,600 health events Jan 1, 2009 – Dec 31, 2012

- **34 most common diseases**
- **Parities 1 – 5**
- **Within 365 d of calving**
- **1 incidence and 5 cows in Herd-Yr**
- **On PCDART for 2 calendar years**

2,029,263 resulting health events

13 diseases with most # cases

Health event	Herds	Lactations	Cases
LAME = lameness	550	468,274	59,922
MAST = mastitis	758	570,225	59,660
METR = metritis	654	540,991	45,740
CYST = cystic ovary	563	322,887	18,254
REPR = other repro prob.	141	155,100	14,427
RETP = retained placenta	530	436,138	11,638
JOHN = Johne's	68	60,160	10,748
KETO = ketosis	269	290,329	10,536
DIGE = digestive prob.	336	318,106	9,653
WART = hairy heel wart	56	80,811	7,458
CALC = hypocalcemia	455	361,183	7,339
RESP = respiratory	354	342,985	6,439
D.A. = displaced aboma.	439	409,836	5,859

12 diseases with least # cases

Health event	Herds	Lactations	Cases
DIAR = diarrhea/BVD	47	63,480	4,298
DYST = dystocia	191	179,551	3,134
INFU = mammary infusion	34	18,733	2,738
ABRT = abortion	456	334,214	2,462
ABCS = abscess	45	58,721	1,967
CLOS = clostridium	20	21,971	1,720
EDEM = udder edema	49	60,564	1,525
SULC = stomach ulcer	20	28,039	1,248
PNEU = pneumonia	42	53,585	713
BLDM = bloody milk	24	35,667	664
PEYE = pink eye	63	56,544	286
DOWN = downer	42	53,057	242

Reasonable LIRs… too few cases/herds

Adhesion
Cancer / tumor
Bloat
Coliform mastitis
E. coli

Foot ulcer
Stillbirth / mum. fetus
Uterine infection / injury
Vaginal / uterine prolapse

Lactation incidence rates (%)

Health event	Lact#	Lact LIR%	Mean
LAME = lameness	1	6.64	
	2	7.27	
	3	8.12	
	4	10.37	
	5	12.47	8.98
MAST = mastitis	1	8.62	
	2	10.18	
	3	11.56	
	4	13.35	
	5	16.30	12.00

Across Lactation LIRs (%)

Health event	Lit.	Mean	S.E.
LAME = lameness	9.27	8.98	2.41
MAST = mastitis	17.98	12.00	2.97
METR = metritis	12.34	8.17	2.14
CYST = cystic ovary	9.05	7.32	2.01
REPR = other repro prob.		6.27	2.58
RETP = retained placenta	8.02	5.49	1.96
JOHN = Johne's		11.88	2.82
KETO = ketosis	5.07	6.27	2.31
DIGE = digestive prob.	2.60	3.84	1.29
WART = hairy heel wart		7.64	2.59
CALC = hypocalcemia	7.44	5.20	3.44
RESP = respiratory	3.30	2.72	0.84
D.A. = displaced aboma.	2.67	3.18	0.93

Across Lactation LIRs (%) cont.

Health event	Lit.	Mean	S.E.
DIAR = diarrhea/BVD	5.88	5.27	2.64
DYST = dystocia	5.29	2.82	1.34
INFU = mammary infusions		10.14	2.34
ABRT = abortion		1.89	0.53
ABCS = abscess		5.03	2.53
CLOS = clostridium		7.67	1.81
EDEM = udder edema		2.47	0.96
SULC = stomach ulcer		6.60	3.11
PNEU = pneumonia		2.09	0.85
BLDM = bloody milk		3.15	0.71
PEYE = pinkeye		1.28	0.63
DOWN = downer		1.53	0.81

Do other herds enter events at same rate?

- Another group of herds do not backup at DRMS…
- But their health transactions are delivered on test day
  - Not a complete backup
  - Most health events are delivered
- Do they enter health events at the same rate?

Events / year / 100 cows

Size	Backup # herds	Event rate backup herds	Non-backup # herds	Event rate Non-B herds
< 100	308	106	462	36
100 – 499	864	102	880	49
500 – 999	173	191	84	126
> 1000	78	246	26	179
Total / Avg	1423	123	1452	52

Conclusions: Health data for the U.S. GEP?

- LIRs are similar to those found in literature
- Reasonable quantities of data are available
- Educational efforts can improve quality and quantity
    - Define, explain and encourage SOPs
- Data will become available when confidentiality protections are assured

DRMS

Questions?