

A Record Guide to Lameness Monitoring Using Dairy Comp 305

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***Disclaimer:** The following records guide for tracking lameness was devised by the authors following extensive practice in the field. The system is NOT supported by DC305 support staff. Therefore, any questions you may have regarding the contents of this guide should be referred to the authors.*

Lameness is unique among the health events that we must record in that treatment is often confined to timed periods – when the hoof-trimmer visits for example. If the trimmer sees the majority of lame cows, then the incidence of lameness in a herd may be more related to the frequency of trimmer visits than to the rate of new cases of disease. This poses us some particular problems in organizing our records system. This guide will discuss use of the LAME and TRIM events in DC305 and demonstrate how we can set up an effective lameness monitoring system in a series of stages.

STAGE 1

Setting up the LAME and TRIM Events

The basic record for lameness should include:

- Cow ID
- Date of treatment
- Limb(s) affected
- Lesion
- Treatment – usually a wrap (W), a block (K) or a drug protocol

The LAME event in DC305 records the event, the cow ID and the date of the event. The remainder of the basic information must be entered in the remark line. For each health event, the remark line may store up to 8 characters. Because hoof lesion records are so complex, we suggest devoting the first 7 characters to recording the most important lesion and limb information. Data entry therefore requires some triage of the information, as frequently more than one affected limb may have more than one lesion.

In general, follow the rules:

1. Enter the most important lesion(s) first – usually the one(s) that were treated – we can easily sort these lesions later
2. Enter the limb(s) that were treated. Hoof-trimmers should circle treated lesions on their record sheets to facilitate this – treatments are usually wrap (W) or block (K).
3. Enter secondary lesions and limbs secondly if there is space.

4. If there was no treatment other than functional or corrective trimming, enter the lesions and limbs in severity order.

The basic lesions that should be recognized and recorded are:

A=white line Abscess or fissure
U=sole Ulcer
T=toe ulcer
F=Foot rot
D=Digital dermatitis (Heel wart)

More advanced recording systems can grow to include other lesions such as heel erosion, corns, sole hemorrhage etc. Whatever lesions are recorded, use consistent nomenclature to record them and use the following gradation for lesion 'importance' when deciding if they need to be entered into the DC305 record:

G=digital sepsis > T=toe ulcer > U=ulcer > A=white line abscess > F=foot rot > D=heel wart > H=sole hemorrhage > E=heel erosion > C=corn

We do not have enough space to enter the lesion severity, so that must be understood by the person entering the information into the record using the grading system above. Thus, a limb with an ulcer, a white line fissure and heel erosion will primarily be recorded as a U=ulcer, and the secondary lesions recorded only if space allows.

Enter the limb(s) affected using the nomenclature; **LF**=left front, **RF**=right front, **LR**=left rear, **RR**=right rear. When space is limited, enter the worst lesion and limb first and enter other information as space allows.

Leave the last character for treatment, which is simply W for wrap, K for block or a number or letter for a drug protocol if a pharmaceutical such as Naxcel is used.

Example:

Lame cow with a sole ulcer on right rear treated with a hoof block and heel warts on both rear feet treated with wraps would be recorded as:

LAME event: **URRKDLRW**

The TRIM event is used to record information from cows routinely presented for trim in much the same way as the LAME event is used. Follow the same lesion and limb record system and record treatments as necessary.

Example:

Trim cow with a mild heel wart on both the left rear and right rear feet in association with corns treated with wraps would be recorded as:

TRIM event: **DCLRRRW**

STAGE 2

Once the records are being stored correctly, the farm must organize the recruitment of LAME and TRIM cows appropriately so that the LAME event can be used to monitor the onset and outcome of new cases of lameness.

Organizing LAME and TRIM recruitment

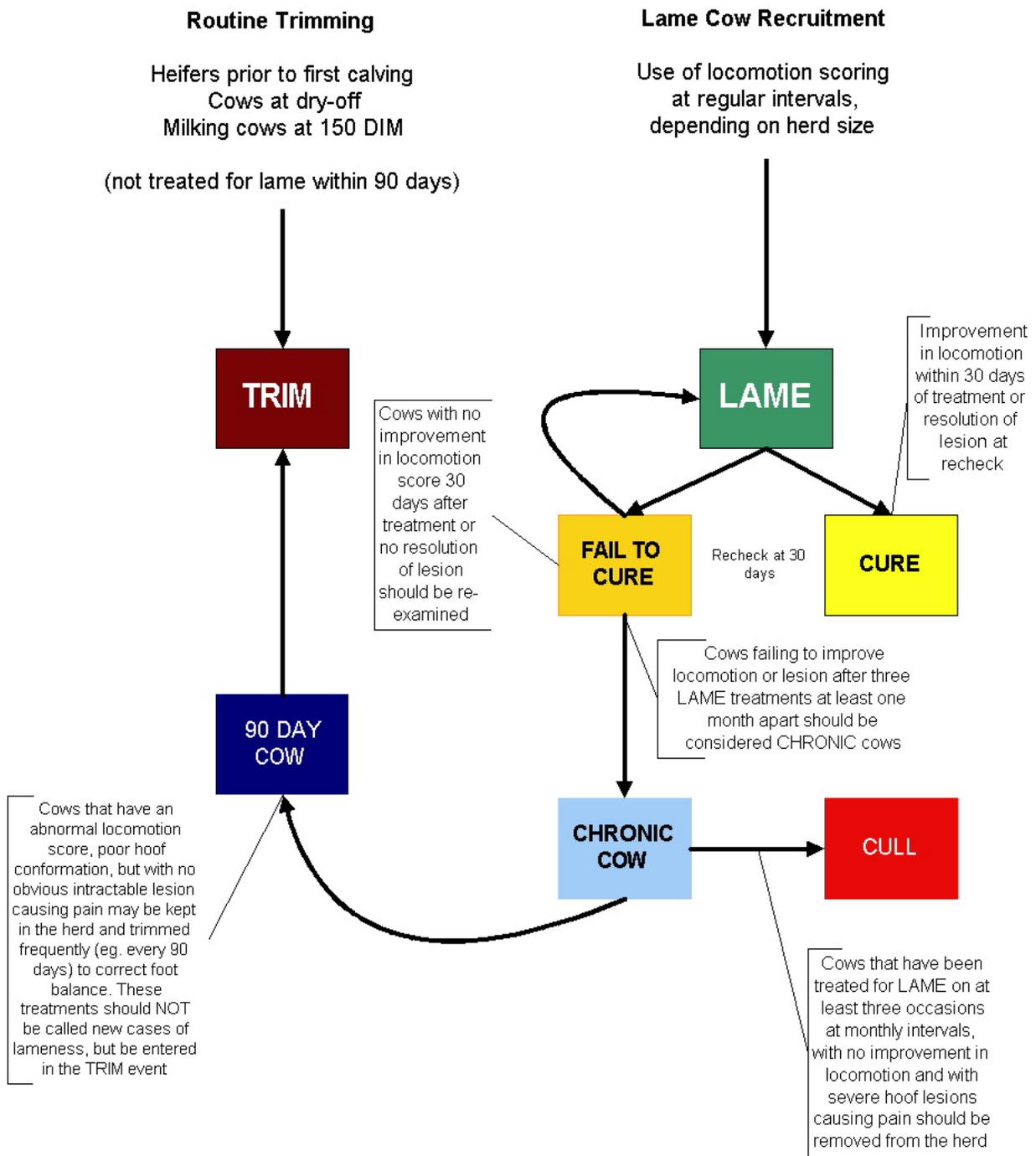
The LAME event is only as good as the system used for recognition of lameness. This is a major problem on our dairy farms as most lameness information comes from routine trimming performed by hoof-trimmers. Analysis of this kind of information may only be used to identify the predominant lesions affecting the cows – both clinically and sub-clinically. It cannot be used to determine when the cows are becoming lame, whether they are curing after treatment or when the lesions are developing in the production cycle.

We face an additional problem in lameness recording in that there are a group of chronically lame cows in every herd. These cows are often at the back of the group as they are moved to and from the pen and they may be repeatedly recognized as lame and presented to the veterinarian or trimmer for treatment. If these cows are entered as a new LAME event every time, we develop a distorted picture of lameness incidence in the herd and misuse valuable trimming slots with the hoof-care professional.

We therefore need to develop an organized system for recruiting cows for routine trimming and for lameness treatment, and we must identify chronically lame cows and deal with them separately. The flow chart below provides an overview of the approach.

The focus of the program should be the recruitment of lame cows for treatment using locomotion scoring (LMS). This will require training of individuals that will be responsible for scoring and identifying cows on a regular basis. Because treatment is limited to periods when the trimmer visits, we must be very careful to avoid over recruiting lame cows, particularly when we start developing the system. If we identify 80% of the herd as 'lame' on the first day, the system for handling these cows will be overwhelmed. Therefore it is best to use the higher locomotion scores to define lameness initially, and once the program is up and running to then use the observation of any abnormal gait to recruit lame cows for treatment.

In large herds, the person can locomotion score one pen per week and identify cows that need to be treated. In small herds, a once per month scoring session should be sufficient provided that the herds person is on the look out for new lameness cases in-between sessions. The LAME list is created from these observations and the trimmer records lesions and treatment information which are entered into the LAME event in DC305.



The LAME event now becomes our means of tracking the treatment of the cow. All cows receiving a block should be seen after 30 days (earlier if the lameness worsens) and re-examined as another LAME event. Severe cases of ulcer or white line abscess usually require a third examination after another 30 days to check on progress.

Cows that have been presented for LAME treatments for **more than three occasions** with at least one month between treatments, with a variety of hoof problems, are the chronically lame cows that are failing to cure. Within this group there are two types of cow that need to be identified.

1. The first is a cow with a lameness problem that is significantly affecting the well-being of the animal. There may be deep digital sepsis and there is usually pain associated with the lesion. Many of these cows cannot be treated effectively and should be culled from the herd.
2. The second are a group of cows that have very poor hoof conformation, that walk abnormally, but without pain or an active lesion. Many of these cows benefit from more frequent hoof-trimming, usually every 90 days, and once on this program they may in fact recover to the point that they no longer have an abnormal gait. We must identify these cows and not record them as new cases of lameness so that they are not repeatedly trimmed at very frequent intervals (ie. every trimmer visit). To do this we use another event - the FOOTREMARK (see later).

Once the herd is frequently being surveyed for abnormal gait, the number of cows submitted for routine trimming may diminish. The TRIM event therefore becomes our default category, so that we make sure that all cows are routinely trimmed at least once a year at dry-off. This is a good time to review the cow history and to check that a cow wasn't neglected throughout her lactation. The TRIM list is a group of cows that have not been treated for LAME within the last 90 days that have reached a certain stage in their lactation cycle, typically at dry-off, and in herds that trim twice a year, at 90-120DIM. A list of TRIM cows should be created and presented to the trimmer. Records of lesions should be completed on a separate recording document and these data entered into the TRIM event.

The FOOTREMARK event

Create the FOOTRMK event using the ALTER command and User defined events option. Add the event and select event date and remark prompts.

In the remark line of the FOOTREMARK event we can record that the cow is a 90 day trim cow by typing '90', and use this to recruit these cows for trimming every 90 days. Typically, any cow that has been recorded as LAME on more than three occasions with at least one month between events should be called a 90 day cow, but trimmers and herdsman are free to use this category on any at-risk cow that requires more frequent attention.

The FOOTREMARK event is also used as a reminder to recheck cows with severe lesions. When entering the lesion data for LAME and TRIM events, any cow treated with a block should also receive a FOOTREMARK event. We can type RECK (RECHECK) and the date in 30 days time when the cow should be rechecked.

For example, a cow receiving a block on the 1st January for an ulcer that should be rechecked would receive a FOOTREMARK such as RECK0201 – indicating the recheck date of February 1st. Note that this event is a temporary management item – once the cow has been rechecked, we

can delete the FOOTREMARK by right clicking on the entry in the cow card and choosing delete entry. This will keep the FOOTREMARK information current for each cow. Do not delete a '90' FOOTREMARK.

STAGE 3

The third stage of developing the lameness monitoring program is to automate the lists required for the hoof-trimmer and to structure the trimmer's day so that we optimize the use of each trimming slot.

Typically, a trimmer will see around 40 cows per day. We should organize the cows being trimmed into four main groups and trim them in the following order:

1. New cases of lameness
2. Recheck lame cows
3. 90 day cows
4. Routine trims

This way, we can utilize the trimmers' skills on the cows that are most difficult to treat early in the day, and then save the easier routine trim cows for later in the day.

Creating the List of Cows

The LAME list includes two groups of cows:

1. New cases of lameness identified using locomotion scoring – usually manually recorded on a separate management sheet.
2. Cows that are recorded in the FOOTREMARK as a RECHECK. These may be identified with the command:

**LIST ID LACT DIM RELV PEN DSLL TLAME LREM FTRMK FOR FTRMK>R
DSLL>29\CU**

```
- Command : LIST ID LACT DIM RELV PEN DSLL TLAME LREM FTRMK FOR FTRMK>REC DSLL=28-42\CU
  ID LACT  DIM RELV PEN  DSLL TLAME LREM      FTRMK
=====
   888    4   313   84   5   28     2 AK3RR   RECK628
  1351    5   281   91   5   28     6 UK2RR   RECK628
  2030    3   396  113  17   30     7 AK3LR   RECHECK
  2067    3   230  100   4   35     3 FEETOK  RECK621
  2111    3   242  108   4   28     3 T3LR    RECK628
  2144    3   252  101   5   28     3 FEETOK  RECK628
  2207    2   460  115  17   30     4 URR     RECHECK
  2264    2   496  114   5   42     7 AK2LR   RECK613
  2402    3   103   91   5   28     4 TK4LR   RECK628
  2685    2   455  130   2   28     2 WALLULRF RECK628
  2865    2   313  110  37   42     7 A3RR    RECK613
  2899    2   267  115   4   35     6 T3RF    RECK613
  3087    2   143  116   4   35     2 FEETOK  RECK621
  3180    2    80   88   5   28     2 AK4RR   RECK628
  8501    4   252  121   4   28     8 T3RR    RECK628
  8503    4   480  107   5   35     7 TK4LF   RECK621
```

Items used in this report include:

DSLL

Type: 72 days since last event
Event: LAME
Value: -1 (last)
Description: Days since last lame

LREM

Type: 73 remark of event
Event: LAME
Value: -1 (last)
Description: Remark of last lame

TLAME

Type: 74 count of events
Event: LAME
Value: 0 for all
Description: times lame

FTRMK

Type: 73 remark of event
Event: FOOTREMARK
Value: -1 (last)
Description: Remark of last footremark

The TRIM list includes three groups of cows:

1. Cows that are recorded in the FOOTREMARK as a 90 day cow that have not been trimmed in the last 90 days
2. Cows for trim at Dry off (days carried calf >220 days) that have not been treated LAME within the previous 90 days
3. Cows for trim at >90DIM that have not been treated LAME within the previous 90 days

The 90 day cows due for trimming can be identified using the command:

**LIST ID LACT DIM PEN DSLL DSTRM TRMRM FTRMK FOR FTRMK=90
DSTRM>90 DSLL>90**

```
-
                                     90 day cow list for hoot-trim
  ID BNAME  LACT  DIM PEN  DSLL TRMRM  DSTRM FTRMK
=====
| 601 ANNA   7   387  1   369 HLRRELR  185 90
| 605 KATRINA 6   419  1   369 ELRRR   185 90
| 640 MERRY  6   415  2   369 ELR     185 90
```

Total: 3

The dry-off list can be made as follows:

**LIST ID LACT DIM DCC PEN DSLL LREM DSTRM TRMRM TLAME FOR
DCC>220 DSLL>90 DSTRM>90**

The 90DIM list can be made as follows:

**LIST ID LACT DIM DCC PEN DSLL LREM DSTRM TRMRM TLAME FOR
DIM>90 DSLL>90 DSTRM>90**

We will need to add the following items:

DSTRM

Type: 72 days since last event

Event: TRIM

Value: -1 (last)

Description: Days since last trim

TRMRM

Type: 73 remark of event

Event: TRIM

Value: -1 (last)

Description: Remark of last trim

Creating Lists of Cows for Follow-up

Several actions need to be performed after the cows are trimmed for TRIM or LAME events.

1. Cows identified for RECHECK should have a FOOTREMARK added so that they are seen again in 30 days. Enter RECK and the date of recheck.
2. Cows that need to be added to the 90 list need a FOOTREMARK entered. Enter 90.
3. Cows that have received a wrap treatment must be identified for wrap removal in 3 days by requesting cows with a TRMRM or LREM > W
4. Cows that have received a hoof block must be identified for block removal in 30 days by requesting cows with a TRMRM or LREM > K

Create a list of LAME cows to be used as a monitor for the next 30 days:

**LIST ID LACT DIM PEN DSLL TLAME LREM RELV DUE RPRO FTRMK
FOR LACT>0 DSLL=(DAY RANGE)\CU**

- Command : LIST ID LACT DIM PEN DSSL TLAME LREM RELV DUE RPRO FTRMK FOR LACT>0 DSSL>0\CU

ID	LACT	DIM	PEN	DSSL	TLAME	LREM	RELV	DUE	RPRO	FTRMK
525	9	458	1	257	1	-	100	-	BRED	-
601	7	387	1	369	1	HELRRR	89	-	BRED	90
605	6	419	1	369	1	DHEALLW	139	9/15/06	PREG	90
640	6	415	2	369	1	HDEALL	109	-	BRED	90
654	6	402	2	257	1	ELFRFR	122	9/29/06	PREG	-
658	4	541	0	369	3	HELRRRF	96	9/22/06	PREG	RCK0901
659	6	247	6	257	0	DELRRRW	92	-	BRED	-
674	4	528	0	369	1	HALL	127	10/27/06	PREG	-
702	4	428	0	369	1	DHERRLRW	105	10/14/06	PREG	-
708	4	404	0	257	1	DLRHALLW	113	12/15/06	PREG	RCK410
715	3	395	2	369	1	DLRRRRFW	122	10/ 6/06	PREG	-
724	3	415	0	384	1	ELRW	128	-	BRED	-

Total: 12

STAGE 4

Once the TRIM and LAME events are being used correctly, we can start to use the DC305 events commands to analyze epidemiological trends.

Monitoring Rates of Lameness

Type **EVENTS FOR LACT>0** in the command line and choose 5. Table by month, and 6. Table by DIM. This will give a crude count of cow cases of lameness and a total along with all of the other recorded health events for the last year. Lameness cow case rate may be calculated from these data.

Event	Total	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
FRESH	1548	106	90	133	105	146	143	143	146	124	129	167	116
OK	2646	261	127	116	156	127	262	220	301	251	218	352	255
CYSTIC	389	36	16	24	21	17	34	30	59	36	37	46	33
SCORE	509	35	35	0	33	42	67	56	63	48	42	46	42
LDA	50	4	7	5	1	8	6	6	2	5	2	1	3
LAME	746	100	72	8	27	33	71	57	34	108	87	66	83
DRYOFF	134	18	5	1	4	3	5	9	14	4	14	41	16
MET	94	7	5	10	9	10	10	8	11	6	7	7	4
RDA	4	1	1	0	0	0	0	0	1	0	1	0	0
KET	1	0	0	1	0	0	0	0	0	0	0	0	0
PNEU	63	10	8	9	3	3	0	3	11	10	5	0	1
TRIM	689	108	123	33	53	53	56	14	45	13	21	21	149

A similar table can be produced by DIM and we can select by parity by changing the FOR statement to LACT=1 or LACT>1.

However, when we use the LAME event to manage lameness treatment, the total number of LAME events becomes a useless monitor of the rate of lameness – it is very easy for a cow to get 3 LAME events as we recheck her, which dramatically increases the incidence of lameness.

The best monitor of lameness is frequent locomotion scoring of the herd. Monitoring the proportion of the herd at each LMS score and how this distribution changes is the best objective monitor of progress over time. However, we may use DC305 to monitor other trends.

DIM and TIME trends using EGRAPH

The days in milk distribution of first and repeat cases of lameness can be examined graphically using the EGRAPH command and selecting the LAME event and the DIM (Adults) option:

EGraph ✖

Events Selected : 1

<input type="checkbox"/> 1 FRESH	<input type="checkbox"/> 22 SCCWORK	<input type="checkbox"/> 43 EXHT
<input type="checkbox"/> 2 OK	<input type="checkbox"/> 23 SICK	<input type="checkbox"/> 44 PRHT
<input type="checkbox"/> 3 RECHK	<input type="checkbox"/> 24 PRBRED	<input type="checkbox"/> 45 HFR
<input type="checkbox"/> 4 HEAT	<input type="checkbox"/> 25 RP	<input type="checkbox"/> 46 TRIM
<input type="checkbox"/> 5 BRED	<input type="checkbox"/> 26 MF	<input type="checkbox"/> 47 J5
<input type="checkbox"/> 6 PREG	<input type="checkbox"/> 27 CYSTIC	<input type="checkbox"/> 48 INJECT
<input type="checkbox"/> 7 OPEN	<input type="checkbox"/> 28 SMOVS	<input type="checkbox"/> 49 PG90
<input type="checkbox"/> 8 PREV	<input type="checkbox"/> 29 SCORE	<input type="checkbox"/> 50 BSTON
<input type="checkbox"/> 9 MOVE	<input type="checkbox"/> 30 HEIGHT	<input type="checkbox"/> 51 BSTOFF
<input type="checkbox"/> 10 BULLPEN	<input type="checkbox"/> 31 WEIGHT	<input type="checkbox"/> 52 ATRISK
<input type="checkbox"/> 11 DRY	<input type="checkbox"/> 32 LDA	<input type="checkbox"/> 53 DIARRH
<input type="checkbox"/> 12 ABORT	<input type="checkbox"/> 33 PGREM	<input type="checkbox"/> 54 HERPES
<input type="checkbox"/> 13 DNB	<input type="checkbox"/> 34 GNRH	<input type="checkbox"/> 55 FOOTRMK
<input type="checkbox"/> 14 SOLD	<input type="checkbox"/> 35 IMPLANT	<input type="checkbox"/> 56 MASTEVL
<input type="checkbox"/> 15 DIED	<input type="checkbox"/> 36 MASCULT	<input type="checkbox"/> 57 HRDWARE
<input type="checkbox"/> 16 CHECK	<input checked="" type="checkbox"/> 37 LAME	<input type="checkbox"/> 58 INFECTN
<input type="checkbox"/> 17 CALFVAC	<input type="checkbox"/> 38 DRYOFF	<input type="checkbox"/> 59 FEVER
<input type="checkbox"/> 18 XID	<input type="checkbox"/> 39 MET	<input type="checkbox"/> 60 LUNGER
<input type="checkbox"/> 19 OVCK	<input type="checkbox"/> 40 RDA	<input type="checkbox"/> 61 NONACHI
<input type="checkbox"/> 20 MAST	<input type="checkbox"/> 41 KET	<input type="checkbox"/> 62 FOOTVAX
<input type="checkbox"/> 21 CULTURE	<input type="checkbox"/> 42 PNEU	

Start Date

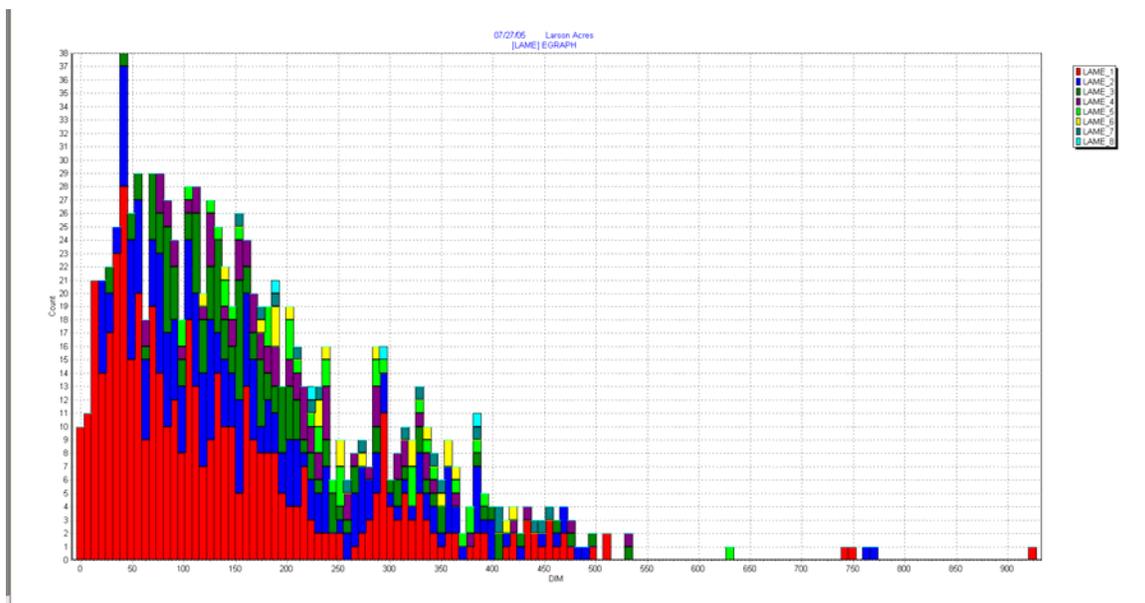
End Date

Graph By Calendar Date
 DIM (Adults)
 Age (Heifers)

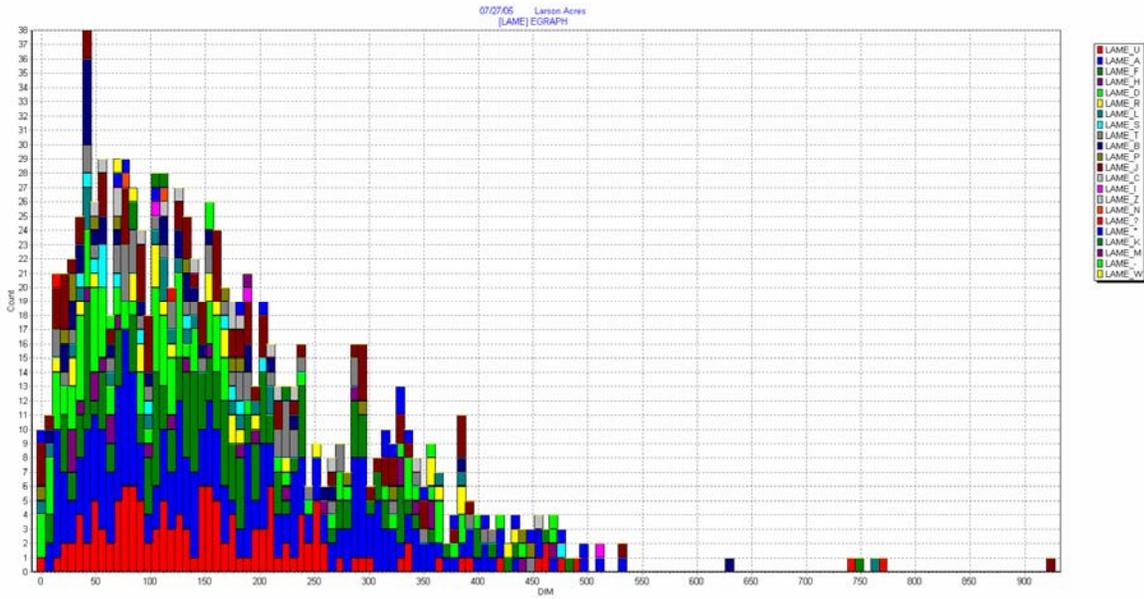
Use Remark

Use Scatter

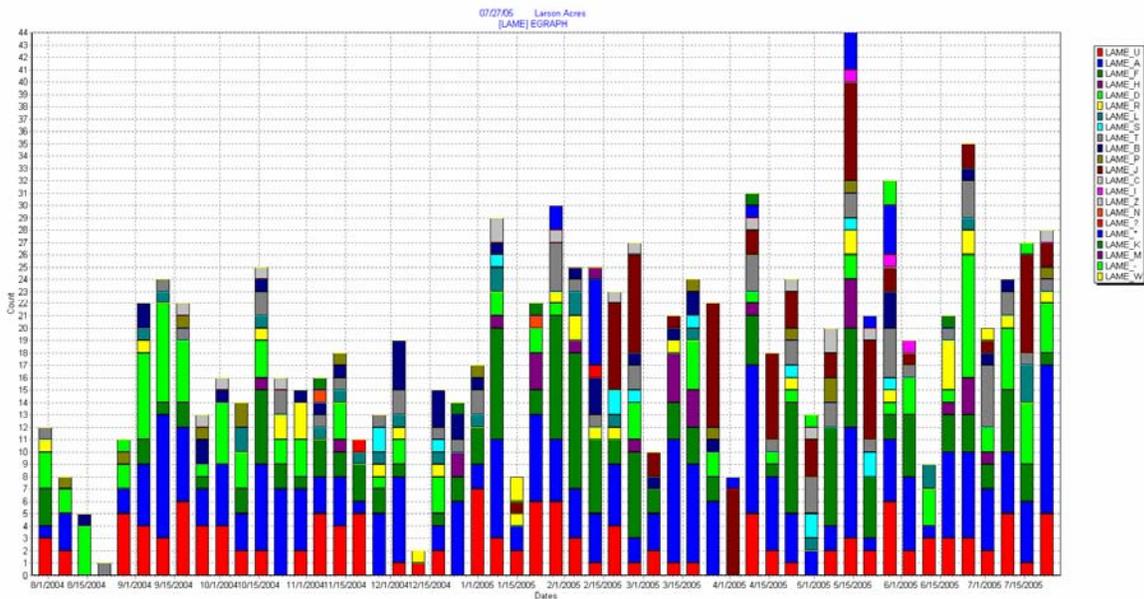
The output is color coded by the number of lameness treatments:



...Or if we click on 'Use Remark' the DIM distribution of each lesion can be examined provided that the first letter of the remark line has been reserved for each different lesion.



If we select the calendar date and remark options, we can track lesion type by date:



The causes of the lame events can be reviewed using the LREM.

We can sort within the remark using the FOR command and select the letter abbreviation for each lesion. Sole ulcers would be selected using LREM>U, white line abscess LREM>A, toe ulcer LREM>T, sole hemorrhage LREM>H. Count and record the total cows listed for each command. This total, for UAT and H is the combined CLAW HORN LESION total.

We can also sort for cases of heel warts LREM>D, foot rot LREM>F, heel erosion LREM>E and corn LREM>C. The total for cows listed in each of these categories (DFE and C) is the combined INFECTIOUS LESION total.

A comparison of these totals may be used to direct an investigation of lameness towards problems of leg hygiene or problems related to nutrition and stall comfort.

The First Case of Lameness

Because of the chronic nature of lameness, it can be very useful to examine the timing of the first case of lameness during a lactation. We can look at lesions responsible for the first case of lameness and their timing using the command:

```
LIST ID LACT DIM LA1RM LAME1 FOR LA1RM>U ..... etc
```

To run this command we will need to enter one additional item:

LAME1

Type: 71 dim at event

Event: LAME

Value: 1 (first)

Description: DIM at first lame

LA1RM

Type: 73 remark of event

Event: LAME

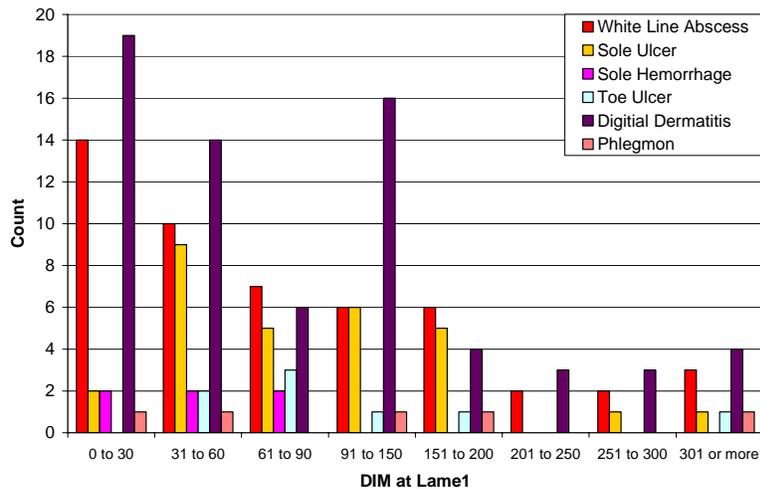
Value: 1 (first)

Description: Remark of first lame

We can sort for lesions in the LA1RM as we did for the LREM and produce a similar set of numbers for claw horn and infectious lesions.

Using Excel and sorting the LAME1 data as described, we can graph out the DIM distribution of different lesions by parity. This information can be used to tell us at what stage the cows are becoming lame.

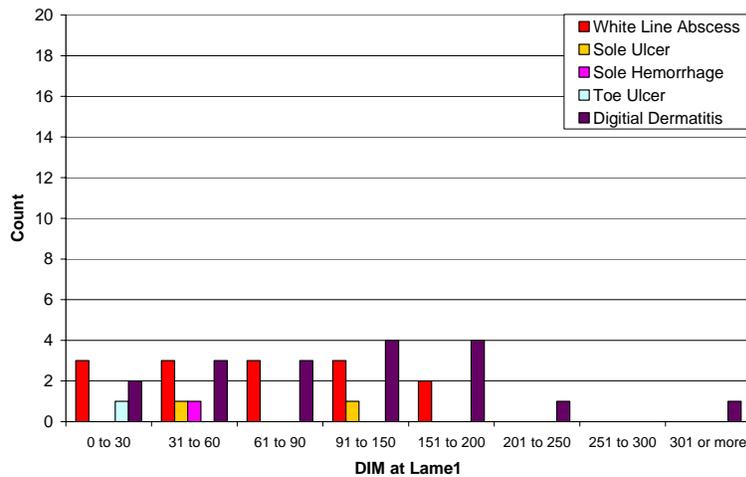
Lame1 by DIM and Lesion Type for Lact>1



In the graph above, white line disease is a particular problem for mature cows in early lactation in this large herd where the dry cows are housed on a slatted floor barn, before being moved to sand stalls and concrete alleys.

In comparison, first lactation heifers are relatively unaffected by lameness of any type in the same herd (pictured below).

Lame1 by DIM and Lesion Type for Lact=1



Monitoring Chronic Cows

Chronically lame cows should make up less than 5% of the herd and they should be monitored by using the FOOTREMARK event to identify cows on the 90 day trim list.

**LIST ID LACT DIM DCC RPRO MILK CWVAL RELV FTRMK FOR
FTRMK=90 BY CWVAL\A**

The switch \a gives averages for cowvalue and relative value in the above command line. These values will typically be below the average of the rest of the herd and the list may be ordered by cowvalue to identify cows for culling.

```

- Command : LIST ID LACT DIM DCC RPRO MILK CWVAL RELV FTRMK FO
=====
ID LACT DIM DCC RPRO MILK CWVAL RELV FTRMK
=====
9000 5 581 0 NO BRED 48 68 111 AGE90
2208 3 258 0 NO BRED 60 316 72 90
902 5 271 255 DRY 0 400 0 90
8095 5 409 0 NO BRED 78 499 107 90
1391 4 382 250 DRY 63 568 95 90
1424 4 431 265 DRY 0 656 98 90
2131 3 304 107 PREG 62 744 92 90
1441 4 426 223 PREG 49 767 99 90
2817 2 358 133 PREG 61 804 90 90
2194 3 285 174 PREG 94 875 108 90
2761 2 305 265 DRY 0 1051 90 90
1842 3 329 125 PREG 60 1120 88 90
9042 4 257 181 PREG 63 1163 83 90
1726 4 329 258 DRY 0 1195 94 90
1589 4 144 0 NO BRED 89 1296 75 90
1610 5 156 79 PREG 111 1297 98 90
1248 6 287 237 DRY 0 1339 105 90
8977 5 209 0 BRED 97 1409 94 90
9085 2 534 125 PREG 65 1415 112 90
1812 4 200 125 PREG 82 1441 74 90
2069 3 183 0 NO BRED 49 1562 64 90
2027 3 305 272 DRY 0 1688 109 90
2068 3 120 0 NO BRED 107 1692 84 90
2270 3 395 175 PREG 96 1851 120 90
1588 4 346 0 NO BRED 79 1880 112 90
1823 3 253 0 BRED 107 1922 105 90
1926 4 276 202 PREG 39 1943 97 90
1551 4 313 279 DRY 0 2035 110 90
2058 3 286 153 PREG 96 2070 113 90
1358 4 240 90 PREG 124 2296 126 90
2361 3 221 0 OK/OPEN 92 2313 97 90
8933 4 382 179 PREG 97 2580 146 90
32 total
Avg 3.7 305 189 79 1320 99 90

```

This is similar to a chronic high SCC cow list for mastitis management.

The identification of the animals on this list and their management in a pen close to the parlor is a major improvement in welfare. These cows all receive the care that they need when they need it, while leading productive lives and contributing to the economics of the dairy herd. Management of such a list effectively reduces the possibility that a cow with deep digital sepsis will be repeatedly presented to the hoof-trimmer and inadequate therapy given because of a lack of records of the history of the cow.