Set Up for Milk Quality and Mastitis Analysis

You will need to familiarize yourself with the items and commands in each cow file before proceeding.

Look at the item definitions by typing:

```
Alter then clicking on:
2 Items
5 Examine/Modify an item
```

Items are listed in alphabetical order. What items are already present and which need to be added? To enter new items click on Add an item. Read the dialogue box and click on drop down menus to change item type, value etc. Follow the program as it guides you through to the point that you click Y to save item definition.

Items that we typically need to add or have in the system include the following:

**SCC (SCA)**
type: 88 Test day SCC
which test: -1 (last test)
value:0
description: last test SCC

**SCC_1 (SCB)**
type: 88 Test day SCC
which test: -2 (two from last)
value:0
description: SCC one test previous to last test

**SCC_2**
type: 88 Test day SCC
which test: -3 (three from last)
value:0
description: SCC two tests previous to the last test

**SCC1**
type: 88 Test day SCC
which test: 1
value:0
description: SCC at first test date
SCC2
type: 88 Test day SCC
which test: 2
value:0
description: SCC at second test

This will allow us to look at chronic cows >200 for at least the last three SCC tests and examine the cows that are >200 at first test. If you prefer, you may enter the log linear score equivalents: LOG, LOG_1, LOG_2 and LOG1. Instead of selecting value = 0 raw, select value = 1 decimal. In some programs, LOG will be lgsc or lsa.

DC305 stores SCC data without any filtering. For example, cows tested on day 1-5 of lactation will have their data stored in DC305, but not in DHIA reports. In order to filter the data, we need to create an item to sort DIM at first test:

DIMT1
type: 81 Test day days in milk
value: 1
description: Days in milk at first test date

Finally, to determine new infections around the dry period, we need to check and see if DRYLG is being used. This is an item that needs to be stored prospectively when a cow is dried off – by telling the computer to store the last linear score of the previous lactation. Unfortunately, if it is not in use, we cannot ask for it retrospectively, but we can set up the system to store the information in the future. This is done by using the following commands:

You must create the item DRYLG in the Alter menu if it is not already there, before the data can be stored:

You must then instruct DC305 to save the DRYLG when entering a dry off event by modifying the dry command:
Type “Alter” in command line
Choose 3. Commands
Choose Exam/Modify a Command
Choose Dry
Enter information in Content line below:

This entry tells DC305 to store the last LOG score as an item called DRYLG.

**Removal Reasons**

We are frequently in need of more accurate culling information than that provided by DHIA. Information on mastitis related culls may be obtained by viewing the culling codes being used by entering:

**Setup**
Select disposal codes:

Eg: 1= sick, 2=dairy, 3=low production, 4=breeding, 5=injury, 6=died, 7=mastitis, 8=abort etc

View a histogram of each of the codes – record the count for code 7=mastitis:

**Graph dcar for lact>0\d**  
(nb. sometimes dcar is just car)

View the individual animals that left the herd:

**Events id\i**
Select sold and died

Similar to the list of mastitis events this will also list DIM at removal and the remark of the cull event. Some remarks may contain information on culling reason – look for mastitis reasons.
**Cowvalue**

It is useful to have Cowvalue activated when we are making lists of cows for culling. To make sure that Cowvalue is correctly set up, type in Cowval in the command line and click on 2. Edit parameters. View the data used to calculate cowval – have they been updated? If not, re-enter cowval in the command line and click on 4. Calculate parameter estimates. This option uses data from the cowfile to update the estimates. Once this has been done, the cwval number should be reasonably accurate for attributing a net present value term to each cow.

**Pen Distribution**

It is often necessary to identify the pens being used to group the animals and to count the number of cows in each pen. This can be done using the following command:

**Sum by pen**

**Analysis of SCC Data**

1. **Summary Data**

View average SCC and log linear score by lactation for all cows:

**Sum scc log by lact for lact>0**

<table>
<thead>
<tr>
<th>Lact</th>
<th>SCC</th>
<th>Av</th>
<th>SCC AvLGSCC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>28</td>
<td>174</td>
<td>204</td>
</tr>
<tr>
<td>2</td>
<td>32</td>
<td>193</td>
<td>222</td>
</tr>
<tr>
<td>3</td>
<td>19</td>
<td>117</td>
<td>254</td>
</tr>
<tr>
<td>4</td>
<td>10</td>
<td>65</td>
<td>433</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>32</td>
<td>768</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>11</td>
<td>173</td>
</tr>
<tr>
<td>7</td>
<td>0</td>
<td>6</td>
<td>62</td>
</tr>
<tr>
<td>8</td>
<td>0</td>
<td>3</td>
<td>214</td>
</tr>
<tr>
<td>9</td>
<td>0</td>
<td>1</td>
<td>29</td>
</tr>
<tr>
<td>10</td>
<td>0</td>
<td>1</td>
<td>185</td>
</tr>
</tbody>
</table>

Create a table with herd average SCC for each test date for the last year:

**Plot scc for milk>0\rz**
The switch r orders the data by test day in reverse order and z creates a table of raw numbers. Note that the number of cows contributing to the average decreases as you go back in time. Cows are leaving the herd and calving again and the data is lost – so the averages are only reliable over the last 6 months or so.

2. Chronic Cow List

Chronic cows are defined as cows >200 SCC at the last two or three tests. A problem cow list may include important elements of a cow’s history which may aid a culling or treatment decision. A suggested command line would be:

```
Show id lact dim milk me305 dcc tmast drylg scc_2 scc_1 scc cwval for scc_2>200 scc_1>200 scc>200 by cwval
```

Listing the cows ‘by cowval’ orders the list of cows from least value to most value. You must make sure that cowvalue has been set up correctly in the file that you are using (see section on making sure that this is the case before using this command).

3. Scatter Graphs

New Infections, Cures and Chronic infection dynamics can be viewed for a herd each month using the commands below:

```
Graph log_1 by log for milk>0
```
Double clicking on each dot will show the cow card and test history for that cow. It is possible to view a 2x2 table of the above with calculated percentages by typing in:

\[
\text{Sum scc}_1 = 200 \text{ scc}=200 \text{ for fdat}>0
\]

or \[
\text{Sum log}_1 = 4 \text{ log}=4 \text{ for fdat}>0
\]

In a scatter plot, the most recent LOG is on the x axis and the previous LOG is on the y axis. Split the plot into quadrants at linear score 4 (or SCC 200).

The lower left quadrant will be where cows should be – uninfected. The upper left quadrant are the cures, the upper right quadrant are the chronics and the lower right quadrant are the new infections.

In the example below, the new infection rate is calculated as follows:

The denominator is the population that tested LOG<4 at the previous test = 1187
The numerator is the population LOG>4 at the current test = 119

Therefore, new infection rate is 119/1187 = 10%

Note that this does not equal the new infection rate in the DC305 analysis as this percentage is the proportion of the total number of cows that had previous and current tests – including chronics.
These calculations may be done for parity groups in large herds, to make the data more manageable.

Provided that drylg (the last log linear score of the previous lactation) has previously been entered as an item, we can view a scatter plot of the last log score of the previous lactation and the 1st log score of the current lactation.

**Graph drylg by log1 for rc=1-5 lact>1 dimt1>5**

Note that the command is followed by a for statement which ensures that dry cows are removed from the selection (rc=1-5), so that the command truly examines non-lactating period infections and cures. The test date restriction is used because several first test log linear scores>4 will be <6 DIM and should not be considered as new infections. A table can be made as described above using the command:

**Sum drylg=4 log1=4 for fdat>0**
What is the new infection rate at first test?

4. Infections at first test in heifers

View a list of first test data for heifers using the command:

    Show id fdat scc1 dimt1 for lact=1 dimt1=5-37 re=1-5 downby scc1

Calculate the percent of heifers infected at first test using the command:

    Pct scc1>200 lact=1 re=1-5 for lact=1 re=1-5

5. Infections at first test in mature cows uninfected at dry off

View a list of cows with new infections at first test that were uninfected at dry off

    Show id fdat drylg scc1 dimt1 for dimt1=5-37 re=1-5 scc1>200 drylg<4 lact>1 downby scc1

Calculate the proportion of clean cows at dry off, infected at first test using the command:

    Pct scc1>200 drylg=0.1-4 re=1-5 dimt1=5-37 for drylg=0.1-4 re=1-5

6. Cure of infections during the dry period

View a list of cows that cured during the dry period:

    Show id lact drylg scc1 dimt1 for drylg>4 scc1<200 dimt1=5-37 re=1-5 downby drylg

Calculate the proportion of infected cows at dry off, uninfected at first test using the command:

    Pct scc1<200 drylg>4 re=1-5 dimt1=5-37 for drylg>4 re=1-5

7. Miscellaneous complex commands

Create a listing of all SCC tests by cow id and test date. To order data by test date rather than DIM, use the switch \r.

    Plot scc by id for lact>0 \r

There is a cow number limitation to this command. Read the last id at the bottom of the data sheet and then repeat the command with a ‘for’ statement which would include id> the last id number on the first run. Repeat as necessary.
Create an analysis of new infections, chronics and cures by using the command:

```
Plot log=4 by log for lact>0 
```

The plot command is used to sort test day values. The switch `\r` uses test date to order the columns and the switch `\y` creates the calculations for new and cure etc. The report page is given below – with dates forming the columns and the calculations divided into % and # for each of the infection categories.

```
- Command : PLOT LOG=4 BY LOG FOR LACT>0 \ KEY

LOG                      TEST DATES
                         119 223 323 510 617 723 828 926 1031 12 7 113
Chronic %                13 16 17 15 16 17 17 19 18 18 14 14
#                        44 59 64 57 60 60 62 75 70 55 59
New Inf %                12 17 13 15 17 18 15 15 14 11 18
#                        41 62 51 57 67 66 65 60 55 43 74
Cured %                  14 10 13 13 9 12 19 12 14 14 19 19
#                        47 38 52 52 36 43 69 47 58 60 60 50
Clean %                  60 56 57 57 58 53 50 54 54 60 57
#                        197 206 219 222 222 222 191 166 211 215 241 239
HiFresh %                29 28 19 11 22 42 46 43 50 28 27
#                        11 19 10 11 6 9 23 16 20 17 17 14
LoFresh %                71 72 81 89 78 58 54 57 70 72 73
#                        27 47 22 47 32 32 19 26 40 43 30
Average                  3.0 3.3 3.0 2.9 3.1 3.1 3.1 3.1 3.1 2.8 3.2
#                        367 430 413 441 426 415 407 439 453 459 473
```
8. Bulk tank contribution

Type ECON in the command line, and click on 3. Edit milk prices. Make sure price and scc premiums are accurate before proceeding.

Then click on 6. Analyze bulk tank somatic cell counts. This will run a % contribution to the bulk tank estimate for the herd. Be careful interpreting the effect of the removal of one cow from the group as these calculations assume that SCC will be constant over time – which is often not the case.
Analyzing 516 cows on Test Date 1/17/05

|------- Current Settings ------|
| Milk price 12.00 |

Without any cows removed:

<table>
<thead>
<tr>
<th>Bulktank SCC</th>
<th>Pay Price</th>
<th>Daily Income</th>
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</thead>
<tbody>
<tr>
<td>227</td>
<td>12.66</td>
<td>5427.59</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ID</th>
<th>MILK</th>
<th>Value</th>
<th>SCC</th>
<th>4Tank</th>
<th>Price @SCC</th>
<th>Income @SCC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1242</td>
<td>104</td>
<td>12.39</td>
<td>9999</td>
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<td>8914</td>
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<td>2.2</td>
<td>12.66</td>
<td>223 5414.79</td>
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</table>

Command: ECON