Goal setting

To be able to define realistic goals for future performance for a specific dairy farm it is probably important to get an idea of current performance. There are no generally applicable udder health and milk quality goals, except to meet the minimum legal standards for milk quality. Any dairy farm will need to decide what the optimal investment is into udder health and milk quality to maximize its overall performance. This decision is likely based on the knowledge of current performance and the short term and long term plans of the management of the dairy farm.

To define performance a set of primary and secondary parameters is provided below. Primary parameters are meant to be an indicator for overall performance. They provide the general state of the farm’s health status, or flag the presence or potential presence of performance flaws. Secondary parameters are especially useful when primary parameters indicate sub-optimal performance. These parameters guide the user to the cause of the underlying problems.

Udder Health

Primary parameter:
Bulk milk somatic cell count (bulk milk SCC or mean SCC and mean Linear Score over time). These parameters are usually provided through the milk buyer or through results from the Dairy Herd Improvement Association (Dairy One in New York).

Secondary parameters:
- Proportion of cows with high SCC
- Proportion of cows with new high SCC (‘new infections’)
- Proportion of cows with chronic high SCC
- Culture results of high SCC cows

The preceding parameters are only available when individual somatic cell counts are measured on a regular basis (preferably monthly) for all cows in the dairy.

Primary parameter:
Clinical mastitis incidence (% cows with ≥ 1 case of clinical mastitis per month)
Secondary parameters:
- Mastitis incidence per lactation group
- Graph of mastitis cases by dim
- Repeat cases of mastitis
- Mastitis incidence per season
- Culture results of mastitis cases

The preceding parameters can only be calculated from records held at the dairy farm. Either hand help records or on-farm computerized records must be kept by the dairy producer.

Primary parameter:
Proportion of cows culled for udder health reason (% culled for mastitis as a percentage of all cows in the herd)

Secondary parameters:
- List of cows culled
- Cows not culled but should have been culled

The preceding parameters can only be calculated from records held at the dairy farm. Either hand help records or on-farm computerized records must be kept by the dairy producer.

Criteria that define excellent udder health status of individual cows and the herd.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Ideal udder health targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bulk milk somatic cell count</td>
<td>&lt; 250,000 cells/ml</td>
</tr>
<tr>
<td>Herd average (actual)</td>
<td>&lt; 200,000 SCC</td>
</tr>
<tr>
<td>Herd average (DHI Linear Score)</td>
<td>&lt; 3.0 LS SCC</td>
</tr>
<tr>
<td>100 % of first calvers (DHI)</td>
<td>&lt; 100,000 SCC</td>
</tr>
<tr>
<td>&gt; 85% of herd</td>
<td>&lt; 200,000 SCC</td>
</tr>
<tr>
<td>&gt; 95% of herd</td>
<td>&lt; 500,000 SCC</td>
</tr>
<tr>
<td>Incidence of clinical mastitis</td>
<td>&lt; 25 cases / 100 cows per year</td>
</tr>
<tr>
<td>Number of culls due to mastitis or other udder health problems</td>
<td>&lt; 5 cases / 100 cows per year</td>
</tr>
</tbody>
</table>
Table 1. Secondary Parameters to be Calculated in Herds with Udder Health Problems

Somatic Cell Counts:

Define cut-off for infection vs no infection (e.g. SCC >250 or LS > 4.5). This is referred to as LS-cutoff in the formula’s below.

% cows infected in the herd: \[
\frac{\text{# cows above LS-cutoff}}{\text{# cows SCC tested}}
\]

% new Infections: \[
\frac{\text{# cows below LS-cutoff last sample and above LS-cutoff this sample}}{\text{# cows below LS-cutoff last sample date}}
\]

% Chronic Infections: \[
\frac{\text{# cows above LS-cutoff last sample and above LS-cutoff this sample}}{\text{# cows SCC tested at both sample dates}}
\]

% Cured infections: \[
\frac{\text{# cows above LS-cutoff last sample and below LS-cutoff this sample}}{\text{# cows above LS-cutoff last sample}}
\]

contribution of highest SCC cows = \[
\frac{(\text{SCC} \times \text{lbs. milk}) \text{ for highest SCC cows}}{\text{Sum of (SCC} \times \text{lbs. Milk) for all cows}}
\]

Incidence of clinical mastitis:

Cumulative Incidence per lactation: \[
\frac{\text{# cows with at least one case of mastitis in this lactation}}{\text{# cows that have completed a lactation}}
\]

Percent of mastitis cases per months: \[
\frac{\text{# cases of mastitis in a given month}}{\text{Avg # cows lactating in a given month}}
\]

Culling due to udder health:

Incidence of culling due to udder health: \[
\frac{\text{# cows culled for mastitis in a given year}}{\text{Avg number of cows present in a given year}}
\]
Milk Quality

Primary milk quality parameters are often reported to the producer by the milk buyer. The parameters usually include Somatic Cell Counts (SCC), Plate Loop Counts (PLC), freezing point information to check for added water, acidity or rancidity, and visible milk cleanliness. Every load of milk is also test for antibiotic residues. Goal setting for bulk milk SCC depends on the ambition of the producer and the possible penalty or additional benefits that may happen by crossing a specific SCC level. In the graph below the advised SCC performance goal is graphed as a function of penalty level. For example, to remain in almost all situations below a level of 750,000 cells, the producer should aim for a mean somatic cell count of approximately 500,000. Similarly, if benefits are paid for milk with a cell count below 300,000, then the performance goal should be approximately 200,000.

![Graph showing SCC performance goal vs penalty level]

- **Regulatory limit**
- **BMSCC goal**
- **Penalty based on mean of:**
  - 1
  - 2
  - 3
Bulk milk PLC should be as low as feasible, but year round production of milk with a bacteria count below 10,000 bacteria is certainly feasible.

Possibly extra information on bacteria counts in milk comes from Preliminary incubation (PI) counts, Coliform counts, and Laboratory Pasteurized Counts (LPC). These tests are described elsewhere and are claimed to make a distinction between washing failures, pipeline contamination and manure contamination in milk.

Residue violations or Growth Inhibitors indicate the presence of antibiotic residues in milk. The average risk of a producer obtaining at least one violation per year is in New York State approximately 3%. It is feasible to put policies in place that there should be no antibiotic residue violation in the herd.