**Supplementary file**

**Table S1.** Main characteristics of the three herds considered

<table>
<thead>
<tr>
<th></th>
<th>Herd</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
</tr>
<tr>
<td>Milking parlour</td>
<td>tandem</td>
</tr>
<tr>
<td>Lactating cows (N)</td>
<td>22</td>
</tr>
<tr>
<td>Parlour stalls (N)</td>
<td>2+2</td>
</tr>
<tr>
<td>Milkers (N)</td>
<td>1</td>
</tr>
<tr>
<td>Pulsation ration</td>
<td>60/40</td>
</tr>
<tr>
<td>Milking vacuum (kPa)</td>
<td>42</td>
</tr>
<tr>
<td>Milkings/d (N)</td>
<td>2</td>
</tr>
<tr>
<td>Average milk yield (kg/d)</td>
<td>24,6</td>
</tr>
<tr>
<td>Healthy cows (N)</td>
<td>7</td>
</tr>
<tr>
<td>Chronic cows (N)</td>
<td>2</td>
</tr>
<tr>
<td>Chronic treated cows (N)</td>
<td>2</td>
</tr>
</tbody>
</table>
Table S2. Results of statistical analysis for repeated measurement on the factors potentially affecting overall milking.

<table>
<thead>
<tr>
<th>Main factors</th>
<th>Interactions with GROUP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>GROUP</td>
</tr>
<tr>
<td>Total milk yield (kg, MGG)</td>
<td>n.s.</td>
</tr>
<tr>
<td>Total milking period (min, tMGG)</td>
<td>0.046</td>
</tr>
<tr>
<td>Average milk flow (kg/min, AMF)</td>
<td>n.s.</td>
</tr>
</tbody>
</table>

† not significant

Table S3. Results of statistical analysis for repeated measurement on the factors potentially affecting main milking process.

<table>
<thead>
<tr>
<th>Main factors</th>
<th>Interactions with GROUP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>GROUP</td>
</tr>
<tr>
<td>Time of main milking process (min, tMHG)</td>
<td>0.0285 n.s.†</td>
</tr>
<tr>
<td>Average yield in main milking process per min (kg, DMHG)</td>
<td>n.s.</td>
</tr>
<tr>
<td>Maximum peak flow per min (kg, HMG)</td>
<td>n.s.</td>
</tr>
</tbody>
</table>

† not significant
Table S4. Results of statistical analysis for repeated measurement on the factors potentially affecting incline and plateau phases

<table>
<thead>
<tr>
<th>Duration of rise phase (min, tAN)</th>
<th>Main factors †</th>
<th>Interactions with GROUP</th>
</tr>
</thead>
<tbody>
<tr>
<td>GROUP</td>
<td>HERD</td>
<td>AGE</td>
</tr>
<tr>
<td>n.s. †</td>
<td>0.0011</td>
<td>n.s.</td>
</tr>
<tr>
<td>Time of plateau phase (min, tPL)</td>
<td>n.s.</td>
<td>n.s.</td>
</tr>
<tr>
<td>Maximum milk yield per min (kg, HMG)</td>
<td>n.s.</td>
<td>0.0518</td>
</tr>
<tr>
<td>Amount of milk 1\textsuperscript{st} min (kg, MG1)</td>
<td>n.s.</td>
<td>0.0021</td>
</tr>
<tr>
<td>Amount of milk 2\textsuperscript{nd} min (kg, MG2)</td>
<td>n.s.</td>
<td>0.0183</td>
</tr>
<tr>
<td>Amount of milk 3\textsuperscript{rd} min (kg, MG3)</td>
<td>n.s.</td>
<td>0.0182</td>
</tr>
<tr>
<td>Maximum milk flow (kg/min, HMF)</td>
<td>n.s.</td>
<td>0.0513</td>
</tr>
</tbody>
</table>

† Results for all main factors and interactions with GROUP were not statistically significant when time difference rise (tAND), and time to maximum milk flow (tHMF) were considered and they were not reported in the table.

Ŧ not significant
**Table S5.** Results of statistical analysis for repeated measurement on the factors potentially affecting to decline, overmilk and stripping phases in the three group of cows considered.

<table>
<thead>
<tr>
<th>Main factors †</th>
<th>Interactions with GROUP</th>
</tr>
</thead>
<tbody>
<tr>
<td>GROUP HERD AGE DIM TIME</td>
<td>HERD AGE DIM TIME</td>
</tr>
<tr>
<td>Time of decline phase (min, tAB)</td>
<td>n.s. n.s. 0.0806 n.s. 0.0466 n.s. 0.0298 n.s.</td>
</tr>
<tr>
<td>Time of overmilking by machine (min, tMBG)</td>
<td>n.s. 0.0518 n.s. n.s. 0.0063 n.s. n.s. n.s.</td>
</tr>
<tr>
<td>Time of stripping phase (min, tMNG)</td>
<td>n.s. &lt;0.0001 n.s. n.s. 0.0018 n.s. n.s. n.s. n.s.</td>
</tr>
<tr>
<td>Milk flow at the beginning of MNG (kg, MFOS)</td>
<td>n.s. n.s. n.s. 0.051 n.s. n.s. n.s. n.s. n.s.</td>
</tr>
<tr>
<td>Time of subsequent milking phase (min, tMBG2)</td>
<td>n.s. 0.0018 n.s. n.s. n.s. n.s. n.s. 0.0113</td>
</tr>
</tbody>
</table>

† Results for all main factors and interactions with GROUP were not statistically significant when duration reduction (t400), time difference decline (tAbD), and subsequent milk yield (MNG) were considered and they were not reported in the table.

Ŧ not significant

**Table S6:** Mean values (± SD) observed for Lactocorder parameters related to electrical conductivity in the three group of cows considered.
### Table S7. Results of statistical analysis for repeated measurement on the factors potentially affecting to electrical conductivity (mS/min).

<table>
<thead>
<tr>
<th></th>
<th>Healthy</th>
<th>Chronic</th>
<th>Treated</th>
</tr>
</thead>
<tbody>
<tr>
<td>At initial phase (Plateau) (mS/min, ELAP)</td>
<td>6.31 ± 0.82</td>
<td>7.20 ± 1.09</td>
<td>6.90 ± 1.23</td>
</tr>
<tr>
<td>Peak difference (mS/min, ELAD)</td>
<td>0.46 ± 0.65</td>
<td>1.12 ± 0.99</td>
<td>0.80 ± 1.03</td>
</tr>
<tr>
<td>Maximum (mS/min, ELMAX)</td>
<td>6.04 ± 0.54</td>
<td>6.45 ± 0.78</td>
<td>6.36 ± 0.51</td>
</tr>
<tr>
<td>At the point of maximum milk flow (mS/min, ELHMF)</td>
<td>5.77 ± 0.43</td>
<td>6.09 ± 0.68</td>
<td>6.07 ± 0.45</td>
</tr>
<tr>
<td>Difference (mS/min, ELND)</td>
<td>0.72 ± 0.36</td>
<td>0.78 ± 0.43</td>
<td>0.65 ± 0.31</td>
</tr>
<tr>
<td>At minimum milking flow (mS/min, ELMNG)</td>
<td>4.51 ± 2.26</td>
<td>4.29 ± 2.97</td>
<td>4.61 ± 2.51</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>GROUP</th>
<th>HERD</th>
<th>AGE</th>
<th>DIM</th>
<th>TIME</th>
<th>HERD</th>
<th>AGE</th>
<th>DIM</th>
<th>TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>At initial phase (Plateau) (ELAP)</td>
<td>0.0429</td>
<td>0.0205</td>
<td>0.0006</td>
<td>0.0846</td>
<td>n.s.†</td>
<td>n.s.</td>
<td>n.s.</td>
<td>n.s.</td>
<td>n.s.</td>
</tr>
<tr>
<td>Peak difference (ELAD)</td>
<td>n.s.</td>
<td>0.0002</td>
<td>n.s.</td>
<td>n.s.</td>
<td>&lt;0.0001</td>
<td>n.s.</td>
<td>n.s.</td>
<td>n.s.</td>
<td>n.s.</td>
</tr>
<tr>
<td>Maximum (ELMAX)</td>
<td>0.0141</td>
<td>0.0546</td>
<td>&lt;0.0001</td>
<td>0.0378</td>
<td>0.0046</td>
<td>n.s.</td>
<td>n.s.</td>
<td>n.s.</td>
<td>n.s.</td>
</tr>
<tr>
<td>At the point of maximum milk flow (ELHMF)</td>
<td>0.0084</td>
<td>0.0501</td>
<td>&lt;0.0001</td>
<td>0.0549</td>
<td>0.0004</td>
<td>n.s.</td>
<td>n.s.</td>
<td>n.s.</td>
<td>n.s.</td>
</tr>
<tr>
<td>At minimum milking flow (ELMNG)</td>
<td>n.s.</td>
<td>0.0008</td>
<td>n.s.</td>
<td>0.0195</td>
<td>n.s.</td>
<td>n.s.-</td>
<td>n.s.</td>
<td>n.s.</td>
<td>n.s.</td>
</tr>
</tbody>
</table>

† not significant

**Figure SF1**
Pattern of average yield in main milking process per min (DHMG) during the follow up in the three group of cows considered.

Figure SF2
Pattern of amount of milk in the 1st min (MG1) during the follow up in the three group of cows considered.