**Supplementary Table 3.** Multivariable general linear mixed model describing the factors associated with total milk yield (kg) from 384 milking observations of 129 cows.

|  |  |  |  |
| --- | --- | --- | --- |
| Item | β1 (SE) | *p* | LSM2 (SE) |
| Intercept | 13.3 (0.5) | <0.001 | – |
| Milking session |  | <0.001 |  |
| Milking #1 | 1.5 (0.2)a |  | 15.7 (0.3) |
| Milking #2 | -2.5 (0.2)b |  | 11.6 (0.3) |
| Milking #3 | -Referent-c |  | 14.1 (0.3) |
| Parity |  | <0.001 |  |
| 1st | -2.3 (0.6)a |  | 12.1 (0.4) |
| 2nd | 0.6 (0.7)b |  | 15.0 (0.5) |
| ≥3rd | -Referent-b |  | 14.4 (0.4) |
| DIM3 |  | <0.001 |  |
| ≤100 | 2.3 (0.6)a |  | 14.7 (0.4) |
| 101-200 | 2.0 (0.6)a |  | 14.4 (0.5) |
| >200 | -Referent-b |  | 12.4 (0.5) |

a-cMain effects marked with different superscript letters differ at a level of *p* ≤ 0.05 in Tukey-Kramer´s post hoc test.

1Linear regression coefficient.

2Least squares means in kg.

3Stage of lactation (days in milk).

**Supplementary Table 4.** Multivariable general linear mixed model describing the factors associated with two-minute milk yield (kg) from 384 milking observations of 129 cows.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Item | β1 (SE) | *p* | LSM2 (SE) | |
| Intercept | 4.2 (0.6) | <0.001 | | – |
| Milking session |  | <0.001 | |  |
| Milking #1 | -0.6 (0.1)a |  | | 6.0 (0.3) |
| Milking #2 | -0.6 (0.2)a |  | | 6.0 (0.3) |
| Milking #3 | -Referent-b |  | | 6.5 (0.3) |
| TMY3 | 0.2 (0.03) | <0.001 | | – |
| TES4 |  | 0.6 | |  |
| Pointed | 0.4 (0.8) |  | | – |
| Flat | -1.1 (1.1) |  | | – |
| Round | -Referent- |  | | – |
| LAG5 | -0.008 (0.04) | 0.8 | | – |
| TES × LAG |  | 0.003 | |  |
| Pointed × LAG | -0.2 (0.1)a |  | | 5.1 (0.5) |
| Flat × LAG | 0.2 (0.1)a |  | | 6.8 (0.6) |
| Round × LAG | -Referent-b |  | | 6.5 (0.2) |

a-bMain effects marked with different superscript letters differ at a level of *p* ≤ 0.05 in Tukey-Kramer´s post hoc test.

1Linear regression coefficient.

2Least squares means in kg. The results are averaged over the levels of all other categorical variables included in the model and the mean lag time of 74 s.

3Total milk yield (kg).

4Teat-end shape. Classified as follows: pointed = 2 or more pointed teats, flat = 2 or more flat teats, round = 3 or 4 round teats.

5Preparation lag time (s, 1-unit = 10 s), time between first teat stripping and milking unit attachment.

**Supplementary Table 5.** Multivariable general linear mixed model describing the factors associated with milking unit-on time (s) from 384 milking observations of 129 cows.

|  |  |  |  |
| --- | --- | --- | --- |
| Item | β1 (SE) | *p* | LSM2 (SE) |
| Intercept | 136 (19) | <0.001 | – |
| Milking session |  | 0.02 |  |
| Milking #1 | -14 (6)a |  | 255 (8) |
| Milking #2 | -12 (4)ab |  | 241 (8) |
| Milking #3 | -Referent-bc |  | 243 (8) |
| TMY3 | 10 (1) | <0.001 | – |
| Parity |  | 0.03 |  |
| 1st | -30 (12)a |  | 230 (11) |
| 2nd | -13 (13)ab |  | 248 (12) |
| ≥3rd | -Referent-b |  | 261 (9) |
| TES4 |  | 0.02 |  |
| Pointed | 36 (15)a |  | 277 (13) |
| Flat | -21 (18)b |  | 220 (17) |
| Round | -Referent-b |  | 241 (6) |

a-cMain effects marked with different superscript letters differ at a level of *p* ≤ 0.05 in Tukey-Kramer´s post hoc test.

1Linear regression coefficient.

2Least squares means in s.

3Total milk yield (kg).

4Teat-end shape. Classified as follows: pointed = 2 or more pointed teats, flat = 2 or more flat teats, round = 3 or 4 round teats.

**Supplementary Table 6.** Multivariable general linear mixed model describing the factors associated with time in low milk flow rate (s) from 384 milking observations of 129 cows.

|  |  |  |  |
| --- | --- | --- | --- |
| Item | β1 (95% CI) | *p* | LSM2 (95% CI) |
| Intercept | 36.42 (24.10-55.04) | <0.001 | – |
| Milking session |  | <0.001 |  |
| Milking #1 | 1.20 (1.08-1.35)a |  | 14 (13-17) |
| Milking #2 | 1.29 (1.11-1.50)a |  | 16 (13-18) |
| Milking #3 | -Referent-b |  | 12 (11-14) |
| TMY3 | 0.94 (0.92-0.96) | <0.001 | – |
| Parity |  | 0.004 |  |
| 1st | 0.75 (0.63-0.89)a |  | 12 (10-14) |
| 2nd | 0.93 (0.76-1.13)ab |  | 15 (12-17) |
| ≥3rd | -Referent-b |  | 16 (14-18) |
| TES4 |  | 0.007 |  |
| Pointed | 0.42 (0.24-0.75) |  | – |
| Flat | 0.56 (0.23-1.32) |  | – |
| Round | -Referent- |  | – |
| LAG5 | 0.996 (0.97-1.03) | 0.8 | – |
| TES × LAG |  | <0.001 |  |
| Pointed × LAG | 1.15 (1.08-1.23)a |  | 16 (13-19) |
| Flat × LAG | 1.07 (0.97-1.19)a |  | 13 (10-16) |
| Round × LAG | -Referent-a |  | 14 (12-15) |

a-bMain effects marked with different superscript letters differ at a level of *p* ≤ 0.05 in Tukey-Kramer´s post hoc test.

1Linear regression coefficient.

2Least squares means in s. The results are averaged over the levels of all other categorical variables included in the model and the mean lag time of 74 s.

3Total milk yield (kg).

4Teat-end shape. Classified as follows: pointed = 2 or more pointed teats, flat = 2 or more flat teats, round = 3 or 4 round teats.

5Preparation lag time (s, 1-unit = 10 s); time between first teat stripping and milking unit attachment.