**Breed of cows and herd productivity affect milk nutrient recovery in curd, and cheese yield, efficiency and daily production**

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**Supplementary Table S1.** *Descriptive statistics of milk composition, of cheese-making traits and production.*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Trait** | N | Mean | P12 | P99 | Kurtosis | Skewness |
| Milk composition: |  |  |  |  |  |  |
| Total Solids, % | 520 | 13.50 | 10.7 | 17.0 | 0.14 | 0.04 |
| Protein, % | 518 | 3.62 | 2.9 | 4.7 | 0.59 | 0.14 |
| Casein, % | 516 | 2.81 | 2.1 | 3.8 | 0.31 | 0.23 |
| Fat, % | 513 | 4.18 | 1.4 | 7.1 | 0.42 | -0.05 |
| Lactose, % | 515 | 5.00 | 4.4 | 5.5 | 0.59 | -0.09 |
| Milk energy, MJ/kg | 515 | 3.29 | 2.2 | 4.5 | 0.35 | 0.00 |
| pH | 515 | 6.49 | 6.3 | 6.7 | -0.02 | 0.13 |
| SCS1 | 518 | 2.70 | -0.6 | 7.1 | -0.14 | 0.09 |
| Curd nutrients recovery (REC), %: |  |  |  |  |  |  |
| RECFAT | 508 | 84.71 | 70.0 | 91.5 | 0.52 | -0.58 |
| RECPROTEIN | 512 | 79.33 | 74.1 | 82.7 | 0.01 | -0.22 |
| RECSOLIDS | 514 | 53.39 | 43.1 | 64.8 | 0.13 | -0.13 |
| RECENERGY | 512 | 68.91 | 58.3 | 78.0 | 0.35 | -0.46 |
| Cheese Yields (CY), %: |  |  |  |  |  |  |
| %CYCURD | 512 | 15.71 | 10.4 | 23.4 | -0.03 | -0.09 |
| %CYSOLIDS | 508 | 7.23 | 4.8 | 10.7 | 0.01 | -0.05 |
| %CYWATER | 512 | 8.48 | 5.3 | 12.4 | -0.14 | -0.05 |
| Theoretical (*Th*) CY, %: |  |  |  |  |  |  |
| *Th-*%CYCURD | 514 | 15.66 | 9.5 | 23.4 | 0.20 | 0.08 |
| *Th-*%CYSOLIDS | 515 | 7.21 | 4.4 | 11.0 | 0.32 | 0.10 |
| Efficiency(*Ef*)of CY, %: |  |  |  |  |  |  |
| *Ef-*%CYCURD | 513 | 101.0 | 77.3 | 123.2 | 0.13 | -0.06 |
| *Ef-*%CYSOLIDS | 512 | 101.0 | 87.9 | 112.4 | 0.50 | -0.27 |
| Daily (d) production, kg/d: |  |  |  |  |  |  |
| dMilk yield | 510 | 20.3 | 6.0 | 41.1 | -0.24 | 0.02 |
| dCYCURD | 504 | 3.16 | 0.8 | 6.0 | 0.02 | -0.06 |
| dCYSOLIDS | 504 | 1.46 | 0.4 | 2.9 | 0.15 | 0.02 |
| dCYWATER | 504 | 1.71 | 0.4 | 3.4 | 0.05 | 0.05 |

1SCS= 3 + log2 (SCC/100,000); 2P1 = 1st percentile; P99 = 99th percentile.

**Supplementary Table S2.** *Effect of parity on milk composition, and on cheese-making traits and production of individual cows.*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Parity (LSM) | | | |  | Parity Contrasts (*F*-value) | | |
|  | 1st | 2nd | 3rd | ≥4th |  | 1st vs ≥2nd | 2nd vs ≥3rd | 3rd vs ≥4th |
| Milk composition: |  |  |  |  |  |  |  |  |
| Total Solids, % | 13.61 | 13.69 | 13.25 | 13.38 |  | 3.2 | 11.0\*\* | 0.8 |
| Protein, % | 3.62 | 3.63 | 3.55 | 3.53 |  | 3.6 | 6.6\* | 0.3 |
| Casein, % | 2.82 | 2.80 | 2.74 | 2.73 |  | 5.9\* | 4.6\* | 0.1 |
| Fat, % | 4.27 | 4.31 | 4.04 | 4.25 |  | 0.7 | 2.6 | 2.8 |
| Lactose, % | 5.07 | 5.01 | 4.94 | 4.97 |  | 17.6\*\*\* | 3.6 | 1.1 |
| Milk energy, MJ/kg | 3.33 | 3.35 | 3.20 | 3.28 |  | 2.3 | 6.2\* | 2.6 |
| Curd nutrients recovery (REC), %: |  |  |  |  |  |  |  |  |
| RECFAT | 85.29 | 84.74 | 85.21 | 84.77 |  | 0.6 | 0.2 | 0.4 |
| RECPROTEIN | 79.94 | 79.42 | 79.36 | 78.75 |  | 15.6\*\*\* | 2.4 | 4.7\* |
| RECSOLIDS | 53.55 | 53.81 | 53.03 | 53.21 |  | 0.3 | 2.3 | 0.1 |
| RECENERGY | 69.53 | 69.15 | 68.78 | 68.40 |  | 4.7\* | 1.7 | 0.6 |
| Cheese yields (CY), %: |  |  |  |  |  |  |  |  |
| %CYCURD | 16.07 | 15.82 | 15.29 | 15.38 |  | 10.3\* | 4.9\* | 0.1 |
| %CYSOLIDS | 7.35 | 7.36 | 7.07 | 7.19 |  | 2.7 | 4.5\* | 0.9 |
| %CYWATER | 8.72 | 8.44 | 8.24 | 8.25 |  | 13.4\*\*\* | 2.0 | 0.0 |
| Theoretical (*Th*) %CY, %: |  |  |  |  |  |  |  |  |
| *Th-*%CYCURD | 15.80 | 16.10 | 15.22 | 15.52 |  | 0.7 | 7.2\*\* | 0.8 |
| *Th-*%CYSOLIDS | 7.27 | 7.41 | 7.00 | 7.14 |  | 0.7 | 7.2\*\* | 0.8 |
| Efficiency (*Ef*) of %CY, %: |  |  |  |  |  |  |  |  |
| *Ef-*%CYCURD | 102.5 | 99.9 | 101.5 | 100.1 |  | 4.4\* | 0.5 | 0.9 |
| *Ef-*%CYSOLIDS | 101.5 | 100.9 | 101.4 | 100.9 |  | 0.9 | 0.3 | 0.5 |
| Daily (d) production, kg/d |  |  |  |  |  |  |  |  |
| dMilk yield | 19.3 | 20.5 | 22.1 | 21.5 |  | 19.0\*\*\* | 4.7\* | 0.8 |
| dCYCURD | 3.06 | 3.29 | 3.41 | 3.25 |  | 10.8\* | 0.1 | 2.0 |
| dCYSOLIDS | 1.41 | 1.54 | 1.58 | 1.52 |  | 13.8\*\*\* | 0.1 | 1.1 |
| dCYWATER | 1.67 | 1.77 | 1.82 | 1.73 |  | 5.6\* | 0.0 | 2.0 |

\**P* < 0.05; \*\* *P* < 0.01; \*\*\* *P* < 0.001.