# Supplementary material

Supplementary material for publication "Linking variation in the casein fraction and salt composition to casein micelle size in milk of Dutch dairy goats". (manuscript submission: December 2023)

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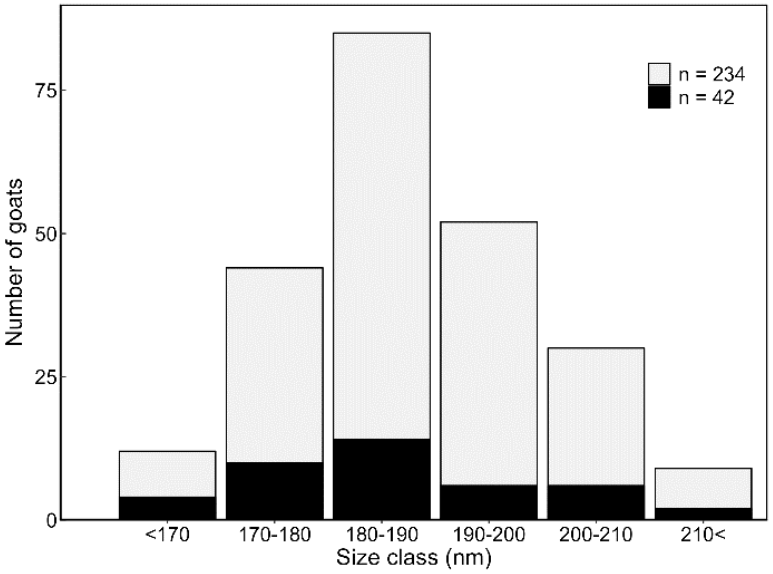
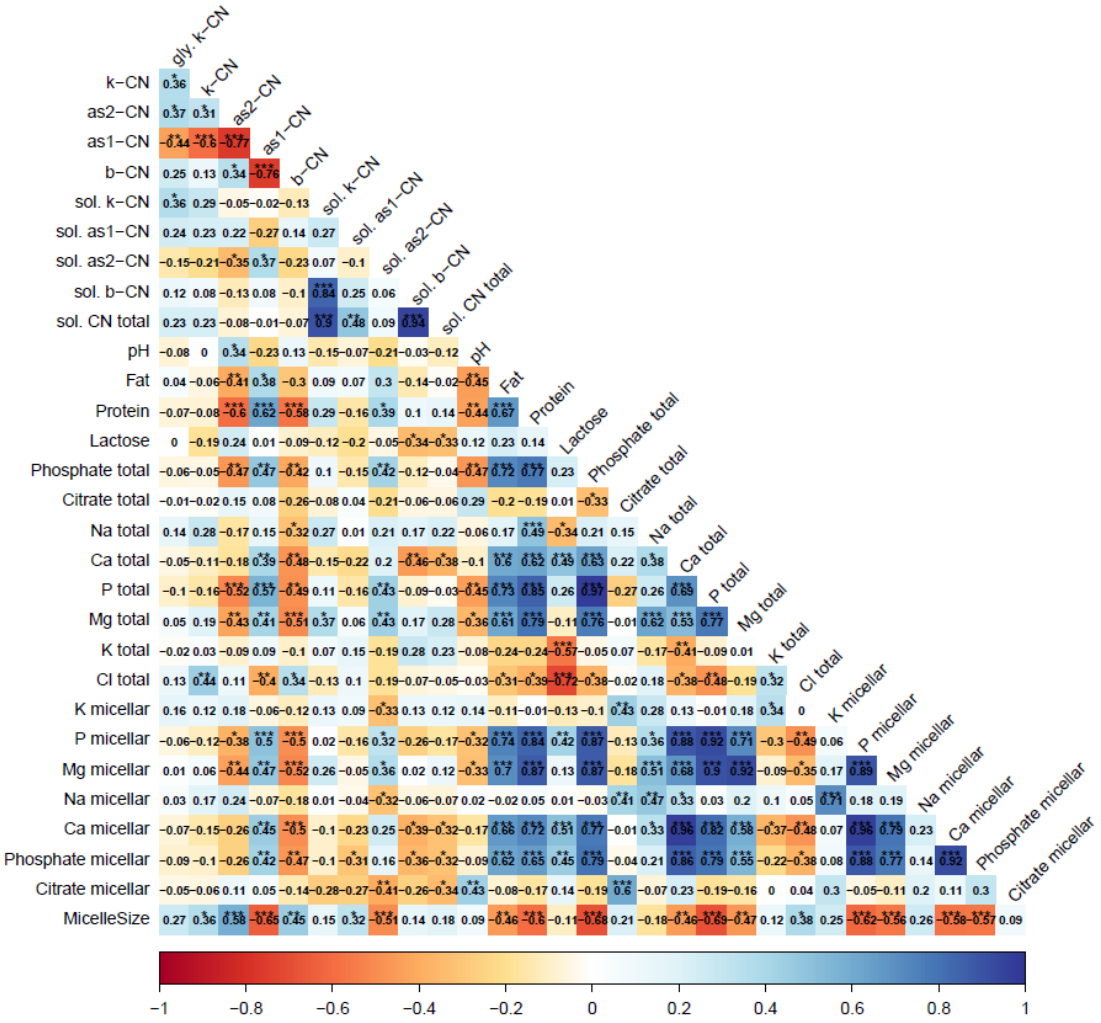
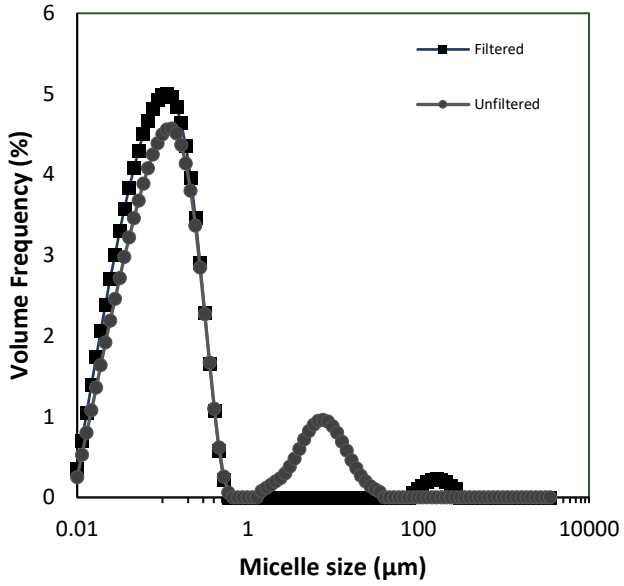



Supplementary Fig. 1. Distribution of average casein micelle size (nm) of 234 goat milk samples, and a subset of 42 milk samples.




Supplementary Fig. 2. Overview of Pearson correlation coefficients and corresponding significance levels for different casein (CN) fractions, soluble (sol.) casein, fat, lactose and protein content, pH, as well as total and micellar salt content, and micelle size in goat milk.




Supplementary Fig. 3. Volume frequency of bulk goat skim milk using no filter of a 1.2 µm syringe filter for sample preparation prior to measurement.

Supplementary Table 1. Comparison of total, micellar, and soluble salt concentrations (mM/L) in goat milk with larger and small casein micelles.

| Salt (mM/ L) | *P* value[1] | Small micelles | Medium micelle | Large micelles |
|---|---|---|---|---|
| | | Mean$_{(SD)}$ | Mean$_{(SD)}$ | Mean$_{(SD)}$ |
| Total Ca | 0.004 | 31.90$_{(3.59)}$ [a] | 28.31$_{(4.34)}$ [b] | 27.33$_{(2.46)}$ [b] |
| Micellar Ca | <0.001 | 23.73$_{(3.15)}$ [a] | 19.86$_{(3.90)}$ [b] | 18.09$_{(2.39)}$ [b] |
| Soluble Ca | 0.03 | 8.17$_{(1.10)}$ [a] | 8.45$_{(0.84)}$ [a,b] | 9.24$_{(1.26)}$ [b] |
| Total P | <0.001 | 37.47$_{(5.28)}$ [a] | 31.40$_{(4.07)}$ [b] | 27.77$_{(2.86)}$ [b] |
| Micellar P | <0.001 | 20.87$_{(3.18)}$ [a] | 17.10$_{(2.80)}$ [b] | 15.51$_{(2.15)}$ [b] |
| Soluble P | <0.001 | 16.60$_{(2.78)}$ [a] | 14.30$_{(2.70)}$ [b] | 12.26$_{(1.57)}$ [b] |
| Total inorganic $P0_4$ | <0.001 | 23.37$_{(4.41)}$ [a] | 18.42$_{(3.12)}$ [b] | 15.99$_{(2.49)}$ [b] |
| Micellar inorganic $P0_4$ | <0.001 | 12.45$_{(2.16)}$ [a] | 9.80$_{(2.67)}$ [b] | 8.78$_{(1.12)}$ [b] |
| Micellar organic $P0_4$ | 0.03 | 8.41$_{(2.09)}$ [a] | 7.30$_{(1.28)}$ [a,b] | 6.73$_{(1.49)}$ [b] |
| Soluble inorganic $P0_4$ | 0.002 | 10.92$_{(3.10)}$ [a] | 8.62$_{(2.62)}$ [a,b] | 7.21$_{(2.01)}$ [b] |
| Soluble organic $P0_4$ | 0.31 | 5.68$_{(1.35)}$ [a] | 5.67$_{(1.17)}$ [a] | 5.05$_{(1.21)}$ [a] |
| Total Mg | 0.01 | 6.43$_{(1.20)}$ [a] | 5.77$_{(0.64)}$ [b] | 5.33$_{(0.89)}$ [b] |
| Micellar Mg | 0.003 | 2.49$_{(0.96)}$ [a] | 1.99$_{(0.34)}$ [a,b] | 1.71$_{(0.40)}$ [b] |
| Soluble Mg | 0.27 | 3.95$_{(0.55)}$ [a] | 3.78$_{(0.46)}$ [a] | 3.62$_{(0.58)}$ [a] |
| Total citrate | 0.44 | 6.67$_{(1.75)}$ [a] | 6.67$_{(1.56)}$ [a] | 7.28$_{(1.36)}$ [a] |
| Micellar citrate | 0.76 | 0.92$_{(0.60)}$ [a] | 0.84$_{(0.57)}$ [a] | 0.99$_{(0.40)}$ [a] |
| Soluble citrate | 0.34 | 5.75$_{(1.50)}$ [a] | 5.83$_{(0.95)}$ [a] | 6.29$_{(1.10)}$ [a] |
| Total Na | 0.54 | 17.15$_{(3.52)}$ [a] | 17.14$_{(2.36)}$ [a] | 16.14$_{(2.03)}$ [a] |
| Total Cl | 0.01 | 41.72$_{(5.08)}$ [a] | 45.18$_{(4.64)}$ [a,b] | 47.88$_{(5.52)}$ [b] |
| Total K | 0.60 | 55.72$_{(4.65)}$ [a] | 55.36$_{(5.47)}$ [a] | 57.22$_{(3.82)}$ [a] |

[1]*P*-values indicates statistical significance of ANOVA or Kruskal-Wallis test.

[a-c] Mean values in the same row with different subscriptions differ by $P < 0.05$ in multi-wise comparison test