

Changes on raw bovine milk composition across the season

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Large fluctuations in the raw bovine milk of many countries have been observed in the past decades because of changes in the feeding regimes, breeding strategies and cattle management. In spite of the fact that dairy manufactures try to keep the levels of the main milk components constant all year around, largest seasonal variations in its values are found and mostly are of dietary origin. The aim of this study was to investigate the variations on the Dutch bovine raw milk across the season. Weekly in 2005, bulk milk samples collected from 17 dairy plants situated in the Netherlands were pooled together and routinely analyzed for milk composition (fat, protein, lactose, casein, cell count, urea and freezing point). On the main milk components, lactose showed the smallest ($0.04 \text{ g } 100 \text{ g}^{-1}$) and fat the highest ($0.19 \text{ g } 100 \text{ g}^{-1}$) seasonal variations, with protein ($0.08 \text{ g } 100 \text{ g}^{-1}$) in between. This is in line with the general assumption that fat is the most sensitive component of milk to dietary changes and lactose is the least sensitive, with protein in between. Fat, protein and casein showed a significant ($P < 0.001$) minimum value during the summer in July (4.10 , 3.39 and $2.64 \text{ g } 100 \text{ g}^{-1}$, respectively) and a maximum value during the winter in January and December (4.57 , 3.56 and $2.78 \text{ g } 100 \text{ g}^{-1}$, respectively). Cell count and urea had a significant ($P < 0.001$) minimum value during the winter in November and December ($167 \times 10^3 \text{ cells ml}^{-1}$ and $22 \text{ mg } 100 \text{ g}^{-1}$, respectively) and a maximum value during the summer in August ($217 \times 10^3 \text{ cells ml}^{-1}$ and $26 \text{ mg } 100 \text{ g}^{-1}$, respectively). Lactose showed a significant ($P < 0.001$) minimum value during the autumn in October ($4.46 \text{ g } 100 \text{ g}^{-1}$) and a maximum value during the spring in May ($4.55 \text{ g } 100 \text{ g}^{-1}$). Freezing point had a significant ($P < 0.012$) minimum value during the summer in July ($-0.517 \text{ }^\circ\text{C}$) and a maximum value during the winter in February ($-0.521 \text{ }^\circ\text{C}$).