

PHTHALATES IN COW MILK: POSSIBLE CONTAMINATION PATHWAYS AT FARM LEVEL

Tine Fierens, *VITO - Flemish Institute for Technological Research, Belgium*
Mirja Van Holderbeke, *VITO - Flemish Institute for Technological Research, Belgium*
Hanny Willems, *VITO - Flemish Institute for Technological Research, Belgium*
Isabelle Sioen, *Ghent University – Department of Public Health, Belgium*
Stefaan De Henauw, *Ghent University – Department of Public Health, Belgium*

Background and Aims: Phthalates are organic lipophilic compounds which are mainly used as plasticizer in plastic polymers. Human exposure occurs mainly via food intake and can cause a wide range of negative health effects. Phthalates are not only present in food because of environmental contamination, but also as a result of migration from contact materials. This study investigated phthalates in cow milk in order to determine the contamination pathways at farm level.

Methods: The levels of eight phthalates were determined in raw milk samples collected during summer and winter at five farms located in 'The Kempen' (Belgium). Both manually obtained milk samples as milk samples milked by machine were collected. Analysis was performed by gas chromatography-mass spectrometry.

Results: The analysis of the milk samples milked by machine revealed a difference in average total phthalate level between the summer and the winter sampling period (572 versus 379 µg/kg fat). While the total phthalate levels of the different farms during winter were nearly of similar magnitude (291-587 µg/kg fat), a wide range could be observed during summer (95-1550 µg/kg fat). Comparing milk samples within a farm, lower total phthalate levels were found in the milk samples milked by hand than those by machine (100 versus 179 µg/kg fat). Di(2-ethylhexyl) phthalate which is the most commonly used plasticizer worldwide, was the most dominating one (79 % of the total concentration in milk from the central collecting tank).

Conclusions: The results indicate that the contamination pathways for phthalates in cow milk vary across seasons. An explanation therefore is that the feed composition is different during summer than during winter. In summer, cows are grazing in the fields where an extra phthalate contamination can occur via soil ingestion. Comparing the milk samples milked by hand with those by machine reveals that the milking equipment is another important contamination pathway.