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Comparison of bovine milk oligosaccharides in native North European cattle breeds

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[AnneVuholmSunds^a](#)[ApichayaBunyatratchata^b](#)[RandallRobinson^b](#)[MariaGlantz^c](#)[MariePaulsson^d](#)[DaivaLeskauskaite^d](#)[AnnePihlanto^e](#)[RagnhildInglingstad^f](#)[Tove G.Devold^g](#)[Gerd E.Vegarud^g](#)[BryndisEvaBirgisdottir^g](#)[MariaGudjonsdottir^g](#)[DanielaBarile^b](#)[Lotte BachLarsen^a](#)[Nina AagaardPoulsen^a](#)

a, Department of Food Science, Aarhus University, Agro Food Park 48, 8200, Aarhus N, Denmark

b, Department of Food Science and Technology, University of California, Davis, USA

c, Department of Food Technology, Engineering and Nutrition, Lund University, Sweden

d, Department of Food Science and Technology, Kaunas University of Technology, Lithuania

e, Natural Resources Institute, Finland

f, Norwegian University of Life Sciences, Faculty of Chemistry, Biotechnology and Food Science, Norway

g, Faculty of Food Science and Nutrition, School of Health Sciences, University of Iceland, Iceland

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Abstract

Milk oligosaccharides are of high interest due to their bioactive properties. This study is the first to characterise milk oligosaccharides from native North European cattle breeds, as represented by 80 milk samples collected from eight native breeds originated from Norway (Norwegian Doela cattle and Norwegian Telemark cattle), Sweden (Swedish Mountain cattle), Denmark (Danish Red anno 1970), Iceland (Icelandic cattle), Lithuania (native Lithuanian Black and White) and Finland (Western Finncattle and Eastern Finncattle). Using high-performance liquid-chromatography chip/quadrupole time-of-flight mass-spectrometry, 18 unique monosaccharide compositions and a multitude of isomers were identified. No N-glycolylneuraminic acid was identified among these breeds. Western Finncattle milk was most abundant in neutral, acidic and fucosylated oligosaccharides. Further, Eastern Finncattle milk was significantly higher in acidic oligosaccharides and Icelandic cattle milk significantly higher in fucosylated oligosaccharides, compared to the mean. This study highlights specific native breeds of particular interest for future exploitation of milk oligosaccharides and breeding strategies.