Comparison of characterization in the proteome of human milk and bovine milk

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Background

• The proteome differences between human milk and bovine milk result in the different growth patterns of the neonate fed by breast milk and infant formulas
• Less babies were given breast milk from birth to six months although drinking breast milk was superior to infant formula
• The differences of low abundant proteins between human milk and bovine milk have not been extensively compared

Objective

• To further study the difference of low abundant proteins between human and bovine milk using DAVID GO and Uniprot based on the first analysis (identification of 268 proteins in human milk and 269 proteins in bovine milk)

Methods

Results

Subcellular location of human and bovine milk proteins

• One third of the proteins were derived from the secretory vesicle
• Human milk had more proteins from the cytoplasm than bovine milk

Biological functions of human and bovine milk proteins

• Higher number of coagulation proteins were identified in human milk than bovine milk
• More enzymes were found in human milk than bovine milk; these enzymes are involved in several metabolic pathways

Conclusions

• The differences between human milk and bovine milk not only involve in the number of identified proteins but also relate to their origination and biological function
• The elaborate analysis of these differences gives a better understanding of characteristic of human milk and bovine milk

Future work

• Study the dynamics of proteome in human and bovine milk over lactation
• The difference in proteome among human individuals and cow individuals

Impact to dairy industry

• Contribute to a deep understanding of differences between human and bovine milk
• Provide guidance on improvement of infant formulas