



## Health Equity to Achieve Health Care Transformation

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### DESCRIPTION

Cytokines can be supportive, provocative, or ameliorative, and both classes are found in breast milk. Cytokine levels are most pronounced early in lactation and decrease over time. During diseases such as mastitis, cytokines optimize the invulnerability response of the thoracic organs, resulting in elevated levels of fiery cytokines. Adipokines, such as leptin and adiponectin, are a subset of cytokines produced by adipose tissue and serve as endocrine markers involved in digestive control body structure as well. Developmental factors are protein-labeled particles associated with tissue development and remodelling. Breast milk is a complex natural fluid containing numerous cells and subatomic parts that are essential for the health and infection status of mother and child. Breast milk provocation is a useful indicator of the current and future health status of the mammary system and plays a role in improving the nutrition, development and safety of the new born. Breast milk contains various cytokines and developmental factors that can act locally in the mammary gland organs or influence the development and development of infant tissues. Cytokines are bioactive atoms that balance invulnerability and fiery responses. In breast milk they are supplied by leukocytes that have migrated into the breast tissue from the basal bloodstream and by the breast epithelium itself. They retain their bioactivity after ingestion and are important in promoting dyspepsia in babies. Within the thoracic organs, developmental factors are important to keep pace with angiogenesis, lactation and control regression. Several cytokines and developmental factors in breast milk are also implicated in breast tumour development. Recognizing mammary epithelial integrity may provide an important framework for understanding cytokine levels in breast milk. Prior to secretory activation (i.e., initiation of mature milk), paracellular pathways between mammary epithelial cells are open, allow-

ing correspondence between the maternal circulation and the mammary gland organs. After birth, the rapid development of tight junctions within the mammary epithelium works with the completion of paracellular pathways, a crucial shift for the foundation and support of milk mixing and milk flow discharge. Sodium (Na) levels are highest in colostrum and decrease. It increases rapidly during the first 5 days of pregnancy due to completion of the paracellular signalling pathway. When the Na level exceeds 10 mmol/L, milk development is completed and potassium (K) is accumulated. When the paracellular pathway is closed, it is included in milk. Both Na alone and the ratio with potassium (Na/K) were used to indicate mammary epithelial porosity. Na/K ratios below 0.6 or not exactly at the 75<sup>th</sup> percentile were used to demonstrate close crossbreeding and milk production. No matter how long the paracellular pathway is closed during established lactation, milk production is maintained and Na levels or Na/K ratios remain low. Nevertheless, both milk flocculation and deterioration are associated with resumption of tight hybrids and increases in Na or Na/K ratios. Our laboratory has recently shown that changes in the Na/K ratio over time are strongly associated with the content of neutralizing agents in individual breast milk, demonstrating the relationship between permeability and tolerance variables. Information on mammary epithelial permeability may also provide important contributions to our understanding of cytokine levels in the mammary gland human milk.

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### CONFLICT OF INTEREST

The author's declared that they have no conflict of interest.

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