

**Title:** The Fluid Properties of the Human Milk

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**Abstract:** This research will characterize the flow properties of human milk. Understanding the flow properties of a fluid is needed to understand how that fluid will react in different situations. The flow properties of human milk are not well studied and poorly understood. The research will be of benefit for medical professionals with applications regarding flow of milk within the human breast and delivery of human milk through artificial feeding apparatus. The aims of this study are to:

- Measure the amount of different nutrients (fat, protein, sugar, and minerals) in breast milk.
- Test the milk in a machine (rheometer) to see how easily it flows in different environments (hot, cold, narrow tube, fat tube, etc.)
- Test the milk to see how quickly it heats up.
- See how the milk flow changes when exposed to an electric field (nutrients separate or stick together).
- Change the amount of nutrients in breast milk and then test it again in the rheometer to measure changes in how it flows.

After collecting milk sample directly from mothers, samples will be tested for different flow properties using specialized equipment, such as rheometer (to test for viscosity under different shear rates). Some samples will be tested immediately and others will be kept frozen until tested.