

**The sialic acid content of infant saliva: comparison of breast-fed and formula-fed infants**

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Sialic acid, a sugar present in human milk and brain gangliosides in large amounts, but in low levels in infant formulas, may be one of several factors in human milk which promotes brain development. We hypothesised that breast-fed infants may have higher levels of sialic acid in body fluids and tissues, including saliva, plasma and brain cortex. In the present study, the aim was to compare the sialic acid content of saliva from full-term breast-fed versus formula-fed infants.

Thirty-three healthy, full term infants, aged  $5 \pm 2$  (mean  $\pm$  SD) months were recruited for the experiment. Eighteen were solely breast-fed and 15 were solely formula-fed with cow's milk-based preparations until weaning between 3 and 5 months of age. At the time of study, 10 of the 18 breast-fed infants and 7 of the 15 formula-fed infants received small amounts of other foods in addition to breast milk or formula. Milk contributed the majority of energy intake and, to our knowledge, it was the only significant source of sialic acid in the diet. Infant saliva (1-1.5 mL) was collected using a sterile pasteur pipette under the supervision of a mothercraft nurse and analysed for free, bound and total sialic acid within one hour of collection by a modified thiobarbituric acid method.

As hypothesised, the amount of free, bound and total sialic acid was higher in the breast-fed infants (1). When compared with formula-fed infants, they had almost two times more free sialic acid in saliva [mean (SE) 16.0 (2.7) vs 8.2 (2.1) mg/L,  $p < 0.036$ ] and nearly 50% more total sialic acid [47.3 (3.9) vs 32.2 (4.4) mg/L,  $p < 0.014$ ] (Figure).

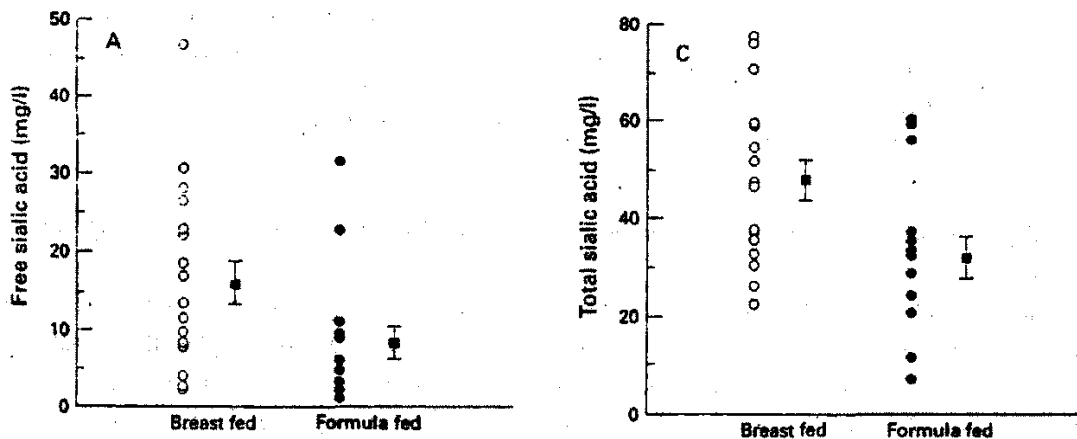


Figure. Free (left hand side) and total (right hand side) sialic acid content of infant saliva.

These provocative findings provide a preliminary indication that breast-fed infants may have higher levels of sialic acid in other body fluids and tissues, including brain. Sialic acid derived from human milk oligosaccharides may contribute to this difference. If further studies confirm the hypothesis, there are important implications for the formulation of breast milk substitutes.

(1) Tram TH, Brand Miller JC, McNeil Y, McVeagh P. The sialic acid content of infant saliva: comparison of breast-fed and formula-fed infants. Arch Dis Child, in press.