THE SERUM PROTEINS AT 6 MONTHS OF AGE IN INFANTS FED ON HUMAN OR COW'S MILK OR ON BOTH

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The finding by Douglas (1950) that breast-fed babies possess an immunity to measles which bottle-fed babies do not, and the fact that the administration of γ globulin can protect a baby from the infection, suggested that babies receiving human milk might have a greater serum γ globulin content than those giving cow's milk from a bottle. In a serological investigation of neonatal antibodies Boorman, Dodd and Gunther (1958) could detect no increase in the baby's circulating Rh antibodies as a result of feeding high-titre serum; nor could they find any effect on serum isoagglutinins from the consumption of colostrum and milk of varying titres of anti-A and anti-B agglutinins which the babies received from their mothers. It seemed possible, however, that γ globulins were more readily absorbed or rebuilt, even though they might lose their particular immunological specificity, from human rather than bovine globulins taken by mouth. The absorption of serum proteins of the animal's own species and not of others has been suggested by Dent and Schilling (1948) from their work on dogs. Although the total quantity of γ globulin needed to alter a baby's susceptibility to measles is small, it seemed worth while to see whether a detectable difference in the serum proteins was produced over a period of months by different methods of feeding.

Present Investigation

In the investigation here reported comparison was made of the serum from babies who were known to have received only one kind of milk, human or bovine, from birth or a mixture of both. By 6 months of age they had, however, all received other foods in small quantities. The total protein in the serum at 6 months of age was estimated by the density method of Linderstrøm-Lang and Lanz (1938) as modified by Lowry and Hunter (1945). The serum was subjected to electrophoresis on a paper strip (Flynn and de Mayo, 1951) and the components were estimated by a scanner and direct transmission of light (Crook, Harris and Warren, 1952).

Results

The sera from the three groups of infants, receiving (*a*) breast milk, (*b*) cow's milk or (*c*) a mixture of human and cow's milk, showed no significant differences in their content of total protein and none in the content of the components of albumin and of α_1, α_2, β and γ globulin (see Table).

It is concluded that no differences in the serum protein levels resulting from feeding the infants with human or cow's milk could be detected in the samples by micro-electrophoretic analysis.

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TABLE

SERUM PROTEINS OF BABIES AT 6 MONTHS FED WITH HUMAN OR COW'S MILK OR A MIXTURE OF BOTH

Feeding	No. of Cases	Mean Birth Weight (g.)	Total Protein (g./100 ml.)		Albumin %		α_1 Globulin %		α_2 Globulin %		β Globulin %		γ Globulin %	
					Rel.	Absol.	Rel.	Absol.	Rel.	Absol.	Rel.	Absol.	Rel.	Absol.
Breast	11	3,400	Mean	6·42	64·56	4·16	4·61	0·293	10·12	0·64	12·87	0·82	7·64	0·48
			S.D.	0·55	3·69	0·55	0·95	0·048	2·43	0·14	1·89	0·13	2·59	0·127
Bottle	6	3,515	Mean	6·37	65·1	4·15	5·42	0·41	10·01	0·64	11·75	0·72	7·74	0·49
			S.D.	0·57	2·38	0·34	0·69	0·073	1·28	0·097	2·24	0·09	2·52	0·19
Mixed	11	3,285	Mean	6·16	62·5	3·79	5·58	0·34	10·91	0·67	13·25	0·81	7·80	0·48
			S.D.	0·47	4·24	0·91	1·32	0·073	1·66	0·117	1·64	0·085	1·92	0·12