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[Intervention Review]

# Formula versus donor breast milk for feeding preterm or low birth weight infants

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## ABSTRACT

### Background

When sufficient maternal breast milk is not available, alternative sources of enteral nutrition for preterm or low birth weight infants are donor breast milk or artificial formula. Donor breast milk may retain some of the non-nutritive benefits of maternal breast milk for preterm or low birth weight infants. However, feeding with artificial formula may ensure more consistent delivery of optimal levels of nutrients. Uncertainty exists about the balance of risks and benefits of feeding formula versus donor breast milk for preterm or low birth weight infants.

### Objectives

To determine the effect of feeding with formula compared with donor breast milk on growth and development in preterm or low birth weight infants.

### Search methods

We searched the Cochrane Central Register of Controlled Trials (CENTRAL 2014, Issue 3), MEDLINE (1966 to March 2014), EMBASE (1980 to March 2014), CINAHL (1982 to March 2014), conference proceedings and previous reviews.

### Selection criteria

Randomised or quasi-randomised controlled trials comparing feeding with formula versus donor breast milk in preterm or low birth weight infants.

### Data collection and analysis

We extracted data using the standard methods of the Cochrane Neonatal Group, with separate evaluation of trial quality and data extraction by two review authors.

### Main results

Nine trials, in which 1070 infants participated, fulfilled the inclusion criteria. Four trials compared standard term formula versus donor breast milk and five compared nutrient-enriched preterm formula versus donor breast milk. Only the two most recent trials used nutrient-fortified donor breast milk. The trials contain various methodological quality weaknesses, specifically uncertainty about adequate allocation concealment methods in three trials and lack of blinding in most of the trials.

Formula-fed infants had higher in hospital rates of increase in weight [mean difference (MD): 2.58 (95% confidence interval (CI) 1.98 to 3.71) g/kg/day], length [MD 1.93 (95% CI 1.23 to 2.62) mm/week] and head circumference [MD 1.59 (95% CI 0.95 to 2.24) mm/week]. We did not find evidence of an effect on post-discharge growth rates or neurodevelopmental outcomes. Formula feeding increased the risk of necrotising enterocolitis: typical risk ratio 2.77 (95% CI 1.40 to 5.46); risk difference 0.04 (95% CI 0.02 to 0.07).

### Authors' conclusions

In preterm and low birth weight infants, feeding with formula compared with donor breast milk results in a higher rate of short-term growth but also a higher risk of developing necrotising enterocolitis. Limited data on the comparison of feeding with formula versus nutrient-fortified donor breast milk are available. This limits the applicability of the findings of this review as nutrient fortification of breast milk is now a common practice in neonatal care. Future trials may compare growth, development and adverse outcomes in infants who receive formula milk versus nutrient-fortified donor breast milk given as a supplement to maternal expressed breast milk or as a sole diet.

### PLAIN LANGUAGE SUMMARY

#### Formula milk versus donor breast milk for feeding preterm or low birth weight infants

When a mother's own breast milk is not available for feeding her preterm or low birth weight infant, the alternatives are either formula or expressed breast milk from a donor mother ('donor breast milk'). This review of nine randomised controlled trials suggests that feeding with formula increases short-term growth rates, but is associated with a higher risk of developing the severe gut disorder called 'necrotising enterocolitis'. There is no evidence of an effect on longer-term growth or on development. Further trials that compare these two strategies are needed. These should probably compare formula adapted for preterm infants with donor breast milk supplemented with extra nutrients.