

# Protein supplementation of human milk for promoting growth in preterm infants (Review)

Kuschel CA, Harding JE



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[Intervention Review]

# Protein supplementation of human milk for promoting growth in preterm infants

Carl A Kuschel<sup>1</sup>, Jane E Harding<sup>2</sup>

<sup>1</sup>Neonatal Services, The Royal Women's Hospital, Carlton, Australia. <sup>2</sup>Department of Paediatrics, University of Auckland, Auckland, New Zealand

Contact address: Carl A Kuschel, Neonatal Services, The Royal Women's Hospital, 132 Grattan Street, Carlton, Victoria, 3053, Australia. [carl.kuschel@rwh.org.au](mailto:carl.kuschel@rwh.org.au).

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## ABSTRACT

### Background

For term infants, human milk provides adequate nutrition to facilitate growth, as well as potential beneficial effects on immunity and the maternal-infant emotional state. However, the role of human milk in preterm infants is less well defined as it contains insufficient quantities of some nutrients to meet the estimated needs of the infant. Preterm infants require higher protein intakes than term infants to attain adequate growth rates, and have relatively higher protein turnover rates. Inadequate protein intakes may be partly responsible for low serum albumin and blood urea concentrations in preterm infants.

### Objectives

The main objective was to determine if addition of protein to human milk leads to improved growth and neurodevelopmental outcomes without significant adverse effects in preterm infants.

### Search methods

The standard search strategy of the Cochrane Neonatal Review Group was used. This includes searches of the Oxford Database of Perinatal Trials, MEDLINE, previous reviews including cross references, abstracts, conferences and symposia proceedings, expert informants, and journal handsearching mainly in the English language.

### Selection criteria

All trials utilizing random or quasi-random allocation to supplementation of human milk with protein or no supplementation in preterm infants who remained in hospital were eligible.

### Data collection and analysis

Data were extracted using the standard methods of the Cochrane Neonatal Review Group, with separate evaluation of trial quality and data extraction by each author and synthesis of data using relative risk and weighted mean difference.

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### **Main results**

Protein supplementation of human milk results in increases in short term weight gain (WMD 3.6 g/kg/day, 95% CI 2.4 to 4.8 g/kg/day), linear growth (WMD 0.28 cm/week, 95% CI 0.18 to 0.38 cm/week) and head growth (WMD 0.15 cm/week, 95% CI 0.06 to 0.23 cm/week). There are insufficient data to evaluate long term neurodevelopmental and growth outcomes.

There are too few infants studied to be certain that adverse effects of protein supplementation are not increased. Blood urea levels are increased (WMD 1.0 mmol/l, 95% CI 0.8 to 1.2 mmol/l).

### **Authors' conclusions**

Protein supplementation of human milk in relatively well preterm infants results in increases in short term weight gain, linear and head growth. Urea levels are increased, which may reflect adequate rather than excessive dietary protein intake. Further research should be directed towards the evaluation of specific levels of protein intake in preterm infants and the clinical effects of supplementation with protein, including long term growth and neurodevelopmental outcomes. This may best be done in the context of refinement of available multicomponent fortifier preparations.

## **PLAIN LANGUAGE SUMMARY**

### **Protein supplementation of human milk for promoting growth in preterm infants**

Not enough evidence to show the effect of protein supplementation of breast milk for promoting growth in preterm babies. Breast milk is the best source of nutrition for full-term babies but babies born preterm (before 37 weeks) have different nutritional needs. It is possible that premature breast milk may not meet all these needs. Preterm infants need more protein but also use up protein more quickly than full-term babies. The review of trials found that adding protein to breast milk increases short-term weight gain and body growth. However, too much protein given in formula can cause problems with infant development in the longer term. More research is needed to find the safest and most effective levels of protein supplementation.