

# INCREASED PROTEIN-ENERGY INTAKE PROMOTES ANABOLISM IN CRITICALLY ILL INFANTS WITH VIRAL BRONCHIOLITIS: A DOUBLE-BLIND RANDOMIZED CONTROLLED TRIAL



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de Betue CT, van Waardenburg DA, Deutz NE, van Eijk HM, van Goudoever JB, Luiking YC, Zimmermann LJ, Joosten KF. 2011

## PURPOSE

The preservation of nutritional status and growth is an important aim in critically ill infants, but difficult to achieve due to the metabolic stress response and inadequate nutritional intake leading to negative protein balance. This study investigated whether increasing protein and energy intakes can promote anabolism. The primary outcome was whole body protein balance, and the secondary outcome was first pass splanchnic phenylalanine extraction (SPE(Phe)), a measure of diet-derived amino acids.

## DESIGN

A double-blind randomized controlled trial. Infants (n=18) admitted to the pediatric intensive care unit (PICU) with respiratory failure due to viral bronchiolitis were randomized to continuous enteral feeding with a protein- and energy-enriched formula (ENDF, Fortini™) (n=8; 3.1 ± 0.3 g protein/kg/24 h, 119 ± 25 kcal/kg/24 h) or a standard infant formula (SIF) (n=10; 1.7 ± 0.2 g protein/kg/24 h, 84 ± 15 kcal/kg/24 h; equivalent to recommended intakes for healthy infants <6 months). A combined intravenous-enteral phenylalanine stable isotope protocol was used on day 5 after admission to determine whole body protein metabolism and SPE(Phe).

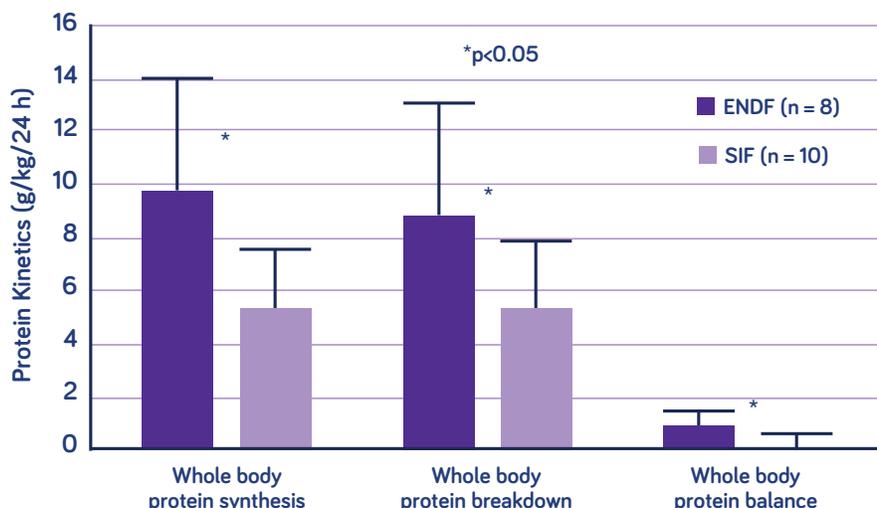
## OUTCOMES

Protein balance was significantly higher with ENDF than with SIF (ENDF: 0.73 ± 0.5 vs. SIF: 0.02 ± 0.6 g/kg/24 h) resulting from significantly increased protein synthesis (ENDF: 9.6 ± 4.4, SIF: 5.2 ± 2.3 g/kg/24 h), despite significantly increased protein breakdown (ENDF: 8.9 ± 4.3, SIF: 5.2 ± 2.6 g/kg/24 h). SPE(Phe) was not statistically different between the two groups (ENDF: 39.8 ± 18.3%, SIF: 52.4 ± 13.6%).

## CONCLUSIONS

Increasing protein and energy intakes promotes protein anabolism in critically ill infants in the first days after admission. Since this is an important target of nutritional support, increased protein and energy intakes should be preferred above standard intakes in these infants.

### RATES OF PROTEIN KINETICS IN BOTH STUDY GROUPS ON DAY 5



“The present study is the first to show that protein anabolism, an important target of nutritional support in critically ill infants, can be achieved within the first days after admission to the PICU by increasing enteral protein and energy intakes above dietary reference levels using [Fortini™].”

Fortini is for the dietary management of term infants and young children from 0 to 18 months of age or up to 198 lbs (9 kg) with or at risk of growth failure, increased energy requirements, and/or fluid restrictions due to conditions such as: congenital heart disease, chronic lung disease, respiratory syncytial virus, neurological syndrome or neuro-disabilities, cystic fibrosis, non-organic failure to thrive. Fortini is known in other countries as Infatini. For US healthcare professionals

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