

Title

Plant-based protein: Can we make artificial nutrition for severely ill children healthier and more sustainable?

Problem statement

The Green Deal to improve environmental sustainability in healthcare aims to ultimately improve the impact of healthcare on climate change. As children will undergo the largest impact of climate change pediatric healthcare should take an important responsibility in achieving the Green Deal. Children who are severely ill often depend on artificial nutritional support, as most children are not able to eat or drink enough nutrients through the mouth (oral nutrition). Artificial nutritional support is based on the provision of micronutrients (vitamins, trace elements and minerals) and macronutrients (carbohydrates, lipids and protein). The protein in current artificial nutrition is animal based, primarily derived from dairy, which has a large CO₂ footprint. In children older than 1 year of age plant-based proteins (nuts, pulses, soy) might be able to provide sufficient protein for nutritional support and be sustainable.



Research question(s)

Can we make artificial nutrition support for children >1 year more sustainable?

- What is the environmental impact of enteral nutritional products in the Sophia Children's Hospital, including waste, transport etc?
- Can the artificial nutrition currently used in the Sophia Children's Hospital be replaced by plant-based protein nutrition?
- What is the optimal animal versus plant-based mix for sick children from a health and sustainability perspective?
- What are the costs and benefits of changing the nutrition for children >1 year old to plant-based nutrition for the hospital, commercial company and environment?

Expected type of work

Material flow analysis, cost-benefit analysis, life-cycle assessment, interviews with commercial suppliers (Danone / Nutricia Netherlands etc), distributors, and with companies, and possibly design of alternative materials, engagement of farmers, Nutritional specialists / nutritionists (explore collaborations, e.g. University Wageningen).

References

- Grossmann, L., Weiss, J. (2021). Alternative Protein Sources as Technofunctional Food Ingredients. Supplemental Material: Annu. Rev. Food Sci. Technol. 12.
- Langyan S et al. (2022) Sustaining Protein Nutrition Through Plant-Based Foods: Front. Nutr. 18

Commissioner details

Organization / Department: Sophia Childrens Hospital (Erasmus MC Rotterdam), Pediatric Intensive Care Unit Department

Name: S. (Sascha) C.A.T. Verbruggen MD, PhD Pediatrician-Intensivist; Suzan Cochius - den Otter MD, PhD Pediatrician-Intensivist

Email: s.verbruggen@erasmusmc.nl, s.denotter@erasmusmc.nl