

The Synbio-Breast study: Relationship between synbiotic components in the diet of atopic mothers and the synbiotic composition of breast milk.

S.P.J. Simons^{1,2}, M.H. Biezeveld¹, O.J. van Doorn¹, J.V. Schilperoort¹, F. Bergsma¹, A. Mooij¹, M.H. Zwietering³, J.H. de Vries⁴, A.A.M.W. van Kempen¹, J.B. van Goudoever², B.J. Vlieg-Boerstra¹.
1. Department of Pediatrics, Onze Lieve Vrouwe Gasthuis OLVG, Amsterdam, the Netherlands 2. Department of Pediatrics, Amsterdam UMC, University of Amsterdam, Vrije Universiteit Emma Children's Hospital, Amsterdam, the Netherlands 3. Division of Food Microbiology, Wageningen University & Research, Wageningen, the Netherlands 4. Division of Human nutrition and Health, Wageningen University & Research, Wageningen, the Netherlands

Rationale

Human milk oligosaccharides (HMOs) (prebiotics) and microbiota (potential probiotics) in breast milk are of particular interest for allergy prevention, based on their influence on the gut microbiome and immunomodulatory properties. Although it is known that the maternal diet influences the composition of breast milk, little is known about how the maternal diet modulates the amount and types of HMOs or microbiota in breast milk.

Hypothesis

The synbiotic composition of the maternal diet is reflected in the synbiotic composition of breast milk.

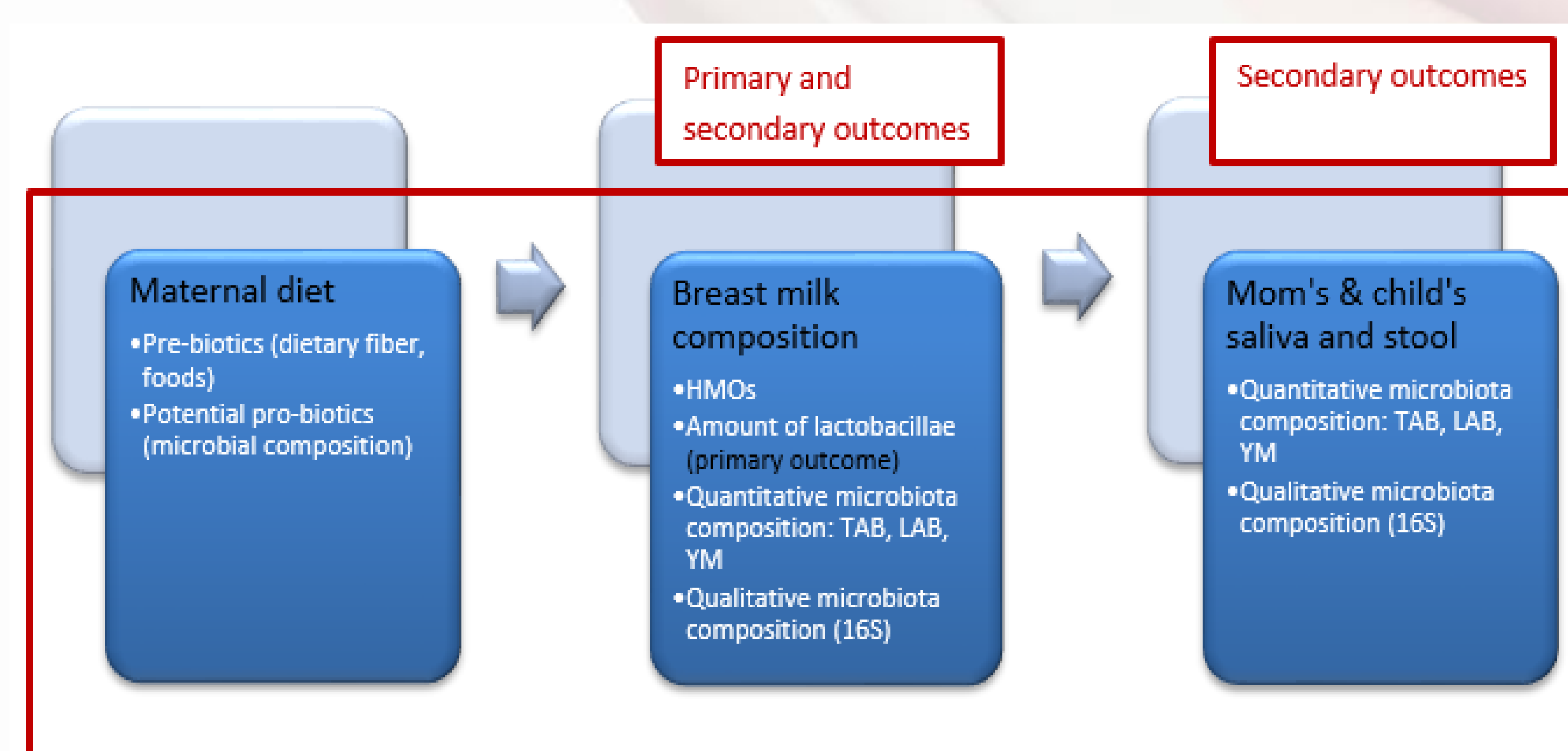
Aims

The aims of this study are to study the relationship between the maternal diet and:

- the amount and types of HMOs and the microbial content in breast milk;
- the microbiota composition of stool and saliva of mother and infant.

The **primary outcome** is the amount of *Lactobacillae* in breast milk.

Figure 1. Study design of the Synbio-Breast study



TAB: total aerobic bacteria, LAB: *Lactobacillae*, YM: yeast/mould

Methods

- Cross-sectional study, 65 atopic and 10 non-atopic (controls) pregnant mothers;
- 3 days and 4 weeks post partum collection of human milk, after proper cleaning and disinfection of the breast;
- 3 days and 4 weeks post partum: collection of saliva and feces of mother and infant;
- A three-day food diary at 4 weeks post partum;
- Microbial analysis by plate counting and 16S sequencing .

Inclusioncriteria	Exclusioncriteria
Vaginal delivery	Cesaerean section
Breastfeeding > 1 month	Formula milk > 1 bottle
Dutch language	Preterm delivery
ppBMI <35 kg/m ²	Diabetes
	Gastro-intestinal disease
	Antibiotics <6 month before/during study
	Prebiotics <4 weeks before/during study

Results

- So far 50/75 women have been included since January 2020;
- 66% of the women who gave informed consent dropped out of the study due to our strict in- and exclusion criteria;
- Data analysis has not been performed yet.
- Recent literature seems to confirm our hypothesis:
 - Cross-sectional by Selma-Royo (2022, N=101) showed a correlation between certain HMOs in human milk and specific components in the maternal diet;
 - Cross-over intervention study by Seferovic (2020, N=7), showed a correlation between a maternal diet high in total fat and a decline in sialylated HMOs in their human milk.

Conclusion

Although results are still lacking, the study design is promising to generate insight into the relationship between the synbiotic composition of the maternal diet and the synbiotic composition of breast milk, yielding unique opportunities for allergy prevention.