

# EFFECT OF A FOLLOW-ON FORMULA SUPPLEMENTED WITH PREBIOTICS ON THE BABY'S GUT COMPOSITION



## Introduction:

The microbial colonization of human intestine begins at birth. Different factors, including the type of birth (vaginal or caesarean), the microflora of the mother's vagina and skin, hygiene during birth, the newborn's environment, antibiotic regime and, above all, the type of diet, influence the development of the baby's gastrointestinal microflora. Human breast milk is the best dietary choice for babies, as it protects babies from allergies, infections and oxidative stress. Breast milk is considered the gold standard against which the quality of adapted formula milks is assessed. Formula feeds, used by women who cannot breastfeed, should satisfy all the nutritional requirements and allow normal development of babies.

## Aim:

The aim of this study was to determine effect of a follow-on formula supplemented with inulin and fructooligosaccharides (FOS) on the gut microbial composition, as well as on the growth and development of babies, and to compare it to that of human breast milk.

## Material and methods:

Healthy, vaginally, term born babies 6 to 12 months old, were enrolled in 28-day study. Babies were divided in two groups according to the type of feeding: those receiving supplemented follow-on formula with inulin and FOS (FF), and those receiving breast milk (BMF, control group). The follow-on formula group received an experimental full-term formula designed for babies 6 to 12 months old, and supplemented with inulin and FOS (4.0 g/l). The inulin and FOS used in this study were produced from natural chicory. Fecal samples were obtained before (D0) and during study at days 14 and 28 (D14, D28), and used to determine the counts of *Bifidobacterium sp.*, *Lactobacillus sp.*, total aerobes, anaerobes, and yeasts and fungi. Every day during the study, the weight and length of the babies, number of feeds, tolerance to the offered meal (follow-on formula or breast milk), and stool frequency and consistency were recorded.

## Results:

Modifications in the levels of microbial colonization between the beginning D0, D14 and the end of the supplementation for both groups are compared in table. The bacterial counts are expressed as means  $\pm$  SD  $10^8$  CFU/g feces. Before and after 14 days of formula administration, the number of bifidobacteria and lactobacilli did not differ among the groups. At the end of the 28-day period, the number of bifidobacteria and lactobacilli significantly increased in formula fed versus breast milk fed group. Simultaneously with the increase in bifidobacterial and lactobacilli populations, decreases in the total aerobes, anaerobes and yeasts and fungi levels were observed. During the study, the numbers of total aerobes and yeasts and fungi continually decreased in the stools of the FF infants, without statistically significant differences between the groups at the end of the study. The anaerobes decreased in both groups during the study, with significant differences with time but without significantly different rates of change. All babies exhibited normal growth during the study, within the normal framework for that period of life (age between 6-12 months). In the study, all babies in each group liked the offered milks. The intake of the bottle formula with added inulin and FOS at 4.0 g/l was well tolerated by the infants: the incidence of side effects did not differ among the feeding groups during the study. Stool frequency and consistency, and side effects (flatus and regurgitations) did not differ among the feeding groups during the study.

## Conclusion:

This study showed that follow-on formula supplemented with inulin and FOS stimulates bifidogenic effect in the baby's intestine during the weaning period. It can be concluded that tested follow-on formula with prebiotics has a similar effect on the baby's gut microflora, and growth development as mature breast milk.

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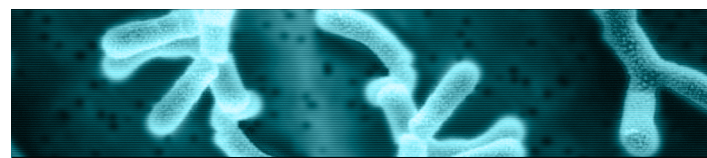
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## LEVELS OF BABY'S GUT COLONIZATION IN THE FOLLOW-ON FORMULA AND BREASTMILK FED GROUPS

Type of feeding	CFUx 10 <sup>8</sup> /g of feces in the following group		p*	F1**	F1group**
	Follow-on formula with added inulin and FOS (FF)	Breastfeeding (BMF)			
<b>Bifidobacterium</b>					
D0	9.86±10.23	9.04±11.97	0.871	0.012	0.022
D14	18.68±19.43	20.81±46.75	0.896		
D28	33.57±20.64	9.91±10.48	0.005		
<b>Lactobacillus</b>					
D0	12.21±12.40	14.95±21.05	0.727	0.003	0.022
D14	18.03±21.35	16.60±18.14	0.874		
D28	60.24±30.23	16.79±12.70	0.001		
<b>Aerobes</b>					
D0	114.34±62.53	67.08±66.21	0.118	0.005	0.198
D14	40.80±32.90	37.21±29.25	0.800		
D28	11.97±10.14	34.43±63.23	0.282		
<b>Anaerobes</b>					
D0	185.95±136.21	205.25±73.42	0.698	0.000	0.989
D14	67.81±42.69	78.54±54.68	0.835		
D28	28.59±39.17	45.09±58.14	0.466		
<b>Yeasts and Fungi</b>					
D0	76.56±105.20	23.94±43.07	0.810	0.017	0.292
D14	16.61±16.40	21.08±29.13	0.677		
D28	7.72±10.78	6.70±7.78	0.161		

\*The p value represents the significance level of the difference in the change between the groups during the study, determined by the independent-sample t-test.  
\*\* F1 and F1 group - given as the internal group factor (within subject factors - F1) and as the factor of differences between the groups (between subject factors - F1 group).