

Abstract

# Our Experience in Testing Potential Prebiotics †

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**Abstract:** Background/objectives: Normal growth and development of the human gastrointestinal tract begins at the earliest age of life. The microbiota is a complex system and there are numerous efforts to influence these microbial species in order to improve health. Prebiotics with probiotics act synergistically in organisms, so they represent supplements or food ingredients specifically intended for this role. In children, analyzing the microbial composition can determine the potential for obesity later in life, which is why the influence of nutrition in the earliest period is an important factor, especially for preterm infants. Human milk is the best source of nutrients, but in cases when it is not available, infant formulas are important because, in addition to their nutritional role, they also achieve a prebiotic effect in the body. The goal of this paper was to provide an overview of our research and application of potential prebiotics. Methods: The methodology was based on the analysis and synthesis of collected and systematized data and research results. Results: Supplementation with inulin, GOS and FOS is very important in the nutrition and development of infants, which was also shown during our clinical research of infant formulas supplemented with these prebiotics, where the bifidogenic effect was pronounced in the feces of infants fed with prebiotic infant formula. Human milk provides unique prebiotics, the effect of which is difficult to replicate. In vitro testing of some microbiologically synthesized potential prebiotics such as levan, pullulan, and beta-glucan, which is the first step in the analysis of potential prebiotics, showed a positive effect on individual probiotic strains or on a consortium of microorganisms isolated from infant feces. Determination of biochemical parameters and gas production are further criteria for the selection of potential prebiotics. Discussion: Our research indicates that there are different effects of prebiotics on selected individual probiotics or cultures from feces, which can be further tested in vitro and in vivo and then potentially applied in nutrition and supplementation.



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