pathogen receptor analogues, but activate immune factors by infant intestinal epithelial cells and/or associated immune cell populations. The function of these breast milk components, functioning as antioxidants and as immune modulators, includes not only the protection of breast milk lipids by peroxidation, but may also assist in the regulation of inflammatory responses to infection or other injury.

[0005] Not all infants receive human breast milk. Further, no vaccines are currently available for the prevention of inflammatory diseases. Therefore, development of safe and efficacious preventative or therapeutic methods would be beneficial, especially for infants.

[0006] It would therefore be desirable to provide nutritional compositions, and synthetic infant formulas in particular, that can produce nutritional benefits including improved immune system growth and development. It would additionally be beneficial if the nutritional compositions could modulate inflammation and enhance immunity against microbial infections, including bacterial and viral infections, and other inflammatory diseases.

SUMMARY OF THE DISCLOSURE

[0007] The present disclosure is directed to nutritional compositions, including synthetic infant formulas, synthetic pediatric formulas, and synthetic child formulas, including at least one HMO, alone or in combination with one or more of long chain polyunsaturated fatty acids (LCPUFAs), antioxidants, and/or nucleotides, for reducing inflammation in an infant, toddler, or child, as well as methods of using the compositions.

[0007a] One embodiment is the use of synthetic composition comprising 0.001 mg/mL to 20 mg/ mL of the human milk oligosaccharide 2' -fucosyllactose; 0.001 µg/mL to 10 µg/mL of a carotenoid; and 0.025 mg/mL to 0.130 mg/mL of a long chain polyunsaturated fatty acid for the manufacture of a medicament for the treatment and/or prevention of an infection-mediated inflammatory condition or disease in an infant, toddler, or child by reducing said inflammation.

[0008] One embodiment is a synthetic pediatric formula comprising a human milk oligosaccharide and from about 0.025 mg/mL to about 0.130 mg/mL of a long chain polyunsaturated fatty acid.

[0009] Another embodiment is a synthetic pediatric formula comprising a human milk oligosaccharide and from about 0.001 μg/mL to about 10 μg/mL of a carotenoid.