glycans of mammalian milk become susceptible to hydrolysis by other bacteria. This releases Free Sugar Monomers (FSMs), which are capable of enabling the growth of opportunistic or highly destructive pathogens that would not have flourished otherwise. The term “dietary glycans”, as used herein, refers to those indigestible glycans, sometimes referred to as “dietary fiber”, or the carbohydrate polymers which are not hydrolyzed by the endogenous enzymes in the digestive tract (e.g., the small intestine) of the mammal.

[0010] Some examples of the disclosure involve compositions and methods of delivering to the gut of a dysbiotic mammal, compositions that include components capable of consuming the dietary glycans. Such compositions can reduce the concentration of FSMs in the mammal. The reduction of FSMs and dietary glycans can minimize the likelihood of an overpopulation of pathogenic bacteria that can harm that mammal. In some examples the compositions comprise certain bacteria (alive or dead) or other orally provided compounds that bind and/or metabolize the FSMs, thereby preventing them from being used as an energy source by the pathogenic bacteria.

[0011] Some of the examples of the present disclosure provide diagnostics for the presence of substrates enabling growth of pathogenic bacteria within mammalian neonates. Specifically, some examples provide diagnostics to determine the presence of FSMs.

[0012] Some of the examples of the present disclosure deliver a suite of a) microorganisms (*e.g.*, bacteria or yeast) that act as probiotics to actively remove substrates including intact dietary glycans and FSMs; b) enzymes capable of inactivating or eliminating dietary glycans and/or sugars; and/or c) binding agents that physically bind and render free sugars monomers unavailable as substrates supporting the growth of pathogenic microorganisms.

[0013] Some examples of the disclosure provide a composition administered to reduce the concentration of FSMs that may be the consequence of the use of antibiotics to treat the pathogenic bacterial overgrowth in mammals including humans.

[0013a] Disclosed is a composition comprising at least two non-pathogenic microbes, wherein one of the at least two non-pathogenic microbes is from a first species capable of internalizing and/or metabolizing dietary glycans, and wherein one of the at least two non-pathogenic microbes is from a second species capable of consuming and metabolizing free sugar monomers. In one aspect, the present disclosure refers to use of at least two non-pathogenic microbes in the manufacture of a composition for treating or preventing infection of an infant mammal by a pathogenic microbe, wherein one of the at least two non-pathogenic microbes is from a first species capable of internalizing and/or metabolizing dietary glycans, which is *Bifidobacterium longum* subspecies. *Infantis,* and wherein one of the at least two non-pathogenic microbes is from a second species capable of consuming and metabolizing free sugar monomers, which is *Lactobacillus plantarum*; wherein each non-pathogenic microbe is present from 10 million to 100 billion CFU per gram, and wherein the composition is to be administered to the infant mammal at a period within 96 hours of the birth of the infant mammal.

CLAIMS

1. Use of at least two non-pathogenic microbes in the manufacture of a composition for treating or preventing infection of an infant mammal by a pathogenic microbe, wherein one of the at least two non-pathogenic microbes is from a first species capable of internalizing and/or metabolizing dietary glycans, which is *Bifidobacterium longum* subspecies. *Infantis,* and wherein one of the at least two non-pathogenic microbes is from a second species capable of consuming and metabolizing free sugar monomers, which is *Lactobacillus plantarum*; wherein each non-pathogenic microbe is present from 10 million to 100 billion CFU per gram, and wherein the composition is to be administered to the infant mammal at a period within 96 hours of the birth of the infant mammal.

2. The use according to claim 1, wherein the pathogenic microbe preferentially consumes sialic acid.

3. The use according to claim 2, wherein the pathogenic microbe is *Clostridium difficile*, or *C. perfringens*.

4. The use according to any one of claims 1-3, wherein the infant mammal is a nursing human, or a nursing foal, or a nursing piglet.

5. The use according to any one of claims 1-4, wherein the first non-pathogenic microbe is activated *B. longum* subspecies *infantis*.