**Xylo-oligosaccharides (XOS)** are prebiotics, ([non-digestible] dietary ingredients that pass unaltered into the lower GI tract and beneficially affect the host by selectively stimulating the growth and/or activity of one or more beneficial bacteria in the colon.)

XOS are abundant in nature and derived from xylan, a yellow, water-soluble, gummy polysaccharide found in plant cell walls that yield xylose upon hydrolysis. Agroresidues [agricultural wastes] such as straw, stalk, cob, hull, husk, bagasse and pulp of hardwood represent a major source of xylan. XOS provide a wide array of demonstrated and potential benefits, with no adverse effects were observed with dosages of (4 grams) or even (8 grams) daily. The fermentation of XOS produces short chain fatty acids (SFCAs), improves gut epithelial health and supports regulation of the metabolic process. XOS possess bound phenolics including ferulic and coumaric acids that impart additional antioxidant effect and immuno-modulatory activity. The graphic shown here provides representation of both numerous and wide-ranging established and potential benefits.

**GENERAL HEALTH BENEFITS**

1. Supports immune function as an Immunomodulator and/or Immunostimulator
2. Stimulation of Bifidobacterium and lactobacilli; beneficial bacteria:
   - Contributes to healthy intestinal flora
   - Decrease in potentially harmful bacteria: Enterococcus, Enterobacter, and Clostridia.
   - XOS stimulated the growth of beneficial bacteria and leading to a suppression of the pathogenic bacteria Escherichia coli, Campylobacter jejuni and Salmonella enteritidis. XOS significantly decreased or reversed the increase in abundance of Howardella, Enterorhabdus, and Slackia.
   - May reverse changes seen in gut microbiota during development of diabetes.
   - Supports gut epithelial and mucosal health;

**IMPRESSED BOWEL HEALTH**

- Enhanced peristalsis (stimulation of intestinal transit), Fecal bulking;
- Normalization of stool consistency.

**OF NOTE:** XOS may provide protective effect on development of aberrant crypt foci (ACFs) and metabolic abnormalities associated with colon cancer. Beneficial effects of dietary XOS were observed on microbiota and the ACFs in the colon of DMH-treated animals. Dietary XOS significantly increased the population of bifidobacteria and alleviated the incidence and multiplicity of ACF formation in the colon. XOS supplementation also ameliorated the level of lipid peroxidation and improved the activities of glutathione-S-transferase and catalase in colonic mucosa and liver, which may have contributed to inhibiting the colon carcinogenesis. Thus, the results suggested the protective effect of dietary XOS on the development of ACFs and on metabolic abnormalities associated with colon cancer.

**GENERAL HEALTH BENEFITS:** XOS (alone or as active components of pharmaceutical preparations) exhibits a range of biological activities different from the prebiotic effects related to gut modulation. The other effects for XOS include antioxidant activity (conferred by phenolic substituents), blood- and skin-related effects, anti-allergy, anti-infection and anti-inflammatory properties, immunomodulatory action, anti-hyperlipidemic effects, and cosmetic and a variety of other properties.

**Additional Research findings:**
1. Supports immune function as an Immunomodulator and/or Immunostimulator
2. Contributes to antioxidant activity
3. Stimulation of Bifidobacterium and improved nutrient absorption and production of B complex vitamins, and improved plasma lipid profile, including reduction in the level of triglyceride content of blood and liver.

**Xylo-oligosaccharide-related References**


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**Potential Health Benefits of Prebiotics/Xylo-oligosaccharides**

- Colonocytes
- Reduced Inflammation
- Improved Bacterial Habitat
- Reduced Pathogens
- Reduced fermentation of XOS
- Mast Cell
- Dendritic Cells
- Immunosuppression
- Reduced Adhesion
- Allergy Prevention

**Source:** Xylooligosaccharide (XOS) as an Emerging Prebiotic: Microbial Synthesis, Utilization, Structural Characterization, Bioactive Properties, and Applications. Acharaya AA and Prupalla SG. Comprehensive Reviews in Food Science and Food Safety 2010, 10, issue 1, p 3, January 2011.


