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1: *Nutrition* 1998 Jul-Aug;14(7-8):585-94

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Immunonutrition: role of biosurfactants, fiber, and probiotic bacteria.

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Phospholipids constitute an important part of cellular membranes, and membrane fluidity and permeability are dependent on the fatty acid composition of the phospholipid. The composition, which changes with aging and disease is, to a large degree, influenced by nutrient supply. Phospholipids have been effective in protecting cellular membranes such as those of the gastrointestinal tract to an extent not much different from that observed with external supply of established mucosa-protective drugs such as misoprostol and sucralfate. Polar lipids have also been shown to be effective in preventing microbial translocation. The effect is further potentiated by an external supply of probiotic fibers such as pectin, guar gum, and oat gum. These and many other fibers also have documented strong mucosa preventive effects. Probiotic bacteria such as *Lactobacillus plantarum* have demonstrated a strong ability to preserve food and prevent spoilage. In addition, *L. plantarum* seems to not only preserve key nutrients such as omega-3 fatty acids, but also increases its content during storage conditions. *L. plantarum* alone or in combination with various fibers has demonstrated a strong ability to reduce and eliminate potentially pathogenic microorganisms both in vitro and in vivo. It has recently been shown that *L. plantarum* possesses the ability to adhere to and colonize intestinal mucosa. It seems unique among the lactobacilli for *L. plantarum* to use mannose-specific adhesins, uncommon among gram-positive, but common among gram-negative bacteria, which makes it possible that *L. plantarum* competes with gram-negative other potential pathogens for receptor sites at the mucosal cell surfaces. Additionally, *L. plantarum* seems to be effective in eliminating nitrate and producing nitric oxide. These functions of *L. plantarum* are among the reasons why it has been used in combination with various fibers and polar lipids to recondition the gastrointestinal mucosa. For the purpose of a *L. plantarum*-containing formula being produced and tried, a treatment policy is regarded as an extension of the immunonutrition program and called ecoimmunonutrition.