Bacterial Infections:


Bitzan, MM, et al. Inhibition of *Helicobacter pylori* and *Helicobacter mustelae* binding to lipid receptors by bovine colostrum. *Journal of Infectious Disease* 177(4):955-961 (1998). *H. pylori* and *H. mustelae* (a gastric pathogen of ferrets) are both bound by lipid receptors (phosphatidylethanolamine, gangliotetraosylceramide and gangliotriaosyl-ceramide) in the gut, allowing them to carry out their pathogenic activities. Bovine colostrum, however, was shown to prevent binding of the pathogens to these lipid receptors even though there was no detectable anti-*H. pylori* antibody activity in the colostrum.


da Costa, RS, et al. Characterization of iron, copper and zinc levels in the colostrum of mothers of term and pre-term infants before and after pasteurization. *International Journal of Food Science and Nutrition* 54(2):111-117 (2003). Milk samples were collected from mothers from day 1 to day 7 postpartum. Milk that was pasteurized showed some diminution of zinc, copper and iron levels, but not to a significant degree. Sufficient levels remained in the pasteurized milk to supply the needs of the new-born infants.


Ellison, RT III, Giehl, TJ. Killing of gram-negative bacteria by lactoferrin and lysozyme. *Journal of Clinical Investigation* 88(4):1080-1091 (1991). Lactoferrin and lysozyme act together to kill gram-negative bacteria, such as *Vibrio cholerae* (cholera), *Salmonella typhimurium* (food poisoning) and *Escherichia coli*. The lactoferrin attaches to and destroys the cell wall of the bacteria, allowing the lysozyme to enter and lyse (burst) the organisms.

Flanigan T, Marshall R, Redman D, Kaetzel C, Ungar B. J Protozool. 1991 Nov-Dec;38(6):225S-227S. Related Articles, Links, In vitro screening of therapeutic agents against Cryptosporidium: hyperimmune cow colostrum is highly inhibitory. Department of Medicine, University Hospitals, Case Western Reserve University, Cleveland, OH.


Holloway, NM, et al. Serum immunoglobulin G concentrations in calves fed fresh and frozen colostrum. Journal of the American Veterinary Medicine Association 219(3):357-359 (2001). No significant difference was found between the IgG concentrations of fresh bovine colostrum and frozen and thawed bovine colostrum.


Gopal, PK, and Gill, HS. Oligosaccharides and glycoconjugates in bovine milk and colostrum. British Journal of Nutrition 84(Suppl.1):S69-S74 (2000). Another way colostrum helps protect against infections is through the oligosaccharides and glycoconjugates it contains. These are complex sugars which compete for binding sites in the GI tract with pathogens.

Graczyk TK, Cranfield MR, Bostwick EF., J Parasitol. 2000 Jun;86(3):631-2. Related Articles, Links, Successful hyperimmune bovine colostrum treatment of Savanna monitors (Varanus exanthematicus) infected with Cryptosporidium sp. Department of Molecular Microbiology and Immunology, School of Hygiene and Public Health, Johns Hopkins University, Baltimore, Maryland 21205, USA.

Korhonen, H, et al. Milk immunoglobulins and complement factors. British Journal of Nutrition 84(Suppl.1):S75-S80 (2000). Bovine colostrum contains three main classes of immunoglobulin IgG (IgG1 75% and IgG2), IgM and IgA, plus hemolytic and bactericidal complement. Complement is a complex group of proteins which act in concert with antibodies to inactivate and/or kill pathogens.


Ogra, PL, et al. Colostrum derived immunity and maternal neonatal interaction. Annals of the New York Academy of Sciences 409: 82-92 (1983). Peyer's patches are found throughout the intestinal tract, and groups of similar immunoactive cells are found in the bronchial mucosa. Both the intestinal and bronchial immunoactive cell groups respond to allergens, antigens and pathogens by neutralizing or destroying them. In newborns, these special cell groups are not immediately operative but protection is provided by a variety of immune factors from the mother's colostrum. Antibodies found in colostrum protect against Eschericia coli, Salmonella, Shigella, Vibrio cholera, Bacteriodes fragilis, Streptococcus pneumoniae, Bordetella pertussis, Clostridium diphtheria, Clostridium tetani, Streptococcus mutans and Candida albicans.

Paulsson, MA, et al. Thermal behavior of bovine lactoferrin in water and its relation to bacterial interaction and antibacterial activity. Journal of Dairy Science 76(12):3711-3720 (1993). Lactoferrin which was either unheated or pasteurized showed similar activity, while lactoferrin exposed to UHT treatment decreased its ability to bind to bacterial species and destroyed its ability to inhibit bacterial growth.


composition. Surgical Research, Department of Surgery and Thoracic Surgery, Kiel, Germany.


Wada, T, et al. The therapeutic effect of bovine lactoferrin in the host infected with Helicobacter pylori. Scandinavian Journal of Gastroenterology 34(3):238-243 (1999). Mice infected with H. pylori were given a daily dose of bovine lactoferrin for 2-4 weeks. Their intestines were then examined for bacterial content. Numbers of H. pylori were reduced to 10% of pre-lactoferrin levels and greatly decreased the numbers of H. pylori bound to the intestinal wall. Serum antibody titer to H. pylori were reduced to practically zero, indicating that the immune response of the host was no longer recognizing H. pylori infection. Therefore it was deduced that lactoferrin has a direct antibacterial effect on H. pylori infection and prevents binding of the pathogen to the intestinal lining.
