



References Supporting the Use of Immunoglobulin in Dietary Supplements to Improve Human Health

Immunity/Immuno-Deficient

Arthington, JA, Weaver, E, Chi, F, and Russell, L. 1997. The use of concentrated spray-dried plasma protein in the preweaned/neonatal pig. American Association of Swine Practitioners pp. 123-124

Behymer DE, Riemann HP, Utterback W, Elmi C, Franti CE. Mass screening of cattle sera against 14 infectious disease agents, using an ELISA system for monitoring health in livestock. *Am.J Vet.Res.* 1991;52:1699-705.

Bosi P, Han IK, Perini S et al. Effect of different spray dried plasmas on growth, ileal digestibility and health of early weaned pigs challenged with E. Coli k88. *Asian-Aust.J.Anim.Sci.* 2001;14:1138-43.

Bouvet JP. Immunoglobulin Fab fragment-binding proteins. *Int.J Immunopharmacol.* 1994;16:419-24.

Brown KH, Santizo M-C, Begin F, Torun B. Effect of supplementation with multiple micro-nutrients (MMN) and/or bovine serum concentrate (BSC) on the growth of low-income, peri-urban Guatemalan infants and young children. FASEB Journal 2000;14:A534 (abstr).

Brunser O, Espinoza J, Figueroa G et al. Field trial of an infant formula containing anti-rotavirus and anti-Escherichia coli milk antibodies from hyperimmunized cows. *J Pediatr.Gastroenterol.Nutr* 1992;15:63-72.

Burrin DG, Davis T, Ebner S, Schoknecht PA, Fiorotto M, Reeds PJ. Colostrum enhances the nutritional stimulation of vital organ protein synthesis in neonatal pigs. *J.Nutr.* 1997;127:1284-9.

Cain, C, 1995. Mode of action of spray-dried porcine plasma in weanling pigs. *American Association of Swine Practitioners*, 225-226

Cain, CM and Zimmerman, DR. 1997. Effect of spray dried plasma (SDP) on fecal shedding of hemolytic Escherichia coli (HEC) and rotavirus by pigs in a segregated early-weaned (SEW) environment. *Journal of Animal Science* 75 (Suppl. 1) : 61

Carroll JA, Touchette KJ, Matteri RL, Dyer CJ, Allee GL. Effect of spray-dried plasma and lipopolysaccharide exposure on weaned pigs: II. Effects on the hypothalamic-pituitary-adrenal axis of weaned pigs. *J Anim.Sci.* 2002;80:502-9.

Hansen, JA, Goodband, RD, Nelssen JL, Friesen KG, and Weeden, TL. 1991. Effect of substituting spray-dried porcine plasma protein for milk products in starter pig diets. *J. Animal Science (Supp. 1)*: 103

Lynch, PB, Weaver, EM, and Russell, LE. 1995. Evaluation of spray-dried porcine plasma (SDPP) and spray-dried blood cells (SDBC) in diets for weaned pigs. TEAGASC Final Report.

Casadevall A. Antibody-based therapies as anti-infective agents. *Exp.Opin.Invest.Drugs* 1998;7:307-21.

Coffey RD, Cromwell GL. The impact of environment and antimicrobial agents on the growth response of early-weaned pigs to spray-dried porcine plasma. *J Anim.Sci* 1995;73:2532-9.

Coffey RD, Cromwell GL. Use of spray-dried animal plasma in diets for weanling pigs. *Pig News and Information* 2001;22:39-48.

Copelan HA, Bechtel TP, Klein JP et al. Controlled trial of orally administered immunoglobulin following bone marrow transplantation. *Marrow Transplantation* 1994;13:87-91.

Corthesy B, Kraehenbuhl JP. Antibody-mediated protection of mucosal surfaces. *Curr.Top.Microbiol.Immunol.* 1999;236:93-111.:93-111.

de Rodas BZ, Sohn KS, Maxwell CV, Spicer LJ. Plasma protein for pigs weaned at 19 to 24 days of age: effect on performance and plasma insulin-like growth factor I, growth hormone, insulin, and glucose concentrations. *J Anim.Sci* 1995;73:3657-65.

Dickinson BL, Badizadegan K, Wu Z et al. Bidirectional FcRn-dependent IgG transport in a polarized human intestinal epithelial cell line. *J Clin Invest.* 1999;104:903-11.

Ermer, PM, Miller, PS and Lewis, AL. 1994. Diet preference and meal patterns of weanling pigs offered diets containing either spray-dried porcine plasma or dried skim milk. *Journal of Animal Science* 72:1548-1554

Facon M, Skura BJ, Nakai S. Potential for Immunological Supplementation of Foods. *Food and Agricultural Immunology* 1993;5:85-91.

Gatnau, R, Paul, PS, and Zimmerman, DR. 1989. Spray dried porcine plasma as a source of immunoglobulins for newborn piglets. *Journal of Animal Science* 67 (Suppl. 1): 244

Gatnau, R, and Zimmerman, DR. 1991. Determination of optimum levels of spray dried porcine plasma (SDPP) in diets for weaned pigs. *Journal of Animal Science* 69 (Supp. 1): 369

Glassman M, Grill B, Gryboski J, Dwyer J. High Incidence of Hypogammaglobulinemia in Infants with Diarrhea. *Journal of Pediatric Gastroenterology and Nutrition* 1983;2:465-71.

Gomez GG, Phillips O, Goforth RA. Effect of immunoglobulin source on survival, growth, and hematological and immunological variables in pigs. *J Anim.Sci* 1998;76:1-7.

Gorczyca W, Ugorski M, Nowacki W, Lisowski J. Immunoglobulins of colostrum-VI. Comparative studies of cytophilic properties of bovine serum and colostrum IgG. *Molecular Immunology* 1986;23:961-4.

Hammarstrom L, Gardulf A, Hammarstrom V, Janson A, Lindberg K, Smith CIE. Systemic and Topical Immunoglobulin Treatment in Immunocompromised Patients. *Immunological Reviews* 1994;139:43-70.

Hanning, R. M. and Drew, M. Bovine Immunoglobulin Feeding Trial. 05/1999. McMaster University. Final Research Report.

Hansen JA, Nelssen JL, Goodband RD, Weeden TL. Evaluation of animal protein supplements in diets of early-weaned pigs. *J Anim.Sci* 1993;71:1853-62.

He F, Tuomola E, Arvilommi H, Salminen S. Modulation of human humoral immune response through orally administered bovine colostrum. *FEMS Immunol.Med.Microbiol.* 2001;31:93-6.

Holmskov U, Laursen SB, Malhotra R et al. Comparative study of the structural and functional properties of a bovine plasma C-type lectin, collectin-43, with other collectins. *Biochem.J* 1995;305:889-96.

Jiang R, Chang X, Stoll B et al. Dietary plasma protein is used more efficiently than extruded soy protein for lean tissue growth in early-weaned pigs. *J.Nutr.* 2000;130:2016-9.

Kats LJ, Nelssen JL, Tokach MD, Goodband RD, Hansen JA, Laurin JL. The effect of spray-dried porcine plasma on growth performance in the early-weaned pig. *J Anim.Sci* 1994;72:2075-81.

Kobayashi T, Ohmori T, Yanai M, Kawanishi G, Yoshikai Y, Nomoto K. Protective Effect of Orally Administering Immune Milk on Endogenous Infection in X-Irradiated Mice. *Agric.Biol.Chem.* 1991;55:2265-72.

Korhonen H, Marnila P, Gill HS. Bovine milk antibodies for health. *Br.J. Nutr.* 2000. 84(Suppl.1):S135-146.

Kuhls TL, Orlicek SL, Mosier DA, Crawford DL, Abrams VL, Greenfield RA. Enteral human serum immunoglobulin treatment of cryptosporidiosis in mice with severe combined immunodeficiency. *Infect.Immun.* 1995;63:3582-6.

Kuipers H, van Breda E, Verlaan G, Smeets R. Effects of oral bovine colostrum supplementation on serum insulin-like growth factor-I levels. *Nutrition* 2002;18:566-7.

Kulczycki A, Macdermott RP. Bovine IgG and Human Immune Responses: Con A-induced Mitogenesis of Human Mononuclear Cells is Suppressed by Bovine IgG. *Int.Archs.Allergy appl.Immun.* 1985;77:255-8.

Lembcke JL, Peerson JM, Brown KH. Acceptability, safety, and digestibility of spray-dried bovine serum added to diets of recovering malnourished children. *J. Pediatr. Gastroenterol. Nutr.* 1997;25:381-4.

Lissner R, Thurmann PA, Merz G, Karch H. Antibody reactivity and fecal recovery of bovine immunoglobulins following oral administration of a colostrum concentrate from cows (Lactobin) to healthy volunteers. *Int.J Clin Pharmacol.Ther.* 1998;36:239-45.

- Macpherson AJ, Hunziker L, McCoy K, Lamarre A. IgA responses in the intestinal mucosa against pathogenic and non-pathogenic microorganisms. *Microbes.Infect.* 2001;3:1021-35.
- Melamed I, Griffiths A, Rolfman C. Benefit of oral immune globulin therapy patients with immunodeficiency and chronic diarrhea. *The Journal of Pediatrics* 1991;119:486-9.
- Mero A, Miikkulainen H, Riski J, Pakkanen R, Aalto J, Takala T. Effects of bovine colostrum supplementation on serum IGF-I, IgG, hormone, and saliva IgA during training. *J Appl.Physiol.* 1997;83:1144-51.
- Mero A, Kahkonen J, Nykanen T et al. IGF-I, IgA, and IgG responses to bovine colostrum supplementation during training. *J.Appl.Physiol* 2002;93:732-9.
- Moreto, M., Amat, C., Pelegri, C., Vicario, M., and Perez, A. Immunoglobulin concentrates: traditional compounds with functional applications in healthy feed and food products. Viability phase. Project FBG 301107. 2001.
- Nash GS, Macdermott RP, Schloemann S et al. Bovine IgG1, but not IgG2, binds to human B cells and inhibits antibody secretion. *Immunology* 1990;69:361-6.
- Oates J, Wood A. Manipulating the immune system with immune globulin. *Drug Therapy* 1992;326:107-16.
- Ojuawo A, St Louis D, Lindley KJ, Milla PJ. Non-infective colitis in infancy: evidence in favour of minor immunodeficiency in its pathogenesis. *Arch.Dis.Child* 1997;76:345-8.
- Owen KQ, Nelssen JL, Goodband RD et al. Effect of various fractions of spray-dried porcine plasma on performance of early weaned pigs. *J.Anim.Sci.* 2000;73:81 (abstr).
- Pierce JL, Cromwell GL, Lindemann MD, Coffey RD. Assessment of three fractions of spray-dried porcine plasma on performance of early-weaned pigs. *J.Anim.Sci.* 1995;73:81 (abstr).
- Prigent-Delecourt L, Coffin B, Colombel JF, Dehennin JP, Vaerman JP, Rambaud JC. Secretion of immunoglobulins and plasma proteins from the colonic mucosa: an in vivo study in man. *Clin Exp.Immunol.* 1995;99:221-5.
- Quan CP, Ruffet E, Arihiro K, Pires R, Bouvet JP. High affinity serum-derived Fab fragments as another source of antibodies in the gut lumen of both neonates and adults. *Scand.J Immunol.* 1996;44:108-14.
- Quigley JD, III, Wolfe TM. Effects of spray-dried animal plasma in calf milk replacer on health and growth of dairy calves. *J Dairy Sci* 2003;86:586-92.
- Reilly R, Domingo R, Sandhu J. Oral Delivery of Antibodies. *Clin.Pharmacokinet.* 1997;32:313-23.
- Shield J, Melville C, Novelli V et al. Bovine colostrum immunoglobulin concentrate for cryptosporidiosis in AIDS. *Arch.Dis.Child.* 1993;69:451-3.
- Srinivasan A, Ni Y, Tizard I. Specificity and prevalence of natural bovine antimannan antibodies. *Clin Diagn.Lab.Immunol.* 1999;6:946-52.

Sprotte, G., Karch, H., Lissner, R., and Moller, W. Oral Administration of Immunoglobulin Preparations for Treatment of Chronic Pain Syndrome. U.S. Patent No. 5,571,731. 1999.

Stahly TS, Cook DR, Swenson SG, Williams NH, Zimmerman D. Growth responses of pigs to dietary plasma protein (PP) additions a influenced by pig antigen exposure and PP source. *J.Anim.Sci.* 1995;73:81 (abstr).

Stephan W, Dichtelmuller H, Lissner R. Antibodies from Colostrum in Oral Immunotherapy. *J.Clin.Chem.Clin.Biochem.* 1990;28:19-23.

Sugii S. Immunological cross-reactivity of mannan-binding proteins in bovine, chicken, and human sera. *J Vet.Med.Sci* 1994;56:787-90.

Thomson JE, Jones EE, Eisen EJ. Effect of spray-dried porcine plasma protein on feed intake, growth rate, and efficiency of gain in mice. *J Anim.Sci* 1994;72:2690-5.

Touchette KJ, Carroll JA, Allee GL et al. Effect of spray-dried plasma and lipopolysaccharide exposure on weaned pigs: I. Effects on the immune axis of weaned pigs. *J Anim.Sci* 2002;80:494-501.

Torrallardona, D, Polo, J, and Robert, E. Plasma and antimicrobials in the feeding of challenged weaning pigs. 2001. 2001.

van der Peet-Schwering. The effect of spray-dried porcine plasma in diets with different protein sources on the performance of weanling piglets. 1-26. 2000.

van Dijk AJ, Everts H, Nabuurs MJ, Margry RJ, Beynen AC. Growth performance of weanling pigs fed spray-dried animal plasma: a review. *Livestock Production Science* 2001;68:263-74.

Weaver EM, Russell LE, Drew M. The effect of spray-dried animal plasma fractions on performance of newly weaned pigs. *J.Anim.Sci.* 1995;73:81 (abstr).

Weaver EM, Strohbehn RE, Yoder R, Bureson G. The immunomodulatory effects of plasma fractions in healthy mice. Unpublished 2001.

Wolf HM, Hauber I, Gulle H et al. Anti-inflammatory properties of human serum IgA: induction of IL-1 receptor antagonist and Fc aR (CD89)-mediated down-regulation of tumour necrosis factor-alpha (TNF-a) and IL-6 in human monocytes. *Clin.Exp.Immunol.* 1996;105:537-43.

Casadevall A, Scharff M. Return to the past: the case for antibody-based therapies in infectious diseases. *Clin. Infect. Dis.* 1995;21:150.

Copelan HA, Bechtel TP, Klein JP, et al. Controlled trial of orally administered immunoglobulin following bone marrow transplantation. *Marrow Transplantation* 1994;13:87-91.

Davidson GP, Daniels E, Numan H, Moore AG, Whyte PBD, Franklin K, McCloud PI, Moore DJ. Passive immunization of children with bovine colostrum containing antibodies to human rotavirus. *Lancet* 1989;2,709.

Hemmingson P, Hammarstrom L. Nasal administration of immunoglobulin as effective prophylaxis against infection in elite cross-country skiers. *Scand.J.Infect.Dis.* 1993;25:783.

Kanfer EJ, Abrahamson G, Taylor J, et al. Severe rotavirus-associated diarrhoea following bone marrow transplantation: treatment with oral immunoglobulin. *Bone Marrow Transplantation.* 1994;14:651-652.

Melamed I, Griffiths AM, Roifman CM. Benefit of oral immune globulin therapy in patients with immunodeficiency and chronic diarrhea. *J.Pediat.* 1991;119:486.

Pletten, A, Stoehr, A, Stellbrink, H-J, Albrech, H. & Meigel, W (1993) A preparation from bovine colostrum in the treatment of HIV-positive patients with chronic diarrhea. *Clin. Invest.* 71, 42.

Ungar, BLP, Ward, DJ, Fayer, R, & Quinn, CA (1990) Cessation of Cryptosporidium-associated diarrhea in an acquired immunodeficiency syndrome patient after treatment with hyperimmune bovine colostrum. *Gastroenterol.* 98, 486

Weiner, C, Q Pan M Hurtig, T Boren, E Bostwick, and L Hammarstrom (1999) Passive immunity against human pathogens using bovine antibodies. *Clin. Exp. Immunol.* 116: 193-205

Pierce, JL, Cromwell, GL, Lindemann, MD, Monegue, HJ, Weaver, EM and Russell, LE. 1996. Spray-dried bovine globulin for early weaned pigs. *J Animal Sci.* 74 (Suppl. 1): 258

Stein, HH. Easter, RA, Guan W, Chi, F, Weaver, EM and Russell, LE. 1996 Effect of dietary spray-dried plasma protein on postweaning pig growth performance – the optimal inclusion level and feed allowance. *J. Anim. Sci.* 74 (Supp. 1): 260

Zhang MF, Zola H, Read LC, Penttila IA. Immunoregulatory functions of breast milk and development of the infant intestinal mucosa immune response. *J.Nutr.Immunol.* 2001;5:1-15.
Wolf HM, Hauber I, Gulle H et al. Anti-inflammatory properties of human serum IgA: induction of IL-1 receptor antagonist and Fc aR (CD89)-mediated down-regulation of tumour necrosis factor-alpha (TNF-a) and IL-6 in human monocytes. *Clin.Exp.Immunol.* 1996;105:537-43.

Bacteria

Akita, E. M., Kitts, D. D., and Nakai, S. Protective Effects of Bovine Immunoglobulins Against *Vibrio Cholerae* Infection. 5-5-1998.
Ref Type: Internet Communication

Bier, M. Oral immunotherapy of bacterial overgrowth. 08/839618 (6096310). 8-1-2000. 4-15-1997.

Bolke E, Orth K, Jehle PM et al. Enteral application of an immunoglobulin-enriched colostrum milk preparation for reducing endotoxin translocation and acute phase response in patients undergoing coronary bypass surgery--a randomized placebo-controlled pilot trial. *Wien.Klin.Wochenschr.* 2002;114:923-8.

Brunser O, Espinoza J, Figueroa G et al. Field trial of an infant formula containing anti-rotavirus and anti-*Escherichia coli* milk antibodies from hyperimmunized cows. *J Pediatr.Gastroenterol.Nutr* 1992;15:63-72.

Carroll JA, Touchette KJ, Matteri RL, Dyer CJ, Allee GL. Effect of spray-dried plasma and lipopolysaccharide exposure on weaned pigs: II. Effects on the hypothalamic-pituitary-adrenal axis of weaned pigs. *J Anim.Sci.* 2002;80:502-9.

Cordle C, Schaller J, Winship T et al. Passive Immune Protection From Diarrhea Caused By Rotavirus Or *E Coli*: An Animal Model To Demonstrate And Quantitate Efficacy. In: Mestecky J, ed. *Immunology of Milk and the Neonate.* New York: Plenum Plus 1991:317-27.

Dickinson EC, Gorga JC, Garrett M et al. Immunoglobulin A supplementation abrogates bacterial translocation and preserves the architecture of the intestinal epithelium. *Surgery* 1998;124:284-90.

Dohler JR, Nebermann L. Bovine colostrum in oral treatment of enterogenic endotoxaemia in rats. *Crit Care* 2002;6:536-9.

Facon M, Skura BJ, Nakai S. Antibodies to a colonization factor of human enterotoxigenic *Escherichia coli* in cows' milk and colostrum. *Food Research International* 1995;28:387-91.

Freedman DJ, Tacket C, Delehanty A, Maneval DR, Nataro J, Crabb J. Milk Immunoglobulin with Specific Activity against Purified Colonization Factor Antigens Can Protect against Oral Challenge with Enterotoxigenic *Escherichia coli*. *The Journal of Infectious Diseases* 1998;177:662-7.

Hammarstrom V, Smith CI, Hammarstrom L. Oral immunoglobulin treatment in *Campylobacter jejuni* enteritis. *The Lancet* 1993;341:1036.

Hodgson JC, Barclay GR, Hay LA, Moon GM, Poxton IR. Prophylactic use of human endotoxin-core hyperimmune gammaglobulin to prevent endotoxaemia in colostrum-deprived, gnotobiotic lambs challenged orally with *Escherichia coli*. *FEMS Immunol.Med.Microbiol.* 1995;11:171-80.

Huppertz HI, Rutkowski S, Busch DH, Eisebit R, Lissner R, Karch H. Bovine colostrum ameliorates diarrhea in infection with diarrheagenic *Escherichia coli*, shiga toxin-producing *E. Coli*, and *E. coli* expressing intimin and hemolysin. *J Pediatr.Gastroenterol.Nutr* 1999;29:452-6.

Ismail T, Wasfy M, Oyofa B et al. Evaluation of Antibodies Reactive with *Campylobacter jejuni* in Egyptian Diarrhea Patients. *Clinical and Diagnostic Laboratory Immunology* 1997;4:536-9.

Korhonen H, Syvaaja EL, Ahola-Luttila H et al. Bactericidal effect of bovine normal and immune serum, colostrum and milk against *Helicobacter pylori*. *J Appl.Bacteriol.* 1995;78:655-662.

Lissner R, Schmidt H, Karch H. A Standard Immunoglobulin Preparation Produced from Bovine Colostra Shows Antibody Reactivity and Neutralization Activity against Shiga-like Toxins and EHEC-Hemolysin of *Escherichia coli* 0157:H7. *Infection* 1996;24:378-83.

McClead R, Gregory S. Resistance of Bovine Colostral Anti-Cholera Toxin Antibody to In Vitro and In Vivo Proteolysis. *Infection And Immunity* 1984;44:474-8.

Mietens C, Keinhorst H. Treatment of Infantile *E.coli* Gastroenteritis with Specific Bovine anti-*E.coli* Milk Immunoglobulins. *Eur.J.Pediatr.* 1979;132:239-52.

Miyazawa H, Bannai H, Yanase T et al. A reverse-sandwich enzyme-linked immunosorbent assay for verocytotoxin 1 and 2 antibodies in human and bovine sera. *Clin Diagn.Lab.Immunol.* 1999;6:701-4.

Novitsky T, Roslansky P. Quantification of Endotoxin Inhibition in Serum and Plasma Using A Turbidimetric LAL Assay. *Bacterial Endotoxins: Structure, Biomedical Significance, and Detection With the Limulus Amebocyte Lysate Test* 1985;181-93 (abstr).

Rainard P. Bacteriostasis of *Escherichia coli* by bovine lactoferrin, transferrin and immunoglobulins (IgG1, IgG2, IgM) acting alone or in combination. *Vet.Microbiol.* 1986;11:103-15.

Reiter B, Brock JH, Steel ED. Inhibition of Escherichia coli by bovine colostrum and post-colostral milk. II. The bacteriostatic effect of lactoferrin on a serum susceptible and serum resistant strain of E. coli. Immunology 1975;28:83-95.

Rivier D, Sobotka J. Protective Effect of Rabbit Immune Serum Administered Orally to Rats Infected by a Human Pathogenic Strain of E.coli. Expl.Cell Biol. 1978;46:277-88.

Schedel I, Dreikhausen U, Nentwig B et al. Treatment of Gram-negative septic shock with an immunoglobulin preparation: A prospective, randomized clinical trial. Critical Care Medicine 1991;19:1104-13.

Steel ED. Adsorption in vitro to Escherichia coli of antibodies and other proteins in bovine serum and colostrum and its effects on the production of E. coli agglutinins. Immunology 1975;29:3138.

Sugii S, Akiyama K, Hirota Y. Serum concentration of a bovine mannan-binding protein reactive with a Ra chemotype strain of Salmonella typhimurium: no significant changes associated with mastitis. J Vet.Med.Sci 1994;56:765-6.

Tacket C, Losonsky G, Link H et al. Protection by milk immunoglobulin concentrate against challenge with enterotoxigenic Escherichia coli. The New England Journal of Medicine 1988;318:1240-3.

Tacket CO, Losonsky G, Livio S, Edelman R, Crabb J, Freedman D. Lack of prophylactic efficacy of an enteric-coated bovine hyperimmune milk product against enterotoxigenic Escherichia coli challenge administered during a standard meal. J Infect.Dis. 1999;180:2056-9.

Tacket C, Binion S, Bostwick E, Losonsky G, Roy M, Edelman R. Efficacy of Bovine Milk Immunoglobulin Concentrate in Preventing Illness after Shigella Flexneri Challenge. Am.J.Trp.Med.Hyg. 1992;47:276-8.

Tomita GM, Todhunter DA, Hogan JS, Smith KL'. Antigenic crossreactivity and lipopolysaccharide neutralization properties of bovine immunoglobulin G. J Dairy Sci 1995;78:2745-52.

Touchette KJ, Carroll JA, Allee GL et al. Effect of spray-dried plasma and lipopolysaccharide exposure on weaned pigs: I. Effects on the immune axis of weaned pigs. J Anim.Sci 2002;80:494-501.

Trebichavsky I, Dlabac V, Rehakova Z. Effect of peroral anti-bacterial antiserum treatment on intestinal immune parameters of germ-free piglets intragastrically infected with virulent salmonella typhimurium or enteropathogenic E. coli. Veterinary Immunology and Immunopathology 1999;67:55-65.

Tsubokura K, Berndtson E, Bogstedt A et al. Oral administration of antibodies as prophylaxis and therapy in Campylobacter jejuni-infected chickens. Clin Exp.Immunol. 1997;108:451-5.

Warny M, Denie C, Delmee M, Lefebvre C. Gamma Globulin Administration in Relapsing Clostridium Difficile-Induced Pseudomembranous Colitis with a Defective Antibody Response to Toxin A. Acta Clinica Belgica 1995;50:36-9.

Warny M, Fatimi A, Bostwick EF et al. Bovine immunoglobulin concentrate-clostridium difficile retains C difficile toxin neutralizing activity after passage through the human stomach and small intestine. Gut 1999;44:212-7.

Zhang G-H, Baek L, Bertelsen T, Koch C. Quantification of the endotoxin-neutralizing capacity of serum and plasma. *APMIS* 1995;103:721-30.

Zinkernagel RM, Colombini A. Passive oral immunization with bovine immunoglobulins: Enteropathogenic *Escherichia coli* from infants and bovine Anti-*E.coli* lactoserum Assayed in the rabbit heal loop model. *Med.Microbiol.Immunol.* 1975;162:1-7.

Viral

Prevention of Rotavirus Infection by Cow Colostrum Containing Antibody Against Human Rotavirus. *The Lancet* 1983;October:1029-30.

Oral Immunoglobulins Speed Recovery from Acute Rotaviral Gastroenteritis. 1994.
Ref Type: Internet Communication

Acres SD, Babiuk LA. Studies on Rotaviral Antibody in Bovine Serum and Lacteal Secretions, Using Radioimmunoassay. *JAVMA* 1978;173:555-9.

Arthington JD, Jaynes CA, Tyler HD, Kapil S, Quigley JD, III. The use of bovine serum protein as an oral support therapy following coronavirus challenge in calves. *J Dairy Sci* 2002;85:1249-54.

Baron S, Singh I, Chopra A, Coppenhaver D, Pan J. Innate antiviral defenses in body fluids and tissues. *Antiviral Res.*2000.Nov.;48.(2.):71.-89.48:71-89.

Besser TE, Gay CC, McGuire TC, Evermann JF. Passive immunity to bovine rotavirus infection associated with transfer of serum antibody into the intestinal lumen. *J Virol.* 1988;62:2238-42.

Brunser O, Espinoza J, Figueroa G et al. Field trial of an infant formula containing anti-rotavirus and anti-*Escherichia coli* milk antibodies from hyperimmunized cows. *J Pediatr.Gastroenterol.Nutr* 1992;15:63-72.

Brussow H, Hilpert H, Walther I, Sidoti J, Mietens C, Bachmann P. Bovine milk immunoglobulins for passive immunity to infantile rotavirus gastroenteritis. *J Clin Microbiol.* 1987;25:982-6.

Coulson BS. Longitudinal Studies of Neutralizing Antibody Responses to Rotavirus in Stools and Sera of Children following Severe Rotavirus Gastroenteritis. *Clinical and Diagnostic Laboratory Immunology* 1998;5:897-901.

Ebina T, Ohta M, Kanamaru Y, Yamamoto-Osumi Y, Baba K. Passive Immunizations of Suckling Mice and Infants With Bovine Colostrum Containing Antibodies to Human Rotavirus. *Journal of Medical Virology* 1992;38:117-23.

Ebina T, Sato A, Umezu K et al. Prevention of rotavirus infection by oral administration of cow colostrum containing antihumanrotavirus antibody. *Med.Microbiol.Immunol.* 1985;174:177-85.

Harrell R, Moon H, Weaver EM, Campbell J, Arthington J, Odle J. Effects of animal plasma proteins on intestinal recovery of neonatal pigs infected with rotavirus. FASEB Journal 2000;14:504.5.

Guarino A, Guandalini S, Albano F, Mascia A, De Ritis G, Rubino A. Enteral immunoglobulins for treatment of protracted rotaviral diarrhea. *Pediatr.Infect.Dis.J.* 1991;10:612-4.

Guarino A, Berni Canani R, Russo S et al. Oral Immunoglobulins for Treatment of Acute Rotaviral Gastroenteritis. *Pediatrics* 1994;93:12-6.

Hilpert H, Brussow H, Mietens C, Sidoti J, Lerner L, Werchau H. Use of bovine milk concentrate containing antibody to rotavirus to treat rotavirus gastroenteritis in infants. *J Infect.Dis.* 1987;156:158-66.

Hodgins DC, Kang SY, DeArriba L et al. Effects of maternal antibodies on protection and development of antibody responses to human rotavirus in gnotobiotic pigs. *J Virol.* 1999;73:186-97.

Kanfer EJ, Abrahamson G, Taylor J, Coleman JC, Samson DM. Severe rotavirus-associated diarrhoea following bone marrow transplantation: treatment with oral immunoglobulin. *Bone Marrow Transplantation* 1994;14:651-2.

Losonsky G, Johnson J, Winkelstein J, Yolken R. Oral Administration of Human Serum Immunoglobulin in Immunodeficient Patients with Viral Gastroenteritis. *J.Clin.Invest.* 1985;76:2362-7.

Singh IP, Copenhaver DH, Chopra AK, Baron S. Innate gastrointestinal immunity: characterization of broadly active viral inhibitors. *Antiviral Res.*2001.Mar.;49.(3.):157-67.

Singh IP, Copenhaver DH, Chopra AK, Baron S. Further characterization of a broad-spectrum antiviral substance in human serum. *Viral.Immunol.* 1992;5:293-303.

Offit PA, Clark HF. Protection Against Rotavirus-Induced Gastroenteritis in a Murine Model by passively Acquired Gastrointestinal But Not Circulating Antibodies. *Journal of Virology* 1985;54:58-64.

Pacyna J, Siwek K, Terry SJ, Robertson ES, Johnson RB, Davidson GP. Survival of rotavirus antibody activity derived from bovine colostrum after passage through the human gastrointestinal tract. *J Pediatr.Gastroenterol.Nutr* 2001.Feb.;32.(2.):162.-7.

Parreno V, Hodgins DC, de Arriba L et al. Serum and intestinal isotype antibody responses to Wa human rotavirus in gnotobiotic pigs are modulated by maternal antibodies. *J Gen.Virol.* 1999;80:1417-28.

Petschow B, Talbott R. Reduction in Virus-Neutralizing Activity of a Bovine Colostrum Immunoglobulin Concentrate by Gastric Acid and Digestive Enzymes. *Journal of Pediatric Gastroenterology and Nutrition* 1994;19:228-35.

Rump JA, Arndt R, Arnold A et al. Treatment of diarrhea in human immunodeficiency virus-infected patients with immunoglobulins from bovine colostrum. *Clin.Investig.* 1992;70:588-94.

Saif LJ, Smith KL'. Enteric viral infections of calves and passive immunity. J Dairy.Sci 1985;68:206-28.

Sarker SA, Casswall TH, Mahalanabis D et al. Successful treatment of rotavirus diarrhea in children with immunoglobulin from immunized bovine colostrum. Pediatr.Infect.Dis.J 1998;17:1149-54.

Schaller JP, Saif LJ, Cordle CT, Candler E, Winship TR, Prevention of human rotavirus-induced diarrhea in gnotobiotic piglets using bovine antibody. J Infect.Dis. 1992;165:623-30.

Turner R, Kelsey D. Passive immunization for prevention of rotavirus illness in healthy infants. Pediatr.Infect.Dis.J 1993;12:718-22.

Barnes GL, Hewson PH, McLellan JA, Doyle LW, Knoche AML, Kitchen WH, Bishop RE. A randomized trial of oral gammaglobulin in low-birth weight infants infected with rotavirus. Lancet 1982: 1371.

Davidson GP, Daniels E, Numan H, Moore AG, Whyte PBD, Franklin K, McCloud PI, Moore DJ. Passive immunization of children with bovine colostrum containing antibodies to human rotavirus. Lancet 1989;2,709

Fruchtman MH, Mauceri AA, Wigley FM, Waldman RH. Aerosol administration of human gamma globulin as prophylaxis against influenza virus challenge. Clin.Med. 1972;79:17.

Kanfer EJ, Abrahamson G, Taylor J, et al. Severe rotavirus-associated diarrhoea following bone marrow transplantation: treatment with oral immunoglobulin. Bone Marrow Transplantation. 1994;14:651-652.

Yolken RH, Losonsky GA, Vonderfecht S, Leister F, Wee SB. Antibody to human rotavirus in cow's milk. N.Engl.J Med. 1985;312:605-10.

Protozoa

Andrews JS, Hewlett EL. Protection against infection with *Giardia muris* by milk containing antibody to *Giardia*. *The Journal of Infectious Diseases* 1981;143:242-6.

Arrowood MJ, Mead JR, Mahrt JL, Sterling C. Effects of Immune Colostrum and Orally Administered Antisporozoite Monoclonal Antibodies on the Outcome of *Cryptosporidium parvum* Infections in Neonatal Mice. *Infection And Immunity* 1989;57:2283-8.

Borowitz SM, Saulsbury FT. Treatment of chronic cryptosporidial infection with orally administered human serum immune globulin. *Journal of Pediatrics* 1991;119:593-5.

Greenberg PD, Cello JP. Treatment of severe diarrhea caused by *Cryptosporidium parvum* with oral bovine immunoglobulin concentrate in patients with AIDS. *J Acquir.Immune.Defic.Syndr.Hum.Retrovirol.* 1996;13:348-54.

Harp JA, Woodmansee DB, Moon HW. Effects of colostrum antibody on susceptibility of calves to *Cryptosporidium parvum* infection. *Am.J.Vet.Res.* 1989;50:2117

Nord J, Pearl M, DiJohn D, Tzipori S, Tacket CO. Treatment with bovine hyperimmune colostrum of cryptosporidial diarrhea in AIDS patients. *AIDS* 1990;4:581.

Perryman LE, Riggs MW, Mason PH, Fayer R. Kinetics of *Cryptosporidium parvum* sporozoite neutralization by monoclonal antibodies, immune bovine serum, and immune bovine colostrum. *Infect.Immun.* 1990;58:257.

Tzipori, S, Robertson, D & Chapman C (1986) Remission of diarrhea due to cryptosporidiosis in an immunodeficient child treated with hyperimmune bovine colostrum. *Br. Med. J.* 293, 1276

Tziporit, S, Robertson, D, Cooper, DA & White, L (1987) Chronic cryptosporidial diarrhoeas and hyperimmune cow colostrum. *Lancet* 2, 344

Ungar, BLP, Ward, DJ, Fayer, R, & Quinn, CA (1990) Cessation of *Cryptosporidium*-associated diarrhea in an acquired immunodeficiency syndrome patient after treatment with hyperimmune bovine colostrum. *Gastroenterol.* 98, 486

Hunt E, Fu Q, Armstrong MU et al. Oral bovine serum concentrate improves cryptosporidial enteritis in calves. *Pediatr.Res.* 2002;51:370-6.

Kuhls TL, Orlicek SL, Mosier DA, Crawford DL, Abrams VL, Greenfield RA. Enteral human serum immunoglobulin treatment of cryptosporidiosis in mice with severe combined immunodeficiency. *Infect.Immun.* 1995;63:3582-6.

Okhuysen PC, Chappell CL, Crabb J, Valdez LM, Douglass ET, DuPont HL. Prophylactic effect of bovine anti-*Cryptosporidium* hyperimmune colostrum immunoglobulin in healthy volunteers challenged with *Cryptosporidium parvum*. *Clin Infect.Dis.* 1998;26:1324-9.

Shield J, Melville C, Novelli V et al. Bovine colostrum immunoglobulin concentrate for cryptosporidiosis in AIDS. *Arch.Dis.Child.* 1993;69:451-3.

Fungal

Tollema J, Gross N, Dolgiras N, Jarstrand C, Ringden O, Hammarstrom L. Fungal prophylaxis by reduction of fungal colonization by oral administration of bovine anti-Candida antibodies in bone marrow transplant recipients. *Bone Marrow Transplant.* 1999;23:283-90.

Sports Nutrition

Nehlsen-Cannarella SL, Nieman DC, Fagoaga OR et al. Saliva immunoglobulins in elite women rowers. *Eur J Appl.Physiol.*2000.Feb.;81.(3.):222.-8.

Mero A, Miikkulainen H, Riski J, Pakkanen R, Aalto J, Takala T. Effects of bovine colostrum supplementation on serum IGF-I, IgG, hormone, and saliva IgA during training. *J Appl.Physiol.* 1997;83:1144-51.

Mero A, Kahkonen J, Nykanen T et al. IGF-I, IgA, and IgG responses to bovine colostrum supplementation during training. *J.Appl.Physiol* 2002;93:732-9.

Jiang R, Chang X, Stoll B et al. Dietary plasma protein is used more efficiently than extruded soy protein for lean tissue growth in early-weaned pigs. *J.Nutr.* 2000;130:2016-9.

Kats LJ, Nelssen JL, Tokach MD, Goodband RD, Hansen JA, Laurin JL. The effect of spray-dried porcine plasma on growth performance in the early-weaned pig. *J Anim.Sci* 1994;72:2075-81.

Hofman Z, Smeets R, Verlaan G, Lugt R, Verstappen PA. The effect of bovine colostrum supplementation on exercise performance in elite field hockey players. *Int.J.Sport Nutr.Exerc.Metab* 2002;12:461-9.

Antonio J, Sanders MS, Van Gammeren D. The effects of bovine colostrum supplementation on body composition and exercise performance in active men and women(1). *Nutrition* 2001.Mar.;17.(3.):243.-7.

Brinkworth GD, Buckley JD, Bourdon PC, Gulbin JP, David A. Oral bovine colostrum supplementation enhances buffer capacity but not rowing performance in elite female rowers. *Int.J.Sport Nutr.Exerc.Metab* 2002;12:349-65.

Buckley JD, Abbott MJ, Brinkworth GD, Whyte PB. Bovine colostrum supplementation during endurance running training improves recovery, but not performance. *J.Sci.Med.Sport* 2002;5:65-79.

Coombes JS, Conacher M, Austen SK, Marshall PA. Dose effects of oral bovine colostrum on physical work capacity in cyclists. *Med.Sci.Sports Exerc.* 2002;34:1184-8.

Jiang R, Chang X, Stoll, B, Ellis R, Shypailo, J, Weaver, E, Campbell J, Burrin, D. 2000. Including Plasma Protein in the Diet Increases Lean Tissue Growth in Infant Pigs. *JPGEN (Abstract)*

Hemmingson P, Hammarstrom L. Nasal administration of immunoglobulin as effective prophylaxis against infection in elite cross-country skiers. *Scand.J.Infect.Dis.* 1993;25:783.

Stability/Functionality

Kelly CP, Chetham S, Keates S, Bostwick EF, Roush AM, Castagliuolo I, LaMont JT, Pothoulakis C. Survival of Anti-Clostridium difficile Bovine Immunoglobulin Concentrate in Human Gastrointestinal Tract. *Antimicrobial Agents and Chemotherapy*. 1997;Feb:236-241.

Janson A, Nava S, Brussow H, Mahalanabis D, Hammarstrom L. Titers of Specific Antibodies in Immunized and Non-Immunized Cow Colostrum; Implications for their use in the Treatment of Patients with Gastro-Intestinal Infections. *Indigenous Antimicrobial Agents of Milk-Recent Developements*. 1998:221-8.

Lissner R, Thurmann PA, Merz G, Karch H. Antibody reactivity and fecal recovery of bovine immunoglobulins following oral administration of a colostrum concentrate from cows (Lactobin) to healthy volunteers. *Int.J Clin Pharmacol.Ther*. 1998;36:239-45.

McClead R, Gregory S. Resistance of Bovine Colostral Anti-Cholera Toxin Antibody to In Vitro and In Vivo Proteolysis. *Infection And Immunity* 1984;44:474-8.

Pacyna J, Siwek K, Terry SJ, Robertson ES, Johnson RB, Davidson GP. Survival of rotavirus antibody activity derived from bovine colostrum after passage through the human gastrointestinal tract. *J Pediatr.Gastroenterol.Nutr* 2001.Feb.;32.(2.):162.-7.

Petschow B, Talbott R. Reduction in Virus-Neutralizing Activity of a Bovine Colostrum Immunoglobulin Concentrate by Gastric Acid and Digestive Enzymes. *Journal of Pediatric Gastroenterology and Nutrition* 1994;19:228-35.

Roos N, Mahe S, Benamouzig R, Sick H, Rautureau J, Tome D. 15N-labeled immunoglobulins from bovine colostrum are partially resistant to digestion in human intestine. *J Nutr* 1995;125:1238-44.

Warny M, Fatimi A, Bostwick EF et al. Bovine immunoglobulin concentrate-clostridium difficile retains C difficile toxin neutralizing activity after passage through the human stomach and small intestine. *Gut* 1999;44:212-7.

Zinkernagel RM, Hilpert H, Gerber H. The Digestion of Colostral Bovine Immunoglobulins in Infants. *Pharmacology* 1998;741.

Blum PM, Phelps DL, Ank BJ, Krantman HJ, Stieim ER. Survival of Oral Human Immune Serum Globulin in the Gastrointestinal Tract of Low Birth Weight Infants. *Pediatric Research* 1981;15:1256-60.

Bogstedt AK, Nord CE, Hammarstrom L. Lack of effect of orally administered human serum immunoglobulin on the normal human oral and intestinal microflora. *Eur J Clin Microbiol.Infect.Dis*. 1995;14:61-4.

Bogstedt AK, Hammarstrom L, Robertson AK. Survival of immunoglobulins from different species through the gastrointestinal tract in healthy adult volunteers: implications for human therapy. *Antimicrob.Agents Chemother*. 1997;41:2320.

Gastrointestinal

Casswall TH, Hammarstrom L, Veress B et al. Oral IgA-IgG treatment of chronic non-specific diarrhoea in infants and children. *Acta Paediatr* 1996;85:1126-8.

Cordle CT, Schaller JP. Method and product for the treatment of gastric disease. European Patent Application 91111558.2.

Eibl M, Wolf HM, Furnkranz H, Rosenkranz A. Prevention of necrotizing enterocolitis in low birth weight infants by IgA-IgG feeding. *N.Eng.J.Med.* 1988;319:1.

McCracken BA, Spurlock ME, Roos MA, Zuckermann FA, Gaskins HR. Weaning anorexia may contribute to local inflammation in the piglet small intestine. *J. Nutrition* 1999;129(3):613-619.

Melamed I, Griffiths AM, Roifman CM. Benefit of oral immune globulin therapy in patients with immunodeficiency and chronic diarrhea. *J.Pediatr.* 1991;119:486.

Murakami T, Hirano N, Inoue A, Tsuchiya K, Kitose KL, Ono K, Yanagihara T. Prevention of calf diarrhea with an immunoglobulin diet in beef herd. *Jpn.J.Vet.Sci.* 1986;48:879.

Pletten, A, Stoehr, A, Stellbrink, H-J, Albrech, H. & Meigel, W (1993) A preparation from bovine colostrum in the treatment of HIV-positive patients with chronic diarrhea. *Clin. Invest.* 71, 42

Bier, M. Oral immunotherapy of bacterial overgrowth. Patent #6096310. 8-1-2000. 4-15-1997. Ref Type: Patent

Bogstedt AK, Nord CE, Hammarstrom L. Lack of effect of orally administered human serum immunoglobulin on the normal human oral and intestinal microflora. *Eur J Clin Microbiol.Infect.Dis.* 1995;14:61-4.

Bogstedt AK, Johansen K, Hatta H et al. Passive immunity against diarrhoea. *Acta Paediatr.* 1996;85:125-8.

Bolke E, Jehle PM, Hausmann F et al. Preoperative oral application of immunoglobulin-enriched colostrum milk and mediator response during abdominal surgery. *Shock* 2002.Jan.;17.(1.):9.-12.17:9-12.

Brandtzaeg P, Bjerke K, Kett K et al. Production and secretion of immunoglobulins in the gastrointestinal tract. *Ann.Allergy* 1987;59:21-39.

Brown WR. Relationships between immunoglobulins and the intestinal epithelium. *Gastroenterology* 1978;75:129-38.

Caldarini dBM, Schiffrin EJ, Ogawa dF et al. Prevention of carrageenan-induced ulcerative colitis in the guinea pig by serum of bovine colostrum. *Medicina.(B.Aires.)* 1987;47:273-7.

Dattani S, Connelly J. Oral Immunoglobulins for Gastroenteritis. *The Annals of Pharmacotherapy* 1996;30:1323-4.

Dickinson EC, Gorga JC, Garrett M et al. Immunoglobulin A supplementation abrogates bacterial translocation and preserves the architecture of the intestinal epithelium. *Surgery* 1998;124:284-90.

Diebel LN, Liberati DM, Dulchavsky SA, Diglio CA, Brown WJ. Synergistic effect of hyperoxia and immunoglobulin A on mucosal barrier defense. *J Trauma.* 1999;46:374-8.

Greenberg PD, Cello JP. Treatment of severe diarrhea caused by *Cryptosporidium parvum* with oral bovine immunoglobulin concentrate in patients with AIDS. *J Acquir.Immune.Defic.Syndr.Hum.Retrovirol.* 1996;13:348-54.

Guarino A, Guandalini S, Albano F, Mascia A, De Ritis G, Rubino A. Enteral immunoglobulins for treatment of protracted rotaviral diarrhea. *Pediatr.Infect.Dis.J.* 1991;10:612-4.

Guarino A, Berni Canani R, Russo S et al. Oral Immunoglobulins for Treatment of Acute Rotaviral Gastroenteritis. *Pediatrics* 1994;93:12-6.

Harrell R, Moon H, Weaver EM, Campbell J, Arthington J, Odle J. Effects of animal plasma proteins on intestinal recovery of neonatal pigs infected with rotavirus. *FASEB Journal* 2000;14:504.5.

Hilpert H, Brussow H, Mietens C, Sidoti J, Lerner L, Werchau H. Use of bovine milk concentrate containing antibody to rotavirus to treat rotavirus gastroenteritis in infants. *J Infect.Dis.* 1987;156:158-66.

Huppertz HI, Rutkowski S, Busch DH, Eisebit R, Lissner R, Karch H. Bovine colostrum ameliorates diarrhea in infection with diarrheagenic *Escherichia coli*, shiga toxin-producing *E. coli*, and *E. coli* expressing intimin and hemolysin. *J Pediatr.Gastroenterol.Nutr* 1999;29:452-6.

Ismail T, Wasfy M, Oyfo B et al. Evaluation of Antibodies Reactive with *Campylobacter jejuni* in Egyptian Diarrhea Patients. *Clinical and Diagnostic Laboratory Immunology* 1997;4:536-9.

Janson A, Nava S, Brussow H, Mahalanabis D, Hammarstrom L. Titers of Specific Antibodies in Immunized and Non-Immunized Cow Colostrum; Implications for their use in the Treatment of Patients with Gastro-Intestinal Infections. *Indigenous Antimicrobial Agents of Milk-Recent Developments.* 1998:221-8.

Jiang R, Chang X, Stoll B et al. Dietary plasma protein reduces small intestinal growth and lamina propria cell density in early weaned pigs. *J.Nutr.* 2000;130:21-6.

Johansson JE, Ekman T. Gut mucosa barrier preservation by orally administered IgA-IgG to patients undergoing bone marrow transplantation: a randomised pilot study. *Bone Marrow Transplant.* 1999;24:35-9.

Khan Z, Macdonald C, Wicks AC et al. Use of the 'nutriceutical', bovine colostrum, for the treatment of distal colitis: results from an initial study. *Aliment.Pharmacol.Ther.* 2002;16:1917-22.

Lodinova-Zadnikova R, Korych B, Bartakova Z. Treatment of gastrointestinal infections in infants by oral administration of colostrum antibodies. *Die Nahrung* 1987;31:465-7.

Losonsky G, Johnson J, Winkelstein J, Yolken R. Oral Administration of Human Serum Immunoglobulin in Immunodeficient Patients with Viral Gastroenteritis. *J.Clin.Invest.* 1985;76:2362-7.

Mietens C, Keinhorst H. Treatment of Infantile *E.coli* Gastroenteritis with Specific Bovine anti-*E.coli* Milk Immunoglobulins. *Eur.J.Pediatr.* 1979;132:239-52.

Offit PA, Clark HF. Protection Against Rotavirus-Induced Gastroenteritis in a Murine Model by passively Acquired Gastrointestinal But Not Circulating Antibodies. *Journal of Virology* 1985;54:58-64.

Ojuawo A, St Louis D, Lindley KJ, Milla PJ. Non-infective colitis in infancy: evidence in favour of minor immunodeficiency in its pathogenesis. *Arch.Dis.Child* 1997;76:345-8.

Playford RJ, Floyd DN, Macdonald CE et al. Bovine colostrum is a health food supplement which prevents NSAID induced gut damage. *Gut* 1999;44:653-8.

Prigent-Delecourt L, Coffin B, Colombel JF, Dehennin JP, Vaerman JP, Rambaud JC. Secretion of immunoglobulins and plasma proteins from the colonic mucosa: an in vivo study in man. *Clin Exp.Immunol.* 1995;99:221-5.

Quan CP, Ruffet E, Arihiro K, Pires R, Bouvet JP. High affinity serum-derived Fab fragments as another source of antibodies in the gut lumen of both neonates and adults. *Scand.J Immunol.* 1996;44:108-14.

Rump JA, Arndt R, Arnold A et al. Treatment of diarrhea in human immunodeficiency virus-infected patients with immunoglobulins from bovine colostrum. *Clin.Investig.* 1992;70:588-94.

Schaller JP, Saif LJ, Cordle CT, Candler E, Winship TR. Prevention of human rotavirus-induced diarrhea in gnotobiotic piglets using bovine antibody. *J Infect.Dis.* 1992;165:623-30.

Singh IP, Coppenhaver DH, Chopra AK, Baron S. Innate gastrointestinal immunity: characterization of broadly active viral inhibitors. *Antiviral Res.* 2001.Mar.;49.(3.):157.-67.

Spitz JC, Ghandi S, Taveras M, Aoys E, Alverdy JC. Characteristics of the intestinal epithelial barrier during dietary manipulation and glucocorticoid stress. *Crit Care Med.* 1996;24:635-41.

Tjellstrom B, Stenhammar L, Magnusson KE, Sundqvist T. Oral Immunoglobulin treatment in Crohn's disease. *Acta Paediatr* 1997;86:221-3.

Warny M, Denie C, Delmee M, Lefebvre C. Gamma Globulin Administration in Relapsing Clostridium Difficile-Induced Pseudomembranous Colitis with a Defective Antibody Response to Toxin A. *Acta Clinica Belgica* 1995;50:36-9.

Wolf HM, Eibl MM. The anti-inflammatory effect of an oral immunoglobulin (IgA-IgG) preparation and its possible relevance for the prevention of necrotizing enterocolitis. *Acta Paediatr Suppl* 1994;396:37-40.