

## The American Journal Of Natural Medicine

March 1998/Vol.5, No.2

pp.19-23

### Clinical Applications: Bovine Colostrum As Immune System Modulator

by Zoltan Rona, M.D.

In the past two years, healthcare practitioners have been hearing a great deal about bovine colostrum, a relatively new food supplement intended to optimize the immune systems of both healthy and chronically ill individuals. Testimonials, anecdotal reports, as well as the marketing efforts of several supplement manufacturers and distributors have generated much of the excitement about colostrum.

The past 20 years has also witnessed the publication of over 2,000 research papers that strongly support both colostrum and its numerous components. The purpose of this paper is to review the scientific evidence for the clinical application of a promising immune system modulator.

In *Colostrum, Life's First Food*, Dr. Daniel G. Clark's basic message, as printed on the back cover of his book, is that bovine colostrum "rebuilds the immune system, destroys viruses, bacteria," " , and fungi, accelerates healing of all body tissue, helps lose weight, burn fat, increase bone and lean muscle mass, and slows down and even reverses aging," According to Clark and well-known naturopathic physician Dr. Bernard Jensen", colostrum plays a therapeutic role in AIDS, cancer, heart disease, diabetes, autoimmune diseases, allergies, herpes", bacterial", viral, and parasitic' infections, gingivitis, colds, the flu, and much more. Colostrum has antioxidant and anti-inflammatory properties, and provides many vitamins, minerals, enzymes, and amino acids.

### Colostrum Rediscovered

Historically, Ayurvedic physicians in India have used bovine colostrum therapeutically for thousands of years. In the United States and throughout the world, conventional doctors used it for antibiotic purposes prior to the introduction of sulfa drugs and penicillin. In the early 1950s, colostrum was prescribed extensively for the treatment of rheumatoid arthritis. In 1950, Dr. Albert Sabin, the polio vaccine developer, discovered that colostrum contained antibodies against polio and recommended it for children susceptible to catching polio.

### What Is Colostrum?

Colostrum is the mammary secretion a mammal provides its newborn within the first 24 to 48 hours. It contains numerous immune system and growth factors as well as essential nutrients, trypsin, and protease inhibitors that protect it from destruction in the gastrointestinal (GI) tract. It is estimated that colostrum triggers at least 50 processes in the newborn.

Bovine colostrum is biologically transferable to all mammals, including man. It is much higher in immune factors than human mother's colostrum. Laboratory analyses of immune and growth factors from bovine colostrum are identical to those found in human colostrum, except that the levels of these factors are significantly higher in the bovine version. For example, human colostrum contains 2% of IgG (the most important of the immuno-globulins found in the body), while bovine colostrum contains 86% of IgG.

In addition, bovine colostrum contains a blocking hormone to prevent the calf from becoming sensitized to its own mother's immune factors. Studies indicate that all species, including man, benefit from the immune-boosting properties of bovine colostrum, with no reports of allergic or anaphylactic reactions to date.

This compound is in a very limited supply because colostrum is only available for a day or two after calving. The needs of the newborn calf must be met first, and only high-quality colostrum is taken from cows that have been certified free of antibiotics, pesticides, and synthetic hormones. colostrum must be processed at low temperatures so the immune and growth factors

remain biologically viable.

### Major Colostrum Components

The most important components of colostrum can basically be broken down into two major categories: immune system factors and growth factors. Drug manufacturers have tried to copy (genetically engineer) and market several of the individual components of colostrum, most notably interferon, gamma globulin, growth hormone, IgF-1, and protease inhibitors. Biotechnology companies are currently selling IgF-1 for as much as \$800 per 50 cc vial. Some of the following colostrum components may very well be next on the list of "major breakthroughs" by the pharmaceutical/nutraceutical industry:

Immunoglobulins (A, D, E, G, and M) are the most abundant of the immune factors found in colostrum. IgG neutralizes toxins and microbes in the lymph and circulatory system. IgM destroys bacteria, while IgE and IgD are highly antiviral.

Lactoferrin is an antiviral, antibacterial, anti-inflammatory, iron-binding protein with therapeutic effects in cancer, HIV, cytomegalo-virus, herpes, chronic fatigue syndrome, Candida albicans; and other infections. Lactoferrin helps deprive bacteria of the iron they require to reproduce, and it also releases iron into the red blood cells, enhancing oxygenation of tissues. Lactoferrin modulates cytokine release, and its receptors have been found on most immune cells, including lymphocytes, monocytes, macrophages, and platelets.

Proline-rich polypeptide (PRP) is a hormone that regulates the thymus gland, stimulating an under active immune system. It also helps down-regulate an overactive immune system, as seen in autoimmune diseases such as multiple sclerosis (MS), rheumatoid arthritis, lupus, scleroderma, chronic fatigue syndrome, and allergies.

Growth Factors include epithelial growth factor (EgF), insulin-like growth factor-I and II (IGF-1 and IGF-II), fibroblast growth factor (FgF), platelet-derived growth factor (PDGF), transforming growth factors A & B (TgA and B), and growth hormones (GH).

These all help stimulate cell and tissue growth by stimulating DNA formation." Genetically engineered versions of IGF-1 and GH are now marketed as anti-aging and AIDS drugs. They are found naturally and in high concentrations in colostrum. Several studies show that these growth factors are capable of increasing T-cell production, accelerating healing, balancing blood glucose levels, reducing insulin need, increasing muscle and bone growth and repair, and metabolizing fat for fuel.

A. 1990 study in The New England Journal of Medicine concluded that GH treatment prevented some of the signs of aging. In his study, Dr. Daniel Rudman treated 26 men between the ages of 61 and 80 with GH. Patients experienced a decrease in overall body fat (up to 14%) and an increase in bone density and lean muscle mass. In addition, their skin was thicker and more elastic. Rudman said the changes were equivalent to those incurred over a 10- to 20-year period of aging. However, Rudman administered GH via injection. There's no evidence that ingesting it through the GI tract would offer similar benefits.

### Clinical Applications

For symptomatic adults, clinicians usually prescribe 1,000 to 2,000 mg twice daily of the dried, encapsulated form of colostrum, best taken on an empty stomach with eight to 12 ounces of water. Preventive doses have not been established, but several authors recommend continuous dosing at levels the consumer/patient has decided upon. For those who show no clinical response to colostrum, the dosage can safely be doubled or even tripled as needed until the desired results are obtained. Children can also take colostrum, but require proportionately less. Herxheimer reactions (mainly flu-like symptoms) can occur in up to 40% of the cases, but are usually mild and disappear with continued supplementation at the same dosage level.

Through hundreds of years of use and over 1,000 clinical studies, colostrum has been demonstrated to be completely safe, without drug interactions or side effects at any level of ingestion. The following clinical conditions have been well-documented to respond favorably to colostrum supplementation:

### **Viral Illnesses**

The GI component of the immune system produces about 75% of the antibodies in the human system. The ability of AIDS/HIV patients to fight infectious disease is severely compromised, partially due to damage to the gut from chronic inflammation and diarrhea. Several recent studies report colostrum's role in the reversal of this chronic problem, stemming from opportunistic infections like *Candida albicans*, cryptosporidia, rotavirus, herpes simplex, pathogenic strains of *E. coli*, and intestinal flu infections. Colostrum handles all gut pathogens well without side effects. Colostrum is composed of numerous factors with strong antiviral activity, especially the immunoglobulins, lactoferrin, and the cytokines.

### **Allergies and Autoimmune Diseases**

PRP from colostrum can work as a regulatory substance of the thymus gland." It has been demonstrated to improve or eliminate symptomatology of both allergies and autoimmune diseases (MS, rheumatoid arthritis, lupus, myasthenia gravis). PRP inhibits the overproduction of lymphocytes and T-cells and reduces the major symptoms of allergies and autoimmune disease; pain, swelling and inflammation.

### **Heart Disease**

Altered immunity may be the hidden cause of atherosclerosis and cardiovascular disease. For example, a type of chlamydia has been associated with arterial plaque formation in over 79% of patients with heart disease. A recent *New England Journal of Medicine* article indicated that heart disease is partially the result of immune sensitization to cardiac antigens. Immune-system-mediated injury results in myocarditis, with lymphocytes and macrophages being the predominant infiltrating cells. Colostrum PRP may have a role in reversing heart disease very much like it does with allergies and autoimmune diseases.

Additionally, IgF-1 and GH in colostrum can lower LDL cholesterol while increasing HDL cholesterol concentrations. Colostrum growth factors promote the repair and regeneration of heart muscle and the regeneration of new blood vessels for collateral coronary circulation.

### **Cancer**

The 1985 Steven Rosenberg book, *Quiet Strides in the War on Cancer*, first popularized the benefits of cytokines in the treatment of cancer. Since that time, the same cytokines found in colostrum (interleukins 1, 6, 10, interferon G, and lymphokines) have been the single most researched protocols in scientific research for the cure for cancer.

Colostrum lactalbumin has been found to be able to cause the selective death (apoptosis) of cancer cells, leaving the surrounding noncancerous tissues unaffected. Lactoferrin has similarly been reported to possess anti-cancer activity.

The mix of immune and growth factors in colostrum can inhibit the spread of cancer cells. If viruses are involved in either the initiation or the spread of cancer, colostrum could prove to be one of the best ways to prevent the disease in the first place.

### **Diabetes**

Juvenile diabetes (Type I, insulin dependent) is thought to result from an autoimmune mechanism, possibly initiated by an allergic reaction to the protein GAD found in cow's milk. Colostrum contains several factors that can offset this and other allergies.

Colostrum IgE-1 can bind to both the insulin and IgF-1 receptors found on all cells. Human trials in 1990 reported that IgF-1 stimulates glucose utilization, effectively treating acute hypoglycemia and lessening a Type II diabetic's dependence on insulin.

### **Weight-loss Programs**

The body requires IgF-1 to metabolize fat for energy through the Krebs cycle. With aging, less IgF-1 is produced in the body. Inadequate levels are associated with an increased incidence of Type II diabetes and difficulty in losing weight despite a proper nutritional intake and adequate

exercise, Colostrum provides a good source of IgF-1 as a complementary therapy for successful weight loss.

### **Athletic Stress**

Exhaustive workouts and athletic competition can temporarily depress the immune system, decreasing the number of I-lymphocytes and NK cells. Athletes are therefore more prone to developing infections, including chronic fatigue syndrome. Many of colostrum's immune factors can help significantly reduce the number and severity of infections caused by both physical and emotional stress.

### **Leaky Gut Syndrome**

One of the major benefits of colostrum supplementation is enhanced gut efficiency, due to the many immune enhancers that control clinical and subclinical GI infections. Colostral growth factors also play a role by keeping the intestinal mucosa sealed and impermeable to toxins. This is evidenced by colostrum's ability to control chronic diarrhea caused by gut inflammation related to dysbiosis.

Healing leaky gut syndrome reduces toxic load and helps reverse many allergic and autoimmune conditions. For the healthy individual or athlete in training, colostrum supplementation enhances the efficiency of the intestine's uptake of amino acid and carbohydrate fuel. More nutrients are made available for muscle cells and other vital tissues and organs. One of the reasons for the energy boost seen in most healthy individuals who use supplemental colostrum, is its ability to improve nutrient availability and correct subclinical leaky gut syndrome.

### **Wound Healing**

Several colostrum components stimulate wound healing." Nucleotides, EgF, TgF, and IgF-1 stimulate skin growth and cellular growth and repair by direct action on DNA and RNA. These growth factors facilitate the healing of tissues damaged by ulcers, trauma, burns, surgery, or inflammatory disease. Colostrum's wound-healing properties specifically benefit the skin, muscle, cartilage, bone, and reserve cells. Powdered colostrum can be applied topically to gingivitis, sensitive teeth, aphthous ulcers, cuts, abrasions, and burns after they have been cleaned once disinfected.

### **Quality Control**

The best quality colostrum is produced organically and is free of pesticides, herbicides, anabolic hormones like rBST, steroids, antibiotics, and other chemicals. Not all colostrum products on the market are biologically active. This is because of improper processing through the use of high temperatures and pasteurization or the formation of colostrum into tablets. This method requires high pressure and generates heat, destroying biological activity. Colostrum in liquid form is also less than ideal. It is not as concentrated as the powdered versions of the product, must be kept refrigerated due to its short shelf life, and preservatives must be added that further dilute and destroy its biological capabilities.

The American Journal of Medicine's web site allows authors to access the Journal's manuscript tracking system for updates on the status of their manuscripts. The journal's interactive site, AJMSelect, features full-text articles, including the "Case of the Month" and "Diagnostic Dilemma", in which users are challenged to provide a diagnosis; and the "Journal Club," in which the editors present expert monthly discussion of an article from the print version. Access AJMSelect at <http://www.ajmselect.com/> . Paid personal subscribers to The American Jour...