

What Can Colostrum Do for Me? What Is Colostrum Good For? Why Is It the Most Important Nutrient for the Prevention of Chronic Disease?

Excerpts from the book: '*Peptide Immunotherapy, COLOSTRUM, A physicians Reference Guide*' By Andrew M. Keech, PhD with contributions from Michail V. Borissenko BS, MS, Steven Bock, MD, Kenneth J. Frank, MD

The first and foremost thing that must be understood about colostrum is what it *isn't*, namely that colostrum is *not* a medication.

Colostrum, our first food of life, is naturally designed to maintain health and prevent disease rather than cure a disease that you already may have. To make an analogy, it's better to close the barn door before the horse runs out than after it already has. So what does it do for us as adults or for children older than babies? Colostrum is incredibly effective at shutting down the cause of most disease and infection; when this occurs our body can then work to repair and rebuild the damage and allow us to enjoy radiant and robust health.

Gut Health: The Key to Health

Colostrum is an amazing cornucopia of everything we need to maintain a healthy, functional gastrointestinal tract, which is the key to good health in general. Many diseases have their origins in the gut, and the proper absorption of nutrients is key to maintaining the body in top running condition. One of the primary functions, if not *the* primary function, of colostrum is gut health. The condition of our gastrointestinal tract—the mouth, the esophagus, the stomach, and the large and small intestines—is our most important health concern due to the amount of potentially harmful material that passes through it and the fact that many, if not most, diseases originate in the gut in one way or another. Yet gut health is mostly ignored unless we are suffering from diarrhea, indigestion, or other GI problems. We don't like to think about our digestive processes—improving our sex life or removing wrinkles on our skin is much more interesting.

When the proportion of beneficial bacteria in our intestines outnumbers the harmful bacteria, our intestines are said to be in a state of *orthobiosis*, a term meaning “in balance” coined by Elie Metchnikoff.

When that proportion is out of balance for some reason and the harmful bacteria predominate, we are in a state of *dysbiosis*, or imbalance. Dysbiosis has a number of harmful consequences, including *leaky gut syndrome* where the permeability of the gut lining is increased so that toxins and pathogens normally excluded from passing through the gut lining now move freely into the body, which can cause or contribute to a multitude of diseases. Many autoimmune conditions, such as Crohn's disease and rheumatoid arthritis, and most food allergies can be traced to leaky gut syndrome. There are many other causes of leaky gut in addition to dysbiosis, including alcoholism, taking non-steroidal anti-inflammatory drugs (NSAIDs), aging, and excessive amounts of toxins in the gut. Whatever the cause, leaky gut can have serious, even life-threatening, consequences.

Colostrum is the best remedy known for all-around gut health. Colostrum restores leaky gut to normal permeability levels.¹ It contains growth factors and hormones to help repair damage to the intestinal lining, including damage caused by NSAIDs and other medications, and restore gut integrity.^{5,6,7} It contains massive doses of immunoglobulins that help control harmful bacteria and fungi, such as *Candida*, in order to restore orthobiosis. It has been clinically proven to control such harmful bacteria as *H. pylori*,^{8,9} which cause ulcers, and many other bacteria. Colostrum has also been shown to increase the surface area of the intestinal lining, improving the absorption of nutrients.^{10,11,12} And there are no known side effects from using colostrum.

Leaky Gut Syndrome (LGS) or Intestinal Permeability

Leaky gut syndrome is the name given to a very common health disorder in which the intestinal lining is more permeable than normal. The abnormally large spaces present between the cells of the gut wall allow the entry of viruses, bacteria, fungi, and other toxic material into the bloodstream. Leaky gut syndrome is at least as common as all the immune system diseases combined. Basically, it is caused by infection and the attendant inflammation of the gut lining. The infection and inflammation can be brought about by any of the following:

- Antibiotic use—leads to the overgrowth of abnormal bacteria in the gastrointestinal tract
- NSAIDs (pain medications)
- Prescription pain medications
- Gastrointestinal infections
- Alcohol
- Genetically modified foods
- Foods contaminated by parasites

- Foods contaminated by bacteria, such as E. coli and salmonella
- Chemicals (including dyes and preservatives) in fermented and processed foods
- Prescription corticosteroids
- Wheat proteins, acidic beverages
- Pesticides, food preservatives, environmental toxins, etc.
- An abundance of highly refined sugars and other carbohydrates in your diet (e.g., candy, cookies, soft drinks, white bread, pasta)

LGS damages the protective coating of antibodies of the immunoglobulin A (IgA) family normally present in a healthy gut.¹³ Because IgA helps us ward off infections, leaky gut problems make us less resistant to viruses, bacteria, parasites, and Candida.^{14,15} These microbes are then able to invade the bloodstream and colonize almost any body tissue or organ, thereby causing disease. LGS also creates a long list of mineral deficiencies because the various carrier proteins needed to transport minerals from the intestine to the blood are damaged by the inflammation process.¹⁶ For example, magnesium deficiency is a very common finding in conditions like fibromyalgia, despite high magnesium intake through diet and supplementation. If the carrier protein for magnesium is damaged, it doesn't matter how much of the mineral you take; it will not get into the body where it is needed. Similarly, the body can be deprived of zinc because of poor intestinal absorption, often resulting in hair loss. Copper deficiency can occur in an identical way, leading to high blood cholesterol levels and osteoarthritis. In addition, when calcium, boron, silicon, and manganese are not absorbed into the bloodstream, bone problems develop. Bloating, cramps, and gas are common ailments associated with a leaky gut. Eventually, however, nutritional deficiencies can also lead to systemic complaints like fatigue, headaches, memory loss, poor concentration, or irritability.¹⁷

High intestinal permeability is a normal feature of newborn gut ecology. Colostrum functions to reduce inflammation, protect against irritation from toxins, and check any potential infection, while promoting epithelial growth and repair. This combination of effects quickly reduces permeability, preventing toxins, irritants, allergens, and infectious agents from entering body tissues. A number of serious health syndromes are now known to be associated with abnormally increased gut permeability. These include all auto-immune diseases including Crohn's disease, diabetes, autism, lupus, multiple sclerosis, Alzheimer's, Parkinson's, arthritis, cholera, Salmonella and E. coli infection, HIV, arthritis, chronic fatigue syndrome, hepatitis, cystic fibrosis, alcoholism, muscular dystrophy, fibromyalgia, and scleroderma, asthma, and allergies. Research shows that colostrum can correct this leaky gut syndrome with its unique combination

of immune factors and growth stimulators, which includes epithelial growth factors. In fact, research has shown that colostrum is the single most effective agent for correcting leaky gut syndrome. Of course, other factors can help, too. These include friendly bacterial flora, folic acid, vitamin B₁₂, and aloe. In addition, optimal nutrition should be ensured with a potent, broad-spectrum multi-vitamin and mineral supplementation program, high fiber and natural enzyme intake with many raw fruits and vegetables, and steamed vegetables and greens in the diet. Avoiding refined foods, sugar, alcohol, caffeine, chemical additives, and tobacco is also crucial.

Colostrum also promotes re-colonization of the bowel by friendly flora. These beneficial organisms help digest our food so that more nutritional value is available from the same diet and supplements. They also enhance nutrient absorption, feed epithelial tissue, produce bulk for healthier elimination of wastes, produce B vitamins, and prevent infection and disease. When colostrum normalizes this gut ecology, assimilation of nutrients is also enhanced. This means that other dietary, nutritional, herbal, homeopathic, and lifestyle interventions work better too.

Immune Supplementation of the Gut

Local protection in the form of immune supplementation with bovine colostrum antibodies has shown to be an effective means of providing local protection to the GI tract against disease. Bovine immunoglobulin in the form of specific antibody has been shown to be effective against various enteric infectious diseases. In trials it has been successfully shown that specific antibodies in bovine colostrum are effective against both enteropathic and enterotoxic *Escherichia coli*, *Cryptosporidium parvum*, rotavirus, and *Shigella flexneri*.^{169,166,169,171,172,173,174}

Clinical research by Dr. David Tyrell in England in 1980¹⁹³ revealed that a high percentage of the antibodies and immunoglobulins present in colostrum are believed not to be absorbed but remain in the intestinal tract where they attack disease-causing organisms before they penetrate the body and cause disease. The remainder is believed to be absorbed and distributed to assist in our internal defense processes. It is this combination of actions that is believed to make colostrum so unique and effective as an oral supplement.

“Studies with human volunteers found that the preservation of the biological activity of IgG (Immunoglobulin), in the digestive secretions of adults receiving bovine colostrum orally, indicates

passive enteral (intestinal) [JC1] immunization for the prevention and treatment of acute intestinal diseases...”

– Dr. L.B. Khazenson, Journal of Microbial and Epidemiological Immunobiology⁷

Autoimmune Conditions

Autoimmune conditions are serious diseases in which the body actually begins to make antibodies against itself, often for no clear reason. Colostrum, and Proline-rich Polypeptides (PRPs) specifically, have been shown to be of benefit in a number of autoimmune conditions,⁷⁷ such as multiple sclerosis,⁷⁸ rheumatoid arthritis,⁷⁹ asthma,⁸¹ systemic lupus erythematosus,⁸³ several experimental autoimmune responses to red blood cells,⁸⁴ and hemolytic anemia.⁸⁵ Chemokines (chemo attractants that attract immune cells to a site) and chemokine receptors have been implicated in a number of autoimmune conditions, such as rheumatoid arthritis, multiple sclerosis, allograft rejection, systemic lupus erythematosus, psoriasis, atopic dermatitis, lichen planus, and graft-vs.-host disease. Expression of chemokines by endothelial cells of the blood vessels appears to be an important step in the development of these diseases. Antagonists of chemokine-chemokine receptor interactions alleviate the symptoms of many of these diseases in animal models.^{86,87} This may suggest a role that PRPs play in the relief of autoimmune conditions.

Autism

Autism is an early-onset biological disorder that causes severe deficits of higher mental functions, as well as behavioral manifestations. There is no single, clear-cut cause and no complete cure for autism.⁸⁸ Causally speaking, immune factors, neurochemical factors, antibiotics,⁸⁹ genetic susceptibility factors, and environmental factors (such as microbial infections and chemical toxicity) have been implicated. Autism is a very complex, multifactorial disorder that may include autoimmunity.⁹⁰ However, immune therapies, such as PRPs and colostrum, have been of benefit in some cases.⁹¹

Diabetes

Both Type 1 and Type 2 diabetes can express autoimmune characteristics.^{68,69,70,71} In a diabetic person, at some time in the body autoimmune antibodies against pancreatic beta-cells were created. These antibodies interfere with beta-cell production of insulin. This can cause an unstable production of insulin

and the inability of the body to regulate blood sugars.⁷² Type 1, or juvenile onset diabetes, can also be considered an autoimmune disease.⁷³

Tests at UCLA and Stanford University showed that a protein called GAD, found in cow's milk, can trigger an allergic response that damages the insulin-producing cells of the pancreas.⁷⁴ Without insulin, the body is unable to use glucose for energy, so it is forced to burn fat instead. This severe metabolic imbalance can lead to a dangerous condition called diabetic coma. Type 1 diabetes seems to occur most often in children who did not receive colostrum at birth or were not breast-fed for long. The immune factors in colostrum increased the tolerance for GAD, preventing the allergic response.⁷⁵ Once an individual has developed Type 1 diabetes, the treatment options are very limited. Generally, the condition is controlled with a combination of dietary restrictions, and daily insulin injections. A 1990 study suggested that colostrum supplementation would be a very beneficial treatment for diabetics, based on the fact that a key growth factor, IGF-1, can stimulate glucose utilization. Researchers found that plasma levels of IGF-1 were lower in diabetic patients than in healthy individuals.⁷⁶ After administering IGF-1 to patients, the doctors noticed a twofold increase in glucose transport to the muscles. The IGF-1 in colostrum could painlessly do the job of the daily insulin injections most diabetics now have to endure. Of course, any change in insulin medication should only be made under a doctor's supervision.

Autoimmune disease can be loosely defined as a condition where the body's immune defenses are turned on itself, or stated in another way, the body cannot distinguish *self* from *non-self*. This state is usually characterized by the synthesis of specific antibodies to proteins that are normally found in bodily tissues and the mobilization of other aspects of the immune system (e.g., white blood cells and inflammatory cytokines), which in turn leads to wholesale tissue destruction.

In the specific case of diabetes, this situation is most readily observed in Type 1 diabetes (juvenile diabetes) where the immune system has attacked and killed the beta-cells that compose the islets of Langerhans in the pancreas. Individuals with Type 1 diabetes lose the ability to produce insulin and must be augmented with insulin therapy for the remainder of their lives. Specific auto antibodies can be found in these individuals along with the activation of natural killer T cells that are normally targeted against invaders such as viruses. Even when people with Type 1 diabetes are treated with insulin, their autoimmune dysfunction still remains; more and more studies are being directed at the root cause of these issues in an effort to improve the overall prognosis of a complete treatment protocol. It is also true that patients with Type 1 diabetes are more likely to suffer from other autoimmune conditions such as

rheumatoid arthritis or psoriasis. Therefore, if progress is made on the autoimmune front for diabetes, there will surely be carryover to these other conditions. More recently a great deal of attention has been paid to Type 2 diabetes, which is most often associated with obesity and inactivity.

New work has shed light on the fact that there is much in common between Types 1 and 2 patients. One of these areas of commonality is the presence of auto antibodies. This fact alone suggests that on the many faces of diabetes (Types 1, 1.5, 2, and now 3) there may be a common imprint of immune dysfunction. And with new revelations linking diabetes with Alzheimer's disease (so-called Type 3), there is even more at stake in deriving and understanding and, more importantly, developing new treatment protocols.

Immune Health

Colostrum is unmatched as an immune system stimulant and modulator. There are numerous "one note" products lining the shelves of natural food stores that claim to stimulate the immune system. Only colostrum, however, plays the whole symphony. It is not only able to stimulate the immune system in a multitude of ways but also has the ability to modulate the immune response, turning it up or down as needed. No other health food product can claim that.

Colostrum can pass immunity to a wide variety of disease-causing pathogens to you—no shots required! Colostrum can protect you not only from dangerous bacteria, like Salmonella, Staphylococcus, and Streptococcus, but it can also protect you against a number of viruses, from colds and flu to HIV, fungi like Candida, and even protozoan parasites like giardia. Not even antibiotics can deliver that broad protection.

Our ability to survive in a world full of dangerous pathogens and toxins is dependent upon the ability of our immune system to neutralize and destroy these potential dangers. To accomplish this, our bodies have developed many strategies that attack or neutralize dangers in a wide variety of ways. Many of these are included in colostrum as well because one of the main routes of infection or toxin entry into the body is through the gut. In fact, no other supplement can come close to colostrum in the variety and effectiveness of its immune support. Colostrum also provides a potent array of immune factors including immunoglobulins, cytokines, interferon, lactoferrin, and PRPs. Supplementation of these factors can dramatically restore immunity, prevent infection, and speed healing and recovery from illness.

Bovine colostrum, in particular, is up to 40 times higher than human colostrum in these immune factors. Plus, only bovine colostrum contains certain glycoproteins and protease inhibitors that naturally protect these immune factors from being digested in the intestinal tract. Even so, prolonged exposure to stomach acids and digestive enzymes destroy most of colostrum's immune benefits. Swallowing colostrum in a capsule with an antacid or with a large glass of alkaline, antioxidant water (coral water or electrolysis water) between meals helps reduce damage and increase effectiveness. But to truly make colostrum effective, it is best to obtain colostrum that has a protective Liposomal Delivery system. Liposomal micro encapsulation has been shown to help deliver colostrum intact into the digestive system, and help it absorb into the blood stream and deliver critical healing components to all of our cells and organs including crossing into nervous and brain tissue for healing and repair of damaged tissue.

Colostrum is also one of the most potent known sources of methylsulfonylmethane (MSM), which relieves pain, aids in healing of scar tissue, deters parasites, supports liver detoxification, and helps elimination of mercury, among its many other functions. MSM, or organic sulfur, is considered the number three mineral in the body. Colostrum even contains powerful, soil-based organisms, which have been found to provide tremendous benefits to human health.

According to the Centers for Disease Control, anywhere from 30% to 80% of commercial chickens are seriously contaminated with Salmonella bacteria.¹⁸ ABC TV quoted a government source that reported as many as 33 million Americans suffer food poisoning every year, and that over 5,000 die.¹⁹ Colostrum has been shown to kill Salmonella, along with other disease-causing bacteria such as Campylobacter, *E. coli* (which can kill people when present in contaminated meat supplies), *Helicobacter pylori* (the main cause of stomach ulcers), Listeria, and multiple Streptococcus species and Staphylococcus and Clostridium Difficile (the main cause of hospital-acquired infections). This is good news in light of the increasing appearance of antibiotic resistant super strains, such as vancomycin resistant *Staphylococcus aureus*. Colostrum has also been found to be effective against *Candida albicans*.²⁰

Research shows that colostrum prevents and controls infection in multiple ways. First, according to clinical studies, colostrum has been shown to inhibit attachment of bacteria to the body's epithelial (surface) tissue. This is a necessary first step for any infection to take hold. Second, lactoferrin acts as a powerful natural antimicrobial, antiviral and is very effective against fungus and yeast infections. Colostrum also imparts passive immunity to many high-risk organisms, including the leading intestinal

killers *E. coli* and rotavirus. At the same time, immune factors enhance the body's natural defense against virtually all pathogenic bacteria and viruses.

Intestinal infections that cause diarrhea can be real killers. Rotavirus, a major cause of diarrhea, is the world's leading killer in areas with poor sanitation and contaminated water, but it is also spreading rapidly due to increased travel and immigration. Clostridium and Shigella are two other major killers linked to diarrhea. Colostrum neutralizes the toxins produced by Clostridium, the organism linked to botulism.²¹ Colostrum showed similar results against shigellosis.²² Taking colostrum, along with friendly bacterial flora, whenever you travel abroad can be a lifesaver.

Infection is becoming increasingly important as a cause of chronic degenerative disease as we understand more about etiology. *Chlamydia pneumonia* (an intracellular parasite), for example, may be a triggering factor in atherosclerosis.²³ Researchers now believe that this factor may account for up to 50% of all heart disease. The best known immune components of colostrum, of course, are the immunoglobulins, also known as antibodies.^{24,25,26} Immunoglobulins, part of the adaptive immune system, are special proteins produced by the body that can specifically bind virtually any bacteria, virus, protein, peptide, carbohydrate, or cell that the body recognizes as "foreign." Once the immunoglobulins attach themselves to the foreign substance, scavenger cells of the immune system can attack and destroy or neutralize it.

The immunoglobulins in colostrum contribute to its ability to neutralize or kill many bacteria, viruses, fungi, and even protozoan parasites. The list of pathogens against which colostrum has been shown to be effective is impressive,²⁷ including such dangerous bacteria as *H. pylori*²⁸ (implicated in ulcer formation in the stomach), *E. coli*^{29,30} (a natural inhabitant of the GI tract that has a number of very dangerous strains that can cause severe diarrhea or intestinal bleeding), pertussis,³¹ cholera,³² and bacterial causes of severe diarrhea,^{33,34,35} which can be lethal in those suffering from AIDS and which kill thousands of infants worldwide every year. It has also been shown to be effective against a number of viruses³⁶ and even protozoan parasites, such as amoebas,³⁷ which cause dysentery and other GI diseases. This is only one weapon in colostrum's great arsenal. It has many other ways of providing protection and modulating our immune response.

Three proteins found in colostrum—lactoferrin, lysozyme, and lactoperoxidase, part of the so-called innate immune system—provide non-specific protection against bacteria, viruses, and fungi.³⁸

Lactoferrin is one of the main proteins in colostrum, making up about 6% of the total protein. It is an iron-binding protein closely related to transferrin, which is a protein that transports free iron in the body. One of the ways lactoferrin destroys bacteria is by binding free iron, which is needed by many bacteria and fungi, such as *Candida*,³⁹ to reproduce. It can prevent the colonization of *Haemophilus influenza*, the primary cause of ear and respiratory infections in children, by inactivating its colonization factors.⁴⁰ Lactoferrin also has the ability to penetrate the cell walls of bacteria, which allows lysozyme to enter the bacterial cell, causing them to lyse, or burst.⁴¹ It also acts in conjunction with lysozyme to destroy *Candida*.⁴² Lactoferrin is a potent destroyer of viruses as well, including cytomegalovirus (can cause birth defects and death in fetuses),⁴³ HIV (AIDS virus),⁴⁴ hepatitis B⁴⁵ and C,⁴⁶ rotavirus (the main cause of diarrhea in infants),⁴⁷ influenza virus, respiratory syncytial virus (causes colds in adults⁴⁸ and severe bronchitis and pneumonia in children), and herpes simplex types 1 (cold sores) and 2 (genital herpes).^{49,50}

In addition to its antimicrobial role, lactoferrin has other important immune functions. Lactoferrin from colostrum increases both motility and superoxide production by polymorph nuclear leukocytes (white blood cells), making them more effective in warding off infections.⁵¹ It strongly augments natural killer cell and lymphokine-activated killer cell cytotoxic activity.⁵² Lactoferrin is also a required growth factor for lymphocytes, the principal cell type of the immune system,⁵³ so it acts to stimulate increased activity of the immune system.

Lactoperoxidase combines with thiocyanate (a sulfur compound) and hydrogen peroxide to form a bactericidal compound that kills bacteria and viruses nonspecifically as well as degrades various carcinogens.^{54,55}

Other components of the innate, or non-specific, immune system are also present in colostrum.⁵⁶ One important component of this system is the glycoconjugates found in colostrum and milk. Glycoconjugates are proteins, fats, or complex sugars (oligo and poly saccharides) that have sugar molecules attached to them. These sugar molecules compete with pathogens for binding sites on the intestinal wall.^{57,58}

Complement,^{59,60} part of the antigen-antibody system, is also found in colostrum. Complement proteins help to remove immune complexes, that is, immunoglobulin-antigen complexes, so that they do not accumulate in the tissues. In addition, there are a number of small proteins and peptides present that are also part of the innate immune system, such as defensins⁶¹ (polypeptides that disrupt bacterial membranes, killing them), toll-like receptors^{53,62,63} (pattern recognition detectors that help the immune

system identify new pathogens), and cathelicidin derived antimicrobial peptide⁵³ (another polypeptide that attacks the membranes of bacteria).

A unique feature of colostrum is its ability to modulate rather than just stimulate, compared to immune products from plants that only stimulate. Colostrum contains a substance known as PRPs or Colostrin, which has the ability to modulate the immune response by either turning up an underactive immune system or turning down an overactive one.⁶⁴ PRPs can also induce the growth and differentiation of resting B lymphocytes,⁶⁵ an important part of turning on the immune system in response to a threat.

Another way colostrum modulates the immune system is through controlling the production of interleukin-2 (IL-2), one of the cytokines—small, hormone-like proteins that regulate the intensity and duration of immune response. By controlling the production of IL-2, colostrum can increase or decrease the activity of natural killer cells⁶⁶—specialized lymphocytes whose function is to attack and kill invading pathogens. Lactoferrin also greatly stimulates the activity of natural killer and other immune cells.⁶⁷

Heart Disease

We have heard so much in recent years about heart disease and what we can do to prevent it. Diet and exercise are some of the best weapons we can use to fight this killer, but for many, the immune and growth factors found in colostrum may be what are needed to win the war.

Altered immunity may be the hidden cause of atherosclerosis and cardiovascular disease. For example, the American College of Cardiology recently reported that a common type of Chlamydia bacteria has been associated with arterial plaque formation in over 79% of patients with heart disease.⁹² Another recent study concluded that heart disease is the result of immune sensitization to cardiac antigens.⁹³ In other words, once heart tissue is damaged, the immune system begins creating antibodies which then cause more harm.

Because heart disease resembles an autoimmune response in this way, colostrum's PRPs can help limit the severity of the disease by toning down the immune system's attack on damaged heart tissue. In addition, the other immune factors found in colostrum can directly combat the Chlamydia bacteria. Finally, IGF-1 and GH in colostrum can lower LDL cholesterol while increasing HDL cholesterol concentrations.^{94,95,96} Colostrum growth factors promote the repair and regeneration of heart muscle and the regeneration of new blood vessels for collateral coronary circulation.⁹⁷ Both milk and colostrum

contain hypotensive factors, called ACE inhibitory peptides (casokinins and lactokinins), which decrease blood pressure and lower the risk of heart attack and stroke.^{98,99} The calcium found in milk and colostrum also contributes to lower blood pressure.¹⁰⁰

Influenza

A recent study¹⁰¹ showed the efficacy of a two-month treatment with oral colostrum in the prevention of flu episodes compared with anti-influenza vaccination. After three months of follow-up, the number of days with flu was three times higher in the non-colostrum subjects. Colostrum, both in healthy subjects and high-risk cardiovascular patients, is at least 3 times more effective than vaccination in preventing flu and is very cost-effective.

Cancer

Colostrum has also been shown to be of benefit against that most feared of diseases, cancer. Numerous research studies have shown that bovine colostrum prevents the development of cancers, particularly cancers associated with the gastrointestinal tract, under experimental conditions. More clinical research is needed to understand colostrum's role in preventing cancer *in vivo*, which is, of course, much more difficult to study.

It has been estimated that one in three people living in Canada and the U.S. will get some form of cancer during their lifetime. The causes of cancer (or cancers) are multiple. There are, of course, the well-known carcinogens like nitrates, hydrogenated oils, cigarette smoke, and radiation. Cancerous cells are continuously being formed and destroyed in almost every human body. The problem comes when a weakened immune system allows for the cancerous cells to spread and destroy other healthy tissues. Ironically, chemotherapy, the treatment of choice for many cancers, compromises the body's natural immune function, leaving patients susceptible to even more infection.

The benefits of natural immune boosters in the treatment of cancer was first popularized by the 1985 Steven Rosenberg book, *Quiet Strides in the War on Cancer*.¹⁰² Rosenberg had great success with cancer patients, including one complete cure, by using a treatment that flooded the body with killer immune cells, as well as chemical messengers called cytokines.^{103,104} Since Rosenberg's time, the same

cytokines found uniquely in colostrum (interleukins 1, 6, 10, interferon-g, and lymphokines) have been the single most researched elements in the search for the cure for cancer.

Colostrum lactalbumin has been found to cause the selective death of cancer cells, leaving the surrounding non-cancerous tissues unaffected. Lactoferrin has similarly been reported to possess anti-cancer activity. The incredible mix of immune and growth factors in colostrum can inhibit the spread of cancer cells. And 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.

PRPs have been shown to be a potent placental antiangiogenic hormone that prevents neovascularization¹⁰⁵ (see also angiogenesis). Tumor cells engineered to express high levels of PRPs show markedly reduced growth rates as tumors in mice.¹⁰⁶ The protein also acts on human endothelial cells.¹⁰⁷ It has been shown that the use of adenovirus vectors expressing PRPs can lead to complete tumor rejection and prolonged survival in a high proportion of animals bearing transplanted mouse B16F10 melanoma cells.^{108,109,110,111}

A series of studies done in Japan on animal models of cancer showed in every case that lactoferrin either prevented the cancer from taking hold or prevented metastasis from established tumors.^{112,113,114,115} Lactoferrin has also been shown to boost the cytotoxic activity of natural killer cells against blood and breast epithelial tumor cell lines^{116,117} and to inhibit the growth of breast cancer cells.¹¹⁸

One study has shown that a number of human cancers become more sensitive to chemotherapy in the presence of epidermal growth factor, one of the growth factors present in colostrum.¹¹⁹

What colostrum does not do in regard to cancer is make it worse. There have been some stories put out that the growth factors in colostrum can cause cancers to grow faster, but these rumors are unfounded and not backed by research.¹²⁰

AIDS (HIV)

Several unpleasant features make HIV one of the most frightening viruses to catch. First of all, the virus mutates so quickly that the body cannot produce an antibody to destroy it. Secondly, how can we fight off a virus that directly targets the body's main defense—the immune system? In fact, it is not finally HIV itself that poses the deadly threat associated with the AIDS disease. Rather, HIV attacks the immune

system, rendering it extremely vulnerable to other invaders. In cases of severe immune damage, a simple cold or flu can be deadly. In a 1995 article in *Scientific American*, researchers concluded that “traditional” disease fighting methods (vaccines, for example) are just not effective in fighting HIV. Instead, they recommend reducing the viral level in the body and stimulating the body’s natural immune response to have the best chance against the tricky virus.¹²¹

Another study¹²² indicates that the colostrum immune factor lactoferrin is one of the best ways to reduce viral levels in the body. For example, lactoferrin inhibited HIV infection of certain body cells. In addition, the immune factor was able to completely block Cytomegalovirus infection. This study also concluded that bovine lactoferrin was up to 2.5 times more potent than human lactoferrin.

Many of the immune factors in colostrum also help to stimulate or “jump-start” a weakened immune system. Lactoferrin, for example, is responsible for “turning on” the immune system in newborn babies and has been proven to do the same thing for adult AIDS patients. In addition, colostrum’s growth factors also boost the body’s immune function. Clinical studies have shown that HIV positive patients who were treated with certain growth factors (in particular growth hormone or IGF-1) were much less likely to develop full-blown AIDS than were patients who received different treatments.¹²³

Growth factors also play an important role in preventing AIDS-associated wasting, or severe weight loss. Wasting occurs when the AIDS infected body begins using muscle for energy. Treatment with growth hormone and IGF-1 showed an increase in lean muscle mass among AIDS patients. This increase in muscle mass is one of the main keys to improving the quality of life of AIDS sufferers. Mass wasting is most often brought about by severe, chronic diarrhea, one of the first symptoms of AIDS. Cryptosporidium and rotavirus take advantage of the weakened immune system, causing acute diarrhea. This results in a loss of vital nutrients and fluids and also depletes much of the supply of intestinal antibodies, leaving the sufferer even more susceptible to dangerous pathogens. Because it is one of the most serious, potentially fatal problems that AIDS sufferers face, much of the research thus far has focused on finding a way to prevent diarrhea. One study¹²⁴ showed that out of 37 immune-deficient patients with chronic diarrhea, 72.4% experienced a significant improvement with the use of immunoglobulins from colostrum. Over half of the patients remained diarrhea free for at least four weeks after the treatment. A 1990 study stated that colostrum immunoglobulins have been able to treat opportunistic, diarrhea-causing infections in AIDS patients where no other treatment was effective.¹²⁵ At the very least, colostrum will benefit the AIDS patient by prolonging and greatly improving the quality of life.

Athletic Use

But wait, that's not all. Athletes love colostrum because the growth factors in it help burn fat while building lean muscle. Colostrum builds strength and shortens recovery time. It also protects athletes from getting sick when at their most vulnerable following a vigorous workout when the immune system is temporarily disabled. Some athletes and trainers have even labeled colostrum as the "new creatine."¹²⁶

In the 2000 and 2004 Summer Olympics, Australian athletes stunned the world by earning more medals than China, a nation with over 100 times as many people and potential athletes. What was their secret? Colostrum!

Fitness

Studies are now showing significant gains in fitness with colostrum supplementation. A widely reported study in Australia found a 20% increase in strength, stamina, and shortened recovery time for both soccer players and cyclists. Many body builders and fitness experts say colostrum works better than any other legal substance they ever experienced.

The growth factors found in colostrum are now known to enhance muscle tone, burn off body fat, promote skin elasticity, and increase bone density. TgF-alpha and -beta (transforming growth factors) stimulate production and repair of RNA and DNA, as well as repair of damaged muscle fibers in athletes. EGF (epithelial growth factor) stimulates enhanced skin healing. IGF-1 (insulin-like growth factor 1) is able to "promote muscle growth by itself," according to *Muscle and Fitness* associate editor Steve Schwade. Bovine IGF-1 is effective in humans, differing in its structure by only 3 out of 67 amino acids, and bovine colostrum is found to be even higher in IGF-1 than human colostrum. The growth factors in colostrum stimulate protein synthesis and slow protein breakdown, resulting in increased lean muscle mass. At the same time, they shift the metabolism from burning carbohydrates to burning more fats.

Olympic skiers taking colostrum experienced less fatigue and improved their performance in a placebo-controlled study in Finland. They also showed only half the level of blood creatine-kinase, a marker of muscle injury, compared to placebo control. Another Finnish study confirmed that athletes taking colostrum during strength and speed training did in fact show increased blood serum concentrations of IGF-1.¹²⁶

Overall, colostrum is considered as powerful as steroids at generating increased muscle mass when used in conjunction with exercise, but without the risks and side effects. Studies have shown that the growth factors present in colostrum increase between 2,500% to 4,000% (from 2–5 ng/mg to 50–200 ng/mg) with exposure to acidity. To gain the maximum fitness benefits from colostrum, take it in powder form (empty the capsule in your mouth or onto food) toward the end of a meal or 45 minutes before a physical workout session with a protein drink. Friendly flora, which naturally promotes a healthy acidity level in the colon, may also enhance the benefits of colostrum.

Athletic Immune Stress

Strenuous exercise associated with athletic training and competition places a tremendous strain on body systems, including the immune system. Studies on the effects of extreme exercise on the immune system have shown profound immune system changes following marathon runs or other forms of athletic performance that push the body to the limit. One study on marathon runners showed that white blood cell counts decreased dramatically after a three-hour run but returned to normal levels within 21 hours.¹²⁸ Another study on marathoners showed decreased natural killer cell activity after a race.^{129,129} This would suggest that athletes who push themselves to their limits are much more susceptible to infectious diseases, such as upper respiratory infections, which is indeed borne out by research.¹³⁰ Combined with proper nutrition and rest, colostrum helps prevent this. Colostrum, with its growth and immune factors, cuts recovery time and boosts immune function, reducing the susceptibility of athletes to infection after exercise,¹³¹ and it can help heal “leaky gut” in athletes, which can be caused by protein supplementation.¹³² Colostrum also speeds the healing of muscle, tendon, and ligament injuries. Other studies on athletes have shown that colostrum can decrease recovery times and increase anaerobic power.^{133,134,135} Colostrum supplementation also builds lean muscle tissue and burns fat.¹³⁶

The International Olympic Committee (IOC) ruled colostrum to be an acceptable supplement. In recognition of colostrum’s natural ability to improve an athlete’s health and physical condition, the IOC ruled that colostrum is an acceptable supplement. They based their decision on the fact that although colostrum supplementation stimulates the production of IGF-1 in the body, the IGF-1 in colostrum is not actually absorbed but digested.^{137,138} So colostrum emerges as an ideal supplement for athletes, whether they are Olympic athletes or weekend warriors. It builds lean muscle, burns fat, protects from disease, and heals the leaky gut condition often associated with athletic training and performance.

Healing, Tissue Repair, and Injury Recovery

Colostrum has been known for its healing abilities since earliest times, being mentioned in Egyptian hieroglyphic texts for its healing properties[JC3] . Skin cells have receptors for growth hormone and IGF-1, showing that they have the ability to react directly to growth hormone stimulation.¹⁵⁷ IGF-II, also found in colostrum, plays a similar role.¹⁵⁸ Fibroblast growth factor (FGF) and epithelial growth factor (EGF), both found in colostrum, are important in healing skin wounds.^{159, 160} Burns suppress the levels of IGF-1 in the affected area,¹⁶¹ which explains why colostrum, with its high concentration of IGF-1, is excellent for burn recovery.

The growth factors in colostrum also accelerate the healing of muscle, tendon, and ligament injuries, such as are commonly experienced by athletes.^{162,163,164,165} Colostrum's growth factors stimulate regeneration and repair of muscle, bone, cartilage, skin, collagen, and nerve tissues, as well as RNA and DNA. This not only means faster, more complete recovery from injury and illness. It is also how colostrum stimulates age-erasing effects.

With prolonged use, the skin becomes more youthful, while age-spots and liver spots disappear. Sexual function is enhanced and bone density increases. Research published in the *New England Journal of Medicine*¹⁶⁶ has shown that transforming growth factor (TGF-b) found in colostrum is also produced by osteoblasts, the cells that build bone. TGF-b was found to dramatically increase cell apoptosis (programmed cell death) among osteoclasts, the cells responsible for breaking down and reabsorbing bone. In addition to colostrum, microcrystalline hydroxyapatite and DHEA are proven to increase bone density.

Colostrum also helps to balance blood sugar and replenish neurotransmitters, resulting in better alertness and concentration, while enhancing mood. Both serotonin and dopamine are released in greater quantities, while their re-uptake is prolonged, allowing each molecule to work longer and more efficiently. For this reason, it is generally best to take colostrum in the morning and again sometime before about 4:00 p.m. (e.g., around lunchtime or a couple hours after).

Weight Loss

Whole, first milking colostrum contains leptin (approximately 50 ng/g). Leptin, discovered in 1994, derives its name from the Greek word *leptos*, meaning thin. This is a polypeptide hormone produced in adipose and many other tissues with many different roles related to the inhibition of food intake and stimulation of energy expenditure. In embryology, its levels are associated with fertility and reproductive maturity in many species. There are several additional hormonal roles in the adult including satiety, adiposity, and metabolism. Higher levels of leptin as a neurotransmitter can accelerate the communication signals to stop eating sooner.

Colostrum also contains insulin-like growth factors. IGF-1 is the predominant of these and is in fact the real growth hormone, not GH which only stimulates the liver to produce IGF-1. IGF-1 is necessary to produce new cells. It stimulates tissue repair and recovery and lean muscle growth, increasing strength and endurance. But it also stops the digestion of our own muscle tissue to balance blood glucose to the brain in times of fast (between meals), and stimulates the utilization of stored body fats for fuel. The only supplementation for IGF-1 hormone is colostrum. The only other way to stimulate more hormone production is via weight training and endurance exercise programs. Colostrum has shown it can significantly enhance our body physiology and therefore improve our appearance and vitality.

To better understand colostrum's growth factors regarding weight loss, read the sections "Athletic Performance" and "Healing, Tissue Repair, and Injury Recovery."

Anti-Aging

Getting a little long in the tooth? Then colostrum is for you. Colostrum has many antioxidant and anti-aging components to keep you in top shape longer. It helps keep skin looking young and healthy. It removes dangerous free oxygen radicals, metabolic waste products that can cause you to age more rapidly. It supplies us with growth factors and other important substances that normally decline with age, leading to cell senescence and accelerated aging. Oxidation is the normal metabolism of nutrients in the body. As we age, we are less able to remove the byproducts of metabolism resulting in high levels of reactive oxygen species (ROS), which results in oxidative stress in the tissues.

What this means to us is rapid aging; damage to DNA, proteins, and lipids; and cancer and degenerative diseases, including arthritis.^{139,140,141} Colostrum can help clean up these waste products and counteract their negative effects on the body. It contains a number of powerful antioxidants, including glutathione, the

most powerful antioxidant known, and its chemical precursors.¹⁴² Glutathione itself is not absorbed through the intestinal wall, but the glutathione in colostrum still plays a major role in maintaining gastrointestinal health. The precursors, cystine, glycine, and glutamic acid, are absorbed and contribute to glutathione production in the body. Colostrum reduces respiratory burst output in white blood cells (polymorpho nuclear leukocytes), which has both an antioxidant and an anti-inflammatory effect.^{143,144} PRPs contribute to the antioxidant effect of colostrum by down regulating lipid per oxidation, inhibiting glutathione depletion, and reducing intracellular levels of ROS (reactive oxygen species).¹⁴⁵ Lactoferrin also has antioxidant properties, preventing lipid peroxidation.¹⁴⁶ Haemopexin is a protein found in milk and colostrum¹⁴⁷ that strongly binds haem, a low molecular weight form of iron that takes part in oxidative reactions in tissues. Haemopexin can inhibit these reactions by up to 90%.¹⁴⁸

Detoxification

Traditionally, detoxification requires taking a powerful herbal concoction that causes the body to dump fluids, thus flushing the system of impurities and toxins.

From the point of view of colostrum, however, this is a limited and potentially dangerous concept of detoxification that puts unneeded stress on the body and can do more harm than good. Colostrum detoxifies the body beginning in the gastrointestinal tract in a much healthier and more efficacious manner. Colostrum inhibits or destroys harmful pathogens that can colonize the gut and cause major health problems, such as *Helicobacter pylori*, the main cause of gastric and duodenal ulcers;^{149,150,151,152} *Candida albicans*, a fungus that can overgrow the intestines, forcing out beneficial bacteria;¹⁵³ and many other pathogens,^{154,155} while promoting the growth of beneficial bacterial colonies. Colostrum also acts to heal the damage to the intestinal lining caused by the pathogens and toxins that can accumulate there. This prevents pathogens and toxins from entering the body and restores normal gut functioning. Colostrum also helps protect and heal both the liver and the pancreas from the effects of toxins in the body by helping to remove dangerous toxins and by stimulating these organs to replace damaged tissue.^{156,157}

Topical Applications

Colostrum, mixed into a paste with water, helps the body heal injuries such as burns, cuts, abrasions, ulcers, acne, and even surgical wounds with topical application.^{159,167} Topical use in the mouth helps

relieve gingivitis, canker sores, and sensitive teeth and speeds recovery from dental work. It can be used in enemas and douches for help in eliminating candida albicans and other infections.

The Perfect Food

Colostrum is the perfect food, combining all the crucial immune and growth factors in the exact synergistic combination necessary to promote life. For many it is considered the ideal alternative to hundreds of pharmaceutical drugs, from antibiotics to steroids. Research on colostrum has documented benefits from dosages in the range of 2 to 60 grams per day with no known contraindications, side effects or allergic reactions reported over thousands of years of use. It is even safe for those with lactose intolerance. Some experts recommend taking it in a divided dose (at least 1 gram twice a day) with antioxidant water on an empty stomach for maximum benefits.

Here is a partial list of the benefits of colostrum:

- Anabolic activity
- Anti aging
- Antifungal
- Anti-inflammatory
- Antimicrobial
- Antiviral
- Auto immune disease (eliminating cause)
- Assimilation
- Athletic performance
- Blood pressure
- Blood sugar (glucose regulator)
- Body building
- Bone density
- Cancer
- Cholesterol
- Cytokines
- Colds

Diet

Diabetes

Digestion

Elimination

Endurance

Epithelial growth factor (EGF)

Fat reduction and utilization

Flu prevention and reduction of infections

Friendly flora growth

Gut health

Heart health

Increased lean muscle mass

Infections (prevention and elimination)

Insulin-like growth factor (IGF-1)

Immunity

Immunologist

Interferons

Interleukins-1, 3, 4, 5, 6, 8, 10, 12, 13, 16, 18

Intestinal permeability or leaky gut syndrome

Joint repair

Lactoferrin

methsulfonylemethane (MSM)

Muscle repair

Muscle tone

Mobility

Nutrient absorption

Pain

Prevention

Proline-rich Polypeptide (PRP) immune modulation and antiviral activity

Recovery time

Retinoic acids

Skin elasticity
Soil-based organisms
Sports performance
Strength
Stamina
Tissue repair and growth
Transforming growth factors alpha and beta (TgF-a and TgF-b)
Weight loss
Wound healing

Following is a list of some of the major conditions that your body may be able to better heal or prevent with colostrum:

Alcoholism
Allergies
ALS (Lou Gehrig's disease)
Anemia
Arthritis
Atherosclerosis
Autoimmune conditions
Asthma
Bacterial infection
Bone marrow transplant
Bone density
Bullous Pemphigoid
Campylobacter
Cancer
Candida albicans
Chlamydia
Cholera
Chronic Fatigue Syndrome (CFIDS)
Crohn's disease

Clostridium Difficile
Cystic fibrosis
Diarrhea (from all known pathogenic sources)
Dysbiosis
Epstein Barr virus (EBV)
E. coli
Fibromyalgia
Food poisoning
Fungal infection
Gut and stomach infections
Guillain-Barré Syndrome
Heart disease
Helicobacter pylori
Hepatitis
Herpes virus
HIV
Hormonal balance
Influenza
Intestinal parasites
Irritable Bowel Syndrome (IBS)
Joint repair
Kawasaki Syndrome
Leaky Gut Syndrome
Listeria
Lupus
Multiple Sclerosis
Muscular Dystrophy
Myasthenia gravis
Neutropenia
Osteoporosis
Overweight

Premature birth
Respiratory Syncytial Virus (RSV)
Rheumatoid Arthritis (RA)
Rotavirus
Osteo Arthritis
Osteoporosis
Salmonella
Scleroderma
Shigella
Staphylococcus aureus
Systemic Lupus Erythematosus (SLE)
Thrombocytopenia
Ulcers
Viral infection
Yeast infection

Colostrum as Functional Food

Functional foods are defined as those foods that have potential healthful benefits beyond the traditional nutrients they may contain. As such, colostrum has great potential as a functional food that can be easily combined with other healthful food products. Whole colostrum or various components of colostrum show great promise as an additive to infant formulas, for example, as well as other dairy products, such as yogurt. To obtain colostrum's IgF-1 growth factor benefits such as anti-aging, athletic recovery, lean muscle growth and retention, and recovery from injuries, it is best to use a colostrum powder mixed into a protein shake. For other benefits, including immunity, colostrum is most effective when in a protective capsule and taken on an empty stomach. Colostrum capsules and Liposomal enhanced delivery make colostrum's unique healing components up to 1,500% more bioavailable and therefore much more effective.

Summary

Mankind was never designed to eat processed foods, breathe polluted air, drink polluted water, or lead sedentary lives. Colostrum can help us restore some of our lost balance. It has shown great promise, for example, in treating autoimmune disorders, which can be traced back to leaky gut and nutritional or environmental imbalances. Colostrum can help repair the damage we do to our gastrointestinal tracts from taking antibiotics as well as pain and other medications, drinking alcohol and acidic beverages, and eating processed, fried, and unhealthy foods. It can help each and every one of us to lead a happier and healthier life.

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