CHAPTER 1

WHAT’S IN COLOSTRUM?

Colostrum is the first pre-milk substance that is produced by the mammary gland of female mammals, including humans, following the birth of the newborn. It is the first food tasted in this life by all mammals. It is a special substance that is very unlike other foods, even milk. It is loaded with immune factors, growth factors, and protective proteins as well as all the nutrients the newborn needs to survive. The immune factors in colostrum provide the immunity necessary to ward off potentially fatal infections until the newborn’s own immune system can get up to speed, and the growth factors help complete the development of the gut, which is not fully developed at the time of birth.

Mankind has known for thousands of years the benefits of colostrum to both the newborn as well as people of all ages. We will discuss the history of colostrum use in the next chapter, but it is important to understand that colostrum holds many benefits for all people. Strangely enough, however, it is not human colostrum that holds the greatest benefit for humans beyond the newborn stage but bovine (cow) colostrum. This is due to a difference in the placentas of cows and humans.

The human placenta allows the passage of immunoglobulin G (IgG), which is responsible for establishing systemic immunity, from mother to fetus. This means that a human baby is born with an immune system that is already primed and ready to begin its work defending the newborn against infection. The placenta of the cow, however, does not allow the passage of IgG from mother to fetus. Therefore when the calf is born it is completely unprotected from infection.
and needs the IgG in the mother's colostrum to survive. Thus bovine colostrum contains predominantly IgG (over 85% of total immunoglobulin) while human colostrum contains predominantly immunoglobulin A (IgA), which is designed for local immunity and is intended to help the newborn's immune system handle infections locally in the gut rather than establish systemic immunity. IgG, because it can pass immunity to a specific pathogen (disease-causing microorganism) from one individual to another, is therefore of much more benefit to humans past the stage of infancy. This is why bovine colostrum is much better for humans. It is also produced in great quantities by the mother cow far exceeding the needs of the calf.

For the consumer seeking a nutritional supplement that will help maintain his or her health, it is important to remember that colostrum is a multifunctional complex of bioactive ingredients produced by mammals for mammals (which means you). If you walk into a natural foods store and examine the products on the shelves, nearly all are derived from plants, and generally speaking, most have only one function. It is also important to remember that most plant-derived supplements or herbs have little if any scientific research to back up their health claims, while many thousands of scientific studies from all around the world and virtually every leading research institution have been done on the health benefits of colostrum and its many ingredients.

Colostrum is so complex that we are only beginning to understand how it all works together. New components are still being identified, and the mechanisms of action of known components are still being worked out. The one thing that can be said with certainty is that there is no simple replacement for colostrum. It does a multitude of tasks, and the individual components work together in a synergy that no combination of plant-derived components could ever simulate.

What Are the Legal vs Actual Definitions of Colostrum?

It is well known that colostrum is the first pre-milk substance that is produced by the mammary gland of female mammals, following the birth of the newborn. However, the legal definition differs from the actual definition.
The legal definition: In the California Food and Agricultural Code, section 35602, “Milk shall be obtained by the complete milking of healthy cows or goats which are properly fed and kept. Milk shall not be obtained or used for human consumption within 15 days prior to or 5 days after parturition.”

Defining colostrum as milk that is collected up to five days is more of a legal definition rather than an actual definition.

The actual definition: Colostrum is actually defined as “milk that is in the mammary glands at the time of birth.” Milk that is manufactured after the birth is characterized as “transitional milk”; actually, the third and fourth milking is transitional milk. By the time of the fifth milking, analytical methods indicate that the milk has essentially the same chemistry as that of mature milk.

One of the main reasons why this five-day period was implemented initially is because most cows, especially older cows, received antibiotic treatments to protect their udders from infection during their dry period, which is typically 45–60 days. After that period the cow could birth another calf. These older antibiotic treatments have a 72-hour withholding period, so one cannot consume the colostrum within 72 hours of birth.

With the advent of modern veterinary dry-cow therapies (beta-lactam drugs or preservatives), these typically have a 28-day withholding period. Thus the residual antibiotics have been removed well before the calf is born (45–60-day non-milking or dry period). So colostrum is safe to consume for animals and humans.

A consumer should seek colostrum powder in the market that is labeled “First Milking.” This can also include the second milking because the second is actually the remaining first milk that was not removed on first milking. See Figure 1, page 64, HPLC graphs of colostrum showing IgG peak at 8 minutes for the first eight milkings after giving birth. A consumer should also look for colostrum peptide (PRPs) content not less than 3% by weight.
Chapter 2

A Brief History of Colostrum

The history of colostrum use, chiefly bovine colostrum, is as old as history itself. Cow and man have enjoyed a symbiotic relationship since before the last ice age. The cow served both as a source of food and a beast of burden. The cow was at the center of the primitive agricultural economies that were the foundation of civilization. The ancient auroch, an extinct species of cattle from which modern cattle are descended, play a prominent role in the 17,000 year old cave paintings found in Lascaux, France—the oldest human art known. Selective breeding of cattle was practiced in Mesopotamia as early as 5,000 BCE.

In Europe, cows and men have lived intimately for centuries. Cows often shared the farmer’s home in cold times. In England and Scandinavia, colostrum is a traditional tonic and folk remedy given to the entire family in the spring to keep them healthy for the entire year. The first milking of a cow following a calving is traditionally made into a pudding called beestings to celebrate the birth and promote good health.¹

Ayurvedic medicine has used colostrum for thousands of years in India where it continues to be widely used today. Cows are considered to be gods in India.² Hieroglyphic texts show that colostrum was used by the Ancient Egyptians as well. On one stele in a temple dedicated to Hathor, the cow goddess and symbol of rebirth, the goddess is depicted suckling the Pharaoh, offering her colostrum as the elixir of metamorphosis to confer immortality upon the king.³
Masai tribesmen in Kenya drink bovine colostrum by the liter because they knew how good it is for them. They are well-known for their toughness under extreme conditions and their healthy constitutions. Cows are considered their most important form of wealth, and they even sing songs of praise to colostrum in recognition of the health it gives them.\(^4\)

However, taboos against the use of colostrum during breastfeeding are found worldwide. Delaying breastfeeding until the fifth day and using a combination of honey and clarified butter (ghee) to evacuate the meconium was practiced in India by the second century BCE. In the Bible, a reference is made to giving curds and honey to the son born of a virgin “until he knows how to reject the evil and choose the good.”\(^5\) This taboo, derived from ancient Greek and Roman sources, carried through to seventeenth century England and France.\(^6\) The taboo against colostrum persists in many cultures even today.\(^7\)

When Antony van Leeuwenhoek—Dutch inventor of the microscope and discoverer of bacteria, red blood cells and protozoa—first peered through his new invention, he was looking at milk. This was in 1674.\(^8\) Both Paul Ehrlich, the “Father of Immunology,” and Elie Metchnikoff, another great nineteenth century immunologist, studied the immunologic properties of colostrum.\(^9,10,11,12\) When Albert Sabin, inventor of the oral polio vaccine, made his first polio vaccine, he used antibodies from bovine colostrum.\(^13,14\)

Prior to 1950, colostrum was intensively studied and used for its immune boosting powers and as a treatment for rheumatoid arthritis, for which it showed great promise. Unfortunately, with the advent of sulfa drugs, cheap antibiotics and other synthetic drugs, interest waned in natural remedies. The benefits of colostrum were lost for over forty years.

Prior to 1980, colostrum was harvested in North America from buffalo and goats. Post-1980s, colostrum was then sourced from bovine or cows owing to the abundant availability of this raw material.
Colostrum remained largely forgotten until 1994 when a man in Utah rediscovered its amazing qualities in his search for relief from his wife’s intolerable suffering. That man was Doug Wyatt, and it was his efforts to find relief for his wife Kaye that opened the door to the rediscovery of the many health benefits of colostrum and began the nutraceutical revolution that continues today. Here is Doug and Kaye’s story in Doug’s own words:

The beginning of the story of colostrum begins for us in 1994. In 1994, my wife, Kaye, came to me and asked me to help her find a way to die. It was the most shocking experience, the most emotional experience, that I had ever had up until had that point. I’m a Vietnam veteran. I’m a Marine pilot, and I flew helicopters in Vietnam. That process, that emotional process for me was nothing compared to what happened that day when Kaye came to me with this startling request.

I have to be very honest with you about this. At that point in time we had tried everything that the medical community had to offer, everything that the alternative community had to offer, every natural healing supplement, Chinese medicine, herbal products, homeopathic products, acupuncture…everything that you could imagine that was
available up until that point in time, and nothing worked. The problem
was that Kaye, when she was an infant, had had her thymus gland
irradiated by a medical doctor. The thymus produces T cells, and if
any of you have read any literature on AIDS, you understand what
T cells are. They are the thing that we measure as a component to
see how well the immune system is functioning during the process of
an onset of AIDS and other immune diseases, like Hepatitis C, etc.
If you can’t produce T cells, in essence, you cannot ward off infection
because they are the backbone of this, the very cornerstone of our
immune system and how well it functions. So [it was] Kaye’s inability
to produce [T cells], with her thymus gland mostly destroyed through
this treatment process, that, by the way, happened to about a half a
million Americans, most of which are not alive today, and it was one
of the big medical mistakes that took place in the ‘50s.

So the only thing that we had left at that time was prayer, and
that prayer was in earnest. I have to tell you that we were honestly
blessed out of that process because the very next morning I was
working with a friend of mine who happened to have a couple of
PhDs, and I didn’t know about one. We were working on a financial
issue for the State of Wyoming, and I found out during that pro-
cess that he was also an MD, a naturopathic doctor, who had been
trained in Europe. We got into this because he said, “Doug, you’re
not here with me this morning. We’re not going anyplace, and I want
you to talk about it. I know that might be difficult, but something is
really going on.”

So we started talking about the history of Kaye’s process. Kaye’s
a very private person, and we’d never shared this. We hadn’t shared
this with her family, so I had no reason to share it with anybody out-
side of our relationship other than the medical professionals we were
working with to try and find a process to deal with it. During that
conversation he asked me if I had looked into bovine colostrum. This
was really not all that long of a conversation. It was one of the first
things that he actually went to, and it was something that I’d missed
because it wasn’t sitting on the shelf of the health food stores and

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none of the practitioners in the United States at that time thought about it, and of course, most of them are vegans, so you couldn’t possibly get well from something that came from a cow.

It clicked with me, and I went, wait a minute, we’re a mammal, we’re not a plant. Plant phytochemicals are basically what we continue to look for. We look for those with drugs. We’re down in the Brazilian rainforest and we’re hunting for everything in the world and we create plant phytochemicals and that’s what becomes our pharmaceuticals, but wait a minute, these are single action substances, and we’re talking about an immune system here that isn’t working, and I don’t believe there’s any one single substance on the planet that is going to replace Kaye’s immune system. And I guarantee you there is not one single substance on the planet that will replace or provide a modulation for a human or a mammal’s immune system except one thing, and that is the immune system’s components itself.

So when I was given this reward the next morning, which I felt was heaven sent, I immediately thought back to the time when I was a child when I worked on my grandfather’s ranch in Southern Idaho. Every summer that was my summer experience. I got sabbaticaled out to put up the hay and milk the cows and brand the cows and cut the cows and go combine wheat, and I knew the calves, the horses, the foals, that this baby calf would die if it didn’t get colostrum within 8 hours after birth. That was the end of it. That was how the immune system was passed on. So colostrum was the immune system, and it came to me at that point in time.

I bought a quarter pound of dried colostrum from this guy. He was actually drying it in his kitchen, of all places. He was getting it from a local dairy farmer. You have to dry it, or you don’t have any shelf life. You don’t want to throw colostrum away in two weeks because you only get it for one or two days out of the cow after birth, right after birth. So I took this home, and Kaye said, “You paid what for what? You take it back!”

I had a couple of abstracts that I’d been able to get out of him. He had a little bit of information on anti-inflammatory action and
pain relief in colostrum, gastrointestinal, immune support, etc., and the fact that it imparts immunity to everything that the mother had been exposed to in her life. So this made sense, and I hid it and kept leaving these abstracts out. It was like a day or two later that Kaye sprained her knee very, very badly, and she came home barely able to make it. We go to the emergency room, she comes back, and it was a bad sprain, not a break, and she had a wrap-on cast on her leg, and she said, “OK, I’ll take some of your dang stuff.” “Your dang medicine,” she called it. Of course, it isn’t medicine, it’s natural food, but she took a couple of teaspoons of colostrum and went to bed in a lot of pain. Of course, trying to roll over in the middle of the night, this thing gets in the way, so she unstrapped it and threw it off by the side of the bed.

The next morning I’m up having coffee and reading the paper, and she walked in the kitchen. I went, “Kaye!” And she goes, “What!” It’s early—no coffee yet. “Kaye!” She says, “What?” I said, “Your leg!” And she pulled up her nightgown and was like, “Huh?” All of the black and blue, all of the swelling, everything had gone virtually overnight. We couldn’t believe it.

It was amazing, and it was so amazing that we were sitting back and saying, OK, maybe some of this other information that we were reading about colostrum is true too. So she kept taking colostrum, and within a couple of days—Kaye had had an ongoing, low-grade fever because of her inability to rid her body of constant infectious processes, so she constantly had infections going on, growing into this or growing into that—colostrum for the first time in about 8–10 years broke that low-grade fever, and it was the most startling event that had happened in all the time that I’d known Kaye, 15 years. And it changed her life.

I can honestly say this made the biggest and most important change in her life, in our lives, and in my life, in our family life, in giving us an ability to have hope for the future, to have an idea that maybe this request that she made to me could be set aside, that maybe we could think about having a life. That change worked and worked
and worked, and it was so startling. What happened with her is that she didn’t need antibiotics every 3 months. She didn’t get every cold and flu that came along. In fact, if they came along, they were gone in an hour or two or overnight. That never happened with Kaye. Every time she got a cold it turned into flu, it turned into pneumonia. Every time.

We were so startled by this that we were inclined to do a couple of things. We didn’t have access to the medical library through the Internet at the time. There was no ProMed, and there was no Web-Net. There was no ability to do research, clinical research, out of your home. The only way you could do that is by going to the medical school. We lived in Salt Lake City. We went up to the University of Utah. We found a friend through another divine intervention, another act of prayer and another gift the next day, and this lady I met working out took her home and introduced her to Kaye. She became very good friends, is Kaye’s best friend today, to this very day. What was interesting, and I don’t know why she was inclined, was that she came to me and said, “What can I do? My husband has been home and in bed for 2½, 3 weeks. He’s on massive antihistamines, every drug that the doctors can find. He has massive allergies. He has hives all over his body, down his esophagus, inside and out, clear throughout him. He can’t even stand to have a sheet touch him, can’t stand to have his clothes touch him, can’t eat because his whole mouth and all his insides are full of hives, and they itch and they’re painful and they’re killing him. They’re driving him crazy.” So I gave her some colostrum, Kaye and I did, and she took it home. Within a day, day and a half, she came back and said they’d all disappeared. All of these hives had disappeared that quick.

We found out she was a medical researcher, so she got us into the University of Utah Medical School. We went online there, and we filled four file drawers full of research on colostrum. We did this, and I have the receipts for it, and I can prove it. We did this, Kaye and I, and we wrote a book out of this. We wrote it with Dr. Daniel Clark out of Florida, who is a cancer and internal medicine specialist.
We felt that the information that we found was the most astounding information that we could possibly put together. There weren’t any MDs, there were no healthcare specialists in our field, there were no wellness people that had ever seen any of this, it had not been published in the newspapers, it had not been published anyplace where the consumers could find it. We’re talking thousands and thousands of clinical studies that had been published in peer review journals, and when I’m talking peer review, that means the kind of journals where the article is submitted and a group of doctors review the article for facts and for accuracy before it’s ever published. We’re talking over 10,000 articles that were published, clinical work that had been done on colostrum, bovine colostrum, its components, and the information was absolutely startling. That information gave us a basis in compiling that to go out and start educating people about what colostrum would do, colostrum’s overall benefits to a whole bunch of things besides Kaye’s immune system.

But I think it’s important to understand really what happened in this. We were the pioneers of colostrum. There were no others.

After discovering the amazing health benefits that colostrum provides, Doug decided he had to let others know about what he had discovered, and he had to find a way to mass produce the colostrum so that whoever needed it could get it. He soon discovered that there were no sources for colostrum anywhere in the US that met the stringent standards set by the USDA for the handling of milk for human consumption. Colostrum was considered a waste product by most dairy farmers. What colostrum was sent to the processors was usually set aside in a can by the side of the road until someone came to collect it. The only commercial sources for colostrum were animal feed companies who sold dehydrated colostrum in bags to dairy farmers who gave it to calves who needed more than their mothers could provide to survive.

Doug decided he needed to figure out a way to improve the collection, processing and distribution of colostrum to meet standards for human consumption, and he needed to figure out a way to process the colostrum to give it a shelf life
longer than two weeks, which is the approximate shelf life for whole liquid co- 
lostrum. Initially he used colostrum from dairy farms where he talked the farmers 
into using a freezer to store the colostrum until it could be picked up rather than 
leaving it by the side of the road. Then he worked on finding dairy companies 
who could process the colostrum using the same quality standards they em-
ployed for producing milk for human consumption. The FDA approves all dairies 
where milk is processed for humans, but colostrum processing at the time was 
only regulated by the USDA, and they regulated it as animal feed, which has much 
lower standards than human food. But Doug persisted, and he got a few dairies 
to start using sterilized equipment for processing.

Then he worked on the drying process. The traditional way of drying colostrum 
was spray drying. The colostrum would be sprayed through hot air coming off a 
gas flame. This worked to dry the colostrum, but the problem was the natural 
gas used for the heat. Natural gas produces nitrates as a combustion product, so 
the colostrum would pick up nitrates in the drying process. Nitrates can act as 
carcinogens, so a way had to be found to dry the colostrum without exposing it 
to natural gas.

Then Doug discovered New Zealand colostrum produced by the New Zealand 
Dairy Board. Here colostrum produced was to human standards in a country 
well-known for the pristine state of its environment. They have very strict en-
vironmental laws and no big pollution producing industry. At the time, New 
Zealand was producing the highest quality colostrum available, so Doug entered 
into an agreement with them to produce colostrum for sale in the US through 
the company he started, Symbiotics, located in Sedona, Arizona. When colos-
trum became popular as a nutritional supplement in the US, however, conditions 
began to improve. The demand for high quality colostrum gave dairy farmers an 
incentive to improve collection and handling techniques for colostrum. In 2003, 
the only processing plant exclusively dedicated to colostrum was built in Phoenix, 
Arizona. It draws colostrum from organic-like dairy farms located throughout the 
Southwest and produces the highest quality colostrum available anywhere. We 
will discuss the process of colostrum production in Chapter 5.
Chapter 4

What Is Colostrum Good For?

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

Gut 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 since 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’re 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, who was mentioned in Chapter 2. When that proportion gets off 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.\textsuperscript{15,16} 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.\textsuperscript{17,18,19} It contains massive doses of immunoglobulins which 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 \textit{H. pylori},\textsuperscript{20,21} 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.\textsuperscript{22,23,24} And there are no known side effects from using colostrum.

### Leaky Gut Syndrome (LGS)

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 put together. Basically, it is caused by
inflammation of the gut lining. This inflammation can be brought about by any of the following:

- Antibiotic use—leads to the overgrowth of abnormal bacteria in the gastrointestinal tract
- Alcohol and caffeine—these can irritate the gut wall
- Foods contaminated by parasites
- Foods contaminated by bacteria, such as E. coli
- Chemicals (including dyes and preservatives) in fermented and processed foods
- Prescription corticosteroids
- An abundance of highly refined sugars and other carbohydrates in your diet (e.g., candy bars, cookies, soft drinks, white bread)

LGS damages the protective coating of antibodies of the IgA family normally present in a healthy gut. Since IgA helps us ward off infections, leaky gut problems make us less resistant to viruses, bacteria, parasites and Candida. 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. 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.
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 or Streptococcus, but it can also protect you against a number of viruses, from 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 since 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 immunoglobins, 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 forty 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 acid would decrease colostrum’s im-
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Immune effects. Swallowing colostrum in a capsule with a large glass of alkaline, antioxidant water (coral water or electrolysis water) between meals (or at the very start of a meal) should be optimum for immune benefits.

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 health 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. 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. 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. 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*.

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 natural antimicrobial and antiviral. 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.
Infections, such as intestinal infections that cause diarrhea, can be a real killer. 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. Colostrum showed similar results against shigellosis. 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 pneumoniae* (an intracellular parasite), for example, may be a triggering factor in atherosclerosis. 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. Immunoglobulins, part of the adaptive immune system [see Appendix A for a brief review of the 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 (called opsonization), 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, including such dangerous bacteria as *H. pylori* (implicated in ulcer formation in the stomach), *E. coli* (a natural inhabitant of the GI tract that has a number of very dangerous strains that can cause severe diarrhea or intestinal bleeding), pertussis, cholera, and bacterial causes of severe diarrhea, 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 viruses and even protozoan parasites, such as amoebas, which cause dysentery and other GI diseases.
What is Colostrum Good For?

But immunoglobulins are 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.50

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 many bacteria and fungi, such as Candida,51 need to reproduce. It can prevent the colonization of Haemophilus influenzae, the primary cause of ear and respiratory infections in children, by inactivating its colonization factors.52 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.53 It also acts in conjunction with lysozyme to destroy Candida.54 Lactoferrin is a potent destroyer of viruses as well, including cytomegalovirus (can cause birth defects and death in fetuses),55 HIV (AIDS virus),56 hepatitis B57 and C,58 rotavirus (the main cause of diarrhea in infants),59 influenza virus, respiratory syncytial virus (causes colds in adults60 and severe bronchitis and pneumonia in children) and herpes simplex types 1 (cold sores) and 2 (genital herpes).61,62

In addition to its antimicrobial role, lactoferrin has other important immune functions. Lactoferrin from colostrum increases both motility and superoxide production by polymorphonuclear leukocytes (white blood cells), making them more effective in warding off infections.63 It strongly augments natural killer cell and lymphokine-activated killer cell cytotoxic activity.64 Lactoferrin is also a required growth factor for lymphocytes, the principal cell type of the immune system,65 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.66,67

Other components of the innate, or non-specific, immune system are also pres-
ent in colostrum. One important component of this system is the glycoconjugates found in colostrum and milk. Glycoconjugates are proteins, fats or complex sugars (polysaccharides) that have sugar molecules attached to them. These sugar molecules compete with pathogens for binding sites on the intestinal wall. Complement, 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 defensins (polypeptides that disrupt bacterial membranes, killing them), toll-like receptors (pattern recognition detectors which help the immune system identify new pathogens), and cathelicidin-derived antimicrobial peptide (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 colostrinin, which has the ability to modulate the immune response by either turning up an underactive immune system or turning down an overactive one. PRPs can also induce the growth and differentiation of resting B lymphocytes, 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 cells—specialized lymphocytes whose function is to attack and kill invading pathogens. Lactoferrin also stimulates the activity of natural killer and other immune cells.

Diabetes

Both Type 1 and Type 2 diabetes can express autoimmune characteristics. 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.84

Type 1, or juvenile onset diabetes, can also be considered an autoimmune disease.85 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.86 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.

This type of 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.87

Once an individual has developed Type 1 diabetes the treatment options are very few. 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.88 After administering IGF-1 to patients, the doctors noticed a two-fold 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. These individuals lose the ability to produce insulin and must be augmented with insulin therapy for the remainder of their lives. Specific autoantibodies 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 autoantibodies. 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.

**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 PRPs specifically, have been shown to be of benefit in a number of autoimmune conditions, such as multiple sclerosis, rheumatoid arthritis, asthma, systemic lupus erythematosus, several experimental autoimmune responses to red blood cells, and hemolytic anemia.

Chemokines (chemoattractants 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.96,97 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.98 Causally speaking, immune factors, neurochemical factors, antibiotics,99 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.100 Immune therapies, such as PRPs and colostrum, have been of benefit in some cases, however.101

**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.102 Another recent study concluded that heart disease is the result of immune sensitization to cardiac antigens.103 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-I 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. 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. The calcium found in milk and colostrum also contributes to lower blood pressure.

**Influenza**

A recent study 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 US 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*. 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. Since Rosenberg’s time, the same cytokines found uniquely in colostrum (interleukins 1, 6, 10, interferon-γ, and lymphokines) have been the singlemost researched elements in the search for the cure for cancer.

Colostral 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 neovascularization (see also: angiogenesis). Tumor cells engineered to express high levels of PRPs show markedly reduced growth rates as tumors in mice. The protein also acts on human endothelial cells. 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.

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. Lactoferrin has also been shown to
boost the cytotoxic activity of natural killer cells against blood and breast epithelial tumor cell lines\textsuperscript{126,127} and to inhibit the growth of breast cancer cells.\textsuperscript{128}

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.\textsuperscript{129}

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.\textsuperscript{130}

**AIDS (HIV)**

Several unpleasant features make HIV one of the most frightening bugs 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.\textsuperscript{131}

Another study\textsuperscript{132} indicates that the colostral 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
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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 are 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.\textsuperscript{133}

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. Cryptosporidia 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 study\textsuperscript{134} showed that out of 37 immuno-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.\textsuperscript{135}

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.”

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\(^{136}\).

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 like One Step. Friendly flora, which naturally promote a healthy acidity level in the colon, may also enhance the benefits of colostrum.

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\(^{137}\). Another study on marathoners showed decreased natural killer cell activity after a race\(^{138}\). 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\(^{139}\). Colostrum, combined with proper nutrition and rest, 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\(^{140}\) and it can help heal “leaky gut” in athletes which can be caused by protein supplementation\(^{141}\). Colostrum also speeds the healing of muscle, tendon and ligament injuries.
Other studies on athletes have shown that colostrum can lower recovery times and increase anaerobic power.\textsuperscript{142,143,144} Colostrum supplementation also builds lean muscle tissue and burns fat.\textsuperscript{145}

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.\textsuperscript{146,147}

So colostrum emerges as an ideal supplement for athletes, whether they’re Olympic or professional level 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.

**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.\textsuperscript{148,149,150} 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.\textsuperscript{151} 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 (polymorphonuclear leukocytes), which has both an antioxidant and an anti-inflammatory effect. PRPs contribute to the antioxidant effect of colostrum by down-regulating lipid peroxidation, inhibiting glutathione depletion and reducing intracellular levels of ROS (reactive oxygen species). Lactoferrin also has antioxidant properties, preventing lipid peroxidation. Haemopexin is a protein found in milk and colostrum 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%.

**Detoxification**

Traditionally, detoxification means 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 efficacious manner. Colostrum inhibits or destroys harmful pathogens which can colonize the gut and cause major health problems, such as *Helicobacter pylori*, the main cause of gastric and duodenal ulcers, *Candida albicans*, a fungus that can overgrow the intestines, forcing out beneficial bacteria, and many other pathogens, 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.
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.

Healing, Tissue Repair and Recovery from Injury

Colostrum has been known for its healing abilities since earliest times, being mentioned in Egyptian hieroglyphic texts for its healing properties. Skin cells have receptors for growth hormone and IGF-1, showing that they have the ability to react directly to growth hormone stimulation. IGF-II, also found in colostrum, plays a similar role. Fibroblast growth factor (FGF) and epithelial growth factor (EGF), both found in colostrum, are important in healing skin wounds. Burns suppress the levels of IGF-1 in the affected area, 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.\textsuperscript{171,172,173,174}

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 \textit{New England Journal of Medicine}\textsuperscript{175} has shown that transforming growth factor (TGF-\(\beta\)) found in colostrum is also produced by osteoblasts, the cells that build bone. TGF-\(\beta\) 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 PM (e.g. around lunchtime or a couple hours after).

\textbf{Intestinal Permeability}

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 an abnormally increased gut permeability. These include Crohn's disease, cholera,
Salmonella and E. coli infection, HIV, arthritis, chronic fatigue syndrome, hepatitis, cystic fibrosis, alcoholism, muscular dystrophy, fibromyalgia, and scleroderma. 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 singlemost 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 intake, and lots of 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.

**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.⁶⁸,¹⁷⁶ Topical use in the mouth helps relieve gingivitis, canker sores, sensitive teeth and speeds recovery from dental work.

**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,
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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 some of the benefits of colostrum:

- Anabolic activity
- Antiaging
- Antifungal
- Anti-Inflammatory
- Antimicrobial
- Assimilation
- Athletic performance
- Body building
- Bone density
- Cytokines
- Digestion
- Elimination
- Epithelial growth factor (EGF)
- Friendly flora
- Insulin-like growth factor (IGF-1)
- Immunity
- Immunoglobins
- Interferon
- Interleukins-1, 3, 4, 5, 6, 8, 10, 12, 13, 16, 18
- Intestinal permeability
- Lactoferrin
- Methyl Sulfonyl Methane (MSM)
Muscle tone
Prevention
Proline-rich Polypeptide (PRPs)
Recovery time
Retinoic acids
Skin elasticity
Soil-based organisms
Sports performance
Stamina
Terrain
Transforming growth factors alpha & beta (TgF-α & TgF-β)
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
ALS (Lou Gehrig’s Disease)
Anemia
Arthritis
Atherosclerosis
Autoimmune conditions
Bacterial infection
Bone marrow transplant
Bullous Pemphigoid
Campylobacter
Cancer
Candida albicans
Chlamydia
Cholera
Chronic Fatigue Syndrome (CFIDS)
Crohn’s disease
Clostridium
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Cystic fibrosis
Diarrhea
Dysbiosis
Epstein Barr virus (EBV)
E. coli
Fibromyalgia
Food poisoning
Fungal infection
Guillan-Barre Syndrome
Heart disease
Helicobacter pylori
Hepatitis
Herpes virus
HIV
Influenza
Intestinal parasites
Irritable Bowel Syndrome (IBS)
Kawasaki Syndrome
Listeria
Multiple Sclerosis
Muscular Dystrophy
Myasthenia gravis
Neutropenia
Osteoporosis
Overweight
Premature birth
Rheumatoid Arthritis (RA)
Rotavirus
Salmonella
Scleroderma
Shigella
Staphylococcus aureus
Systemic Lupus Erythematosus (SLE)
Thrombocytopenia
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. It is used as an ingredient in nutritional supplements such as Nutriboost. By itself colostrum can be put in capsules or tableted for easy consumption.

In Summary

Mankind was never designed to eat processed foods, breath 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 often be traced back to nutritional or environmental imbalances. Colostrum can help repair the damage we do to our gastrointestinal tracts from eating processed, fried and unhealthy foods. It can help each and every one of us to lead a happier and healthier life.
How colostrum is collected and processed matters. Care must be taken to preserve the bioavailability of the components of colostrum in order for it to be effective.

First, the cows used for colostrum production must be organically raised and pasture fed to ensure that the colostrum contains antibodies to a wide variety of pathogens. The Southwestern United States is ideal for colostrum production as cows give birth year round, rather than just in the spring as occurs in most locales. Grass used for feed is grown on DDT-free soil. The dry desert climate helps minimize insect populations without the need for pesticides. The cows should not be given hormones or antibiotics.

After collection, the colostrum should be frozen or cooled below 40°F to maintain freshness until it reaches the processing plant. At the plant, the frozen colostrum must be thawed and then homogenized to restore the casein micelles that protect the proteins. Freezing colostrum does not damage its proteins if done properly. Processing should be done daily to ensure freshness and maximum quality.

First and second milking colostrum are the richest in immunoglobulins, growth factors and peptides. These milkings should be done only after the calves have had their fill to ensure their survival. The graph below shows that first and second milking colostrum has a higher percentage of IgG than subsequent milkings.
While the concentrations of immunoglobulins and growth factors decrease over time, other factors, including lactose, increase. The amount of lactose is important for lactose-intolerant individuals as higher levels are more likely to produce an allergic response.

Colostrum must then be properly dried and defatted. Colostrum that is not defatted will quickly go rancid. This deactivates many of the components of colostrum, such as vitamin A, and makes it unpalatable. There is no evidence that defatting the colostrum in any way affects the bioavailability of its components.

As with any dairy product, the colostrum must be pasteurized to guarantee safety. Most producers of colostrum use high heat pasteurization and drying processes.
Collection and Processing

that can denature the proteins in colostrum. They use this technique because they process their colostrum in milk processing plants that use high heat pasteurization to pasteurize the milk. This batch pasteurization method can destroy up to 58% of the IgG in colostrum. Ultra high temperature (UHT) sterilization of colostrum destroys all IgG and protein activity. Unfortunately, most commercially available milk in the US is prepared using UHT, resulting in most milk in the grocery dairy section being biologically inactive. A preferable technique called high temperature short time (HTST) pasteurization, or flash pasteurization, preserves the bioactivity of the proteins while still ensuring that any pathogens are killed. Both temperature and time are important in maintaining bioactivity of IgG in colostrum. The higher the temperature, the shorter the time it takes for denaturation of IgG to take place. Other components, such as growth factors, 

---

Figure 2. Proportions of various components of colostrum at different times following birth.

<table>
<thead>
<tr>
<th>Time After Birth, hr</th>
<th>Total (i) Protein %</th>
<th>Casein %</th>
<th>Albumin %</th>
<th>Fat %</th>
<th>Lactose % (ii)</th>
<th>Ash %</th>
<th>Total Solids % (iii)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>17.57</td>
<td>5.08</td>
<td>11.34</td>
<td>5.10</td>
<td>2.19</td>
<td>1.01</td>
<td>26.99</td>
</tr>
<tr>
<td>6</td>
<td>10</td>
<td>3.51</td>
<td>6.30</td>
<td>6.85</td>
<td>2.71</td>
<td>0.91</td>
<td>20.46</td>
</tr>
<tr>
<td>12</td>
<td>6.05</td>
<td>3.00</td>
<td>2.96</td>
<td>3.80</td>
<td>3.71</td>
<td>0.89</td>
<td>14.53</td>
</tr>
<tr>
<td>24</td>
<td>4.52</td>
<td>2.76</td>
<td>1.48</td>
<td>3.40</td>
<td>2.98</td>
<td>0.86</td>
<td>12.77</td>
</tr>
<tr>
<td>36</td>
<td>3.98</td>
<td>2.77</td>
<td>1.03</td>
<td>3.55</td>
<td>3.97</td>
<td>0.83</td>
<td>12.22</td>
</tr>
<tr>
<td>72</td>
<td>3.86</td>
<td>2.70</td>
<td>0.97</td>
<td>3.10</td>
<td>4.37</td>
<td>0.84</td>
<td>11.86</td>
</tr>
</tbody>
</table>

(i) Contains cytokines and other protein compounds of very low molecular weight that act as Biologic Response Modulators (BMRs), which intervene locally in most biological processes.
(ii) Lactose has a great influence on allergic-like responses experienced by some individuals due to the lack of lactase and β-galactosidase. Unlike immunoglobulin IgG, lactose rises in value from the first milking through subsequent several milkings.
(iii) Total solids are determined by the dried solids by the original quantity of liquid started with.
are similarly affected.\textsuperscript{184} Lactoferrin subjected to UHT was not destroyed, but its ability to bind various bacterial species was decreased, and its ability to inhibit bacterial growth was destroyed.\textsuperscript{185}

Following pasteurization, the colostrum is dried into a fine pale yellow powder. The preferable method is spray drying at temperatures less than 145°F using an indirect steam heating method. Many colostrum producers use direct heating from gas flames which introduces dangerous nitrogen oxide chemicals into the colostrum.

Following drying, the colostrum should then be agglomerated to produce consistently sized particles. This allows the colostrum to more readily dissolve in liquid. It is also important that the manufacturer follow Good Manufacturing Process (GMP), including microbiological analysis on each batch to ensure safety and the highest quality.

Immunoglobulins should be quantified using Ion Exchange HPLC-MC (Minus-Casein, not by Ion Exchange HPLC Protein G alone), or by Radial Immunodiffusion (RID).

Most manufacturers stop here, but the highest quality colostrum will have a lipid coating that forms liposomes (lipid globules) around the proteins for protection and easy absorption in the gut. This replicates the globules in milk produced in the mammary gland and provides the best possible delivery system for the colostrum. The best liposomes are formed using the same phospholipids found in milk globules and which also make up the cell membranes of all cells in the body, phosphatidylethanolamine, phosphatidylcholine, phosphatidylinerine, phosphatidylserine, phosphatidylinositol, and sphingomyelin. Phospholipids are unique in that they are soluble in both water and oil, ensuring they remain in solution until they reach the gut lining where they fuse with the cell membranes of the cells lining the gut. Their contents then pass into the bloodstream for use within the body without being digested or degraded.

There are several types of phospholipids that can be used to produce the li-
posomes. One is extracted from the anhydrous milk fat in cream and may be referred to as Alpha-lipid, Beta-lipid or BIO-lipid™. Another type of phospholipid that is used for liposomal delivery systems is lecithin, which is usually composed of phosphatidylcholine, one of the major membrane phospholipids in the body. A new type of coating is made up of vegetable oils, usually derived from soybeans. Phospholipids tend to form liposomes spontaneously in solution. The basic makeup of a cell membrane is shown in Figure 1.

![Figure 1. Typical cell membrane structure with bilamellar phospholipid organization.](image)

Note that the hydrophilic ends of the phospholipids all point out, and the hydrophobic (lipophilic) ends all point in towards the other layer of the membrane. The benefit of using phospholipids to make the liposomes in the delivery system is that phospholipids themselves are beneficial to one’s health, particularly brain and nervous system health, cell signaling pathways, and anti-aging benefits.

In addition to protecting the contents from digestion in the gastrointestinal tract, liposomes also aid in dispersion. The large proteins in colostrum tend to clump together and disperse poorly if just put into solution. Inside liposomes, they disperse evenly and thus are more likely to be absorbed in the gut. Freeze facture
electron microscopy of phospholipid liposomes show that they can be produced in unilamellar or multilamellar forms for different applications.

Always check to make sure that any colostrum you purchase meets the criteria listed in this chapter. Only then will you receive any benefit from the colostrum. Colostrum is a biologically active product. The quality of a good colostrum is determined by the quantity of bioactive constituents of the colostrum product and not by marketing hype.

**Figure 2. Freeze fracture electron micrographs of different BIO-lipid preparations showing both unilamellar and multimlamellar liposomes.**
CHAPTER 6
WHAT’S IN COLOSTRUM?

Not an easy question to answer! Scientists are still unraveling the amazingly complex web we call colostrum. However, we have a good idea of the main ingredients and how they work. This list is not exhaustive but indicative of how complex this life-giving substance is.

IMMUNE COMPONENTS

Immunoglobulins

The natural environment contains a large variety of infectious microbial agents—bacteria, viruses, and fungi. If left unchecked and allowed to multiply, pathogenic species will eventually kill the host. In normal healthy animals most infections are of limited duration and cause little if any permanent damage. This is due to the immune system—a natural defense mechanism that helps ward off or combat infectious agents.

Immunoglobulins have an integral role in this defense system in that they function as antibodies. There are five classes of immunoglobulin recognized in mammals: IgG, IgA, IgM, IgE, and IgD. While the most prevalent class in most mammals is IgG, the other immunoglobulins also have very important functions. The fact that in human milk and colostrum IgA is the predominant immunoglobulin should be noted. The main function of these molecules is to bind to invading organisms and to activate specific mechanisms that help rid the body of disease-causing agents.
In human and animal trials it has been demonstrated that specific antibodies exist in bovine colostrum which are effective against both enteropathogenic and enterotoxigenic organisms.

Immunoglobulins are also known as antibodies. They are the main component of the adaptive immune system (for a brief explanation of how the immune system works, see Appendix A). When an antigen (a foreign protein) is discovered in the body by immune scout cells, a chain of events is begun that results in antibodies specific to that antigen being produced by certain blood cells called B lymphocytes. The antigen might be a protein from a bacteria or virus, or it could be from a toxin. It could even be a protein produced by your own body, as happens in the case of autoimmune conditions. These specific antibodies fit the antigen like a key fits a lock. The disabled antigen can then be targeted for elimination by the immune system. There are different types of immunoglobulins found in the body, and these are also found in colostrum.

Immunoglobulins are glycoproteins and are present in serum and other tissue fluids, including the milk and colostrum, of all mammals. Antibodies are produced in response to the host being exposed to immunogenic foreign substances (antigens), such as infectious microbes. They are an important element in the adaptive immune response in that they are directed specifically to the antigen that induced their formation and that they impart memory. In this manner the body is effectively prepared to repel any later invasion by the same organism.

Antibodies are produced by activated B cell lymphocytes (plasma cells). Each plasma cell secretes one class of antibody, and all the antibody produced by a single plasma cell is of the same specificity. There are five classes of immunoglobulin that are recognized in mammals: IgG, IgA, IgM, IgE and IgD. The most prevalent class of immunoglobulin in all species of animals is IgG. However, in humans the IgA class is the predominant form found in breast milk and colostrum. The function of these molecules is to bind to invading organisms and to activate specific actions that help rid the body of disease-causing agents. They function in cell killing, inflammation, and prevention of bacterial and viral attachment.
IgG is the form in which antibodies occur most abundantly. In all species of mammals IgG is passed from the mother to its young, although the actual mechanism of transmission varies from species to species. In humans and apes it has been shown that IgG and its complement of antibodies pass across the placental barrier from mother to fetus during the second two-thirds of gestation. This passage appears to be selective in that IgG is transferred but not the other immunoglobulins. Albumin is also transferred, but to a lesser degree. Other plasma proteins are not transferred across the placental barrier. In cattle it appears that the same type of selection occurs in absorption of antibody through the gut in that there is a preferential passage of IgG but not IgA, IgM, IgD or IgE.

Immune factors in colostrum include immunoglobulins (A, D, E, G, M), cytokines, including interleukins 1, 3, 4, 5, 6, 8, 10, 12, 13, 16, 18, interferon-γ, and lymphokines, leukocytes, lactoferrin, proline-rich polypeptides (PRPs), protease inhibitors, trypsin inhibitors, antibodies, glycoproteins, Lactobacillus, Bifidus, Acidophilus, oligosaccharides, glycoconjugates, orotic acid, secretory IgA, IgA specific helper, β-lactoglobulin, lactalbumin, albumin, prealbumin, alpha-1 antitripsin, alpha-1 fetoprotein, alpha-2 macroglobulin, alpha-2 AP glycoprotein, C3 and C4 orosomucoids, lysozyme, lactoperoxidase, thiocyanate, xanthine oxidase, vitamins A, B₁₂, E, and sulfur.

**Immunosupplementation of the Gut**

Local protection in the form of immunosupplementation with bovine milk antibodies has been 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 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.*

Clinical research by Dr. David Tyrell in England in 1980 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 are 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) immunization for the prevention and treatment of acute intestinal diseases...”

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

**Bovine Immunoglobulins**

The cow is an ideal source of natural occurring antibodies. Though all species of mammals have antibodies to various pathogenic microbes, the established supply and volume of cow’s milk available make this species an ideal candidate as a source of the natural antibodies. Further, as mentioned previously, a very important aspect of this local immune protection is that it is not species specific, so we as humans and all other animals can use bovine colostrum for its various health benefits.

The principal immunoglobulins that function as antibodies are IgG, IgA and IgM. Also present in bovine colostrum and other biological fluids are IgE and IgD, though only in small amounts. All these immunoglobulins function synergistically in such a way as to complement one another’s ability to hunt down, fight and destroy invading pathogenic microbes. The immunoglobulin fraction in bovine colostrum is composed of approximately 70–80% IgG, 10–15% IgA, 10–15% IgM, while IgE and IgD are found in small amounts.

The function of these immunoglobulins (antibodies) is as follows:

- **IgG**—predominant immunoglobulin in bovine milk colostrum; primary function is to identify and help destroy invading pathogenic microbes.
- **IgA**—predominant immunoglobulin in human milk and colostrum; primary role
is as first line of defense, protects mucosal surfaces and prevents the attachment of pathogens to them.

**IgM**—primary role is “first to fight;” enhances phagocytosis by destroying invading pathogens.

**IgE**—involved with the allergic reaction and histamine-associated allergic reaction; also involved with active defense against enteric parasites.

**IgD**—attached to B cells; it stimulates lymphocytes to produce antibodies by presenting antigens to them.

Bovine immunoglobulins, once again, are a group of bioactive molecules, all of which work together to fight disease. IgG is simply a member of this mighty defense system. To date, IgG measurement has been used as a marker to designate overall immune strength, but this is only a small part of the immune defense system. The fact that IgG only constitutes approximately 70% of the overall total immunoglobulin present in colostrum should be noted. To illustrate the differences and functions of the three predominant immunoglobulins the following schematics may be of value:

**BOVINE IMMUNOGLOBULIN G (IgG)**

Note the basic immunoglobulin structure: the “Y” and the two antigen binding sites.
BOVINE IMMUNOGLOBULIN A (IgA)
In colostrum and milk IgA is present as secretory IgA.

Note the presence of two “Y” elements and the presence of four antigen binding sites.

BOVINE IMMUNOGLOBULIN M (IgM)
In colostrum and milk IgM is present as secretory IgM.

Note the presence of five “Y” elements and the presence of ten antigen binding sites.
What's in Colostrum?

<table>
<thead>
<tr>
<th>IgG</th>
<th>sIgA</th>
<th>sIgM</th>
</tr>
</thead>
<tbody>
<tr>
<td>45 mg/ml</td>
<td>5.5 mg/ml</td>
<td>6.9 mg/ml</td>
</tr>
<tr>
<td>~80%</td>
<td>~10–15%</td>
<td>~10–15%</td>
</tr>
<tr>
<td>150,000 Daltons</td>
<td>380,000 Daltons</td>
<td>980,000 Daltons</td>
</tr>
<tr>
<td>2 ABS</td>
<td>4 ABS</td>
<td>10 ABS</td>
</tr>
<tr>
<td>Specific</td>
<td>Specific &amp; Non-specific</td>
<td>Specific &amp; Non-specific</td>
</tr>
<tr>
<td>Blood, Tissue Fluids, Milk &amp; Colostrum</td>
<td>Mucous Fluids, Tissue Fluids, Milk &amp; Colostrum</td>
<td>Mucous Fluids, Tissue Fluids, Milk &amp; Colostrum</td>
</tr>
<tr>
<td>90 ABP</td>
<td>22 ABP</td>
<td>69 ABP</td>
</tr>
</tbody>
</table>

Note how significant the Antigen Binding Potential (ABP) of sIgA and sIgM are in bovine colostrum.

**Bovine Secretory Immunoglobulin A (sIgA)**

The beneficial aspects of milk and colostrum in maintaining health and well-being are well established. In humans it has been shown that the incidence of common infections of the intestinal and respiratory systems is significantly reduced in breast-fed infants when compared to non-breast-fed infants. The protective effect of human milk has been attributed to its immunoglobulin content, primarily secretory IgA, whereas in most other animals it is primarily IgG. Other nonspecific factors have also been implicated, including lactoferrin and lysozyme. The pharmacological action of milk and colostrum lies in its ability to function as an antibacterial, anti-inflammatory, and antiviral agent. All these activities have been attributed to secretory IgA.

The IgA and IgM immunoglobulins present in bovine colostrum are of the secre-
tory type—secretory IgA and secretory IgM. Though far more research has been conducted on secretory IgA because of its importance in human immunity, its counterpart, secretory IgM, most probably possesses similar bioactive properties.

**Antibacterial/Antiviral Activity**

In humans, secretory IgA is the predominant immunoglobulin in seromucosal secretions such as colostrum, milk, saliva, tears, nasal mucus, tracheobronchial secretions and genitourinary secretions. Structurally, secretory IgA consists of two monomeric IgA molecules linked by disulfide bonds to a joining chain (J-chain) and one molecule of secretory component. The main features distinguishing secretory IgA from the other immunoglobulins is that it functions predominantly in mucosal immunity and that the molecule is protected from proteolytic degradation by its association with secretory component. Secretory IgA can be regarded functionally as “antiseptic paint,” providing a first line of defense that prevents infectious organisms from entering the body proper. It is probably most important early in life where it may limit the extent of infection and give the newborn’s system time to mature.

Adherence to epithelial cells of mucous membranes is essential for viral infection and bacterial colonization. Secretory IgA functions to inhibit the adherence of these pathogens, thus limiting disease. In addition, secretory IgA functions to neutralize the toxins and virulence factors from microbial pathogens by immunoagglutination. The leading cause of death for newborns in developing countries has been attributed to infantile diarrhea.40 This is also true of domestic animals where scours (enteric dysentery) is the major cause of mortality in newborn calves.41 The enterotoxic form of *Escherichia coli* is one of the pathogens most frequently associated with this disease state.41,42,43,44 Secretory IgA has been shown to neutralize this toxin, as well as enterotoxins of *Vibrio cholerae*, *Shigella*, and *Salmonella*.45

**Anti-inflammatory Activity**

Inflammation is a complex localized event in response to either injury, invasive foreign substance (pathogen) or in some instances to internally produced sub-
stances (such as in rheumatoid arthritis). This is a protective adaptation that serves to isolate, destroy, and rid the infected area of both the injurious agent and the injured tissue. Inflammation is characterized by an increase in vascular permeability and vasodilation with a subsequent migration of leukocytes into the inflamed area. Clinically, inflammation is associated with pain, swelling, tenderness, redness and general discomfort. Prostaglandins (PG) and leukotrienes (LT) play an important role in mediating the process of inflammation by increasing histamine-mediated vascular permeability. It is predominantly this action that causes the discomfort associated with inflammation. The common anti-inflammatory analgesic and antipyretic drugs, such as corticosteroids, aspirin, and indomethacin, inhibit PG and or LT synthesis. In fact, most, if not all, of the anti-phlogistic actions of steroidal and non-steroidal anti-inflammatory drugs act by inhibiting prostaglandin synthesis. The anti-inflammatory effect of aspirin and indomethacin is inhibition of cyclooxygenase, whereas those of corticosteroids are thought to inhibit the release of fatty acids from phospholipids either by inhibition of phospholipase A2 or by interfering with the release of membrane phospholipids.

The adverse side effects associated with certain anti-inflammatory agents limit their use. In the case of natural and synthetic corticosteroids, the potential side effects include the elevation of blood pressure, water and salt retention, increased calcium and potassium excretion, gastric upset and possibly peptic ulceration. In addition, the use of these compounds may also aggravate diabetes mellitus. The non-steroidal anti-inflammatory compounds (salicylates) are synthetic biochemical substances, which can be toxic at high doses. The possible side effects associated with these substances include gastric upset and gastric bleeding, prolonged clotting time and liver damage. Though the number of various anti-inflammatory agents is great, so are the potential side effects and adverse reactions associated with these compounds. It has been shown by in vitro studies that the secretory component of secretory IgA inhibits phospholipase A2 activity and therefore prostaglandin and leukotriene synthesis by limiting the release of arachidonic acid. This inhibition of prostaglandin and leukotriene synthesis thus gives supporting evidence that secretory component and secretory IgA possess anti-inflammatory properties. As was mentioned previously, it is most probable that secretory IgM possesses similar biological functions to secretory IgA.
Stability

An important consideration is the stability of antibodies in the digestive tract. In a study conducted to ascertain the stability of bovine immunoglobulins to proteolytic digestion, it was found that antibodies that possess specific activity can pass through the gastrointestinal tract of infants without being completely destroyed. This indicates that the specific action of antibodies in the gastrointestinal tract is not adversely affected and that biological activity is retained. Secretory IgA and IgM have been shown to be more resistant to degradation and that the secretory piece is responsible for the added protection.

Immunoglobulin G (IgG)—The predominant antibody found in bovine colostrum, making up about 85% of the total immunoglobulins. Human colostrum, as was mentioned, contains significantly less IgG and much more IgA due to the differences in human and cow placentas. IgG imparts systemic immunity. That is, it can induce immunity in one individual if taken from another individual who already has immunity to a certain pathogen. This is how a mother cow imparts her own immunity to her calf. It is also how the same immunity can be transferred from a cow to a human via colostrum.

There are four subclasses of IgG, known as IgG₁, IgG₂, IgG₃ and IgG₄. While all function as antibodies, they differ in the types of antigens they protect against. IgG₁ and IgG₃ are predominantly antibodies against proteins found in bacterial toxins, such as those produced by diphtheria and tetanus bacteria, and viral proteins. IgG₂ is made up of antibodies against the polysaccharide (complex sugar) capsule of certain pathogenic bacteria, such as pneumococcus and Haemophilus influenzae. IgG₄ is involved in repeated, long-term antigenic stimulation.

A study by Borrisenko et al (the Otago study) exposed 19 different pathogenic bacteria and yeasts to a 15% IgG colostrum and were assayed using enzyme linked immunosorbent assay (ELISA). The Specific IgG Antibody Titers were then measured. The 19 bacteria were:
What’s in Colostrum?

- **Bacillus cereus**—food poisoning, mastitis
- **Campylobacter jejuni**—food poisoning
- **Candida albicans**—thrush, yeast infection
- **Clostridium difficile**—food poisoning
- **Escherichia coli**—commensal bacteria
- **Escherichia coli 0157:H7**—food poisoning
- **Haemophilus influenzae**—bacterial meningitis, can be fatal
- **Helicobacter pylori**—stomach ulcers
- **Klebsiella pneumoniae**—pneumonia, urinary tract infection
- **Listeria monocytogenes**—food poisoning, can be fatal
- **Propionibacterium acnes**—acne
- **Salmonella enteritidis**—food poisoning, can be fatal
- **Salmonella typhimurium**—food poisoning, can be fatal
- **Staphylococcus aureus**—pneumonia, osteomyelitis, carditis, meningitis, arthritis, toxic shock syndrome, antibiotic resistant—MRSA (methicillin-resistant *Staphylococcus aureus*)
- **Staphylococcus epidermidis**—multiple antibiotic resistance (MAR)
- **Streptococcus agalactiae**—mastitis, bacteremia, meningitis, pneumonia, can be fatal
- **Streptococcus mutans**—periodontal disease, tooth decay, atherosclerosis, endocarditis
- **Streptococcus pyogenes**—strep throat, flesh-eating bacteria, myositis, strep shock syndrome, rheumatic fever, kidney disease
- **Yersinia enterocolitica**—food poisoning, septicemia, can be fatal

They found success in killing all 19 bacteria. It was also found that colostrum was better in killing these bacteria than milk hyperimmunized against the same 19 bacteria.

**Immunoglobulin A (IgA)***—This immunoglobulin is mainly involved with local immunity against pathogens. The type of IgA in colostrum is called secretory IgA (slgA) because it has a protective protein attached to it to protect against digestive enzymes, to help the molecule pass through the intestinal lining, and to prevent the attachment of pathogens to mucosal surfaces in the gastrointestinal
tract. Its main function in colostrum appears to be to prevent gastrointestinal infections.

**Immunoglobulin M (IgM)**—Basically five or six IgG molecules strung together in a circular arrangement, IgM is the first antibody produced in response to an antigen. While its function remains unclear, it is involved in aggregating antigens and reactions involving complement.199,200,201

**Immunoglobulin E (IgE)**—Involved in allergic responses to antigens. It binds to mast cells and basophils, specialized cells in the body that participate in allergic reactions. When an antigen comes into contact with IgE, the mast cell or basophil releases histamine and other chemicals which produce the allergic reaction.202 Highly antiviral.

**IgE Binding Factor (Igebf)**—This molecule binds to IgE to suppress its action and may provide the anti-allergic function of colostrum.203

**Immunoglobulin D (IgD)**—IgD acts as an antigen receptor on B cells. It is also highly antiviral.204

**OTHER IMMUNE FACTORS**

**Complement**

Technically part of the innate immune system, complement is triggered by the adaptive immune system to form part of the membrane attack complex that penetrates the cell membrane of pathogens and results in their destruction. Complement is composed of over twenty separate proteins and protein fragments.205,206

**Lactoferrin**

An antiviral, anti-bacterial, anti-inflammatory, iron-binding protein with therapeutic effects in cancer, HIV, Cytomegalovirus, herpes, chronic fatigue syndrome, *Candida albicans*, and other infections. Lactoferrin helps deprive bacteria of the
iron they require to reproduce and 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.

Lactoferrin is a large iron-binding protein with a complex structure. It has a multitude of functions and is found in all mucus secretions of the body.\textsuperscript{207} It is closely related to transferrin, a protein that transports iron in the body. It is an integral part of the innate immune system, a non-specific first line of defense against pathogens. Lactoferrin is a potent anti-microbial against bacteria, viruses,\textsuperscript{208} fungi (such as \textit{Candida}),\textsuperscript{209} and protozoan parasites (like \textit{giardia}).\textsuperscript{210,211} It kills pathogens by withholding the iron they need to reproduce, blocking the attachment of pathogens to target cells,\textsuperscript{212} binding to the outer membrane of microorganisms, causing them to lyse (burst), along with other effects. In addition, it is an essential growth factor for lymphocytes (immune blood cells),\textsuperscript{213} stimulates the activity of polymorphonuclear leukocytes (white blood cells),\textsuperscript{214} strongly promotes natural killer (NK) cell cytotoxic (cell killing) activity,\textsuperscript{215,216} stimulates the production of various cytokines (chemicals that promote or inhibit the inflammatory response to infection),\textsuperscript{217} and is a powerful antioxidant and anti-inflammatory.\textsuperscript{218} It inhibits tryptase, an enzyme secreted by mast cells and which may be a causative agent for asthma.\textsuperscript{219} In experimental animal models, lactoferrin has been shown to prevent cancer.\textsuperscript{220} Lactoferrin has been shown to have an immunomodulatory effect on the immune system, controlling the release of cytokines and regulating the proliferation and differentiation of immune cells.\textsuperscript{221} In addition, lactoferrin helps maintain iron homeostasis in the body, regulates bone metabolism, and is involved in reproductive function and embryonic development.\textsuperscript{222}

**Lysozyme**

An enzyme that is capable of degrading the outer membrane of gram-positive bacteria.\textsuperscript{223} It also acts in concert with lactoferrin to kill gram-negative bacteria.\textsuperscript{224} Lysozyme is also a hydrolyzing agent and immune system booster capable of destroying bacteria and viruses on contact.
**Lactoperoxidase**

Another enzyme which, in the presence of hydrogen peroxide (formed naturally in the body), catalyzes the oxidation of thiocyanate, a component of saliva, to form hypothiocyanate, which can kill both gram-positive\(^{225}\) and gram-negative\(^ {226}\) bacteria.

**Growth Factors**

Colostrum, as might be expected, contains many growth factors\(^{227,228}\). Their presence in colostrum is primarily to complete the growth and development of the newborn gut, but in older children and adults they act to repair damage to the gut lining that might result in leaky gut syndrome as well as other health maintenance functions\(^{229,230}\). Their main function in the organism is to regulate the growth and development of cells\(^ {231}\). They play a major role in wound healing and the repair of broken bones\(^ {232}\) as well as injured tendons and ligaments\(^ {233}\). Growth factors, just like PRPs, are generally peptides that function as intercellular signaling molecules to turn on or turn off the production of specific proteins in the target cells.

The body’s growth factors are capable of increasing T cell production, accelerating healing, balancing blood glucose, reducing insulin need, increasing growth, and repair of vital tissues while metabolizing fat for fuel. Medical studies have shown the vital growth factors IgF-1, TGF-α & β, and nucleotides from bovine colostrum to be identical to human in composition. They help provide the raw materials to repair vital DNA and RNA in the body’s cells. By stimulating DNA formation, it has been shown that they can help stimulate normal cell and tissue growth, regeneration, and accelerated repair of aged or injured muscle, skin collagen, bone, cartilage, nerve tissues, heart muscle and new blood vessels for collateral coronary circulation. These growth factors facilitate the healing of tissues damaged by ulcers, trauma, burns, surgery, or inflammatory disease.
What’s in Colostrum?

“Transforming growth factors-α & β (TGF-α & β) in bovine colostrum were involved in normal cellular activities such as cell proliferation, and tissue repair. Also reported it promoted the synthesis and repair of DNA—the master code of the cell.”

Colostrum provides a good source of IGF-1 as a complementary therapy for successful weight loss and building of lean muscle. IGF-1 is required by the body to metabolize fat for energy through the Krebs cycle, but with aging, less IGF-1 is produced in the body. It helps stimulate the body to burn fat for fuel instead of the body’s own muscle tissue in times of diet and fasting.

“High age is associated with reduced levels of growth hormones GH and IGF-1. Induction of GH and IGF-1 increase body weight through muscle growth of aged subjects”
– Drs. Ullman, Sommerland and Skottner, Departments of Pathology and Pharmacology, University of Gothenburg, Sahlgren Hospital and HabVitrum AB, Stockholm, Sweden

Human trials in 1990 reported that IGF-1 stimulates glucose utilization. It can help balance blood sugars (non-insulin diabetics and hypoglycemia). Inadequate levels of IGF-1 are associated with an increased incidence of Type 2 diabetes and difficulty in losing weight despite a proper nutritional intake and adequate exercise. Additionally, IGF-1 and GH in colostrum normalize LDL cholesterol while increasing HDL cholesterol concentrations (the good cholesterol).

Genetically engineered versions of IGF-1 and GH are now marketed, but they are found in high concentrations in colostrum. Biotechnology companies are currently selling IGF-1 for as much as $800 per 50 cc vial. GH is also very expensive. Even less expensive products marketed as growth hormone releasers (designed to help the body to manufacture their own hGH) are markedly more expensive than colostrum. None of these expensive products contain any of the vast array of immune factors in colostrum.
Colony-stimulating Factor-1 (macrophage colony-stimulating factor)—A growth factor that stimulates stem cells in the marrow to differentiate into macrophages, phagocytic (“eating”) cells that enter the connective tissue in order to clean up dead pathogens and other debris from infections.234

Epidermal Growth Factor (EGF)—Stimulates the proliferation and differentiation of epidermal cells, including the lining cells of the gut that maintain the gut integrity and the proper permeability.235,236 It exerts its effects by binding to the EGF receptor protein in the cell membrane of the target cell.237 It has been used to promote wound healing by stimulating cell proliferation in the wound.238

Betacellulin—A member of the EGF family of growth factors, the function of betacellulin remains unclear, but it appears to play a role in the growth and development of the neonatal gastrointestinal tract.239,240

Fibroblast Growth Factor (FGF)—Fibroblasts are the cells in the connective tissue that help to promote wound healing by stimulating cell proliferation in the wound. It also helps maintain normal bone and repair fractures.241,242 It also plays a role in the healing of ulcers.243

Granulocyte Colony-stimulating Factor (G-CSF)—Increases growth, differentiation and activation of granulocytes (eosinophils, basophils, neutrophils).244

Insulin-like Growth Factor 1 (IGF-1)245—Originally known as somatomedin C. It is very similar in structure to insulin. IGF-1 affects nearly every cell in the body, in particular muscle cells, cartilage, bone, liver, kidney, nerves, skin and lungs.246 It regulates cell growth and development as well as cellular DNA synthesis. Studies have shown that both TGF-β and IGF-1 speed the healing of bones, which is particularly important in the elderly whose bones heal very slowly.247 IGF-1 also is responsible for increasing muscle mass in response to muscle overloading.248 Both IGF-1 and IGF-2 promote the growth of arterial cells, and disruption of the dynamic balance between IGF-1, IGF-2 and IGF binding proteins has been implicated in the formation of atherosclerotic plaques in the arteries and resulting restenosis (narrowing of the artery).249 IGF-1 has also shown promise in
peripheral nerve regeneration.\textsuperscript{250} In the newborn, IGF-1 plays a critical role in the development of the newborn gut.\textsuperscript{251}

**Insulin-like Growth Factor (IGF-2)**—Very similar in function to IGF-1. Its major function is to promote growth during fetal development.\textsuperscript{252}

**Insulin**—Insulin is also present in bovine colostrum, starting out at high levels (327 μg/l in first milking colostrum) and tapering off thereafter.\textsuperscript{253} While the exact role of insulin in colostrum is unclear, it is known that insulin receptors are found in the membranes of intestinal epithelial cells,\textsuperscript{254} indicating it may act as a growth hormone.

**Insulin-like Growth Factor Binding Proteins (IGFBP)**—Proteins which bind to IGF-1 and IGF-2.\textsuperscript{255} An important part of the IGF axis that forms a dynamic balance to regulate the activity of IGF in the body.\textsuperscript{256} IGFBP-3 is the most common form of IGFBP in bovine colostrum and milk.

**Platelet-derived Growth Factor**\textsuperscript{257}—Plays a role in bone metabolism as a mitogen (stimulator of cell division) for osteoblasts.\textsuperscript{258} It is important in angiogenesis (the formation of blood vessels).\textsuperscript{259} It also stimulates fibroblast division in wound healing\textsuperscript{260} and the healing of ulcers.\textsuperscript{261} Its role in tissue modeling involves both the stimulation of growth as well as apoptosis (programmed cell death).\textsuperscript{262,263}

**Transforming Growth Factor-alpha (TGF-α)**—Induces epithelial development\textsuperscript{264,265,266,267} and stimulates neural development in the injured brain.\textsuperscript{268} It is closely related to EGF.

**Transforming Growth Factor-beta (TGF-β)**—Has three isoforms, TGF-β1, TGF-β2 and TGF-β3.\textsuperscript{269,270,271,272} Only TGF-β1 and β2 are found in human and bovine milk and colostrum. TGF-β controls cellular proliferation and differentiation.\textsuperscript{273} It stimulates the production of IgA by B lymphocytes.\textsuperscript{274,275} It is particularly important in the development of cartilage and bone.\textsuperscript{276,277}
Vascular Endothelial Growth Factor (VEGF)\textsuperscript{278}—a member of the PGDF family, VEGF plays a role in the healing of injuries and wounds, such as ligament and tendon injuries, by providing blood supply to damaged areas.\textsuperscript{279}

Lactalbumin
Research indicates that lactalbumins may be highly effective against numerous forms of cancer and viruses. Colostral lactalbumin has been found to be able to cause the selective death (apoptosis) of cancer cells, leaving the surrounding non-cancerous tissues unaffected.

Lactobacillus, Bifidus, Acidophilus
Friendly flora, which are necessary for the digestion of food and in the reduction of the growth of harmful bacterial in the digestive system. They have been shown to effectively combat \textit{Candida albicans}.

Vitamins and Minerals
Colostrum is not a supplement; it is whole food for the newborn. Its combination of vitamins and minerals are naturally occurring and in perfect combination. Vitamins A, B\textsubscript{12}, and E are found in small amounts, while traces of all others are also present in colostrum.

Sulfur
A mineral with multiple uses in metabolism and as part of many structural body proteins.

Enzymes
Lactoperoxidase-thiocyanate, peroxidase and xanthine oxidase oxidize bacteria through their ability to release hydrogen peroxide.

Trypsin Inhibitors and Protease Inhibitors
Prevent the destruction of immune and growth factors in colostrum from being broken down in the GI tract. They also prevent \textit{H. pylori} from attaching to the walls of the stomach and can have a beneficial role in the treatment of peptic ulcers.
Lymphokines
Hormone-like peptides produced by activated lymphocytes which mediate the immune response.

Oligopolysaccharides and Glycoconjugates
Attract and bind to pathogens, such as *Streptococcus*, *E. coli*, *Salmonella*, *Cryptosporidia*, *Giardia*, *Entamoeba*, *Shigella*, *Clostridium difficile* toxins A & B and cholera, preventing them from attaching or entering the mucous membranes.

Orotic Acid
Stops the formation of pyrimidine nucleotides and prevents hemolytic anemia.

Neurotransmitters
Endogenous signaling molecules such as leptin that alter the behavior of neurons or effector cells. Neurotransmitter is used here in its most general sense, including not only messengers that act directly to regulate ion channels, but also those that act through second messenger systems and those that act at a distance from their site of release. Included are neuromodulators, neuroregulators, neuromediators, and neurohumors, whether or not acting at synapses.

Cytokines
Cytokines are also small peptides that exert either a pro- or anti-inflammatory effect on the immune system. Colostrum is known to stimulate the production of cytokines in peripheral blood cells. Cytokines found in colostrum include interleukin-1 (IL-1), IL-1β, IL-1ra, IL-3, IL-4, IL-5, IL-6, IL-8, IL-10, IL-12, IL-13, IL-16, IL-18, interferon-gamma (INF-γ), tumor necrosis factor-alpha (TNF-α), and TNF-α receptors.

- **IL-1**—pro-inflammatory, can induce fever in large amounts
- **IL-1β**—pro-inflammatory, similar in action to IL-1
- **IL-1ra**—IL-1 receptor antagonist, a protein that binds to IL-1, inhibiting its action and producing an anti-inflammatory effect
- **IL-3**—pro-inflammatory, growth and differentiation of granulocytes and red blood cells, growth of mast cells and release of histamine
IL-4—anti-inflammatory, proliferation and differentiation of B cells, proliferation of T cells, plays important role in allergic response with IgE

IL-5—production of eosinophils, differentiation of B cells and production of IgA by B cells

IL-6—differentiation of B cells into plasma cells, antibody secretion by plasma cells, differentiation and acute phase reaction of T cells, differentiation of stem cells

IL-8—actually a chemokine, neutrophil chemotaxis (movement of neutrophils to site of inflammation)

IL-10—anti-inflammatory, activates B cells, cytokine production by macrophages, inhibits Th1 response, stimulates Th2 response (see Appendix 1)

IL-12—pro-inflammatory, differentiation into cytotoxic T cells, increased TNF-γ and INF-γ, decreased IL-10

IL-13—anti-inflammatory, stimulates growth and differentiation of B cells, inhibits Th1 and production of macrophage inflammatory cytokines, decreased IL-8, IL-10, IL-12

IL-16—anti-inflammatory, CD4+ lymphocyte chemoattractant

IL-18—pro-inflammatory, induces production of IFN-γ, increases NK cell activity

TNF-α—pro-inflammatory, the controlling cytokine for the entire inflammatory cascade

TNF-α receptors—anti-inflammatory, proteins which bind to TNF-α, inhibiting it

Osteopontin—a member of the tumor necrosis family of cytokines that is expressed at high levels in both human and bovine colostrum and milk;²⁹⁴,²⁹⁵ vital to cell-mediated immunity²⁹⁶ and may activate T lymphocytes

Osteoprotegerin—another member of the tumor necrosis family of cytokines, osteoprotegerin inhibits osteoclast (“bone-eating”) differentiation, preventing bone destruction; also induces apoptosis (programmed cell death) in T lymphocytes to inhibit their proliferation; may help prevent immune and bone disorders in the newborn²⁹⁷

INF-γ—inhibits proliferation of certain cell types, immunomodulatory,
Cytokines are any of several regulatory proteins, such as the interleukins and lymphokines, that are released by cells of the immune system and act as intercellular mediators in the generation of an immune response. Cytokines are produced in the human body by the actions of PRPs. Two main cytokines that are produced by PRPs are IFN-α and IFN-β. The function and applications of just these two cytokines are described below. Cytokines IL-1, -6, interferon-γ, and lymphokines stimulate the lymph glands and are thought to be highly effective antiviral immune substances. Interleukins that regulate the duration and intensity of the immune response are responsible for cell-to-cell communication and boost T cell activity and the production of immunoglobulins. Interleukin-10 is strongly anti-inflammatory, especially in arthritic joints.

The benefits of cytokines in the treatment of cancer was first popularized by the 1985 Steven Rosenberg Book, *Quiet Strides in the War on Cancer*. Since that time, the same cytokines found in colostrum (IL-1, 6, 10, interferon-γ, leukocytes, lymphokines, tumor necrosis factor) have been the most researched protocols in scientific research for the cure for cancer.

The term cytokine, or immunocytokines, was used initially to separate a group of immunomodulatory proteins, also called immunotransmitters, from other growth factors that modulate the proliferation and bioactivities of non-immune cells. However, this terminology suggesting a clear-cut distinction cannot be maintained and may not be altogether meaningful. Some cytokines are produced by a rather limited number of different cell types while others are produced by almost the entire spectrum of known cell types.

Today the term cytokine is used as a generic name for a diverse group of soluble proteins and peptides that act as humoral regulators at nano to picomolar concentrations and that, either under normal or pathological conditions, modulate the functional activities of individual cells and tissues. These proteins also mediate interactions between cells directly and regulate processes taking place in the body.
extracellular environment (for some mechanistic concepts underlying cytokine actions see also: autocrine, paracrine, juxtacrine, retrocrine). Many growth factors and cytokines act as cellular survival factors by preventing programmed cell death.

**Chemokines**

Small pro-inflammatory cytokines that act primarily as chemoattractants to draw immune cells to the site of infection and activators of specific types of white blood cells. Chemokines found in milk and colostrum include CXLC 1-7 (chemokine ligands), eotaxin (chemoattractant for eosinophils), GRO-alpha (Growth-Related Oncogene, also called CXLC1; activates neutrophils, chemotactic for neutrophils), IP-10 (may contribute to migration of intestinal T lymphocytes to enhance mucosal immunity), MCP-1 (Monocyte Chemoattractant Protein; monocyte chemotaxis), MIG (Monokine Induced by interferon Gamma, also called CXC chemokine ligand 9; chemotactic for tumor infiltrating lymphocytes), and RANTES (Regulated upon Action, Normal T cell Expressed, also called CCL5; chemotaxis of T cells, eosinophils and monocytes).

**Proline-Rich Polypeptides (PRPs)**

Peptides are short chains of amino acids—the building blocks of proteins—without the complex tertiary structure of proteins. Proline-rich polypeptides, so-called because they contain an unusually high proportion of the amino acid proline, are intercellular signaling molecules that have the unique ability to modulate the immune system, turning it up when needed to fight an infection, or turning it down when it is overactive, such as is the case in autoimmune disorders.

Proline-Rich Polypeptides (PRPs) function as a hormone that regulates the thymus gland (the body’s central command for the immune system, and the gland responsible for the normal development of immunologic function in the body), stimulating an underactive immune system or down regulating an overactive immune system as seen in autoimmune disease (MS, rheumatoid arthritis, lupus, scleroderma, chronic fatigue syndrome, allergies, etc.). They have been shown to improve or eliminate symptoms of both allergies and autoimmune conditions. PRPs inhibit the overproduction of lymphocytes and T cells and reduce the major
symptoms of allergies and autoimmune disease: pain, swelling, and inflammation.

“PRP, in bovine colostrum, has the same ability to regulate activity of the immune system as hormones of the thymus gland. It activates an underactive immune system, helping it move into action against disease-causing organisms. PRP also suppresses an overactive immune system, such as is often seen in the autoimmune conditions. PRP is highly anti-inflammatory and also appears to act on T-cell precursors to produce helper T cells and suppresser T cells”

— Drs. Staroscik et al, Molecular Immunology

“PRP turns white blood cells into functionally active T cells. Results were shown in treatment of autoimmune disorders and cancer. An important immune modulator stimulates an underactive immune system and tones down an overactive one”

— Drs. Janusz & Lisowski; Archives of Immunology

We will explore PRPs in much greater detail later in this book.

**Defensins**

Polypeptides that disrupt bacterial cell membranes, such as pertussis, killing them.

**Soluble CD14**

CD14 is a membrane-bound pattern recognition protein found on monocytes and expressed mainly by macrophages and, to a lesser extent, neutrophil granules. It acts as a co-receptor with toll-like receptor 4 (TLR 4) to detect bacterial lipopolysaccharide in the presence of lipopolysaccharide-binding protein as well as other pathogen associated molecules. CD14 is found in a soluble form in colostrum and milk where it acts to directly induce B cell growth and differentiation, thus enhancing IgG secretion.

**Toll-like Receptors**

Pattern recognition detectors that help the immune system recognize new pathogens.
**Cathelicidin-derived Antimicrobial Peptide**

Certain peptides of the cathelicidin family of peptides found in milk and colostrum have antimicrobial activity against both gram-positive and gram-negative bacteria. They have been found to be particularly effective against antibiotic resistant opportunistic pathogens found in AIDS and cystic fibrosis patients, including *Pseudomonas aeruginosa, Burkholderia cepacia, Stenotrophomonas maltophilia,* and *Achromobacter xylosoxidans.*

**Glycoproteins**

Colostrum contains a number of complex carbohydrates, including glycoproteins, glycolipids, glycosaminoglycans, mucins, and oligosaccharides, which are basically complex sugars either alone or in combination with proteins or lipids (fats). They are known to inhibit pathogen binding to gut lining cells, preventing their entry into the bloodstream, usually by competing for binding sites on the cell membranes. One fucosyloligosaccharide inhibits *E. coli* toxin. Another inhibits *Campylobacter jejuni,* which is a major cause of gastroenteritis and food poisoning. Oligosaccharides inhibit the binding of *Streptococcus pneumoniae,* which causes many infections such as pneumonia, meningitis, otitis, osteomyelitis, peritonitis and endocarditis, and enteropathogenic *E. coli,* which causes diarrhea. A mannosylated (mannose is a type of sugar) glycopeptide inhibits the binding of enterohemorrhagic *E. coli,* which causes bloody diarrhea. One of the glycosaminoglycans prevents the binding of HIV structural protein to CD4+ cells (T cells), which is the first step in HIV infection. Mucin, found in milk and colostrum, inhibits the binding of S-fimbriated *E. coli* (fimbriae are thread-like structures used by certain bacteria to adhere to cells). Ganglioside GM1, a membrane protein, reduces diarrhea due to cholera toxin and *E. coli* labile toxin. Glycosphingolipid Gb3, another membrane protein, binds to shiga toxin, a toxin produced by *Shigella dysenteriae* (cause of dysentery) and the shigatoxigenic group of *E. coli.* Shiga toxin functions much like the deadly toxin ricin by inhibiting protein synthesis in target cells.

**Kappa-caseino Glycomacropeptide**

This is a peptide from the casein fraction of milk and colostrum that interferes with the binding of viruses and bacteria in the intestine, binds cholera and *E. coli*
What’s in Colostrum?

toxins, promotes the growth of beneficial bacteria in the gut, and helps modulate the immune system.314,315,316

**Fatty Acid Binding Protein**
A member of the lipocalin family of secreted proteins, fatty acid binding protein regulates two molecular pathways in macrophages that coordinate inflammatory activity and cholesterol uptake.317

**β-lactoglobulin**
Another member of the lipocalin family of proteins, β-lactoglobulin has antimicrobial and antiviral activity.318,319

**Orosomucoids**
Increased levels of this glycoprotein are associated with inflammation. It acts as an anti-inflammatory mediator, particularly in the endothelium of capillaries where it inhibits the effect of histamine.320,321

**Clusterin (Apolipoprotein J)**
Clusterin plays an important role in cell-cell and cell-substratum interactions.322 It also acts as an extracellular molecular "chaperone" that "steers" proteins into cells.323

**Haemopexin**
A transporter and binder of free haeme (iron) molecules.324 It has an antioxidant function by preventing the participation of haeme in oxygen radical reactions in tissues.325,326 It also plays a key role in the homeostasis of nitric oxide. It is also known to suppress tumor growth. The haeme-haemopexin complex supports and stimulates the proliferation of T lymphoblasts (lymphocyte stem cells).327 It has an anti-inflammatory effect by suppressing neutrophil accumulation and phagocytosis328 and by inhibiting the magnesium-dependent adhesion of polymorphonuclear leukocytes (white blood cells).329 Its anti-inflammatory activity could be of use in autoimmune disorders.
Haptoglobin
A protein binder of free hemoglobin. Binding free hemoglobin prevents hemoglobin-induced oxidative damage to healthy tissue, so haptoglobin is in effect an antioxidant. Levels of haptoglobin are increased in acute phase inflammation where they act to selectively suppress monocyte production of pro-inflammatory cytokines TNF-α, IL-10, and IL-12 while not inhibiting IL-6, IL-8, or IL-1 receptor antagonist. This is thought to selectively dampen the inflammatory effects of lipopolysaccharide (a component of bacterial cell walls that acts as an endotoxin), probably to modulate cytokine release and protect against endotoxin damage to tissues.330

Sporozite Inhibitory Lipid (SIL)
A new addition to the list of immune components in bovine colostrum is sporozite inhibitory lipid (SIL). This is a lipid that inhibits the adhesion of Cryptosporidium parvum sporozites to host cells, preventing infection. SIL has been identified as oleic acid, a monosaturated fatty acid likely released from colostrum triglycerides and phospholipids by digestion in the small intestine. A related lipid, linolenic acid, also displays potent inhibitory activity.331

Nucleotides
Dietary nucleotides, the building blocks of DNA and RNA, enhance dietary growth and maturation as well as humoral and cellular immunity.332 Infants who receive human milk with nucleotides have higher antibody levels, lower rates of diarrhea, and higher natural killer cell activity.333,334

Hormones
Colostrum includes a number of hormones. Their presence in colostrum is somewhat problematic as it is often unclear if they act upon the infant or are artifacts of lactation. Hormones identified in colostrum include:

**EPO (Erythropoietin)**—stimulates red blood cell production.335

**Estrogen**—The “female” hormone is found in bovine milk. It appears to be an artifact of maternal serum.336
What’s in Colostrum?

**Gonadotropin-releasing Hormone (GnRH)**—A hypothalamic hormone that stimulates the release of gonadotropin, a hormone that promotes gonadal growth and development.\(^{337,338}\) It is believed that GnRH is an artifact from maternal serum.

**Growth Hormone**—Also known as somatotropin. A pituitary hormone that promotes body growth, fat mobilization and inhibition of glucose utilization.\(^{339}\)

**Insulin**—In addition to the activity already mentioned above, insulin promotes glucose utilization, protein synthesis and storage.\(^{340}\)

**Leptin**—Secreted by fatty tissues, acts to curb appetite and increase energy expenditure as body fat stores increase.\(^{341}\)

**Luteinizing Hormone-releasing Hormone (LHRH)**—A hypothalamic hormone that stimulates the release of luteinizing hormone.\(^{342}\) Another artifact from maternal serum.

**Melatonin**—Produced by the pineal gland, controls circadian rhythms.\(^{343}\)

**Procalcitonin/Calcitonin/Thyrotropin**—Produced by the parathyroid, thyroid and thymus glands. Increases the deposit of calcium and phosphate in bone and lowers their levels in blood.\(^{344}\)

**Progesterone**—The “pregnancy hormone” that prepares the corpus luteum of the uterus and the placenta for pregnancy.\(^{345}\) An artifact of maternal serum.

**Prolactin**—Pituitary hormone that stimulates the production of milk in the mother. Artifact of maternal serum.\(^{346}\)

**Relaxin**—A peptide hormone that aids delivery.\(^{347}\) Artifact of maternal serum.

**Somatostatin**—Inhibits the release of somatotropin and the release of insulin and gastrin.\(^{348}\)
Thyrotropin-releasing Hormone (TRH)—hypothalamic hormone that stimulates the release of luteinizing hormone. Artifact of maternal serum.

Cardiovascular Health
A number of components of colostrum are important to cardiovascular health, including ACE inhibitors that help regulate blood pressure, and clotting factors.

ACE (Angiotensin-I Converting Enzyme) Inhibitors and Competitive Substrates

- Bradykinin—vasodilatory peptide activated by ACE
- Enkephalins—endorphin-like peptides found throughout the body, natural pain killer, antidepressant, and immune modulator
- Substance P—a neurotransmitter and potent vasodilator and secretagogue (agent that promotes secretion)
- Casokinins—casein-derived ACE-inhibitors
- Lactokinins—whey-derived ACE inhibitors
- α-lactorphin—antihypertensive milk peptide

Thrombospondin—Extracellular proteins involved in cell-to-cell and cell-to-matrix communication, including cell adhesion, platelet aggregation, cell proliferation, and tissue repair; potent inhibitors of angiogenesis and tumor growth; interact with coagulation and anticoagulant factors in blood.

Kappa-caseino glycomacropeptide—In addition to the functions given above, this component of colostrum helps prevent the formation of arterial thrombi (blood clots), a leading cause of heart attack and stroke.

κ-caseinoglycopeptide—A peptide produced by digestion of kappa-casein, found in both bovine and human colostrum and milk, which is absorbed into the blood serum and which has antithrombic properties, preventing platelet aggregation.

α2-macroglobulin—Inhibits thrombin and other proteases.
α₂-antiplasmin—Thrombin inhibitor, fibrinolysis inhibitor.\textsuperscript{362,363}

Antithrombin III—Inhibits thrombin (coagulation protein).\textsuperscript{364,365}

Apelin—First identified as a ligand for the APJ-receptor;\textsuperscript{366} functions as a mediator of cardiovascular control, including blood pressure and blood flow; the most potent stimulator of cardiac contractility known;\textsuperscript{367} important in maintaining fluid homeostasis.\textsuperscript{368}

**Digestive Enzymes and Proteins**
Colostrum contains proteins that inhibit the action of digestive enzymes, allowing the contents of colostrum to reach their targets without significant degradation.\textsuperscript{369} Protease inhibitors also facilitate the passage of macromolecules through the gut lining, which is important in the newborn.\textsuperscript{370} Colostrum also contains various enzymes that help the components of colostrum do their job. Enzymes basically function to facilitate chemical reactions in the body.

**Protease Inhibitors\textsuperscript{371}**

- **C1-inhibitor**—inhibits C1 protease, a digestive enzyme
- **Chymotrypsin inhibitor**—inhibits chymotrypsin, a digestive enzyme\textsuperscript{372,373}
- **Elastase inhibitor**—inhibits elastase, a digestive enzyme\textsuperscript{374}
- **Inter-α-trypsin inhibitor**—inhibits inter-α-trypsin, a digestive enzyme
- **Trypsin inhibitor**—inhibits α₁,-trypsin, a digestive enzyme\textsuperscript{375,376,377}

Of the enzymes found in colostrum, some of the more interesting are matrix metalloproteinases, which are zinc-dependent endopeptidases.\textsuperscript{378} There are two found in human colostrum, matrix metalloproteinase-2 (MMP-2) and tissue inhibitor of metalloproteinase-4 (TIMP-1). Matrix metalloproteinases degrade extracellular matrix proteins and are important in tissue remodeling, cell proliferation, migration and differentiation, angiogenesis, apoptosis and host defense. They are widespread in both the animal and plant kingdoms. A good example of their function is the metamorphosis of a tadpole (with a tail) to a mature frog (no tail).
Fats

Although normally defatted when converted into a powder, whole colostrum also contains fats, including phospholipids, fatty acids (linoleic acid, dihomo-gamma-linoleic acid, alpha-linoleic acid, octadecatetraenoic acid, eicosatrienoic acid, docosahexaenoic acid, docosapentaenoic acid, and arachidonic acid), saposins (A, B, C, D), prosaposin, tocopherols, and cholesterol. These are necessary nutrients for the newborn, while in the adult, milk fat in whole milk is believed to be beneficial to the regulation of blood sugar levels and appetite.

This is only a partial listing of the components of colostrum, as was stated. There are also abundant nutritional components as colostrum supplies all of the newborn’s nutritional needs until transitional and mature milk begin to flow. These include vitamins, minerals, essential fats, and bulk proteins, such as albumin. There are also components that aid the digestion and absorption of the nutrients as well as contribute to the maturation of the gastrointestinal tract of the newborn. Additionally, there are beneficial bacteria that help seed the newborn’s gastrointestinal tract with the flora that will help keep it healthy.

Another thing that may be noted from reading through these components is that very often one finds both stimulatory and inhibitory components, for example, MMP and TIMP, which inhibits MMP. This illustrates the fact that the processes of the body are always in a state of dynamic balance. As soon as the balance is disrupted, the body acts to bring it back into equilibrium. Most enzymes, such as MMP-2 and TIMP-1, as well as other proteins exist in a “turned off” state until activated.

Drug manufacturers have tried to copy (genetically engineer) and market several of the individual components of colostrum, most notably interferon, gammaglobulin, growth hormone, IGF-1, and protease inhibitors. 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.
It is important to note that some of the components listed have thus far only been identified in human colostrum and milk, or that of other species than cows. They are included on the assumption that the colostrum from different mammalian species is essentially the same. This has generally proven to be the case. Bovine colostrum has been shown to be essentially bioidentical to human colostrum, the major difference being in the relative amounts of some components, such as IgG and IgA.
C hapter 7

Y es, But Does It Work?

C olostrum does indeed contain many amazing components, but the bottom line is, does it actually work? Let’s look at what actual users and professionals have to say about colostrum.

G u t H e a l t h

C olitis

I was diagnosed with colitis 1½ years ago. None of the medications helped me. Several made me worse. High doses of prednisone helped, but symptoms would worsen when trying to reduce dosage. I took 6–8 Imodium daily, and water ran straight through me. I could barely eat for almost a year. I began searching for help on the Internet when none of the medications would work. I read about colostrum and decided to try it. I saw immediate results when I started taking it. It made me feel bad, so I dropped the dosage to two pills every other day for several months. I wouldn’t stop taking it even though it made me feel bad because it was drastically reducing my diarrhea. I still had to watch my diet for about 6 months, and I gradually got better. I eventually also started taking multi-enzyme pills that really helped with my stomach cramps. I can’t say that I know it cured me, but it definitely helped. I also completely changed my lifestyle and reduced stress in my life by working at home. I really had no choice. I couldn’t leave the house too long at a time and sure couldn’t eat. I feel that a combination of things has completely cured me: the power of God, stress reduction, my diet and colostrum. I would definitely recommend anyone trying it that has colitis
Yes, But Does it Work?

or any other illness. I eat a full normal diet—even pizza and milk! I am fat and sassy once again!

— DIANNE B., HOUSTON, TEXAS

Ulcerative Colitis

Approximately two years ago my then eleven-year-old son was diagnosed and then hospitalized with severe ulcerative colitis. His weight dropped dramatically down to 56 pounds (he was then 4’10”) and nothing helped until, after a month and only days away from losing his entire colon, they tried a very powerful experimental drug on him, one that shut down his immune system. That, along with prednisone (a steroid), allowed him to be released from the hospital and begin to recover and lead a fairly normal life. However, after six months, now off the prednisone and on a milder version of the immune suppressant drug, he stopped gaining weight, was still 4’10” and some of his symptoms had returned. Afraid that we were going to have to go back on the steroids (which gave him a big, puffy face—tough for a middle schooler) and higher doses of Purinethol (mercaptopurine), we began to search for more natural, alternative cures.

We discovered colostrum through a doctor friend in the Midwest. He advised Sean to take two capsules before breakfast and two at bedtime. Within weeks we saw an amazing change in our son. He began gaining weight, getting stronger, and he even seemed to be growing faster! He has now been taking colostrum for about a year now. He weighs 100 pounds, is 5’4” and is the pitcher on his baseball team. In other words, he is the picture of health! He leads a totally normal life and amazes his doctor here at UCLA who calls his recovery nothing short of a “miracle.” We know that colostrum has made all the difference—and given us back a happy, healthy now thirteen-year-old son. We are forever grateful for your product.

— JEAN L., WESTLAKE VILLAGE, CALIFORNIA

Irritable Bowel Syndrome

Two years ago I received massive antibiotic treatments for H. pylori (ulcers), which cured my stomach pain but devastated my intestinal tract! I had chronic intestinal pain, cramping, diarrhea, indigestion and could no longer tolerate many of the foods
I used to enjoy. Eventually I was diagnosed with Irritable Bowel Syndrome after losing 20 pounds, and I was miserable. Four months ago I began taking colostrum with probiotics and began to exercise. I now feel better than I’ve felt in years. I have regained 15 pounds (mostly muscle), and my IBS symptoms have improved dramatically! I wholeheartedly recommend colostrum for IBS sufferers.

— John Q., Lodi, California

**IMMUNE SYSTEM**

**Colds and Flu**

Last winter I think I had every flu bug and virus that came around. I was on one after another type of antibiotics, trying to shake what was bound to get the best of me. I had acute sinus problems, the inside of my mouth broke out in blisters, as did my throat. My ears ached and popped constantly. The worst part was the chronic fatigue and general feeling that I was going downhill fast and nothing seemed to help. I also had a serious case of acid reflux and terrible heartburn. Wow, I was a mess! I went to the local health supplement store to purchase another supplement and brought home some literature on colostrum. After reading the literature, I decided to try it…what the heck, nothing to lose, right?

That was about three weeks ago. I started taking the colostrum faithfully. My sinus problems, blisters in the mouth and throat and ear popping and aching have stopped. The acid reflux and heartburn have stopped, and the intestinal problems have stopped. What can I say except thank God I read that literature and started taking colostrum!

— Shari R., Libby, Montana

**Staph Infection**

It was July 4th of 2002 when a friend called me, and during the conversation she began talking as if she was drunk. Because I know of her commitment to a health lifestyle, I knew this was out of character. She told me that she hadn’t been drinking or taken any medication but that she did have a staph infection. This lady is the victim of mercury poisoning which severely compromises her immune system and means that
any sign of infection must be met with aggressive measures. However, her adherence to natural health principles and her experience has led her to be adamantly opposed to antibiotic therapy. She didn’t respond adequately and immediately to the presence of the staph infection and instead kept her appointment for an out-of-town trip. By the time she returned home, the staph infection had gone out of control. An alternative-minded medical doctor told her that the symptoms warranted an immediate trip to the emergency room and intravenous antibiotics. She refused!

Had I known the danger of staph infection or that her “drunkenness” was evidence of blood poisoning that had reached the nervous system and brain, I probably would not have had the courage to do what I did next. (Ignorance truly is bliss!) I told her I would be right over with the intention of trying to persuade her to go to the emergency room even though I too can’t tolerate antibiotic therapy. The cure is never worth the suffering that ensues. Before leaving the house I asked God what I should do. As clearly as you would speak to me, I heard, “take your colostrum,” so I grabbed it and ran out the door. Upon arriving, her drunken state had increased, but initial appeals to go to the emergency room were rejected. I went to her kitchen and began mixing five heaping tablespoons of powdered colostrum, which may have equaled closer to ten tablespoons if measured accurately. I sat with her anxiously waiting to see if there was any improvement and using the time to negotiate “Plan B” with her, watching for signs of progress or deterioration. One hour and forty-five minutes later she turned the corner and slowly began to come out of the drunkeness. Two hours later she had returned to normal, and I was able to go home. I strongly encouraged her to go to an alternative doctor in town the next day for an intravenous ultraviolet light treatment, which is beyond conventional antibiotics in effectiveness without the harmful side effects, and she agreed.

From that moment on, if I read any information that attempts to question the health benefits of colostrum, I just have to laugh. There’s no way I would believe that a product that can pull a person out of a septic condition could also be responsible for producing harm. Several RNs have responded in awe when I’ve told them this story and shared the horror of what it means to be septic. Again, I say that I’m thankful I didn’t know so I would have the courage to see this miraculous event.

Thank you for making such a wonderful product!

— Kathy B., Austin, Texas
**Fever of Unknown Origin**

For approximately two years we had been taking our daughter to Children’s Hospital to find out what was wrong with her. She was coming down with a fever of 102.8–103.6°F every 4–5 weeks without fail! No doctor could find out what was wrong. She would get so ill at times that she had to take antibiotics to get over the infection. She missed so much school because of her illness that the school spoke to us about it, but thank goodness that she is a superb student because she still did very well with all her subjects. She would feel horrible when it would hit. She was bedridden 5–6 days each time it happened!

We felt helpless. Children’s Hospital infectious disease doctors knew us on a first name basis because we were there so often. They were puzzled and had us bring her in every time she was sick to draw blood and examine her.

We were at our wits’ end until a friend gave us a bottle of colostrum and said it helped him recover from an illness that forced him to retire from veterinary practice prematurely. He said it couldn’t hurt her and it might help! I thought we had nothing to lose. She was beginning an infection right when we were given the first bottle. We gave the colostrum to her 2 tablets 4–5 times a day. After one day on the colostrum the lymph node swelling went down completely! The next day she was completely normal, feeling totally well. From that point onward, she has not gotten sick at all! It has been 1 ½ years and she has been around numerous people that were sick but hasn’t gotten sick at all. Thank you, from the bottom of our heart!

— WILLIAM S., SAN DIEGO, CALIFORNIA

**Herpes and Hashimoto’s Disease**

I have suffered from herpes encephalitis Type A severely for approximately ten years. My symptoms have been weakness, breathlessness and seizures. I have also had drop attacks and intense pressure in my head. Of course, I’ve had eruptions of herpes on the skin as well. I also suffer with Hashimoto’s disease, a lupus disease which attacks the thyroid, since having my thyroid gland irradiated in 1984. This radiation process was the medically prescribed treatment of Grave’s disease—an inherited disease in my family.

Since taking colostrum (two pills twice daily) I’ve noticed less weakness, much
milder seizures, less pressure occurring in my head and an added bonus of mood elevation. My menstrual cycles are even easier. I’ve felt a definite surge of immune function…I noticed a difference in about one week. With the help of colostrum I look forward to complete recovery—I believe it is possible.

Also, my dog, Traveler, has severe allergies to grass and certain weeds that appear in the spring. He can scratch himself to the point of bleeding. In the past I had to resort to cortisone treatments. With the usage of colostrum (one pill a day), it is a remarkable change. He hardly appears to itch at all—even when he’s directly exposed to allergens!

— S.N., Woodacres, California

Mononucleosis

I received a positive blood test for mono last spring while trying to work and go to college and just before I was scheduled to house-sit for my employers while they were on vacation. They loaded me down with everything in their Health Food store that might help me fight the disease, including colostrum. I pretty much forgot to take everything else, but I faithfully took the colostrum. The first week I went to school full-time despite tremendous fatigue, and the second week I worked full-time. At the end of the second week I had a second blood test, and it came back negative. The disease never progressed past the fatigue stage and went away in record time.

— Jessica F., Susanville, California

DIARRHEA AND DYSENTERY

Down Syndrome and Diarrhea

My son Zachary was born in 1993 with diagnosis of Down syndrome. He was pretty lucky except for his constant ear, nose and throat infections. He was always on antibiotics and had tubes put in his ears. He was very irritable and had escalating behavior problems because he was always ill.

Well, a little over a year ago I read an article about colostrum. We had tried virtually every natural product on the market, and his body often reacted with diarrhea (I think probably leaky gut syndrome). We had visited several specialists trying to stop
the constant diarrhea. One doctor wanted us to try a potent antibiotic, and this time I put my foot down. So now I was ready to try colostrum. What if this was the answer?

Within a matter of weeks we began to see a difference, and now after a year and 3 months, it is just phenomenal. He is rarely sick, and when he is he gets better with a normal few days. The last time he had an infection was a year and 2 months ago. No more doctors, improved mood, all round better behavior. I will keep him on colostrum…

We also had his blood tested before starting colostrum. They measured the oxy-markers in his blood, an indication of free radicals. They called me up concerned about how awful his blood results were, concerned that he would get very sick and be in danger of contracting a serious disease (Down’s children are more likely to get things like diabetes and leukemia, for example). After being on the colostrum 3 months we had him retested. The results were not a surprise because he was not getting sick any longer, but they showed a normal amount of free radicals compared to the normal population—not the Down syndrome population which have more free radicals than normal.

I would recommend this product to any child born with this. It is a godsend!

— Susan T., London, Ontario

INFLAMMATION

Bursitis

The bursitis in my left hip was so bad that my doctor was going to send me to a surgeon to have the bursa removed. I was crying every night from the pain. I could hardly walk.

I read some of the testimonials about taking colostrum, and one lady said her hip was improved in three weeks. Well, I had to try it. It took longer than three weeks for me. By the end of seven weeks, I felt like my hip was 95% better.

For two years my boss tried getting me to take colostrum. I’m just sorry I waited so long!

— Louise V., Omaha, Nebraska
Scalp Inflammation

I have an inflammatory scalp condition that no doctor has been able to properly diagnose. The condition causes inflammation on certain areas of my scalp that causes some of the hair to fall out. I read about bovine colostrum on a Web site and thought I’d give it a try. I was skeptical since nothing seems to help my condition. I’ve been taking it now for almost three weeks and am really amazed at how much the inflammation went down. I hope this is finally the answer I’ve been searching for. There are hardly any red areas on my scalp anymore!

— Kristen M., Drexel Hill, Pennsylvania

Brown Recluse Bite

A couple of years ago I was bitten by a brown recluse spider on the palm of my left hand. A sore formed with infection, and a hole was forming. My whole hand was swelling.

At the time I did not know of any treatment, so I mixed colostrum powder and aloe vera into a paste that I applied at least a dozen times a day. Believe it or not, within two days the swelling went down, and the near panic I felt was relieved. Healing had begun! Within two weeks, it was nearly healed.

Because amputation was the alternative, the healing was a wonder. Today there is no evidence of it at all. I love colostrum! It saved my hand.

— Patrick H., Sedona, Arizona

Poison Oak

A friend of mine told me that colostrum helped get rid of poison oak. My mom and daughter came down with it at the same time, so I told them to take the powder and mix it with a non-scented lotion to make a paste-like lotion and put it on the poison oak every 4 hours. It was gone in 24 hours. No one could believe it! I work at a school and this little boy came in one day covered in poison oak and his eyes were swelling shut. I ran home and got my colostrum and came back and put the lotion all over his poison oak. The school nurse saw him while I was putting the colostrum on him, and she thought it was so bad she took him to the doctor. By the time they got there, the
swelling and redness was gone. When he came back to school, everyone in the office wanted to know what the doctor had given him. He told them, “Nothing.” He had a prescription to go get filled and hadn’t done it yet. Amazing!

— Nanette E., Willow Creek, California

AUTOIMMUNE DISORDERS

Chronic Fatigue

Before the colostrum, Jessica [my daughter] was seeing a doctor monthly or more frequently. She was on about ten or more different pills and supplements and on a very strict four-day cycle diet. Though we saw some improvement, it was very little. She is fifteen and is being home schooled. It was very difficult for her to finish a day of schoolwork. She would sleep at night and sleep five or more hours during the day. Even when she wasn’t sleeping, it was difficult for her to do anything. Getting dressed was even a chore for her. Colostrum has given her her life back. Even though she is not yet well, she is able to complete a day of school work, go shopping and enjoy other things.

— Anne A., Carencro, Louisiana

Chronic Fatigue Syndrome/Fibromyalgia

In July of 1996 my wife, age 45 at the time, came down with a very mysterious illness that changed her entire life. Prior to July she was very active in the operation of our quarter horse business and only complained of the aches and pains that are expected with this kind of work. One particular day she began to get very weak and disoriented. She was rushed to the emergency room of a local hospital where they found no evidence of anything that should cause

She made very little recovery progress over the next ten days. Finally a new symptom surfaced, severe pain in the muscles and joints. Over the next six months she was seen by fourteen different doctors, and not ONE of them could put their finger on the problem. By this time orthodox medicine had her on several pain medications, and she stayed drugged to the point of all day sleeping all day.

I was introduced to colostrum and started her on it with her medications. After
taking this product for three days I could see a noticeable difference in her pain and her energy. Being an individual that believes in natural body healing, I began to wean her from the conventional drugs until we got solely on the colostrum (this took me two weeks). She continued to take the colostrum and continued to improve. To eliminate any coincidence, I pulled her from the colostrum, and within two days she was going backwards again. After the second day, I returned her to the colostrum, and immediately she began to show progress again. She has been on the colostrum regularly ever since, taking four capsules in the morning and 4:00 in the evening. Today she is back working and doing things that were impossible prior to the colostrum.

She was finally diagnosed with chronic fatigue syndrome and fibromyalgia, and she does not take ANY drugs of any kind. Her last doctor was critical of the colostrum and suggested that we do away with it and take his recommended medications. We chose to terminate the doctor and his recommendations and continue on with the colostrum. This was in February of 1998, and she continues to do well.

— Dave S., Griffin, Georgia

**Crohn’s Disease**

Kristen is a darling second grader with a huge challenge! At age six she was diagnosed with an autoimmune disease, Crohn’s. As her mother, I was completely devastated when I heard the doctor give us the diagnosis. Where would I begin? How to begin helping my little girl live with this chronic illness? Kristen was having such a difficult time assimilating her food that her weight loss was alarming. The doctors had started her on large doses of steroids. My husband and I were frightened by the long-term effects of this medicine.

Late at night I would search the Internet for answers. Then I found colostrum. I called the company and asked a multitude of questions. They were so helpful and reassuring. Kristen has been on colostrum for three months now. She is steadily gaining weight, increasing the type of foods she can eat, and has not had a cold for eight weeks, which is absolutely exciting. At school she was always catching colds. We have been courageous enough to take her off the steroids.

— Tracey C., South Bend, Indiana
Multiple Sclerosis

Twelve years ago I was diagnosed with multiple sclerosis, and the neurologist who diagnosed this suggested I begin taking cortisone. Well, being the careful person I am, I began to do research about this drug. Upon finding information that indicated severe side effects and possible long-term damage to some major organs, I declined. So three years later I came upon alternative healing, i.e., herbs, vitamins, etc.

Even with this, I still had the major battle of locating a natural product to assist with my autoimmune disease. Thanks to all the information herb and vitamin stores gladly hand out, I came upon an article about colostrum. So again I did some intense research. After looking at all the materials and making phone calls, I decided to try colostrum. That was about three years ago, and thanks to the colostrum, my immune system is stronger than it ever was, even before my diagnosis of multiple sclerosis. I have also recommended colostrum to a couple of friends who also have multiple sclerosis, and their stories are just like mine—success!!

It has also benefited my skin condition, eczema.

– Jude R., Green Bay, Wisconsin

Arthritis and Bone Disease

I am very pleased with the effects colostrum has had on my overall health. I began taking concentrated doses about two months ago and after one month reduced to the regular recommended dosage. I have noticed a few things. First, I soon felt in better health, with higher levels of energy than I had experienced before. Within a few weeks I reduced the amount of arthritis medications I took each day by half, with no increase in pain and no decrease in my activity level. I also experience less stiffness and pain in the morning upon awakening.

For whatever reason, about 1½ months ago I began to wonder if the colostrum was really helping me all that much and if I could do without it. Also, the daily drudgery of taking yet another pill began to wear on my patience. I stopped taking the supplements. Within a week I felt noticeably more tired, even badly for a few days. I began experiencing pain in my legs and had more general aches and pains than I’d been used to. I also realized that since beginning to take the colostrum I’d experienced no yeast infections, which had before been a monthly occurrence coinciding with the on-
Yes, But Does it Work?

set of my menstrual cycle. I of course immediately began taking colostrum again. With days I was feeling better and had the level of energy back that I’d so quickly become accustomed to. I have decided swallowing a few capsules a day is a very small inconvenience that has greatly enhanced my overall quality of life.

— CONNIE, FOGELSVILLE, PENNSYLVANIA

No More Scooters

My experience with colostrum has been very good for me in many ways. The first was the strengthening of my muscles to walk again. I have relied on a scooter for three and a half years and a walker to try to get some exercise around the house. I have arthritis in both hips, and one hip is worse than the other. Because of the fear of the hip giving out, it was easier to ride around. In the process of enduring this, the doctors prescribed Indocin, which I took for six years—I later read that it should be only prescribed for three months—which had the effect of my gaining weight. The good result of colostrum is the arthritis has left, I am losing weight, and I have a better disposition.

One day I was out on my scooter and hit something that caused my scooter to tip over, and I bruised my hip really bad. It was almost black and probably four inches by four inches around. I thought I would be really stiff the next day and my neck hurt the night before, but the next morning there was no stiffness at all and the bruise started to go away and was gone by the end of the week.

Because of these results several people are taking it because of what it has done for me. They were skeptics in the beginning.

— NANCY N., ROCKFORD, ILLINOIS

Osteoporosis

I am writing this letter to thank you for getting me to try colostrum. As you know, on June 15, 2000, I broke the L-1 vertebra bone in my back. I was out of work for twelve weeks. The bone and joint specialist sent me for a whole body scan, MRI, countless X-rays, and a bone density test.

The diagnosis was osteopenia [decreased bone density] throughout my body and spine. This is the last stage before full-blown osteoporosis. I was told by my bone and
joint doctor that there was no cure for this bone disease. There were only two types of medicine available to treat this disease. The medicine I was placed on is called Fosamax. This drug is used to slow down the bone loss. The other is given if you have full-blown osteoporosis. I cannot tell you the pain got any better because it did not. It felt like my muscles were ripping away from my bones. I came to your office for my monthly visit. During our conversation, I told you of the problems with my back and the pain I was experiencing from the bone disease. You suggested I try colostrum.

But, being the skeptic that I am, I put you off for months. But you never gave up on trying to help me. Every time I came in, you said, “Please, just give them a try.” First I bought some for my husband because they are good for his arthritis. He said he felt much better. The pain for me was getting much worse. On my next visit to your office I purchased a bottle and started to take them. About four to five weeks later I noticed a difference in the amount of pain I was experiencing. I have been taking colostrum for a year now. Today I got the best news. My doctor gave me another bone density test, and the test came back normal, no trace of osteoporosis. My spongy, thin bones are back to normal thanks to you and most of all thanks to colostrum.

— M. Hall, Lutz, Florida, from a letter to her chiropractor, Dr. Donald Wolfe, DC, Bayonet Point, Florida

Of Cats and Sunburn

I have been taking colostrum now for two months. I have noticed improvement in a lot of areas, especially my joint pain. I also have been giving my cat colostrum who had a severe upper respiratory infection for two years that was finally killing him. I was told to put him down; there was nothing else to do for him. With a raw food diet and colostrum, my cat is healthier than I could have ever hoped for, and his coat is amazingly beautiful.

Two days ago I went to the beach to lay in the sun, and I was silly enough to stay too long. By the time I got home I was so burnt I was shocked to see myself in the mirror. I was in a lot of pain, and I knew this was serious. I was so frightened I started crying. Then I thought of mixing some colostrum with water and applying it to my burns. Almost right away I felt the pain lessen, and I reapplied some more. Within about fifteen minutes I was pain free. By the time my husband got home two hours later, I was exercising. He was not surprised after seeing what it has done for our cat. My
burns healed. Without the colostrum I would have certainly ended up in the hospital.

— JOHANNE T., RICHMOND, BRITISH COLUMBIA

Allergies

I have been using your brand of colostrum all through the pollen season, and I am still using it now to help with grass and mold pollen. This is the first time in many years I have found relief. I am very pleased and recommend it [colostrum] highly to everyone and anyone with allergies and sinus problems.

I used to have to take Claritin, a prescription drug, very expensive, with limited benefits and many side effects. I suffered from dry eyes, dry mouth, headaches and itching from taking Claritin. I have none of these side effects and great benefits from your colostrum, a great product!

— ANNA M, COLUMBUS, GEORGIA

Asthma and Allergies

I am a 72-year-old male. I have suffered with asthma, severe allergies and low blood sugar for the past ten years. I started using colostrum approximately two months ago. My allergies cleared up almost immediately. The only time I use my asthma medication is before exercise, i.e. treadmill, weight lifting, etc. This is a reduction of 90%. And my blood sugar is normal.

— CHARLES C., HENRIETTA, TEXAS

Hives

Prior to taking colostrum, I had hives throughout my body, both internal and external. My doctors were not able to determine the source and in frustration prescribed a strong medication to help alleviate the pain but could not and did not help with the symptoms. After taking colostrum, I immediately had an elimination of my allergic reactions. The hives are not entirely gone, but are 95% eliminated. For the first time in years I know can sleep, wear clothes comfortably, go to work, eat normal foods. The change in my life has been incredible. My wife thinks she’s married to a new man. We cuddle, and it doesn’t hurt! There are no words to express how incredible all this is and
what it means to me. Because of colostrum I have my life back—plain and simple. Also, I sleep better, have more energy and am less moody than before.

— Warren D., Salt Lake City, Utah

Warts

My son had two warts on his foot for seven years that responded to treatment but always came right back. My sister had given me some colostrum to help speed up his recovery from strep throat. To my amazement, the warts just fell off! It has been two years, and the warts have not returned. I had a plantar wart that was not responding to treatment after four months, so I decided to try the colostrum. After two weeks the wart was gone and has not returned.

— Karen W., Hendersonville, Tennessee

Hemophilia

James [not his real name] was born with hemophilia. He is a fifteen-year-old Amish young man. Throughout his young life he has had several bleeding episodes from falls and injuries. He has always had to be very cautious, not playing hard like many of his friends did.

Approximately 18 months ago, James started taking colostrum powder. He mixed it in different foods and ate it very willingly. Soon James’ brother was eating colostrum too. Colostrum has been the only supplement James has taken. No other vitamins, minerals, herbs or medications.

James has been working at a sawmill in Southern Indiana close to Bloomfield. One day his sleeve caught and pulled his forearm into the saw. The saw tore into his forearm making a deep and ragged wound. The ambulance was called. On the way to the hospital something began to happen: the bleeding slowed, slowed even more, and finally there was no bleeding. Actual clotting was taking place!

For James, his family and community, it was the “Miracle of Colostrum.” James and his parents say the only thing different was the colostrum he was taking for the past many months because hemophilia is a frequent illness among the Amish people, they are now buying cases of colostrum. The Amish community is truly rejoicing for James and many others!

— S. Plew, Bloomfield, Indiana
COGNITIVE DISORDERS AND ALZHEIMER’S

Brain Damage

A lady we know has a boy, Casey, who at nine years of age was badly brain damaged in an accident with a pet donkey. He was in a coma on life support for some six months. He has slowly made a remarkable comeback. He can now walk but falls a lot. He has had bad memory problems and couldn’t remember for even a few minutes what he was told to do. He also craved milk. His mother said he would “kill for milk.” If allowed to, Casey would drink two gallons or more per day.

We gave this lady her first bottle of colostrum to see if it would help him, having read that colostrum would help brain damaged people. Within one week, she said Casey was so much better. It stopped his unreal milk cravings. He now drinks two or three glasses a day. He remembers so much better now, and is learning to take charge of his life. Also she says she has hardly had to help him up off the floor since taking colostrum.

The family was living in Modesto, California, and ran out of colostrum. After several days, Casey was falling again, craving milk, and the poor memory returned. She tried another brand from a health food store, but it didn’t do the job. They then drove 700+ miles up here [to Idaho] to get some more colostrum. Needless to say, this customer is thoroughly sold on the product!

— Ken I., Melba, Idaho

Cancer

After becoming a cancer patient a couple of years ago, I began a journey to a healthier lifestyle, and much of that included the use of dietary supplements and vitamins. With all the immune boosting products out there and the hard sell many vitamin stores push to get you to buy things not necessarily in your best interest, I was still very excited to try colostrum. Furthermore, members of my online cancer group have been highly recommending many of your (colostrum) products as a good supplement to include in the anti-cancer arsenal.

— Cyd S., Littleton, Colorado
I believe it is worthwhile to tell you about the history and progress of Charles Kellum, a 57-year-old white male who was diagnosed with Non-Hodgkin’s Lymphoma in September, 2005. Mr. Kellum, an RN, self diagnosed himself with splenomegaly at that time and a splenectomy was performed. Subsequent CAT scans revealed perirectal lymph nodes and he was started on rituxin, velcaid, and sandostatin. He was plagued by diarrhea which the sandostatin relieved. He took chemotherapy from February 2006 through July 2006, and he had a weight loss of 50 pounds from 220 to 170 pounds. He was extremely fatigued and suffered from diminished energy.

He was noted to have no change in lymph node masses via CAT scan. He was placed on more chemotherapy: rituxin, etoside, and cysblantin. This chemotherapy regimen began in April 2008 and finished four months later. His energy decreased significantly, his physical robustness diminished radically; he was only capable of staying in bed. His weight leveled off at 97 pounds. He was severely emaciated in appearance on May 11th, 2008 I wondered silently to myself when I saw him if would he survive for more than a month!

In April, 2008, I met you, and you told me about colostrum, the sublingual preparation. I said to myself—this polypeptide is worth a try. He was instructed to take the colostrum sublingually, beginning in the morning and evening for six months. When I saw him in May 2008, I called you and you said to have him take colostrum every 4 hours. In July 2008, he starting gaining weight, his weight currently is 137 pounds. He also became more physically active and was able to work at his hobby of repairing engines.

My clinical impression, which is not based on scientific fact but clinical observation of this patient, is that colostrum played a role in helping him battle with cancer. I know he is very grateful for the donated colostrum you have provided. I am also appreciative of the donation.

— Dr. John P. Miller, M.D.

Injury Recovery and Wound Healing

Before using colostrum repair cream, I would have a cut, scratch, wound, whatever take up to three months to totally heal and then would end up with a scar. Since I found this wonderful product—the repair cream—I apply it three times a day or more and have small wounds heal in about two to three weeks with no scarring. It is a terrific product and sure works well.
Also with reference to the colostrum capsules, they can be broken open and the powder patted onto cold sores with a healing, drying ability far surpassing any cold sore medication I’ve ever used, and with no symptoms of excessive drying and tightness as with other over-the-counter cold sore meds.

— Mimi P., Lewiston, New York

ATHLETICS

Muscle Building at 70

Golf is my game. When I retired, I thought playing on the golf course would keep me lean and toned. Did not happen. Then I started taking colostrum. Four weeks later I stepped out of my shower and looked in the mirror—a miracle had happened! I had muscles at 70! Nothing I had anticipated at all. But taking colostrum powder before my golf games had burned fat into muscles. Now I am exercising three times each week with weights and swimming at the gym. Colostrum energy is remarkable at my senior age. Thank you for the great surprise!

— Bill C., Ithaca, New York

PET HEALTH

Elderly Pets

Kindred Spirits Animal Sanctuary is dedicated to caring for elderly animals and, at the end of life, the Sanctuary offers compassionate hospice care. Prior to coming to the Sanctuary, most of our animals have suffered severe neglect, abuse and abandonment, and many are frail with a variety of ailments and disabilities.

The Sanctuary has always practiced high standards of nutritional care. However, about a year ago a holistic veterinarian suggested that the one real improvement we could make would be to add colostrum. I was concerned about the expense but decided to give it a try for our resident dogs. He was absolutely right. After only a few weeks, I noticed a marked improvement in their vitality. Minor eye and ear infections disappeared, wounds healed, and their coats gained a new luster. However, most of all they seemed to brighten in spirit. In fact, visitors often comment, “They all look so
happy!” I feel that having added colostrum to their diets is a major improvement and has made a real difference in the lives of our senior dogs.

— ULLA PEDERSEN, DIRECTOR

KINDRED SPIRITS ANIMAL SANCTUARY AND ELDERCARE HOSPICE, SANTA FE, NEW MEXICO

Testimonial Snippets about PRP Spray

I have to say the biggest results I have seen are from my ninety-year-old father-in-law. He has five small tumors in his brain, and it has been affecting his balance and hearing. He also complains about headaches. He is taking medication for high blood pressure.

After the first day, his headaches and balance improved. He told me he now sleeps through the night, which he has never done. He has more energy than a forty-year-old. He has reduced his blood pressure medication. His blood pressure, which usually ran 158/115 with medication, now runs around 120/72. It’s unbelievable. Also, his disposition is so much better. It’s like a miracle drug for him.

My mother-in-law took it for a few days but went off it because it made her really tired. She blames the spray, but she wasn’t feeling well before she took it. When she went to the doctor, her CBC came back showing infection, so I think it was that.

Paul, my Lou Gehrig’s friend, has started to take it. He goes in for experimental treatments, which really took a toll on him, so we don’t really see any major results. I would assume knowing his chronic condition it would take a really long, long time to show improvement.

My mom says her arthritis is better, and she has tons of energy. My granddaughter loves it. She is the only one from her pre-school who has not gotten sick. She has not had immunization shots, so this should keep her really healthy. I haven’t heard from anyone else.

The spray has given me more energy then I had. I went to the doctor and found out I have something going on with my heart. I need further tests to figure out what. I have received your care package. Thank you, thank you.

I’m so thankful to have met you. You are a special person. My gratitude is so great just for the results my father-in-law is having. I have enjoyed the time that we have spent together. I am really thankful again to have met you. I know I already said it once, but I truly mean it.
I hope everything is going well for you...and you’re out there saving the planet. I know you are.

— Colleen Kelly, Tucson AZ

The following are a collection of letters from Richard
Kolt of Tucson, Arizona:

Sunday, Dr. Catare and the group filmed the 30+ people at Reverend Bea’s church. I had given colostrum to a woman and two children who are sickle cell victims. We took testimonies to be shown on TV, and the sickle cell child was well, just as had been reported. The interesting thing was that he only had one bottle of the PRP spray. They ran out in late January. It appears that a single bottle will reverse SCA? Now for the $64,000 question: how to expose this to the SCA community. Does anyone out there have an idea?

Sunday I had agreed to go to Rev. Bea’s church. She is still in the Kwalangare slum, but she had to move into a building twice the size. Bea is quite a preacher. She reminds me of the movie about Amiee Semple McPherson who built the first entertainment-type church in LA in the ‘30s. Aimee passed the plate with clotheslines overhead where you clipped your bills. Change was not accepted, even then when a dollar was a dollar.

Bea’s new church was on Church Row. Reminded me of the bars in Chicago, seven or eight on every block. The competition was from the music, the amplified speakers and a half-dozen talented preachers shouting and rolling. Since Bea started giving out colostrum, her flock has doubled. Location, location. Location or COLOSTRUM.

Bea’s church starts at 9:30 AM with a half-dozen camp meeting hymns and rolls right into a couple of sermons by her helpers. Then for my benefit, I’m sure, she had testimonials from 12–15 people marveling about everything from HBP to arthritis and AIDS. I then spoke to the group again and received their thanks and gratitude. It’s amazing what the product can do. Then I mentioned that we had been successful with a sickle cell anemia child and asked if anyone knew anyone with such a child. The first lady we had ever treated said there was one two minutes away. I asked her to go get the lady.

She was a pretty thirty-five-year-old woman with a two-year-old suckling and a ten-year-old boy, David. When she walked into the church, she had already heard
the details from our friend, and she was sobbing. She has another thirteen-year-old son who is in a boarding school for sickle cell kids. She got the whole nine yards in Swahili translated by Bea. As she listened, she lit up. The whole thing was thrilling and unbelievable for her. We, of course, cautioned her that only one SCA child had been treated, but she said she had been praying and praying for years that something could help her babies.

We started the two kids on the spot. When I looked at her, she was awestruck and loving, focusing on the children while the whole congregation sang and prayed. She looked like she’d just won the lottery and spent two sputtering minutes thanking me. I again cautioned her that we had only worked on one, but she said, “It will work. God has answered my prayers.” I’ll never forget the eyes. Tough stuff! Made the rest of the three-and-a-half-hour service pretty tame. I asked each of the members to bring one other sick person with them next Sunday for some free samples, and they all promised.

I told Bea to start collecting more chairs.

Just another Sunday in the Kwalangre (Nairobi) Slum.

I had forgotten to mention that Saturday I also saw Rev. Martin. I had met him around Christmas. He had fallen twice when his blood sugar was out of balance. He is a handsome sixty-year-old preacher of a small poor church outside Nairobi. He obviously has other income as he wears Seville Row suits, but he heard I was in town and came in to see me Saturday evening. He had completed the two bottles of PRP spray I had given him, had been taking two injections of insulin a day, and his eyesight was failing. According to him, “It’s truly a miracle! Why doesn’t everyone know about it?”

Monday morning at breakfast one of the waiters came up to me and told me quietly that his CD4 count was normal. He’s been on PRP spray since January 10th!

At the office, Rhoda, the mayor’s wife, brought Susan and Hassan. Hassan and her husband Iman had recently converted to Christianity. Their son, Hassan, had to have a shunt inserted in his brain because he had meningitis. After the operation he was paralyzed on his right side. He is five-years-old and has ADHD. Susan was concerned about the overactivity because they wouldn’t let him stay in school. Also he was having convulsions three or four times per day.
Yes, But Does it Work?

I held the boy and told him we would have a party, four squirts for Hassan, four for GGP. Within two minutes Susan started to cry because Hassan’s behavior was 90% normal. His teeth and gums were awful, so I gave us each four more squirts. She then told me that she needed spray for herself (ulcers, etc.), and her mom is a diabetic. They left the office higher than a kite.

I had eleven meetings/treatments/presentations ending with the final meeting at 6:30. Rhoda was still awestruck and told the four pastors what happened to Hassan. Two minutes after they left me walking down the hall, Hassan yelled, “Mom, look! I can move my hand!” A few steps later, “Mom, I can lift the water bottle to my mouth! Mom, look! I can walk without dragging the leg.” Rhoda said, “All Susan could say was ni mujizza, ni mujizza, ni mujizza, ni mujizza...ni mujizza! She cried all the way home!”

Is it a miracle, is it the PRPs? I don’t know, but it looks like what I’ve said before: colostrum fixes everything! Add meningitis to the list.

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Today an article in *Parade* talks about the work that Dr. Paul Law is doing on autism.

“I am currently using bovine colostrum on a group of 37 autistics in Nogales, Sonora, Mexico. I have been using colostrum for over two years on immune and autoimmune conditions in Africa.

“Almost by accident I gave colostrum to a grandmother here in Tucson who began treatment on her five-year-old grandson. His improvement was so stunning that the autistic program at the University of Arizona declared they had misdiagnosed the boy. The grandmother said, ‘Isn’t it amazing that he could never say my name?’ And so forth.

“The boy at last report was acting normally. Keep in mind that the results were strictly anecdotal, but two months ago when I was in Africa one of my friends emailed me to report that a woman with terminal cancer had had infant twin babies and was looking for someone to adopt them, and that my friend was starting colostrum therapy. She had terminal cancer, unable to work. My friend began colostrum on that lady and also a nine-year-old leukemia victim who had not eaten in days.

“The colostrum comes in a spray bottle. When the colostrum was taken to Mexico, an extra bottle was given to a neighbor child that was autistic. The results of all three
were staggering. My friend made an appointment for me to meet the woman and sick child, who were back to work and back to school respectively, at an autistic house in Nogales. I am not at the computer to attach the results of my work there, but tomorrow from my office I will forward my letter.

“I have now used colostrum on the kids for three months, and copies of the parents’ letters, which I just received Friday, will be translated from Spanish, and I will forward as well.

“I am a humanitarian and am spending my time and money helping people around the world to get well. I have never charged anyone, and pay for the products myself.”

Somewhere I have seen the phrase, “Expect a Miracle.” Well, here’s one.

In the past I have had many unbelievable experiences with colostrum. Yesterday was another Top Ten.

In Nogales, Sonora, Mexico, there is a day care home that cares for 37 autistics. I found the house through my friend, Myra, who is a friend of Alma, who is a friend of Fran, etc.—all colostrum missionaries. Myra had sent colostrum to Mexico to treat a woman who had terminal cancer. The woman had been looking for someone to adopt her twin baby daughters. I met her at the autistic house. The woman had been started on product four or five weeks ago. She is back to work!!

Also I met the nine-year-old that had leukemia; she was started on the product at the same time. Lupita was unable to eat and was bedridden for weeks. I held her and her mother while we all cried. Nobody can believe it but that’s how it is. I will try to attach pictures of these people to this letter or send them later.

But that was just an extra on this trip. Sandra and her husband Jesse Tapia picked me up in Nogales, Arizona, and took me across the border to the house. The house is run by the parents and has no other funding. They have 37 people, mostly 4–12 years old, but with three or four adults. They have a medical doctor who has computerized the information. They have a supplement that is marketed by Kirkman who specializes in diet and supplements for autistics.

When I entered the house, it was organized bedlam, even though the most disruptive were in a separate population upstairs. After introductions and translations (my seventh grade Spanish, their seventh grade English), they assembled about 25 of the
more sedate kids, and I outlined colostrum and expected results. When I asked one of the three women who were in charge, Maria, which was her child, she told me he was upstairs with the most disruptive kids. I insisted that all of them should assemble in the little entry area. I then sat on the floor with all the kids. It was bedlam. We then gave bottles of colostrum to each parent and had them apply the first dose. Some day I hope to be organized enough to capture these experiences on tape, but the worst case boy, Maria’s son, is about fourteen. He couldn’t control his arms and legs and had to be restrained from eating his arm. He had large, open scars on his arms from his teeth. He also is blind in his right eye where he had tried to gouge it out.

Within a minute, the bedlam was not from the kids but from the parents. Each of the kids was visibly less active. Marie’s son actually sat still some of the time, and there was probably a 70–80% reduction in the activity of each of the kids. The parents were amazed! They were chattering like magpies about what they had witnessed. I had seen this before with an autistic kid in my office, but never with 37 people. It was simply indescribable.

We then met with the MD and the head women and reviewed the computerized records. The doctor had started, like many people, withdrawn and skeptical. After witnessing the first application, he was enthralled.

The hair sample tests show that all of them had very, very heavy contamination of heavy metals, aluminum, mercury, and eight or ten others. He showed me the reduction that had been achieved with the Kirkman supplement, which was impressive, but not enough to noticeably reduce their overactivity.

We outlined a test, and they agreed to place a group of six or eight of the same age kids on colostrum and the supplement and another group on just colostrum. We talked about doing a test without colostrum, but we all agreed that the results we had just seen indicated that it would be wrong to exclude any kid that could be helped. So my test may not fit Big Pharma parameters, but it can help them decide on what’s best for the kids.

Please tell everyone you know about the miracle of colostrum. Sandra has journaлизed all the results so far, and each parent has promised to record individual results. Somehow I suspect that we will have the best efforts of 37 poor, less distressed people. When I have the results, we will print and distribute them.

With everyone’s agreement I renamed the house La Casa de Tranquilla—The Quiet House. I promised to return November 20th as soon as I return from my two
weeks in Africa. They are planning to have newspaper and TV reporters there to record the happenings. Hopefully it will be a non-event because I expect all the kids to be much more sedate.

Today I meet with fifteen autistic kids and their parents from Tucson in my office. So expect another miracle soon.

On November 27th, exactly one month from the beginning of treatment of the 37 autistics in Nogales, Sonora, Mexico, we returned for our second visit.

Myra’s sister, Sue, had arranged for Mexican newspaper and TV stations to be there to report on the first month’s results. Of the 37 clients, only two failed to show much progress. Those two were older children that had habituated their different behaviors, and although they may have improved medically, they will require mental therapy.

Every one of the others had significant improvement. Marie’s son, the most unmanageable of the group, was almost placid. Marie reported that the best part was he was much happier and easier to manage. I have pictures of him hugging and playing with Marie, which was previously impossible. (I’ll try to forward the pics later.)

A number of the mothers were interviewed with me by the paper and the TV reporters. Each related their particular story, and the most poignant perhaps was Maria #2. In Spanish, of course, she said that her six-year-old daughter was epileptic as well as autistic. She said that the daughter had experienced half as many epileptic incidents in the last month, and that every one was two-thirds less severe. She said that the best part was that she was able to sleep, because in the last six years she seldom had a good night’s sleep due to the daughter’s attacks. Since colostrum she had only one major attack and that was a day when she had forgotten to give the child the colostrum. She then hugged me and said, “You aren’t ever going to let my child run out of colostrum, are you?” And as you can imagine, that will never happen.

Clinically, the parents agreed that the improvement has been progressive, so it will be interesting to follow.

The only flaw, remember, is that there is an MD on staff who was originally skeptical then supportive. He had agreed to test a group of kids with and without colostrum. Unfortunately, the Medical-Industrial Complex reared its ugly head once again. He said he was concerned about being involved because of possible profes-
sional conflicts and elected not to do it. We will just have to wait a few months, let him see the continued improvement, and twist his tail again. He is still supportive and very positive but just pharmaceuticalized. It’s truly amazing how deep the fear of Big Pharma goes.

— RICHARD KOLT, TUCSON AZ

I wish to take this opportunity to sincerely thank you for taking time to visit the Garden of Hope Centre, Ngon Town, this morning to start colostrum treatment on the few needy cases at the center. As we briefed you, the center supports over 150 orphans, 30% of whom are HIV/AIDS infected. A few other children are suffering from a combination of sickness due to their families’ inability to provide a balanced diet.

Today you were able to start the supplement with one child suffering from cerebral palsy and an old woman aged sixty-six years who has hip and joint problems. We will include three other persons who are infected by HIV/AIDS in the program as well and monitor their progress. We trust that this sample group will motivate others to try it. Am optimistic that the wonder supplement is going to work as I have the evidence that it’s working on my cold. As from Wednesday when you introduced the colostrum to us during our breakfast prayer meeting, I have been using it, and the effects are wonderful. My chest and throat that were blocked are clearing quite well.

I wish you God’s favor even as you try to reach over a million souls through the wonder supplement.

It’s a job worth the sacrifice!

— SAMUEL KIMORI, NAIROBI, KENYA

Professional Testimonials

We are so excited about the results we are having from the colostrum. Here are four wonderful healing results we have to share with you. There are a lot more that will be using this colostrum. This truly is a wonderful product for those who are fighting to regain health and wholeness. Please share these healing testimonies with others who need healing.

One young twelve-year-old boy in California was suffering from a severe case of mucosa colitis and losing weight. He was literally dying. His doctor was planning surgery to remove his colon. His father called me and asked what could be done natu-
rally. I recommended that he start taking double doses of colostrum. After 5 days, the bleeding from the rectum ceased, and within 7 days he began to have normal bowel movements. From that point on he has gained 32 pounds of weight. His parents were most delighted to see the change.

Here in our town of Cottage Grove, Minnesota, a local minister had uncontrollable diabetes and was taking three insulin injections daily. I shared with him the benefits of colostrum, and several months later he came back to me and was convinced that something besides injections had to be done. He purchased the colostrum, and within one week the miracle of healing kicked in and he was no longer giving himself insulin injections. Now he will not go without colostrum to regulate his insulin secretion. He is totally convinced of the benefits of taking colostrum.

Then his wife came to see me. She had a staphylococcal infection and numerous ulcer-type sores on her body. We placed her on double doses of colostrum and natural zinc ointment. Within two days the sores began to heal, and in one week they were gone. She had visited no less than two medical doctors who could not help her. Now her countenance has changed with joy and health restored.

A lady in our church had bouts of heavy asthma-like breathing. We put her on colostrum, and she noticed how easy her breathing became. She found that she has more energy and continues her daily schedule with ease and comfort.

Miss C.B., age eleven, has suffered from severe juvenile rheumatoid arthritis since age one. She has also been under the care of a pediatric rheumatologist since age one. This rheumatologist has tried every nonsteroidal anti-inflammatory agent available with no great improvement. When she presented to my office three weeks ago, she was taking Celebrex 200 mg daily, which is widely known to be the best treatment available. The rheumatologist was planning to place C.B. on methotrexate and steroids if no improvement was seen.

When I saw C.B., she was wearing braces on her lower legs, had swollen joints, to include her knees, elbows, neck, and back. I placed her on colostrum 4000 mg daily (4 capsules every 12 hours), and three weeks later she no longer needed her braces. She had no more pain or swelling in her joints. Her recovery was nothing short of miraculous. She is continuing to take her colostrum as directed, and she has had no
relapse of symptoms. Her rheumatologist is shocked and amazed. I continue to see wonderful results in my patients. Keep up the good work. If every person were taking (colostrum), most of the medical community as we currently know it would dry up and blow away. Very few people would get sick.

— Gary Mezo, ND, PhD
Westchase Alternative Medicine, Inc., Tampa, Florida

M.T., a seventy-year-old female, complained of “bowel trouble all my life.” Constipation requiring continuous use of laxatives, stool softeners and enemas might last several weeks, followed by diarrhea for a few weeks. Then the cycle would repeat.

She had seen many doctors, had many tests, including barium enema X-rays, colonoscopy, etc. Her most frequent diagnosis was irritable bowel syndrome and slight iron deficiency. No treatment, diet or drug therapy was effective.

M.T. is an active person of normal weight and is a competitive barrel racer on the rodeo circuit. There were times when she had to drop out of competition due to explosive bouts of diarrhea. She complained of ongoing pain in her abdomen and chronic fatigue.

I started her on broad spectrum colostrum, and within two weeks she noted a good improvement. By the end of the third week she had completely normal gastrointestinal function. No more diarrhea. No more fatigue. No more constipation. The slight iron deficiency has normalized, and she has, in her own words, “energy to burn.”

I feel your colostrum is the only truly effective product on the market today. We have in past years used several other brands of colostrum with little or poor results.

— E.W. McDonagh, DO
McDonagh Medical Center, Kansas City, Missouri

My use of bovine Colostrum is based on good science, experience, and common sense as I was introduced to veterinary medicine while working on a dairy farm during high school and later as a milk test supervisor for the University of Georgia Dairy Department. I have been a veterinarian for 52 years—the last 44 years in small animal practice—and have been involved in numerous clinical trials. I have seen old, favorite treatment modalities replaced with new and better protocols. The use of bovine colostrum in my practice has favorably impacted a greater diversity of diseases than any other product except the “silver bullet,” cortisone.
Jake, a 125-pound Rottweiler, was presented with a sarcoma half the size of a tennis ball just lateral to the fetlock. Excision necessitated transpositioning the skin to cover the defect. Ten days post surgery the graft had failed, and the exposed tissue appeared to be a recurring tumor. Treatment consisted of debriding dead tissue, two capsules of colostrum twice a day, and powdered colostrum liberally applied under bandage to the wound every other day. Healing was complete after six weeks. Six months later there has been no evidence of recurrence of tumor, and no further surgery was needed.

Nancy is one of those unfortunate women who are addicted to picking up strays. In spite of reasonably good care, antibiotics and appropriate vaccines, she was continually plagued with upper respiratory infections in both kittens and puppies, non-responsive to anything except tincture of time. Addition of colostrum to her regimen had kept Nancy happy for the last ten months.

For about six months now, we have been seeing an unusual number of cats with recurring cystitis in spite of various antibiotics or diets. Approximately two months ago, we started giving these cats one capsule of colostrum twice a day, maintaining them on the cystitis diet and discontinuing antibiotics. To date all have responded (at least 2–3 per week).

The most gratifying results have been in “curing” inflammatory bowel disease and controlling the many forms of allergic dermatitis/otitis/pododermatitis and the accompanying yeast and/or bacterial infections. Clients continue to amaze me with their reports of the improved quality of life in their senior citizen arthritic dogs and cats.

– B.S. Austin, DVM, Longwood, Florida

I have a number of patients who are arthritic, and bovine colostrum dispensed for the treatment of rheumatoid and osteoarthritis has provided them with amazingly good results. One small-boned elderly gentleman who was terribly overweight did suffer in total agony from rheumatoid arthritis. He could hardly walk. I put him on colostrum, about a bottle of 120 capsules per week, and he soon reached the point where he could walk without pain even though he did not lose the weight.

I used bovine colostrum for the arthritic treatment of my fifty-six-year-old mother. Her left knee exhibited a lot of inflammation as the result of having been damaged in a prior automobile accident. I had tried a number of different therapies such as shark
Yes, But Does it Work?

cartilage and MSM without success, but when I added the bovine colostrum she was pain free in three days. She now takes it religiously.

In Mexico, my staff and I do a lot of work with cancer, and two-thirds of my cancer patients are taking colostrum. About half of my patients are poverty-stricken, and I stretch my resources to help them by dispensing colostrum to them at little or no cost. For those who can afford it, I typically have them take five or more 480-milligram capsules a day—that's over 2000 mg. Colostrum really does seem to make a beneficial difference for my cancer patients. They have more energy, and it keeps down some of their infections as a complication of the illness.

I am giving colostrum to hepatitis C patients. One of these people living in Northern California who found it impossible to come to Mexico consulted me by telephone. His situation was really serious because he had a hepatitis C viral load of 8 million. I put together a protocol for him of bovine colostrum, calcium orotate, reduced glutathione and protease enzymes. Within two months, this patient returned for laboratory testing and discovered that his hepatitis viral load had plummeted to 100. Since the patient did not take treatment with anything else, this is convincing proof to me that bovine colostrum works synergistically in a combined nutritional protocol. I’ve gone on to successfully treat many more cases of hepatitis C.

– STEPHEN HYNES, ND

DR. HYNES RUNS A CLINIC IN CIUDAD ACUNA, MEXICO,
JUST ACROSS THE BORDER FROM DEL RIO, TEXAS.

Scientists have long known about the increased resistance of breast-fed babies to certain infections, particularly to intestinal disorders. However, because of changing cultural values, many post-war mothers didn’t breast-feed their babies, and now many of these grown-up babies are dealing with prevalent and difficult-to-treat immune-compromised conditions. Part of this problem is due to the breakdown of the environment and the nutrient-deficient food we eat. Furthermore, many older people have fragile immune systems due to a multiplicity of factors, including stress, illness, viruses, diseases, toxin-laden food and polluted air. Colostrum may well be one of the most important immune system nutrients to come along in the last fifty years, since more and more illnesses and disease conditions are linked to a suppressed or compromised immune system.

– JAMES WILSON, DC, ND, PhD
We have had this man on heavy colostrum from three or four months. He is riddled with cancer but continues to improve. I have been treating Charles, using the standard protocol with colostrum but on higher doses.

Two weeks ago Charles had a septic knee that was treated with antibiotics successfully. His weight was 100 pounds, but he now weighs 120 pounds and is regaining his vigor! I find it astounding that he didn’t die.

— John Miller MD