THE COLOSTRUM ADVANTAGE:
Supporting Overall Health and Wellness Through the Gut
A GUT FEELING:
THE GUT IS CENTRAL TO OUR TOTAL HEALTH AND WELL-BEING

It is no surprise that consumers rank gut health as a very important health benefit, given that the gut is truly central to the body’s overall well-being and health through the gut-body connection.

**Immune:**
The intestines contain over 70% of the entire immune system, meaning that a healthy gut translates to an optimal immune system, which in turn gives the body the best chance to fight off infection and limit overall inflammation.

**Heart:**
The bacterial make-up of the gut or microbiota also have an impact indirectly on the heart, where good bacteria in the gut can improve good cholesterol (HDL) levels.

**Your “Second Brain” - The Nervous System:**
It is not widely known, but the intestines are home to what some people call the second brain. There are hundreds of neurons in the intestine which are similar to the cells that are in your brain. These neurons control the movement and regularity of the digestive process and can communicate directly to the brain.

These are just a few of the other systems involved in the gut-body connection, underscoring how intestinal health affects functions across the entire body and the importance of supporting gut health for optimal health and wellbeing.
FUNCTIONAL INGREDIENTS FOR GUT HEALTH

Probiotics and Prebiotics
One of the commonly utilized functional ingredients on the market to help improve gut health are probiotics. These are beneficial bacteria that can colonize and replicate in the intestine. However, probiotics require a food source (prebiotics) and may perform better when provided with prebiotics (sometimes called a symbiotic combination). When you combine the two, it can help shift the microbiota in your intestine more toward beneficial bacterial species. This is important since a good gut flora or bacteria balance will lead to a stronger gut barrier of intestinal epithelial cells. Those bacteria will produce functional metabolites like short, fatty acids that help nourish the cells of the intestine and act as signaling molecules. Additionally, the probiotics will compete against and crowd out bad bacteria, causing an increase in local immune proteins called immunoglobulins which help keep the intestinal environment clear of pathogens, like bacteria and viruses. While probiotics are indeed a popular choice to support gut health, the fact is that there are hundreds of probiotic strains, which makes it confusing and difficult to feel confident about which product to choose.

Colostrum from Dairy Cows
Colostrum from dairy cows is a solution for gut health that is already comprehensive. There is no searching for several ingredients to combine together or infinite combinations. Colostrum is an all-in-one ingredient.

WHAT IS COLOSTRUM?
Colostrum is the first few days of milk that a mother provides to her child. It really is the first food of life. It helps prepare a mother’s child for the world around her or him. Given that it is the first food, it is no surprise that it helps to transfer the mother’s immunity to the child, helps with the development of the immune system and the digestive tract, ensures that baby’s intestinal barrier is strong and can absorb key nutrients, and promotes healthy bacteria like probiotics while inhibiting bad bacteria and viruses. This is true for all mammals, not just human, and is certainly the case for dairy cows as well.

Harnessing Colostrum from Dairy Cows
Given that dairy cows produce colostrum, it provides an opportunity for all of us to harness the benefits of colostrum across the lifespan. Dairy colostrum is completely natural, produced by nature, and is meant to nurture. The dairies ensure that the calf receives all of the colostrum it needs first, and then any excess colostrum is collected and gently dried into a powder. The resulting product contains all the great bioactive components of liquid colostrum and has been shown to support immune and digestive health. It is also used in sports nutrition applications.

Colostrum is Comprehensive with Over 250 Beneficial Bioactive Components
Unlike standalone probiotic and prebiotic products, colostrum is a unique, functional ingredient containing more than 250 beneficial bioactive components, which include:

- **Immunoglobulins**: Large functional proteins that work against pathogenic bacteria
- **Growth Factors**: Proteins and peptides, which are important for gut barrier integrity and healing processes
- **Oligosaccharides**: Complex sugars, which can feed good bacteria in the gut (a prebiotic function)
- **Immune Factors**: Proteins that protect against things like viruses and bacteria, as well as modulate the immune system
**COLOSTRUM COMPONENTS FOR OPTIMAL GUT HEALTH**

Given that colostrum is the first food for mammals, it is perhaps not surprising that many of the functional components in colostrum help support intestinal health, which in turn supports overall health and well-being across the body and throughout the lifespan.

**Oligosaccharides**
Colostrum oligosaccharides can act as prebiotics to feed beneficial microbes in the intestine. Traditional prebiotics like galacto-oligosaccharides (GOS) and fructo-oligosaccharides (FOS) have simple structures and do improve gut health, however they can be associated with side effects like bloating, gas, and discomfort. If you take human milk as an example, there are human milk oligosaccharides (HMOs) that are much more complex in structure and selectively feed beneficial microbes in the infant gut like Bifidobacterium infantis. Cow colostrum oligosaccharides also have a more complex structure. As a result, they have the ability to increase the growth of several different strains of probiotics and increase the production of healthy metabolites, which feed the intestinal cells — among other beneficial effects.

**Immunoglobulins**
Colostrum immunoglobulins act to improve the intestinal environment, getting “the house in order” so-to-speak. Immunoglobulins can interact with a wide variety of bacteria and viruses in the intestine, thereby reducing the likelihood of infection. This allows probiotics and good bacteria to have more resources to flourish, helping to establish a better balance of gut bacteria. Immunoglobulins from colostrum also help probiotics adhere or stick to the cells of the intestinal wall, which is important for successful colonization of probiotics in the intestine.

**Growth Factors**
Growth factors from colostrum can help support healing of damage done to the intestines and support a healthy gut barrier. The gut barrier is prone to certain levels of permeability (or leakiness) caused by several factors, including a poor diet high in inflammatory fats and sugars, certain medications, alcohol consumption, a stressful life situation, and environmental toxins and infections, to name a few. When the gut barrier becomes leaky, the junctions (or connections) between the intestinal cells become loose and can allow pro-inflammatory components to make it pass the barrier into our blood stream. This causes an overall increase in inflammation and autoimmunity, potential issues with nutrient absorption, and possibly impact the integrity of the blood brain barrier. Colostrum from cows contains several growth factors, which are proteins and peptides that help to protect and heal the intestinal barrier. Two examples are epidermal growth factor, EGF, and insulin-like growth factor, IGF.

**PROTECTING AND HEALING FROM WITHIN**

In two recent studies published in 2021, colostrum from PanTheryx was shown to protect intestinal cells from becoming permeable (or leaky), and to heal a damaged layer of intestinal cells.

The first study\(^1\), tested the effect of PanTheryx’s ColostrumOne against nine bacterial strains that are known to cause intestinal barrier permeability. This was an in vitro cell culture study using human intestinal cells, which were grown as a continuous layer of cells to stimulate the normal lining of the gut. These bacteria all cause an increase in leakiness of the intestinal cell layer, which in turn leads to bacteria passing through the cell barrier, an increase in intestinal cell death, and reduced tight junction components, which reduces the integrity of the intestinal cell layer. In this study, colostrum reduced the number of bacteria that passed through the barrier, reducing the leakiness caused by the bacteria to similar levels comparable to a no bacteria control. Furthermore, colostrum decreased the cell death and loss of tight junction components due to exposure to the bacteria.

In the second study\(^2\), a similar in vitro approach was utilized whereby a continuous layer of human intestinal epithelial cells was used as a model of the human intestinal barrier. The researchers performed a physical insult to the layer resulting in a “wound” or opening to mimic an injured intestinal barrier. When placed in the presence of ColostrumOne, the barrier wound healed significantly faster than non-colostrum treated control.

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\(^1\) Playford, R. J., Choudhry, N., Kelly, P., & Marchbank, T. (2021). Effects of Bovine Colostrum ... Nutrients, 13(3), 1024

CLINICAL TRIALS

Colostrum from dairy cows has been clinically studied for decades across several health benefit areas, including immune and digestive health, and has a long history of safe consumption. There are more than 6,000 published studies on the benefits of cow colostrum for human nutrition. The following is a sampling of the clinical trials demonstrating the digestive health benefits of bovine colostrum.

Gut permeability (“leakiness”):
In this double-blind placebo controlled trial\(^3\), healthy male participants were supplemented with 1 gram per day of colostrum from dairy cows or a placebo for 20 days. The researchers measured stool zonulin — a biomarker linked to gut permeability — at the end of the supplementation period. Results showed a significant decrease in gut permeability in the participants who were supplemented with colostrum as compared to the placebo control group.

Population characteristics:
- Healthy adult males between 20 and 43 years of age
- 16 participants

Treatment protocol:
- Double-blind, placebo controlled
- Supplementation with 1 gram of colostrum from cows per day or a placebo for 20 days
- Stool zonulin levels (measure of gut permeability) determined at baseline and on day 20

SUMMARY OF OUTCOMES

Supplementation with colostrum significantly reduced gut permeability as compared to placebo.

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CLINICAL TRIALS CONTINUED

Pediatric Diarrhea:
In this open label, multicenter clinical trial with children experiencing recurrent diarrhea, the researchers examined the effect of colostrum from dairy cows on the change in diarrhea episodes, as compared to each child’s own baseline status. They found that supplementation with colostrum from cows resulted in a dramatic drop in the percentage of children reporting a diarrhea episode and the percentage of children hospitalized due to diarrhea as compared to baseline.

Population characteristics:
- Children ages 1-8 years old
- Recurrent diarrhea (>6 episodes in prior 6 months)
- 605 participants

Treatment protocol:
- Open label, multicenter trial
- Supplementation with 3 grams of colostrum from cows per day for 12 weeks
- Follow up at 4-weeks, 8-weeks, and 12-weeks

SUMMARY OF OUTCOMES
Compared to baseline control
- Significant reduction in children reporting a diarrhea episode
- Significant reduction in children hospitalized due to diarrhea

KEY TAKEAWAY POINTS
First, and most importantly, the health of the gut has an impact on other aspects of optimal healthy living. Thankfully, unlike other single ingredient supplements, colostrum from dairy cows is an all-in-one solution for gut health through its many bioactive components, which support both gut and immune health. We know that growth factors in colostrum help to heal and protect the gut barrier, immunoglobulins from colostrum improve the intestinal environment by acting on pathogenic bacteria and viruses, and colostrum can act as a prebiotic to support the growth and colonization of probiotics. Finally, the clinical evidence shows that colostrum can be effective in supporting digestive and immune health across the lifespan. Colostrum from dairy cows — a comprehensive solution for the gut-body connection.

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**Why Choose ColostrumOne?**
ColostrumOne provides a lifetime of benefits through a multi-faceted approach to digestive health.

- Completely natural product, produced by nature and meant to nurture
- 1st Day Milkings: To ensure the most potent biological activity of immune and digestive health factors including IgGs it is important for the colostrum to be collected on the same day a dairy cow gives birth within the first 24 hours of calving.
- Ethically collected, so the calf receives all the colostrum it needs to kickstart its immunity and aid early digestion
- Bovine colostrum has a unique composition and contains immunoglobulins, growth factors, immune factors, and more than 250 individual characterized functional beneficial components that provide an array of benefits.
- Supports immune health, digestive health, early life nutrition, and more
- Designed by nature, ColostrumOne is a comprehensive health solution that helps to strengthen and sustain health and vitality at all stages of life.

**ABOUT THE AUTHOR**
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Dr. Weiser has more than 10 years of experience in research and development and innovation within the nutrition and biotechnology sector. Prior to joining PanTheryx, Dr. Weiser led innovation and product development for DSM’s early life nutrition ingredient portfolio and has published dozens of peer-reviewed publications. He earned his PhD. in Biomedical Science from Colorado State University.
HEALTH & WELL-BEING START WITH A GOOD GUT

Proactive health and well-being are top of mind to consumers today. Our strongest boost comes early in our lives from our mothers. The first food mammals produce for their newborns, Colostrum is nature’s nourishing superfood, containing immune factors, protective proteins, growth factors, and prebiotics.

ColostrumOne takes that science and extends those benefits beyond newborns. The health benefits of bovine colostrum have been studied for decades. Researchers have explored the benefits of bovine colostrum for children and adults in multiple areas of human health including immunity, gut health, digestive health and sports performance.

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<tr>
<th>ColostrumOne Benefits:</th>
<th>ColostrumOne Formulated For:</th>
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<tbody>
<tr>
<td>Supports the immune system</td>
<td>Higher bioactivity</td>
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<tr>
<td>Supports respiratory health</td>
<td>Superior solubility and dispersibility</td>
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<tr>
<td>Supports digestive health</td>
<td>Blending easily into capsules, tablets, &amp; powders</td>
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SECURE COLOSTRUMONE AS YOUR DIGESTIVE HEALTH INGREDIENT:
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