The IMUPlus™ Story

An Elite Formula

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FORWARD

As a pioneer researcher, who is medical director of two major clinics treating CFS and Fibromyalgia, I have evaluated and treated thousands of CFS patients. There is no doubt that the depletion of cellular glutathione is one of the salient characteristics of CFS. It is critical to supply glutathione precursors. IMUPlus™ works exceptionally well in this regard.

The typical whey products did not elevate glutathione (GSH) to any perceptible degree (if at all). I have found that only a couple of whey products contain the levels of bioactive precursors needed to support the body's mechanism to modulate synthesis of intracellular glutathione.

What is rare is a whey protein product that is highly non-denatured. The cystine-rich bioactive components of this type of whey are alpha-lactalbumin, serum albumin, and lactoferrin. These proteins are thermolabile, meaning that heat will break them down. They are also very susceptible to mechanical stress, so they must be handled gently.

IMUPlus™ proprietary process guarantees a >99% non-denatured product, insuring maximal bioactivity. In addition, what has impressed me is Swiss Bioceutical International's dedication to quality. Each step, from manufacturing to twin sealed pouches with sterile packaging techniques, preserves the bioactivity, ensuring the highest quality for patients. It truly is an elite product.

Hosts of my CFS patients have had remarkable turnarounds with IMUPlus™ many having first tried other whey proteins to no avail. In fact, many patients often stop, or forget to take, their other supplements but almost never stop their IMUPlus™. They can really tell the difference.

Although I have primarily addressed the use of IMUPlus™ with CFS/Fibromyalgia, I find IMUPlus™ is effective in other protocols for Cancer, ALS and chronic degenerative diseases, providing excellent results in terms of normalizing hematology and immune function and enhancing quality of life. I heartily recommend this product to any person who desires to maintain and defend their immune system in an increasingly toxic world.

Ferre Akbarpour, M.D., F.A.C.I.P.

Director of Orange County Medical Diagnostic Institute Director of CFIDS and MCS Program, Orange County Center for Spinal Immunology

PREFACE

When asked by Swiss Bioceutical International to write an educational booklet, I replied by expressing my professional priorities. Among them were the following characteristics of the kind of company I would be willing to work with.

- Compassionate patient advocacy
- Scientifically validated natural products
- Fair pricing (value for price)

I am glad to report that my experience with Swiss Bioceutical International (SBI) has been gratifying. SBI possesses the characteristics I expect from a truly professional company.

During the course of my research for the book I have come a long way in understanding whey proteins in general, and particularly the difference in whey protein isolate formulas. There exists a substantial body of medical literature that validates the health benefits of the bioactivity of whey proteins. The pivotal word is "bioactive."

Stores, gyms, and e-commerce sites are loaded with whey proteins. Some erroneously make claim to the health benefits conferred by high-end pharmaceutical grade products such as IMUPlus™. Preserving the bioactive proteins and formulating them for maximum benefit requires sophisticated and expensive equipment and technology. Cheap, bulk packaged whey proteins are not manufactured in a way that provides acceptable levels of bioactive proteins necessary for health benefits, and these products are further degraded by air and moisture when opened.

From production to packaging, SBI does all that is necessary to insure a product whose proteins are more than 99% non-denatured. Still, Swiss Bioceutical International manages to provide the product to the consumer at a reasonable price.

SBI is currently engaged in ongoing research to further elucidate the benefits of IMUPlus™.

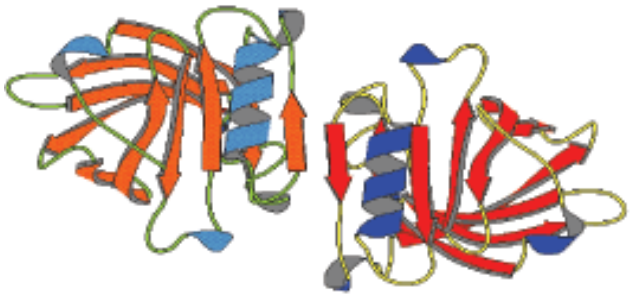
--W. Michael Guthrie, R.Ph.

INTRODUCTION

For many years, nutritional scientists have looked at proteins for their nutrient value only. The nutrient value of proteins was attributed to two properties. First, proteins can be digested into their base components: amino acids. These amino acids can be reassembled in the body by various mechanisms into tissues, organs, enzymes and a host of other protein based components. The second nutritional property of proteins is the fact that they can be used for energy production when required. Specifically, proteins supply approximately 4 calories per gram, about the same as sugar.

Recently, scientists have discovered that certain proteins, specifically proteins from the whey fraction of bovine (cow) milk, actually possess unique biological activity. Most importantly, this activity can be preserved as the protein passes through the digestive tract and into the bloodstream. Unfortunately these proteins are very fragile, and loose their biological activity through the normal processes employed in milk production. When these proteins loose their biological activity, they are referred to as denatured proteins.

The Bioactive components of whey proteins are extremely fragile. Heat, mechanical stress, and adverse pH balance (processes that are germane to normal milk production) are the major culprits that denature these vital components.



Schematic of denaturization of B-lactalbumin

Scientists for Swiss Bioceutical International have developed elaborate and patented processes to preserve, isolate, and blend the bioactive components of whey protein. This is the IMUPlus™ Story, but before we delve too deeply into that story, let's look at some basic nutrition. I call it nutrition 101.

NUTRITION 101

It is interesting to note that food in the daily diet contains as many as 100,000 substances, of which 300 are nutrients, and 45 are essential nutrients.

First, let's divide nutrition into two broad categories: macronutrients and micronutrients (other useful components of food aren't digested or metabolized to any appreciable extent: these include some fibers, such as cellulose, pectins and gums). For the purposes of our discussion, macronutrients can be defined as the elements of our diet that contribute calories. Calories are actually a measurement of energy, and energy potential. Let's look at calories as it affects our weight for starters. Basically, if we consume around 3500 calories, we will gain a pound, and likewise if we burn around 3500 calories we will lose a pound (this is an oversimplification, but adequate for our discussion).

Many of us are familiar with exercise equipment that tells us how many calories we are burning per hour. This can be calculated by the electronics in the exercise equipment due to the fact that calories can be converted to energy, and the equipment knows how much energy we are expending. Calorie requirements vary greatly by age, sex, and physical activity. Typically sedentary women, young children, and older adults need around 1,600 calories per day, while older children, active adult women and sedentary men need around 2,000 calories per day. Active adolescent boys and younger men require around 2,400 calories per day.

Calories come from three types of macronutrients: carbohydrates, proteins and fats (lipids). Carbohydrates and proteins each contain around 4 calories per gram, while fat contains around 9 calories per gram.

Carbohydrates: Here is the technical definition: - *Any of various neutral compounds of carbon, hydrogen, and oxygen (such as sugars, starches, and celluloses), most of which are formed by green plants and which constitute a major class of animal foods.* Simply stated, carbohydrates usually come from plants, and are basically sugars and starches.

Proteins: Here is the technical definition: - *Any of a group of complex organic compounds, consisting essentially of combinations of amino acids in peptide linkages, that contain carbon, hydrogen, oxygen, nitrogen, and usually sulfur. Widely distributed in plants and animals, proteins are the principal constituent of the protoplasm of all cells and are essential to life. (Going back to a Greek word meaning "first" or "primary;" because of the fundamental role of proteins in sustaining life.)* Meat is the most abundant source of protein for most people. Vegetarians must eat particular protein rich

vegetables or dairy products to receive their protein requirements. As much as one-half of our dry body weight, including most of our muscle mass, skin, hair, eyes, and nails is made up of protein. A certain number of amino acids are essential to our diet. They cannot be made by our bodies.

Fats: Lipid is the technical term for fat or fat-like substances. Fats are composed of fatty acids, and at least two are essential, that is they must be consumed in our diets. These essential fats are broken down into two groups: omega 3 and omega 6. Not all fat is bad; in fact, many important functions of our bodies depend on fats.

Proteins

Now lets look a little more closely at the nutritional aspects of proteins. In our bodies, protein is more plentiful than any other substance, but water. About one half of our dry body weight (i.e. if you took all the water away) is protein. Most of our muscle mass, skin, hair eyes and nails are made of protein. It is also the main structural component of our cells including our immune systems. The chemical linking of carbohydrates and proteins together forms glycoproteins, substances which are vital for cellular communications.

In much the same way that carbohydrates are made from sugars, proteins are made from amino acids arranged in various configurations to form all of our body structures. The “computer program” for putting these amino acids together to form unique structures and organs is encoded into genes found in DNA, the basis of all living things. Our body uses 20 unique amino acids. Nine of them cannot be made by our bodies, and are therefore called essential amino acids. The essential amino acids are valine, leucine, isoleucine, threonine, lysine, phenylalanine, tryptophan, methionine and histidine. Meat contains all of these essential amino acids, but vegetarians must eat a variety of the right vegetables to get the whole complement. Chicken eggs are a complete protein (having all the essential amino acids) as is dairy, so lacto-vegetarians and ovo-vegetarians are usually getting all the essential amino acids. Pure vegetarians usually combine a number of products to receive all the essentials. This is accomplished, for example, by eating whole grains plus some beans or seeds. Others eat soybeans plus certain types of rice. Pure vegetarians should obtain competent advice to avoid amino acid deficiencies. These deficiencies can have serious consequences.

Unfortunately protein often gets a bad rap from the medical establishment. This is because much of the protein Americans eat comes from red meat, and whole dairy products, which also contain large amounts of saturated fat. Saturated fat can be unhealthy. It is beyond the scope of this booklet to address various diets such as the Atkins diet, the Pritikin Diet, the Zone Diet, the Mediterranean diet and others.

Nonetheless, it is primarily the ratios of carbohydrates, proteins and fats that differentiate these diets.

Milk Proteins

We'll move now from proteins in general to milk proteins. After that, we'll focus on a specific fraction of milk proteins known as whey proteins.

We'll get a little technical for a moment, but don't get too bogged down if you don't fully understand. You'll understand the main point in a moment. The primary structure of milk proteins consists of a chain of amino acids joined together by special linkages called peptide linkages and they may also be cross-linked by disulfide (two sulfur molecule) bridges.

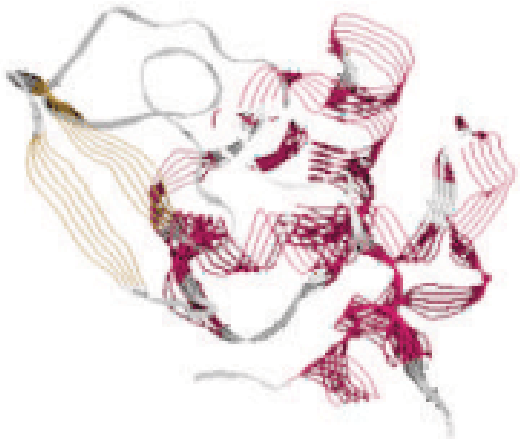
Here is the important point. The three-dimensional organization of proteins also involves special arrangements, which leads to the shape or conformation of the protein.

Maintaining that conformation is essential to preserving unique biochemical properties of specific proteins. In the case of some whey proteins, these conformations are also bioactive, meaning they elicit some biological response in our bodies. Now, just a little more of the techno stuff. We've already established that proteins do not have their constituent amino acids lined up in a row, but instead are bent or coiled into certain conformations.

Secondary structures of proteins affect the spatial arrangement of amino acids that are near each other. Tertiary arrangements affect the spatial arrangement of amino acids that are far from each other leading to further coiling. When the protein is tightly coiled and folded into a somewhat spherical shape, it is called a globular protein.

Below is a model of a globular protein, alpha-lactalbumin.

As can be seen by this model of a globular protein, in this case alpha-lactalbumin, the conformation of the protein is quite complex. It is this conformation that is subject to damage via heat, mechanical stress, and adverse pH (acid-base balance). It is vital to grasp this concept. Processing equipment costing tens of millions of dollars is required to process these proteins in a way that maintains conformation.



The proteins in milk are distributed among caseins (76%) and whey proteins (18%). The remaining 6% is not protein nitrogen, and is not relevant to our discussion.

Below is a breakdown of the concentrations of various milk proteins.

	Grams/liter	Percent of total protein
Total Protein	33	100
Total Caseins	26	79.5
alpha s1	10	30.6
alpha s2	2.6	8.0
beta	9.3	28.4
kappa	3.3	10.1
Total Whey Proteins	6.3	19.3
alpha lactalbumin	1.2	3.7
beta lactalbumin	3.2	9.8
Bovine serum albumin	0.4	1.2
Immunoglobulins	0.7	2.1
Proteose peptone	0.8	2.4

We won't spend a lot of time sorting through the data in the graph. Suffice it to say that the whey proteins comprise a small percent of the total proteins. The total protein in milk is just over 3% of the total weight of the milk, and the whey protein is only 6.3% of that 3%.

Simply stated, it takes a lot of milk to get whey proteins. Most importantly it takes considerable care to extract the whey proteins in such a way that they maintain their conformation (i.e. maintain bioactivity). Some bioactive components not in the graph are lactoferrin, glycomacropeptides (GMP), lysozyme and lactoperoxidase. These are not pure proteins, but important glycoproteins which will be discussed.

Casein proteins are fairly stable in the presence of heat and mechanical stress. However the vast majority of the beneficial bioactive components are found in the whey proteins and the glycoproteins mentioned above.

Biological Value: One topic comes up frequently when discussing whey proteins, and that has to do with the term biological value. Biological value is an attempt to measure how efficiently protein is taken up into the body. Theoretically, a biological value (BV) of 100 is the maximum. Milk, cheese, and whey all have BV's of 100. Sometimes you will see a BV of over 100 listed on a product, but in reality, you cannot have a BV over 100. It is good to know that whey protein has a high BV when one is considering nutritional value alone (see introduction). However, what sets the best whey proteins apart from the rest has to do with the *preservation of non-denatured, bioactive components* and the *blend of those components*. So, let's jump into a discussion on whey proteins in particular.

Whey proteins in bovine (cow's) milk comprise less than 20% of the proteins. Human mother's milk contains from 50% to 60% whey protein. Also, the distribution of protein in mothers milk is significantly different than cows milk. The dominant whey protein in human mother's milk is alpha-lactalbumin, while the dominant whey protein in cow's milk is beta-lactoglobulin. With this in mind, the most expensive processes actually "humanize" the whey protein by increasing components such as alpha-lactalbumin. We'll discuss the benefit of these modifications in a moment.

Warning! The following discussion can be confusing so really pay attention. Let's start it off by getting right to the point.

Whey Protein Concentrates

ARE NOT

Whey Protein Isolates.

It is very unfortunate that the terminology of the industry evolved as it has, because it is very confusing. So, let's define our terms:

Whey Protein Concentrate: After removal of the casein protein, the product is filtered through membranes with the result being a product with anywhere from 35% to 85% protein. This is officially referred to by the dairy industry as Whey Protein Concentrate (WPC).

Whey Protein Isolate: Whey Protein Isolate is obtained by other processing. Some of the processes employed to obtain Whey Protein Isolate (WPI) are microfiltration, ultrafiltration, spray drying, ion exchange and other elite proprietary processes that companies strictly will not talk about. The processes employed in manufacturing WPI significantly affect 1) which bioactive proteins are isolated and preserved and 2) the quality of these proteins (i.e. the degree of denaturation).

Now that we have that out of they way, let's talk about whey protein isolates, specifically the bioactive components. Running the risk of being redundant, let's state one more time that it is the specific blend of bioactive proteins and the degree to which they are non-denatured which determines the *quality* of the product as a nutraceutical (food supplement).

IMUPlus" is an Elite Whey Protein Isolate Formula.

Bioactive Components of Whey Protein Isolates

Having laid the foundations in the previous pages, we are now prepared to discuss the bioactive components of non-denatured whey protein isolates. Let's start with the interesting glycoprotein lactoferrin.

Lactoferrin: Lactoferrin found in WPI is very similar to transferrin which is found in the blood stream. Lactoferrin possesses a number of valuable biological properties.

1. Antiviral activity: The mechanism of action appears to be the inhibition of the absorption process of the virus particle to the cell. This activity has been demonstrated against HIV and CMV (Harmsen, 1995), Herpes simplex types and 2 (Marchetti et al., 1998), hepatitis C (Yi et al., 1997), influenza (Kawasaki et al., 1993), and rotavirus. (Superti et al., 1997)

2. Antibacterial activity: Lactoferrin accomplishes its antibacterial activity by at least two mechanisms: sequestering iron away from the bacteria and binding to the cell wall of the bacteria and destabilizing it. This action of lactoferrin is especially potent against many pathogens yet leaves normal flora of the gut, such as bifidobacteria and lactobacilli intact. Pathogens with a high requirement for iron in which lactoferrin has been found to have antibacterial activity include Coliforms, E. coli, Salmonella, Shigella, Staphylococcus aureus, Bacillus species and Listeria monocytogenes. (Reiter, 1985 Renner, 1989, Yamauchi, 1991)

3. Antifungal activity: This includes candida. (Samaranayake et al., 1997)

4. Iron Transport: Lactoferrin has an extremely high affinity for iron. It also possesses the unique ability to transport iron and release it again at specific receptor cells in the colon. This allows iron to be absorbed (and thus be made available for hemoglobin and red cell production) without having to use high doses or oral iron supplements. (Kawakami et al., 1988)

5. Immune Modulation: The most important pool of circulating lactoferrin is found in neutrophils, a type of white blood cell. During infection, neutrophils release lactoferrin, which binds up iron, making it unavailable to the pathogen. (Sanchez, 1992)

6. Antioxidant: Lactoferrin binds up free iron, i.e. iron that is not biologically complexed. Free iron is a potent free radical. (Marx, 1996)

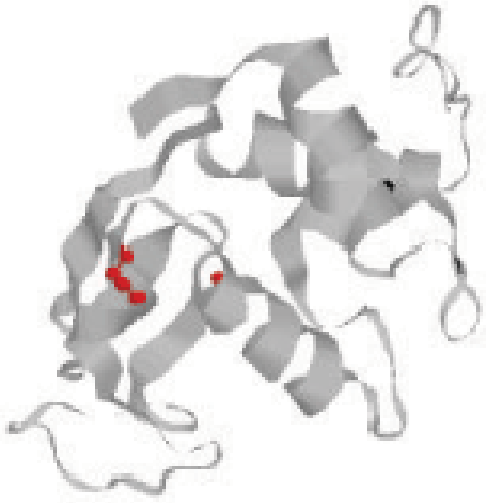
Lysozyme: Lysozyme is normally not present in high amounts in cow's milk, but is very high in human milk.

Humanized Whey Protein Isolate formulas such as IMUPlus™ humanize whey isolate by blending back higher amounts of this important enzyme.

Lysozyme possesses antibacterial activity against a number of bacteria, and works synergistically with lactoferrin against bacteria such as Escherichia coli, and Salmonella species.

Lysozyme is found in saliva, tears, and other body fluids, where it serves an important function as a natural antibiotic.

As can be seen on the right, lysozyme has a folded structure typical of bioactive proteins. Once again, heat and mechanical stress can denature this fragile protein. Scientists for Swiss Bioceutical International use elaborate and sophisticated processes to preserve the conformation of the protein. It is interesting to note that lysozyme was the first enzyme whose three dimensional structure at a molecular level was determined. Like Penicillin, lysozyme exhibits its antibacterial activity by disrupting the cell walls of bacteria. (Kelly, 1970)



Lactoperoxidase: The lactoperoxidase in cow's milk is identical to that found in bovine tears and saliva, and is probably important in controlling bacteria (Bjorck et al., 1970). Lactoperoxidase exhibits its antibacterial action by combining with other molecules that are distributed throughout the body (hydrogen peroxide and thiocyanate). The lactoperoxidase acts as a catalyst in the formation of the short-lived hypothiocyanate which kills bacteria.

Glycomacropeptide: Most of the research to date with glycomacropeptide (GMP) has centered around a peculiar bioactive behavior. GMP stimulates the release of a hormone called cholecystokinin (CCK) in the gastrointestinal tract. CCK has the following effects.

1. Acts on nerves in the lining of your stomach, which tells your brain your stomach is full.
2. Slows the movement of food from your stomach so you feel full longer.
3. Works directly on the appetite control centers in the brain.

The Cystine Rich Whey Proteins and their effect on Glutathione.

The proteins we have discussed so far are quite interesting, and their implications for health are significant. The next group of proteins are especially delicate, quite subject to heat, mechanical stress and fluctuations in acidity and alkalinity. We've already discussed the health benefits of one of them, lactoferrin. The other cystine rich whey proteins are alpha-lactalbumin, and serum albumin. These three proteins contain far more available cystine than the other whey sources. The importance of cystine lies in the fact that it is an essential precursor to our bodies' most important natural antioxidant: **glutathione**.

In order to understand the seminal importance of glutathione, an introduction to free radicals and antioxidants is in order.

Antioxidants and Free Radicals: We read about them all the time. We hear references to them on radio and television continually, but just what are antioxidants? The simple answer is that antioxidants are substances that protect our cells from oxidation. Some refer to this oxidation as "body rust", as rusted iron is oxidized iron; a nice analogy, but far too simple to describe the destructive effects of antioxidants' target: **free radicals**. Let's look at what free radicals are.

Molecules are composed of atoms bonded together, via the sharing of electrons. Generally, atoms exist in pairs, with each electron of the pair having an opposite spin to the other. When a molecule is split, two things can happen. First, the electrons can stay together. When this happens, we say the molecule has ionized. For example, table salt, which is Sodium Chloride (NaCl), ionizes into two charged ions, specifically a sodium ion and a chloride ion. In this case, the Chloride received the electron pair, and the Sodium lost it. The other thing that can happen is that the electron pair is split. This leaves a highly reactive atom (a free radical), seeking to steal an electron, which sets up a domino effect of electron stealing. Antioxidants work by offering easy electron targets for free radicals.

If the free radical is not neutralized by an antioxidant it can wreak all sorts of havoc in our bodies. Current research, for example, is pointing to the fact that it is not only the presence of fat in our bodies that leads to plaque formation on our arteries, but the

oxidation of fat by free radicals. In the case of Cancer, the problem starts when free radicals chip away at the DNA of our cells, eventually causing mutations that lead to malignancies.

Okay, so where do we get these antioxidants? Well, fresh fruits and vegetables are just teaming with them. Some important ones are vitamins A, C, E and Selenium. High quality supplements also provide effective antioxidants. There is no doubt we need them, as there are well over 50,000 new chemicals in our world today (since 1940). Suffice it to say these chemicals are ubiquitous in our lives. While we cannot escape them, we can take responsible measures to limit them. Bruce Ames, Ph.D. at University of California, Berkeley estimates that every single one of our trillions of cells suffers about 10,000 free radical hits daily (Ames, 1993).

Vitamins, such as those previously mentioned, are antioxidants, because they can donate electrons to free radicals, thus neutralizing them. However, this makes the vitamin molecule unstable. Now it needs an electron. This is sort of like passing a very hot potato from person to person until someone finds a place to lay it down. In our bodies, that place is glutathione.

The chemical equation gets fairly technical but in the end glutathione donates an electron and becomes a stable molecule known as GSH. Glutathione can then be regenerated via an enzymatic pathway that involves lipoic acid. The details of the chemistry involved is beyond the scope of this booklet, but is well established in the scientific literature. Also well established is the fact that the glutathione antioxidant system is the most important system in our bodies when it comes to the destruction of reactive oxygen compounds (very potent free radicals) (Meister, 1994).

Glutathione is often referred to as GSH. GSH's metabolic functions include (Gutman, 1998):

- **Enhancement of Immune Function**
- **Elimination of Toxins**
- **Elimination of Carcinogens**
- **Antioxidant Cell Protection**
- **Protection against Ionizing Radiation**
- **DNA Synthesis and Repair**
- **Protein Synthesis**
- **Prostaglandin Synthesis**
- **Leukotriene Synthesis**

- **Amino Acid Transport**
- **Enzyme Activity and Regulation**

Now that we've laid a foundation for the importance of glutathione, let's discuss the role of cystine in glutathione synthesis.

Glutathione is a tripeptide made up of three amino acids: L-glutamine, L-cysteine and L-glycine. The amino acid most important (known as the rate-limiting factor) is cysteine. (DeLeve, 1991).

There are a few challenges in providing precursors for glutathione production. First of all, there is no evidence that glutathione itself is transported into cells (Meister et al., 1993). Consumption of cysteine itself is problematic in a number of regards. Free cysteine is toxic (Meister, 1984; Baruchel et al., 1996) and it is poorly absorbed and transported. However, there is a form of cysteine that is non-toxic, easily transported into the gut, and transferred into cells. This form is cystine and is comprised of two cysteines joined together by a disulfide bond. Upon cell entry the cystine is reduced to cysteine. (Droege et al., 1994)

Having established that cystine is the crucial element in supporting glutathione production, let's return to our cystine rich proteins. Alpha-lactalbumin, lactoferrin and serum albumin are all high in cystine. Serum albumin and lactoferrin are also high in the combined molecule of glutamine and cysteine (gamma glutamylcysteine) which can also be transported into cells. So, it is obvious that a product high in the non-denatured conformation of these three proteins is essential for increasing intracellular glutathione levels. IMUPlus™is such a product.

Cellular depletion of glutathione has been implicated as a causative, or contributory factor in many pathologies including Parkinson's, Alzheimer's, cataracts, arteriosclerosis, cystic fibrosis, malnutrition, aging, AIDS and cancer (Bounous et al., 1991). In addition, glutathione is essential in supporting the immune system, including natural killer cells (Droege et al., 1997) and in the maintenance of T-lymphocytes (Gutman, 1998). Recent research indicates that propensities toward many degenerative diseases and aging itself are related to the capacity of the cell to robustly recover from oxidative insult. The capacity of a cell to recover from such insult can be determined by measuring the intracellular stores of glutathione (Noelle et al., 1981).

The liver is the main detoxification organ of the body. In the liver we find very high concentrations of GSH, as it is a major factor in numerous biochemical detoxification pathways. Numerous studies have demonstrated that patients with compromised liver function due to alcohol abuse have significant reduction of GSH in the liver (Lamestro, 1995).

Hemoglobin

Currently, studies are being performed with IMUPlus™ to determine effects on hemoglobin. The preliminary results, especially in cancer patients with depressed hemoglobin and hematocrit are dramatic.

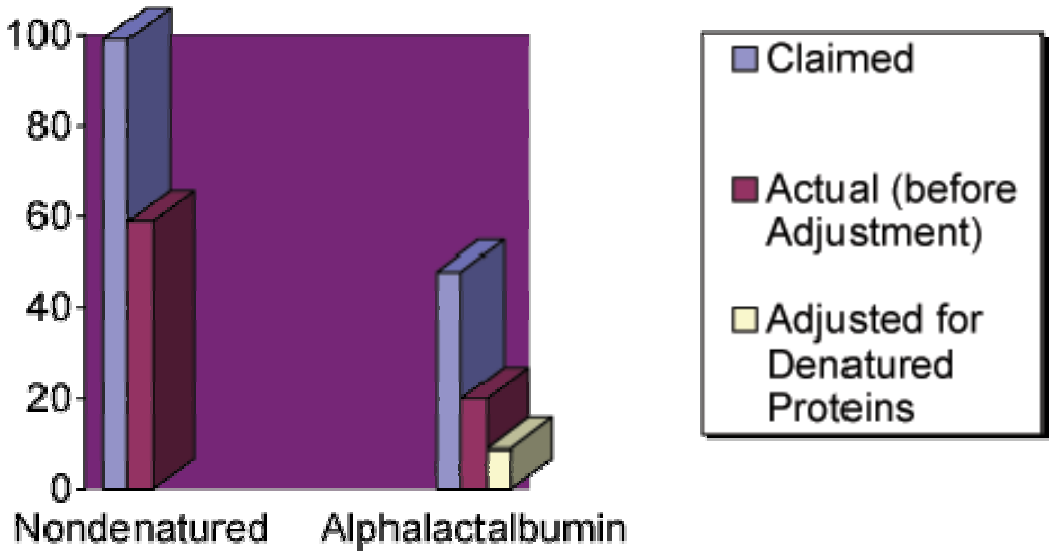
Swiss is conducting these studies because clinicians are reporting dramatic improvements in these lab values as a side benefit of IMUPlus™. Improvements in hemoglobin are dramatic and rapid according to clinicians*, thus further study was warranted. The mechanism for improvement may be a synergistic effect involving a number of non-denatured proteins. Swiss is currently researching this topic.

* For example, this observation of a well-respected clinician:

> In my 35 years as a Pharmacist/Naturopathic physician, I have seen few products, either on prescription or OTC, that can compare to IMUPlus™ in regards to modulation of blood chemistry.
>
> I put a 70 year old female with chronic lymphatic leukemia on IMUPlus™ because she had received blood transfusions in February, March and April of 2000, the transfusions did not hold, and her RBCs continued to drop to a low of 8.2. The answer from her oncologist was to increase to a heavier chemotherapeutic regime. I convinced him and the patient to try IMUPlus™, with 800 mcg of folic acid, and 400 mcg of selenium daily. A retest in three weeks showed 9.7, however, platelets were still low, but rose slightly. I increased the IMUPlus™ to four pouches a day and retested in four weeks. RBCs went to 10.4 and her platelets normalized.
>
> --James Brodsky, R.Ph., N.D.
> Adjunct Assistant Professor of Pharmacy Practice University of Southern California, School of Pharmacy

CAUTION

Not all Whey protein is alike



The processes involved in making a highly non-denatured whey protein product (pharmaceutical grade) are extremely sophisticated and expensive. Only the most elite manufacturing companies are capable of the quality control necessary to achieve acceptable results. Because of this, the consumer is often confronted with confusing (and occasionally fraudulent) advertising. For example, the product whose claims, and actual content are shown above is advertised as "The Finest Whey Protein". We submitted a fresh sample of this product to a sophisticated laboratory for analysis. The results? The product contained only 59% non-denatured protein (remember, the bioactive components only work if they are non-denatured). IMUPlus™ contains over 99% non-denatured proteins.

In any non-denatured whey protein product, the major contributor of cystine is non-denatured alpha lactalbumin. The graph above shows the "claimed" amount, the actual amount, and most importantly, the actual amount when adjusted for denatured proteins. In addition, the product contains nearly 10% lactose (milk sugar) which is over 15 times the amount listed on the label. Sadly, such nonsense is rampant in the whey industry.

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Conclusion

It has been the privilege of Swiss Bioceutical International to prepare this educational booklet. Research into the non-denatured bioactive proteins in whey continues. We should not find it surprising that milk contains so many life sustaining and life protecting components. Milk is provided to the newborn in all mammals as a tailor-made food, containing bioactive components that strengthen the newborn's naive immune system. It also provides components to insure a healthy intestinal flora, and of course, nutritional components perfect for growth and development. **The challenge has been to isolate and stabilize the fragile bioactive components of milk.**

Scientists for Swiss Bioceutical International have developed sophisticated and patented processes in the development of IMUPlus™. IMUPlus™ is "humanized" in order to make it more like mother's milk.

Most importantly:

- IMUPlus™ is a Whey Protein Isolate Formula (not WPC)
- The bioactive proteins in IMUPlus™ are greater than 99% non-denatured.
- Exclusive packaging insures the stability of IMUPlus™ from the factory to the consumer.

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