NanoPro FAQ:

Q: What is whey protein?

A: Whey protein is made from cow's milk and contains vitamins, minerals, protein, lactose and traces of milk fat. Most commonly, whey protein and casein are harvested during cheese production. Liquid whey is separated from casein while whey proteins are then isolated from the liquid whey and purified.

Whole milk is only 6.25% protein. The two proteins that make up milk are *casein* (approximately 80%) and *whey protein* (approximately 20%). Whey is a complete protein, meaning it contains all essential and non-essential amino acids vital to your metabolism and good health. It is often referred to as the "Gold Standard" of protein as it is the most nutritious protein available.

Studies have shown that *undenatured* whey protein can increase our blood levels of *glutathione*. Glutathione is an antioxidant which is essential to a healthy immune system. As we get older glutathione levels decrease and our immune system weakens. At the University of Nebraska Medical Center scientists were able to extend the life span of hamsters by 60% by supplementing their diet with whey protein. So, whey protein is not only good for building and repairing muscles, it just may also extend your life!

Q: What does "un denatured" mean as applied to whey and colostrum?

A: To denature something is to deprive it of its natural character, properties, etc. In biochemistry it means to treat (a protein or the like) by chemical or physical means so as to alter its original state. In the case of whey, in the processing and purification and pasteurization, too much heat for too much time "cooks" some the *bioactive* peptides so as to deactivate them. When this happens much of the antioxidant, detoxification and immune support *undenatured* whey supplies is lost.

Q: What does "bioactive" mean as applied to whey and colostrum?

A: Bioactivity [bahy-oh-ak-tiv-i-tee] refers to any nutrient that has an effect on, or creates a response from, living tissue. Such a nutrient is called bio-active. Undenatured whey and colostrum have many bioactive peptides and proteins. Some, like immune globulins, confer *passive* immunity. Others, like PRPs, *actively* modulate (balance) immune function.

Q: What is colostrum?

A: Colostrum is a form of milk produced by mammals in late pregnancy and the few days after giving birth. It has very high concentrations of vitamins, minerals, protien, fats, immune and growth factors, gram for gram much higher then whey. It has a mild laxative effect. Ingesting colostrum establishes beneficial bacteria in the

digestive tract. Bovine colostrum (from cows) is used by humans as a dietary supplement. It has been attributed with curative powers and used as an ingredient for the ill or invalid. Purified bovine colostrum extract is also used in protein supplements used by athletes and bodybuilders.

Q: What are the reasons I should supplement with whey and colostral proteins?

A: Whey and colostral proteins may assist you in building muscle and bone mass; speeding recovery time from exercise, injury, illness, or surgery; reducing injuries related to working out; maintaining a trim, fat burning lean body mass; enhancing immune functions; stabilizing blood sugar and blood lipids, and perhaps even extending life expectancy.

Q: What are the sub-fractions of whey and colostral proteins?

A: Whey protein is a combination of a number of individual protein components, several components of which work synergistically to boost immune function. Whey protein includes the following building blocks:

Beta Lactoglobulin is an excellent source of *branched chain amino acids* that help maintain muscle strength and spare glycogen during exercise. Beta lactoglobulin is often the most abundant component of whey protein, making up 50-55% of composition.

Alpha lactalbumin is the second most abundant whey protein component, making up approximately 20-25% of the whey protein. It is a rich source of essential amino acids and is capable of binding with calcium. High in *tryptophan*, alpha lactalbumin also assists in sleep regulation and mood improvement.

Immunoglobulins, the predominant component of colostrums, make up approximately 10-15% of the whey protein. Immunoglobulins provide immunity enhancing benefits.

Bovine Serum Albumin (BSA) is a large sized protein with fat binding properties and a good essential amino acid profile that makes up approximately 5-10% of the whey protein.

Glycomacropeptide (GMP) helps control and inhibit the formation of dental plaque and dental cavities.

Lactoferrin makes up approximately 1-2%, and primarily helps to inhibit the growth of bacteria and fungi due to its ability to bind iron. Lactoferrin also promotes the growth of beneficial bacteria in the intestines. Additionally, it is a natural anti-oxidant found in many body secretions such as tears, blood, breast milk, saliva and mucus.

Lactoperoxidase & Lysozyme make up approximately 0.6% of whey, and help inhibit the growth of iron dependent bacteria while supporting immune activity.

Q: Does harvesting the colostrum harm the newborn calves?

A: Cows are not wild animals. They have been especially bred to produce copious amounts of milk, much more than needed to feed their young. This is true of colostrum as well. The calves feed first and then the colostrum is garnered. This is true for both the first and second milkings in the first 24 hours, which are the only times we harvest.

Q: What is the difference between Whey Protein Isolate (WPI) and Whey Protein Concentrate (WPC)?

A: The isolate form of whey protein is the most refined and pure form of whey protein, and contains between 90 to 95% protein, with little if any fat or lactose. A concentrate is typically at 80% protein content and can contain more lactose, fat and minerals.

Q: What are the side effects of taking whey protein?

A: Of course, those on protein restricted diets, usually related to advance kidney disease, need to restrict all protein, including whey protein, as directed by their physicians. Those few with PKU should avoid whey proteins.

There are no documented side effects of whey protein as such in healthy individuals. Those with milk allergies, which make up 1 % of the population, may be allergic to either casein proteins or whey proteins, or both. If you are allergic to dairy proteins please consult with your health professional prior to consuming any type of whey protein.

Please note that true milk allergy should not be confused with the much more common lactose intolerance discussed fully below.

Lactose Intolerance

Current data show that the main milk sugar, called lactose, interacts with the absorptive cells of the intestine to increase their permeability to calcium.

To minimize this occurrence, lactose digesting enzymes can be added to the whey or colostrum and/ or low lactose formulas, less then 1%, can be used, as in NanoPro^{PRP}.

Q: Is whey protein safe for pregnant and lactating women?

A: Whey protein is a high quality, complete protein. Indeed, the second most

abundant component in whey protein is alpha-lactalbumin, which is one of the main whey proteins in human breast. Whey protein is safe for use by pregnant women provided they are not allergic to dairy proteins or have advanced kidney disease.

Prior to taking whey protein, pregnant women should consult their health professional to be sure whey protein is right for them.

Q: Is colostrum safe for pregnant and lactating women?

A: Conception and pregnancy have significant effects on our immune systems. These are designed to protect the early embryo and fetus. Although there are no documented case of side effects, pregnant and lactating women should not take colostrum products without first speaking with their physician.

Q: Is whey protein safe for infants and children?

A: Mother's breast milk is the best nutrition for young infants. Still, whey protein is a complete high quality protein and is an acceptable protein source for children, provided they are not allergic to dairy proteins, have advanced kidney disease , or the very rare PKU disorder. Indeed, infant formulas often contain whey protein, including special formulas for premature infants.

Prior to taking whey protein and/ or colostrum, pregnant women should consult their health professional to be sure whey protein and colostrum are right for them.

Q: Is colostrum safe for cancer patients?

A: Bovine colostrum contains insulin-like growth factor-1 (IGF-1). IGF-1 levels are elevated in prostate, colorectal and lung cancer. Recent studies have found that IGF-1 levels correlate with risk of prostate cancer and colorectal cancer in men, pre-menopausal breast cancer in women and lung cancer in both men and women. It is unlikely that the amount of IGF-1 in bovine colostrum would be a problem, but consulting your health care professional is advised.

Q: Can too much protein hurt my kidneys?

A: Bodybuilders frequently consume 300-500g of protein per day for months - even years, yet there is no scientific evidence that this high protein intake causes kidney problems. In other studies, animals with high protein intakes for more than half their lifetime showed no kidney damage. High protein intake may be hazardous only for individuals with abnormal kidney function or kidney disease. For the disease-free individual, the most serious concern with high protein intake is dehydration, because it takes a lot of water to metabolize protein. This is avoided by drinking 8 or more 8 oz. glasses of water a day.

Q: When is the best time to take a protein supplement?

A: This depends on your diet and when you are eating foods rich in protein. Here are a few points when it is best to take a protein supplement:

- Right before a workout when your body needs protein for recovery and growth. Having the amino acids in your blood stream is key at this point.
- First thing in the morning as your body has just gone though 8 hours or so of not having food.
- Between meals when you need a quick pick up without the let down of sugar or caffeine.
- 30 minutes before meals to lower appetite.
- Before you go to sleep to prevent the protein breakdown that naturally occurs when we sleep, especially if you are trying to build muscle mass.

Q: Why is whey protein good for athletes and people who exercise?

A: Whey protein is a high quality, complete protein, with all the essential amino acids. Whey protein is also the richest known source of naturally occurring *branched chain amino acids* (leucine, isoleucine and valine). The body requires higher amounts of branched chain amino acids during and following exercise as they are taken up directly by the skeletal muscles unlike other amino acids which are first metabolized by the liver. Low BCAA levels contribute to fatigue. They are best replaced in one-hour or less following exercise or participation in a competitive event. Many athletes consume a whey beverage both before and immediately after exercise or an event to help repair and rebuild lean muscle tissue.

Q: Is whey protein compatible with a low-carbohydrate diet?

A: Whey protein is not only compatible with low-carbohydrate diets, it is an ideal choice! Be sure to select whey protein blends that provide high quality protein without added sugar or artificial sweeteners, but good tasting enough on their own so no extra carbs need to be added to enjoy.

Q: Will whey protein help me lose weight?

A: Whey protein is a key ingredient in numerous weight loss and meal replacement products. Studies have found that individuals who combine diets with BCAA rich protein foods like whey protein with exercise have more lean muscle tissue and lose more body fat. As they gain muscle mass their metabolic rate increases and they naturally burn more calories each day!

Another way that whey protein helps manage weight is by promoting satiety, or a feeling of fullness. One recent study showed that whey protein was superior to casein, the other protein in cow's milk, in promoting satiety.

The amino acids in protein may also help keep your blood sugar levels stabile. This is important because it keeps you feeling good all day and stops your craving for food that occurs when your blood sugar level drops. If your diet is too high in carbohydrates your blood sugar levels go though peaks and valleys. You go from a burst of energy and feeling full to a lull and being hungry. In addition, if you are dieting, getting 20 grams of protein from a protein shake that has less than 200 calories is better than getting your protein from a big meal which may have hundreds of calories.

Q: How does whey protein compare to soy protein?

A: Unlike soy protein, whey protein is a nutritionally *complete protein*. It also contains bioactive ingredients, like immunoglobulins and *lactoferrin*, that help support the immune system. Athletes prefer whey protein to soy protein due to its rich abundance of branched chain amino acids and its quick absorption rate. These are important to help repair and rebuild muscles after a workout or competitive event. Whey protein has a fresh, neutral taste compared and will not change the taste of foods you add it to. Whey protein does not contain *isoflavones* with its potential hormonal effects.

Q: Can I get enough whey protein by drinking milk?

A: Milk may be a highly nutritious beverage, however it only contains about 1% of whey protein. In order to get all the benefits of whey protein, you need to take a concentrated whey protein powder blend.

Q: Aren't all whey proteins more or less the same?

A: No. There may be a major difference in the quality of whey protein based upon the following factors: Source of the Milk -Production Method-Individual Manufacturer Specifications-Added Ingredients- Proprietary Blends.

Is the source of the milk from herds that are feed antibiotics, hormones, antibiotics, chemicals or genetically modified organisms and plants? Are they feed unnatural or man-made substances? Is there a history of bovine disease with the milk cows?

Are the delicate milk peptides subject to high heat? Does the isolation method destroy the immune peptides.

Is the blend rich in the immune peptides?

What is the nature and quality of other ingredients added?

Are there added synergistic nutrients, like *soluble prebiotic fiber, reduced glutathione and organic selenium* to increase the antioxidant, immune and detoxification functions of undenatured whey?

Have they been fortified even further with the addition of colostrum?

Q: Is whey protein easy to digest?

A: Whey protein is a soluble, easy to digest protein. It quickly enters the body to provide the important essential amino acids needed to nourish muscles and other body tissues. This is one of the reasons it is a common ingredient in infant formula and protein supplements for medical use. With whey *concentrates*, lactose digesting enzymes need to be added.

Q: Is whey protein a good choice for vegetarians?

A: A: Yes, for vegetarians who include dairy products in their diet, whey protein is an excellent source of *complete proteins*.

Q: What is the BV rating I see associated with protein?

A: The better a protein is absorbed by the body the higher the Biological Value (BV) the protein is said to have. The BV measures the amount of nitrogen retained in the human body per gram of protein absorbed. Currently 159 is the highest possible BV. Here is the BV of some common foods:

Protein BV:

- Whey Protein Blends 104-159
- Whole egg 100
- Cow's milk 91
- Egg white 88
- Fish 83
- Beef 80
- Chicken 79
- Casein 77
- Soy 74
- Rice 59
- Wheat 54
- Beans 49

Q: Is whey protein safe for the lactose intolerant?

A: Whey protein *isolates* and colostrum contain less than 1% lactose. This low level of lactose is usually well tolerated in milk intolerant individuals. Additional lactose digesting enzymes, as in NanoPro^{PRP}, will create even better tolerance.

Q: If I'm lactose intolerant should I avoid whey protein?

A: Individuals with lactose intolerance should either select a pure whey protein

isolate, which has less than 1% lactose, or take a whey protein concentrate that has milk digestive enzymes added to it. NanoPro fits both requirements.

Q: What is lactose intolerance, and why can't some people tolerate milk products?

A: Lactose is milk sugar that cannot enter the bloodstream directly from the digestive tract. It must be broken down in the small intestine by an enzyme called lactase to form glucose and galactose before it can enter the bloodstream.

If you don't have enough lactase and thus the lactose is not digested properly, the undigested milk sugar moves into the large intestine, where it is consumed by bacteria that live in your digestive tract. There, the lactose can cause your gastrointestinal tract a lot of problems. It can pull water from the bloodstream into the gut and cause diarrhea. As the bacteria digest the lactose, they produce acids and gas that can cause bloating, cramping and flatulence.

Because of heredity, about 75% of adults in the world have trouble digesting lactose. The exceptions are northern and some central Europeans, several people from Africa and some people from India. The remainder of the world's population has difficulty digesting lactose.

The National Institutes of Health estimate that 30-50 million Americans are lactose-intolerant -- about 20% of Caucasians, 70% of African-Americans and American Indians, and 50% of Hispanic-Americans. Intermarriage between races has decreased the number of people who can't digest milk.

Many people who think they have difficulty digesting milk really don't have a problem. Recent studies have shown that lactose intolerance may be confused with other digestive disorders such as acid indigestion, ulcers, irritable bowel syndrome and intestinal gas. Taking drugs to ward off muscle pain, such as ibuprofen and aspirin, can also upset your stomach. Lactose intolerance is a trendy condition of the '90s. But just because your stomach hurts, don't automatically assume it's because of milk intolerance.

You can improve your ability to digest lactose just the way you can train your muscles. People can increase their tolerance to milk products by eating fermented products such as cottage cheese, yogurt and hard cheeses, or taking *probiotics*. Whey concentrates are available that have *lactose digestive enzymes* added.

Completely avoiding milk products may make your problem worse. You need to take in some milk products to maintain the lactose-consuming bacteria. If you totally avoid these foods, you suppress these bacteria while the number of gas-producing bacteria increases. When this happens, you become much more sensitive to lactose in the future.

Those with severe verified lactose intolerance should follow the advice of their health professional. But for those with only suspected lactose intolerance or mild lactose intolerance, slowly adding whey protein blends, especially those which are fortified with lactose digesting enzymes and/or low in lactose, may be the best solution.

Q: I get gas when I take NanoProPRP and I am not milk intolerant. Why?

A: Each serving of NanoPro contains two grams of inulin, a soluble fiber. Fiber is a non-digestible carbohydrate. That fiber is however, fermentable by friendly bacteria in the intestine. These friendly bacteria are called probiotics. Soluble fiber is food for these health supporting organisms and are therefore described as “prebiotics”. As the soluble fiber starts to work, some persons may experience “gas”. This is usually temporary. The usual solution is to wait for the bowels to return to normal, and then re-introduce NanoPro slowly, starting at ¼ scoop and increasing by a quarter scoop weekly until a full serving is enjoyed. If discomfort returns, discontinue and inform your health professional.

The above statements have not been evaluated by the FDA. NanoProPRP is not intended for the diagnosis, treatment, or prevention of disease.