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Newsletter
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Muscle Mass in Aging, Health, and Disease – The Importance of Quality Protein Supplementation for General Health

While not often recognized explicitly**, loss of muscle mass is a major factor in the debilitating effects of chronic degenerative disease and aging.** Losing muscle tissue as we age will hinder metabolism, and may make many day-to-day physical activities difficult, significantly reducing quality of life. Compromised levels of muscle mass may also prevent complete recovery from illness, trauma or surgery with potentially life threatening results.

As the average adult loses 5 pounds of muscle mass per decade over the age of 20, building or maintaining muscle structure and function should be a major goal of any person looking to maintain their quality of life under the inescapable onslaught of stress and aging. Luckily, with a concerted effort, muscle loss in aging and disease can be minimized and possibly prevented altogether. High quality protein supplementation, especially when combined with even moderate exercise and a balanced diet may be enough to support healthy levels of muscle tissue and many aspects metabolism and quality of life.

Protein Supplements Go Mainstream

Long a mainstay of workout enthusiasts and bodybuilders, protein supplements are beginning to be recognized within the mainstream fitness and medical communities as valuable tools which sedentary individuals can also use to support healthy levels of muscle mass.

Protein supplements can help prevent the loss of muscle mass associated with aging and disease, but all protein supplements are not created equal. Only the highest quality products can offer the full benefits of protein supplementation.

But as the market for convenient and economical protein supplements grows, so does the production of inferior products, products which

ironically may actually *compromise* the health of the consumers they are meant to serve.

With dietary protein being such an important and often lacking component of our diet, we think it's high time to set the record straight on why protein supplementation is indeed important for everyone, but why **choosing the wrong protein supplement could end up doing you more harm than good, and why choosing a *quality* protein supplement is the only way to reap the full benefits of this important nutrient.**

Protein Requirements

Mainstream nutritional thinking on the subject of dietary protein has operated for decades under the assumption that the average American consumes more than enough protein to prevent outright deficiency, but in looking at *muscular function* as the standard, **it is becoming increasingly recognized that many Americans, especially the sick, elderly, or those recovering from trauma or surgery may suffer greatly from an inadequate intake of quality dietary protein**.

With the passing of time our bodies begin to lose the muscle mass of our youth. This can affect much more than just our body image. With increasing muscle loss, our functional strength and ability to respond to stress are compromised. Strategies to build muscle, or minimize muscle loss should be a part of every anti-aging program.

In order to reach optimal levels of protein in the diet, even for non-athletes, intakes of protein as high as 1.8 grams per kilogram of body weight have been recommended in the scientific literature[1]. This translates into 135 grams of protein daily for a 165 pound person – significantly higher than the 50 gram daily value recommended by the FDA.

As degenerative diseases are increasingly becoming viewed as *systemic* metabolic disorders (involving the entire body and arising from many causes) any nutritional weak link which compromises the structure and function of muscle – our most metabolically active tissue - is bound to hasten the degenerative process. Not surprisingly then, if protein - the structural building block for our muscle cells and vital enzymes - is in short supply, our bodies simply become more susceptible to the ravages of aging.

Heart disease, cancer, diabetes, obesity, immune disorders, osteoporosis and even old age itself all carry with them a component of decreased muscle mass and/or function, and as our muscular capacity declines, so does all metabolic function in a downward spiral of physical degeneration.

For lack of a better analogy, **as we age, we begin to fall apart at the seams**, and if we are to prevent this all-too-common fate we must know a thing or two about how to best nourish and support our bodies with high quality food and nutritional supplements.

Muscle Mass in Aging – The Downward Spiral

The average sedentary man or woman between the ages of 20 and 50 will lose 5 pounds of muscle per year. This rate of muscle loss increases after age 50, especially in post menopausal women.[2] It may not sound like much, but, even by conservative estimates, **over 30 years this adds up to 15 pounds of metabolically active tissue lost to the ravages of time.**

It has also been found, and this is the important part, that as muscle mass declines, the metabolic slowdown that results causes **fat gain to increase at triple the rate.** That is to say that as muscle is decreasing by 5 pounds per decade ***fat mass is***

increasing by 15 pounds per decade – 45 pounds in our 30 year example.

So, if I may borrow an illustrative device from Ellington Darden PhD., the next time you go to the grocery store, pick up a roast or brisket or a similar cut of meat weighing 5 pounds. This represents 5 pounds of muscle tissue. Then pick up three of them. Imagine over the course of your life from ages 20 to 50, male or female, you've probably lost (or are going to lose) this amount of metabolically active tissue. It's quite a hefty amount of muscle to be sure. Then go (and try, if you can to) pick up a 40 pound bag of dog food. Imagine lugging this around on your frame as fat tissue at the same time you lose the 15 pounds of muscle.

Now realize that the body-compositional changes that would take place if this scenario were to play out, would not only be aesthetically displeasing for your physique, but would **greatly increase your risk of serious injury and every single degenerative disease.**

Requirement for Protein in Stress, Trauma, and Injury

Stress and injury can impart enormous demands for amino acids, so much so in fact that the stressed state can cause more muscle wasting than even fasting:

"The stressed state, such as that associated with sepsis, advanced cancer, and traumatic injury, imposes greater demands for amino acids from muscle protein breakdown than does fasting.[1]"

And injuries are more apt to be permanently debilitating in the context of insufficient muscle mass:

"If there is a preexisting deficiency of muscle mass before trauma, the acute loss of muscle mass and function may push an individual over a threshold that makes recovery of normal function unlikely to ever occur. For this reason, >50% of women older than 65 who break a hip in a fall never walk again.[1]"

Osteoporosis and Muscle

While aging women are often warned about the ravages of bone loss, the loss of muscle mass that often accompanies (and may contribute to) osteoporosis still goes largely unheralded. It has been postulated that it is often actually *muscular* weakness, and not bone frailty which is often the cause of falls and accidents in the elderly. In other words the fall may break the bone, but **muscular weakness may have *caused* the fall in the first place.**

Healthy muscles generate the mechanical force and stability which can keep our bones healthy, and consequently, a regimen of weight-bearing exercise is often recommended for those at risk of osteoporosis.

But it's important to remember that when on an exercise program, one's nutritional requirements increase significantly, especially those for protein. Adequate nutrition, often including quality protein supplementation, should be sought to ensure the recovery of all the body's tissues including bone AND muscle.

The average sedentary person may lose 15 pounds of muscle tissue between the ages of 20 and 50. To remain active, healthy and strong as we age, we must do everything we can to maintain muscle.

Sarcopenia and Cachexia Both Involve Muscle Loss

While it seems obvious to observation that people often lose muscle mass as they age, or during illness, the clinical implications of this phenomenon often go underappreciated. The age-related loss of muscle mass is called **sarcopenia** within the medical community, and it can have a devastating and sometimes fatal effect in those who suffer its effects.

Cachexia is the term for a similar sort of wasting disorder common in people suffering from disease-states like cancer and AIDS. In both sarcopenia and cachexia, levels of muscle mass are *very* important markers of health. As muscle mass declines, so does the health of the individual, so integrated approaches to build or maintain muscle mass ***must*** be employed. One approach is to increase protein intake through supplementation.

Both the elderly and the very ill may have a difficult time ingesting or digesting sufficient protein, and both may very well benefit from quality protein supplementation. It is especially important, however, that specialized populations who are looking to build or maintain muscle mass choose quality protein supplements. **As unethical as it may be, many of the protein drinks marketed toward the elderly, cancer patients, patients recovering from surgery, or dieters may contain many undesirable and unhealthy ingredients.**

Who Needs Protein?

As we've just seen, muscle mass is vital to our health and functionality - nobody can afford to waste an ounce of it. And while exercise is vitally important in aging populations, just as important is the role of nutrition – engineering the diet with supplements to avoid this pernicious metabolic decline.

Much of the confusion that surrounds the role of supplemental protein may stem from the athletic and bodybuilding community. It was these athletes who pioneered the use of protein supplements as an aid to muscle recovery and growth. Though waning slowly, there still exists a widespread misconception that protein supplements are of exclusive benefit to athletes and bodybuilders looking to build larger muscles.

We think it's time to lay this myth to rest. The fact is, that while a high protein intake *can* help build larger muscles, it can only *aid* in this process in conjunction with a very specific training stimulus. In other words, bodybuilders look like bodybuilders because of the intensity, frequency, and type of their *exercise training*, not solely because of their protein intake.

Proper protein supplementation has such far reaching benefits on muscle integrity, metabolism, and immune function, that it is a valuable tool for *any* person looking to nourish their body, and forestall the aging process.

Protein Supplementation in Non-Athletes

Adequate protein intake alone, *even in the absence of a training stimulus*, serves to increase protein synthesis and inhibit protein breakdown, a valuable benefit for those at increased risk of muscle wasting.

". . . [T]here are ample relevant studies of the metabolism of muscle protein that support the concept that increasing protein intakes above current guidelines would benefit muscle. Muscle protein is directly affected by protein intake in the diet. High dietary protein intakes increase protein synthesis by increasing systemic amino acid availability.[1]"

Protein supplements aren't just for people looking to build larger muscles, but for everybody looking to maintain healthy levels of muscle mass as they age.

Of course proper exercise focusing on increasing functional ability would certainly work *synergistically* with increasing protein intake, but even if exercise is not performed, increased protein intake alone still imparts many valuable benefits to muscle structure and function.

A Brief History of Protein Supplements

The use of protein supplements dates at least as far back as the late 1930s when pharmacist Eugene Schiff invented the first process to isolate, and turn into a powder, the protein from dairy whey. Subsequent decades saw the introduction of protein powders made from soy, whole egg, egg whites and milk all of which were produced by methods so crude as to, in all likelihood, destroy any health-promoting benefits of the foods from which they were derived.

Many of the harmful effects of food processing which are known today were scarcely suspected in the 1930s, and by the time the harmful effects of turning real food into powders began to be discovered (probably around the 1960s or 70s), the powdered proteins were already such a profitable enterprise that none of the marketers of them dared to acknowledge their nutritional dark side.

Wholesome, real food should always comprise the basis of our nutrition – supplements don't make up for a poor diet, but quality whey protein isolate supplies immune-boosting proteins rarely found in food making it the perfect protein supplement.

So, ironically enough, although protein supplements have been a mainstay of the fitness community for decades, many of these protein supplements may actually have done more *harm* than good. The supplements marketed toward athletes were - and continue to be to this day – shockingly substandard nutrition, loaded with the cheapest byproducts of an increasingly processed food supply. It's these same ingredients (or very similar ones) which have now found their way in to many mainstream diet drinks and medical nutritional shakes.

What Would The Perfect Protein Supplement Be?

With the knowledge that people of all ages and levels of health can benefit from protein supplementation, and that most of the protein supplements on the market are substandard nutrition at best, the question naturally arises: What would the perfect protein supplement be?

To answer that question, let's look at a few criteria:

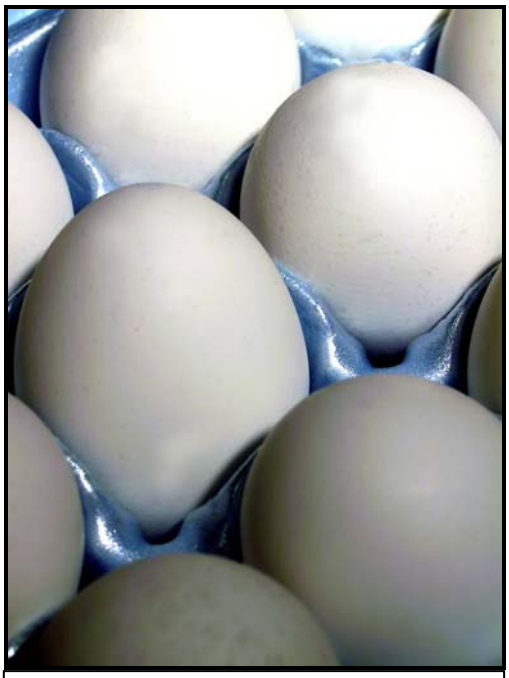
1) Protein which contains the lowest level of denatured proteins or residual ingredients – Many protein supplements, especially the "ready-to-drink" types in cans, cartons, and bottles, may have high levels of denatured, structurally altered proteins which may have toxic effects. The high heat used to sterilize these drinks causes chemical reactions between certain amino acids and sugars, and the production of these toxic compounds may be increased if the product contains a high amount of sugar (as many of these products do).

Similarly, the fats and cholesterol in products processed at high temperatures are particularly prone to harmful oxidation. The perfect protein supplement would be a powder produced at low temperatures, containing the lowest possible amounts of lactose, fat, or cholesterol.

2) Protein that is easily digested – Many elderly people, people suffering from disease, or recovering from surgery (like the increasingly common gastric bypass), often have reduced appetites and compromised digestive function. Many protein supplements, like those containing soy can be difficult to digest and irritating to the gastrointestinal tract. A protein supplement should be first and foremost easily digested.

3) Protein which contains calcium – For women of all ages and the elderly in particular, calcium intake is an important part of building strong bones. A high protein intake may potentially compromise the calcium content of the bones, so a protein supplement should ideally contain naturally occurring calcium.

4) Protein which aids in muscle growth and repair – A protein supplement should be specifically chosen for its beneficial effects on the maintenance or building of muscle. Some protein supplements, like those which are highly denatured or those derived from plant foods may not support muscle maintenance as well as those carefully produced from the highest quality sources.



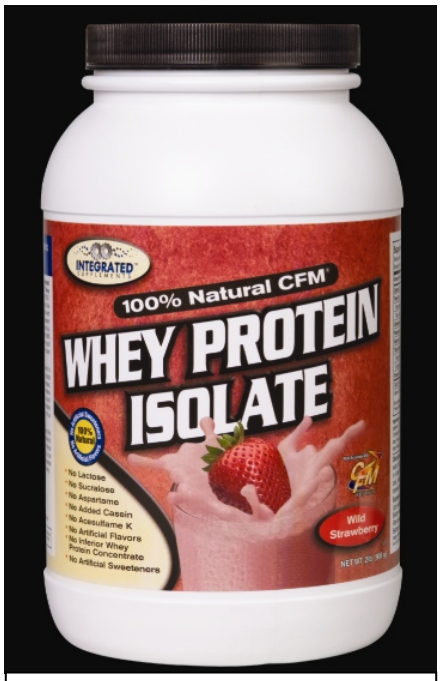
Nature's exquisite design is often altered by food processing. If we are to reap the benefits of protein supplementation, we want to make sure that our supplements are produced with the utmost care, delivering us nutrients as nature intended.

5) Protein which aids in immune function – Especially considering the inflammatory/immune system component of muscle-wasting states, the perfect protein would also support the immune system, aiding in a healthy and balanced immune response. This is a feat that very few protein supplements can claim.

6) **All Natural AND Low Sugar** – Many protein supplements are either loaded with potentially toxic chemical sweeteners or loaded with refined sugar, both of which should be avoided. The ideal protein supplement would be low in sugar and sweetened without the use of artificial sweeteners.

CFM® Whey Protein Isolate - Not Just Any Whey Protein

Only a quality whey protein **isolate** can fulfill all of the requirements listed above, but be warned, many of the whey protein supplements in the nutrition market contain whey protein **concentrate**, a whey ingredient with higher levels of fat, cholesterol, and denatured proteins than the highest quality whey protein isolate.



Integrated Supplements 100% Natural CFM® Whey Protein Isolate is the highest quality filtered whey protein, produced with only all natural flavors and sweeteners.

Many products in both the nutritional supplement industry and the mainstream market of diet and medical shakes may also contain caseinates which are highly processed and largely denatured types of milk protein. Caseinates do not exhibit the same immune and antioxidant boosting capacity of quality whey isolate.

Integrated Supplements 100% Natural CFM® Whey Protein Isolate is produced at low temperatures to protect the fragile whey proteins from denaturation, and filtered with the highest quality ceramic filters available to achieve the lowest levels of lactose, fat, or cholesterol, with the highest levels of undenatured, active protein. Only this type of processing allows CFM® Whey Isolate to impart the full health-promoting benefits of whey protein,

If you've read any of the articles on www.IntegratedSupplements.com, you know that quality protein supplements are few and far between. Realize also that those who would sell you low quality proteins aren't content to limit themselves to the arena of sports nutrition alone. After all, the elderly population is the fastest growing population segment in the country, and medical "functional foods" and diet shakes are a booming business. In many ways the protein drinks sold to these segments of society are even lower quality than those sold to unsuspecting athletes.

But realize that the technology to create the ideal protein supplement does exist and if you know what to look for, you can benefit from all of the remarkable health-giving properties which only a properly formulated whey protein isolate can offer.

Unfortunately, in today's society, achieving optimal health isn't just about *deciding* to make the right choices, it's also about seeing through the marketing hype and figuring out what the right choices *are*.

That's why we feel it's our job to not only create the best nutritional products on the market, but to educate you as well, giving you the tools you need to break the downward spiral of physical degeneration and rise to your full human potential.

References:

(1)Wolfe RR. The underappreciated role of muscle in health and disease. *Am J Clin Nutr* 2006;84:475-82

(2) Forbes GB. The adult decline in lean body mass. *Hum Biol* 1976; 48:161–71

Quick and Easy Ideas for Integrated Supplements 100% Natural CFM® Whey Protein Isolate

With some practice, finding ways to incorporate protein powders into your daily routine is easy, and the quality of nutrition you'll receive is far beyond that of ready-to-drink protein shakes. Here are some ideas:

You could obviously mix the protein in liquids such as milk, water or juice, or you could get creative for a real treat. Try mixing one scoop of your favorite flavor of **Integrated Supplements Whey Protein Isolate**:

- **Rich Dutch Chocolate**
- **Wild Strawberry**
- **Vanilla Ice Cream**
- **Natural (unflavored)**

Into 6-8 ounces of yogurt.

Optional Additions:

- Oat Bran
- Granola
- Fiber Cereal
- Raisins
- Fruit
- Cinnamon

Some of our favorite concoctions:

Vanilla or Chocolate Protein
Plain Yogurt
Dried Cherries

Strawberry Protein
Plain Yogurt
Crushed Banana Chips

Natural (Unflavored) Protein
Vanillla Yogurt
Granola
A dash of Cinnamon