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Whey products have, for some time, maintained their position as the gold standard in protein supplementation - whey is the biggest selling protein supplement by far, due to the powerful anabolic effect it exerts on muscle growth.

Whey is thought to contain the perfect combination of muscle-building amino-acids (the building blocks of protein) and enhance the immune system. It has also shown a rapid utilization capacity, for maximum protein absorption by the muscles (making it perfect as a post-workout drink).

Compared to other forms of protein, Whey is thought to be superior, ideally positioned to render these other formulations obsolete. However, there is an alternative protein source considered to be equally as effective as whey: soy.

Soy protein, much derided in bodybuilding circles as a "feminizing" compound (which, as such, is thought to make it harder to gain muscle), has received a lot of negative press over recent years. Why then, would one replace their tried and tested whey with the much maligned, supposedly inferior, soy?

As is so often the case, when a particular scientific issue is debated, there is another side to the story. In recent years, scientists have been looking closely at the effects soy consumption really has on testosterone, and muscle gain.

Recent studies have suggested soy to be as effective, if not more so, than whey in terms of its ability to promote gains in lean muscle mass.

In this report, the latest 'cutting edge' research on soy supplementation will be presented along with the benefits soy might hold for the bodybuilding population, as a legitimate alternative to the whey protein.

Soy Supplementation

Is Soy Detrimental?

Studies have suggested that the phytoestrogens⁴ contained in soy protein lead to both unwanted decreases in testosterone, and increases in the female sex hormone estrogen.

For example, the isoflavones (a phytoestrogen) found in soy are thought to upset hormone balance, and result in the aforementioned unwanted testosterone and estrogen changes in addition to thyroid problems.

Some nutritional counselors have begun to suspect that soy may be to blame for the low energy, digestive disturbances, hypothyroidism, infertility, and other ailments they see in clients.

However, on the other side of the coin, many scientists believe soy to be relatively innocuous, and in fact beneficial for a whole range of physical ailments.

Is Soy Beneficial?

Soy protein, extracted from the annual leguminous soybean plant that has been in the food chain for over 5,000 years, is the only plant-based protein considered to be a high-quality protein, containing all of the essential amino acids in the ratios needed to support growth and development.

The soybean was introduced to the US in the 1880s, and before then was, and still is, a staple of the Asian diet.

Soybeans In The U.S.

The first soybeans arrived in America in the early 1800's as ballast aboard a ship! It wasn't until 1879 that a few brave farmers began to plant soybeans as forage for their livestock. The plants flourished in the hot, humid summer weather characteristic of the northeastern North Carolina. In 1904, the famous American chemist, G. W. Carver discovered that soybeans are a valuable source of protein and oil. He encouraged farmers to rotate their crops with soybeans. To the surprise of farmers, this produced a better crop.

Soy is comprised of 30% carbohydrate (15% of this is fibre), 38% protein, 18% oil (85% of this unsaturated), and 14% moisture. Soy contains all nine essential amino-acids, in the perfect ratio for health and well-being.

Soy's other nutritional functions include providing a respectable amount of potassium, zinc, iron, vitamin-E, phosphorous as well as the full B-complex¹¹.

Used together in an exercise regimen, soy and whey proteins complement each other well. Whey protein, as mentioned, is high in branched chain amino acids, used as an important energy source by the body during exercise, while soy protein has high amounts of the amino acids arginine and glutamine.

Arginine is well known as a stimulant of anabolic hormones that stimulate muscle formation, while glutamine is considered essential during metabolic stress.

Recent Studies Support Soy's Efficacy

The latest studies into soy protein suggest it does not decrease testosterone and raise estrogen, as previously thought.

The first of these studies, presented at the American College of Sports Medicine (ACSM) Meeting, May 2004, and sponsored by the US National Dairy Council, found the post-workout consumption of isonitrogenous and isoenergetic soy drink to be statistically significant in hastening mass, fat-bone free mass (FBFM) and increases in strength, when compared to other post-workout formulations (skim milk and maltodextrin beverage), both of which had a similar degree of efficacy⁶.

This study demonstrated that intact proteins from both soy and milk protein are effective in supporting muscle hypertrophy, lending a degree of support to soy as a legitimate post-workout nutritional beverage.

This studies method involved randomizing 34-subjects to milk (n=12, skim milk), soy beverage (n=11) or maltodextrin beverage (n=11) (note: n= number of subjects per randomized group), using a double-blind allocation process.

Participants trained 5 days-per-week on a whole body split resistance training program and consumed 500ml of their assigned drink immediately and 1h post-exercise following every training bout.

The most recent study into soy as an effective aid to muscle-building (this study served to help dispel the notion that testosterone decreases in concert with soy consumption), was presented on April 5 2005, and underwritten by the Solae Company.

They found daily supplementation of soy protein, whey or a soy/whey blend resulted in an increase in lean body mass and did not negatively affect testosterone or estradiol levels in 41 male athletes engaging in a weight-training program.

The study's purpose was to compare the effect of supplementation of 50-grams-per-day of four different protein supplements in combination with resistance training on lean body composition and serum sex hormone changes in males.

The method of this study involved, over a 12-week-period, the 41-subjects consuming protein shakes twice daily and participating in three hypertrophy-oriented sessions per-week.

The protein shakes consisted of either soy protein concentrate (SPC), soy protein isolate (SPI), a soy/whey blend composed of a 50/50 mixture of SPI with whey protein concentrate (WPC) and whey protein isolate (WPI), or whey protein composed of a 50/50 mixture of WPC and WPI.

The Study Found

- All of the protein sources resulted in the desired affect of increasing lean body mass. In addition, there was no difference between the supplement sources on changes in testosterone levels.
- The lean muscle mass gains that were demonstrated in this study are consistent with prior research looking at how soy and whey impact lean muscle mass in conjunction with an exercise regimen.

Discussion

- Athletes who incorporate both soy and whey protein in their nutritional regimens may benefit from their different rates of digestion and amino acid absorption. Whey protein digests more quickly, while soy protein digests more gradually. Together, they may provide a more prolonged, deliberate release of amino acids to key muscle groups.
- In addition, soy protein consumption may provide additional health benefits including a reduced risk of coronary heart disease when combined with a healthy diet. Recent studies also demonstrate that soy protein consumption may reduce the risk of certain kinds of cancer including prostate cancer.
- This study is consistent with other studies, which have demonstrated that soy protein has unique benefits for exercising adults in improving antioxidant status. These findings indicate that soy protein can help combat free radical formation during exercise, which may help speed muscle recovery after exercise.

The Experts Speak

Greg Paul, Ph.D., director of health and nutrition for The Solae Company says:

"The results of this study show that soy protein is just as effective as whey protein in building lean muscle mass as part of a dedicated exercise and nutrition regimen, while contradicting the myth that soy protein may negatively impact testosterone levels in men."

"These results are consistent with prior studies which have compared the effect of whey protein and soy protein on lean muscle mass, and supports the notion that dedicated athletes may benefit from a nutrition regiment that includes both soy and whey proteins."

Douglas S. Kalman, M.S, R.D., Director of Nutrition & Applied Clinical Research at Miami Research Associates says:

"We believe that this study validates that soy protein is safe and just as effective as whey protein in helping exercising males achieve their fitness goals and supports the development of lean muscle mass."

Benefits Of Soy Protein

A review of the research into soy consumption for health purposes, uncovered many benefits.

1. Soy protein has a 1.0 PDCAAS (Protein Digestibility Corrected Amino Acid score) score - the highest possible. The PDCAAS is the standard measurement of protein quality.
2. Soy protein increases the nutritional value of other foods due to its complete amino acid profile.
3. Soy has been shown to reduce the likelihood of heart disease through its ability to lower cholesterol. Results from a meta-analysis of 38 clinical studies concluded that soy protein consumption may help lower total blood cholesterol and LDL-cholesterol as compared to animal protein consumption.

In 1999, the FDA determined that four-servings of soy protein per-day could reduce LDL cholesterol (the bad type, HDL being the good) by up to 10%.

Although soy helps to lower LDL, it doesn't effect HDL status, which is also a good thing. The American Heart Association also recommends the consumption of soy protein (with naturally occurring isoflavones) as part of a heart-healthy diet for those with elevated total and LDL cholesterol.

4. Soy protein is also thought to reduce the risk of other illnesses such as colon, breast and prostate cancer²³⁷, as well as osteoporosis. Research has shown several bioactive compounds found in soybeans (isoflavones being one) to reduce the risk of certain cancers⁷.
5. Soy enhances athletic performance⁶⁸⁹. The isoflavones found in soy protein produce antioxidant effects, which speed recovery and reduce muscle soreness and inflammation.

In addition, soy does supply a full complement of amino acids for the exercising muscles - muscles will become larger and stronger with soy protein. In fact, athletes who incorporate both soy and whey protein in their nutritional regimens may benefit from their different rates of digestion and amino acid absorption.

Whey protein digests more quickly, while soy protein digests more gradually. Together, they may provide a more prolonged, deliberate release of amino acids to key muscle groups.

6. Cost: one of the biggest benefits to the consumer is the considerable reduction in cost, using soy will present. With whey protein costs soaring, soy might prove to be much less expensive (around two-dollars-per-pound less).
7. Beneficial for women's health⁷. Consuming soy protein has a number of benefits unique to women's health, including the alleviation of symptoms associated with menopause, the protection of bone health and the a reduction of the risk of breast cancer.

Conclusion

Obviously, more research will need to be done, but if the studies presented here are anything to go by, the future of soy supplementation looks good.

This report is not intended to denounce whey protein or hail soy as the newest miracle product, but, rather, present another side to the whey vs. soy story, with the latest research to help people make more informed choices.

Soy protein could be an excellent anabolic aid, used independently, or in concert with whey protein, to stimulate further gains in muscle.

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