

REPORT

WHEY FOR THE BODY AND MIND

An update



Just a short time ago, whey was on the very fringe of mainstream consciousness with researchers and lay people alike. It was used primarily by bodybuilders and other "health nuts." Considering whey's historical use as a medicinal food going as far back as the time of Hippocrates, it's encouraging to see that many researchers have discovered whey's benefits for a wide variety of human ailments, and have started to give this functional food the attention it deserves. Two recent studies show whey may have beneficial effects on both the body and mind.

An article in the January 2002 edition of Life Extension magazine entitled "The New Faces of Whey" highlighted the idea that whey may have direct cognitive effects, according to researchers. The study discussed in this article examined whether alpha-lactalbumin would increase plasma tryptophan levels as well as reduce depression and cortisol levels in subjects under acute stress considered to be vulnerable to

stress. (Note: Alpha-lactalbumin is a major sub fraction found in whey, which has an especially high tryptophan content.) The study found the ratio of plasma tryptophan to the other amino acids tested was 48% higher in subjects on the alpha-lactalbumin diet than in those given casein, another milk based protein. This was accompanied by a decrease in cortisol levels and higher prolactin concentration. The researchers concluded that the "Consumption of a dietary protein enriched in tryptophan increased the plasma Trp-LNAA (large neutral amino acids) ratio and, in stress-vulnerable subjects, improved coping ability, probably through alterations in brain serotonin." [1]

Whey improves memory

Recently, the same group of researchers sought to find out if whey protein could improve cognitive performance under stress. Cognitive performance declines under chronic stress and it is theorized that the effect of chronic stress on performance may be partially due to reduced brain serotonin levels. As the previous study found, whey increased serotonin levels by dramatically increasing tryptophan levels. Tryptophan is an amino acid that is the direct precursor to serotonin. The study looked at 23 "high stress-vulnerable" and 29 "low stress-vulnerable" subjects using a double-blind, placebo-controlled, crossover design. After each group was given either whey or casein (used as control), all the subjects were given a memory-scanning task and blood samples were taken to measure the effect of dietary whey or casein on plasma levels of tryptophan vs. other large neutral amino acids (the Trp-LNAA ratio). The plasma Trp-LNAA ratio is considered to be an indirect indication of increased brain serotonin levels. Similar to the other study, they found a significantly greater increase in the plasma trp-LNAA ratio after consumption of whey rather than after casein. Most interesting was a significant improvement in memory test performance observed only in the stress-vulnerable subjects. Worthy of note is the fact that participants who were not vulnerable to stress did not show an improvement in memory. These findings show that those prone to stress may benefit greatly from the use of whey and other nutrients known to raise serotonin levels. [2]

Because whey has so many other known benefits, such as possible cancer prevention, immune system enhancement and body building, it should be a staple food supplement in any anti-aging and anti-disease regimen. However, people should realize that not all whey proteins are equal, depending upon the method and care with which the whey is processed.

Whey may increase muscle mass



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Due to whey's high biological value and its other properties, such as its high branch chain amino acid content, it has been theorized that whey could be a particularly effective protein for gaining or preserving muscle mass. This is one reason whey is the best selling protein on the market with bodybuilders. Nevertheless, there are very little hard data that directly support this, and what does exist is often contradictory. One recent study in animals, however, supports the role of whey as being potentially superior to other proteins for body building.



The study looked directly at the effects of different pre-workout drinks on muscle mass and body fat. The study came to some very interesting conclusions. The composition of the pre-exercise meal does affect substrate utilization during exercise and thus might affect long-term changes in body weight and composition. That is, what you eat before you work out can dictate what you use for energy (i.e. carbs, fats, and/or proteins), which alters what you burn (oxidize) for energy.

The researchers took groups of rats and made them exercise two hours daily for over five weeks (talk about over training!), either in the fasted state or one hour after they ingested a meal enriched with a simple sugar (glucose), whole milk protein or whey protein. The results were quite telling. Compared with fasting (no food), the glucose meal increased glucose oxidation and decreased lipid oxidation during and after exercise. Translated, they burned sugar rather than fat for their energy source. In contrast, the whole milk protein and whey meals preserved lipid oxidation and increased protein oxidation. This means fat burning was maintained and the rodents also used protein as a fuel source. Not surprisingly, the whey meal increased protein oxidation more than the whole milk protein meal, most likely because whey is considered a "fast" protein that is rapidly absorbed.

As one would expect, by the end of the five weeks, body weight was greater in the glucose, whole milk protein and whey fed rats than in the fasted ones. No shock there. Here is where it gets interesting: In the group getting the glucose or the whole milk protein, the increase in weight was from body fat, but in the whey fed group, the increase in weight was from an increase in muscle mass and a decrease in body fat! Only the rats getting the whey before their workout increased muscle mass and decreased body fat. The researchers theorized this was due to whey's ability to rapidly deliver amino acids during exercise.[3]



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Is this the next big find in sports nutrition and populations (i.e. elderly, people with wasting diseases such as HIV, cancer, etc.) looking to preserve muscle mass and lose body fat? Hard to say at this time since the study was done in rats. But if it turns out to be true in humans-and there is no reason people can't try it now-it would indeed be a breakthrough in the quest to add muscle and lose fat.

References

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2. Am J Clin Nutr 2002 June;75(6):1051-1056.
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