Breaking Health news

Whey Protein... For Osteoporosis?!

If you've spent any time in a health food store, you've seen whey protein. Tucked away with the sports nutrition products, whey protein comes in big tubs, emblazoned with names like "Ultra Muscle Builder." And with good reason: whey protein is an excellent, high-quality protein source, well-absorbed and well-utilized by the body. But while the focus of most of the marketing of whey protein is on guys who want to be the next Arnold Schwartzenegger, research has been piling up for years on the *health* benefits of whey protein, and specifically of its important subfractions -- proteins and peptides like **alpha-lactalbumen, glutamylcysteine, glycomacropeptides**, and **lactoferrin**.

These important whey components are found in significant amounts in "filtered" whey proteins: by contrast, proteins produced by the "ion-exchange" method have very slightly less carbohydrate and fat, but are also much lower in these health-promoting whey fractions. That's because the ion-exchange method only draws in the smallest amino acid chains, leaving most of the health-promoting fractions behind. Research suggests that **whey protein and its fractions stimulate the body's antioxidant[1-3] and immune[4-6] defenses,** and may even provide potent **nutritional support against cancer**.[7-10]

And now, preliminary evidence in lab animals is suggesting that **whey protein may be protective against osteoporosis**.

Bone-Sparing Protein

People concerned about bone health have long been counselled to drink plenty of milk. And, indeed, analysis of both controlled trials and studies of the diets of large groups of women consistently shows that **women drinking more milk have higher bone density and lower risk of fracture** than women drinking less.[11] Obviously, the high calcium content of milk (about 300 mg per cup) plays a big role in this, but scientists have long guessed that something else might be involved. Now it looks as if **milk basic protein (MBP), found in whey protein, helps prevent the breakdown (resorption) of bone**.

The first evidence of this effect was seen in isolated bone cells.[12] Japanese researchers found that, when bone cells were raised in a medium containing whey protein, the growth of the bone cells responsible for tearing down bone (**osteoclasts**) was inhibited, and the resorption activity of those cells was also reduced. To see whether this would apply in a whole organism, the same research team decided to see what effects MBP would have in lab rodents. Animal rights groups will not be happy with the research methods, but the results may be of great interest to human women concerned with their long-term health and independence.

To imitate the hormonal changes created by menopause, the scientists first removed the ovaries of one group of rodents – a crude, but effective, simulation – while a control group was given "sham" surgery (in which their bellies were simply opened and then sewn back up, with no internal changes made). All animals were then given four weeks to heal. Next, the "menopausal" rodents were divided into three groups: a group fed standard rodent chow, a second group in which 0.01% of the protein in the standard diet was replaced with MBP, and a third group receiving 0.1% protein as MBP.

Stronger, Denser Bones

Over the course of 17 weeks (about 2.5 "rat years,") the **bone mineral density (BMD)** of all of the rodents was reduced as they aged. But while the controls' BMD went down by just 4% in this time frame, the "menopausal" group fed the standard diet dropped by over 12%. But while the rodents getting the low-MBP chow didn't fare significantly better, **the "menopausal" rodents eatting the high-MBP diet maintained 92% of their original BMDs** – a significant improvement over the regular-chow "menopausal" group.

And their bones weren't just denser -- they were *stronger*. After sacrificing the animals at the end of the 17 weeks, scientists tested the strength of the hip-and-thigh bone (**femur**) by determining how much energy it took to break the bone at three different points. Again, the energy required to break the bones of the "menopausal" rodents eating standard chow was remarkably (38.5%) less than that of controls; and, again, **"menopausal" rodents eating a higher-MBP diet had bones that were much more resistant to breakage** than those fed standard rodent food, having only lost 12.8% more of their strength than the control animals!

To help figure out the *reasons* for the differences, the scientists also measured the **deoxypyridinoline (D-Pyr)** in the rodents' urine. D-Pyr is a substance used to measure the resorption of bone: the more D-Pyr is found in your urine, the more bone resorption is happening. **"Menopausal" rodents receiving either MBP-enriched diet had lower D-Pyr** than their regular-fed, "menopausal" cohorts: in fact, their D-Pyr levels did not differ significantly from the control animals. The scientists were also able to prove that the previously-shown **inhibition of bone-teardown activity in isolated osteoclasts was due to the MBP fraction of the whey protein**.

Thus, using three different measures of bone health – bone mineral density, bone strength, and a marker of bone resorption -- the researchers were able to conclude "that **MBP directly suppresses osteoclast-mediated bone resorption, resulting in the prevention of the bone loss**" that accompanies the surgical "menopause" model.

Why Whey?

Why would this special protein be found in *milk?* Certainly, Nature did not design cow's milk for the benefit of women at risk for osteoporosis! But evolution *did* design milk -- including its whey fraction -- as the perfect food to support the development of rapidly-growing young mammals, whether the mammal in question is a cow or a human being.

The growing calf, pup, or baby is adding new bone to its body from the second it leaves the womb. Obviously, this development creates a massive need for calcium, and milk has this mineral in spades. But evolution hasn't left it at that!

Thus, milk also contains special proteins (**phosphopeptides**) which enhance calcium absorption.[15,16] Note that phosphopeptides are found in the **casein** fraction of the milk, which is not included in whey protein, but is found concentrated in cottage cheese. Many people are allergic to casein, however, or have problems with mucus production when they eat it, so this may not be a good choice for some.

But having *absorbed* calcium, growing infants also need to optimally *utilize* it in the building of bone. This new research suggests that MBP, found in the *whey* portion of the milk, helps with ensure this last, crucial step.

This new evidence proves that what will support the skeletal health of the infant will also support skeletal health in a rodent model of menopause. Will the same hold for real, menopausal humans? There isn't enough evidence to say for sure, one way or the other. Only time -- and further research -- will tell.

So what can we do with this discovery in the meantime? One course of action is obvious. **We all need protein anyway**, and the protein in whey is an excellent source. When you look at all the known benefits of whey as a protein source, and the new suggestion that it might support the health of the bones, the next few years may see a wider and wider spectrum of health-conscious people making whey protein a part of a broader, healthy lifestyle.

Whey will then become recognized for what it is: a valuable *health food*, with benefits which extend far beyond the gym.

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