On the Power of Leucine

Reformatted e-newsletter from Dr Stephan Chaney
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Subject: Health Tips from the Professor: On the Power of Leucine

As I continue with your weight loss tips for the New Year I want to talk about the importance of leucine in helping you lose weight and keep it off.

If I were a internet marketer, I would probably have titled this segment "The magic of leucine". However, I'm not an internet marketer. I'm a scientist.

I've already told you that there are no "magic" foods or "magic" supplements that are simply going to make the fat melt away.

However, there are some nutrients such as leucine that are important for long term weight control and whose role in weight control is based on solid science.

The Weight Loss Problem

But, let's start with the problem before I discuss the solution. The problem is that whenever we lose weight we generally lose muscle mass as well as fat. To be precise, you lose about 5 pounds of muscle for every 12 pounds of weight loss.

That is a concern because muscle is metabolically much more active than fat. Since each pound of muscle burns about 50 calories a day, that 5 pounds of muscle you lost costs you 250 calories a day.

That means that if you want to keep losing weight at the same rate after you have taken off that first 12 pounds, you will need to reduce your calories by another 250 calories a day - and if you manage to lose another 12 pounds you will have to reduce your calories by yet another 250 calories per day to keep losing weight.

Now you understand what causes the dreaded weight loss plateau! But, it just gets worse.

Let's say that you lose 12 or 24 pounds (corresponding to 5 to 10 pounds of muscle or 250 to 500 calories per day) and go off of your diet because you got discouraged by the plateau. When you regain your weight it comes back mostly as fat, not as muscle. So now you need to eat 250-500 calories a day less just to maintain your weight.

The result is that you usually gain back more weight than you lost. Now you understand the cause of the dreaded weight loss yo-yo!

Exercise – Leucine

You can reduce the loss of muscle mass when you are losing weight by adding the exercise component – particularly resistance training.

But exercise can't do it all. What you eat is important as well. This is where leucine comes in. "What is leucine?", you might ask.

Leucine is an essential amino acid. It's also what we call a "branched chain" amino acid, a term that refers to its chemical structure.

Leucine has been used by bodybuilders for years to increase muscle mass when they are working out. And there is good evidence that it is effective for that purpose. I did a quick literature search and found over 20 clinical studies on the topic in just the last few

years - but that is another story for another time.

It has just been in the last few years that evidence started to accumulate that leucine can also help preserve muscle mass when people are losing weight.

This research was spearheaded by Dr. O. K. Layman and colleagues at the University of Illinois.

Their early studies showed that leucine stimulates the synthesis of new protein in the muscle, suppresses appetite and results in better blood sugar control. They then showed that leucine supplementation during weight loss in animals resulted in greater overall weight loss and better retention of lean muscle mass. They went on to do two clinical studies with women, aged 40-56, who had BMIs of 31 (if BMI is not a familiar term, suffice it to say that those women really needed to lose weight).

Dr. Layman had discovered in preliminary studies that leucine was most effective in preserving muscle mass when the carbohydrate to protein ratio was 1.5:1 (For comparison, current dietary guidelines recommend a carbohydrate to protein ration of 3:5 1, and that is the formula most weight loss diets follow).

Thus, the experimental diet designed by Dr. Layman provided 10 g of leucine/day in a diet with an overall carbohydrate to protein ratio of 1.5:1. The control diet only provided 5 g of leucine in a diet with an overall carbohydrate to protein ratio of 3.5:1.

The two diets were identical in terms of calories (~1700 calories/day) and were designed to create an energy deficit of ~500 calories/day. The diets contained identical amounts of fat (30% of calories) and fiber (~20 g/day).

The first study lasted for 10 weeks and did not have an exercise component. The second study lasted for 16 weeks and both groups in that study exercised 5 days/week using an exercise program designed to create an energy deficit of 300 calories/day.

There was no significant difference in overall weight loss between the high leucine - high protein group and the control group in either study – but there was a huge difference in where that weight loss came from.

In the second study with the exercise component only 4% of the weight loss came from muscle in the high leucine - high protein group compared to 16% from muscle in the control group.

As you might expect, the first group that didn't exercise didn't do as well. In that study 11 % of the weight loss came from muscle in the high leucine - high protein group compared to 18% from muscle in the control group.

You may have noticed that exercise had only a modest effect on preserving muscle mass for the subjects on a standard weight loss diet (16% loss of muscle mass with exercise compared to 18% muscle loss without).

The bottom line is that if you want to rely on exercise to preserve muscle mass on a standard weight loss diet, it really has to be high intensity resistance exercise.

In contrast exercise was much more effective in preserving muscle mass in the high leucine - high protein group (4% loss of muscle mass with exercise compared to 11 % loss of muscle mass without exercise).

The bottom line is that weight loss diets providing around 10 g of leucine/day coupled with a 1.5:1 ratio of carbohydrate to protein are more effective at preserving muscle mass than the kind of weight loss diet that most people follow.

Shaklee CINCH Inch Loss Plan

*Some of you may be asking how this relates to Shaklee's Cinch Inch Loss Plan. The **Cinch Inch Loss Plan** provides 12 g of leucine/day and the carbohydrate to protein ratio is 1.4:1 for the **Cinch Shake Mix** and 1.6:1 for the **Cinch Meal Bar**.*

*So it shouldn't come as any surprise that in Shaklee's 12 week clinical study of people on the **Cinch Inch Loss Plan** the average weight loss was 15.4 pounds - and **none of***

that came from muscle!

References:

Layman, J. Nutr, 133: 216S-267S, 2003.

Layman and Walker, J. Nutr., 133: 405-410, 2003 Layman et ai, J. Nutr., 133: 411-417, 2003

Layman and Walker, J. Nutr., 136: 319S-323S, 2006

Jitomer and Willoughby, J. Med. Food, 11: 606-609, 2008

*The **Cinch Inch Loss Plan** is a diet plan based on the latest scientific advances in the field and clinical studies show that it works!*

To Your Health!

Dr. Stephen G Chaney

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Added by reformatter and not in Dr Chaney's original e-mail

Clinical results of a 12 week study of Shaklee's CINCH Inch Loss Plan

Average weight loss - 15.4 lbs; Average loss of fat - 16.2 lbs

Average inch loss - 4.1 from waist; 2..6 from hips.

Study participants following the Cinch Inch Loss Plan experienced no significant changes in fat-free mass over 12 weeks. These data suggests that most, if not all, weight loss was derived from body fat and fat-free mass was preserved.

Study participants experienced an average reduction in total cholesterol by 22 points (or 10%) while on the Cinch Inch Loss Plan.