



# Understanding protein and satiety.

*Why protein ingredients can  
make food products more satisfying  
and appealing to consumers.*

*flavored water*  
**+ WHEY PROTEIN**  

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*= a clear difference*



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## How can you capitalize on consumers' desire to feel full?

It's no surprise. Many Americans trying to lose weight fail because they feel hungry. Lingering hunger can lead to more snacking and ultimately cheating on a diet. And a recent study by Dairy Management Inc.™ (DMI) found that two-thirds of consumers agree that:

- Feeling full is important if you are trying to lose weight.<sup>1</sup>
- If you feel hungry, you can't be at your best.<sup>1</sup>

To complicate matters, hectic schedules often cause these same people to skip sit-down meals and get through their days by snacking on the go.



### Consumers are interested in products with a satiety benefit.

In the same DMI study, two-thirds of consumers said it was extremely important or very important that a food or beverage makes them feel full.<sup>1</sup> Why? Because feeling full reduces cravings for snacks and helps them eat less, and because feeling full makes them feel satisfied and content. This satiety benefit was most compelling to specific consumer groups, especially women ages 18 to 34 and people who exercise.<sup>1</sup>

And, more than half of consumers studied believed foods enriched with protein can increase satiety.<sup>1</sup>

### Protein's role in satiety is clear.

Many research studies have concluded that diets higher in protein can help promote satiety, or a feeling of fullness.<sup>2-4</sup>

### Research shows a positive meal effect of protein on satiety.

Several recently published review papers,<sup>2-4</sup> as well as an independent review of the literature conducted by the National Dairy Council,<sup>5</sup> have concluded that protein has a greater effect on satiety than carbohydrates or fat.

These findings further reinforce a 2002 report released by the Institute of Medicine (IOM) that concluded, "A number of short-term studies indicate that protein intake exerts a more powerful effect on satiety than either carbohydrate or fat."

The majority of these studies have shown a meal with 30 to 50 grams of protein to be effective in producing satiety. Future research needs to address whether smaller amounts are equally effective.

### Longer-term effects of protein on satiety.

In addition to meal-by-meal effects of protein on satiety, studies have shown higher protein diets also can have a satiety effect. One review concluded, "Protein-induced satiety has been shown with high protein *ad libitum* diets, lasting from one to six days, up to six months. After a high protein *ad libitum* diet, significantly greater weight loss has been observed."<sup>3</sup>

## How is satiety studied?

### A working definition of satiety.

**Satiety** = A feeling of fullness after eating, which can be ascribed to a particular food or meal, or to the overall diet.<sup>5</sup>

Researchers measure satiety in a number of ways:

- Fullness ratings using visual analog scales administered prior to and for one to six hours after a fixed test meal, or "preload"<sup>6</sup>
- Assessment of motivation to eat up to about six hours after a meal<sup>6</sup>
- Quantification of caloric intake at an *ad libitum* subsequent meal offered one to eight hours after the preload meal
- Assessment of voluntary energy intake over time (24 hours to several weeks)

*"Several studies have suggested that higher protein diets may increase total weight loss and increase the percentage of fat loss."*<sup>4</sup>

### As part of a higher protein diet, whey protein can help promote satiety.

Whey protein can be used to create products to help promote satiety. Here's why:

- Whey protein is a complete protein, containing all of the essential amino acids required by the body. It also offers one of the highest biological values of any protein, which means whey protein is easily absorbed and utilized by the body.
- Whey protein can be incorporated into a variety of foods, providing an easy way to increase the nutrient value of food products and giving consumers options for increasing the protein content of their diets.
- Whey protein may lead to satiety by stimulating several gastrointestinal hormones that are thought to regulate appetite control in the brain.



Whey protein is functional, flexible and high-quality.  
Add it to manufactured products to help create  
the protein-enriched products consumers desire.

#### Top three satiety claims for generating purchase interest in a food or beverage.<sup>1</sup>

1. Helps keep your hunger down and your energy up (appeals most strongly to those ages 18 to 24)
2. Helps you feel satisfied until your next meal (generates more interest with males and older age groups)
3. Helps you feel fuller with fewer calories



#### Moving to meet consumers' desire for protein.

Whey protein ingredients in your products can help deliver satiety benefits. So it makes sense to add whey protein to food and beverage formulations and make satiety claims. Here are some insights from our research on a range of consumer desires on this subject.

#### Satiety claims appeal to several consumer targets.

##### Consumers interested in weight loss:

- Respond to language such as “feel full with fewer calories,” “reduce appetite” and “helps you eat less”
- More likely to be female

##### Consumers interested in a healthy, balanced diet:

- Respond to language such as “reduces cravings for unhealthy snacks”
- 72 percent of consumers strongly or somewhat agree that the best way to control hunger is through a nutritionally balanced diet<sup>2</sup>

##### Consumers who want to feel satisfied:

- Respond to language such as “feel satisfied until your next meal” and “hunger satisfaction”
- 44 percent of respondents cited feeling satisfied or content as a reason why satiety was important<sup>1</sup>
- More likely to be male and less concerned about eating healthy

Contact [techsupport@InnovateWithDairy.com](mailto:techsupport@InnovateWithDairy.com) to learn more about the Satiety and the Consumer study. Consider how your products can benefit from the addition of whey protein ingredients.

<sup>1</sup>Dairy Management Inc.™ *Satiety and the Consumer*. July 28, 2008.

<sup>2</sup>Veldhorst M et al. Protein-induced satiety: Effects and mechanisms of different proteins. *Physiology & Behavior* 2008;94:300-307.

<sup>3</sup>Westerterp-Plantenga MS. Protein intake and energy balance *Regul Pept.* 2008; 149:67-69.

<sup>4</sup>Paddon-Jones D et al. Protein, weight management and satiety. *Am J Clin Nutr.* 2008;87(suppl):1558S-1561S.

<sup>5</sup>National Dairy Council, Rosemont, Ill. *Protein, dairy protein and whey: Effects on satiety and food intake regulation.* March 10, 2008.