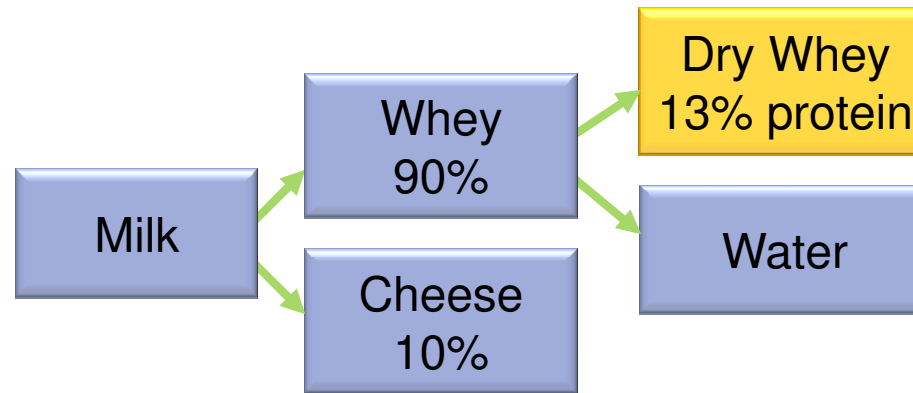




Why Protein? What is It? and Is It Something I Should Consume?"

Mary Higgins
Vice President, Ingredient Marketing

Whey: What is it?



Composition:	
Lactose	74%
Whey Protein	13%
Ash/Minerals	8%
Fat	1%
Moisture	4%



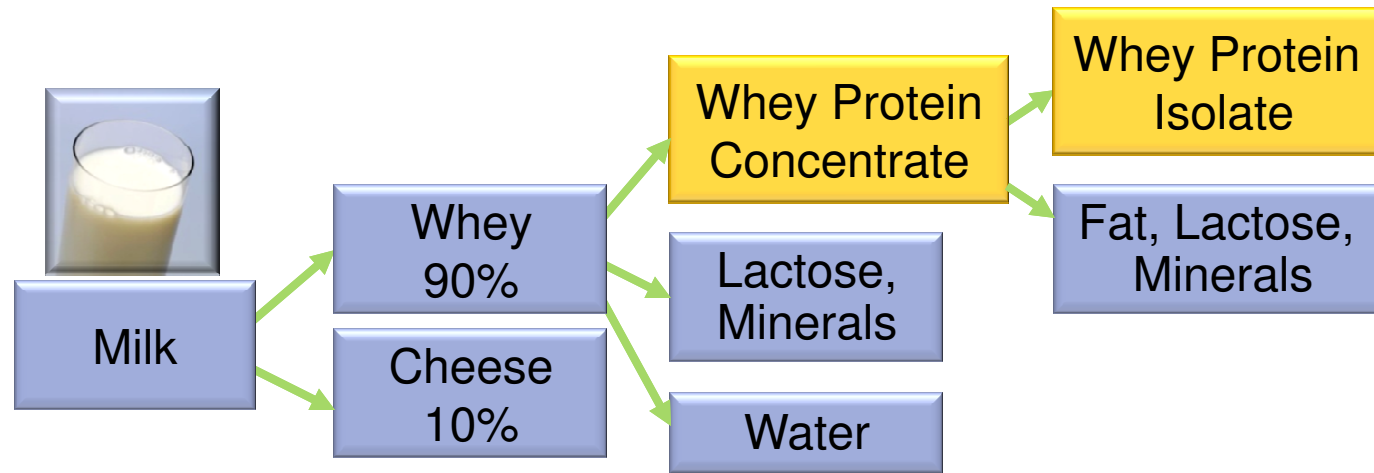
Technological Advances



The advent of ion exchange and micro-filtration equipment now allows for production of new dairy ingredients made from whey.



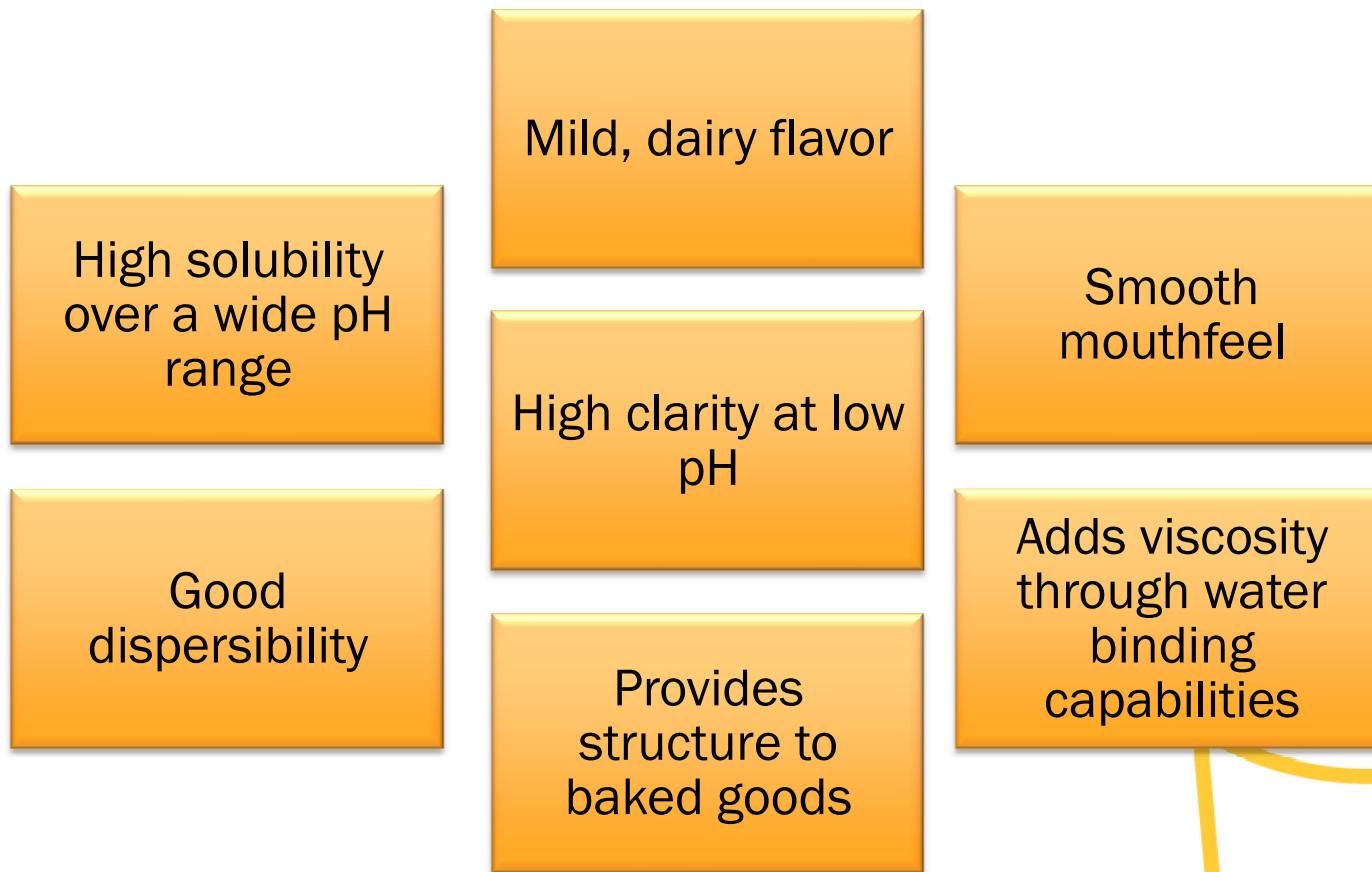
Whey Protein Concentrate/Isolate:



Composition:

	<u>WPC</u>	<u>WPI</u>
Whey Protein	34-80%	90+%
Lactose	10-55%	0.5%
Moisture	3-4%	4.5%
Fat	1-10%	1%
Minerals/Ash	4-8%	2%

Whey Protein Characteristics



So do I need to consume it?





Protein Needs

- RDA: 0.8 g/kg for adults
 - Preventing deficiencies vs. optimizing health
- Acceptable Macronutrient Distribution Range (AMDR): 10-35% total calories
- Who could benefit from more?
 - Active adults and athletes
 - Aging adults
 - Weight conscious individuals
 - More studies on the horizon



Position Statement: ACSM/ADA/Dietitians of Canada



- Protein recommendations are increased in highly active people.
 - 1.2 – 1.7 g/kg/day
- Protein consumed after exercise will provide amino acids for the building and repair of muscle tissue.



ACSM/ADA Position Stand, MSSE, 2009



Protein and Muscle Synthesis

- Dietary protein is critical to build and maintain muscle
- Quality of dietary protein matters





Protein Quality Ratings

Protein Type	PDCAAS	Biological Value	Net Protein Utilization	Protein Efficiency Ratio
Whey Protein	1.00	104	92	3.2
Milk	1.00	91	82	2.5
Casein	1.00	77	76	2.5
Egg	1.00	100	94	3.9
Soy Protein	1.00	74	61	2.2
Beef	0.92	80	73	2.9
Black Beans	0.75		0	0
Peanuts	0.52			1.8
Wheat Gluten	0.25	64	92	0.8

Journal of Sports Science and Medicine, 2004



BCAA & Leucine

Branched Chain Amino Acids (BCAA)

- isoleucine, *leucine* and valine
- uniquely metabolized by skeletal muscle

Leucine

- stimulates muscle protein synthesis
- greatest effect when combined with resistance exercise
- one of the most rapidly absorbed amino acids



BCAA Content of Foods



	LEUCINE	ISOLEUCINE	VALINE
1 scoop (36g) whey protein isolate	3.2 g	1.8g	1.7g
1 scoop (36g) soy protein isolate	2.4 g	1.5g	1.5g
4 oz. sirloin steak	2.0 g	1.1g	1.3g
4 oz. chicken breast	2.0 g	1.4g	1.4g
1 cup low-fat yogurt	1.1 g	0.6g	0.9g
1 cup skim milk	0.8 g	0.4g	0.4g
1 egg	0.5 g	0.3g	0.4g
2 T peanut butter	0.5 g	0.2g	0.2g
1 slice wheat bread	0.1 g	0.05g	0.07g

Sources: USDA National Nutrient Database for Standard Reference, Release 20. and GNC WPI 28



Key Benefits of Whey Protein



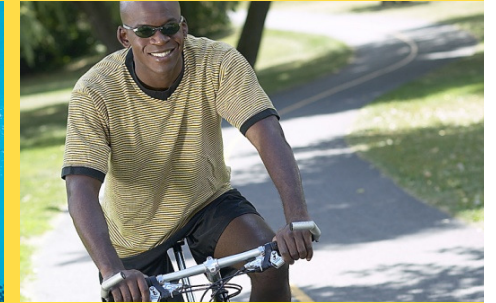


Who Benefits From Whey Protein?

- Healthy, active adults exercising 2+ times per week
- Aging population
- Those looking to improve body composition

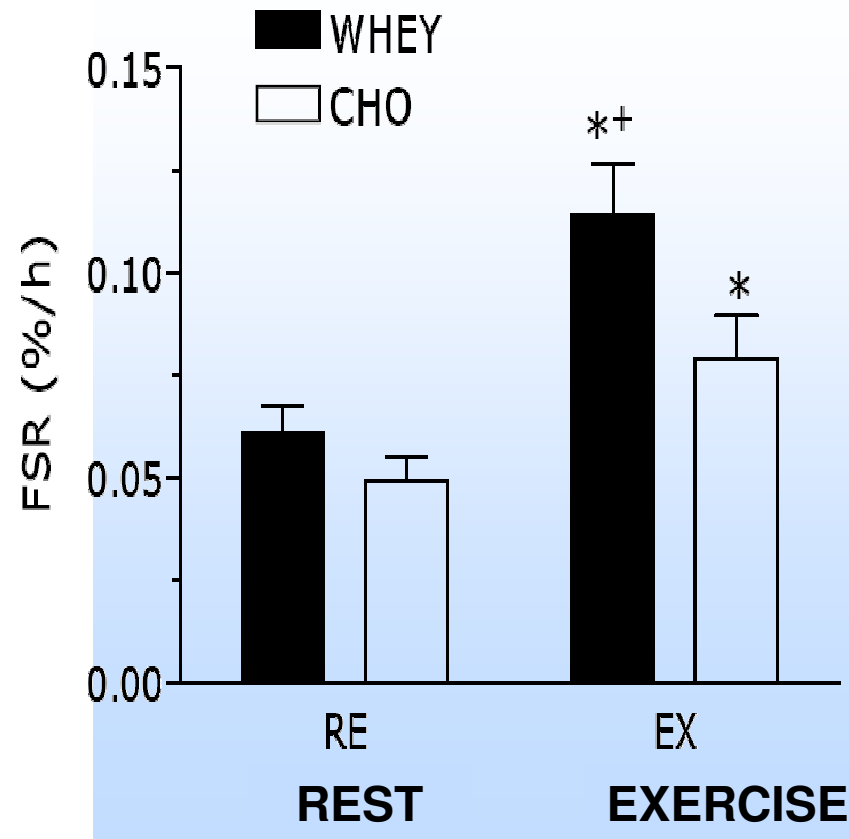


Protein Synthesis



Why protein helps
increase protein synthesis

Whey Protein After Resistance Exercise Increases Muscle Protein Synthesis More Than Carbohydrates Alone

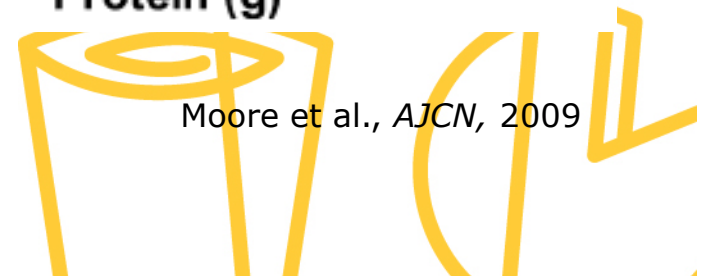
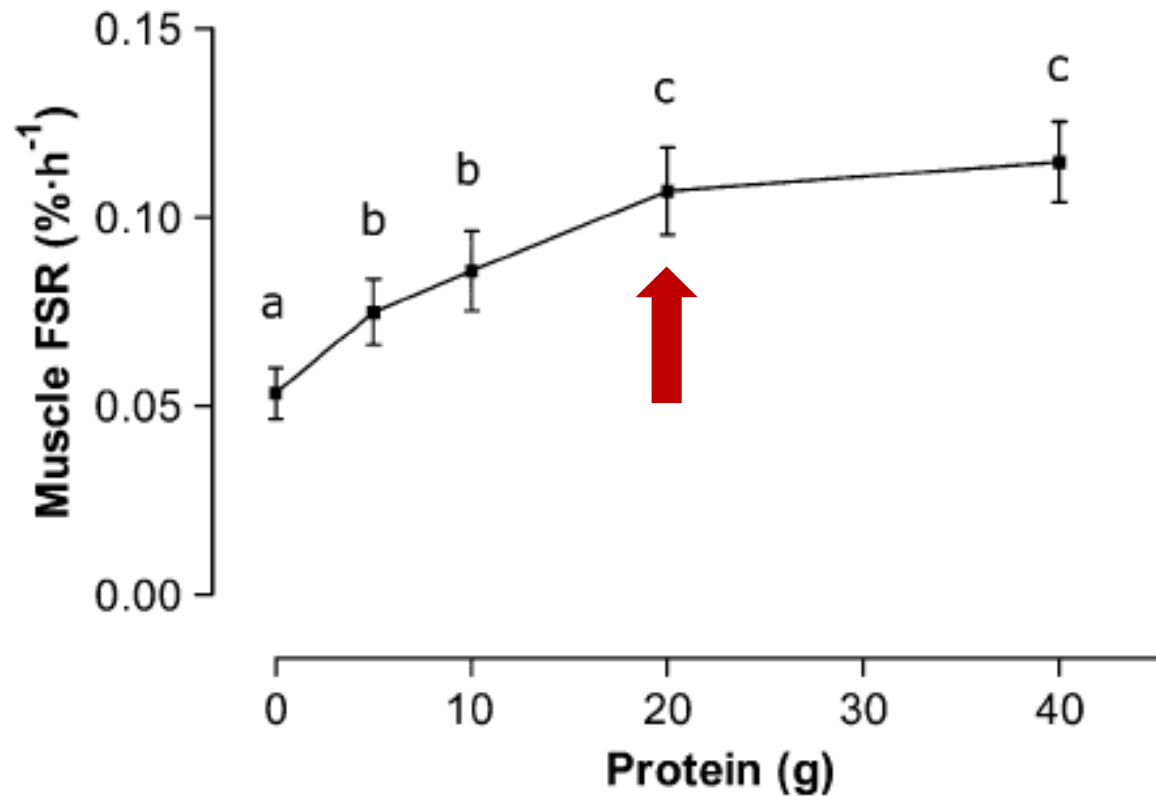


Tang et al., *Appl Physiol Nutr Metab*, 2007

Protein Dose to Maximize Muscle Protein Synthesis

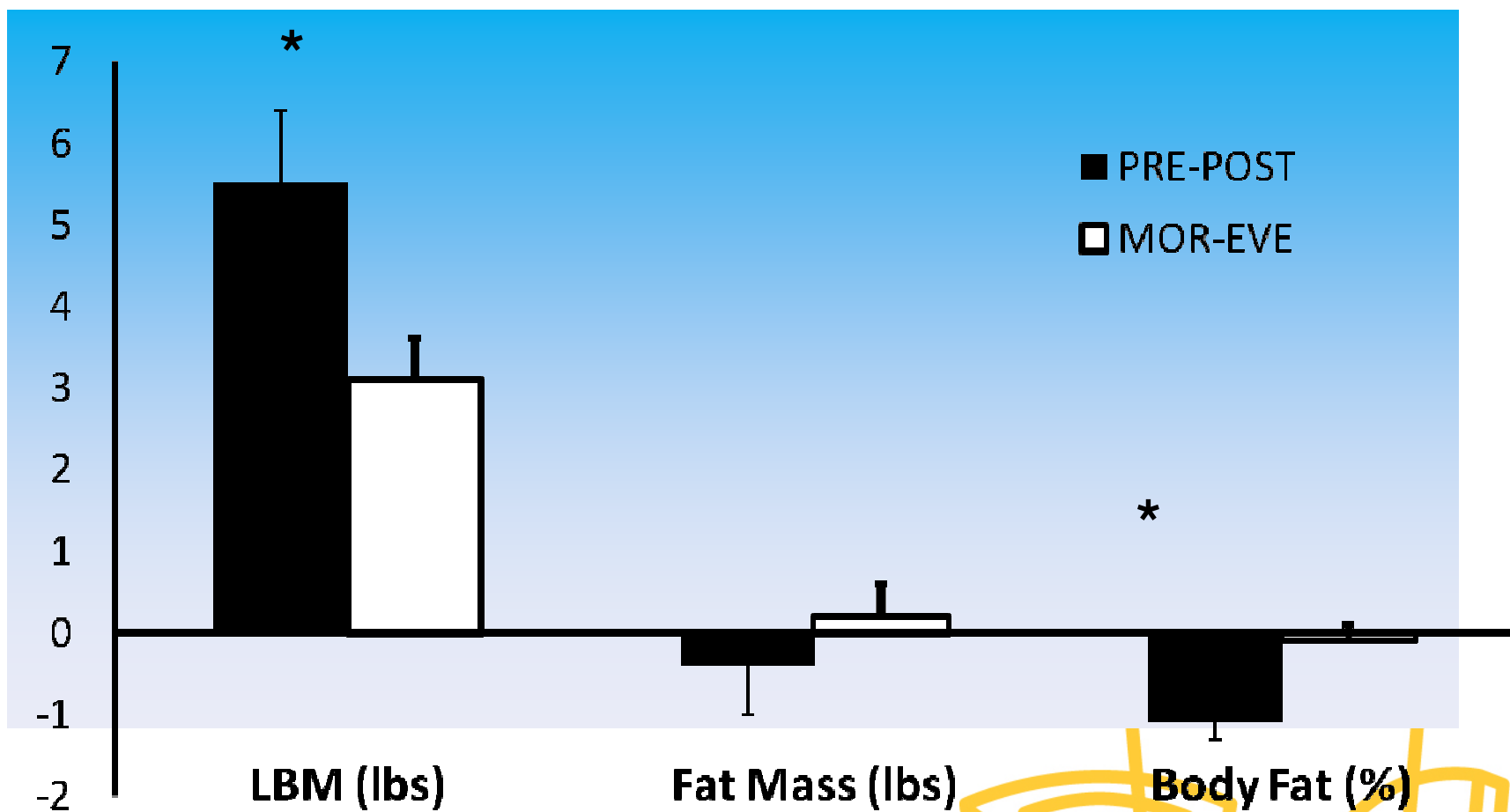


- 20 grams = *maximum* protein synthesis stimulation



Moore et al., *AJCN*, 2009

Whey Protein and Resistance Exercise Improve in Body Composition



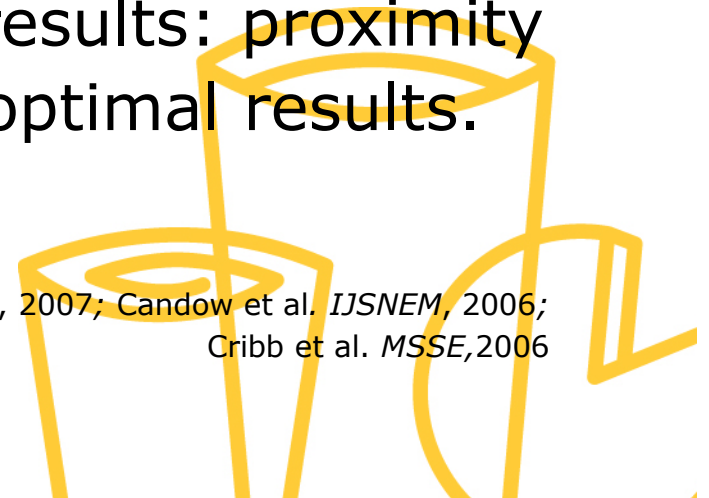
Cribb et al., MSSE, 2006



Key Points

- Whey protein following resistance exercise stimulates an **increase in protein synthesis**.
- Routine whey protein intake and resistance exercise training promotes long-term **gains in muscle mass**.
- **Timing** of intake may impact results: proximity to exercise session is key for optimal results.

Tang et al. *App Phys Nut Met.*,2007; Tipton et al., *MSSE*, 2004, 2007; Candow et al. *IJSNEM*, 2006; Cribb et al. *MSSE*,2006



Recovery Nutrition



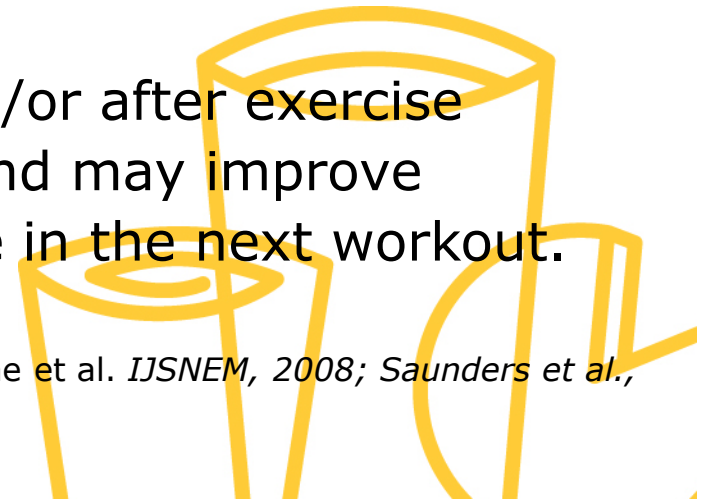
Why protein enhances exercise recovery



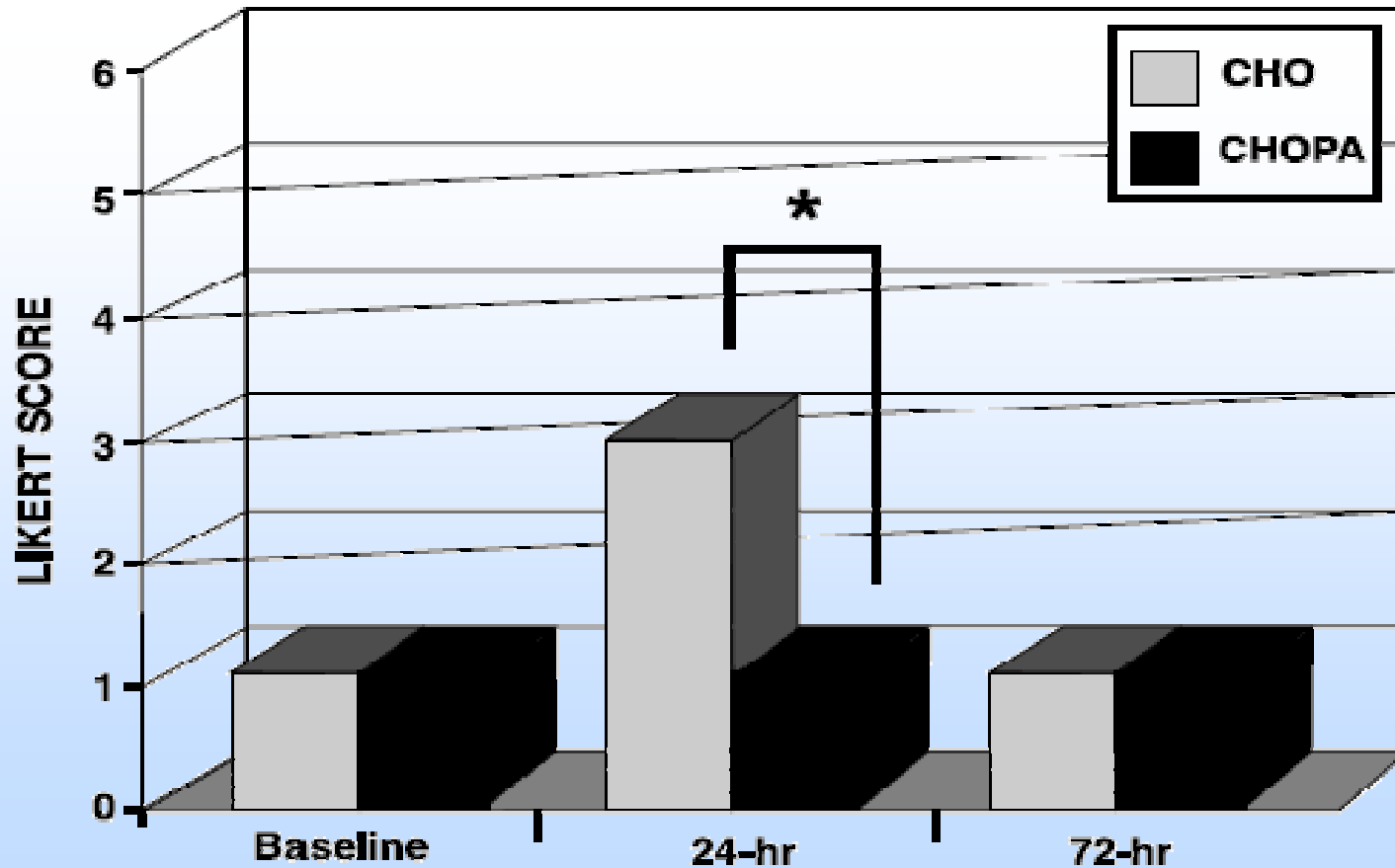
Whey Protein and Exercise Recovery

- Whey protein is a complete protein that helps promote muscle repair and recovery after exercise.
- Consuming whey protein as part of a higher protein diet and exercising regularly can help build more lean muscle compared to resistance training alone, or resistance training combined with carbohydrate consumption.
- Consuming whey protein during and/or after exercise may help reduce muscle soreness and may improve muscle function and/or performance in the next workout.

Romano-Ely et al., *MSSE*, 2006; Luden et al., *IJSNEM*, 2007; Valentine et al. *IJSNEM*, 2008; Saunders et al., *MSSE*, 2004 and *JSCR* 2006



Carbohydrate/Whey Protein Drink Decreases Ratings of Muscle Soreness



Romano -Ely et al., MSSE, 2006

Why Protein and Healthy Weight



Higher protein diets may help maintain a healthy weight

Higher Protein Diets May Help Maintain a Healthy Weight



- Eating a higher protein diet has been shown to increase a feeling of fullness, which may contribute to people consuming fewer calories, which can help maintain or lose weight.
- As part of a reduced calorie diet, higher protein diets may improve the quality of weight loss by helping people lose more fat and/or maintain more lean muscle.
 - Lean muscle helps to promote a healthy metabolism and burn more calories.

Weigle et al, *AJCN*, 2005; Layman et al, *JNut*, 2009; Leidy et al, *Obesity*, 2007; Skov et al, *IJO*, 1999, Gordon et al, *JNut Healthy Aging*, 2008, Halton et al, *JACN*, 2004





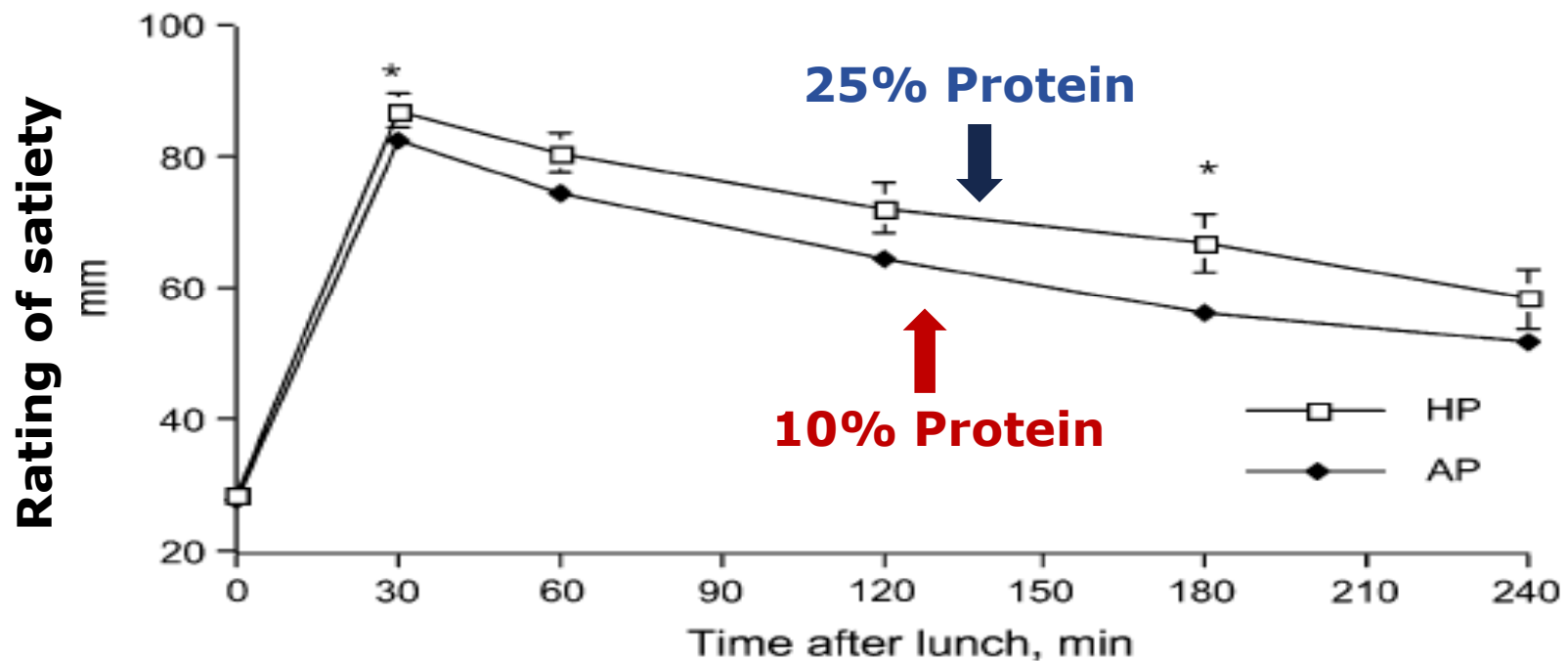
Protein Can Increase Satiety

- Consuming more protein, such as whey protein, may help people feel fuller longer than carbohydrates or fat.
- IOM Dietary Reference Intakes for Macronutrients:
 - *"A number of short term studies indicate that protein intake exerts a more powerful effect on satiety than either carbohydrate or fat"*

Institute of Medicine 2005, Halton et al, JACN, 2005

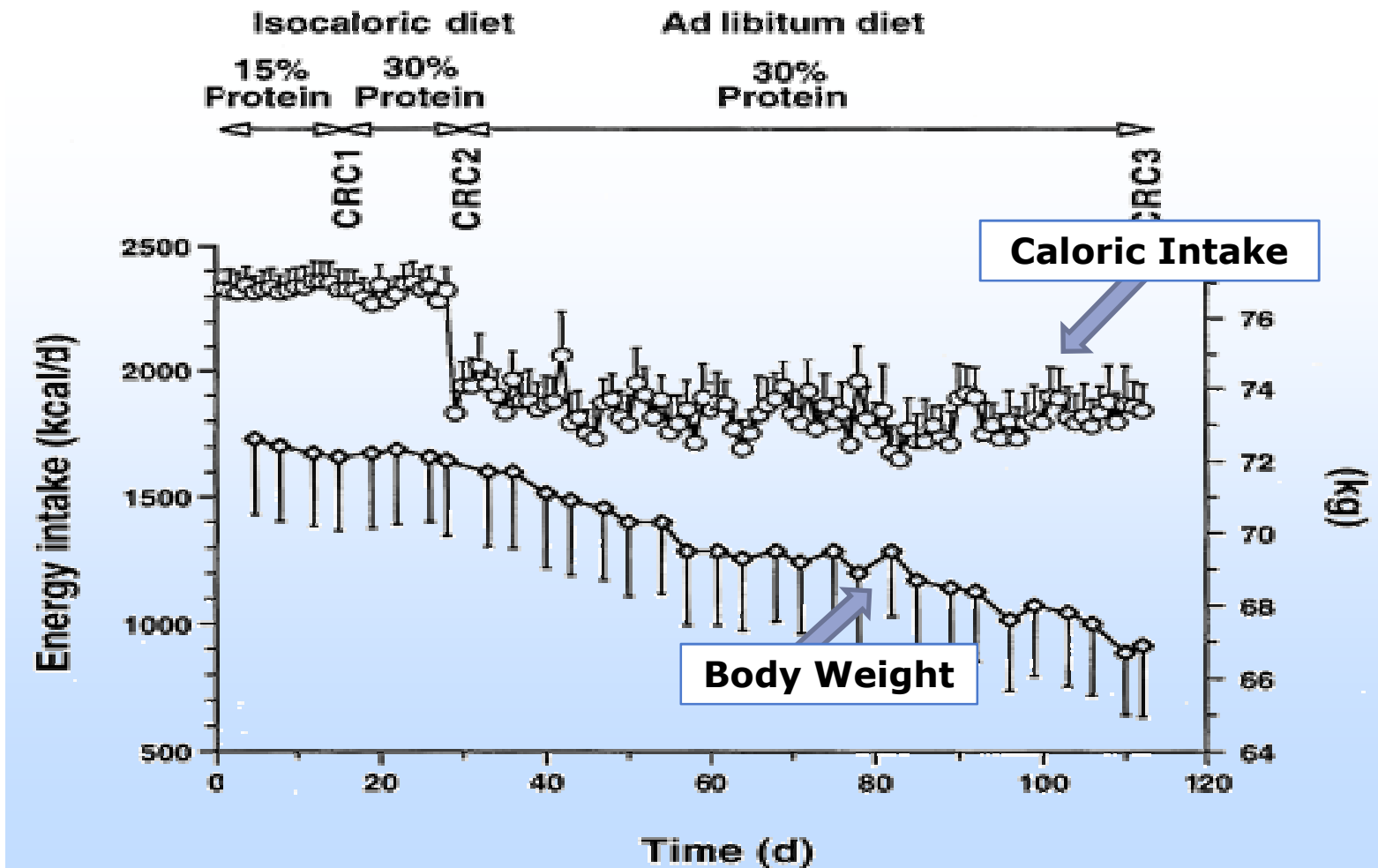


Higher Protein Meals: Increase Fullness and Reduce Desire to Eat



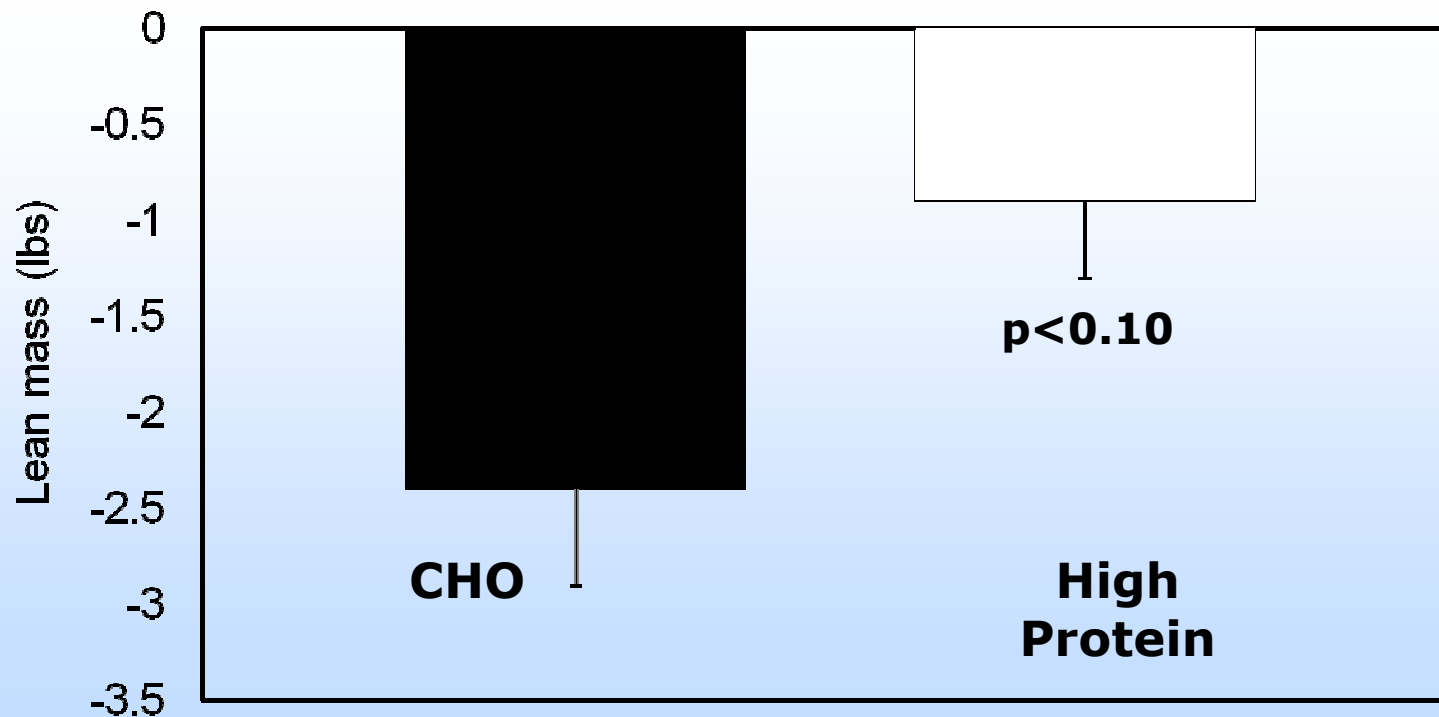
Smeets et al., *J Nutr*, 2008

A High Protein Diet Decreased *Ad Libitum* Caloric Intake & Body Weight



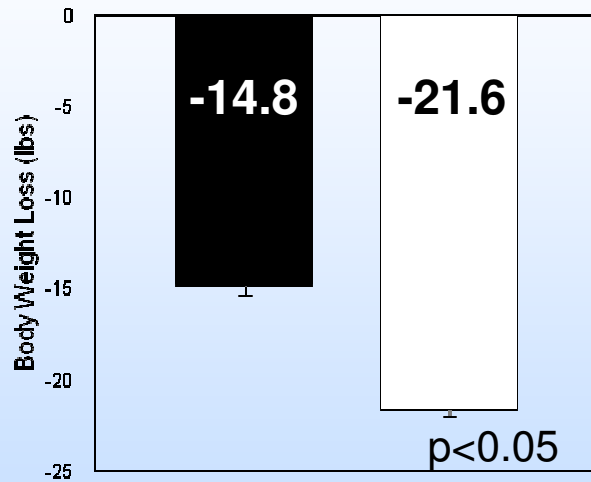
Weigle et al., *AJCN*, 2005

Higher Protein Diets: Preserve Lean Body Mass

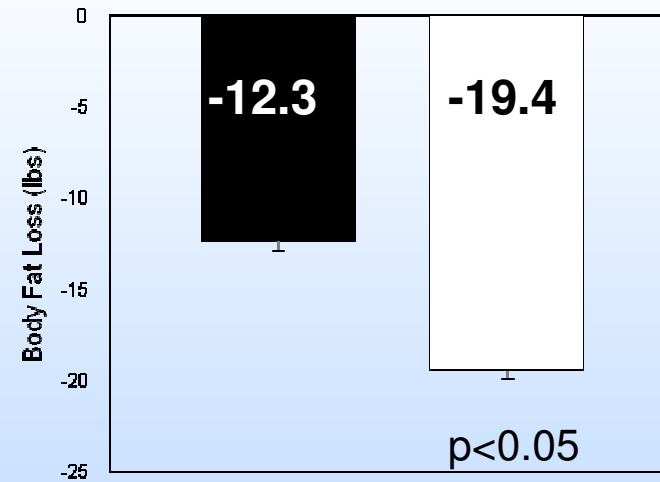


Layman D. J. *Nutr*, 2005

Higher Protein Diets: Increase Body Weight Loss and Fat Loss



CHO **High Protein**



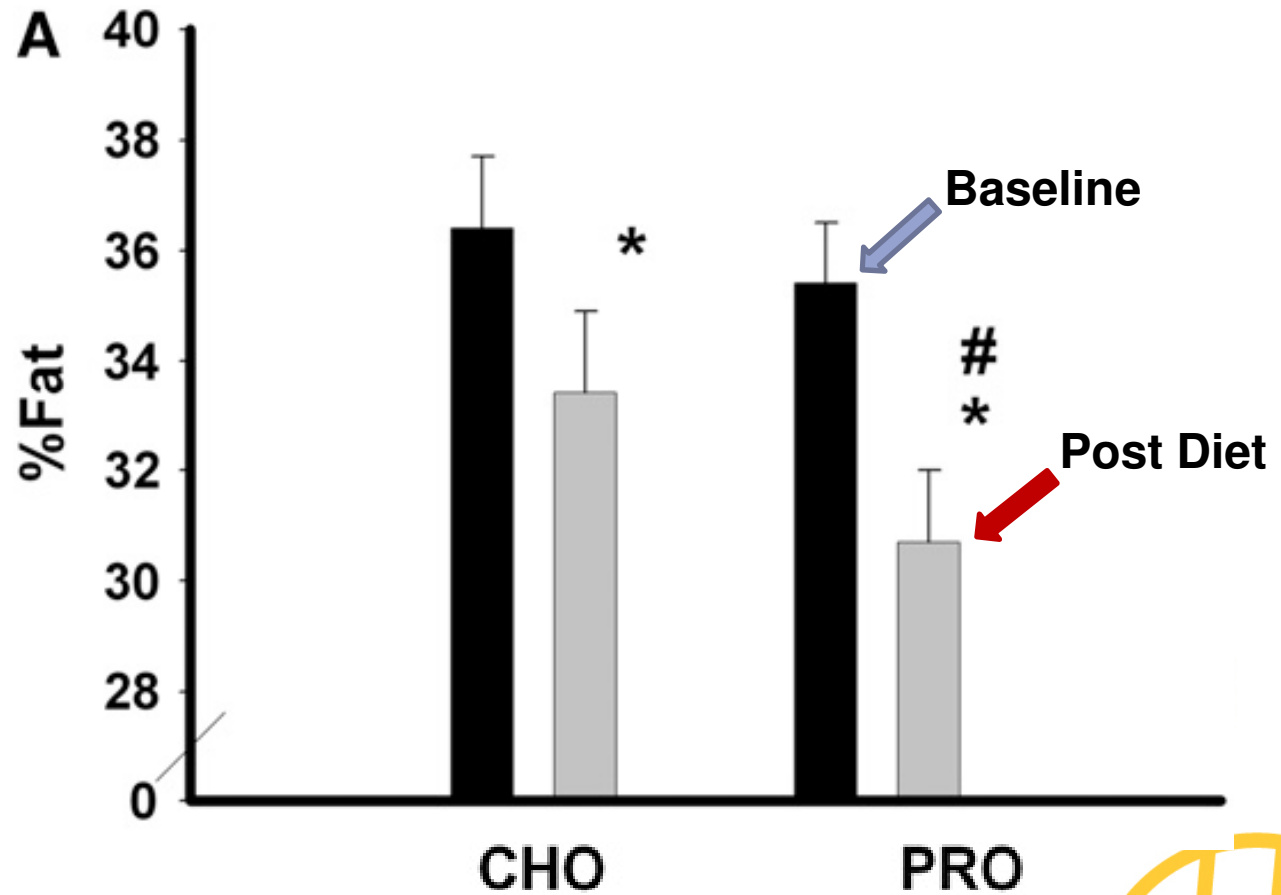
CHO **High Protein**

Layman D. J. *Nutr*, 2005

Higher Protein Diets Boost Body Fat Loss



Subjects who consumed a weight loss diet of 30% protein lost more body fat after one year than those who consumed a diet of 15% protein



Layman D. J. *Nutr*, 2009



Higher Protein Diets Help People Maintain Weight Loss

- Higher protein diets following weight loss result in:
 - less weight regained in subsequent months, and
 - better quality weight gain (i.e. less fat gain).

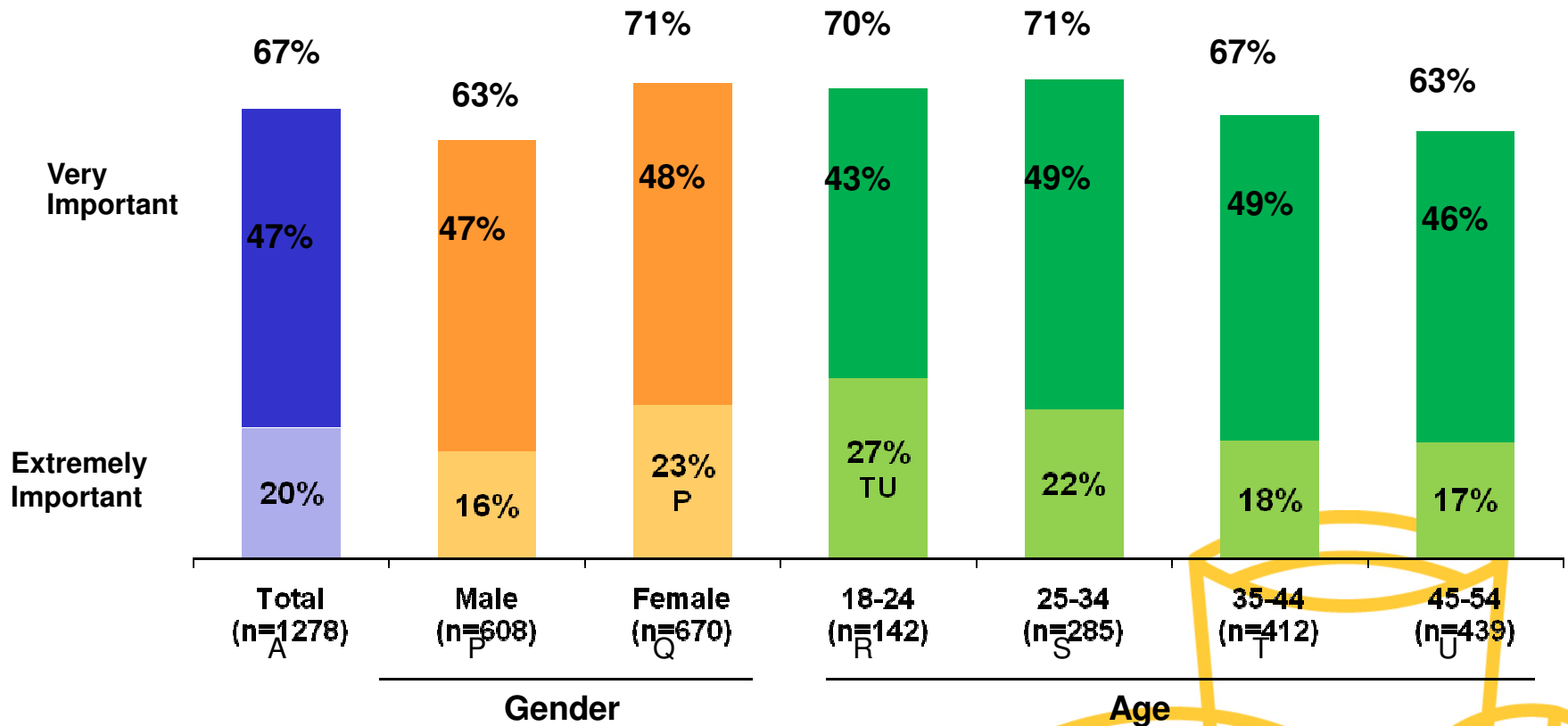
Classens M et al., *Int J Obesity*, 2009; Westerterp- Plantenga et al., *Int J Obes*, 2004; Lejeune et al., *Br J Nutr* 2005



What do consumers think of satiety?



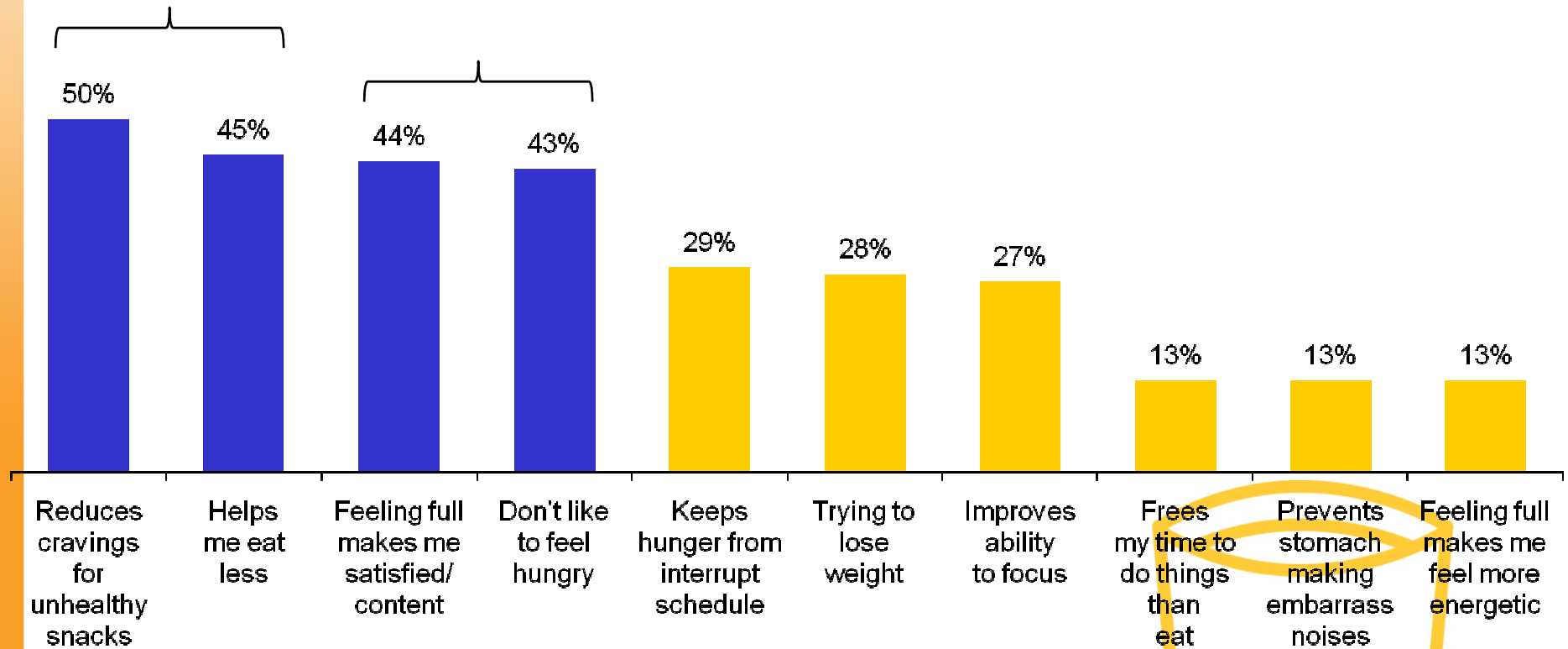
Two thirds of consumers believe that satiety is extremely or somewhat important



Q.3 Satiety is defined as a -feeling of fullness or satisfaction- after you eat or drink something. How important is it to you that a food or beverage make you feel satiated (full or satisfied) after you eat or drink it?

Why It's Important

Two primary themes: avoiding food and feeling good



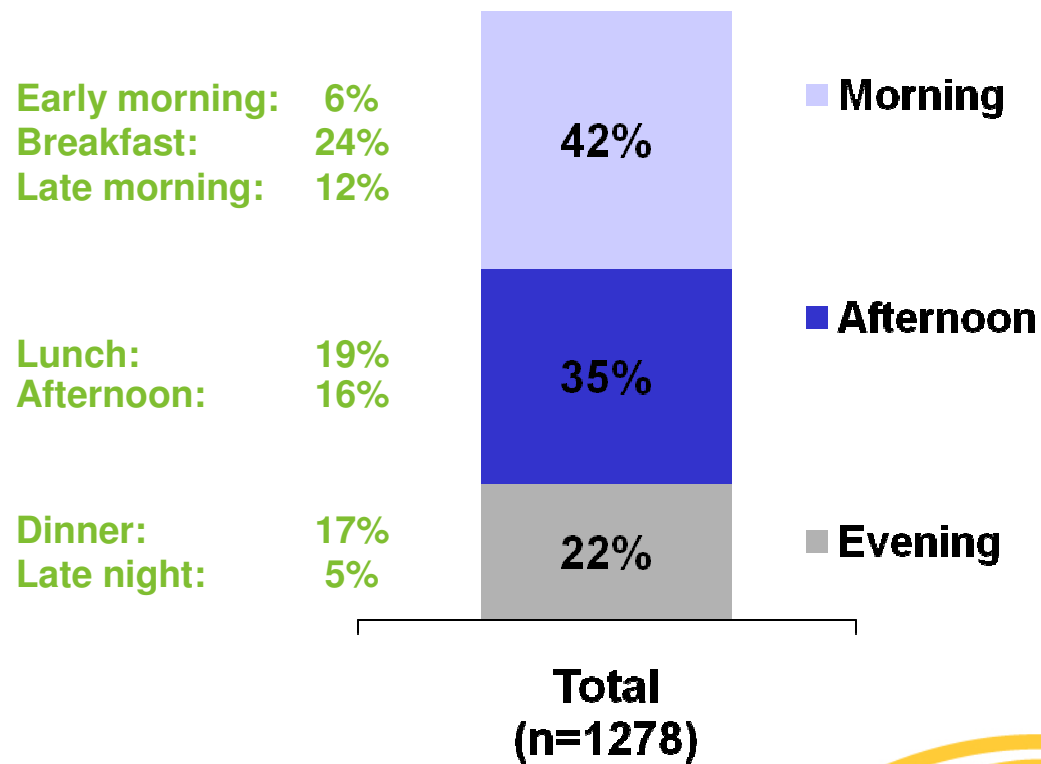
Q.4 Why is satiety (feeling full) important to you?

Base: Those Who Feel Satiety Is Important (n=1221)

When It's Important



Morning is seen as the most important time to eat or drink something satiating



Q.8 At what time of day is it most important for you to eat or drink something that will satiate your hunger?

Base: Total Respondents (n=1278)

Healthy Aging



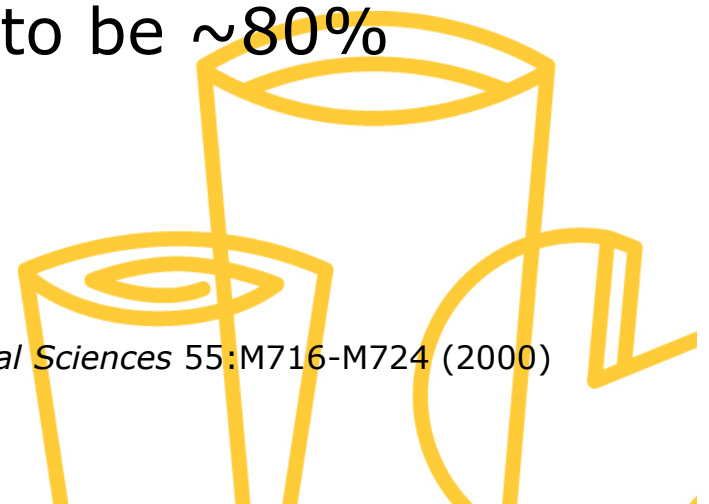
Protein helps maintain muscle mass that naturally declines with aging



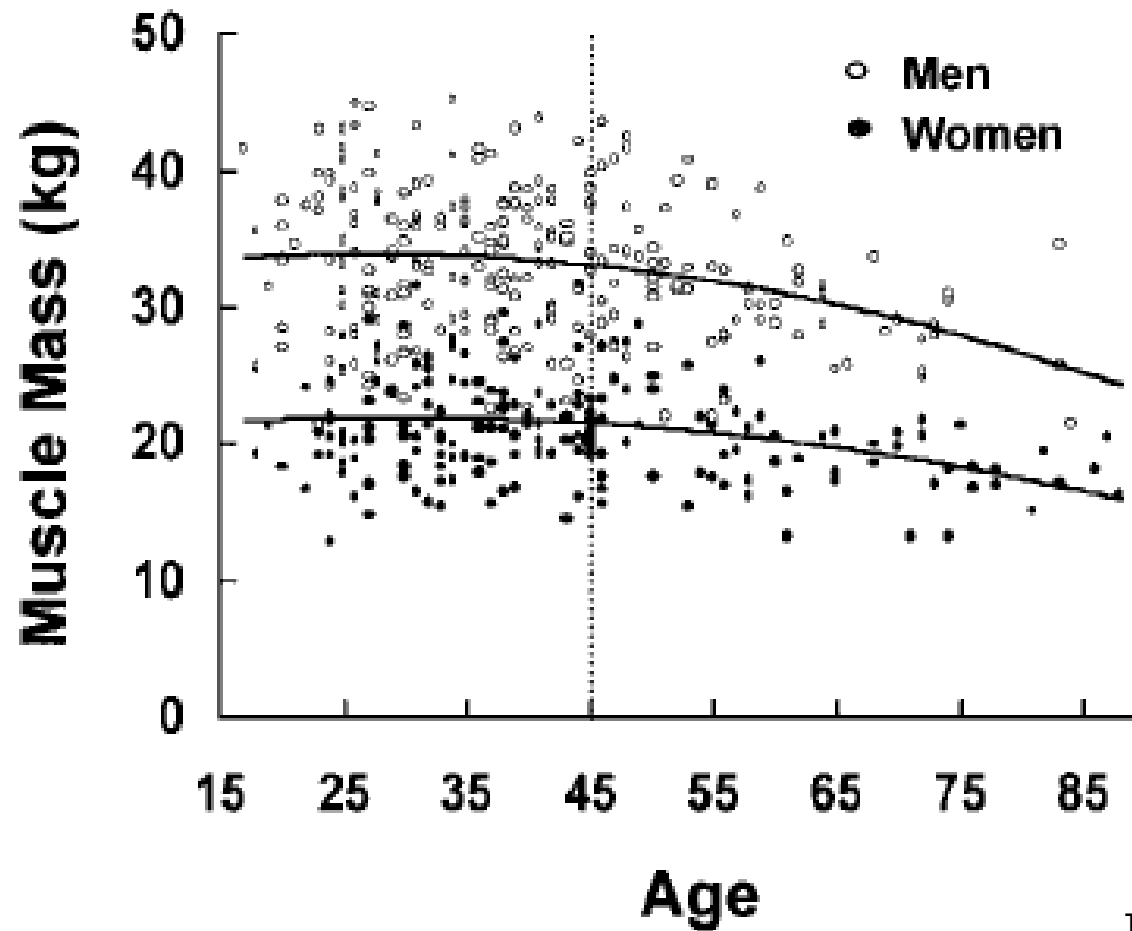
Sarcopenia: A Public Health Concern

- Average loss of muscle mass $\sim 0.5-1\%/yr$ beginning at \sim age 40*
- Estimated to affect 30% of people over 60 years and $> 50\%$ of people over 80 years
- Census Bureau data: by 2025 elderly population in U.S. is expected to be $\sim 80\%$ greater than number in 2000

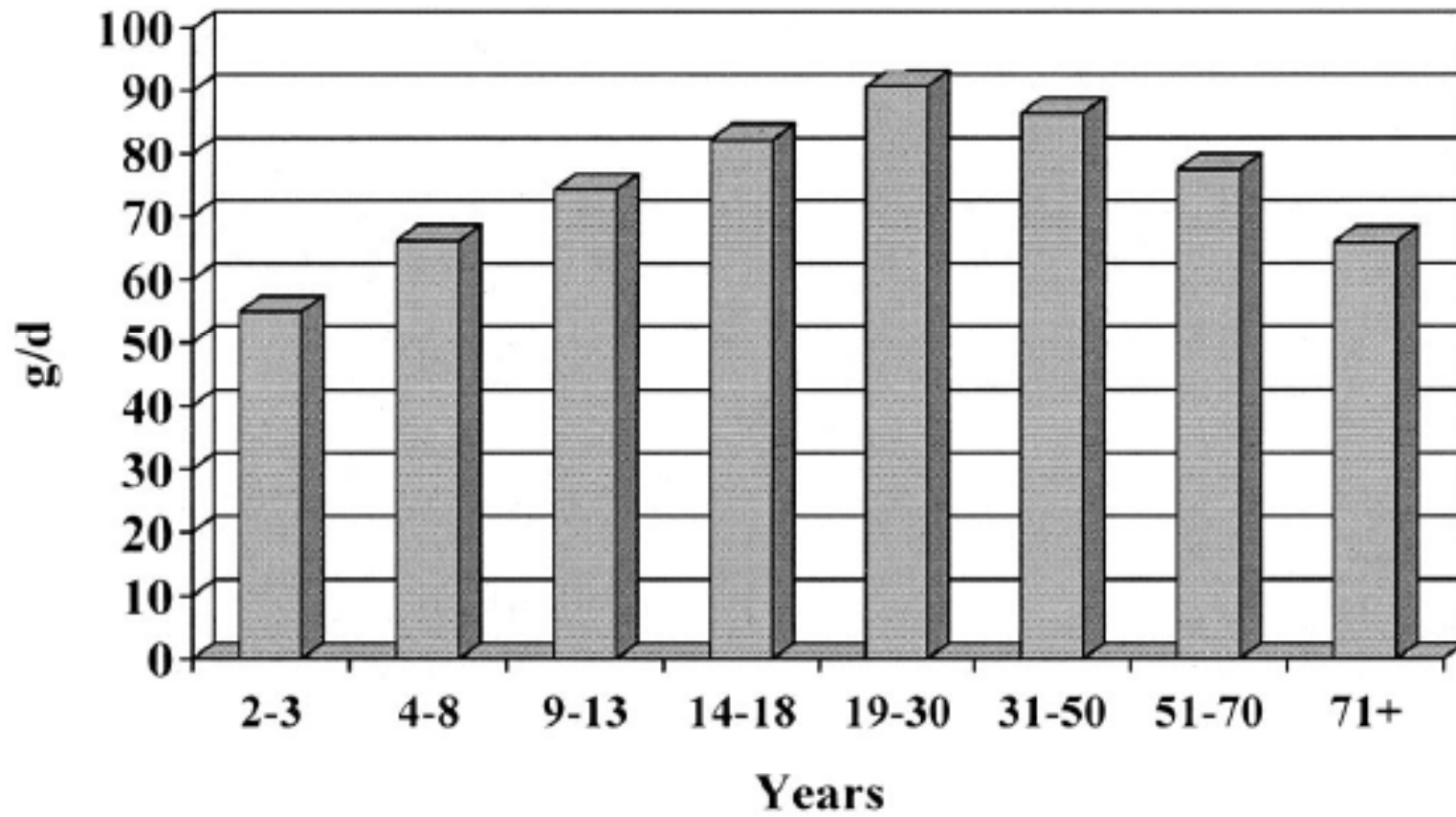
**The Journals of Gerontology Series A: Biological Sciences and Medical Sciences 55:M716-M724 (2000)*



Muscle Mass Declines With Age



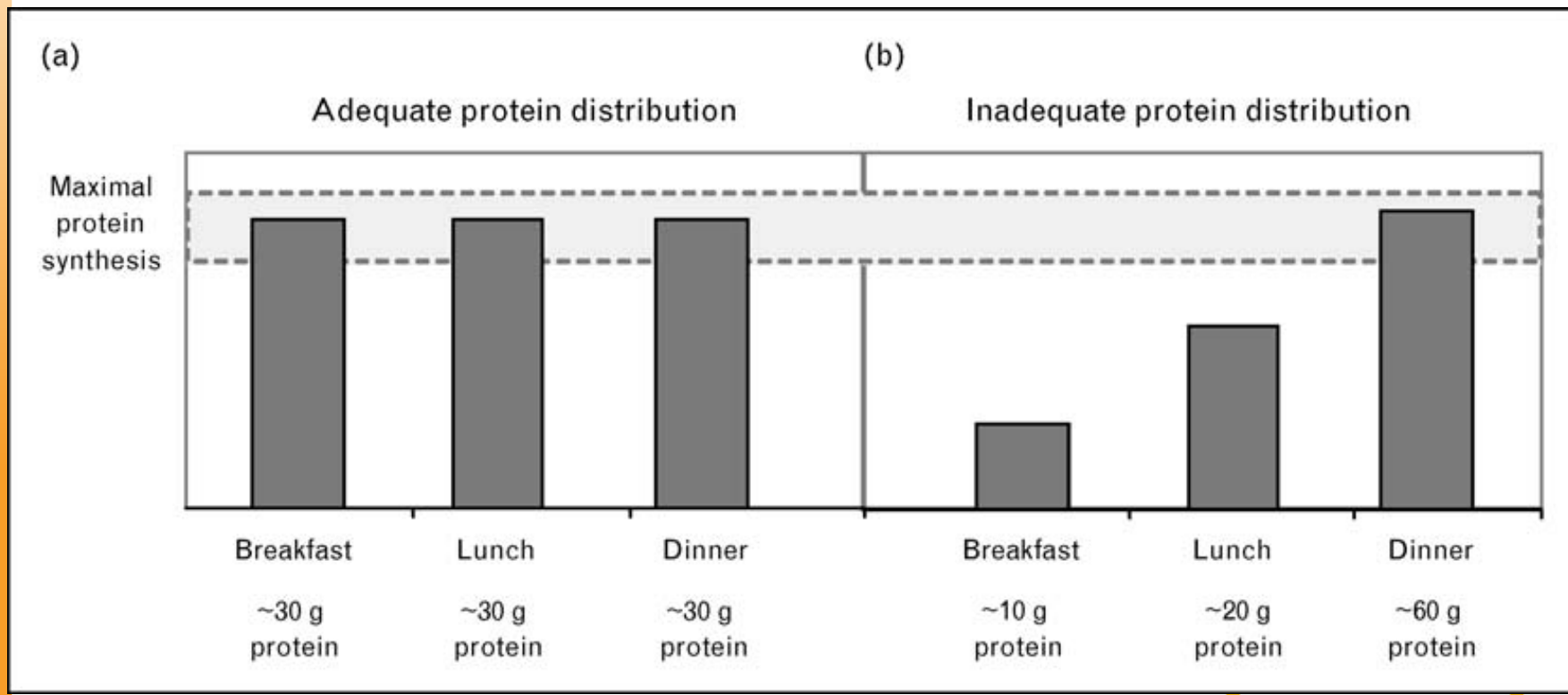
Janssen, JAP, 2000



Fulgoni, AJCN, 2008



The Importance of Adequate Protein Throughout the Day for Older Adults



Paddon-Jones, *Curr Op in Clin Met Care*, 2009

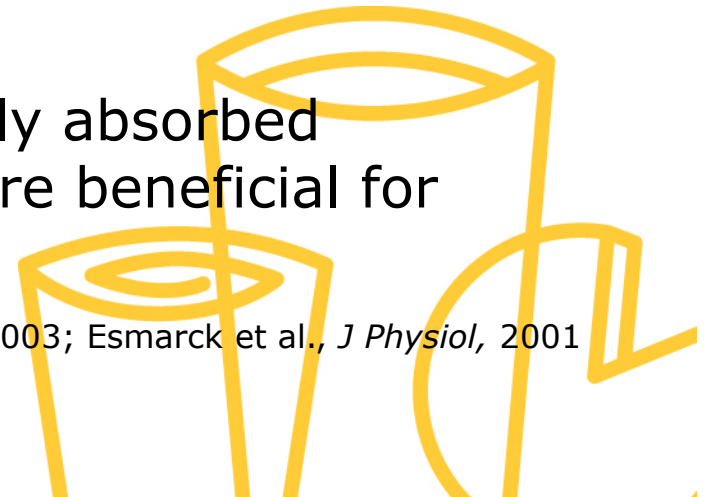




Whey Protein Effective For Older Adults

- Protein digestion and whole body protein synthesis were greater following whey protein intake for both young and older adults -- with the effect magnified in older adults.
- Whey protein consumption led to greater gains in body protein than casein in older adults.
- Findings may suggest that a quickly absorbed protein, such as whey, may be more beneficial for older adults.

Dangin et al., *J Phys*, 2003; Esmarck et al., *J Physiol*, 2001



Key Points

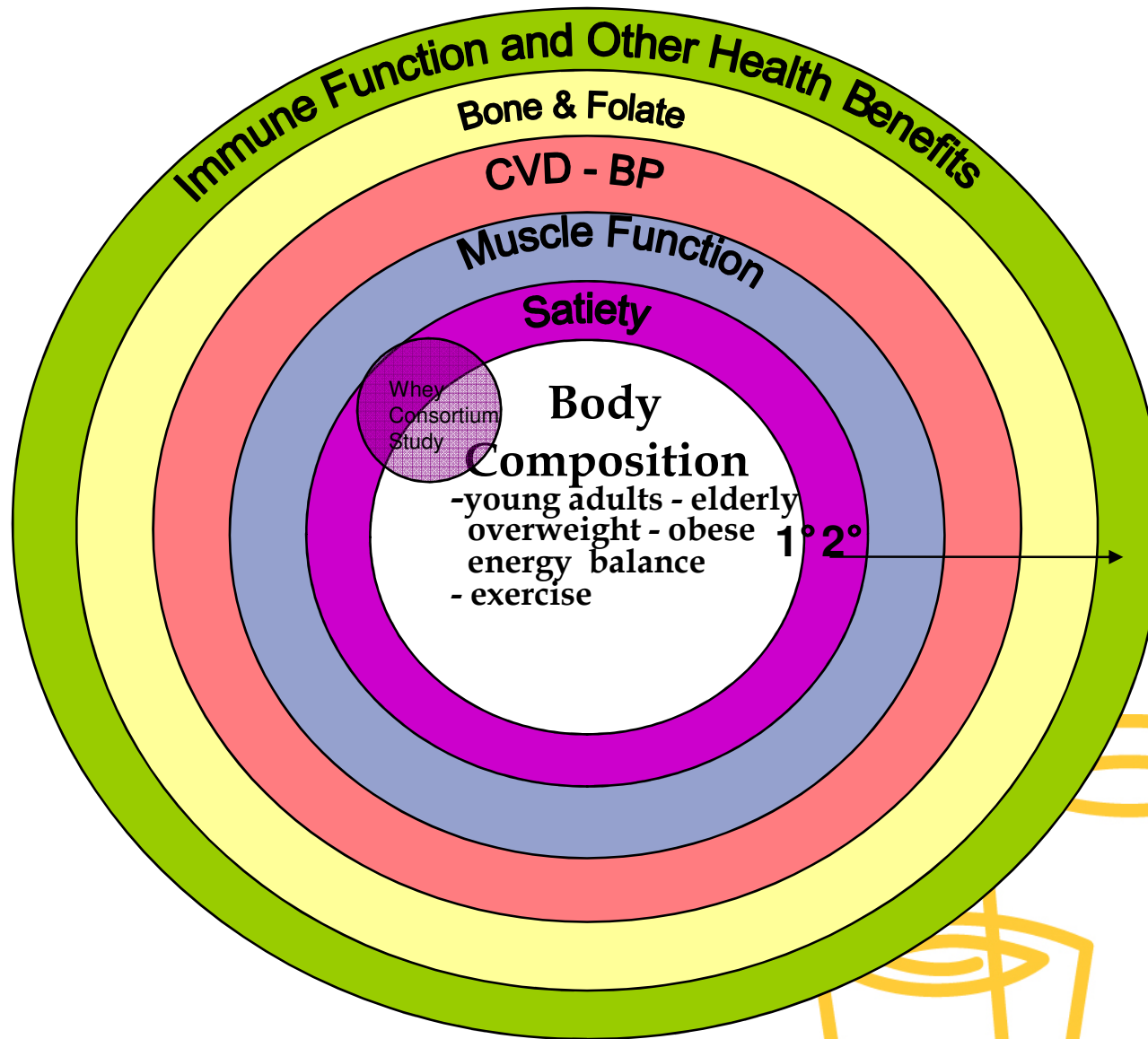


- A higher protein diet may help preserve muscle mass as we age.
- Consuming 25-30 grams of high-quality protein at each meal is important to maximize muscle protein synthesis in older adults, which may help prevent or slow muscle loss associated with aging.
- Whey protein is a good source of protein for the elderly because it is a high-quality protein that is easy to add to the diet.

Paddon Jones et al, *AJCN*, 2008; Houston et al, *AJCN*, 2008, Paddon Jones, *Curr Op in Clin Nut Met Care*, 2009



Nutrition Whey Research Program Initiatives



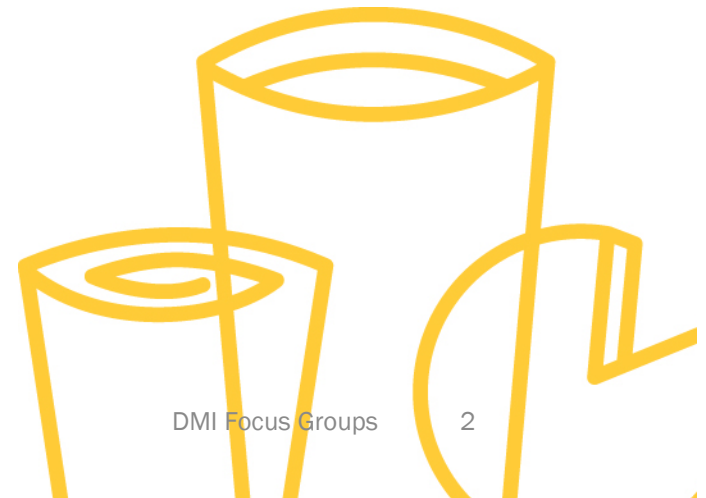
Yet what do consumers really know?



Consumers are favorable to protein but admit they have more to learn about this nutrient

They currently:

- Know it's an essential part of their diet
- Associate it most frequently with meat, energy, and muscles
- Use external cues to gauge its importance

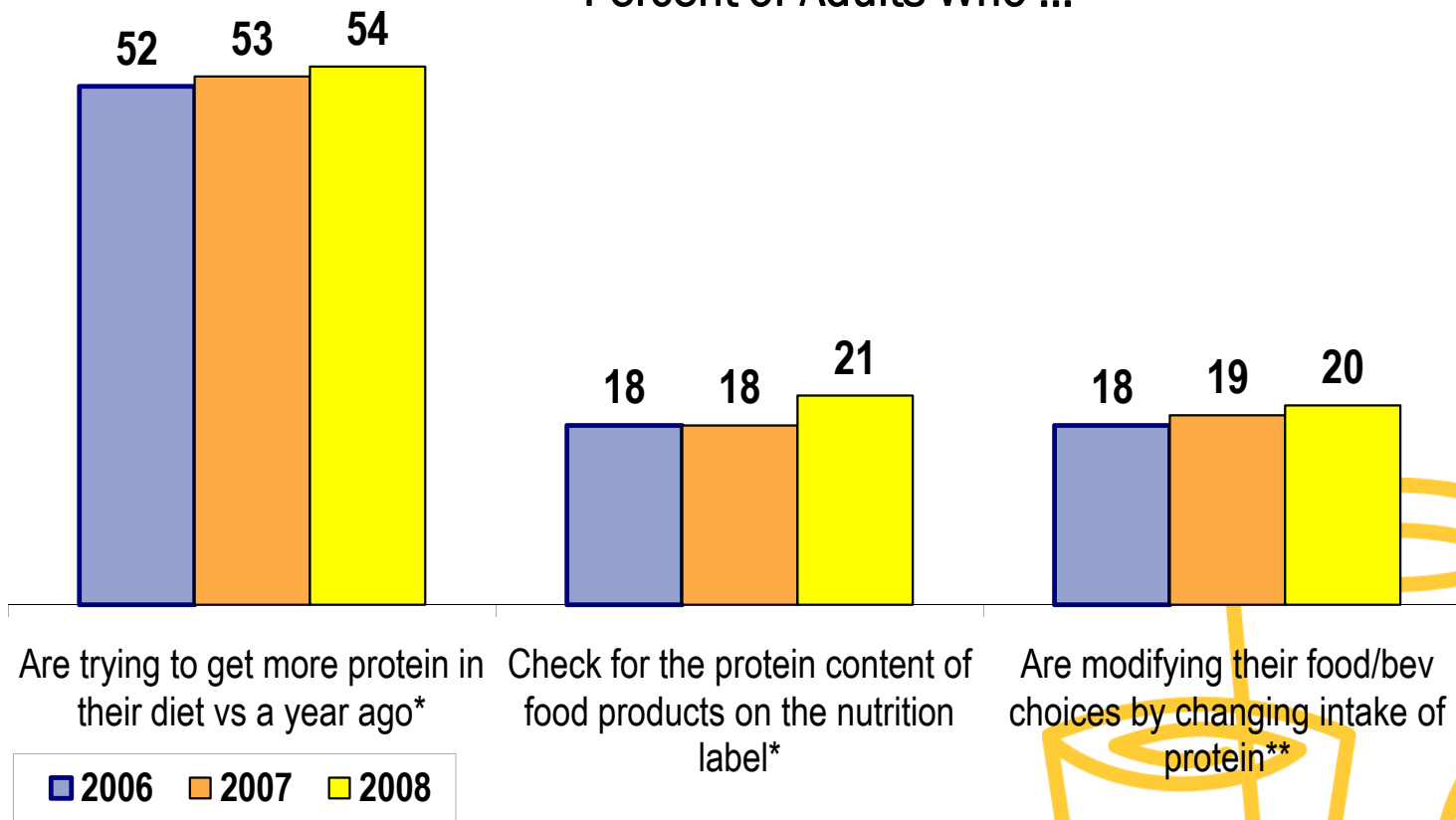


Involvement with Protein



The % of consumers who are actively looking for protein is trending upwards

Percent of Adults Who ...



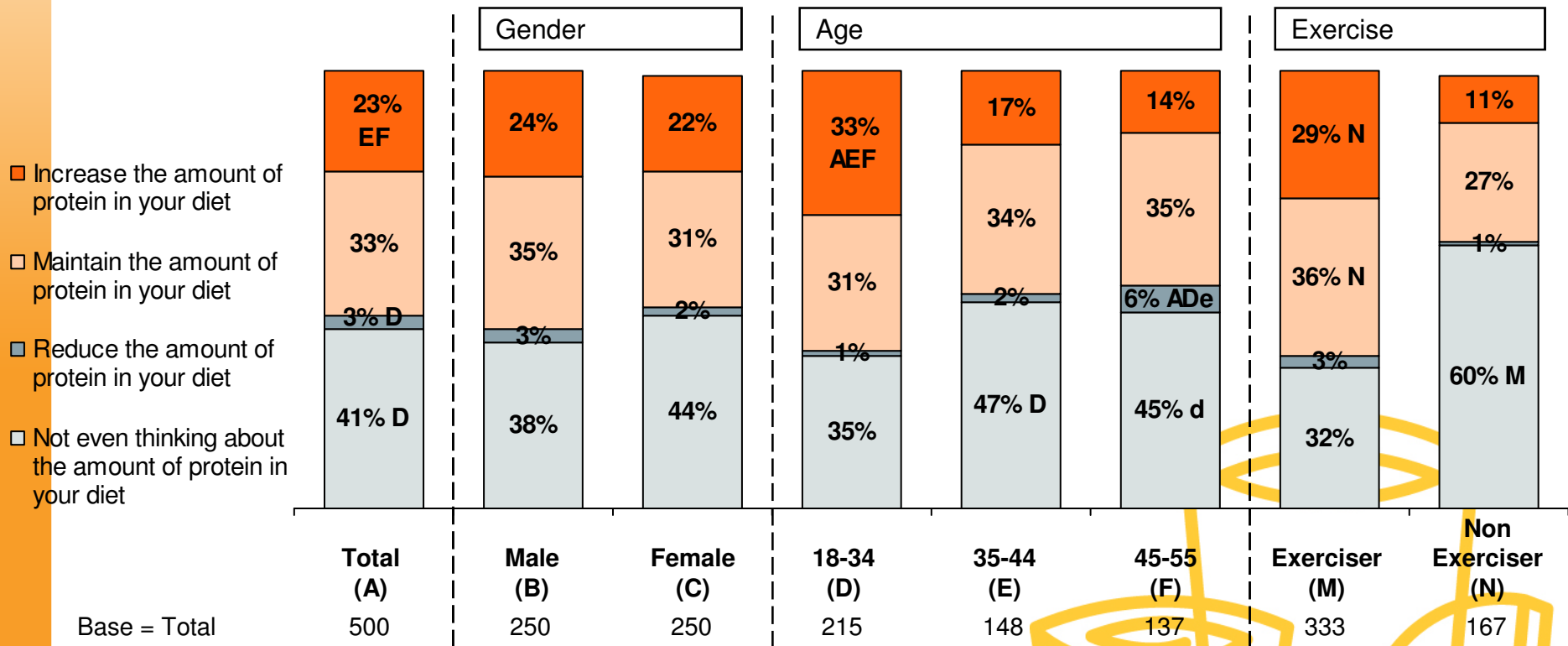
*The NPD Group's Dieting Monitor Service '07

**The NPD Group's NET Service '07

Who's Most Involved?



Younger adults and exercisers are most likely to be increasing the amount of protein in their diets



Q8.0 Which of the following best describes you? Are you trying to...



Female Consumer Testing Objective

- To understand and refine whey protein messages that encourage young, active women to use whey protein in support of their muscle-related health and body image goals.



Study Methodology



- Three online bulletin board focus groups
 - 15 participants/group (total of 45 women)
 - Data collected Feb 10-12, 2009
- Participants Qualifications
 - Female, ages 18-29
 - Exercise 2x per week or more at a gym
 - Do more than just aerobics (including strength training)
 - Self-focused
 - Consume dairy products





Benefit Statement Appeal

<i>Benefit Statement</i>	<i>Score</i>
Body Toning	97
Long Term Health	99
Athletics and Fitness	151
Increased Metabolism	159
Increased Strength	172

- Respondents asked to rank in order from most appealing to least (**lower number is better**).
- Body Toning and Long Term Health clearly the most appealing.





Body Toning Statements

Most Appealing

- Achieve muscle definition, not bulk
- Tone up or firm up problem areas
- Look healthy and in shape
- Have your shape be defined by muscle, not fat

Less Appealing

- Achieve a shapely, hourglass figure
- Keep your body looking proportionate

Insights:

- Body Toning is a benefit most women can relate to.
- Often, appearance and quality of their shape are more important than actual weight.
- Women want to 'look their best', 'toned', 'in shape', 'firm' and 'healthy.'
- Key area for toning are arms and abs.



Long Term Health Statements



Most Appealing

- Avoid specific health problems
- Achieve a healthy lifestyle (i.e. feeling good and eating well)
- Reduce stress

Less Appealing

- Achieve long term independence

Insights:

- Most women find little to disagree with here, but some admit being less concerned about them at a young age.
- 'Reduce stress' received the most positive response
- When probed, women see Long Term Health as being able to stay active, healthy, independent and happy leading to a richer, higher quality of life.





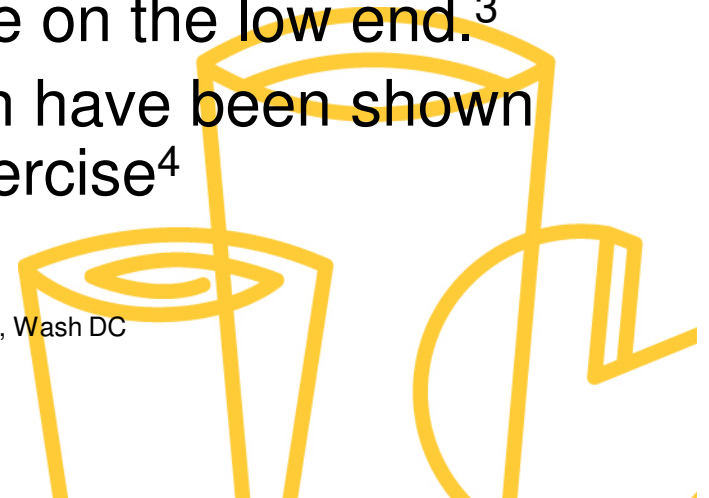
Women and Protein

- Most women believe there is a clear, direct link between consuming high quality protein and the benefit areas tested.
- On average women get about 14% of their daily calories from protein.²
- Protein recommendations in general are based on body weight and activity level and should total 10-35% of daily calorie intake, so women are on the low end.³
- As little as 10 grams of whey protein have been shown to promote muscle benefits after exercise⁴

2. Fulgoni VL 3rd, Am J Clin Nutr, 87(5):1554S-1557S, 2008

3. Institute of Medicine, 2005, Dietary Reference Intakes, National Academies Press, Wash DC

4. Tang et al., Appl Physiol Nutr Metab, 2007



Where To Find Whey Protein



How-To Resources



The Power of WHEY PROTEIN Naturally Found in Dairy

Whey Protein: FOR active Women

What is whey protein?
Whey protein is a complete, high-quality protein naturally found in dairy, and it's a natural source of the essential amino acids, or "building blocks," the body needs.

Why is whey protein smart for women?

- **Get Lean:** Whey protein is an excellent workout partner and when consumed as part of a resistance training program, it can help you meet your goals for more lean muscle.
- **Curb Hunger:** Research shows that calorie-for-calorie, whey protein can increase the feeling of fullness more than starches or fat.* When you are not hungry, you are more apt to reach for a snack. Adding whey protein to your diet is an easy way to get more protein.
- **Future Workouts:** Muscle protein breakdown is a tough workout and along with glycogen, which is your body's energy source, needs to be renewed after a workout. Consuming whey protein and carbohydrates after your workout can help replenish glycogen and help you get the most out of your next workout.**

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WHEY PROTEIN

Whey Protein and Your Post-Workout Nutrition Recovery

It's what you eat AFTER a WORKOUT is important to boost the benefits of your daily exercise routine. Incorporating whey protein into your post-workout "recovery nutrition" plan can help keep you on track.

WHEY PROTEIN TO PROTECT AND BUILD UP: After exercise, muscle protein breakdown is at its peak. Whey protein is a high-quality, complete protein that provides all the essential amino acids that your body needs to rebuild muscle. Consuming whey protein after exercise may reduce muscle soreness and help you recover faster.

PROTEIN WISELY: Not all proteins are equal – quality matters. Whey protein is a high-quality, complete protein that provides all the essential amino acids that your body needs to rebuild muscle. Consuming whey protein after exercise may reduce muscle soreness and help you recover faster.

ADD WHEY PROTEIN TO YOUR DIET: Whey protein is widely available – it's in a variety of products. Check the ingredient label for specific information about whey protein content.

For more information, visit us at:
www.nationaldairyCouncil.org

The Power of WHEY PROTEIN Naturally Found in Dairy

Where's The Whey Protein?

Whey protein is a high-quality, complete protein that is naturally found in dairy. It provides protein, which your body needs each day to build and maintain muscle. Eating a higher-protein diet can also help you feel full longer and, along with regular exercise, high-quality protein can help you maintain a healthy weight. In addition, whey protein can help enhance the benefits of exercise* and promote muscle repair after a workout.**

Whey protein is available as a powder and can be found in many foods and beverages such as energy bars, oatmeal, yogurt and flavored water.

Tips for finding whey protein:

- Look for these words on an ingredient label to be sure the product includes whey protein:
 - ✓ whey protein
 - ✓ whey protein isolate
 - ✓ whey protein concentrate
 - ✓ hydrolyzed whey protein
- Look for products that promote "protein" in the front label. Whey protein is often used as a high-quality protein source in products. Check the ingredient label for specific information about whey protein content.

How to spot whey protein on a label:

INGREDIENTS: PROTEIN BLEND (WHEY PROTEIN CONCENTRATE, WHEY PROTEIN ISOLATE, HYDROLYZED WHEY PROTEIN), SOY PROTEIN ISOLATE, MILK CHOCOLATE FLAVORED COATING (SUGAR, PALM KERNEL OIL, NONFAT DRY MILK SOLIDS, COCOA POWDER, SOY LECITHIN, SALT, NATURAL FLAVOR), INULIN (CHICORY EXTRACT), VEGETABLE GLYCERIN, PEANUTS, CARAMEL (CORN SYRUP, SUGAR, NONFAT MILK, FRACTIONATED PALM KERNEL OIL, CREAM, MILK PROTEIN, NATURAL FLAVOR)...

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WHEY PROTEIN

Whey Protein and Satiety

Whey protein, as part of a higher protein diet, may help increase satiety*, or the feeling of fullness, which can help curb snacking or over-eating.

In fact, a recent survey by Dairy Management Inc.™ found that two-thirds of consumers said it was extremely or very important that a food or beverage makes them feel satisfied†. Consumers say that a feeling of fullness reduces their cravings for snacks, helps them eat less, and makes them feel more satisfied and content. In the same study, two-thirds of consumers agreed that feeling full is important if you're trying to lose weight and that if you feel hungry, you can't be at your best. Satiety benefits were especially important to people who exercise.

Research shows that calorie-for-calorie, consuming more protein can increase the feeling of fullness more than carbohydrates or fat†, and diets high in protein have been shown to help people eat fewer calories.**

How Can I Increase My Protein Intake?

Whey protein, a natural dairy protein low in fat, is a convenient way of adding more high-quality protein to your diet. Why protein?

- Is a complete protein, containing all of the essential amino acids ("building blocks") your body needs.
- Is one of the best sources of branched-chain amino acids (BCAA), especially leucine, which has been shown to help increase muscle protein.†
- Helps increase protein synthesis, which can help our bodies function properly.

A simple way to increase protein intake is by enjoying snacks and other foods with whey protein as part of a healthy, active lifestyle. Try:

- Grabbing an energy or meal bar that contains whey protein
- Drinking beverages with whey protein
- Dropping a scoop of whey protein powder into your milk, yogurt, cereal, or smoothies for an added boost

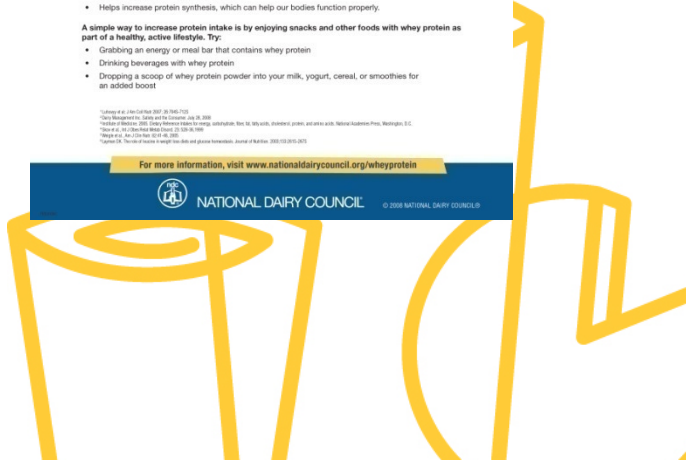
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The 'Whey' to a Higher Protein Diet:

Using Whey Protein to Help Fuel Your Active Lifestyle

NATIONAL DAIRY COUNCIL

www.nationaldairyCouncil.org
www.wheyforyou.com





Thank You!

mhiggins@usdec.org

