Canadian Academy of Sports Nutrition

Let's Excel Together

Lecture 14:

Protein Powders

Part 1

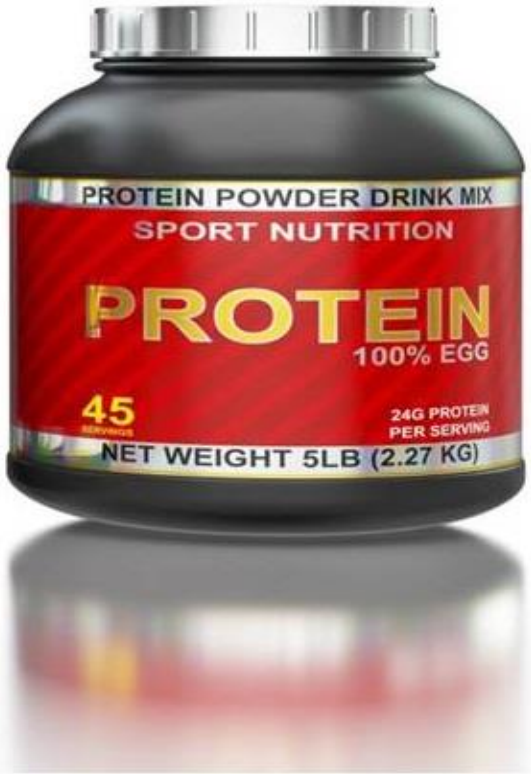
Copyright Protection:

Sports Powders:

- Protein Powders.
- Meal Replacements.
- Weight Gainers.

Protein Powders:

- Whey protein.
- Casein protein.
- Soy protein.



Protein Powders:

- As a sports nutrition advisor, you would need to know 3 things about each protein powder:

- 1) Indications.
- 2) Contraindications.
- 3) Interactions.

Whey Protein:

- **Whey is the most popular protein powder consumed in the world of sports and fitness.**

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- **Whey is the white – yellowish liquid part of milk after removing casein protein during the process of making cheese.**

- **It is the watery portion of milk separated from curds. In fact, it is a by – product of cheese production.**

Constituents:

- Whey protein is the second common protein in cow`s milk (20% whey compared to 80% casein).

The protein fractions of whey include:

- Beta – Lactoglobulin (55 - 60%).
- Alpha – Lactalbumin (15 - 20%).
- Glycomacropeptide (10 – 20%).
- Bovine Serum Albumin (3 – 7%).
- Immunoglobulins (3 – 4%).
- Lactoferrin (1%).
- Lactoperoxidase (1%).

Amino Acid Compositions of Whey, Casein, Soy, and Egg Proteins (% per 100 grams):

Amino acids	Whey	Casein	Soy	Egg
Alanine	4.6	2.7	3.8	5.5
Arginine	2.3	3.7	6.7	5.9
Aspartic acid	9.6	6.4	10.2	10
Cysteine	2.8	0.3	1.1	2.3
Glutamic acid	15	20.2	16.8	13
Glycine	1.5	2.4	3.7	3.3
Histidine	1.6	2.8	2.3	2.3
Isoleucine	4.5	5.5	4.3	5.3
Leucine	11.6	8.3	7.2	8.4
Lysine	9.1	7.4	5.5	7.1
Methionine	2.2	2.5	1.1	3.0
Phenylalanine	3.1	4.5	4.6	5.2
Proline	4.4	10.2	4.5	3.9
Serine	3.3	5.7	4.6	7.3
Threonine	4.3	4.4	3.3	4.7
Tryptophan	2.3	1.1	1.1	1.1
Tyrosine	3.3	5.7	3.3	4.0
Valine	4.5	7.6	4.5	6.0

Digestibility:

- **Whey protein is easily dissolved in water, making it convenient mix with any drinks without excessive clumping. It is digested rapidly.**

- **Whey protein leaves the stomach much faster than casein and soy, leading to a rapid but short – term spike in amino acid pools of the body, which makes it the preferred protein for muscle recovery after exercise.**

- **This is why whey protein is sometimes called "fast protein".**

Advantages of Whey Protein:

- 1) It is a fast protein.
- 2) It has the highest biologic value, making it an excellent protein for building muscles and boosting body metabolism.
- 3) Whey protein provides higher amounts of leucine, the most important BCAAs (branched – chain amino acids) used by the body during exercise, calorie restriction, trauma, and infections

Types of Whey Proteins:

There are four types of whey proteins:

- **Isolate.**
- **Concentrate.**
- **Hydrolysate.**
- **Blend.**

Whey proteins isolate and blend are the most commonly consumed forms.

Whey Isolate:

- Contains a trace amount of fat.
- Has a small amount of carbohydrate.
- Is less allergenic.
- Has a fast absorption.

Whey Concentrate:

- Has small amounts of fat.
- Has more carbohydrates than whey isolate.
- Is more allergenic than isolate.
- Has lower rate of absorption compared to whey isolate.

Whey Hydrolysate:

- Is a predigested form.
- Has slightly bitter taste.
- Is the least allergenic form.

Whey Protein Blend:

It is a mixture of two or three other forms of whey.

Indications of Whey Protein:

Athletic Indications:

- To increase muscle mass.
- For post – exercise recovery.
- To prevent from overtraining syndrome.
- To boost body metabolism.

Non – Athletic Indications:

- **Weight management.**
- **Muscle wasting diseases.**
- **Compromised immune system.**
- **End stages of cancers.**
- **Vegetarians.**
- **Any catabolic states, such as severe burns, surgery, and infections.**

How to Take Whey Protein:

- **Due to versatility of whey protein, it is usually added to varieties of foods and beverages.**

- **You may incorporate whey protein into your diet as a supplement especially if you are not getting enough protein from your foods.**

- **Whey protein is available with or without flavors.**

- **It is a personal preference to choose any of them. You can mix your whey protein with water, milk, or any other drinks, or even you could make a smoothie with it.**

Athletes and Gym – Goers:

- upon waking up in the morning.
- within 30 minutes after exercise or competition.

Non – Athletic Persons:

- as snacks.
- along with your meals.

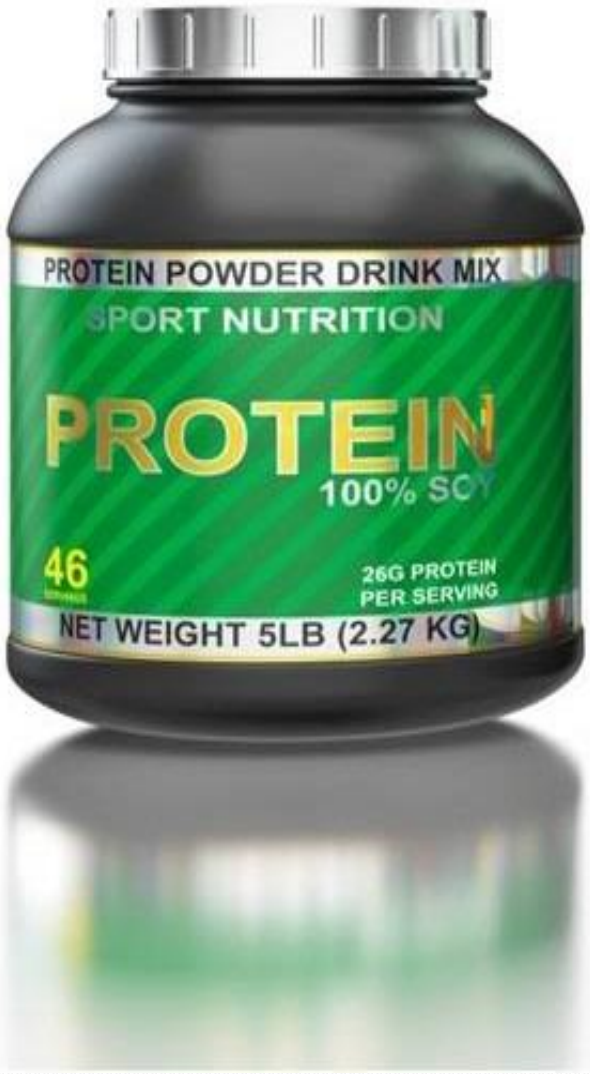
For providing "*the right amount of protein*" to your body, try to rely on your foods.

How to Choose Whey Protein:

- **When purchasing whey protein, we strongly recommend you pay attention carefully to the following points:**

- **1) Long – term consumption of whey protein may deplete calcium from the body. Choose a whey powder with calcium in it. The amount of calcium in whey powders should be 10 – 20% of daily value.**

- **2) For better digestion and absorption, choose a whey powder that contains digestive enzymes.**



- **3) Choose a whey powder without benzoyl peroxide .**

- **The increasing demand and usage of whey protein as an ingredient require removing its color and flavor. For this purpose, whey bleaching agents are used.**

- They are benzoyl peroxide (BP) and hydrogen peroxide (HP). In other words, these agents are used to bleach liquid whey before drying it out into powder.

- BP is more effective in removing the color of whey. However, it breaks down to benzoic acid (BA), which may be found in a trace amount in bleached whey powder.

Interactions of Whey Protein:

- 1) **Bisphosphonates:** these medications are used to increase bone density in Osteoporosis. Whey protein may decrease their absorption and effectiveness.

- They should be taken minimum 2 hours apart.

- **These medications are:**
- **- Alendronate.**
- **- Etidronate.**
- **- Pamidronate.**
- **- Residronate.**
- **- Tiludronate.**
- **- Zoledronic acid.**

- **2) Levodopa: this medication is used to treat Parkinson`s disease. Whey protein may decrease the absorption and effectiveness of Levodopa.**

- **They should not be taken at the same time!**

- **3) Antibiotics: whey protein may interact with the following antibiotics and slow down their absorption:**

- **- Quinolones: ciprofloxacin, enoxacin, gemifloxacin, grepafloxacin, norfloxacin, ofloxacicn, and trovafloxacin.**

- **- Tetracyclines: demeclocycline, doxycycline, minocycline, and tetracycline.**

Extreme Cautions:

- 1) Liver diseases.
- 2) Kidney diseases.
- 3) Chronic pancreatitis.
- 4) Hartnup syndrome.
- 5) Cystinuria.
- 6) Along with corticosteroids.

Contraindications:

- 1) Acute renal failure.
- 2) Hepatic encephalopathy.
- 3) Diabetic nephropathy.
- 4) Rhabdomyolysis (post – trauma/exercise myoglobinuria).

Side Effects of Whey Protein:

- **In general, whey protein is considered safe. However, nothing is risk free. The side effects are minimal.**

- **If you are an occasional consumer of whey protein, you may not experience any unwanted effects.**

- **If you are a regular and heavy consumer of whey protein, you might experience few side effects.**

Short – Term Side Effects:

- a) Allergic reactions.
- b) Nausea.
- c) Bloating.
- d) Abdominal cramps.
- e) Fatigue.
- f) Diarrhea.
- g) Constipation.
- h) Headaches.

Long – Term Side Effects:

- **a) Dehydration.**
- **b) Increased urinary loss of calcium.**
- **c) Increased propensity of developing Osteoporosis.**
- **d) Deterioration of previously existed kidney and liver diseases.**

Homework:

- 1) Describe interactions of whey protein.
- 2) Describe side effects of whey protein.