

## Definition of Terms:

### 1) Whey Proteins

- Proteins from milk that remain soluble at pH 4.6 (acidic conditions).

### 2) Whey Protein components are:

- $\beta$ -lactoglobulin ( $\beta$ -lg)
- $\alpha$ -lactalbumin ( $\alpha$ -la)
- Bovine serum albumin (BSA)
- Immunoglobulins (Ig)
- Glycomacropeptide (GMP)
- Lactoferrin (LF)
- Lactoperoxidase (LP)
- Proteose Peptones (PP)

### 3) WPI

- Whey Protein Isolate

### 4) Ion-Exchange Chromatography

- Isolation of whey proteins using charge affinity.

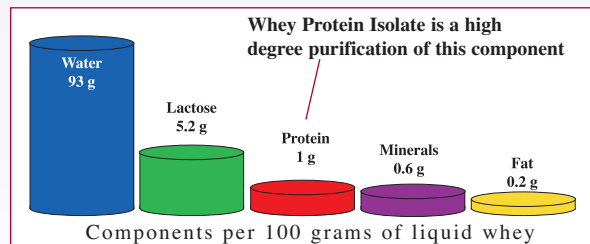
### 5) Microfiltration

- Separation of some non-protein components and concentration of whey proteins based on molecular weight and permeation properties.

### 6) BCAA

- Branched chain amino acids (leucine, isoleucine, valine) are important for muscle growth and repair.

### Composition of Liquid Whey



### Whey Protein Characteristics:

Native (undenatured) whey proteins have good solubility, gelling and whipping properties. Denatured whey proteins lose their solubility and precipitate in solution. Denaturation increases water holding capacity of proteins.

## **BiPRO**<sup>®</sup> Whey Protein Isolate

The Gold Standard Whey Protein Isolate

Davisco's BiPRO is manufactured utilizing a gentle proprietary Ion-Exchange process, resulting in a highly purified and isolated source of undenatured whey proteins.

Typical protein content of BiPRO is 97-98% on a dry basis.

### Composition of BiPRO:

- Excellent source of essential amino acids and branched chain amino acids (20-23g per 100g of protein)
- High metabolic efficiency:
  - Biological value (BV) of 100
  - Protein digestibility-corrected amino acid score (PDCAAS) of 1.0
- Low non-protein nitrogen components, negligible amounts of fat and lactose

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# The Facts About Ion-Exchange Whey Protein Isolate

## Frequently Asked Questions



# DAVISCO

FOODS INTERNATIONAL, INC.<sup>®</sup>

[www.leadingthewhey.com](http://www.leadingthewhey.com)

### Question:

#### Are Microfiltered WPIs nutritionally superior to Ion-Exchange WPI?

##### Answer: No

- Davisco's BiPRO (Ion-Exchange WPI) provides 93-95g protein/100g of powder.
  - Other WPIs provide only 89-93g protein
- BiPRO contains only "true" intact proteins.
  - BiPRO has less than 5% non protein nitrogen (NPN)
  - Other WPIs may have up to 20% NPN components

### Question:

#### Is Ion-Exchange WPI more allergenic than Microfiltered WPI?

##### Answer: No

- $\beta$ -lactoglobulin is the main allergenic protein in whey, though all of the whey proteins can be allergenic.
- All WPIs contain large amounts of  $\beta$ -lactoglobulin.
- All WPIs will cause allergenicity regardless of the manufacturing process.
- $\beta$ -lactoglobulin is a nutritionally important protein.
  - Rich source of BCAA

### Question:

#### Do the Ion-Exchange and Microfiltration processes use the same chemicals?

##### Answer: Yes

- Processing aids (acids and alkali) are commonly used in many food manufacturing processes.
- Ion-Exchange is similar to a gentle home water softening system.
- BiPRO can be labeled as a "Natural" ingredient.

### Question:

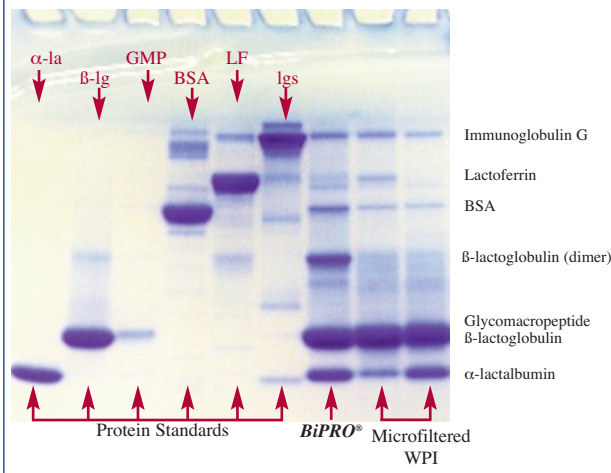
#### Does Ion-Exchange WPI contain lower amounts of Immunoglobulins (Ig) and Lactoferrin (LF) than Microfiltered WPI?

##### Answer: No

- Protein profiles vary by manufacturer.
- BiPRO contains Immunoglobulins (Ig) and Lactoferrin (LF).
  - Igs make up 2-3% of the protein in BiPRO
  - LF constitutes 0.05-0.2% of the protein in BiPRO
- Some microfiltered isolates have lower amounts of Ig and LF than BiPRO.

#### Electrophoretic Patterns of WPIs

Each protein creates a unique pattern in the gel. Whey protein isolates can be compared qualitatively to evaluate the presence of individual proteins.



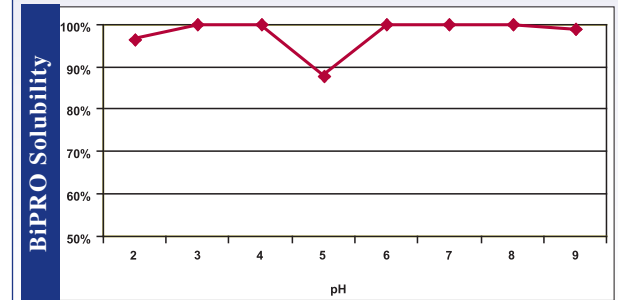
For more information about Ion-Exchange Whey Protein Isolate and Davisco's BiPRO call 1-800-757-7611 or visit our web site at [www.leadingthewhey.com](http://www.leadingthewhey.com)

### Question:

#### Does Ion-Exchange denature whey proteins?

##### Answer: No

- Whey proteins are acid soluble.
- Denatured proteins are acid insoluble.
- BiPRO has high solubility over a wide pH range.
- Testing methods for denaturation are not standardized.



### Question:

#### Is Ion-Exchange WPI lower in GMP than Microfiltered WPI?

##### Answer: Yes

- The biological effects of GMP, such as satiety (suppression of gastric secretions), inhibition of bacterial and viral adhesion, and promotion of bifidobacterial growth require high purity.
- Whey contains 15-20% Glycomacropeptide (GMP), which is a casein derived peptide.
- BiPRO contains less than 1% GMP.
- GMP content of other WPIs is not high enough to provide efficacy.
- Davisco's BioPURE-GMP™ (90% pure) is commercially available to take advantage of the biological activity of GMP.