Agri Articles
(e-Magazine for Agricultural Articles)
Volume: 03, Issue: 06 (NOV-DEC, 2023)
Available online at http://www.agriarticles.com
©Agri Articles, ISSN: 2582-9882

Whey Protein Preparation & Its Utilization

(*Sambhaji T. Zole[1], Sachin N. Waychal[2] and Prajwal D. Kanchan[1])
[1]BSc Agri. Student, College of Agriculture, Bhanashiware
[2]Assistant Professor, College of Agriculture, Bhanashiware
*Corresponding Author's email: sambhuzole@gmail.com

Abstract
A large number of workers have carried out studies on the composition and processing of whey for its use in foods and animal feeds besides studying the nutritive, therapeutic and functional properties of whey. Whey is a liquid by-product obtained during manufacture of coagulated milk products like paneer, cheese etc. Its disposal as waste leads to heavy load in dairy effluent and loss of valuable milk solids.

Introduction
Whey is the liquid fraction that remains following manufacture of cheese, chhana, paneer and casein. Total production 3.0 million tonnes per annum whey proteins, have antimicrobial, antiviral and antioxidant properties. Productions of whey proteins by ultrafiltration, lactose hydrolysis products, and the use of whole whey or whey permeate as a fermentation feedstock are possible options. Whey protein is a popular type of protein supplement derived from milk. It is a complete protein, meaning it contains all nine essential amino acids that the body cannot produce on its own. Whey protein is absorbed quickly by the body, making it an ideal choice for athletes and individuals seeking to enhance their muscle growth and recovery.

Types of Whey Protein
There are three main types of whey protein:
Whey protein concentrate (WPC): This is the most common and affordable type of whey protein. It contains 25-80% protein and may also contain some carbohydrates and fats.
Whey protein isolate (WPI): This is a more refined form of whey protein that contains 90-95% protein. WPI is lower in carbohydrates and fats than WPC.
Whey protein hydrolysate (WPH): This is the most easily digestible form of whey protein. WPH is partially broken down into smaller peptides, making it easier for the body to absorb.
Nutritional Value :{ For 100gm }

Nutrient	Amount
Calories	360
Protein	70gm
Fat	09gm
Carbohydrate	10gm
VitaminB12	10% of the Daily Valve (DV)
Phosphorus	20% of the DV
Calcium	25% of the DV

Utilization of Whey

Whey is a liquid by product of cheese making. It is about 93% water and 7% solids. The solids are mostly lactose (milk sugar) and protein. Whey can be used in a variety of food and non-food products. Whey protein is a complete protein, meaning it contains all nine essential amino acids that the body cannot produce on its own. Whey protein is a popular supplement for athletes and bodybuilders because it helps to build and repair muscle tissue.

Other uses for whey include

Animal feed: Whey is a good source of protein and lactose for animal feed.
Bioplastics: Whey can be used to make bioplastics, which are biodegradable plastics.
Ethanol: Whey can be fermented to produce ethanol, which can be used as a fuel.
Cosmetics: Whey can be used in cosmetics as a moisturizer.

Whey utilization is a growing industry, as companies are finding new and innovative ways to use this valuable by product.

Procedure

Flowchart for Preparation of Whey Protein.

Good quality buffalo milk
⇩
Standardization (Fat: SNF 1: 1.65 using buffalo skim milk)
⇩
Heating (82°C, 5 min)
⇩
Cooling (70°C)
⇩
Addition of coagulant (1% citric acid solution at 70°C).
⇩
Continuous stirring till clear whey separates out Settling for 10 min
⇩
Drainage of whey
⇩
Clarification of the collected whey in centrifugal separator (@5000-6000 rpm at 40-45 °C, two passage).
⇩
Filtered through double layered muslin cloth.
⇩
Whey protein is prepared.

(**Note :** Add Fragrance / Essence & Colour on your choice.)

Benefits

Whey protein has a wide range of potential health benefits, including :-

- **Muscle growth and repair:** Whey protein is a rich source of branched-chain amino acids (BCAAs), which are essential for muscle growth and repair. Studies have shown that whey protein supplementation can help increase muscle mass and strength.
- **Improved exercise performance**: Whey protein can help improve exercise performance by reducing muscle fatigue and promoting recovery. Studies have shown that whey protein supplementation can enhance endurance and reduce muscle soreness.
- **Weight management**: Whey protein can help with weight management by increasing satiety and reducing appetite. Studies have shown that whey protein can help individuals feel fuller for longer and eat less overall.

- **Blood pressure control**: Whey protein may help lower blood pressure in individuals with hypertension. Studies have shown that whey protein supplementation can reduce blood pressure levels.
- **Reduced inflammation**: Whey protein has anti-inflammatory properties that may help reduce inflammation throughout the body. Studies have shown that whey protein supplementation may help reduce inflammation associated with chronic diseases, such as heart disease and arthritis**.**

Opportunity

The India whey protein market size is expected to grow from USD 91.78 million in2023 to USD 120.29 million by 2028, at a CAGR of 5.56% during the forecast period. The daily average protein intake for a sedentary person should be 0.8g/Kg of body weight of person; Tremandous scope in the Sportsman life to use the whey protein to recover immediate supply of nutritional value(Energy drink).

Conclusion

Paneer whey is a good source of nutrients possessing; almost all essential minerals like calcium and magnesium but lacks iron. Thus, it can be inferred that incorporation of paneer whey in the preparation of various food products enhances nutritional properties of the food products in addition to providing a method for utilization of paneer whey.

References

1. MILK & MILK PRODUCTS:- D.D.PATANGE,D.K.KAMBLE,R.C.RANVEER.
2. Choudary, P.L. and Sandey, K.K. 2009. Sensory characteristics of whey mango herbal (cardamon) beverage. Indian J. Dairy Sci., 62: 20-23.
3. Cheese whey utilization. In: Total food – Exploiting co products-minimizing waste, Waldron K, Faulds C & Smith A (eds), Proceeding of workshop on Total Food, Institute of Food Research, Norwich, UA, pp 132- 143
4. Hobman, P.G. 1984. Review of processes and products for utilization of lactose in deproteinated milk serum. J. Dairy Sci., 67: 2630-53.
5. Dairy Techonology :- V.P.Singh , Neelam Sachan.