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NUTRACEUTICAL'S: FORMULATION AND EVALUATION OF HERBAL PROTEIN POWDER

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ABSTRACT

Protein supplements are extensively used for muscle building, weight loss, recovery from exercise, improving endurance & cardio-performance. Major challenge with protein supplement is undigested protein and impaired gut health which result in nausea, dehydration, diarrhoea, indigestion, stomach pain, and decreased appetite. Several studies have linked plant protein with reduced metabolic syndrome incidence.

In recent years, there has been growing interest in developing nutraceuticals that address specific health needs. One such area is weight gain, especially for individuals who are underweight or seeking to build muscle mass. This study aimed to formulate a protein-rich nutraceuticals powder specifically designed to promote healthy weight gain.

From a purely pragmatic standpoint, consuming protein post-workout represents an opportunity to feed; this in turn contributes to one's total daily energy and protein intake. Furthermore, despite recent suggestions that one does not "need" to consume protein during the immediate (1 h or less) post-training time frame, it should be emphasized that consuming nothing offers no advantage and perhaps even a disadvantage.

Thus, based on performance and recovery effects, it appears that the prudent approach would be to have athletes consume protein post-training and post-competition.

KEYWORDS: *Protein, Dietary Supplement, Minerals, Vitamins, Balanced Diet, Weight Gain, Food.*

INTRODUCTION

Protein is a macronutrient that is essential to building muscle mass. Protein is development of muscle, help with bone metabolism, maintain ideal weight, prevent heart related diseases, control sugar level, promote the brain function, slow down ageing process, improve immune system, Hormone balance, prevent hair damage, makes skin healthy, eliminate anxiety. Protein also helps repair and strengthen muscle tissues, which is important to build lean muscle and may reduce the risk of injury. Quinoa has a higher protein content and has a high lysin content. Now here we are initiating the development of "Protein rich health mix". Adding equal proportion of quinoa, green gram dal, soya bean, horse gram, peanut, black gram, green gram, jaggery, almond, milk powder. In this health mix nutritional adequacy are good sources of protein, fibre, calcium, fat, carbohydrate, iron, vitamin and minerals.

Protein – the body-building warrior, plays a critical role in countless physiological processes in the body. In sports nutrition, athletes are more concerned about muscle gain, which is increased by protein supplementation. Protein and amino acid supplements are widely marketed for athletes and habitually active consumers as muscle growth and performance-enhancing products, and high-protein, low-carbohydrate diets are traditionally applied for weight-loss purposes.

Nutraceuticals, a portmanteau of "nutrition" and "pharmaceuticals," represent a rapidly growing sector in the field of health and wellness. These bioactive compounds derived from foods, herbs, and dietary supplements have gained significant attention for their potential health-promoting and disease-preventing properties. With increasing consumer interest in natural and alternative therapies, the global nutraceutical market has expanded exponentially in recent years. Despite their popularity, the scientific evidence supporting the efficacy and safety of nutraceuticals remains variable and sometimes conflicting. This research aims to explore the current state of knowledge regarding the benefits, mechanisms of action, and potential risks associated with various nutraceuticals. Through a comprehensive review of existing literature, we seek to provide valuable insights that can guide healthcare professionals, researchers, and consumers in making informed decisions about the use of nutraceuticals for health enhancement and disease prevention.

MATERIAS & EQUIPMENTS

- **Ingredients**

Milk powder, Makhana, Cashew Nuts, Oats, Almonds, Pumpkin seeds, Sunflower seeds, Fennel seeds, Bengal gram, Chia seeds, Stevia, Liquorice.

Equipments

Weighing balance, mortal & pestle, burner, petri plates, sieves no. 40 & 80,
Grinder mixer, spatula etc.

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INFORMATION ABOUT INGREDIENTS

- **Milk Powder**

1. Protein Source: Especially skim milk powder contains both casein and whey proteins, making it a complete protein with all essential amino acids.

2. Improved Texture & Taste: It adds creaminess and a milky flavour to protein powders, enhancing palatability.



Fig. 1 Milk Powder

- **Makhana**

Lotus seeds, also known as 'lotus nuts or makhana', are the seeds of the lotus flower and have been consumed for centuries in Asian cuisine and traditional medicine.

Nutrient-Rich: Lotus seeds are a good source of protein, fibre, magnesium, potassium, and phosphorus. They are also low in calories and fat, making them a nutritious snack or ingredient in various dishes.



Fig 2. Makhana

- **Cashew Nuts**

Cashew nuts are edible seeds from the cashew tree, native to Brazil. They are:

- **Rich in nutrients:** good source of healthy fats, protein, magnesium, copper, and zinc.
- **Culinary uses:** Eaten raw, roasted, or used in cooking, baking, and dairy alternatives (e.g., cashew milk, cashew cheese).



Fig 3. Cashew Nuts

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❖ **Oats**

Oats are whole grains from the plant Avena sativa, commonly eaten as oatmeal or used in baked goods. They are:
Nutrient-rich: High in fibre (especially beta-glucan), protein, vitamins, and minerals.
Heart-healthy: Help lower cholesterol and support digestion.
Types: Includes rolled oats, steel-cut oats, and instant oats.



Fig 4. Oats

❖ **Almonds**

Almonds are nutrient-dense nuts that offer a range of health benefits, making them a popular choice as a nutraceutical ingredient. Here's some information about almonds as a nutraceutical:

- **Nutrient Profile:** Almonds are rich in essential nutrients, including protein, healthy fats, fibre, vitamins, and minerals. They are an excellent source of vitamin E, magnesium, manganese, and biotin.



Fig 5. Almonds

❖ **Pumpkin Seeds**

Pumpkin seeds, also known as pepitas, are the edible seeds of a pumpkin. They are:

- **Nutrient-dense:** Rich in protein, healthy fats, magnesium, zinc, and antioxidants.
- **Culinary uses:** Eaten raw, roasted, or added to salads, granola, and baking.

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Fig 6. Pumpkin seeds

❖ **Sunflower Seeds**

Sunflower seeds are the edible seeds of the sunflower plant (*Helianthus annuus*). They are:

- **Nutritious:** Rich in healthy fats, protein, vitamin E, selenium, and fibre.
- **Uses:** Eaten raw or roasted, added to snacks, salads, and protein blends.



Fig 7. Sunflower Seeds

❖ **Fennel Seeds**

Fennel seeds are the dried seeds of the fennel plant (Foeniculum vulgare). They are:

- **Aromatic and flavourful:** Used as a spice in cooking and herbal teas.
- **Health benefits:** Aid digestion, reduce bloating, and have anti-inflammatory properties.

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Fig. 8 Fennel seeds

❖ **Bengal Gram**

Bengal gram, also known as chana dal or split chickpeas, is a type of legume. It is:

- **High in protein and fibre:** A good plant-based protein source.
- **Uses:** Common in Indian cooking (curries, snacks) and also used in protein flours and powders.



Fig. 9 Bengal Gram

❖ **Chia Seeds**

Chia seeds are tiny seeds from the plant *Salvia hispanica*, native to Central America. **Highly nutritious:** Packed with omega-3 fatty acids, fibre, protein, calcium, and antioxidants.

- **Uses:** Added to smoothies, yogurt, puddings, and baked goods. They absorb liquid and form a gel-like texture.



Fig. 10 Chia Seeds

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❖ **Stevia**

Stevia is a natural sweetener derived from the leaves of the *Stevia rebaudiana* plant. It is:
Zero-calorie: Much sweeter than sugar but contains no calories.
Diabetic-friendly: Doesn't spike blood sugar levels, making it suitable for diabetics.
Uses: Common in diet foods, beverages, and sugar-free products as a sugar substitute.
Safe: Approved by major food safety authorities when used in moderation.



Fig. 11 Stevia

❖ **Liquorice**

Liquorice is a sweet-tasting root from the Glycyrrhiza glabra plant. It is:
Traditionally used: In herbal medicine for soothing sore throats, coughs.
Uses: Found in candies, teas, syrups, and natural remedies.



Fig. 12 Liquorice

FORMULATION TABLE

Sr. no.	Ingredients	Quantity (gm)	Uses
1	Milk powder	20gm	Rich in fibre & mineral.
2	Makhana	15gm	Anti-aging property, good for hair, relives stress.
3	Cashew nuts	15gm	Boost immunity, reduce inflammation.
4	Oats	10gm	Reduce asthma, antioxidant.
5	Almonds	10gm	Blood sugar control, bone health.
6	Pumpkin seeds	5gm	Control blood sugar, better sleep.
7	Sunflower seeds	5gm	improved heart, increased energy & immunity.
8	Fennel seeds	5gm	Improve digestion, reduce blotting & gas.
9	Bengal gram	5gm	Energy booster, improves haemoglobin.
10	Chia seeds	5gm	Antioxidant, control blood pressure.

Tabel no. 1 Ingredients

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- **Method of Preparation**

➢ Step 1: Firstly, weigh accurately all ingredients required for protein powder formulation.
➢ Step2: Then slightly dry roasted all ingredients one by one for 3 to 4 min.
➢ Step3: A grinder was taken for grind the ingredients well, firstly all ingredients were grinded one by one.
➢ Step4: After that all ingredients were mixed in one container.
➢ Step5: Then Stevia and ~~shatavari~~Liquorice powder was added in that mixture; as well as dried ginger powder added in it.
➢ Step6: Final mixture was weighed and transferred in an air tight and well closed container (bottle)
➢ Step7: For better result enjoy it with milk, or water.

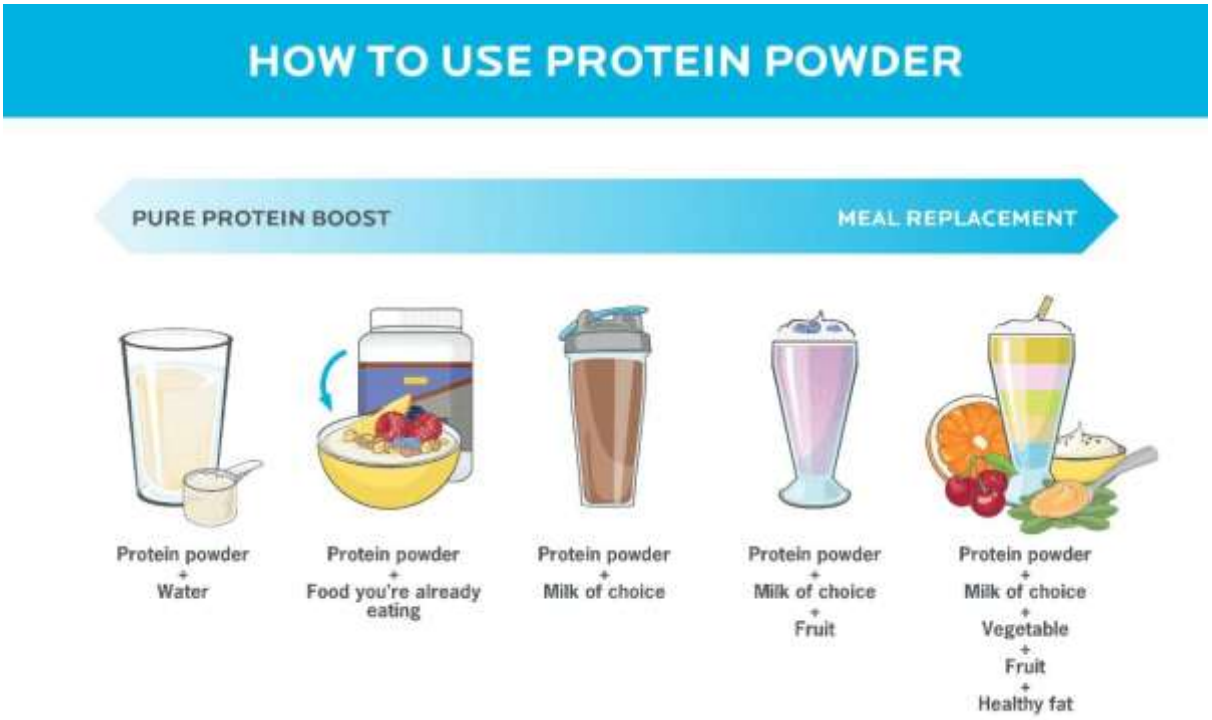


Fig. 13 How toUse Protein Powder

EVALUATION

Evaluation: When evaluating protein powder, several key factors should be considered to assess its quality, efficacy, safety, and suitability for individual needs. Here are some aspects to evaluate:

ORGANOLEPTIC TESTS

Organoleptic tests refer to the evaluation of a product's sensory characteristics:

1] **COLOUR**: White
2] **ODOUR:** Sweet & Aromatic
3] **TASTE:** Sweet & Fruity
4] **TEXTURE:** Gritty/grainy.

❖ **CHEMICAL TESTS:**

1] Biuret Test:

- Take a cleaned and dried test tube.
- Add the food samples of your choice into the test tubes.
- Add 2ml of sodium hydroxide and 5 to 6 drops of copper sulfate solution to it.
- Shake the test tube gently to mix the ingredients thoroughly and allow the mixture to stand for 4-5 minutes.
- If there is the appearance of bluish- violet color, it indicates the presence of protein.

RESULT:

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The appearance of bluish-violet color confirms the presence of Proteins.



Fig 14. Biuret test

2] Xanthoproteic Test

1. Take a cleaned and dried test tube.
2. Add the food samples of your choice into the test tubes.
3. Add a few drops of concentrated sulfuric acid and shake the test tube.
4. Heat the test tube gently on a Bunsen burner.
5. If there is a formation of yellow precipitate, then the presence of protein is confirmed.

RESULT: The appearance of yellow color confirms the presence of Protein.

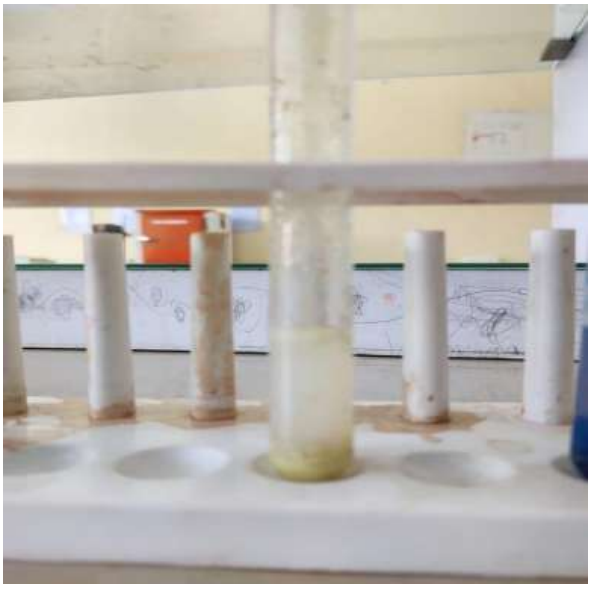


Fig 15. Xanthoproteic Test

3] Millions Test

1. Take a cleaned and dried test tube.
2. Add the food samples of your choice into the test tubes.
3. Add 2-3 drops of Millon's reagent and shake well.
4. Observe the change.
5. If there is the formation of white precipitate or if the sample changes to brick red on heating, then the presence of protein is confirmed.

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RESULT: The appearance of brick red color confirms the presence of Protein.

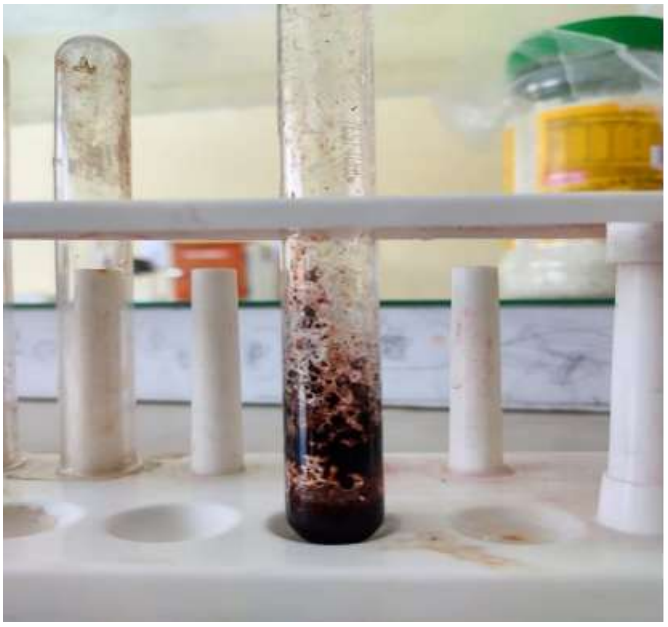


Fig 16. Millions test

4] Ninhydrin Test

1. Take a cleaned and dried test tube.
2. Add the food samples of your choice into the test tubes.
3. Add 1-2ml of ninhydrin solution to it and shake the test tube.
4. Boil the mixture and observe the change.
5. If there is the appearance of deep blue or purple color then the presence of protein is confirmed.

RESULLT: The appearance of deep blue or purple color confirms the presence of Proteins.

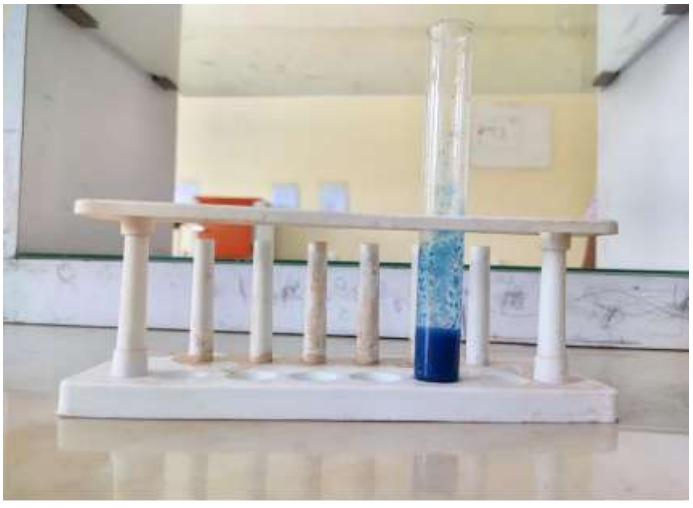


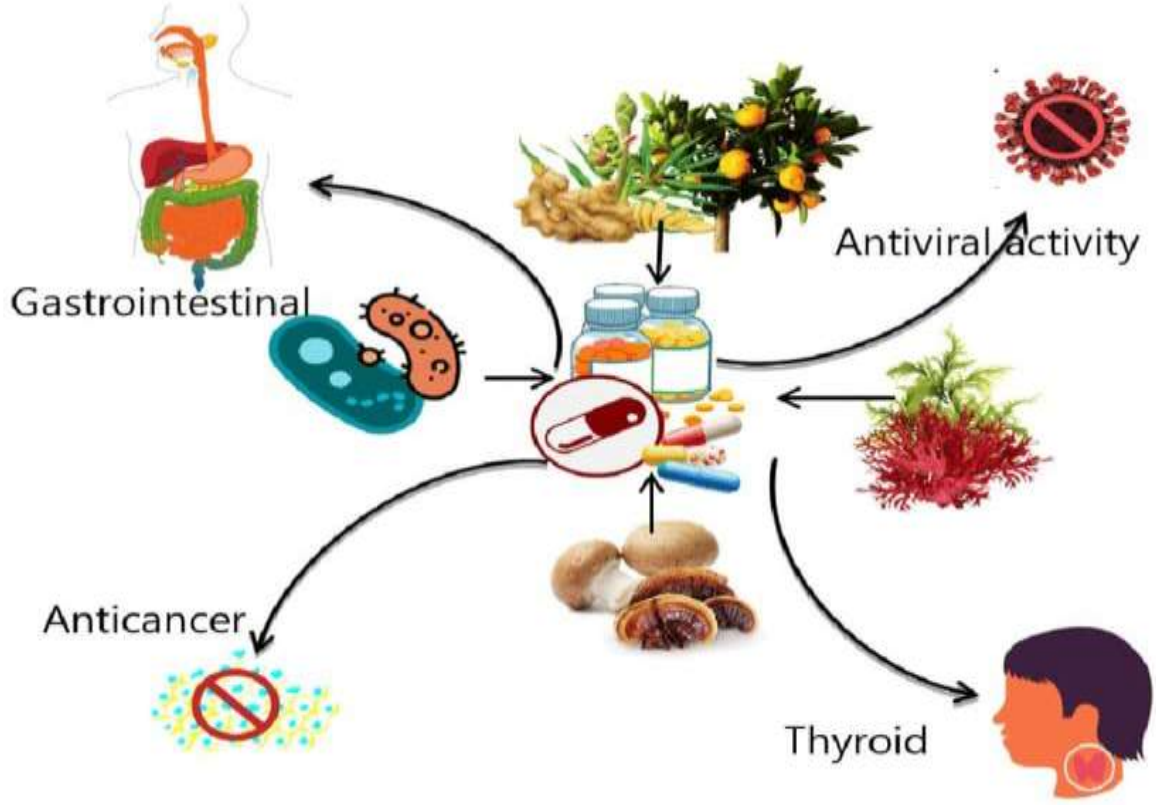
Fig 17. Ninhydrin test

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Uses of Protein Powder

This Protein powder is used for weight gain for all age group person, as well as both male and female. It is also beneficial for pregnant women.

➢ Here are some common uses of protein powder:
- Muscle Building and Recovery.
- Weight Management and Appetite Control.
- Convenient Protein Source.
- Dietary Supplementation.
- Meal Replacement.
- Bone Health and Aging.
- Enhanced Athletic Performance.



RESULT

The study of Nutraceuticals & The formulation and evaluation of protein powder
were done successfully.

DISCUSSION

➢ Nutraceutical protein powder supplementation involves using protein supplements derived from natural sources to enhance overall health and well-being. These supplements are often used by athletes and fitness enthusiasts to support muscle growth, recovery, and overall performance.

➢ The key benefits include increased protein intake, improved muscle repair and growth, enhanced exercise performance, and support for weight management. However, it's essential to choose high quality products and consult with a healthcare professional before starting any supplementation regimen.

➢ They are popular among athletes, fitness enthusiasts, and individuals seeking to enhance their nutrition. However, it's essential to choose products wisely, considering factors like ingredients, quality, and individual health goals.

CONCLUSION

The study investigated the efficacy, safety, and consumer perceptions of protein powder supplementation.

Overall, the findings of this research contribute to our understanding of protein powder supplementation and provide evidence-based recommendations for consumers, healthcare professionals, and industry stakeholders. By addressing the efficacy, safety, and consumer preferences of protein powder products, this study aims to support informed decision-making and promote optimal health and wellness outcomes.

herbal protein powders offer a convenient and diverse source of protein, potentially beneficial for muscle building, satiety, and overall health, particularly when combined with resistance exercise. However, more research is needed to fully understand their long-term effects and optimal use, and individuals should carefully consider the specific ingredients and potential risks before incorporating them into their diet. The study investigated

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REFERENCE

1. *Abd El-Baset, W.S. & Almoselhy, R.I.M. (2023). Effect of Some Packing Materials on OxidativeStability of Fats in Date Biscuits. Oxidative Stability of Fats in Date Biscuits. Food Technology Research Journal, 1, 1, 15-25*
2. *Ai, Z., Ren, H., Lin, Y., Sun, W., Yang, Z., Zhang, Y., Zhang, H., Yang, Z., Pandiselvam, R., Liu, Y. (2022).(2022). Improving drying efficiency and product quality of Stevia rebaudiana leaves using innovativemediuminnovative medium and short-wave infrared drying (MSWID). Innovative Food Science &Emerging Technologies, 81, 103154.*
3. *Akilen, R., Pimlott, Z., Tsiami, A., Robinson, N. (2013). Effect of short-term administration of cinnamon on blood pressure in patients with prediabetes and type 2 diabetes. Nutrition, 29, 10, 1192-1196.*
4. *Allerton, D.M., West, D.J., Stevenson, E.J. (2021). Whey protein consumption following fastedexerciseWhey protein consumption following fasted exercise reduces early postprandial glycaemia in centrally obese males: a randomised controlled trial. Eur J Nutr 60, 999–1011.*
5. *Almoselhy, R.I.M. (2021a). Extra Virgin Olive Oil as Nutritional Therapeutic Immuno-Enhancer. International Journal of Family Studies, Food Science and Nutrition Health, 2, 2, 26-45.*
6. *Almoselhy, R.I.M. (2021b). A Review of Emerging Health Risks with 3-MCPD Processing Contaminantin Refined Edible Oils. Contaminant in Refined Edible Oils. J MicrobiolMicrobial Biotechnol, 6, 3, 000202.*
7. *Dubois, P., Albuquerque, P., Allais, O., Bonnet, C., Bertail. P. et al. (2021). Effects of front-of-pack labelson the nutritional quality of supermarket food purchases: evidence from a large-scale randomizedcontrolled trial.randomized controlled trial. J. of the Acad. Mark. Sci. 49, 119–138.*
8. *Ducrot, P., Julia, C., Méjean, C., Kesse-Guyot, E., Touvier, M., et al. (2016). Impact of Different Front of-Pack Nutrition Labels on Consumer Purchasing Intentions. American Journal of Preventive Medicine,50, 5, 627-636.*
9. *Egyptian Standards (2007). ES: 2730/2007 PROTEIN-RICH SUPPLEMENTARY FOODS. EgyptianOrganizationEgyptian Organization for Standardization and Quality. Arab Republic of Egypt.*
10. *FDA (2013). A Food LabelingLabelling Guide: Guidance for Industry. U.S. Department of Health and HumanServicesHuman Services, Food and Drug Administration, CenterCentre for Food safety and Applied Nutritionhttps://www.fda.gov/regulatory-information/search-fda-guidance-documents/guidance.*
11. *Filho, P.A.D.C., Chen, Y., Cavin, C., Galluzzo, R. (2022). Mid-infrared spectroscopy: Screening methodformethod for analysis of food adulterants in reconstituted skimmed milk powder. Food Control, 136, 108884.*
12. *Flores-Flores, M.E. & González-Peñas, E. (2018). Short communication: Analysis of mycotoxins inSpanish milk.in Spanish milk. Journal of Dairy Science, 101, 1, 113-117.*
13. *Gantumur, M.A., Sukhbaatar, N., Shi, R., Hu, J., Bilawal, A. et al. (2023). Structural, functional, andphysicochemicaland physicochemical characterization of fermented whey protein concentrates recovered from variousfermentedvarious fermented-distilled whey. Food Hydrocolloids, 135, 108130.*
14. *Gardana, C. & Simonetti, P. (2018). Determination of steviol glycosides in commercial extracts ofSteviaof Stevia rebaudiana and sweeteners by ultra-high performance liquid chromatography Orbitrap massspectrometry.mass spectrometry. Journal of Chromatography A, 1578,14.*
15. *Giacalone, D., Wendin, K., Kremer, S., Frøst, M.B., Bredie, W.L.P. et al. (2016). Health and quality of lifeinlife in an aging population – Food and beyond. Food Quality and Preference, 47, B, 166-170.*
16. *Gopinath, B. Russell, J., Flood, V.M., Burlutsky, G., Mitchell, P. (2014). Adherence to Dietary Guidelines Positively Affects Quality of Life and Functional Status of Older Adults, Journal of the Academy ofNutritionof Nutrition and Dietetics, 114, 2, 220-229.*
17. *Hartmann, C., Hieke, S., Taper, C., Siegrist, M. (2018). European consumer healthiness evaluation of 'Free-from' labelled food products. Food Quality and Preference, 68, 377-388.*
18. *Hashem, H., Almoselhy, R.I.M., El-Waseif, M., Magdy, A. (2020) Rapid Authentication of Extra VirginOlive Oil using UV and FTIR Spectroscopy.Virgin Olive Oil using UV and FTIR Spectroscopy. Middle East Journal of Applied Sciences, 10, 2, 263- 271.*