

Optipep®

Whey hydrolysates for clinical nutrition



CARBERY

What is a protein hydrolysate?

A protein hydrolysate is when the long protein chains in the whey protein have been broken down into shorter chains called peptides. This makes the whey protein more easily absorbed by the body and may reduce the potential for allergic reactions. The hydrolysis process does not reduce the nutritional quality of the whey protein.

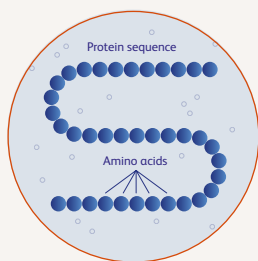
PROTEIN HYDROLYSATES OFFER THREE MAIN BENEFITS:

- Reduced allergenic potential compared to intact proteins
- Easier digestion compared to intact protein and free amino acids
- Faster absorption compared to intact proteins

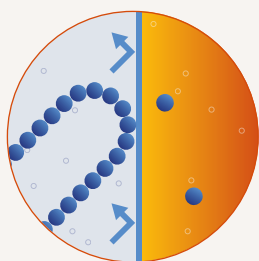
Enzymatic hydrolysis is similar to the natural breakdown of proteins that takes place in the gastrointestinal system during digestion of a protein meal. For this reason, hydrolysed protein is seen as 'pre-digested' and a more rapidly absorbed source of protein for the human body.

Protein absorption

WITHOUT HYDROLYSIS

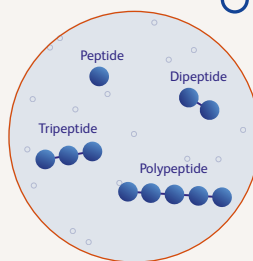


Primary protein structure is a chain of Amino Acids

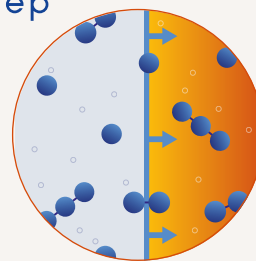


Impaired digestion, absorption, malnutrition

AFTER HYDROLYSIS



Primary protein structure is broken down into protein hydrolysates



Protein hydrolysates are more easily absorbed while maintaining nutritional quality



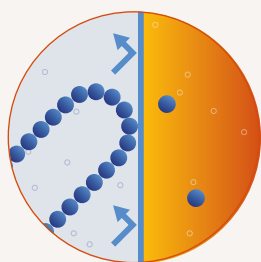
Protein hydrolysates in clinical nutrition

The provision of timely and sufficient nutritional support is of utmost importance in patients with acute and chronic diseases to secure optimal body functions, improved outcome and fast recovery. The digestion and absorption of nutrients, especially protein, can be impaired in such patients to a varying degree.

There are several underlying causes of this pathologically induced protein maldigestion and mal-absorption (inadequate assimilation of protein due to defects in digestion, absorption, or transport.) However, both conditions compromise patient outcome.

Critical illness dramatically increases muscle proteolysis, making free amino acids available for new protein synthesis at sites of tissue injury and at other locations in the body to regulate inflammatory and immune responses, and more than doubles the dietary protein requirement.¹

Rationale for clinical nutrition support



Impaired digestion, absorption, malnutrition



Optipep®



Pre-digested high quality whey protein hydrolysate



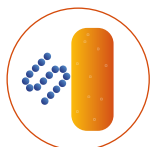
Clinical nutrition improves patient outcome

Enteral nutrition products, are designed to feed patients with specific diseases, disorders or medical conditions, and who have nutritional needs that cannot be met by consuming standard foods.

It has been suggested that proteins in the form of peptides provide an advantage for certain critically ill patient groups as well as for some patient groups with chronic maldigestion and malabsorption and impaired digestive functions.

- 1 Decreased length of hospital stay
- 2 Maintains GI Tract structure, integrity and function
- 3 Improved wound healing
- 4 Decreased risk of complications
- 5 Enhances intestinal immune function

Optipep® specialised whey protein hydrolysates have also shown positive nutritional benefits in specific conditions and need states, such as...



PROTEIN MALNUTRITION

Protein-energy malnutrition is a common problem in hospital patients. Studies have reported 40 % of surgical and medical patients to be malnourished on admission to hospital. Nutritional support leads to improved nutritional status and clinical outcome in severely depleted patients.²

Whey protein is considered one of the highest quality dietary proteins. Whey protein hydrolysates have a faster absorption rate compared to intact protein and free amino acids and are therefore very suitable to help prevent protein malnutrition.



CRITICAL CARE

Whey proteins are recognized as high nutritional quality proteins that support nutritional status in patients and help speed up recovery after illness. Whey proteins are furthermore able to help maintain muscle mass during illness and bed rest due to a strong stimulation of muscle synthesis. Whey protein hydrolysates may improve nutritional status in specific patient groups and furthermore help prevent loss of lean body mass during hospitalisation and shorten hospital stays.⁽³⁻⁵⁾



GASTROINTESTINAL DISORDERS

Patients with gastrointestinal disorders are at risk of nutritional depletion from inadequate nutritional intake, surgical stress and the subsequent increase in metabolic rate.^(6,7) Hydrolysed proteins are digested and absorbed more rapidly than intact protein, and are ideal for patients who experience digestive discomfort due to a sensitivity or poor tolerance of proteins.



TYPE 2 DIABETES

Several clinical studies indicate that a high intake of milk and dairy products may reduce the risk of developing Type 2 diabetes, obesity and cardiovascular disease, with a possible protective mechanism ascribed to the protein fraction. Whey protein hydrolysates may also help improve blood glucose control in persons with the metabolic syndrome or type 2 diabetes due to a superior insulin tropic effect compared to intact proteins.^(8,9)



SARCOPENIA

Based on the high nutritional quality of whey proteins, foods/nutritional products formulated with whey proteins can help improve the physical status of individuals suffering or at risk of suffering from sarcopenia. Whey protein is superior to other high quality protein sources for muscle synthesis in the elderly due to higher leucine content and a fast absorption rate.^(10,11)



Introducing Optipep[®] whey protein hydrolysates

Our dedicated range of hydrolysed whey proteins for clinical nutrition are specifically designed and tested for important quality descriptors such as antigenicity, molecular weight distribution and degree of hydrolysis and taste to ensure a consistent quality to this sensitive consumer group.

We offer forms from mild to extensively hydrolysed whey proteins, which brings different health effects and application possibilities.

We work closely with our customers across the globe to develop and customise products to meet their nutritional and requirements.

OPTIPEP[®] product range for clinical nutrition

Product name	Benefits	Protein source	Degree of hydrolysis (DH)	Protein content (%)
OPTIPEP[®] 8291	Mild taste, good heat stability, low ash content	Whey	14-16	80
OPTIPEP[®] RTD	Heat stable hydrolysate with low bitter flavour profile. Suitable for use in RTD beverages and UHT applications	Whey	5-7	80
OPTIPEP[®] 90 PRO	Low bitter taste, high quality source of peptides	Whey	4-6	90

NOTE: Low lactose versions are available on request

Key benefits

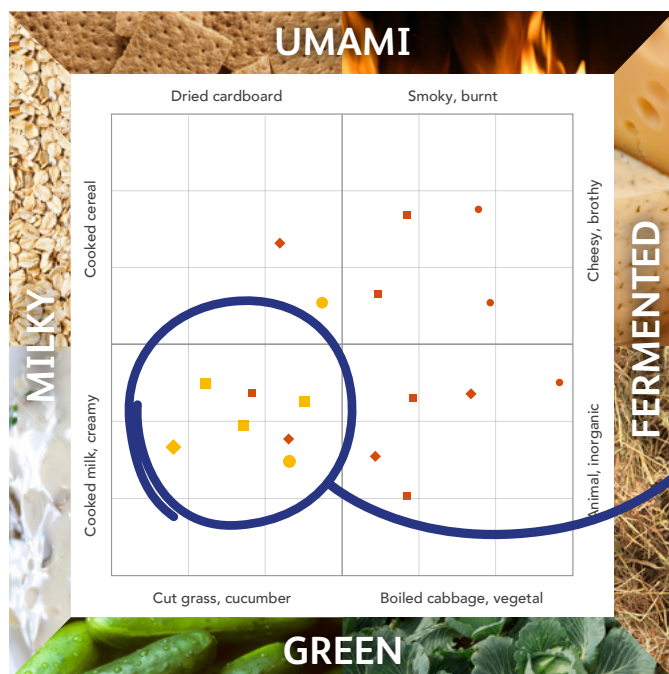
NUTRITIONAL BENEFITS

- Superior protein source
- Excellent nutritional quality (PDCASS/DIAAS > 1)
- Enhanced digestibility
- Rich source of essential amino acids (EAA)
- Naturally high in BCAA: leucine, isoleucine and valine
- Optimised peptide profile for enhanced bioactivity
- Fast gastric emptying and rapid absorption
- Insulinotropic effect
- Stimulation of muscle protein synthesis that helps prevent muscle disuse atrophy

FUNCTIONAL BENEFITS IN APPLICATIONS

- Multiple application possibilities for high protein applications (> 20%)
- Suitable for various UHT drinks (juice-like and milky beverages), gels, shots, tube-feeds and powders
- High solubility compared to intact proteins
- Lower osmolarity compared to free AA formulas
- Heat stability
- Emulsification properties
- Kosher & Halal
- Hormone and antibiotic free
- Excellent microbiology
- Uniform quality

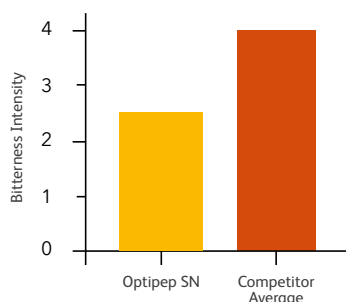
Taste preference starts with Optipep®



◆◆◆ Optipep® ◆◆◆ Competitor WPH

Adapted from Lekrisompong et al., J. Agric. Food Chem. 2010 58,6318-6327

Protein hydrolysates with the most favourable sensory profile and closest profile to milk.



Optipep®
40%
Less bitter
than competitors

Taste benefits

- 1 Clean Taste Profile
- 2 Least Bitter
- 3 Easy to Flavour
- 4 Fresh & Natural Dairy Taste
- 5 Most Palatable

Innovating for future generations

Our unique disciplinary approach to milk mining leverages the expertise of food scientists, microbiologists and immunologists within our Food for Health Ireland research partnership. We identify, characterise and compare relevant compositions and bioactive fractions in milk to uncover nutritional benefits. Our research programme includes a focus on next generation hydrolysates focused on:

- 1 Malnutrition
- 2 Glycemic Management
- 3 Sarcopenia
- 4 Appetite Modulation
- 5 Immune Protection



Want to find out more?

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8. Linda E Mignone, Tongzhi Wu, Michael Horowitz, and Christopher K Rayner: **Whey protein: The “whey” forward for treatment of type 2 diabetes?**
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11. Ce M. Op den Kamp, Ramon C. Langen, Astrid Haegens and Annemie M. Schols: **Muscle atrophy in cachexia: can dietary protein tip the balance?**

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Research references available on request.

To find out more on our extensive market leading range of whey proteins and fractions, please contact:

Carbery Food Ingredients, Ballineen, Cork, Ireland.

tel: +353 23 8822 200 | **email:** info@carbery.com

www.carbery.com

