



Optipep®

Hydrolysed whey protein at its best

# PERFECT BALANCE

---

# OF TASTE AND PERFORMANCE

From the experts in whey protein science for sports nutrition



# An optimised nutritional strategy is essential for anyone who is serious about managing intensive training loads for fitness or performance.

**Optipep®** is a range of advanced hydrolysed whey proteins that offer the perfect balance between a great taste experience and nutritional impact.

## FRESH & NATURAL TASTE

- Least bitter
- Most palatable
- Easy to flavour
- Works with a wider choice of flavours; from tempting cookies & cream to tangy fruit flavours

## HIGH PERFORMANCE

- Rich source of essential amino acids (EAA)
- Naturally high in branched chain amino acids (BCAA); leucine, isoleucine and valine
- Optimised peptide profile for enhanced bioactivity
- Fast absorption

## ADVANCED PORTFOLIO

- Comprehensive range
- Hydrolysed WPC (80% protein); Hydrolysed WPI (90% protein)
- Low lactose and low fat options
- Sustainably sourced from grass fed cows
- Suitable for vegetarians
- Kosher & Halal certified



**BUILD**

muscle mass and strength

**REPAIR**

muscle damage post training

**REFUEL**

muscle glycogen stores

**ADAPT**

feel the performance benefit

# Optipep® – the fast acting, great tasting advanced whey protein solution for sports nutrition.

TASTE BUD



## TASTES GREAT

Proprietary hydrolysis technology creates unique taste profile producing protein hydrolysates that work with the broadest range of flavours.

MUSCLE FIBRE



## BUILDS & REPAIRS MUSCLE

Restores muscle function, post exercise, due to greater bio-availability of essential and branched chain amino acids.

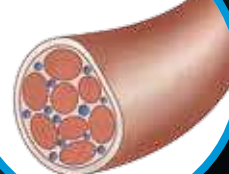
DIGESTIVE SYSTEM



## PEPTIDE DELIVERY

Achieve higher performance with optimal concentrations of di and tripeptides and amino acids transported to the blood stream.

MUSCLE GLYCOGEN



## REFUELS MUSCLE

Helps replenish lost energy faster through insulin mediated glycogen synthesis to enhance recovery.



Faster to absorb.  
Faster to perform.



Kick start muscle growth and recovery. Fast.

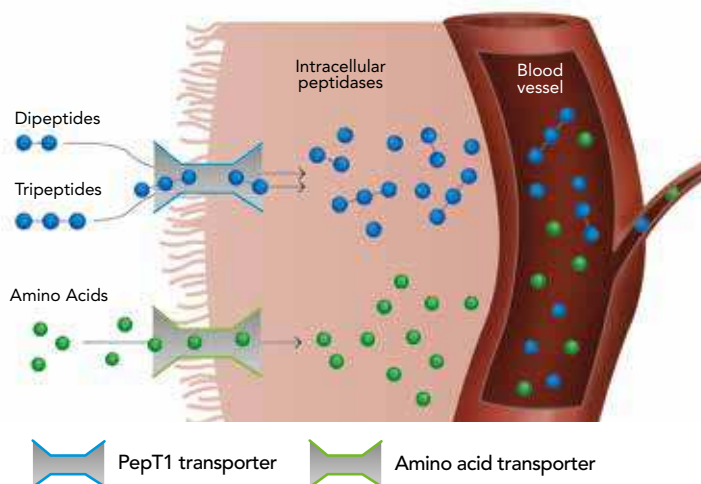
Peptides and free amino acids are rapidly transported and absorbed.

Amino acid absorption is facilitated by multiple transport mechanisms including the PepT1 transporter for di and tripeptides and a family of transporters for single amino acids. Post absorption at the luminal interface, di and tripeptides are absorbed into the blood stream as peptides or further digested by intracellular peptidases to individual amino acids.

Optipep® is specifically hydrolysed to produce optimal levels of di and tripeptides and free amino acids. This maximises the absorption capacity and effective delivery of nutrients needed to facilitate muscle growth, repair, refuelling and recovery.

**40%** GREATER AVAILABILITY OF  
BCAA FROM HYDROLYSATES  
AFTER 60 MINUTES.

Morifuji et al., J. Agric. Food Chem. (2010), 58, 8788-8797

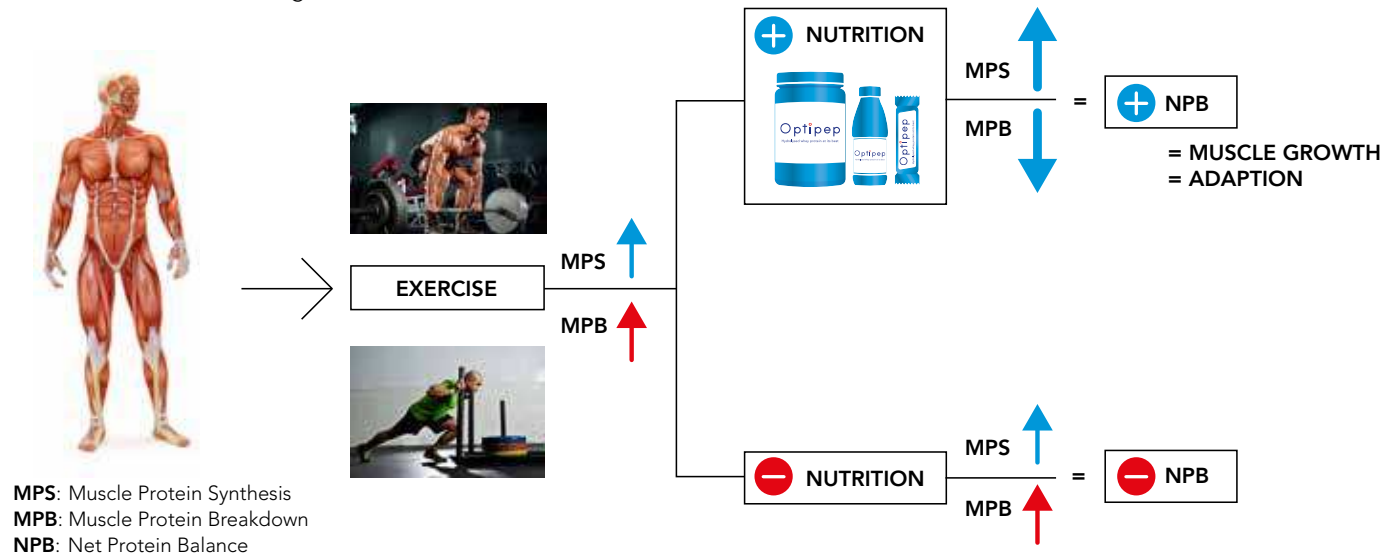




# Accelerating muscle growth.

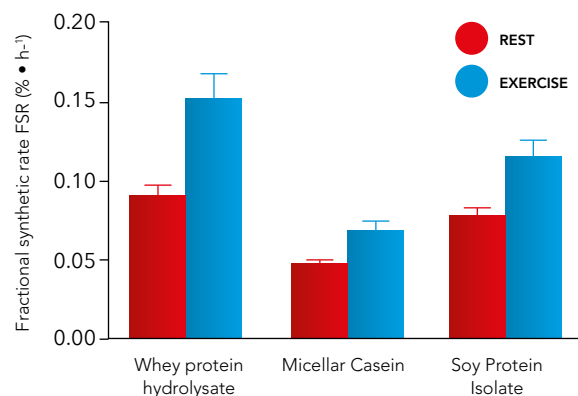
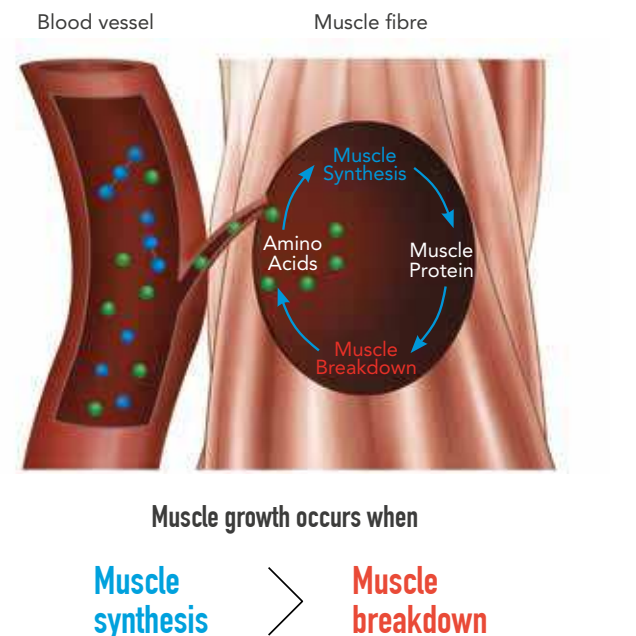
## How protein promotes muscle development after exercise.

Exercise increases the rate of muscle protein synthesis (MPS) and muscle protein breakdown (MPB). Net muscle protein balance (NPB) is the difference between MPS and MPB. Post exercise without protein intake, NPB remains negative. Protein acts synergistically with exercise to increase the rate of MPS and inhibit MPB. This results in a positive NPB, which when repeated over time leads to muscle growth.



## Why protein hydrolysate increases muscle protein synthesis.

WPH has been shown to result in a higher rate of MPS post exercise relative to other protein sources (Tang et al., J. Appl. Physiol. 2009). This is due to superior digestion and absorption kinetics and higher protein quality with a greater proportion of EAA, and in particular leucine. Leucine is a key stimulator of MPS (Atherton et al., Amino Acids 2010).



Adapted from Tang et al (2009), J.Appl. Physiol. 107 (987-992).

FSR measures how much of the protein consumed is incorporated into muscle protein post feeding

# Restore muscle strength. Fast.

## Reduce recovery times with whey protein hydrolysates.

Repeated high intensity training sessions often result in muscle damage and soreness. Muscle pain and reduction in performance capacity are common training intensity limiters. Whey protein hydrolysate has been shown to reduce recovery times and improve strength relative to standard whey protein isolate.

Buckely et al, J Sci Med Sport (2010); 13(1): 178-81

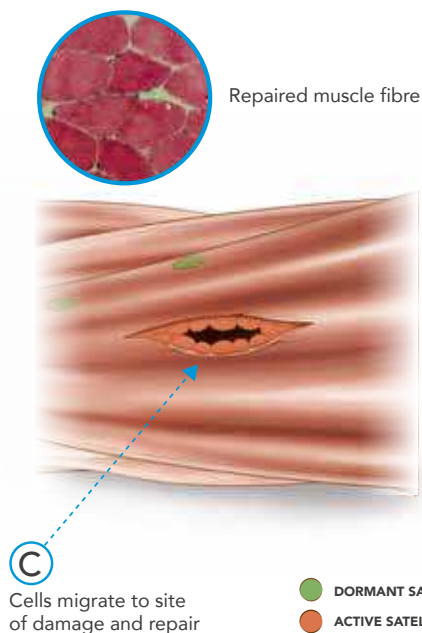
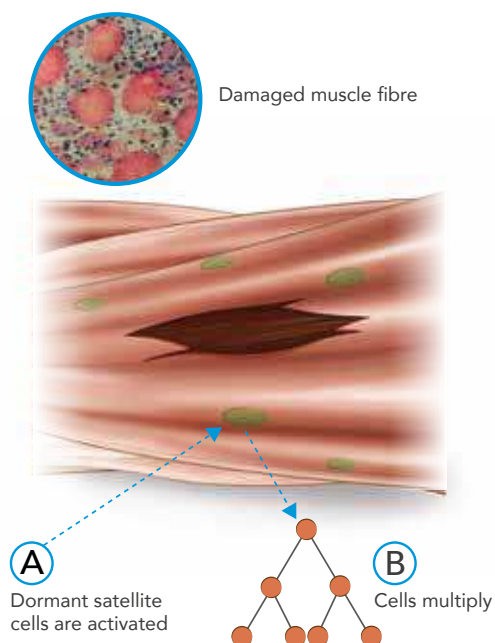
Hydrolysis maximises transport across the gut wall, so amino acids are available more quickly at the site of muscle damage. This facilitates optimal recovery and adaptation to incremental increases in training intensity and competition.

## The mechanism of muscle repair

When muscle fibres are damaged during exercise:

- (A) Dormant satellite cells are activated.
- (B) These satellite cells multiply and,
- (C) Migrate to the site of muscle damage, fusing with the damaged muscle providing the additional cells for the repair process.

These cells drive the muscle protein synthetic response during the repair process, incorporating amino acids into newly synthesised muscle protein (via mRNA transcription and subsequent protein translation), thus repairing and growing the muscle fibre.



**“Hydrolysates are a rich source of amino acids, the building blocks of muscle protein.”**

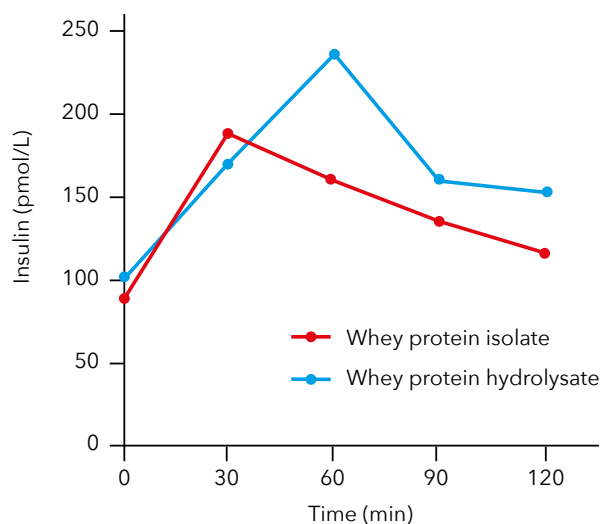


# Replacing muscle energy stores. Fast.

## The insulinotropic effect of whey protein hydrolysate.

Whey protein hydrolysates have been shown to support higher glycogen resynthesis rates than carbohydrates alone. During the 60' recovery window, whey protein hydrolysates boost glycogen synthetase activity through an insulin mediated response. This increased rate of glycogen synthesis replenishes energy stores in the muscle. These energy stores are critical to fuel subsequent high intensity exercise sessions.

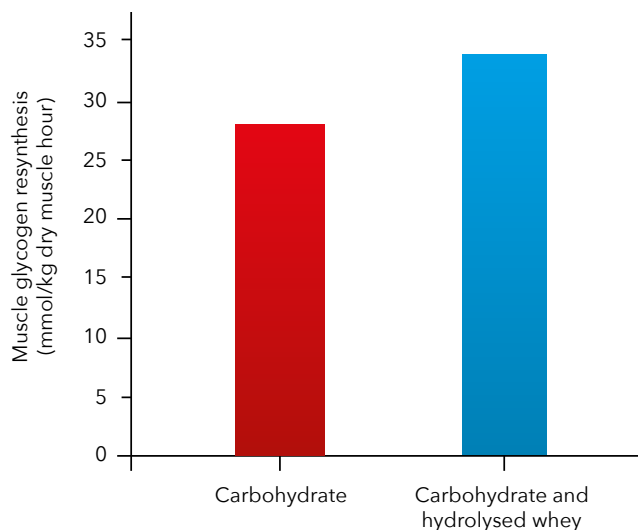
Adapted from Power et al., *Amino Acids* (2009); 37(2): 333-9



## Hydrolysed whey proteins boost the rate of glycogen synthesis.

Rate of glycogen resynthesis was 20% higher over a three hour post exercise recovery period when whey protein hydrolysate was fed in combination with carbohydrate relative to carbohydrate alone. Depletion of muscle glycogen stores during high intensity exercise leads to fatigue and reduced performance capacity. Complete resynthesis of muscle glycogen stores, post-exercise, is required to prevent fatigue from occurring early during the next training session.

Adapted from Van Hall et al., *Int. J. Sports Med.* (2000); 21(1): 25-30.



**GREATER RATE OF  
GLYCOGEN RESYNTHESIS**

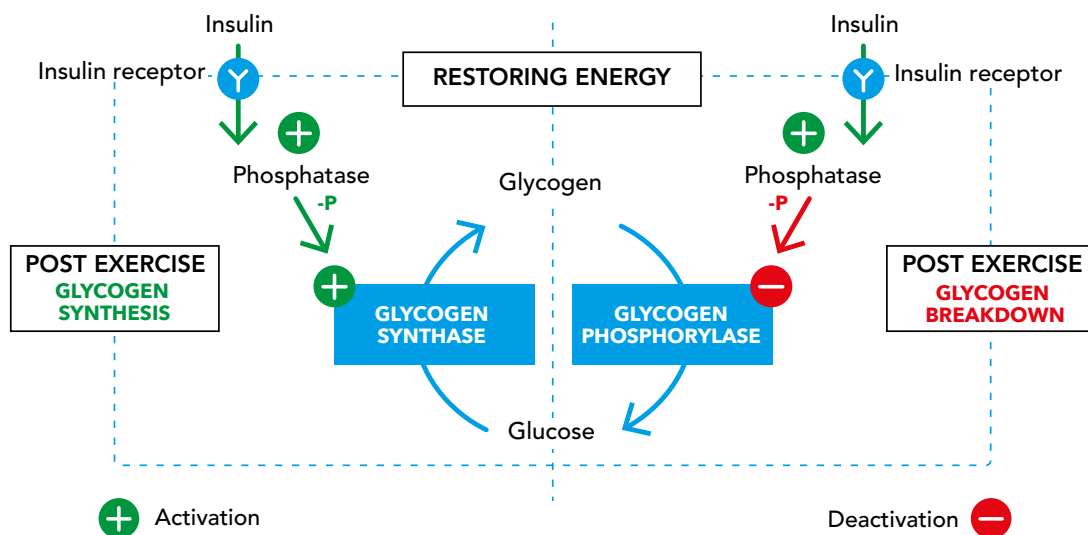
**“Post exercise, Optipep® results in higher levels of blood insulin when it is needed most.”**

“Muscle glycogen stores are crucial to optimally fuel subsequent training sessions.”

## Replace muscle energy stores. Fast.

### How insulin supports muscle glycogen resynthesis.

Post exercise – insulin inhibits glycogen breakdown and activates glycogen synthase converting glucose into glycogen and thereby replenishing the energy stores in muscle cells. Post-exercise, muscle glycogen re-synthesis is key to fuelling subsequent high intensity training sessions.

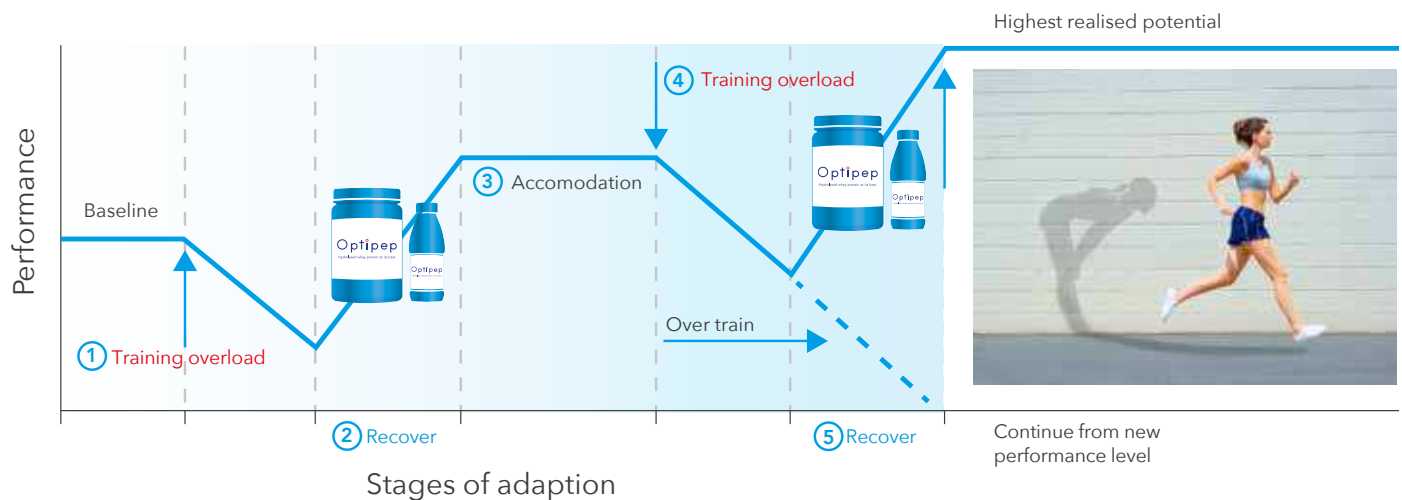




# Muscle recovery and adaptation.

## Reach new levels of performance with whey protein hydrolysates.

Intense resistance and endurance training induce muscle protein breakdown during physical activity. Ingestion of high quality protein is required for muscle synthesis and repair. This facilitates optimal recovery and adaptation to incremental improvements in training intensity and competition. Training stimuli and nutrition strategies will, over time, result in higher realised athletic potential.



### ① TRAINING OVERLOAD

Initial phase of training when stimulus is first applied and performance generally decreases in response to fatigue (principle of overload).

### ② & ⑤ RECOVERY

The phase in which adaptation occurs and the system is returned to baseline or in most instances elevated above baseline. Appropriate nutritional intervention (timing / quantity / quality) facilitates optimal adaptation.

### ③ ACCOMMODATION

New level of performance capacity that occurs in response to the adaptive stimulus and subsequent recovery.

### ④ TRAINING OVERLOAD

Ensuing phase of training when stimulus is applied and again performance decreases in response to fatigue. Overtraining will occur if training stimulus is excessive or if recovery is inadequate.

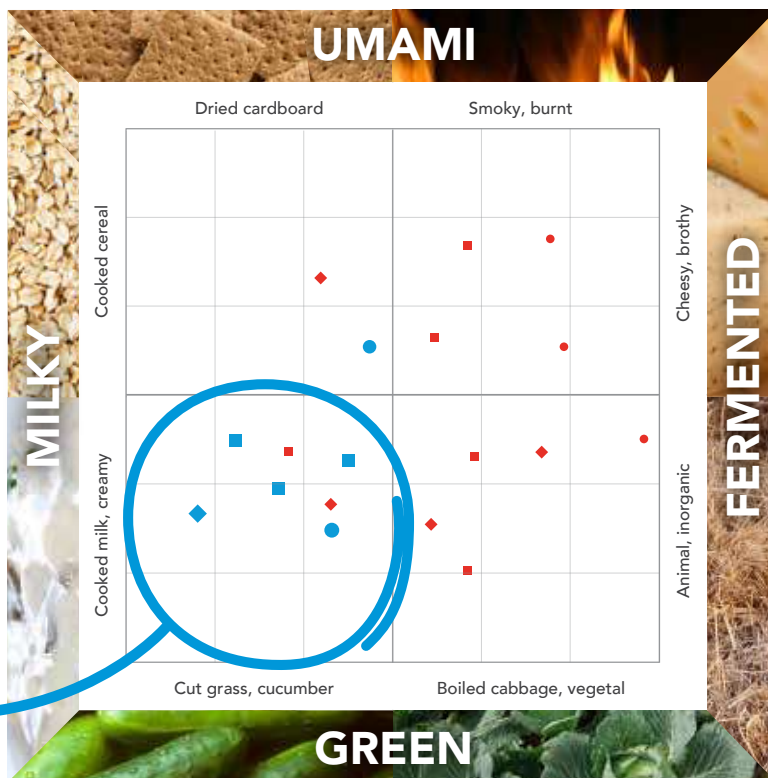
**“The right nutrition at the right time is critical to enabling performance athletes to maintain high intensity training programmes.”**



TASTE

Protein hydrolysates which work best with the broadest range of flavours.

## SENSORY MAPPING WHEY HYDROLYSATES



◆◆◆ Optipep® ◆◆◆ Competitor WPH

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

## Taste perfection – start with Optipep®

Protein hydrolysates are easily distinguished by their unique organoleptic profile. Carbery commissioned the first ever comprehensive research in sensory mapping of whey hydrolysates involving expert descriptive panels, flavour analysis and consumer research. The map, based on the analysis of 22 commercially available whey protein hydrolysates, charts 8 different flavour profiles that fall under the categories of 'umami', 'fermented', 'green' and 'milky'.

This characterisation helps to optimise the choice of flavours with different protein bases. With Optipep®, product developers now have greater creative scope when developing sports nutrition products, providing athletes with greater flavour variety and satisfaction.



of customers say taste influences purchase of sports nutrition products.

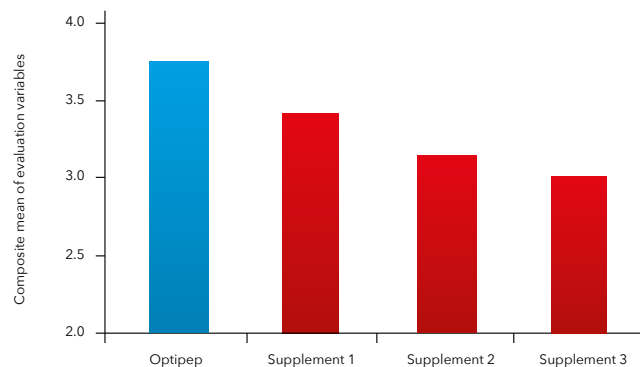


## #1 Top ranked flavoured WPH supplement.

## Optipep® – consumers' preferred choice.

An independent consumer study found that the sports supplement with Optipep® SN was significantly better than comparative supplements with other hydrolysed whey proteins.

- Aroma
- Mouthfeel
- Flavour
- Natural taste
- Refreshing
- Pleasant aftertaste.



## Create the best

We are the whey protein and flavour experts. Together with Synergy, our taste specialists, we offer protein science, formulation and consumer insights. We are passionate about helping our customers make the most of market opportunities with the best tasting, high protein products.







# Optipep<sup>®</sup>

Hydrolysed whey protein at its best

## PERFECT BALANCE OF TASTE AND PERFORMANCE

All information contained herein (the "Information") is confidential and proprietary to Carbery Food Ingredients Limited ("Carbery") and may not be disclosed to third parties or used without Carbery's prior written consent. The Information is provided in good faith "as is" without any warranty as to accuracy, fitness for purpose, compliance with applicable laws or otherwise. All rights to this Information are reserved.

Research references available on request

Carbery Food Ingredients, Ballineen, Cork, Ireland.  
T +353 23 8822200 E [info@carbery.com](mailto:info@carbery.com)

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



CARBERY