

# # PROTEOSOL™: Revolutionising Protein Enrichment in the Tea and Analogues Industry

In a market where functional beverages are constantly growing, PROTEOSOL™ marks a before and after in the tea and analogues industry by offering a revolutionary solution for protein enrichment in clarified beverages. This document details how our patented ultra-enzymolysis technology achieves what was previously impossible: incorporating high-quality proteins into transparent beverages without compromising their clarity, flavour, or texture. Discover why leading international brands are already integrating PROTEOSOL™ into their most innovative formulations.



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



## # Total Solubility: The Historic Challenge of Clarified Beverages

Protein enrichment in clarified beverages such as tea and analogues has historically presented one of the greatest challenges for the food and beverage industry. This issue, far from being trivial, has significantly limited innovation in a sector with enormous growth potential.

### **Solubility Issues**

Conventional proteins, both animal and plant-based, exhibit a strong tendency towards molecular aggregation when introduced into aqueous matrices such as tea and analogues. This inevitably leads to the formation of visible particles that remain in suspension, creating a turbid appearance that is unacceptable to the discerning consumer of premium beverages.

### **Sensory Limitations**

Protein sedimentation not only affects visual appearance but also negatively alters the consumption experience. Precipitates can generate a gritty mouthfeel, whilst changes in viscosity modify the release profile of the characteristic aromas and flavours of tea and analogues.

### **Long-term Instability**

Previous attempts to incorporate proteins into tea and analogue beverages have faced stability issues during storage. Over time, proteins tend to interact with other components such as polyphenols and tannins, forming complexes that precipitate and reduce both the nutritional value and the sensory quality of the final product.

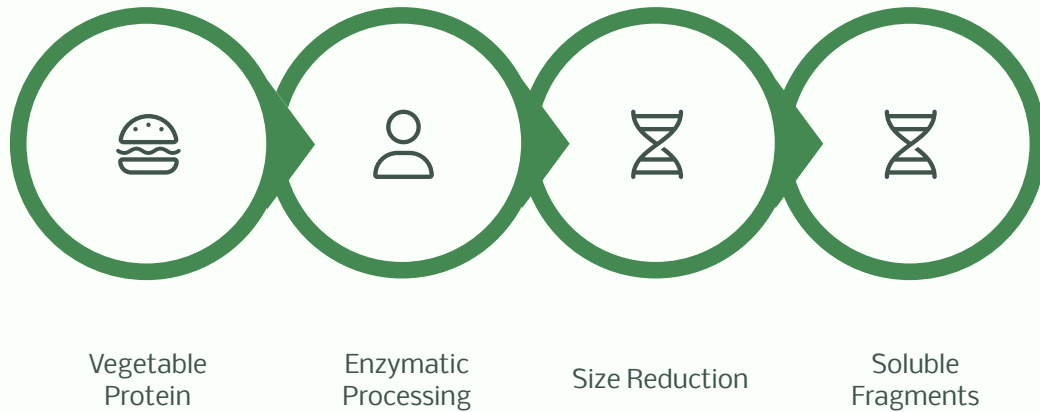
# These technical limitations have prevented manufacturers from offering tea and analogue beverages that combine the natural antioxidant benefits of this infusion with a significant protein contribution.



Partial solutions available until now involved significant compromises in terms of transparency, flavour or stability, which has kept this market segment virtually unexplored despite its enormous potential.

The expectations of today's increasingly demanding consumer require products that not only offer nutritional benefits but also a superior sensory experience. The inability to achieve true protein integration in clarified beverages has, therefore, represented a significant technological barrier that limited innovation in premium categories of the functional beverage market.

## # Innovative Technology: PROTEOSOL™'s Unique Ultra-Enzymolysis



At the heart of **PROTEOSOL™** lies a revolutionary process developed and patented by Intabiotech SL that fundamentally transforms the molecular structure of vegetable proteins to overcome historical solubility limitations.

### Patented Ultra-Enzymolysis Process

Our exclusive technology employs a precise combination of specific enzymes under controlled conditions, enabling profound enzymatic hydrolysis. Unlike conventional processes that achieve only partial hydrolysis, our method reaches levels of protein fragmentation previously unattainable on an industrial scale, whilst preserving nutritional value.

The process involves multiple stages of sequential enzymatic reaction, where each phase is optimised to target specific peptide bonds. This methodological approach, the result of years of research, allows us to obtain a low molecular mass peptide profile with superior functional characteristics.

### Key Molecular Transformation

Ultra-enzymolysis significantly reduces the molecular mass of proteins, transforming them into short-chain peptides and free amino acids with physico-chemical properties radically different from the original proteins. These protein fragments, with molecular masses below 1000 Daltons, exhibit:

- Greater exposure of hydrophilic groups that enhance interaction with water
- Reduction of intermolecular interactions that previously favoured aggregation
- Elimination of secondary and tertiary structures responsible for precipitation
- Decreased net charge that minimises interactions with other components



**This advanced process not only enhances solubility, but also significantly increases the bioavailability of amino acids by facilitating their intestinal absorption. The controlled fragmentation also eliminates potential protein allergens, reducing the risk of adverse reactions and broadening the spectrum of potential consumers.**

- The **\*\*PROTEOSOL™\*\*** technology is protected by multiple international patents that cover both the production process and specific applications in clarified beverages and analogues. This intellectual protection guarantees the exclusivity and differentiation of products developed with our technology.

## **# The New Benchmark in Solubility and Transparency for Vegetable Proteins**

**\*\*PROTEOSOL™\*\*** establishes a new standard in the protein ingredient industry by offering unprecedented solubility and transparency characteristics, particularly valued in the demanding sector of clarified beverages such as Tea and analogues.

# 100%

### **Complete Solubility**

Verified in independent laboratories through standardised tests (Nitrogen Solubility Index method) across the full pH range relevant for beverages.

# 0%

### **Added Turbidity**

Nephelometric measurements confirm the absence of additional turbidity when incorporated up to 10g/L in water and Tea and analogues, even after temperature cycles.

# <1kDa

### **Molecular Weight**

Ultra-enzymolysis reduces molecular size below the critical threshold that causes solubility and precipitation issues.



## Exceptional Performance in Complex Matrices

The true test of **PROTEOSOL™**'s efficacy lies in its performance within real food systems, not merely in laboratory solutions. Our comprehensive studies demonstrate that it maintains its solubility properties in:

- Acidic teas and analogues (pH 2-4) where proteins traditionally precipitate due to denaturation
- Infusions rich in polyphenols which typically form insoluble complexes with proteins
- Beverages formulated with minerals that often promote protein aggregation
- Systems subjected to thermal treatments such as pasteurisation and sterilisation

## Proven Sensory Neutrality

A fundamental aspect for applications in teas and analogues is the complete absence of interference with the delicate organoleptic profile of these beverages. **PROTEOSOL™** has been evaluated by trained sensory panels, confirming:

- Absence of residual bitterness common in protein hydrolysates
- Does not mask subtle aromatic notes characteristic of premium teas and analogues
- Does not generate an undesirable aftertaste or finish
- Maintains the body and mouthfeel characteristic of each type of tea and analogue

This unique combination of perfect solubility, optical transparency, and sensory neutrality makes **PROTEOSOL™** the ideal ingredient to revolutionise the market for functional teas and analogues, enabling formulations that were previously technically impossible.





# Advantages for the development of protein beverages in the Tea and Analogue industry



## Premium Products

Develop protein-enriched teas and analogues that maintain the crystal-clear transparency associated with high-quality beverages.



## Formulative Versatility

Compatibility with all types of tea and analogue bases: black, green, white, oolong, and herbal blends in hot or cold format.



## Competitive Differentiation

Offer superior nutritional benefits without compromising the sensory qualities that define your brand.

**Broad spectrum of applications in the tea industry and other analogue products where enrichment is desired without sacrificing the product's appearance, without cloudiness or visible particles.**

## Complete Functional Stability

**PROTEOSOL™** maintains its exceptional properties under all conditions relevant to the tea and analogue industry:

- Perfect solubility within the pH range of 2-6, covering everything from the most acidic teas and analogues to alkaline herbal infusions
- Thermal stability that guarantees transparency in both cold brew applications and hot teas and analogues
- Compatibility with pasteurisation

## Additional Technical Benefits

Beyond perfect solubility, **PROTEOSOL™** provides significant technical advantages for formulators:

- Does not increase beverage viscosity, maintaining the light mouthfeel characteristic of tea and analogues
- Reduces the natural astringency of some teas and analogues by interacting favourably with polyphenols
- Improves colour stability during prolonged storage

**The exceptional versatility of PROTEOSOL™ allows tea and related product manufacturers to explore entirely new innovation territories, offering products that combine the traditional benefits of tea and related products with a significant protein contribution, all without compromising the sensory experience that consumers expect.**

Tea & Related Product Format	Recommended Concentration	Primary Benefit	Technical Considerations
Bottled RTD Tea & Related Products	5-8 g/L	Protein Enrichment with Optical Clarity	Compatible with common preservatives and acidulants
Cold Brew Tea & Related Products	3-6 g/L	Nutritional Improvement without Altering Sensory Profile	Incorporate during final maceration stage
Tea & Related Product Concentrates	15-25 g/L	High Protein Contribution in Concentrated Format	Maintains solubility even at high concentrations
Powdered Blends	20-30% by weight	Protein Fortification in Instant Format	Excellent dispersibility even in cold water



## # Superior Nutritional Profile: Unprecedented Recovery and Health

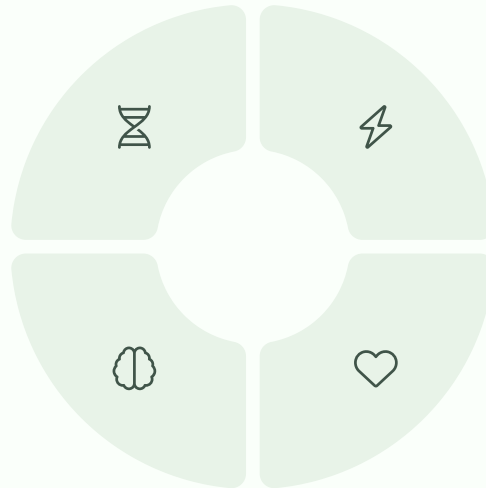
The true revolution represented by **PROTEOSOL™** is not limited to its exceptional solubility properties; it extends to a nutritional profile specifically optimised to maximise health and well-being benefits for consumers.

### **Complete Essential Amino Acids**

Complete profile with all essential amino acids in optimal proportions according to FAO/WHO recommendations, with a PDCAAS greater than 0.95.

### **Cognitive Function**

Rich in neurotransmitter precursor amino acids that promote concentration and mental performance.



### **Rapid Absorption**

Protein fragmentation through ultra-enzymolysis facilitates intestinal absorption up to 3 times faster than intact proteins.

### **Cardiovascular Benefits**

Contains bioactive peptides with proven hypotensive effects, contributing to cardiovascular health in addition to protein intake.

## **Perfect Synergy with the Natural Benefits of Tea and Analogues**

The combination of **PROTEOSOL™** with tea and analogues creates a particularly valuable nutritional synergy:

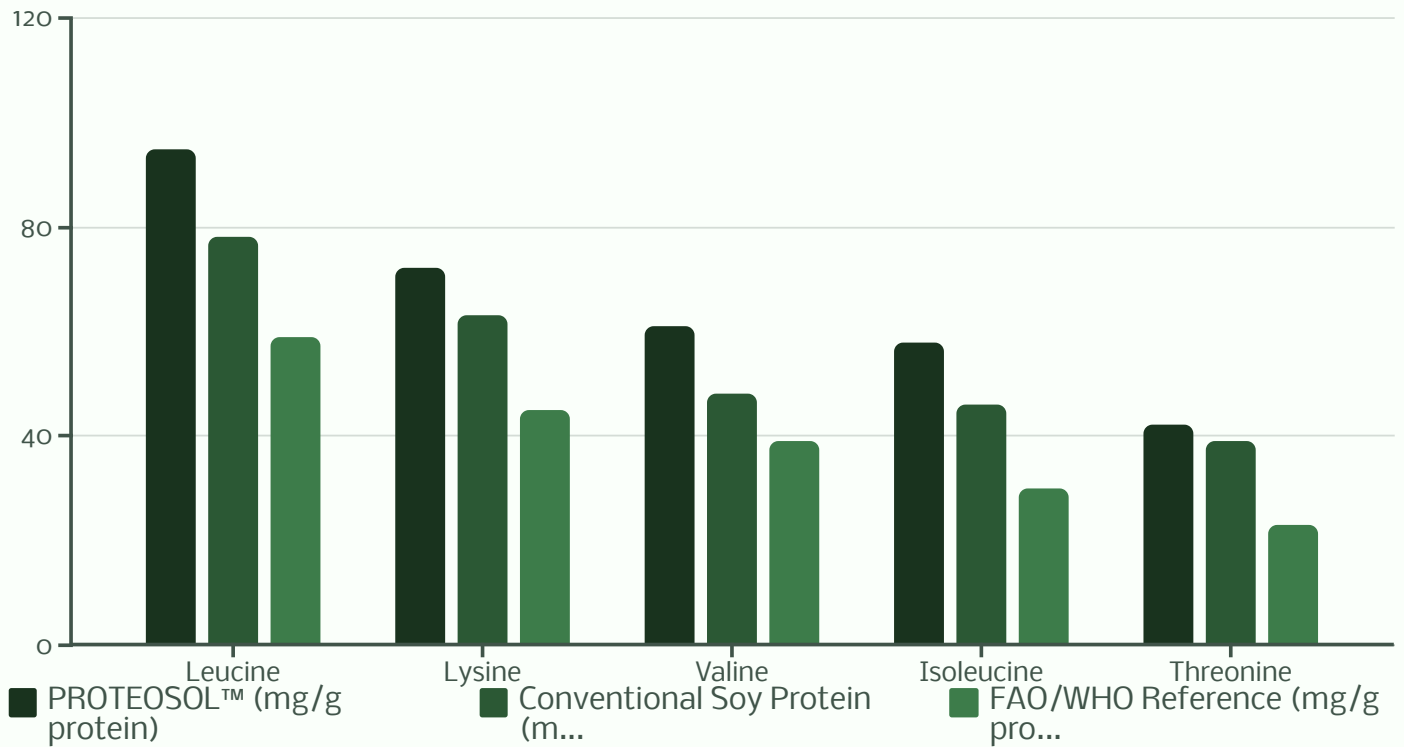
- The antioxidants in tea and analogues enhance the anti-inflammatory action of certain peptides present in **PROTEOSOL™**
- The natural caffeine in tea and analogues acts synergistically with branched-chain amino acids (BCAAs), improving physical performance and muscle recovery
- The L-theanine present in green tea and analogues complements the effect of bioactive peptides in reducing stress and improving mood

### **Specific High-Value Applications**

The nutritional profile of **PROTEOSOL™** makes it especially suitable for developing tea and analogue beverages aimed at specific segments:

- Athletes and active individuals: accelerated muscle recovery and improved performance
- Older adults: prevention of sarcopenia and maintenance of muscle mass
- Weight management: satiating effect and preservation of lean tissue during diets
- Cognitive well-being: ideal combination of amino acids and antioxidants for brain health

**This superior nutritional profile, combined with its unparalleled solubility and clarity in clarified beverages, makes PROTEOSOL™ the definitive ingredient for transforming tea and analogues into a true next-generation functional beverage, capable of delivering tangible health benefits without sacrificing sensory experience.**





## Industrial Application Cases and Data

The validation of **\*\*PROTEOSOL™\*\*** extends beyond the laboratory, with numerous successful real-world industrial application cases demonstrating its capability to transform the market for protein-enriched tea and analogue beverages.

1

### **Pilot Trials with Leading Brands**

Collaborations with five of the ten largest global manufacturers of RTD tea and analogues have validated the complete solubility of **\*\*PROTEOSOL™\*\*** at concentrations of up to 10g/L in various commercial formulations without altering the characteristic transparency of these products.

2

### **Extensive Sensory Validation**

Professional tasting panels, comprising over 200 participants in total, have confirmed the absence of organoleptic impact on key attributes such as colour, aroma, flavour, and mouthfeel, even in delicate teas and analogues like oolong and white tea.

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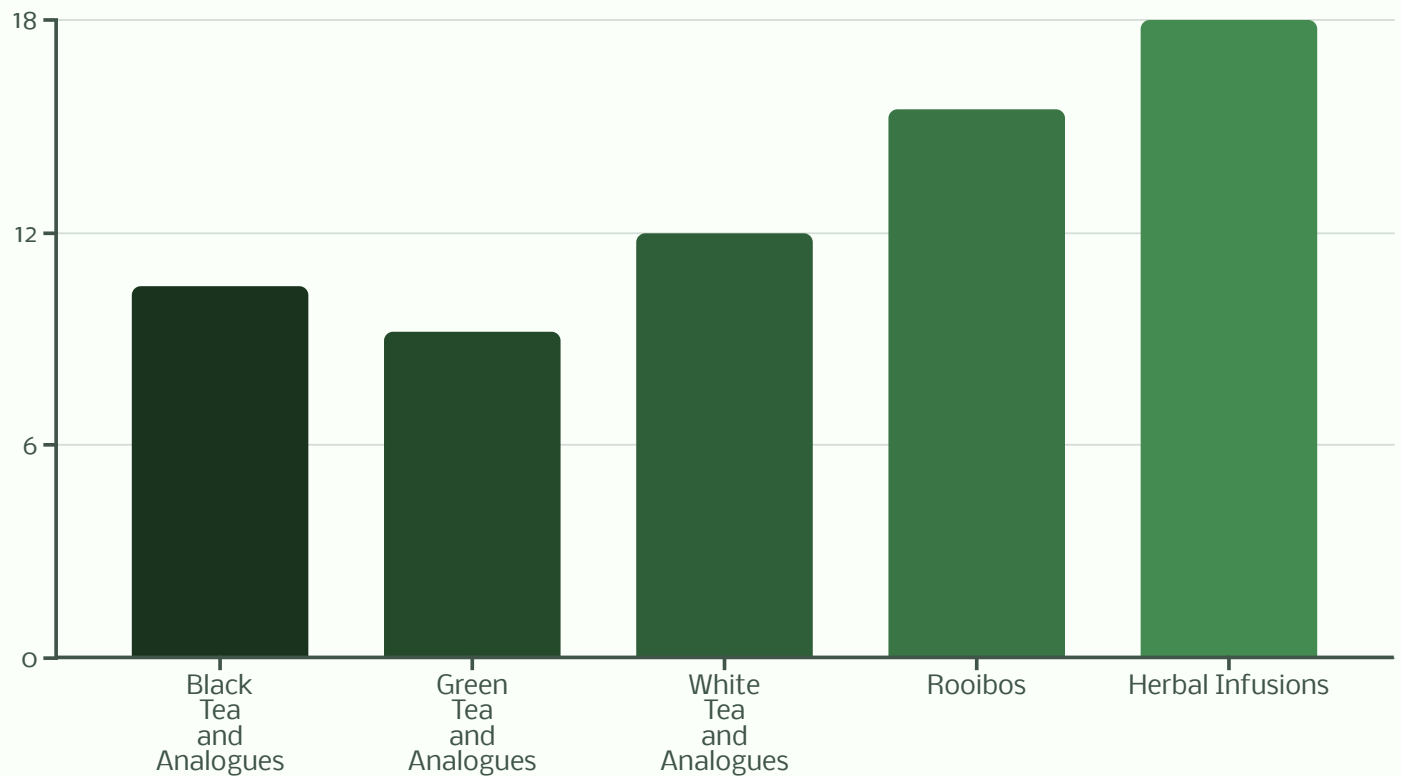
### **Stability Studies**

Accelerated and real-time tests demonstrate that beverages formulated with **\*\*PROTEOSOL™\*\*** maintain their clarity and sensory properties for periods of up to 12 months, significantly outperforming other protein alternatives.

## Comparative Results with Other Protein Solutions

Parameter Evaluated	PROTEOSOL™	Whey Isolate	Pea Protein	Collagen Peptides
Solubility in Tea and Analogues (pH 4.2)	100%	35%	15%	70%
Optical Clarity	Excellent	Poor	Very Poor	Moderate
6-Month Stability	No Change	Precipitation	Sedimentation	Slight Turbidity
Flavour Impact	Neutral	Moderate	Significant	Slight
Biological Value (BV)	98	104	65	0*

\*Collagen does not contain all essential amino acids



# Regulatory Compliance and Nutritional Claims

Beverages enriched with **PROTEOSOL™** can qualify for significant nutritional claims under major international regulations:

## European Union (EFSA)

- "Source of protein" ( $\geq 12\%$  of the energy value provided by protein)
- "High protein content" ( $\geq 20\%$  of the energy value provided by protein)
- "Contributes to the maintenance of muscle mass" (authorised claim for proteins)

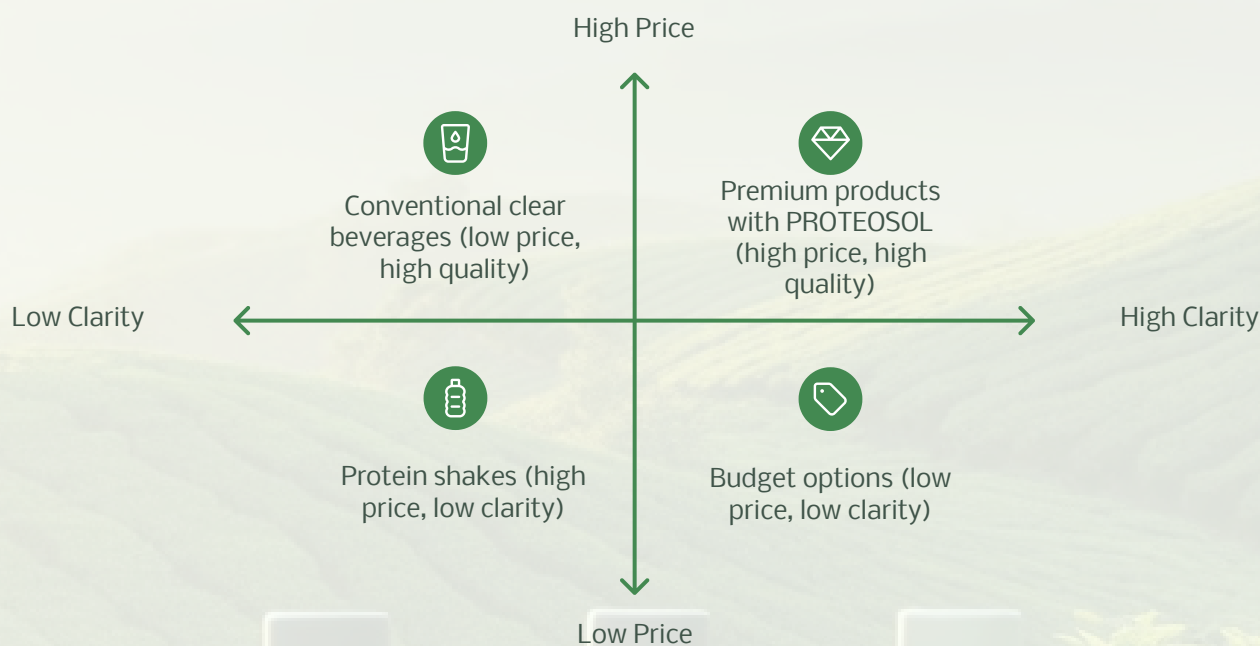
## United States (FDA)

- "Good source of protein" (5-9.9g per serving)
- "Excellent source of protein" ( $\geq 10\text{g}$  per serving)
- "Complete protein" (contains all essential amino acids)

These results, under real production conditions, confirm that **PROTEOSOL™** not only offers theoretical advantages but also concrete and verified solutions to the specific challenges faced by the tea and analogues industry, enabling the development of innovative products that meet both organoleptic and nutritional expectations.



# Competitive Differentiation and Market Opportunities



## Expansion into Unexplored Innovation Territories

**PROTEOSOL™** opens the door to a new generation of tea and analogous beverages that combine advanced nutrition with the premium sensory experience characteristic of quality infusions. This unique positioning provides access to high-value, fast-growing market segments:

### Immediate Market Opportunities

- Premium RTD tea and analogous beverages with protein claims: estimated market of €1.2 billion in Europe by 2025
- Tea- and analogous-based post-workout functional drinks: projected annual growth of 24% until 2027
- Enriched wellness teas and analogues for the senior segment: potential of €850 million in Japan and Korea alone
- Functional infusions with specific benefits: segment with higher willingness to pay premium prices (+70% over base)

### Exclusive Competitive Advantages

- Technological barrier: patented process impossible to replicate without IP infringement
- Time-to-market: immediate implementation without the need for complex reformulations
- Scalability: **PROTEOSOL™**'s production capacity already adapted to industrial volumes
- Sustainability: 100% plant-based protein production with low environmental impact

# Strategic Positioning in the Premium Beverage Sector

## Phase 1: Innovation

Introduction of premium RTD tea and analogue lines with **\*\*PROTEOSOL™\*\***, highlighting crystal clear clarity and protein enrichment as key differentiating elements.

## Phase 3: Consolidation

Establishment of a new beverage category where optical clarity and nutritional enrichment are not mutually exclusive.

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## Phase 2: Expansion

Development of specialised ranges by functional benefit (sports recovery, cognitive well-being, weight management), maintaining sensory excellence as the core focus.

The transformative potential of **\*\*PROTEOSOL™\*\*** in the tea and analogue industry transcends mere product innovation, becoming an element of categorical disruption. The possibility of combining the millennia-old tradition of tea and analogues with the latest advances in protein nutrition represents a unique opportunity to redefine consumer expectations and create a new generation of functional beverages that do not sacrifice an iota of sensory experience.



- Intabiotech SL offers comprehensive support for the implementation of **\*\*PROTEOSOL™\*\*** into your product portfolio, including technical assistance in formulation, customised stability studies, and specific regulatory documentation for each target market. Please visit [www.intabiotech.com](http://www.intabiotech.com) for more information or contact our technical team.

# Ready to transform your beverages? Contact Intabiotech.

At Intabiotech, we are prepared to help you integrate **PROTEOSOL™** into your products and bring innovation to your range of tea and analogue beverages. Our team of experts is at your disposal to offer technical support, formulation advice, and all the necessary information to ensure your project is a success. Please do not hesitate to contact us via the following channels:



## Commercial Enquiries

For information on pricing, orders, and other business opportunities, our sales team is ready to assist you.

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## Technical Support & R&D

If you have technical questions, need assistance with any aspect of formulation, or require further new developments, please contact our specialists.

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## General Information

For any other enquiries or to learn more about Intabiotech and our vision, please visit our website or send us a message.

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**We look forward to the opportunity of collaborating with you and revolutionising the protein beverage industry together.**

