



PARRY<sup>TM</sup>  
Nutraceuticals



# Harness the Power of Organic Spirulina

A guide to selecting the  
highest-quality Spirulina  
for your application

# SPIRULINA QUALITY – AND WHY IT MATTERS

Spirulina is the nutrient-dense dried biomass of freshwater *Arthrospira* spp. microalgae – a versatile, whole food source of plant-based complete protein and bioactives. Scientific research has demonstrated Spirulina's ability to deliver a range of health benefits, supporting its status as a superfood<sup>1</sup> and, in turn, increasing demand. As a result, the global market for Spirulina is forecast to grow by 11% CAGR to \$1.2 billion between 2023 and 2030.<sup>2</sup>

With Spirulina's popularity growing, many suppliers are entering the market and/or increasing the volumes available. While it can be tempting to select the cheapest option, **it's important to note that not all Spirulina is equal**. Spirulina quality varies greatly and is determined by a wide range of factors. As such, it is always recommended that you ask your supplier for clarification on the points listed below to ensure the quality and safety of the Spirulina you source.

## SPIRULINA QUALITY CHECKLIST



**Sun exposure** – Spirulina thrives in high-intensity sunlight and pristine environments. Suboptimal conditions reduce growth, nutrient content, and pigment synthesis.



**Strain** – Proven, human-safe Spirulina strains offer high levels of pigment, protein, and antioxidants, which help ensure nutritional potency.



**Harvesting** – Should be carried out during Spirulina's peak growth phase to ensure maximum nutrient density.



**Processing technique** – Gentle, minimal processing helps keep Spirulina's delicate cell structure intact, preserving nutrient integrity.



**Nutrient profile** – Spirulina should offer not just 60-70% protein content, but also high levels of pigments and essential fatty acids.



**Purity** – It's vital to have full traceability from cultivation to end-product, to ensure low heavy metal and polycyclic aromatic hydrocarbon (PAH) contamination levels even at high dosages.



**Water quality** – Spirulina grows in fresh water, so a clean and controlled supply minimizes the risk of contamination by industrial or agricultural run-off.



**Third-party certifications** – Spirulina should be compliant with globally recognized safety and quality standards, including cGMP, BRCGS, USP®.

# PARRY ORGANIC SPIRULINA: THE HIGHEST QUALITY AND SAFETY

Parry Nutraceuticals' Organic Spirulina is the only Spirulina in the market that meets all of these criteria.

**It is certified organic by the top three certification bodies – USDA NOP, the European Union and the organic farming association Naturland, and is the first and only organic Spirulina to complete the United States Pharmacopeia (USP) Dietary Ingredient Verification Program. It also has FDA GRAS status.**

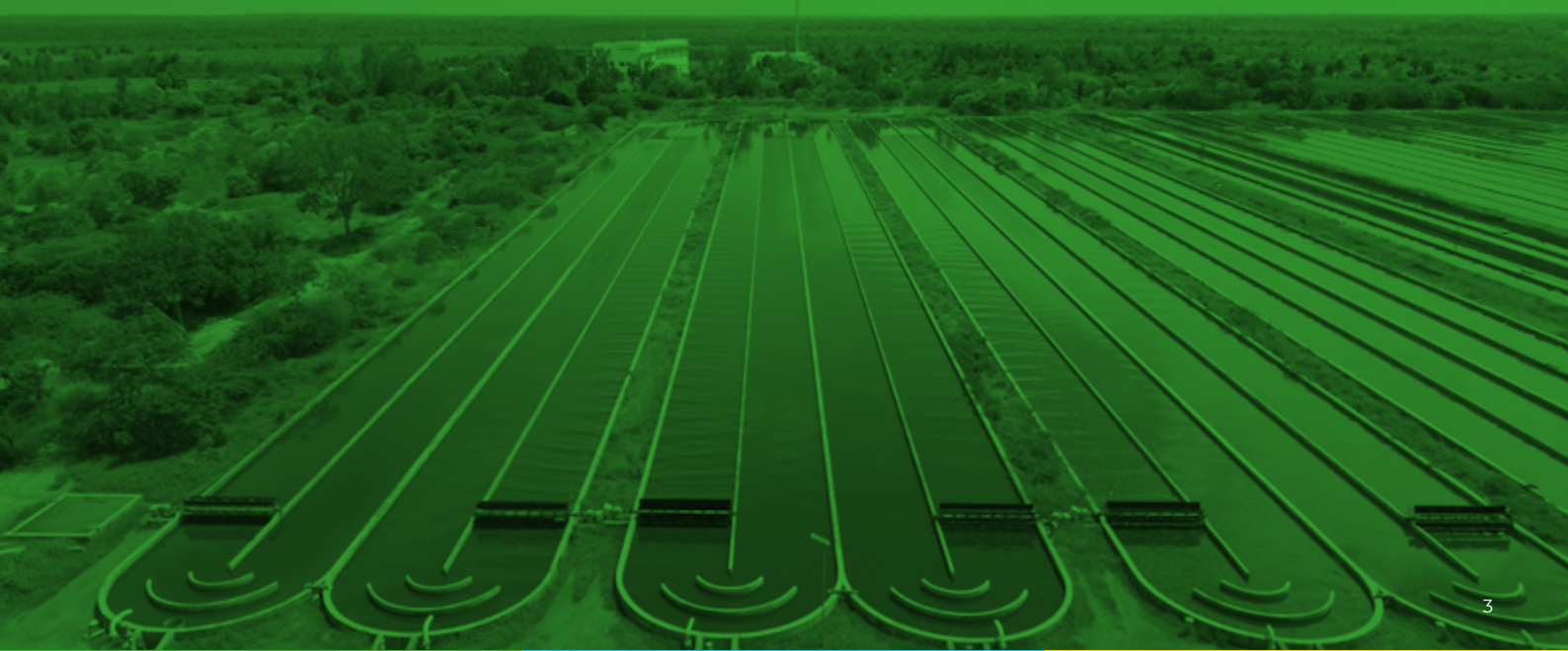
It is fully traceable from raw material to finished product, with a dedicated Parry Nutraceuticals quality assurance team closely monitoring each batch on a daily basis.

Parry Organic Spirulina is cultivated from non-GMO *Arthrospira platensis* in environmentally pristine, controlled raceway ponds in the tropical state of Tamil Nadu in southern India. This remote, pollution-free location receives year-round, high-intensity sunlight, which is essential for growth. Harvesting takes place at the exponential phase, when biomass, protein, and pigments are accumulating at the fastest rate. This optimizes **nutrient density** and contributes to the **synergistic functional benefits** of the many phytochemicals in Spirulina.

The Spirulina is processed using Parry's Tuymai system (Tuymai means 'clean' in local language of Tamil Nadu). This process employs a four-step filtration method to preserve cell structure and conserve sensitive compounds, including pigments and vitamins. The result is a pure, higher quality biomass with superior organoleptic characteristics and optimized nutrient bioavailability.

- ✓ Pristine location
- ✓ Certified USP & Organic Naturland
- ✓ GMP Process
- ✓ Unique process to maximize nutrition

To highlight the exceptional quality of its Organic Spirulina, Parry Nutraceuticals carried out a study to compare it with eight existing Spirulina brands from the EU and USA using raw material sourced from China. The study encompassed a range of metrics, including pigment content and contaminant levels. The results, which are detailed on the next page, demonstrated the superiority of Parry's Spirulina in all respects.



# Superiority of Parry Organic Spirulina: Test #1

## PIGMENT LEVELS

High levels of pigments such as phycocyanin, beta-carotene, and chlorophyll are a sign of Spirulina quality and functionality, demonstrating optimal growing conditions and careful processing.

In the comparison tests, Parry Organic Spirulina's pigment levels were 20-30% higher than in all eight brands tested and outperformed both its own specification and that of the USP Spirulina monograph. In addition, Parry Organic Spirulina offered 10 percentage points more phycocyanin than the average across all other Spirulina products tested. The results are presented in the graphs here (Figures 1, 2, and 3).

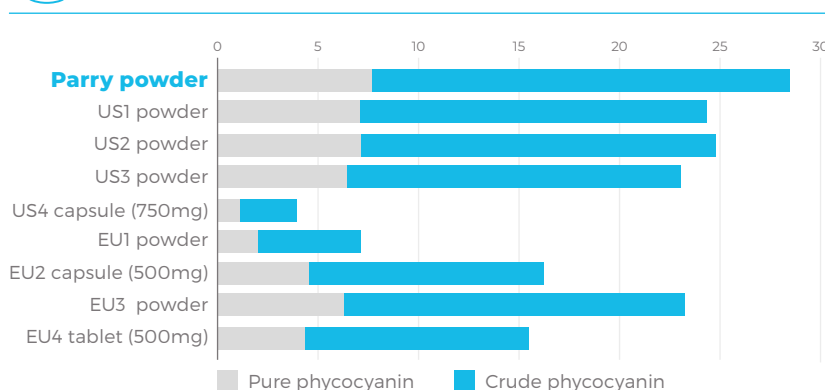
Sample sources:

US = USA

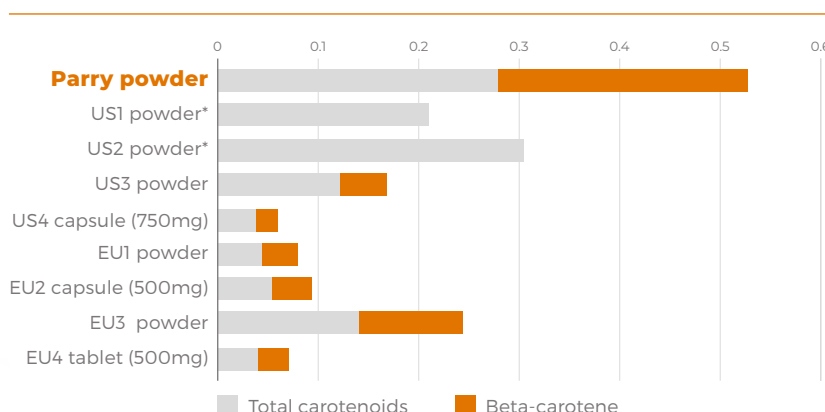
EU = European Union



**Figure 1. Percentage of *phycocyanin* pigment in Parry Organic Spirulina vs eight existing brands.**



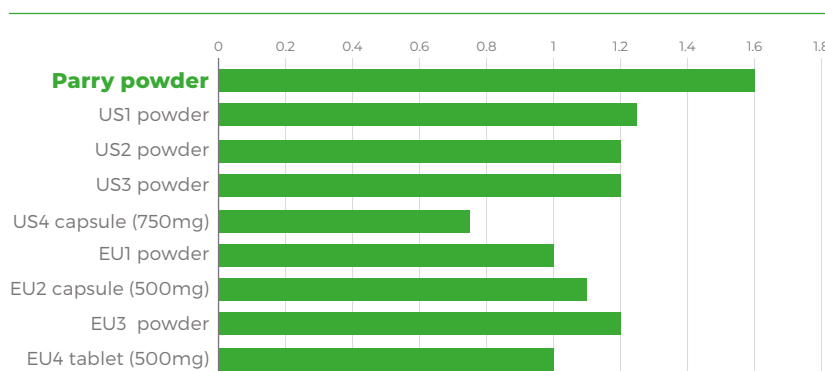
**Figure 2. Percentage of *carotenoid* pigment in Parry Organic Spirulina vs eight existing brands.**



\*Beta-carotene not tested in these samples



**Figure 3. Percentage of *chlorophyll* pigment in Parry Organic Spirulina vs eight existing brands.**



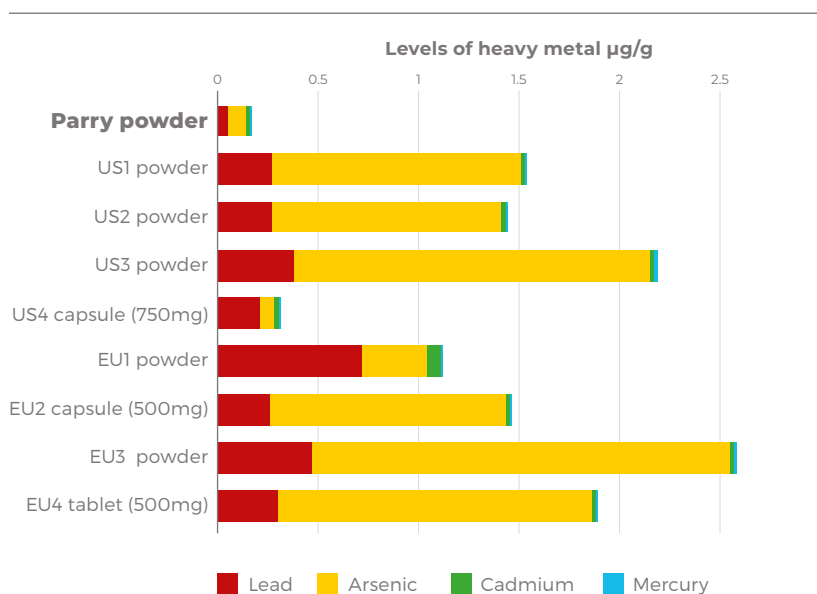
# Superiority of Parry Organic Spirulina: Test #2

## SAFETY STANDARDS

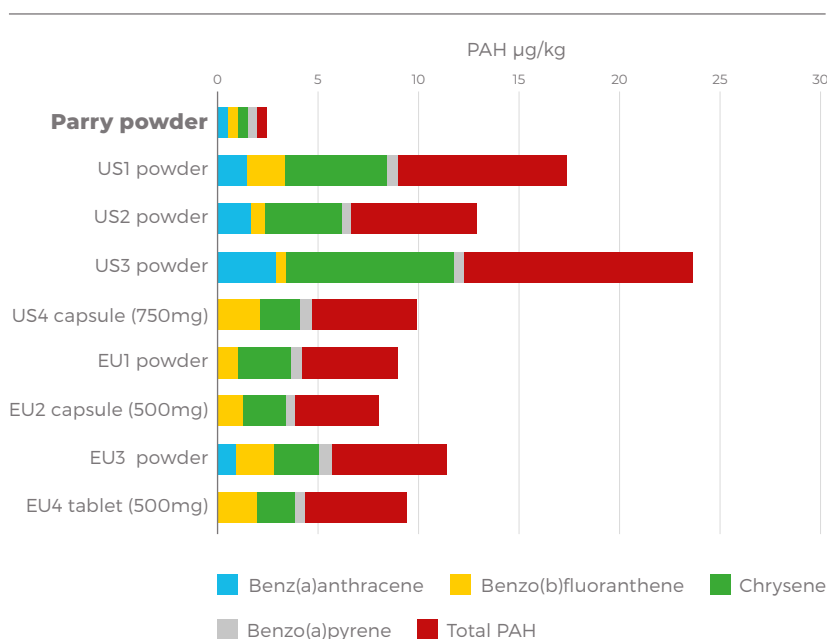
Spirulina is a bioaccumulator, readily absorbing any substances that enter its localized environment and concentrating them in its biomass. These substances might include toxic heavy metals, including lead, arsenic, cadmium, and mercury, and PAHs. As such, it is crucial these contaminants are present only at very low levels for safety reasons and for compliance with international regulations.

In the comparison study, Parry Organic Spirulina was found to have significantly lower levels of heavy metals and PAHs than the eight market samples, and levels of heavy metals 50% below the stringent USP Spirulina monograph thresholds. Heavy metal content was 70% less than the EU organic average and compliant with strict California Prop 65 food and nutraceutical safety standards at high servings of 6 to 8 gm daily. PAH levels were three to five times lower than EU regulatory requirements. The results can be seen in the graphs here (Figures 4 and 5).

**Figure 4.** Levels of heavy metals in Parry Organic Spirulina vs eight existing brands.



**Figure 5.** Levels of PAH contaminants in Parry Organic Spirulina vs eight competitor brands.





# DIGESTIBILITY, GUT HEALTH, AND IMMUNITY

Spirulina is an exceptionally high quality, complete protein offering all nine of the essential amino acids required for good health. Complete proteins are typically more digestible and bioavailable than incomplete sources, which lack or are low in at least one essential amino acid.

Efficient protein digestibility supports nutrient absorption in the small intestine. This minimizes the risk of poorly digested proteins passing into the large intestine, where fermentation produces byproducts harmful to gut health, affecting gut-barrier integrity, immunity, and disrupting gut microbiota balance.

Harnessing its status as both an expert in microalgae science and a large-scale producer, Parry Nutraceuticals' medical and science team explored this area further by conducting a series of studies investigating the digestibility of its Organic Spirulina, and its effects on gut health.

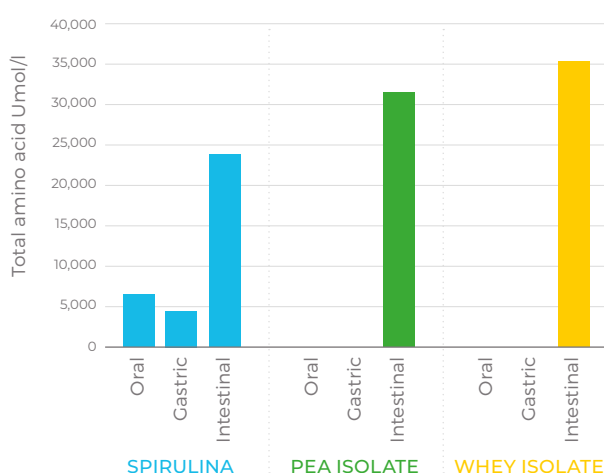


# Breakthrough Study – Parry Organic Spirulina and PROTEIN DIGESTIBILITY

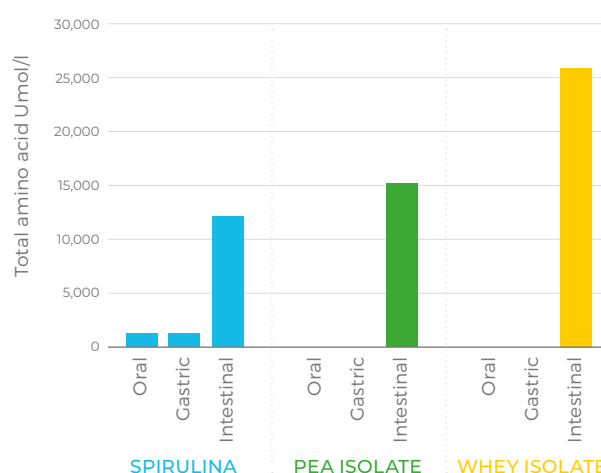
An *in vitro* study compared the digestibility of Parry Organic Spirulina protein to that of pea protein isolate (with whey protein isolate as a positive control).

Using a model of human digestion, intact protein, peptides, and amino acids were measured across the three digestive phases – oral, gastric, and small intestinal.

In contrast to the pea and whey, Parry Spirulina was shown to rapidly release free amino acids as early as the oral phase (Figure 6). Of these, almost 57% were essential amino acids (Figure 7).

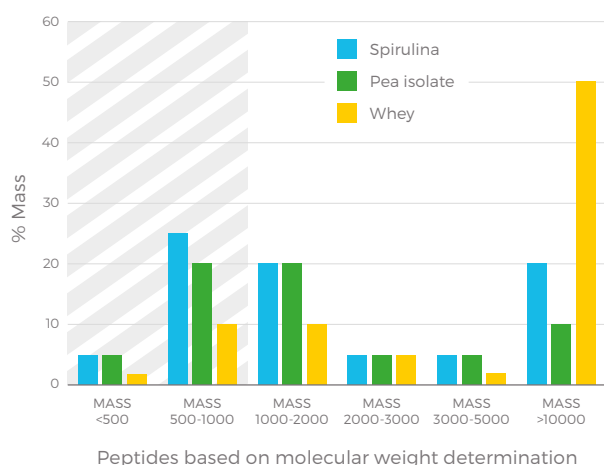


**Figure 6: Total amino acid release**

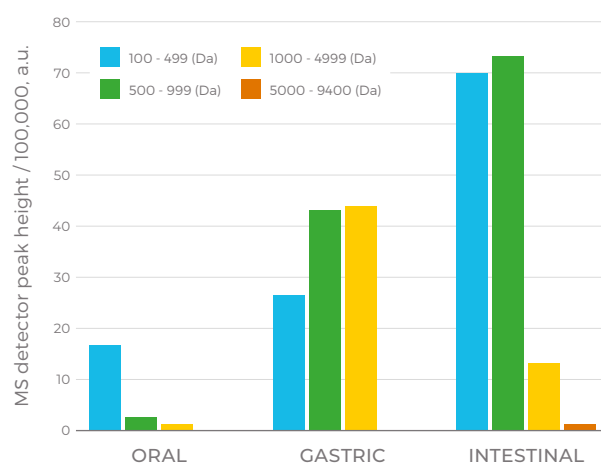


**Figure 7: Essential amino acid release**

In the intestinal phase (Figure 8), the percentage of small peptides available from Spirulina was around 25% – comparable with pea protein isolate. The systematic increase in the percentage of total peptides and the shift from larger to smaller peptides as Spirulina digestion progressed indicated high bioavailability (Figure 9).



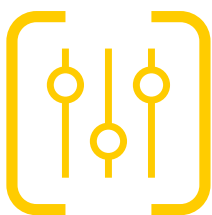
**Figure 8. Peptide release in the intestinal phase (smaller peptides = better availability)**



**Figure 9. Total amount of peptides increases as spirulina digestion progresses**

## Breakthrough Study – Parry Organic Spirulina and GUT HEALTH

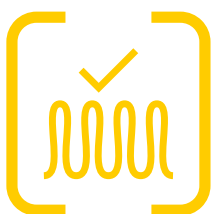
In the second phase of the research, an *in vivo* study investigated the effects of gut health following two weeks of Parry Organic Spirulina supplementation. The following findings were recorded:



Higher counts of ‘friendly’ *Lactobacilli* spp. and *Bifidobacterium* spp. bacteria, and fewer harmful *Clostridium* spp. bacteria – suggesting that Parry Organic Spirulina can **modulate gut microbiota**.



Elevated gut levels of the anti-inflammatory cytokine IL-10, which may signify an increase in anti-inflammatory macrophages. It may also indirectly correlate with a **strong immune response** in the gut lining’s lamina propria, a layer of tissue which is crucial for preserving gut-barrier integrity and supporting the health and function of nutrient-absorbing villi.



**Maintenance of normal villi structure** and architecture, indicative of a well-functioning gut with good gut-barrier integrity.

**Together, the data from both studies demonstrate how Parry Organic Spirulina benefits whole gut health.**





# A NUTRITIONAL POWERHOUSE

Parry Organic Spirulina is naturally **rich in key, highly bioavailable nutrients**, including the following:



All the **essential amino acids** – it is a complete source of plant protein (60-70% of biomass).



**Phycocyanin pigment** – one of the **highest levels in the global market**, with potent antioxidant and immunomodulatory activity.



**Carotenoid pigments**, including beta-carotene, the primary precursor for vitamin A – important for maintaining normal vision, skin, and immune function.



A high percentage of **gamma-linolenic acid**, which aids anti-inflammatory lipid balance and immunity.



**Sulphated polysaccharides** – a type of carbohydrate with antiviral properties.



**Bioavailable iron** – supporting normal red blood cell formation, immunity, cognitive function, energy-yielding metabolism, and reduction of tiredness and fatigue. **Natural, bioavailable iron** from Parry's Organic Spirulina is a particularly strong proposition in the market for products targeting **women's health**.



A full range of **B vitamins**, which have multiple accepted health claims for normal energy metabolism, nervous system and cognitive function, blood formation, and fatigue reduction.

With such a wide range of micronutrients, Parry Organic Spirulina is a true superfood. In fact, its biomass delivers nearly all the essential phytonutrients the human body needs to stay healthy and function normally.

Parry Organic Spirulina is available in a number of flexible formats:



**Powder**



**Tablets** – these can, uniquely, be punched with a brand logo



**Granules** – an alternative to powder, which is compressible into tablets and ideal for inclusion in cereals, cereal bars, chocolate, dairy (cheese and yogurt) and other pastry recipes.



**XTRA** – which contains 20% more phycocyanin (available in tablet and powder formats)

It is suitable for use in a wide range of applications, including:



**Dietary supplements**



**Beverages**



**Smoothies**



**Bakery goods**



**Snack bars**



**Protein bars**



**Dairy products**



**Pasta and noodles**

# ON-TREND BENEFITS

Parry's Spirulina is a nutritional ingredient closely aligned with a number of key trends in the market and, as such, offers superb potential for product innovation.



## COMPLETE PROTEIN

Protein has become a hero nutrient among health-conscious consumers. As a result, the market for protein-rich products is increasingly crowded. **It pays, therefore, to offer differentiation, and here Parry Organic Spirulina excels.** It is an all-natural source of complete plant protein, providing all the essential amino acids and, crucially, is easily digested and highly bioavailable.



## GUT HEALTH AND IMMUNITY

Digestive and immune health continue to be top health priorities for consumers. As demonstrated in the digestibility and gut studies,<sup>1</sup> Parry Organic Spirulina is easily and rapidly digested, supporting **nutrient absorption** and promoting the **growth of beneficial gut bacteria**.



## NUTRITIONAL SUPPORT FOR GLP-1 USERS

The rapid rise of GLP-1 medications presents a challenge for manufacturers but also an opportunity. These drugs work by mimicking the hunger-suppressing GLP-1 hormone, which is produced in the gut after eating. As a result, users experience a substantial reduction in appetite, which means they are at **risk of inadequate nutrient intake**. The rich nutrient density of **Parry Organic Spirulina makes it a powerful tool that could help GLP-1 users bridge this gap**. Furthermore, emerging *in vitro* research suggests a Spirulina-derived peptide called SP6 could even elevate circulating GLP-1 levels, indicating potential for non-pharmaceutical products that help to generate similar effects.<sup>3</sup>



## CLEAN LABELS

Parry Organic Spirulina undergoes minimal processing using a patented downstream process, which ensures the highest levels of nutrition and bioactives in the final product. It is non-GMO Project Verified, 100% vegetarian, and carries multiple organic certifications. Quite simply, it is the ultimate **clean label nutrition ingredient** and is sure to appeal to the large numbers of consumers who value clean and clear labels.



# Good on the inside

Parry Organic Spirulina is a complete plant protein ingredient, rich in essential nutrients, with gut health and immunity benefits. In a nutshell, it is:

- ✓ The world's **only USP ingredient-verified Spirulina**
- ✓ A clean label, non-GMO ingredient with **global organic certification, premium organic EU Naturland certification, and USDA NOP**
- ✓ FDA GRAS status
- ✓ Sustainably produced and fully traceable
- ✓ Scientifically supported
- ✓ Easily digested
- ✓ **Richer in phycocyanin and carotenoid pigments** than other brands available in the market
- ✓ Rich in essential fatty acids, carbohydrates, vitamins, and minerals
- ✓ A promoter of **beneficial gut bacteria growth and gut-barrier integrity, and smaller peptides**
- ✓ Available in powder, granules and tablet formats and formulations
- ✓ An excellent superfood, suitable for a wide range of food, beverage, and supplement applications





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🌐 [www.parrynutraceuticals.com](http://www.parrynutraceuticals.com)

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Learn more about  
how we produce Parry  
Organic Spirulina



See how we build  
sustainability into our  
manufacturing process

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3. Carrizzo et al. Abstract 13544: a naturally-derived spirulina peptide reduces the deleterious vascular effects of hyperglycemia regulating the DPP-IV activity and LPCAT1. Circulation, 2022;146:suppl