

BioSyntex

MICROALGAE FOR A GREEN ECONOMY.



Microalgae

Transforming Food Innovation

Applications

Bakery | Beverages | Pasta & Snacks
Meat Analogs | Dairy Analogs

Products

Nutrition



AboutUs

BioSyntex Srl (BSX)

Founded in 2018 with a share capital € 2.3 million.

Innovative applications

A multidisciplinary team of biologists, biotechnologists work alongside universities and Strategic Partners to develop new applications out from our biomasses and extracts.



Sustainability

to convert by-products and CO₂ into natural raw materials from sustainable alternative sources.



Environment

to preserve natural resources and mitigate environmental impact.



Health

to reduce our dependence on synthetic compounds and promote the use of microalgae in formulating natural products intended for end customers.





Our Microalgae



100%
Natural



Additive
free



Fiber



Superfood



Protein



Vitamin
B12



GMO
free



Fertilizer
free



Omega-3



Vegetarian



Vegan



Lactose
free



Gluten
free



Sports
& Fitness

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Our Microalgae

Specials					
	Natural food dyes	Fragrance & flavor	Techno-Functional highlights	Nutritional highlights	Applications in food
Yellow Chlorella	 Vibrant yellow color	Delicate, tart, yeasty and malt-like	<ul style="list-style-type: none"> Emulsion capacity Emulsion stability Gel-forming capacity Water retention prolong the shelf life of a product by lowering humidity and aw 	High in protein, fibers and Vitamin B12	Egg and meat analogs, bakery, patisserie, pasta, food supplement, smooths, soups, sauces, emulsions and enrichment of flour
White Chlorella	 No hue shifts	Delicate, malt-like, nuts and yeasty	<ul style="list-style-type: none"> Emulsion capacity Emulsion stability Water retention prolong the shelf life of a product by lowering humidity and aw 	High in protein, fiber and Vitamin B12, source of ALA (Omega-3)	Egg and meat analogs, bakery, patisserie, pasta, food supplement, smooths, sauces and enrichment of flour
Organic Spirulina Iron Plus	 Green-blue color	Same of standard Spirulina	<ul style="list-style-type: none"> Oil absorption Emulsion capacity Water retention prolong the shelf life of a product by lowering humidity and aw 	Source of bioavailable iron. Source of vitamin E. "Alpha - Tocopherol" deficiency leads to weakness and damage of erythrocytes. Enhance the production of ferritin, leading to a major iron accumulation. C-PC binds the iron present into the biomass, making it absorbable the level of the gastrointestinal system.	Sport food, Protein food, Energy bars, Food supplements
Classic					
	Natural food dyes	Fragrance & flavor	Techno-Functional highlights	Nutritional highlights	Applications in food
Green Chlorella	 Vibrant green color	Delicate, green, hint of the sea	<ul style="list-style-type: none"> Oil retention Gel-forming capacity Water retention prolong the shelf life of a product by lowering humidity and aw 	High in protein and fibers, source of Vitamin B12 and Zinc	Smoothies, bakery, pasta, food supplement, soups, sauces and emulsions
Organic Spirulina	 Green-blue color	Delicate, green, vegetal and reminiscent of the sea	<ul style="list-style-type: none"> Oil absorption Emulsion capacity Water retention prolong the shelf life of a product by lowering humidity and aw 	High in protein, source of fibers, Vitamin B12, iron and ALA (Omega-3)	Supplementing nutrition, snacking, garnishing and finishing dishes
LAB & Yeast Fermented					
	Natural food dyes	Fragrance & flavor	Techno-Functional highlights	Nutritional highlights	Applications in food
Sour Chlorella/Spirulina	 Yellow, white and green color	Sour flavour. improved taste thanks to LAB & Yeast fermentation	<ul style="list-style-type: none"> Emulsion capacity Emulsion stability Water retention prolong the shelf life of a product by lowering humidity and aw 	Improved flavor & taste, higher digestibility, antioxidant and antiinflammatory activity	Dairy, bakery, food supplements, pasta

YellowChlorella

Nutrition

Source of Vitamin B12, which supports normal immune and nervous system function, cognitive functions, as well as red blood cell formation and energy metabolism.

Yellow Chlorella is rich in protein, which helps preserve muscular mass and promotes bone health.

The presence of alfa-linoleic acid (ALA), an Omega-3 fatty acid, promotes healthy levels of blood cholesterol.



35,0-40,0% Protein
20,0% Fibers
10,0% Lipids
**2,7% Vitamins
& Minerals**

Functionality

Naturally yellow color, Soft flavor, Versatility in use, Potential natural colorant, Nutritional enrichment, Texture enhancer, Water solubility, High emulsifying capacity.



WhiteChlorella

Nutrition

White Chlorella boasts a wealth of vital nutrients such as vitamins (including B), minerals (iron, magnesium, zinc), protein, and dietary fiber. It can contribute to the overall food nutritional content.

The biomass contains Vitamin B12, which contributes to a normal immunitary, nervous systems function, cognitive functions and promotes energy metabolism.

Chlorella components may have immune modulating effects to immune system support.

Functionality

Naturally white color, Mild flavor, Fine particle, Versatile application, Allergen-free, Clean label, High emulsifying capacity, Texture enhancement.



43,0% Protein
15,0% Fibers
9,0% Lipids
3,6% Vitamins & Minerals



GreenChlorella

Nutrition

Green Chlorella is rich in essential nutrients, including vitamins (such as B vitamins), minerals (like iron, magnesium, zinc) and protein.

Contains antioxidants like chlorophyll and carotenoids, which help neutralize free radicals in the body and contribute to overall health.

The presence of alfa-linoleic acid (ALA), an omega-3 fatty acid, promotes healthy levels of blood cholesterol.



33,0% Protein
16,0% Fibers
7,5% Lipids
**4,3% Vitamins
& Minerals**

Functionality

Green color, Smooth flavor, Innovative culinary applications, Texture enhancement, Versatility in use.



Organic Spirulina

Nutrition

Organic Spirulina contains a high protein content contributing to the preservation of muscular mass and bone health.

Source of Vitamin B12, supporting normal immune and nervous system function, cognitive functions.

Spirulina contains a variety of antioxidants (including beta-carotene, phycocyanin, and chlorophyll) protecting cells from oxidative stress and supporting overall well-being.



60,0% Protein
6,5% Lipids
6,0% Fibers
**5,5% Vitamins
& Minerals**

Functionality

Mild and slightly earthy flavor, Natural umami flavor, Blue-green color, Nutrient-rich, High protein content, Essential fatty acids, Antioxidant properties, Nutrient density, Claim health benefits.



Organic
Agriculture



Organic Spirulina Iron Plus

Nutrition

The possibility of changing the biochemical composition of Spirulina is an opportunity to obtain products with improved nutritional properties (e.g. oligo and microelements).

Iron fortified Spirulina provides an organic iron source, overcoming the side-effects typical of oral iron salts administration.

Potential source of dietary iron to address IDA (Iron Deficiency Anemia).



60,0% Protein
6,5% Lipids
6,0% Fibers
5,5% Vitamins & Minerals

Min. 3g/kg Fe

Bioaccessibility and iron speciation Spirulina Iron Plus

Source of bioavailable iron.

Source of vitamin E. "Alpha - Tocopherol" deficiency leads to weakness and damage of erythrocytes.

Enhance the production of ferritine, leading to a major iron accumulation.

C-PC binds the iron present into the biomass, making it absorbable the level of the gastrointestinal system.



Organic
Agriculture



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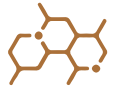
SourChlorella/Spirulina

Nutrition

Yeast & Lactic acid fermentation enhances food preservation, aroma, texture, and nutritional profiles. LAB and Yeast improve the safety, shelf life, and sensory properties of several food stuff, demonstrating health benefits like gut colonization, cholesterol reduction, and antioxidant effects. The rising demand for lactose-free and vegan alternatives has highlighted algae, such as Chlorella, as an ideal substrate for LAB & Yeast fermentation due to its high nutritional value and bioactive properties. Our fermented Chlorella products (Yellow, White, Green)



Probiotics



↑ **Polyphenols**



↑ **Digestibility**



↑ **Antioxidant**



↓ **Free Sugars**

show enhanced LAB growth, improved nutritional quality and taste and increased antioxidant capacity.

Functionality

Fermented flours improve digestion due to probiotics, increase nutrient bioavailability, and reduce the content of antinutrients.

Additionally, they promote gut health and contribute to a more complex flavor and better digestibility compared to non-fermented flours.

**Lactobacillus
plantarum**



**Saccharomyces
cerevisiae**



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Bakery Apps

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Bakery Applications

Specials	Fragrance & flavor	Techno-Functional highlights	Nutritional highlights
Yellow Chlorella 	<ul style="list-style-type: none"> Strengthening the bread's structure and expanding it in size. High sensory acceptance with high incorporation rates. 	<ul style="list-style-type: none"> Up to 10% w/w provide a bright yellow color. High sensory and color acceptance with high incorporation till 10% w/w Increases dough water retention, resulting in stiffer cookies. 	<ul style="list-style-type: none"> Yellow color is seen when it contains at least 5%w/w microalgae. Increases water retention, resulting in stiffer bars with less moisture and Aw and a longer shelf life.
White Chlorella 	<p>Strengthening the bread's structure and expanding it in size. High sensory acceptance with high incorporation rates.</p>		<ul style="list-style-type: none"> Up to 5% w/w incorporation results in no color changes. Increases water retention, resulting in stiffer and crunchier bars with less moisture and Aw and a longer shelf life.
Organic Spirulina Iron Plus 	<ul style="list-style-type: none"> Green-blue color endures through storage. The loaf's inside is lighter in color while the crust generally turns browner (Maillard reaction). Incorporating up to 2% w/w promotes dough elasticity and provides good sensory acceptability with a light scent and flavor. 	<ul style="list-style-type: none"> Green-blue color endures through storage. The color is seen when cookies contains at least 5% microalgae. Increases dough water retention, resulting in stiffer cookies with less moisture and Aw and a longer shelf life. Low incorporation has delicate flavors and is highly sensory acceptable. Up to 6% w/w yields distinct and mild flavors. 	<ul style="list-style-type: none"> Source of bioavailable iron. Source of vitamin E. "Alpha - Tocopherol" deficiency leads to weakness and damage of erythrocytes. Enhance the production of ferritin, leading to a major iron accumulation. C-PC binds the iron present into the biomass, making it absorbable the level of the gastrointestinal system.
Classic	Fragrance & flavor	Techno-Functional highlights	Nutritional highlights
Green Chlorella 	<ul style="list-style-type: none"> Green color is seen when it contains at least 3% w/w microalgae. The loaf's inside is lighter in color while the crust generally turns browner (Maillard reaction). Up to 2% w/w improves the bread's ability to retain moisture and strengthens the gluten protein network, resulting in doughs that are firmer, crispier, and more viscoelastic. High levels of sensory acceptance even with high incorporation rates. It is possible to substitute up to 4% w/w flour in bread or wraps. 	<ul style="list-style-type: none"> Green color is seen when it contains at least 3% w/w microalgae. Increases dough water retention, resulting in stiffer cookies with less moisture and water activity (aw) and a longer shelf life. Low incorporation adds delicate flavors resulting in high sensory acceptance. Up to 6% w/w yields distinct and mild flavors. 	<ul style="list-style-type: none"> Green color is seen when it contains at least 5% microalgae. Increases water retention, resulting in stiffer and crunchier gluten bars with less moisture and Aw and a longer shelf life. ≥5% w/w or more strengthens the gluten-free structure, increasing the stiffness, adhesiveness, cohesion, and viscoelasticity of the bars. ≥5% w/w has a delicate flavor and scent, with a strong preference for texture.
Organic Spirulina 	<ul style="list-style-type: none"> Green-blue color endures through storage. The loaf's inside is lighter in color while the crust generally turns browner (Maillard reaction). Incorporating up to 2% w/w promotes dough elasticity and provides good sensory acceptability with a light scent and flavor. 	<ul style="list-style-type: none"> Green-blue color endures through storage. The color is seen when cookies contains at least 5% microalgae. Increases dough water retention, resulting in stiffer cookies with less moisture and Aw and a longer shelf life. Low incorporation has delicate flavors and is highly sensory acceptable. Up to 6% w/w yields distinct and mild flavors. 	<ul style="list-style-type: none"> Increases water retention, resulting in stiffer and crunchier bars with less moisture and Aw and a longer shelf life. Up to 5% w/w has a delicate flavor and scent, with a strong preference for texture.
LAB & Yeast Fermented	Fragrance & flavor	Techno-Functional highlights	Nutritional highlights
Sour Chlorella/Spirulina 	<ul style="list-style-type: none"> Sour flavor and aroma. Increased antioxidant and polyphenol content. 	<ul style="list-style-type: none"> Increased water absorption and dough stability. Up to 10% inclusions. Sour flavor and aroma. Increased antioxidant and polyphenol content. 	<ul style="list-style-type: none"> Sour flavor and aroma. Increased digestibility. High protein. Rich in Vitamines.



The integration of microalgae such as spirulina and chlorella into **bakery products** marks a nutritional revolution.

These superfoods not only enhance the color and flavor but also contribute essential nutrients, making baked goods a **healthier and innovative dietary choice.**



Beverages Apps

Beverages Applications

Specials

Juices

Shakes & Smoothies

Yellow Chlorella



- Mild flavor
- Enhances the vivid yellow color of the juice.
- Color stability is extended when stored at low temperatures.
- Microalgae's high water retention thickens liquids increasing beverage viscosity.

- Thickener.
- Emulsification and solubilization is more effective at lower temperatures.

White Chlorella



- Because to microalgae's strong water retention, it thickens fluids while having minimal impact on taste.
- It usually has a little effect on the color, giving it a creamier, lighter appearance.
- It has great observability for thickening and solubility, and it emulsifies more effectively at lower temperatures.

Classic

Juices

Shakes & Smoothies

Green Chlorella



- Up to 3% w/w has an unnoticeable mild flavor and a vivid green color.
- Nutritional advantages, such as higher protein and mineral content, are already evident with a 2% w/w addition.

- Up to 2% w/w in the smoothie part offers complete coverage of the recommended daily dose of vitamin C once produced and slows down the degradation of the same vitamin throughout a 17-day shelf life.
- At 2% w/w structural reinforcement is already evident, leading to smoother surfaces that are more stable for up to 28 days.

Organic Spirulina



- Adding 1% w/w microalgae powder: has no impact on product acceptance; It does induce an 8% increase in protein and an 8% decrease in carbohydrates; It has a shelf life of 19 months and a higher purchasing intention.
- It usually darkens liquids with low pH that are treated at high temperatures.

- Up to 2% w/w in the smoothie part offers complete coverage of the recommended daily dose of vitamin C and vitamin B12 once produced and slows down the degradation of the same vitamin throughout a 17-day shelf life.
- It thickens fluids because of strong water retention.



The incorporation of microalgae into **beverages** has gained popularity for their nutritional benefits.

These algae, rich in vitamins and antioxidants, **enhance the drink's health profile**, offering a unique and sustainable option for



Pasta & Snacks Apps

Pasta & Snacks Applications

Specials

Pasta with and without Gluten

Adding more than 50% w/w microalgae creates a rebound effect that strengthens the dough's gluten network

Snacks

Yellow Chlorella



- Up to 3% w/w increase in firmness and swelling of dough after cooking because of water retention and gelling ability of microalgae.
- Up to 2% w/w excellent sensory acceptance and consistent colors after cooking.
- The heating water removes some of the yellow hue.

- A decrease in water loss and Aw and an increase in humidity might be observed.
- Increases the mass's viscosity, elasticity, and textural properties—specifically, firmness, hardness, and adhesiveness.

White Chlorella



- A 2% to 10% w/w application it is possible reducing flour content, boost firmness and chewiness to enhance texture, and increase nutritional qualities as more protein and fiber.

- Even in large %, causes minimal color changes.
- A decrease in water loss and Aw and an increase in humidity.
- Increases the mass's viscosity, elasticity, and textural properties—specifically, firmness, hardness, and adhesiveness.

Organic Spirulina Iron Plus



- At 1% w/w the visco-elasticity of the dough already has a structural reinforcement, and it has a smooth flavor. At ≥3% w/w this reinforcement is achieved, the pastas' dough gets harder, stickier and more cohesive.
- The heating water removes some of the blue-green hue.

- 2,6% w/w of Spirulina in corn and rice extruded snack provided nutritional increase of 22.6% in proteins, 28.1% in lipids and 46.4% in minerals.
- Reduce aw without change neither extrusion capacity nor hardness of product. Resulting in a high level of textural acceptability.
- Up to 4% w/w had light colors and mild flavors.

Classic

Pasta with and without Gluten

Adding more than 50% w/w microalgae creates a rebound effect that strengthens the dough's gluten network

Snacks

Green Chlorella



- Up to 2% w/w increase in firmness and swelling of dough after cooking because of water retention and gelling ability of microalgae.
- Up to 2% w/w excellent sensory acceptance and consistent colors after cooking.
- The heating water removes some of the yellow hue.

- A decrease in water loss and Aw and an increase in humidity.
- Increases the mass's viscosity, elasticity, and textural properties—specifically, firmness, hardness, and adhesiveness.
- With additions of more than 6% w/w, vibrant hues tend to dull.

Organic Spirulina



- At 1% w/w the visco-elasticity of the dough already has a structural reinforcement, and it has a smooth flavor. At ≥3% w/w this reinforcement is achieved, the pastas' dough gets harder, stickier and more cohesive.
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LAB & Yeast Fermented

Pasta with and without Gluten

Adding more than 50% w/w microalgae creates a rebound effect that strengthens the dough's gluten network

Snacks

Sour Chlorella/Spirulina



- Up to 10% w/w increase in digestibility and protein content.
- Improved polyphenol content.
- Reduction of glycemic index.

- Up to 10% w/w improved protein content.
- Fortification in minerals and vitamins.
- Improved antioxidant capacity.



The incorporation of nutrient-rich microalgae into **pasta and snacks** reflects a growing commitment to health-conscious and sustainable food choices.

These green superfoods enhance nutritional value, contributing unique flavors and vibrant colors to create a **visually appealing culinary experience.**



Meat Analog Apps

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MeatAnalog Applications



Specials Sausages Extruded Tofus

Yellow Chlorella



- Chlorella 3% w/w of a mild yellow tint that is reminiscent of mustard seasoning.
- Reduces the loss of water and fat when food is heated by stabilizing emulsions without coalescence.
- <3% w/w adds chewiness and improves sensory acceptability.

- When coupled with soy concentrate, the addition of up to 30% w/w results in extruded goods with a high-moisture fibrillar structure and increased softness.
- By infusing vitamins B and E, microalgae improved the nutritional profile of the extrudate, with more than 95% of the vitamins remaining in the final product.
- Up to 10% w/w is mild yellow, while 20% is bright yellow.

- The high protein content of microalgae (up to 5% w/w addition) aids in the retention of water and gel, as well as providing structural strength.
- Provides a yellow tint that is reminiscent of mustard seasoning.

White Chlorella



- Reduces the loss of water and fat when food is heated by stabilizing emulsions without coalescence.
- Not changing color by 3% w/w adding. Also, it produced better sensory acceptance and more chewiness.

- Improve structure, fiber formation, enhances texture and provides a juicier mouthfeel when mix with pea or soy protein isolate. Replacing part of the pea (up to 10%), or soy (up to 20% w/w) and reduce pea/soy taste.

- Adding up to 10% w/w has no impact on the color, flavor, or scent of the tofu.
- The high protein content of microalgae (up to 5% w/w addition) aids in the retention of water and gel, as well as providing structural strength.

Organic Spirulina Iron Plus



- In more basic conditions and at temperatures below 70°C, it performs better due to its emulsion, solubility, and water retention characteristics.
- Reduces the loss of water and fat when food is heated by stabilizing emulsions without coalescence.

- After heat treatment, the combination of \geq 10% w/w microalgae with soy or lupin displayed a profound, dark blue color shift.
- An increase in spirulina content intensified the flavor, odor, and aftertaste while softening and decreasing the fibrous, elastic texture.

- The high protein content of microalgae (up to 5% w/w addition) aids in the retention of water and gel, as well as providing structural strength.

The integration of microalgae into **meat analogs** enhances the nutritional value by providing essential amino acids, vitamins, and minerals.

Classic Sausages Extruded Tofus

Green Chlorella



- It naturally gave the product a greener, lighter hue.
- Due to the water retention and gelling properties of microalgae, the dish had a thick, creamy texture.

- Microalgal proteins with strong gelling and emulsifying ability helps to produce fat mimetic features.
- Plant proteins and microalgae work together to create counterparts that are more palatable and resilient in texture.

- The high protein content of microalgae (up to 5% w/w addition) aids in the retention of water and gel, as well as providing structural strength.
- Tiny amounts result in a gentle green hue.

Organic Spirulina



- In more basic conditions and at temperatures below 70°C, it performs better due to its emulsion, solubility, and water retention characteristics.
- Reduces the loss of water and fat when food is heated by stabilizing emulsions without coalescence.

- After heat treatment, the combination of \geq 10% w/w microalgae with soy or lupin displayed a profound, dark blue color shift.
- An increase in spirulina content intensified the flavor, odor, and aftertaste while softening and decreasing the fibrous, elastic texture.

- The high protein content of microalgae (up to 5% w/w addition) aids in the retention of water and gel, as well as providing structural strength.

This sustainable approach aligns with the growing demand for plant-based alternatives rich in proteins, promoting **health and environmental benefits.**



Dairy Analog Apps

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Dairy Analogs Applications



Specials

Yellow Chlorella



- The addition of microalgae to processed cheese improves texture by enhancing hardness and flexibility while maintaining other properties.
- Yellowish-colored cheese.

- Increased anti-oxidant activity, carriers of health-promoting probiotic bacteria, enhanced antioxidant activities expressed as potential to quench free radicals and the carotenoids content.
- Promotes a moderate flavor with pleasant light yellow.

- The viability of *L. acidophilus* and bifidobacteria was considerably enhanced by the addition of 1% w/w microalgae till the completion of fermentation. The pH remained maintained throughout the 28-day storage period.
- Promotes a moderate flavor with pleasant light yellow.

White Chlorella



- Promotes a moderate flavor with minimum color change.
- VEGAN ANALOGUE: the hardness and elasticity of semi-hard plant-based cheese are improved by the addition of 2% w/w microalgae mix to the plant protein concentrate.

- Increased anti-oxidant activity, carriers of health-promoting probiotic bacteria, enhanced antioxidant activities expressed as potential to quench free radicals and the carotenoids content.
- Promotes a moderate flavor with minimum color change.

- The viability of *L. acidophilus* and bifidobacteria was considerably enhanced by the addition of 1% w/w microalgae till the completion of fermentation. The pH remained maintained throughout the 28-day storage period.
- Promotes a moderate flavor with minimum color change.

Classic

Green Chlorella



- Addition to ripened cheese, it strengthens the casein network and causes it to retain more water, producing softer cheeses. As a result, the product is stable for up to 45 days.
- The inclusion of proteins and carbs from microalgae up to 3% w/w resulted in a decrease in oil separation rates and an increase in cheese firmness and viscoelasticity.

- Increased anti-oxidant activity, carriers of health-promoting probiotic bacteria, enhanced antioxidant activities expressed as potential to quench free radicals and the carotenoids content.

- The viability of *L. acidophilus* and bifidobacteria was considerably enhanced by the addition of 1% w/w microalgae till the completion of fermentation. The pH remained maintained throughout the 28-day storage period.

Organic Spirulina



- Green-blue color endures through storage. The loaf's inside is lighter in color while the crust generally turns browner (Maillard reaction).
- Incorporating up to 2% w/w promotes dough elasticity and provides good sensory acceptability with a light scent and flavor.

- Increased anti-oxidant activity, carriers of health-promoting probiotic bacteria, enhanced antioxidant activities expressed as potential to quench free radicals and the carotenoids content.
- Ice cream overrun and melting point were higher in fortified samples.
- It also gave natural light green color to ice cream.

- Boosts the bacterial qualities of yogurt and helps with fermentation by accelerating PH drop. It also makes yogurt retain more water.
- Provides a consistent bluish green tint that lasts for up to one month.
- The syneresis between whey and yogurt can be reduced by up to three times due to increased protein, lipid, and dietary fiber content generated by microalgae. Along with enhancing suppleness and cohesiveness in small quantities.

LAB & Yeast Fermented

Sour Chlorella/Spirulina



- Neutral color.
- Improved nutritional values.
- Improved organoleptic properties.

- Up to 10% w/w increase in digestibility and protein content.
- Reduction of glycemic index.
- Probiotic.

The integration of microalgae into **dairy analogs** marks a nutritional breakthrough.

These microscopic powerhouses **enhance product profiles** by offering rich sources of proteins, essential vitamins, and antioxidants, creating a promising synergy between plant-based alternatives and microalgal nutrition.

BioSyntex

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