ChloroBlast™

ChloroBlast™ Alfalfa Concentrate:

Unlocking the true value of alfalfa's nutritional content

Alfalfa: A prized crop

Alfalfa is a perennial forage crop that has long been prized for its superior content of vitamins, minerals and proteins.
It is cultivated in many countries around the world.

The opportunity: Alfalfa's impressive nutrient content

Medicago sativa, commonly known as alfalfa, is one of the most important legume forages in the world, thanks to its high nutritional quality, high adaptability, and high yield.

With a high-quality protein and balanced amino acid content, alfalfa provides all the elements required for optimal nutrition and proper functioning of the human body, including: organic acids, carbohydrates, phospholipids (omega-3), and vitamins A, B, D, E, C and K. Featuring higher antioxidant, chlorophyll, beta carotene and phospholipid content than other plants found in nature, alfalfa is also a good source of minerals, such as calcium, sodium, magnesium, potassium and zinc.

The challenge: Extracting the nutrient content

The full value of alfalfa as a source of high-quality nutritionis dramatically under-exploited. The reason? Alfalfa is a leafy crop; humans cannot digest untreated leaves and extract nutrients. Furthermore, alfalfa foliage containsanti-nutritional factors (ANFs) that must be removed before consumption.

It is well known that the highest value components of alfalfa are those of one key sub-cellular organelle, the chloroplast. However, chloroplasts lack an outer protective shell. Extracting and separating these fragile organelles from the other leaf components during fractionation is extremely challenging. In addition, the use of pHs, heat and/or chemical contents outside of physiological ranges provokes irreversible alteration of alfalfa's valuable components.

Developing an effective and economical industrial-scale process to extract and preserve alfalfa's high-value components represented a significant challenge, until now.

For more information
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Alfalfa: A carbon-positive plant /

Alfalfa increases the fertility of the soil by fixing nitrogen, which makes it one of the most sustainable crops in the world.

Enter ChloroBlast™

In partnership with Canada-based Virentia, ChloroBlast™ is developed using a patented industrial fractionation process that isolates, extracts and concentrates intact chloroplasts from alfalfa leaves. The chloroplast integrity in ChloroBlast is maintained throughout the entire extraction process. No chemicals or harsh mechanical treatments are used during fractionation, product preparation or finishing. Moreover, the chloroplasts in ChloroBlast are not subject to high temperatures or extreme pH conditions.

The extraction process also purifies the chloroplasts, removing soluble components, including phenolics and volatiles, that cause off-odors and "grassy" flavors.

Completely scalable for mass production, our process is fully sustainable thanks to its carbon positive and no-waste manufacturing approach.

ChloroBlast: Pure chloroplast concentrate

ChloroBlast is a raw, organic and non-GMO ingredient.

Maintaining chloroplast integrity concentrates high value components within a particle of defined size and physical characteristics. This ensures that the final ingredientwill be easy to suspend in liquids and be of definite particle size upon resuspension.

By removing soluble contaminating components, ChloroBlast allows for the purest chloroplast suspensions with a high, reproducible and unique phospholipids (omega-3)/protein ratio.

ChloroBlast: A concentrate unlike any other

The composition of ChloroBlast differs drastically from currently commercialized alfalfa leaf coagulates. Rather, it compares to that of high-value microalgae concentrates. Microalgae and ChloroBlast have comparable protein, antioxidant, pigment, phospholipids and micro-ingredient content. For all other nutritional criteria other than protein (for chlorella), ChloroBlast equals or exceeds the nutritional values of current microalgae concentrates on the market.

	ChloroBlast™ Alfalfa Chloroplast concentrate	Organika® Chlorella compound	In Situ Marine microalgae
Protein (% dry basis)	52.70	61.09	39.6
Chlorophyll (mg/g)	30.5	7.7	4.6
Total lipids (% dry basis)	20.7	7.15	8.9
Phospholipids (% dry basis)	17.5	Not disclosed	8.1
Omega-3 - fatty acid (% dry basis)	9.67	0.85	2.02
Beta carotene (mg/g)	5.48	0.18	5.64
Antioxidant (umol TE/g)	232.4	33.1	ND

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