

# Hydrolyzed Quinoa Protein

## Organic Quinoa Protein

Quinoa is an ancient grain that grows high in the Andes Mountains of Peru and Bolivia, as well as the high-altitude regions of Colorado well above the tree line in the purest environments. This “noble grain” was a very important food to the ancient Incas and is highly regarded today as an essential part of a healthy diet.

Vege Tech uses certified organic quinoa grain to produce our Quinoa Protein, thus ensuring the product is free of synthetic fertilizers, growth stimulants, GMOs and pesticides. We extract the protein and a number of other important molecules from quinoa utilizing Vege Tech’s proprietary enzymatic process.

It is commonly known by personal care formulators that proteins of widely differing molecular weights are important for optimum efficacy in hair treatment or conditioning applications. On one hand, very low molecular weight proteins or polypeptides penetrate the hair’s cuticle offering significant repair and function as humectants and moisturizers. This happens because these molecules are hygroscopic, that is they associate with and hold water molecules. The forces responsible for this hygroscopic effect are known as hydrogen bonding. On the

other hand, proteins with larger molecular weights (10,000 and above) are excellent film-formers, giving hair the appearance of shine and body. These large molecular weight proteins also effectively repair man-made or environmental trauma to the hair, by reattaching the separated cuticle layers with a protein layer between them. Finally, proteins of intermediate sizes share some of the properties of both small and large protein molecules and can penetrate the surface of the hair shaft and hold moisture in, but also lay on the surface of the hair strand and add shine and combability.

Vege Tech Hydrolyzed Quinoa Protein and its organic version offer a naturally-based alternative to synthetic fixative resins by creating a medium hold in hair spray formulations when used at levels greater than 10%. Its unique composition is effective as a skin hydrating complex offering a combination of moisture-balancing and film-forming properties that work synergistically to give skin a smoother, more supple feel.

One of the ways that hair care proteins attach to human hair is thought to be by disulfide bonds (protein-S-S-hair). Human hair contains both cystine (hair-S-S-hair) and cysteine (hair-S-H) amino acids. Where (S) represents sulfur. Many proteins, including plant proteins, also contain cystine and cysteine amino acids. It has been proposed that, when human hair is treated with a protein, the following two reactions can take place. These could covalently attach the exogenous protein to the hair.

1.  $\text{hair-S-S-hair} + \text{protein-S-H} \rightarrow \text{protein-S-S-hair} + \text{hair-S-H}$
2.  $\text{protein-S-S-protein} + \text{hair-S-H} \rightarrow \text{protein-S-S-hair} + \text{protein-S-H}$

However, a significant portion of the protein deposited on human hair by hair care products is adsorbed on the hair by non-covalent forces. These forces are either ionic or hydrophobic in nature. Adsorbed protein can be washed off. The ionic interaction involves oppositely charged residues on opposing sides of the protein - protein interaction site. Hydrophobic interaction forces involve pairing of hydrophobic amino acids on opposing sides of the protein interaction site. Vege Tech Quinoa Protein is replete with both types of residues and has a high cysteine and cystine content.

## FEATURES & BENEFITS

- » amazing amino acid profile similar to animal protein
- » high cysteine/cystine content
- » excellent film-former with a wide molecular weight range
- » sourced from pure environments - free of pesticides, GMOs

INCI	CAS #	EINECS/ELINCS
Hydrolyzed Quinoa	N/A	N/A
Organic Chenopodium Quinoa	N/A	N/A
Organic Alcohol	64-17-5	00-578-6

### SUGGESTED USE LEVELS:

Skin: 0.5% - 5%

Hair: 0.5% - 20%

NOTE: When formulating with Quinoa Protein as a replacement for synthetic fixative resins in hair sprays, it is recommended for lower VOC formulas (approx. 30% alcohol).

**pH:** 4 - 6

### PACKAGING:

Quinoa Protein is available in the following standard sizes:

- » sample size (2 fl oz)
- » 40 lbs (5 gal pail)
- » 240 lbs (30 gal drum)
- » 400 lbs (55 gal drum)

### SHELF LIFE:

12 months after date of manufacture. Protect from freezing and excessive heat.

**\*\*\* NOT FOR HUMAN CONSUMPTION \*\*\***