ACB Pisum Sativum Peptide

BACKGROUND

Hydrolyzed proteins such as soy, wheat or oat have been used to impart **conditioning benefits and film-forming properties** to the hair for decades. These hydrolysates are comprised of random amino acid sequences that aid in **improving the elasticity, texture, and hydration** of the hair. Recent efforts within the Nutritional Industry have focused on the selection of more precise protein fragments to improve the benefits of supplements. In the course of that research, it has become clear that protein fragments from different sources have varied benefits. To use the verbiage of Malcolm Gladwell, one of the “Outliers” is Pisum sativum.

Recently, **Pisum sativum proteins** have attracted the interest of Nutrition and Health advocates as a plant-based, hypoallergenic protein that yields a **high Biological Value (BV)**. Biological Value is an accurate indicator of the available nutritional potential of a protein. On average, Pisum sativum Protein has a 65.4% BV, in comparison to Soy Protein which only has a 50.0% BV average and Wheat Protein with only a 49.0% BV average. While it may have had a modest beginning, the **enhanced bioavailability** of Pisum sativum proteins has caught the market by storm as the quality alternative to other vegetable proteins; providing benefits such as high solubility (for easy digestion), enhanced kidney function, and lowering of the blood pressure.

SCIENCE

Proteins are traditionally hydrolyzed using acids, alkalis, and enzymes or some combination thereof to produce random amino acid sequences. While traditional methods of hydrolysis are well accepted and effective, they are simplistic efforts to duplicate normal cellular protein catabolism whereby cells digest proteins into specific sequences to meet their nutritional needs. Active Concepts has harnessed the **digestive abilities** of a proprietary non-GMO bacterial strain, *Lactobacillus bulgaricus*, to produce Pisum sativum peptides with a **controlled molecular weight** of approximately 2000 Da.

Pisum sativum protein is a **complete source of Essential Amino Acids** (EFAs). In fact, Pisum sativum has the **most balanced amino acid profile** of any vegetable protein, consisting of 22 amino acids, notably, **rich in lysine**. Lysine functions as a **vital building block** in human biology. Since lysine synthesis does not occur in the body naturally it must be obtained from outside sources, such as protein derived from Pisum sativum.
Technical Data Sheet

**ACB Pismum Sativum Peptide**

**BENEFITS**

Anti-Aging is the latest trend in Hair Care. ACB Pismum Sativum Peptide provides a **potent and cost effective** solution by delivering **volume and antioxidant protection** offsetting the symptoms of hair aging. ACB Pismum Sativum Peptide's **film-forming** properties render it an effective material for **hydrating** the hair for a silky feel. Recent demand for **anti-aging hair products** has prompted formulators to seek out materials and manufacturing methods that will allow targeted claims. ACB Pismum Sativum Peptide reduces the damage caused by free radicals to promote the **scalp and follicle health** essential producing youthful, voluminous looking hair.

**EFFICACY**

A series of **in-vivo** and **ex-vivo** studies were performed on volunteers and human hair tresses to evaluate the ability of ACB Pismum Sativum Peptide to provide perceivable benefits to the hair.

The first study study was conducted at Gaston College Technology Center (USA) where the diameter of colored hair was measured at different intervals to determine an increase in hair thickness. Using 60 strands of hair, a 2.0% solution of ACB Pismum Sativum Peptide was applied to each strand. A solution of 2.0% Wheat Hydrolysate in water was used as a positive control for comparison. Immediate results showed an average **increase in hair diameter** of 11.08% when using the ACB Pismum Sativum Peptide. Four hours after application an average increase of 9.65% was measured when comparing the ACB Pismum Sativum Peptide to the control. These results indicate that 2.0% ACB Pismum Sativum Peptide **provides thickening benefits** to the hair.

![Ex-vivo Hair Diameter Assay](image)

Figure 1. Increase in hair diameter after application of 2.0% ACB Pismum Sativum Peptide in solution compared to the control of 2.0% Wheat Hydrolysate in solution.

Microscopy Imaging of the individual strands were then taken to visually demonstrate the increase in hair diameter achieved when using 2.0% ACB Pismum Sativum Peptide in comparison to 2.0% Wheat Hydrolysate. From these images it can be seen that the ACB Pismum Sativum Peptide is **instantly substantive** to the hair producing an **even film**, whereas the Wheat Hydrolysate beads onto the strand. These images further demonstrate the increase in hair diameter achieved when using ACB Pismum Sativum Peptide compared to the Wheat Hydrolysate. ACB Pismum Sativum Peptide is able to effectively thicken the strands for fuller and **younger looking hair** giving a revolutionary step for anti-aging hair care products.
Increased hydration of the hair is a key benefit of hydrolyzed proteins. As evidenced in an in-vivo study, ten (M/F) subjects between the ages of 24 and 37 were instructed to apply either an untreated control, a solution containing 5.0% ACB Pisum Sativum Peptide, or a 5.0% solution containing Wheat Hydrolysate to their hair as a leave-in conditioner, once a day for a week. A DPM 9003 Nova Impedence Meter was used to test the moisture levels on the hair. The results demonstrated a comparable increase in hair hydration on subjects using both a 5.0% solution of ACB Pisum Sativum Peptide and a 5.0% solution of Wheat Hydrolysate.

![Figure 6. Increase in hair hydration when treated with 5.0% of ACB Pisum Sativum Peptide in solution compared to the control of 5.0% Wheat Hydrolysate in Solution](image)
ACB Pisum Sativum Peptide

An in-vivo half head study was conducted using five participants with a variety of hair types to determine the comparison of using a shampoo and conditioner incorporating 2.0% ACB Pisum Sativum Peptide vs. a control shampoo and conditioner. Each volunteer’s hair was photographed before and after washing and blow dry styling with the test and control products. The images of the half head study were used in conjunction with a sensory assessment subjectively rating shine, volume, dry and wet combability, thickness, smoothness, hydration, softness and manageability.

Figure 7. Half-head study to compare hair washed and styled after using a base shampoo and conditioner (left) vs hair washed and styled using a base shampoo and conditioner plus 2.0% ACB Pisum Sativum Peptide (right)

Figure 7 shows that the hair treated with 2.0% ACB Pisum Sativum Peptide appears more voluminous, shiny, soft and healthy than when using the base shampoo and conditioner on their own. Consequently, these results highlight that ACB Pisum Sativum Peptide is capable of enhancing the volume and overall health of the hair perfect for use in anti-aging hair care product lines.