

# ACB Modified Pumpkin Enzyme PF



Natural  
Water Soluble Extract  
Enzymatic  
Phytochemicals  
Exfoliator  
Moisturizing Action

## BACKGROUND

Recent trends in cosmetics have led more technically minded consumers away from products that are not backed by substantiated science. This, along with the advent of Alpha Hydroxy Acids in cosmetics has led to a flood of products on the market delivering perceivable consumer benefits. This saturated market has made it exceedingly difficult for producers to differentiate their products. Consumers and producers alike began looking for a point of difference, this market need has led to research and product development with proteolytic enzymes.

The idea to create **ACB Modified Pumpkin Enzyme PF** blossomed from the fruit's very decomposition. Pumpkins are hearty and resilient throughout their lifespan, then seemingly overnight begin to soften and collapse. This has been attributed to proteolytic enzymes, potent natural molecules with several other industrial uses. Unfortunately, preliminary tests in cosmetics showed too much irritation to be useful. By using natural sources such as pumpkin, Active Concepts has made these incredible molecules viable with all the benefits and none of the irritation.

**ACB Modified Pumpkin Enzyme PF** is sourced in the most sustainable manner possible, as the flesh of the pumpkin is almost wholly considered a byproduct of pumpkin seed harvesting. This flesh which would otherwise be considered a waste product is kept, concentrated, and fermented in order to increase the bio-activity and availability of its individual components. This Central American crop has seen tremendous growth within the United States in the last 10 years. Each year pumpkin production has increased with the overwhelming majority being grown in the Midwest United States. An invaluable source of Vitamin A and packed with a litany of simple sugars and complex carbohydrates, pumpkin is a mainstream, flexible crop that is not going anywhere anytime soon.

**Code Number:** 20496

**INCI Name:** Lactobacillus/Pumpkin Fruit Ferment Filtrate

**INCI Status:** Conforms

**REACH Status:** Complies

**CAS Number:** 89998-03-8

**EINECS Number:** 289-741-0

**Origin:** Bacterial/Botanical

**Processing:**

GMO Free

No Ethoxylation

No Irradiation

No Sulphonation

**Additives:**

Preservatives: None

Antioxidants: None

Other additives: None

**Solvents Used:** Water

**Appearance:** Clear to Slightly Hazy  
Viscous Liquid

**Soluble/ Miscible:** Water Soluble  
90.8% Biodegradability

**Microbial Count:** < 100 CFU/g,  
No Pathogens

**Suggested Use Levels:** 1.0 - 10.0%

**Suggested Applications:**

Cellular Renewal, Effective Exfoliation,  
Hair Care, Collagen Production

**Benefits of ACB Modified Pumpkin Enzyme PF:**

- Strong Exfoliation
- Promotes Collagen Production
- Skin & Hair Care

# ACB Modified Pumpkin Enzyme PF

## SCIENCE

Pumpkin is widely used in many cultures as a food. As is common with many plants, pumpkin contains its own set of proteases, the proteins which breakdown other proteins. By fermenting the pumpkin fruit with *Lactobacillus lactis* we are able to breakdown many of the complex bio-molecules releasing isolated phytochemicals. Through the use of selective filtration techniques we are then able to further isolate the proteolytic fractions to produce **ACB Modified Pumpkin Enzyme PF**.

The enzymes within fruit as well as virtually all other organisms are natural catalysts (modify or increase the rate of a reaction with out being consumed by the reaction) that regulate intrinsic functions such as fruit ripening and color changes in the plants' leaves. Most enzymes are proteins, which lose functional activity as they denature. Utilizing enzyme extractions from fruit is not a new practice. The benefits of enzymes have been known and practiced in Ayurvedic medicine as well as folk medicines for centuries. Enzymes in fruits are attributed with having functional properties for cosmetics. Proteins and enzymes naturally experience darkening due to what is known as the Maillard Reaction, a chemical reaction between the amino acids and sugars present in the protein solution. This is a natural process and is common for all enzyme materials. However, Active Concepts offers modified enzymes, such as **ACB Modified Pumpkin Enzyme PF** where we have eliminated the residual carbohydrates during the manufacturing process. This allows for the production of an enzyme material that is not susceptible to the Maillard-associated darkening of typical protein solutions. Our modified enzymes are the superior choice for stability without the concern of darkening.

## BENEFITS

Find the beauty that lies beneath. **ACB Modified Pumpkin Enzyme PF** provides exfoliation and provides a great alternative to alpha hydroxy acids. Sustainably manufactured, **ACB Modified Pumpkin Enzyme PF** is extracted along with the intact chaperone proteins, which helps increase stability and higher enzyme activity. **ACB Modified Pumpkin Enzyme PF** may be used in a variety of products including cleansers, facial masks, anti-age creams, anti-acne products, exfoliators, shampoo and conditioner as well as other hair care treatments.

## EFFICACY DATA

An *in-vitro* Sirius Red/Fast Green Collagen Assay was conducted to assess the changes in collagen synthesis by **ACB Modified Pumpkin Enzyme PF** on cultured human dermal fibroblasts. Collagen is the main protein of connective tissues. Collagen has great tensile strength while being responsible for skin's elasticity and, therefore, its degradation leads to wrinkles that accompany aging. As shown in Figure 1 below, **ACB Modified Pumpkin Enzyme PF** exhibited potent collagen synthesis activity. For these reasons, we can assume **ACB Modified Pumpkin Enzyme PF** is suitable for cosmetic applications designed to boost collagen synthesis to aid in providing a younger and healthier complexion.

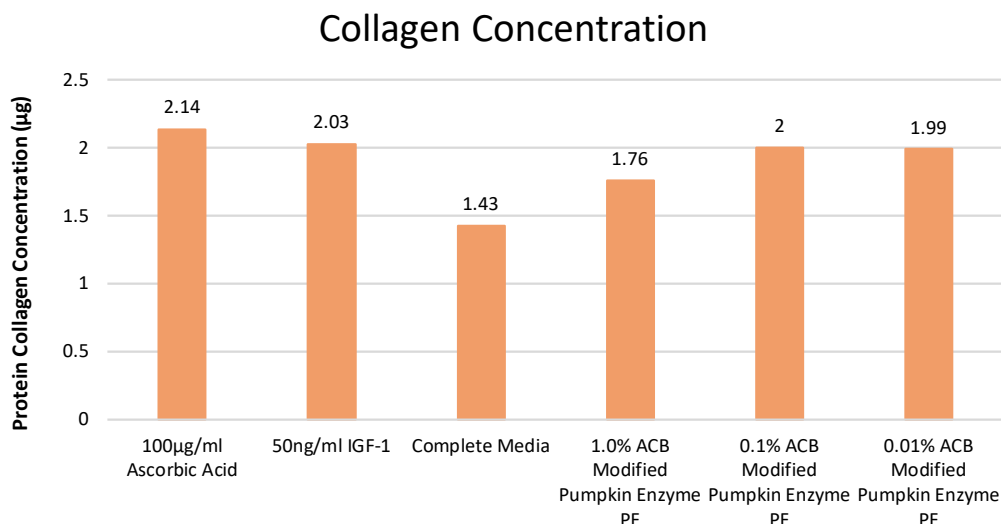


Figure 1. Collagen concentration

# ACB Modified Pumpkin Enzyme PF

A half head study was conducted to determine the comparison of a control shampoo vs. 2.0% **ACB Modified Pumpkin Enzyme PF** in the control shampoo. Additionally, a comparison between the control conditioner and 2.0% **ACB Modified Pumpkin Enzyme PF** in the control conditioner were reported. Each volunteer's hair was photographed prior to the treatment and again after the shampoo and conditioner had been applied and the hair was styled. The images of the half head study were used in conjunction with a sensory assessment subjectively rating the parameters - cleansing, smoothing, dry and wet combability, anti-frizz, overall feel, shine and hydration. This assessment was conducted both before and after treatment. Based on the results obtained, **ACB Modified Pumpkin Enzyme PF** is capable of enhancing smoothing, wet and dry combability, anti-frizz, overall feel, shine and hydration of the hair.

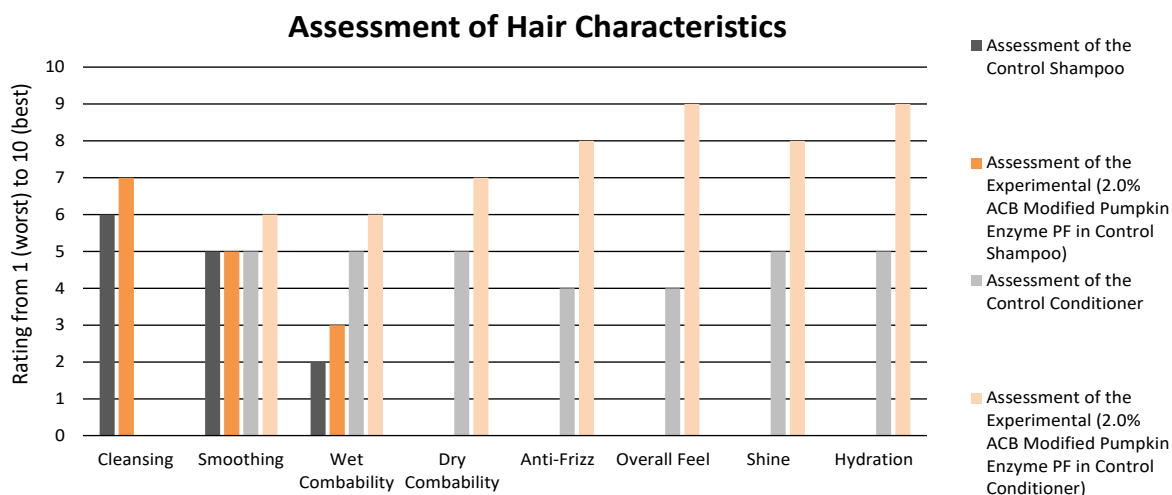


Figure 2. Salon half head study results

References

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2. Lazos, E. et al. 2006. Journal Of Food Science. Nutritional, Fatty Acid, and Oil Characteristics of Pumpkin and Melon Seeds. 51 (5): 1382-1383
3. Rezig, L. et al. 2012. Industrial Crops and Products. Chemical composition and profile characterization of pumpkin (Cucurbita maxima) seed oil. 37(1): 82-87