

Salon Half-Head Study



Pseudo-Protein System
 Condition & Protect
 up-cycled Oranges
 improves hydration
 enhances overall hair feel

ABSTRACT

The use of proteins in personal care has come under scrutiny in recent years. The main reason being the association of protein sensitization, which is becoming more and more common. Wheat proteins are particularly divisive due to their potential gluten content, and in Europe, cosmetic regulations specify that their maximum molecular weight must not exceed 3.5 kDa. In hair care, the anti-protein movement has gone even further as “protein sensitive hair” can become stiff and brittle. Some celebrity stylists are even avoiding proteins, as over use can “crack the hair follicle” or “cause breakage”.

PhytoCycle® Orange is a pseudo-protein system. This active can be used to replace proteins in hair care applications, promoting comparable benefits of hydration, protection and manageability. Derived from upcycled orange fruit waste, this natural active supports the sustainable and clean movement, allowing brands to build a sense of trust and transparency with their customers. The purpose of this study was to confirm if **PhytoCycle® Orange** is capable of providing comparable hair care benefits to hydrolyzed wheat protein in rinse-off shampoo and conditioner controls.

A half head study was conducted to compare the activity of a control shampoo and conditioner supplemented with 2.0% hydrolyzed wheat protein vs. 2.0% **PhytoCycle® Orange**. 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, the protein free **PhytoCycle® Orange** performed equally, and in some cases better, than the hydrolyzed wheat protein control. **PhytoCycle® Orange** proved to be an efficient protein-free alternative for rinse-off formulations without any compromise to hair characteristics.

Code Number: 16925

INCI Name: Water & Citrus Aurantium Dulcis (Orange) Fruit Extract & Lactobacillus Ferment

INCI Status: Conforms

CAS Number: 7732-18-5 & 84012-28-2 (or) 8028-48-6 & 1686112-36-6 (or) 68333-16-4

EINECS Number: 231-791-2 & N/A (or) 232-433-8 & N/A (or) N/A

TRF#: HRI 042

Lot Number(s): N210201E

Suggested Use Levels: 1.0 - 10.0%
Use Level for Assay: 2.0%

Sponsor:

Active Concepts, LLC
 107 Technology Drive
 Lincolnton, North Carolina 28092

Study Director: Maureen Danaher
Principle Investigator: Candice Sneed

Suggested Applications: Condition, Hydrate, Strengthen, Protect

Benefits of **PhytoCycle® Orange**:

- Hair Humidity Protection
- Increased Hair Hydration
- Improved Hair Manageability



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MATERIALS AND METHODS

The study was conducted using five participants. Each subject had their baseline photo taken prior to having their hair washed. The participant was also asked to complete a survey rating their hair prior to treatment on a scale of 1 to 10, with 1 being the lowest and 10 being the highest, using the following parameters cleansing, smoothing, dry and wet combability, anti-frizz, overall feel, shine and hydration.

Half of the head was treated with the control shampoo and conditioner supplemented with 2.0% hydrolyzed wheat protein while the other half of the head was treated with 2.0% **PhytoCycle® Orange** in the base shampoo and base conditioner. After the application and rinse of the test and positive control products, each participant's hair was blown dry using a round brush on both sides of the head. Once the hair was completely dry, the participant was asked to again assess the same parameters of both halves of their hair. Assessments were made using a rubric from 1 to 10, with 1 being the lowest and 10 being the highest.

RESULTS

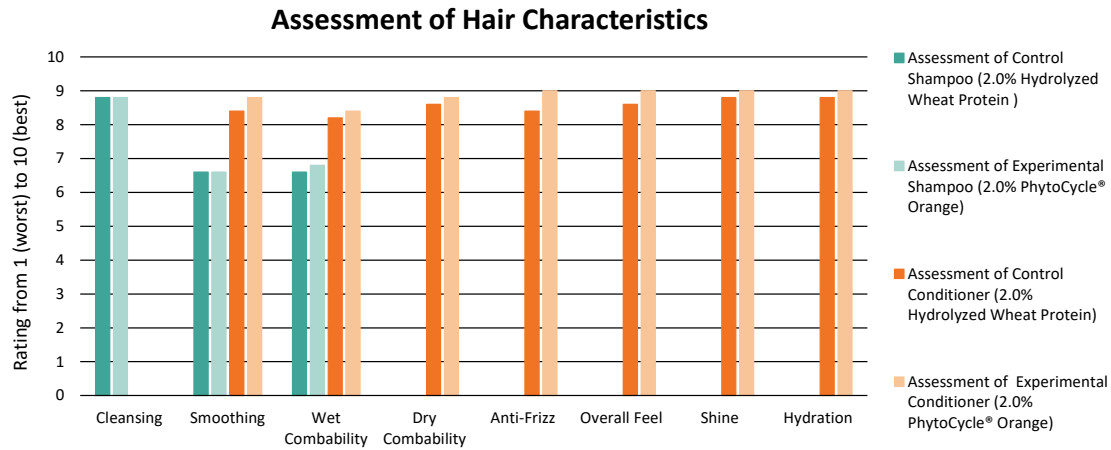
Parameters Tested	Assessment of Control Shampoo (2.0% Hydrolyzed Wheat Protein)	Assessment of Experimental Shampoo (2.0% PhytoCycle® Orange)	Assessment of Control Conditioner (2.0% Hydrolyzed Wheat Protein)	Assessment of Experimental Conditioner (2.0% PhytoCycle® Orange)
Cleansing	8.8	8.8	X	X
Smoothing	6.6	6.6	8.4	8.8
Wet Combability	6.6	6.8	8.2	8.4
Dry Combability	X	X	8.6	8.8
Anti-Frizz	X	X	8.4	9
Overall Feel	X	X	8.6	9
Shine	X	X	8.8	9
Hydration	X	X	8.8	9
Mean	7.3	7.4	8.3	8.6

Chart 1. Average Results for Participant's Sensory Assessment.

Parameters Tested	Percent Difference Comparison of Control Shampoo vs. Experimental Shampoo	Percent Difference Comparison of Control Conditioner vs. Experimental Conditioner
Cleansing	0%	X
Smoothing	0%	5%
Wet Combability	3%	2%
Dry Combability	X	2%
Anti-Frizz	X	7%
Overall Feel	X	5%
Shine	X	2%
Hydration	X	2%

Chart 2. Percent Difference of Participant's Sensory Assessment.

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Graph 1. Rating of hair characteristics following sensory assessment.



Figure 1. Full Head Baseline, Untreated Hair.



Figure 2. Half Head Treated.



Figure 3. Full Head Baseline, Untreated Hair.



Figure 4. Half Head Treated.

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Figure 5. Full Head Baseline, Untreated Hair.



Figure 6. Half Head Treated.



Figure 7. Full Head Baseline, Untreated Hair.



Figure 8. Half Head Treated.



Figure 9. Full Head Baseline, Untreated Hair.



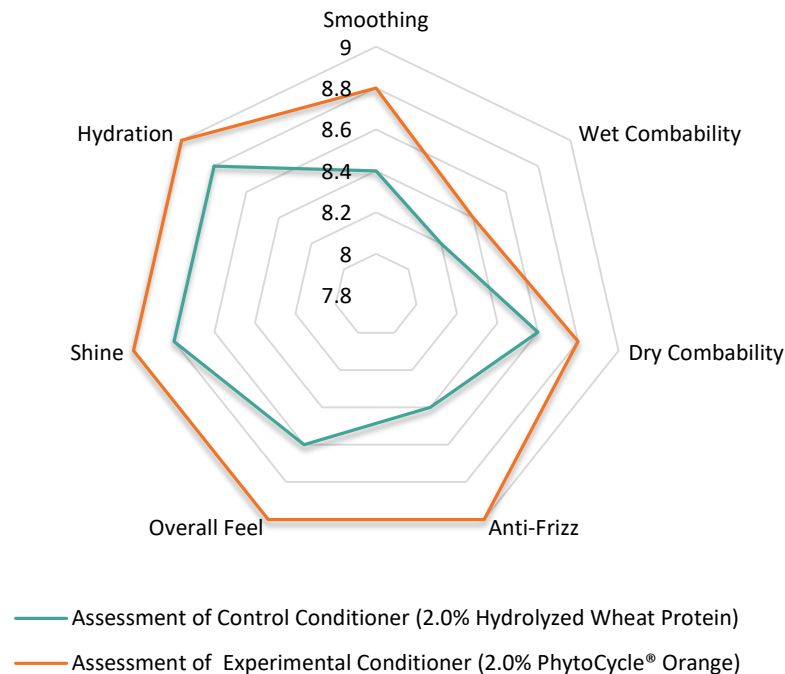
Figure 10. Half Head Treated.

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When comparing hair characteristics of the baseline assessments to the post style assessments, the benefits of including 2.0% **PhytoCycle® Orange** or 2.0% hydrolyzed wheat protein in a shampoo and conditioner are apparent. When comparing the two half-heads, treated with either the control or experimental shampoo and conditioner, it can clearly be perceived that there is no significant difference between the 2.0% **PhytoCycle® Orange** or 2.0% hydrolyzed wheat protein. It is clear from the images in this study that **PhytoCycle® Orange** and hydrolyzed wheat protein helps create a smooth, sleek hairstyle. Additionally, in all images, the hair is noticeably hydrated and offers a revitalized appearance.

The professional stylist, who performed the study protocol by applying the products, styling the hair and documenting the images, noted that the **PhytoCycle® Orange** and hydrolyzed wheat protein generally performed equally, and for some participants, the **PhytoCycle® Orange** could be considered to have performed even better.

Comparison of Control Conditioner (2.0% Hydrolyzed Wheat Protein) vs. Experimental Conditioner (2.0% PhytoCycle® Orange)



Graph 2. Hair Assessment Results for Sensory Characteristics in a Conditioner.

DISCUSSION

The results of the assessment indicate that when incorporated into a shampoo, **2.0% PhytoCycle® Orange** showed comparative cleansing, smoothing, and wet combability to that of 2.0% hydrolyzed wheat protein. Additionally, when used in a conditioner **PhytoCycle® Orange** performed comparably to that of the 2.0% hydrolyzed wheat protein, and was even shown to give a slight improvement in smoothing, dry and wet combability, anti-frizz, overall feel, shine, and hydration more than the control conditioner. This comparative half-head study demonstrates **PhytoCycle® Orange** to be an efficient protein-free alternative for rinse-off formulations without any compromise to hair characteristics.