

**Tradename:** ABS Pomegranate Sterols

**Code:** 10247

**CAS #:** 949109-75-5

**Test Request Form #:** HRI 005

**Lot #:** 65622P

**Sponsor:** *Active Concepts, LLC; 107 Technology Drive Lincolnton, NC 28092*

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**Principal Investigators:** *Candice Sneed*

**Test Performed:**

Salon Half-Head Study

**Introduction**

Hair appearance is reflective of an individual's self-esteem, mental-image, and well-being. The condition of an individual's hair significantly impacts how one views themselves as it relates to their physical appearance. Additionally, hair is often the initial feature that others observe about one's appearance. The vibrance and condition of hair is indicative of how another individual may perceive personality and self-confidence. In addition to promoting hair hygiene and health, a proper hair care routine that incorporates appropriate products may reduce the possibility of premature hair loss. Therefore, maintaining a healthy hair appearance can improve an individual's relationship with themselves and others as well as enhance their well-being.

Accordingly, a Salon Half-Head Study was conducted to evaluate the perceived hair benefits of **ABS Pomegranate Sterols** in a shampoo and conditioner on wet and dry hair.

**Study Principle**

Initial photographs of participants hair were obtained. Following baseline images, participants had half of their hair washed with a control Base Shampoo and Base Conditioner, while the other half of their hair was washed with the test material in a Base Shampoo and Base Conditioner. Participants completed wet and dry sensory analysis assessments and final photographs were obtained after participant's hair was completely dry.

**Materials**

- A. **Materials:** T3 Blow-Dryer; 1.5" Round Brush
- B. **Products:** Base Shampoo and Base Conditioner (Table 1)
- C. **Software:** Excel Analysis ToolPak (Microsoft)

**Table 1.** Ingredient List (INCI Names) of Base Shampoo and Base Conditioner

| Base Shampoo                          | Base Conditioner                 |
|---------------------------------------|----------------------------------|
| Water                                 | Water                            |
| Guar Hydroxypropyltrimonium Chloride  | Polyquaternium-10                |
| Sodium Methyl 2-Sulfolaurate          | Glycerin                         |
| Cocamidopropyl Betaine                | Cetrimonium Chloride             |
| Lactobacillus Ferment                 | Behentrimonium Methosulfate      |
| Lactobacillus                         | Cetearyl Alcohol                 |
| Coco Nucifera (Coconut) Fruit Extract | Butylene Glycol                  |
|                                       | Hydrogenated Ethylhexyl Oliviate |
|                                       | Lactobacillus Ferment            |

## Methods

Five volunteers between the ages of 22 and 32 participated in this study. Each participant had both halves of their head assigned to a specific condition and were blinded to the treatment (Table 2). The left half of their head was treated with the Base Shampoo and Base Conditioner alone. Conversely, the right half of their head was treated with 2.0% **ABS Pomegranate Sterols** in the Base Shampoo and Base Conditioner. Baseline photographs were taken of participants' hair prior to washing. After the shampoo treatment was applied and washed out, participants completed a wet sensory analysis regarding the shampoo. Next, the conditioner treatment was applied, washed out, and a wet sensory analysis pertaining to the conditioner was completed. After each participant's hair was blown dry with a round brush, final photographs were taken, and participants were asked to complete a dry sensory analysis of the conditioner treatment.

**Table 2.** Descriptions of the Conditions and Treatments for each Test Site

| Hair Test Site | Condition                           | Treatment / Test Article Application Description                         |
|----------------|-------------------------------------|--|
| 1              | Base Shampoo and Base Conditioner   | Base Shampoo and Base Conditioner  |
| 2              | 2.0% <b>ABS Pomegranate Sterols</b> | 2.0% <b>ABS Pomegranate Sterols</b> in Base Shampoo and Base Conditioner |

The wet and dry sensory analyses were implemented to evaluate multiple perceived hair benefit parameters of each shampoo and conditioner treatment. Analyses were completed using a scale from 1 to 10, with 1 indicating the lowest perceived benefit and 10 representing the highest perceived benefit. Results from the wet and dry sensory analysis assessments were averaged for each parameter. Data is displayed as averages and was analyzed using paired t-tests with statistical significance accepted at  $p \leq 0.05$ . The percent change in each parameter was calculated relative to the Base Shampoo and Base Conditioner, using the following equation:

$$\text{Percent Change (\%)} = \frac{\text{Rating}_{2.0\% \text{ ABS Pomegranate Sterols}} - \text{Rating}_{\text{Base Shampoo and Base Conditioner}}}{\text{Rating}_{\text{Base Shampoo and Base Conditioner}}} \times 100$$

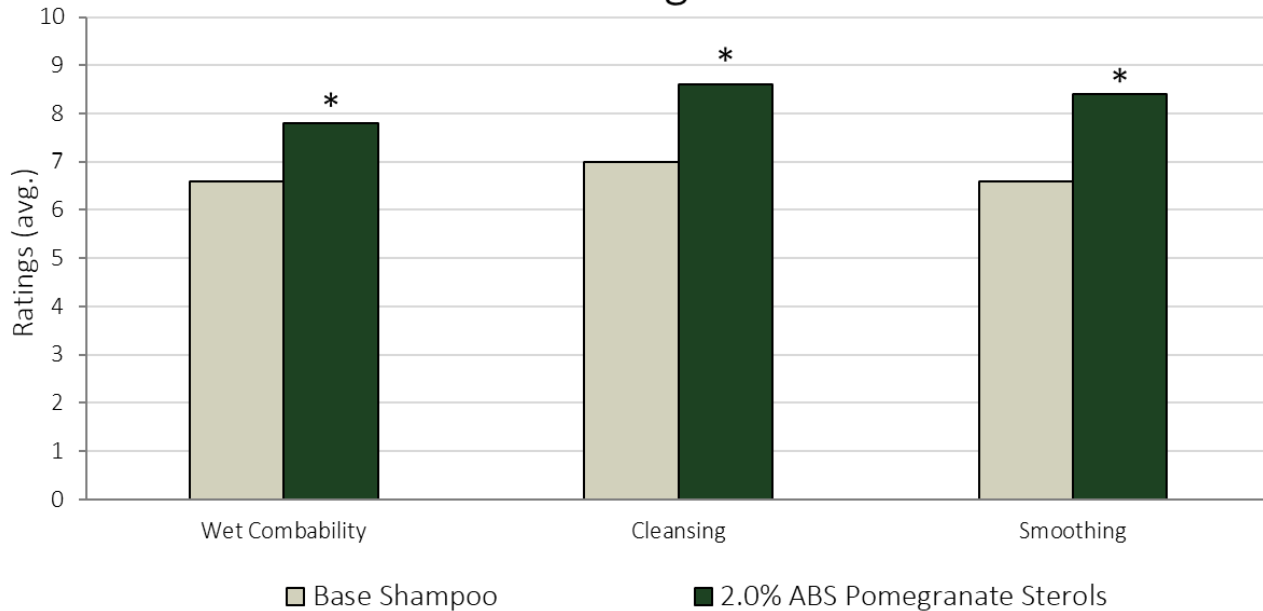
**Table 3.** Wet and Dry Sensory Analysis Parameter Descriptions

|                | Parameter       | Description  |
|----------------|-----------------|--|
| Wet Assessment | Wet Combability | Ability to brush hair easily without pulling while the hair is wet             |
|                | Cleansing       | Ability to leave hair feeling clean and remove product build-up                |
|                | Smoothing       | Ability to make hair fall in the same direction with no visible knots          |
| Dry Assessment | Dry Combability | Ability to brush hair easily without pulling while the hair is dry             |
|                | Anti-Frizz      | Ability to make hair fall uniformly while also decrease the amount of flyaways |
|                | Overall Feel    | Satisfaction of hair feel  |
|                | Shine           | Ability to make hair look bright and luminous                                  |
|                | Hydration       | Ability to make hair look clean and feel soft                                  |

## Results

The data obtained met criteria for a valid study as the Base Shampoo and Base Conditioner performed as anticipated. The addition of 2.0% **ABS Pomegranate Sterols** in shampoo and conditioner improved the perceived benefits in wet and dry hair compared to the Base Shampoo and Conditioner.

## Shampoo: Wet Sensory Analysis ABS Pomegranate Sterols

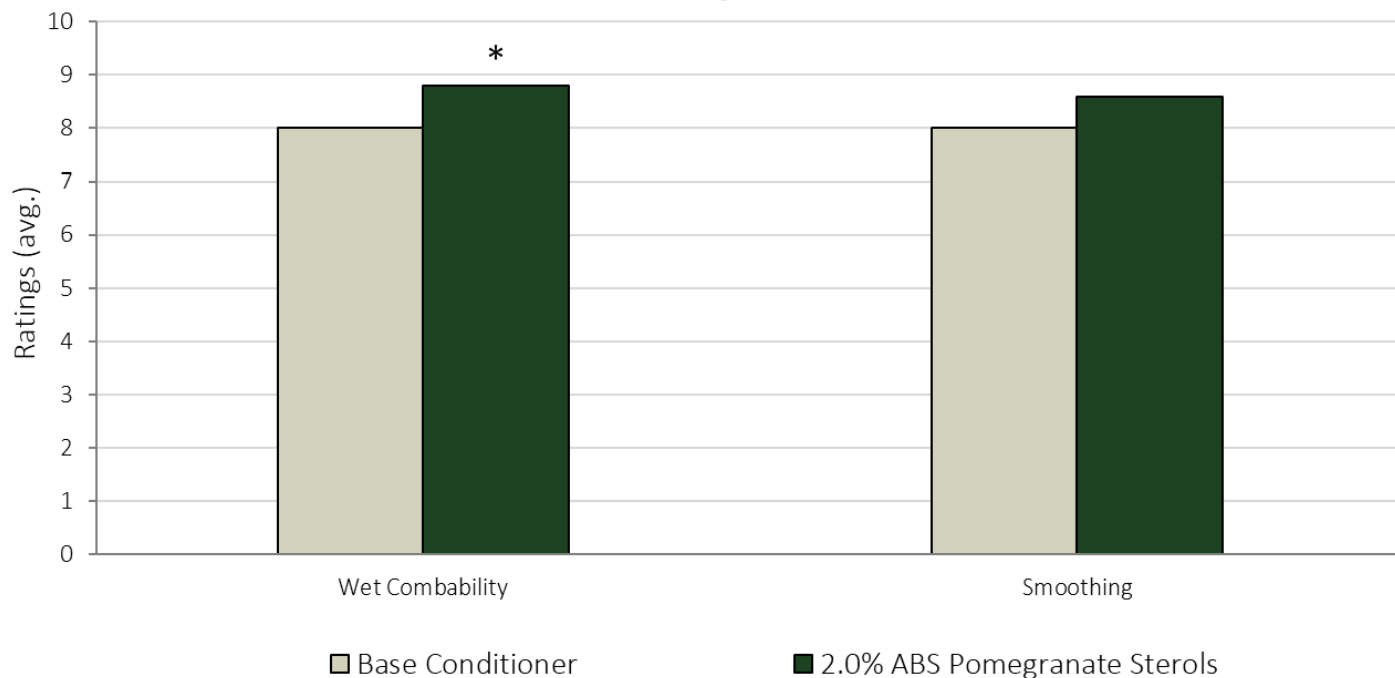


**Figure 1.** Results of the Wet Sensory Analysis After Shampoo Treatments. Analyses were completed using a scale from 1 to 10, with 1 indicating the lowest perceived benefit and 10 representing the highest perceived benefit. \* indicates significance ( $p \leq 0.05$ ) between conditions.

**Table 4.** Results from the T-test Analysis of the Wet Sensory Analysis Parameters between Base Shampoo and 2.0% **ABS Pomegranate Sterols**. \* indicates significance ( $p \leq 0.05$ ) between conditions.

|         | Wet Combability | Cleansing | Smoothing |
|---------|-----------------|-----------|-----------|
| P-value | 0.045*          | 0.003*    | 0.006*    |

## Conditioner: Wet Sensory Analysis ABS Pomegranate Sterols

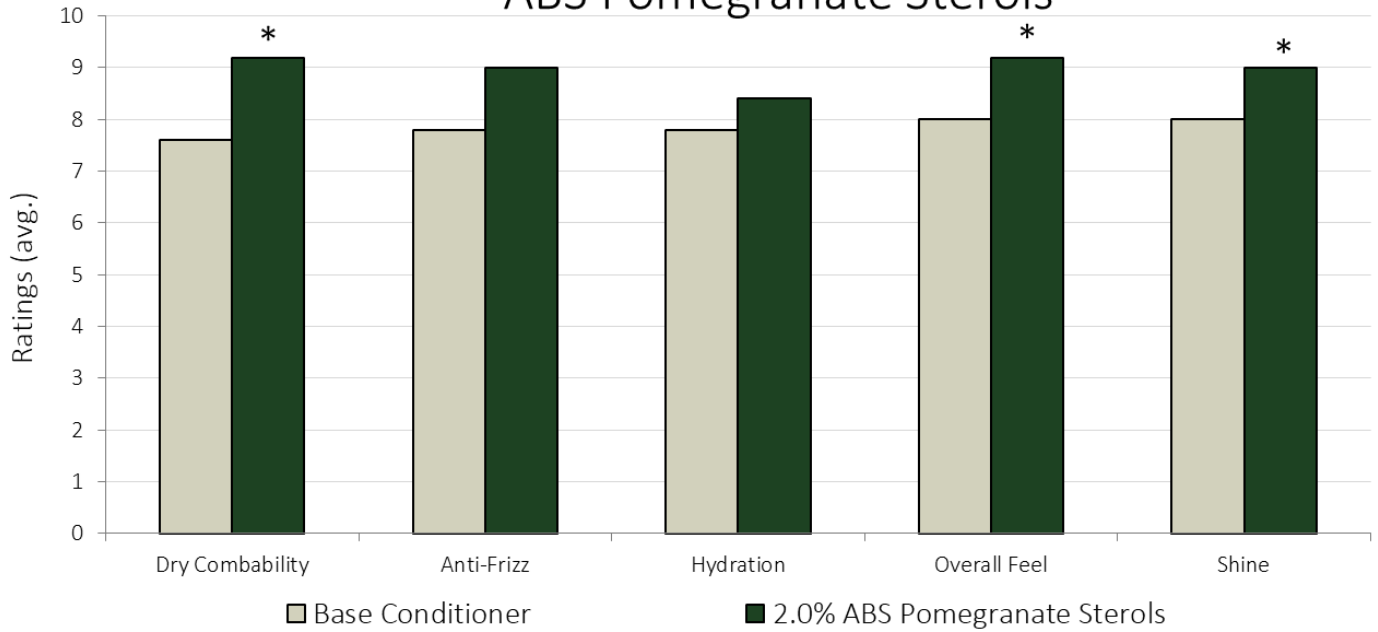


**Figure 2.** Results of the Wet Sensory Analysis After Conditioner Treatments. Analyses were completed using a scale from 1 to 10, with 1 indicating the lowest perceived benefit and 10 representing the highest perceived benefit. \* indicates significance ( $p \leq 0.05$ ) between conditions.

**Table 5.** Results from the T-test Analysis of the Wet Sensory Analysis Parameters between the Base Conditioner and 2.0% ABS Pomegranate Sterols. \* indicates significance ( $p \leq 0.05$ ) between conditions.

|         | Wet Combability | Smoothing |
|---------|-----------------|-----------|
| P-value | 0.008*          | 0.104     |

## Conditioner: Dry Sensory Analysis ABS Pomegranate Sterols



**Figure 3.** Results of the Dry Sensory Analysis After Conditioner Treatments and Hair was Blown Dry. Analyses were completed using a scale from 1 to 10, with 1 indicating the lowest perceived benefit and 10 representing the highest perceived benefit. \* indicates significance ( $p \leq 0.05$ ) between conditions.

**Table 6.** Results from the T-test Analysis of the Dry Sensory Analysis Parameters between the Base Conditioner and % ABS Pomegranate Sterols. \* indicates significance ( $p \leq 0.05$ ) between conditions.

|         | Dry Combability | Anti-Frizz | Hydration | Overall Feel | Shine  |
|---------|-----------------|------------|-----------|--------------|--------|
| P-value | 0.009*          | 0.117      | 0.213     | 0.039*       | 0.044* |



**Image 1.** Participant Images Before Shampoo and Conditioner Application and After Blow Drying



**Image 2.** Participant Images Before Shampoo and Conditioner Application and After Blow Drying



**Image 3.** Participant Images Before Shampoo and Conditioner Application and After Blow Drying



**Image 4.** Participant Images Before Shampoo and Conditioner Application and After Blow Drying



**Image 5.** Participant Images Before Shampoo and Conditioner Application and After Blow Drying

## Discussion

A Salon Half-Head Study was conducted to evaluate the perceived hair benefits of 2.0% **ABS Pomegranate Sterols** in a shampoo and conditioner on wet and dry hair.

Wet sensory analysis of the Base Shampoo demonstrated perceived hair benefits were slightly above average for Wet Combability, Cleansing, and Smoothing (Figure 1). However, the addition of 2.0% **ABS Pomegranate Sterols** to the Base Shampoo significantly improved perceived benefits of Wet Combability by 18%, Cleansing by 23%, and Smoothing by 27% in wet hair (Figure 1; Table 4). These results demonstrate **ABS Pomegranate Sterols** increases the perceived ability to brush wet hair easily, leaves wet hair feeling clean while removing product build-up, and helps wet hair fall in the same direction with no visible knots when added to a shampoo.

Similarly, wet sensory analysis of the Base Conditioner demonstrated perceived hair benefits were above average for Wet Combability and Smoothing (Figure 2). However, the addition of 2.0% to the Base Conditioner increased perceived benefits of Wet Combability by 10% and Smoothing by 8% in wet hair (Figure 2; Table 5). These results demonstrate **ABS Pomegranate Sterols** augments the perceived ability to brush wet hair easily and helps wet hair fall in the same direction with no visible knots when added to a conditioner.

After hair was blown dry with a round brush, dry sensory analysis of the Base Conditioner demonstrated perceived hair benefits were above average for Dry Combability, Anti-Frizz, Hydration, Overall Feel, and Shine (Figure 3). However, the addition of 2.0% **ABS Pomegranate Sterols** to the Base Conditioner improved perceived benefits of Dry Combability by 21%, Anti-Frizz by 15%, Hydration by 8%, Overall Feel by 15%, and Shine by 13% in dry hair (Figure 3; Table 6). These results demonstrate **ABS Pomegranate Sterols** enhances the perceived ability to brush dry hair easily, helps hair fall uniformly while reducing flyaways, improves the satisfaction of hair feel, increases the brightness and luminous appearance of hair, and improves the appearance of clean hair with a soft feel when added to a conditioner.

Furthermore, participants of all hair types experienced visual hair benefits when treated with 2.0% **ABS Pomegranate Sterols**. Specifically, hair treated with 2.0% **ABS Pomegranate Sterols** is visibly smoother, shinier, and more hydrated with less fizziness compared to hair treated with the Base Shampoo and Conditioner (Images 1, 2, 3, 4, 5). These results demonstrate **ABS Pomegranate Sterols** elicits visual hair benefits when added to a shampoo and conditioner.

Taken together, these results indicate **ABS Pomegranate Sterols** improves the perceived benefits with wet and dry hair when added to shampoo and conditioner at recommended use levels. Collectively, **ABS Pomegranate Sterols** demonstrates visual and perceived hair characteristics which contribute to a healthier looking hair appearance.