SYNOPSIS:
Finding natural emollients with a distinct sensory profile and desirable attributes is an ongoing challenge to formulators. Natural Plant Products and Sensory Spectrum partnered to explore how natural emollients can complement or replace popular synthetic emollients to expand options available.

OBJECTIVE:
Explore sensory profiles and identify key differentiators for natural and synthetic emollients by blending findings from qualitative consumer and quantitative technical research.

MATERIALS AND METHODS:
TECHNICAL QUANTITATIVE EVALUATIONS – Trained Descriptive Analysis Panel Spectrum Skinfell Descriptive Analysis Method” provides detailed quantitative data using a 0-100 point intensity scale for defined sensory attributes to form a sensory “fingerprint” of each product. The product profiles allow a comparison of products on an attribute by attribute basis.

CONSUMER QUALITATIVE FEEDBACK – Consumer Sensory Experience Consumer qualitative research was conducted using the Spectrum Community Narrative Panel (SCAN)™. SCAN is an articulate group of consumers skilled at describing sensory properties of products using consumer language. SCAN panels used products at home and in a qualitative research session at an on-site facility. During the home and group sessions panelists were asked to assign perceived benefits to each product.

The technical descriptive analysis provided an understanding of the sensory cues of individual products and the consumer qualitative added depth and a tool to better articulate the benefits.

“Sensory Spectrum

PRODUCTS TESTED = 8 Facial Serums prepared by Natural Plant Products, each containing one of the following emollients:
• Meadowfoam Seed Oil / Limnanthes Alba (Meadowfoam) Seed Oil (MSO)
• Daikon Seed Extract / Raphanus Sativus (Radish) Seed Extract / (DSE)
• MSO/DSE 50:50 blend
• Argan Oil / Argania Spinosa Kernel Oil (ARG)
• Pentaerythritol Tetraethyleneoxide (PET)
• Cetyl Ethylhexanoate (CET)
• Dimethicone 100 cst (DMC100)
• Dimethicone 350 cst (DMC350)

DATA FROM TECHNICAL QUANTITATIVE EVALUATIONS – In the quantitative phase, products were tested in a randomized complete block design. Data was analyzed statistically using ANOVA to determine significant differences among samples for each attribute. A multivariate factor analysis (FA) was conducted on the average sensory profiles of the samples to identify key dimensions of sensory variability. The location of the products on these key dimensions can be used to illustrate their similarities and differences in a perceptual map.

DATA FROM CONSUMER QUALITATIVE FEEDBACK – Qualitative comments were summarized to highlight consistent themes among panelists. While all panelist experiences represent a subset of the larger consumer population, repeated patterns within the SCAN panelists’ qualitative data are identified as key product differentiators. Qualitative results should be confirmed with larger groups of targeted consumers.

RESULTS:

• Products with DSE, MSO/DSE blend, and PET are described as having a relatively high amount of residue which feels greasy, and somewhat waxy (Figure 1), and consumers perceived as soft, silky-smooth, and cushioning (Sensory Figure 2).

• CEH, and to a lesser extent ARG and MSO, have very low residue with silicone & powder characteristics (Figure 1) which translated to fast-absorbing, light finish, and primed skin for consumers (Figure 2).

• Dimethicones had low residue that was waxy but not oily and powdery, which consumers identified as tightening and smoothing (Figure 2). Consumers also found MSO, DSE, CEH, and PET to be tightening/ firming.

• While some SCAN in-home assessments mirror the quantitative descriptive analysis, additional insights emerged from the on-site group sessions:
  • MSO/DSE blend was favorite among consumers for smoothing, long-lasting, substantive skinfeel
  • MSO favored by consumers for fast absorption
  • DSE had velvety, silky-smooth skinfeel

KEY FINDINGS:

Table 1. Combined technical and consumer language of facial serum characteristics

<table>
<thead>
<tr>
<th>Emollient</th>
<th>Key Differentiators</th>
<th>Consumer Experience</th>
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<tbody>
<tr>
<td>Daikon Seed Extract</td>
<td>High Residue</td>
<td>Soft, Silky - Smooth</td>
</tr>
<tr>
<td>Meadowfoam Seed Oil / Arg</td>
<td>Low Residue</td>
<td>Skin Preparation</td>
</tr>
<tr>
<td>Argan Oil</td>
<td>Low Residue</td>
<td>Light Finish</td>
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<tr>
<td>Olive Seed Oil</td>
<td>Smooth</td>
<td>Long Lasting</td>
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<tr>
<td>Dimethicone 100 cst</td>
<td>Smooth</td>
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DISCUSSION AND CONCLUSIONS:
Finding natural emollients with a distinct sensory profile and desirable attributes is an ongoing challenge to formulators. The methods used in this study can help translate technical profiles to consumer experience. Figure 2 demonstrates this translation from technical to consumer language. Consumer qualitative findings confirm interpretation of the technical language and identify consumer terms to describe the products, benefits, and uses. Connecting the technical and consumer attributes enables a formulator to identify product characteristics that deliver a specific consumer benefit.

This study shows that natural oils, like meadowfoam seed oil and daikon seed extract, provide significant new opportunities for the cosmetic industry. With distinctive skinfeel and unique textures these oils are viable natural alternatives to synthetic emollients.

Based on comparative characteristics, there may be an opportunity for natural ingredients to serve as substitutions for synthetic ingredients in simple systems or finished formulations:
• DSE and MSO/DSE for PET
• MSO (or ARG) for CEH
• MSO performed very similarly to the more expensive ARG and could provide a more cost-effective alternative where similar characteristics are desired.