INTERESTERIFIED SOYBEAN OIL

February 15, 2017
THE PHO SITUATION

• Partially hydrogenated oils (PHOs – source of trans fats) are no longer considered GRAS
  • “Banned” after June 18, 2018
  • Food industry has already reduced trans fat in foods by 86%

• Most common high stability, liquid oils now:
  • Conventional soybean and canola oil
  • Other natural oils – corn, peanut, cotton, sunflower
  • Imported palm/palm olein

• Gaining in popularity:
  • High oleic soybean
  • High oleic canola, sunflower, safflower

• Solid fat sources
  • Physical blend of fully hydrogenated oil with liquid oil
  • Blends of oils with palm oil
  • Interesterified soybean oil
### FATTY ACID PROFILE

<table>
<thead>
<tr>
<th></th>
<th>Conventional Liquid SBO</th>
<th>High Oleic Liquid SBO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Palmitic</td>
<td>11%</td>
<td>11%</td>
</tr>
<tr>
<td>Stearic</td>
<td>33%</td>
<td>33%</td>
</tr>
<tr>
<td>Oleic</td>
<td>16%</td>
<td>40%</td>
</tr>
<tr>
<td>Linoleic</td>
<td>33%</td>
<td>11%</td>
</tr>
<tr>
<td>Linolenic</td>
<td>4%</td>
<td>2%</td>
</tr>
</tbody>
</table>
FUNCTIONALITY TESTING:
DOUGHNUT FRYING

Fry life
– EIE high oleic soy outperformed EIE conventional soy and the palm-soy blend shortening

Product appearance
– EIE high oleic soy outperformed EIE conventional soy and the palm-soy blend shortening

Texture change over time
– EIE high oleic soy exhibited less staleness than either EIE conventional soy and the palm-soy blend shortening

Oil weeping
– EIE high oleic soy exhibited less weeping than either EIE conventional soy and the palm-soy blend shortening

The EIE soy donut frying shortening came closest to emulating the performance of the traditional PHO donut frying shortening
FUNCTIONALITY TESTING: WHITE CAKE BATTER

- The finished baked cake was measured for dome peak height, dome edge height, and the dome peak height to dome edge ratio
- Dome height
  - Enzymatically interesterified (EIE) high oleic soy results were essentially identical as that of PHO shortening
  - EIE conventional soy showed similar height results as the palm-based shortening
- Edge height
  - EIE high oleic soy came closest to that of the PHO shortening
  - EIE conventional soy showed similar height results as the palm-based shortening
FUNCTIONALITY TESTING: BUTTERCREAM ICING

- Buttercream icing is the most common type of icing used in the bakery industry with quality typically measured by viscosity and specific gravity.
- Icing viscosity
  - The viscosity of icing made from EIE high oleic soy was closest to that made with PHO shortening.
- Icing specific gravity
  - The specific gravity of icing made with both EIE high oleic and EIE conventional soy was closer to that made with PHO.
  - The specific gravity of icing made with a palm shortening was considerably lower than the soy icings.
INTERESTERIFIED SOYBEAN OIL PRODUCTION

Million Lbs.

- 2015
- 2016
- 2017
- 2018
- 2019
- 2020
- 2021
- 2022
- 2023
- 2024
- 2025
EIE Soybean Oil Suppliers

- BUNGE
- STRATAS FOODS
- ADM
Active Food Company Outreach
confidential

• Weaver Popcorn
• CSM Bakery Solutions
• T Marzetti Company
• Dawn Foods
• Bay Valley Foods
• Treehouse Foods
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