

No PHOs, No Problem

ENSEMBLE™ Solutions Mimic PHO Performance in Blind Comparison Studies

Now that the U.S. Food and Drug Administration (FDA) has officially revoked the generally recognized as safe (GRAS) status of partially hydrogenated oils (PHOs), food and beverage manufacturers must find suitable non-PHO alternatives that mimic the performance of their PHO counterpart.

When it comes to emulsifiers, a variety of options are available; yet, when tested, most fail to match the functionality that PHO emulsifiers provide, presenting reformulation hassles and operational disruptions.

Corbion's ENSEMBLE™ is a full line of non-PHO emulsifiers that deliver drop-in functionality, so you can make the switch from PHOs without missing a beat. Made from a proprietary mixture of non-PHOs, ENSEMBLE™ solutions mimic the thermal stability and maintain the flavor, texture, quality, ease of handling and shelf stability that once only PHOs could provide.

The ENSEMBLE™ portfolio:

BFP® 550

Starplex® 590

Starplex® 590 F

Alphadim® 570

Coming soon:

GMS® 520 & 540

The Best Thing Since ... Well, You Know

The experts at Corbion know that maintaining product quality is at the top of your priorities list. That's why they rigorously tested the ENSEMBLE™ portfolio of non-PHO emulsifiers in both the field and lab to make certain that they meet Corbion's high standards for performance.

Corbion conducted blind tests of several ENSEMBLE™ solutions in applications. The non-PHO emulsifier Starplex® 590, for example, was tested in bread applications against the PHO-containing emulsifiers Starplex® 90 K and Alphadim® 90 DBK as well as a no-add formulation.

A large production of white bread samples (no-time and sponge/dough) was used for the evaluation, and all process variables were kept the same and monitored. Testing criteria included dough handling, processing, texture (punch on day 3 and 7), crumb characterization/volume and sensory preference among 50 panelists.

WHAT CAN DROP-IN FUNCTIONALITY DO FOR YOU?

Drop-in functionality means Corbion's **ENSEMBLE™** solutions can help you:

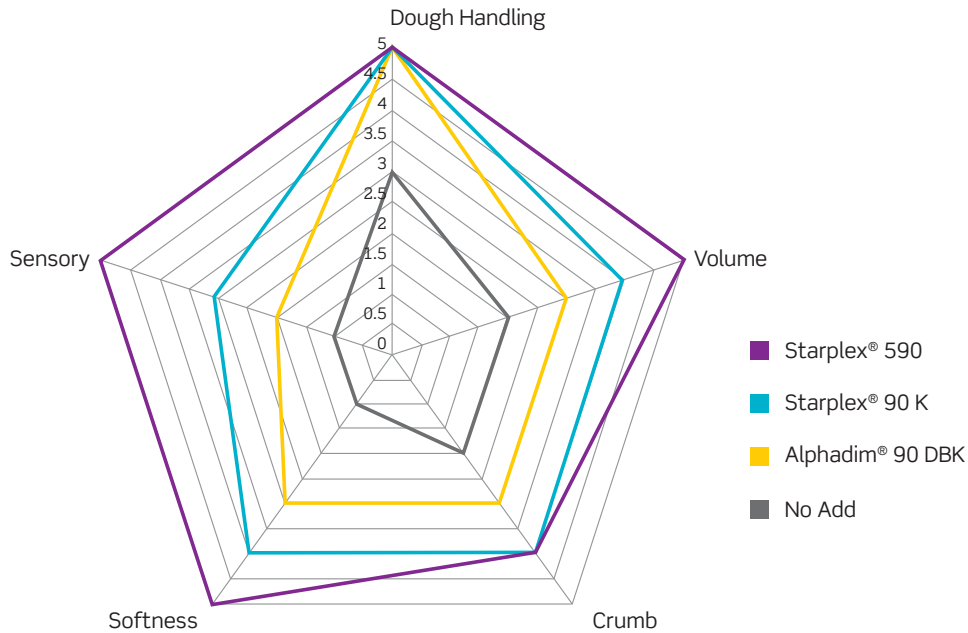
- ▶ **Maintain functionality**
- ▶ **Preserve product handling**
- ▶ **Sustain quality attributes**
- ▶ **Minimize reformulation hurdles**
- ▶ **Decrease reformulation costs**
- ▶ **Avoid production disruptions**
- ▶ **Simplify formulation efforts**



The Results

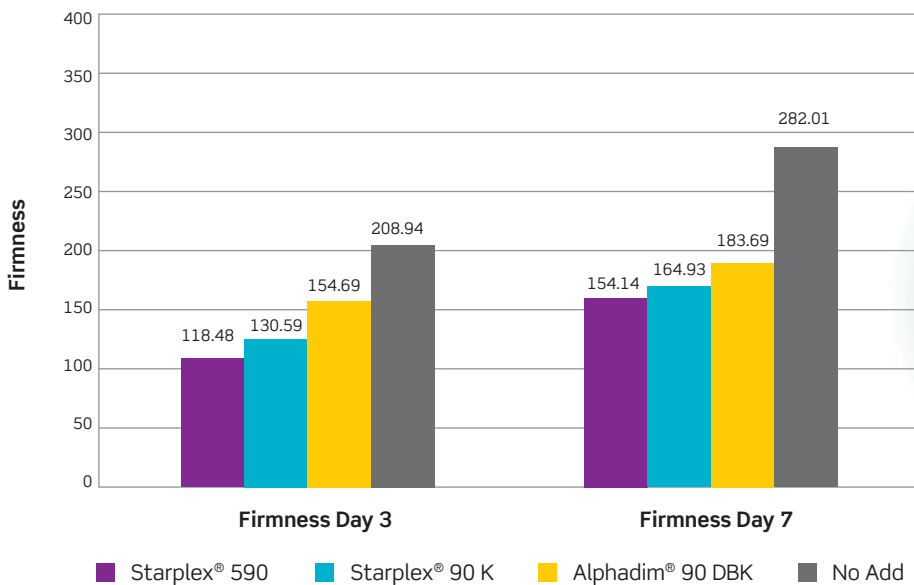
Starplex® 590 was shown to mimic the performance of the PHO-containing emulsifiers in terms of firmness, adhesiveness and resilience and was even preferred in blind sensory testing among 50 panelists for freshness, softness, taste and texture.

White Bread (Sponge & Dough)



Firmness: There was no significant difference between Starplex® 590 and the PHO-containing emulsifier Starplex® 90 K.

White Bread Firmness (Sponge & Dough)

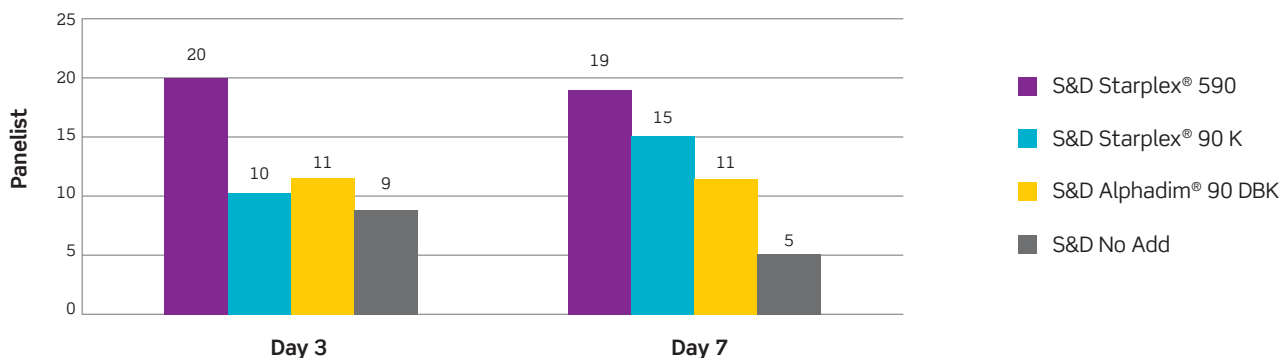


Adhesiveness: There was no significant difference between Starplex® 590 and the PHO-containing emulsifier Starplex® 90 K in sponge and dough method. Starplex® 90 K had a higher level of adhesiveness than Starplex® 590, when used in the no-time method. However, sensory panelists did not observe this difference.

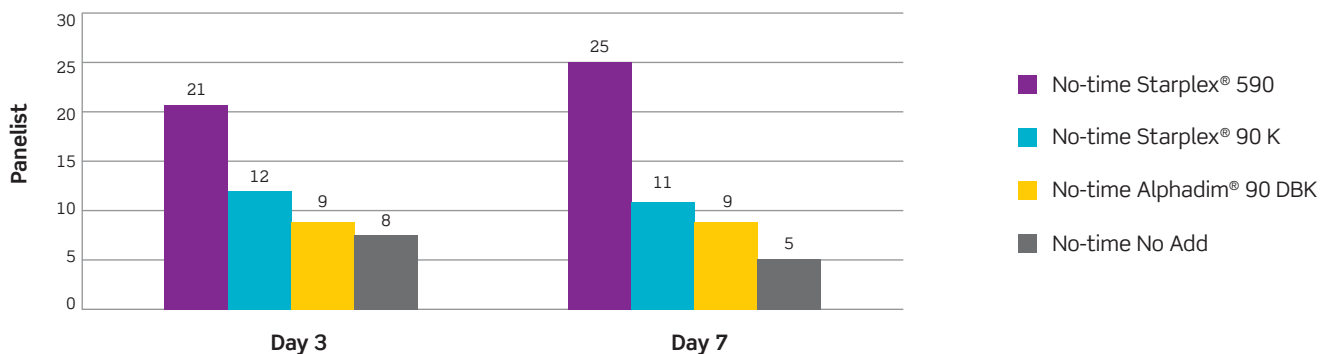
Resilience: There was no significant difference between Starplex® 590 and the PHO-containing emulsifier Starplex® 90 K.

Sensory Testing: Starplex® 590 was preferred over the PHO-containing emulsifiers Starplex® 90 K and Alphadim® 90 DBK, no matter the day (day 3 or day 7) or method (sponge/dough or no-time).

Preferred Sponge & Dough Sample by Panelist



Preferred No-time Dough Sample by Panelist



Drop-in Functionality You Can Trust

Bread applications are just one example where drop-in functionality of ENSEMBLE™ is evident. Based on Corbion's popular PHO-containing emulsifiers, Corbion's ENSEMBLE™ offers solutions for a variety of applications noted below:

BAKERY - Products that apply: Starplex® 590, Starplex® 590 F, BFP® 550

BEVERAGES - Products that apply: Starplex® 590, Starplex® 590 F, BFP® 550

CONFECTIONERY - Products that apply: Starplex® 590, BFP® 550

DAIRY AND NON-DAIRY - Products that apply: BFP® 550, Alphadim® 570

PROCESSED FOODS - Products that apply: Starplex® 590, Starplex® 590 F, BFP® 550

As you create your action plan for adhering to the FDA's new mandate, the last thing you need is a complete overhaul of processes and time-honored formulations. Corbion's ENSEMBLE™ offers an alternative to the hurdles of costly reformulation: A portfolio of tested, drop-in non-PHO emulsifiers you can trust.

To learn more about the Corbion ENSEMBLE™ portfolio of non-PHO emulsifiers, visit CorbionEnsemble.com.