When it comes to removing partially hydrogenated oils from formulations, it’s not enough to just substitute a non-PHO option. You deserve more. That’s why Corbion created ENSEMBLE – the full line of non-PHO emulsifiers that knows how to play together, right from the first note.

**Drop it in. Move on.**
Corbion experts have re-engineered our popular emulsifier portfolio with one goal in mind: provide non-PHO options that deliver drop-in ease while maintaining flavor, texture, quality, ease of handling and shelf stability.

The result? ENSEMBLE non-PHO emulsifier solutions minimize reformulation hurdles and operational disruptions, allowing you to simplify and streamline formulation efforts.

**Short mixing time? Quick Solution.**
When a powdered monoglyceride isn’t fast enough, try Corbion’s GMS product line. These hydrated monoglycerides deliver the power of a powder, in a fraction of the time. Provided in an easy-to-disperse, pumpable paste, they are ideal for no-time dough processes. GMS can eliminate the time-consuming sponge stage, or applications with short mixing times.

Want more advantages? GMS® 520 and GMS® 540 offer the same handling and quality as their PHO counterparts (figure 1 and 2). As demonstrated in figure 2, GMS® 540 can even outperform its PHO counterpart at a 20% reduced usage rate, saving you time and reducing your cost in use. Lower usage rates. Lower costs. Better results!

---

**GMS® Hydrated Emulsifiers**
**An ENSEMBLE™ non-PHO Solution**

- Best solution for no-time dough systems
- Drop-in functionality
- Improves crumb grain
- Enhances softness

CorbionEnsemble.com
GMS® Hydrated Emulsifiers
An ENSEMBLE™ non-PHO Solution

Double the options. Double the strength.

GMS products utilize a hydration process that creates a monoglyceride with a higher surface area than powdered versions. This results in a faster acting emulsifier that provides superior functionality to no-time dough systems and applications requiring short mixing times. To best meet your needs, we offer both GMS® 520 and GMS® 540. The difference? GMS® 520 provides a 21% minimum monoglyceride content, while the 540 version offers 38.5% monoglyceride.

GMS® 520 Applications

<table>
<thead>
<tr>
<th>Category</th>
<th>Function</th>
<th>Usage Rate</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breads &amp; rolls</td>
<td>Shelf life extension</td>
<td>0.5%-1.25% flour basis</td>
<td>Hydrated softeners for yeast-raised breads and rolls</td>
</tr>
<tr>
<td>Pasta/Noodles</td>
<td>Starch complexing</td>
<td>0.5%-1.0% dry wt</td>
<td>Improves freeze-thaw stability, prevents sticking, gives resistance to overcooking and adds stability and firmness</td>
</tr>
</tbody>
</table>

GMS® 540 Applications

<table>
<thead>
<tr>
<th>Category</th>
<th>Function</th>
<th>Usage Rate</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breads &amp; rolls</td>
<td>Shelf life extension</td>
<td>0.5%-1.25% flour basis</td>
<td>Hydrated softeners for yeast-raised breads and rolls</td>
</tr>
</tbody>
</table>

Interested in additional non-pho solutions? Go to CorbionEnsemble.com

With over 100 years of global food technology experience and an extensive portfolio of high quality products, Corbion Caravan has a wealth of expertise in the world of food ingredients. Corbion is a leading company in natural food preservation, lactic acid based bioplastics, biobased chemicals and the worldwide market leader in lactic acid, lactic acid derivatives and lactides. Corbion operates 10 production plants, in the USA, the Netherlands, Spain, Brazil and Thailand, and markets its products through a worldwide network of sales offices and distributors.

© Copyright 2015 Corbion. All rights reserved. No part of this publication may be copied, downloaded, reproduced, stored in a retrieval system or transmitted in any form by any means, electronic, mechanical, photocopied, recorded or otherwise, without permission of the publisher. No representation or warranty is made as to the truth of accuracy of any data, information or opinions contained herein or as to their suitability for any purpose, condition or application. None of the data, information or opinions herein may be relied upon for any purpose or reason. Corbion disclaims any liability, damages, losses or other consequences suffered or incurred in connection with the use of the data, information or opinions contained herein. In addition, nothing contained herein shall be construed as a recommendation to use any products in conflict with existing patents covering any material or its use.