



Leading to Better

## Kerry Bakery





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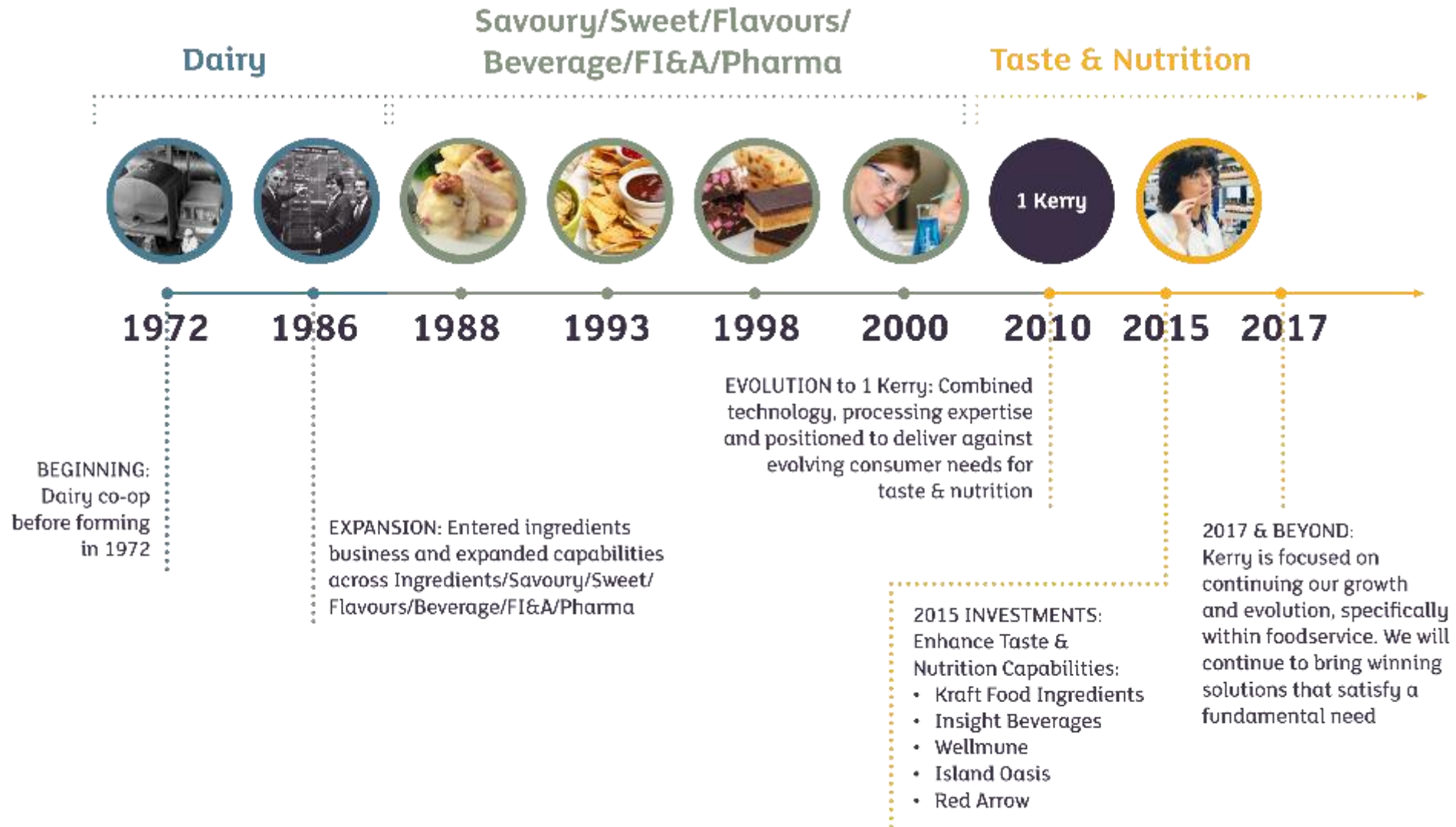


## Taste & Nutrition

Kerry is the largest and most technologically advanced developer and provider of taste and nutrition solutions in the world. Kerry has strong customer alliances with leading global, regional and local food, beverage and pharmaceutical companies

Our leading-edge research in markets and consumer behaviour and our unparalleled expertise in the science of taste allows us to deliver products that nourish and delight consumers

# 40+ Years of Strategic Evolution



# Global Credibility

Quoted on the London & Dublin Stock Exchanges

Corporate headquarters

• Tralee, Ireland

2015 revenues

**€6.1 bn** Kerry Group Global Revenue

TASTE & NUTRITION  
REVENUE BY REGION



24k+  
Employees

800+  
Scientists

Supplying  
Customers in  
140  
Countries

130  
Production  
Facilities

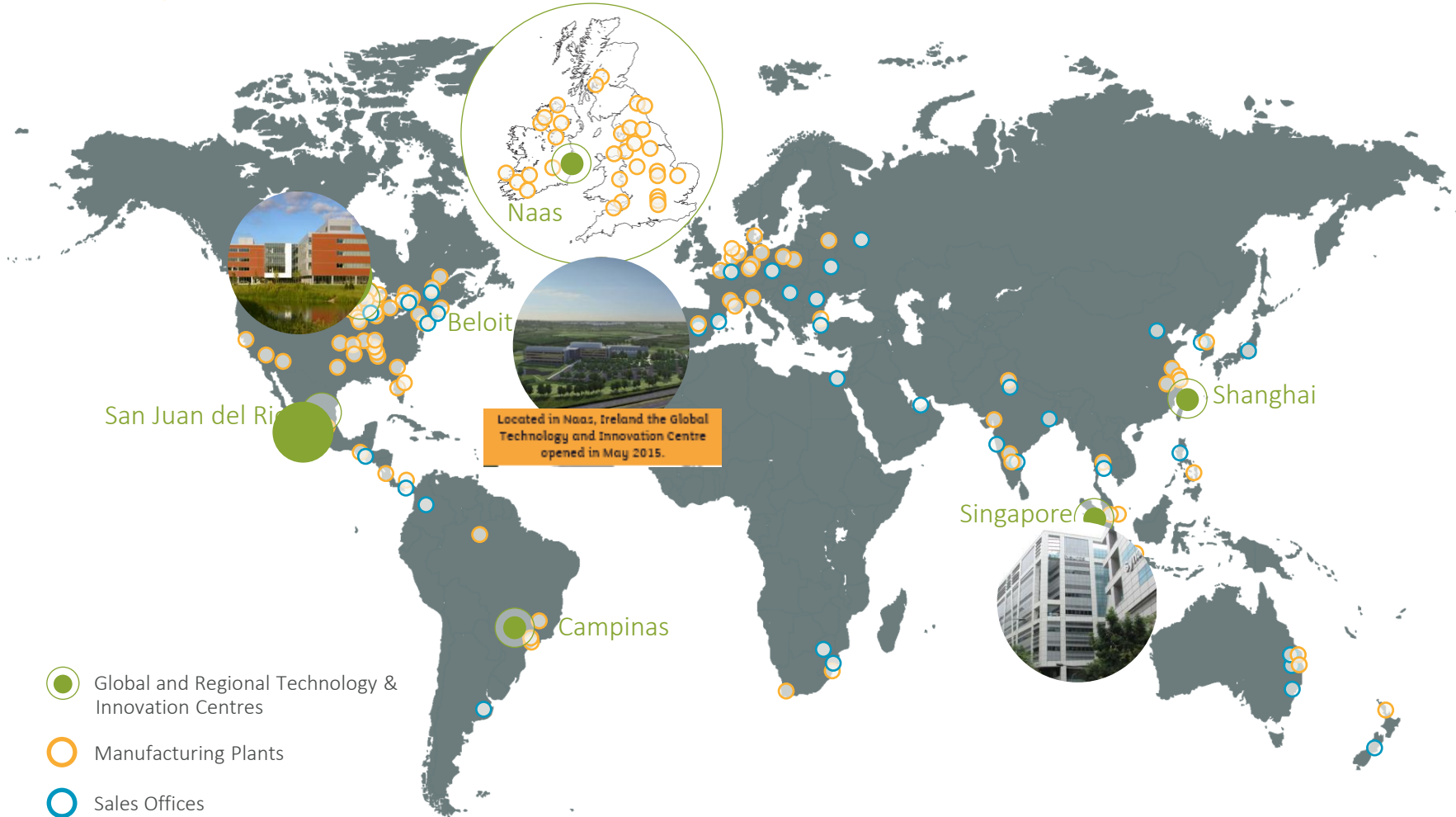
15k+  
Products

Operations in  
25  
Countries

KERRY

# Kerry Group – Worldwide Locations

## Manufacturing Footprint



- |            |              |
|------------|--------------|
| Australia  | Malaysia     |
| Belarus    | Mexico       |
| Brazil     | Netherlands  |
| Canada     | New Zealand  |
| China      | Panama       |
| Costa Rica | Philippines  |
| Denmark    | Poland       |
| France     | South Africa |
| Germany    | South Korea  |
| Guatemala  | Spain        |
| India      | Thailand     |
| Indonesia  | Turkey       |
| Ireland    | UK           |
| Italy      | USA          |

# Naas (Ireland) Technology Innovation Center



## **Emulsifier R&D:**

New product development, process and product improvement, new application screen

## **Analytical R&D:**

Product quality and performance, product composition, development of new analytical methods

## **Application Specialists:**

Market knowledge, customer technical application support, combined technological solutions

# Kerry's Unique Taste & Nutrition Growth Model

## Taste

### Pure & Simple

Clean Label; Trusted;  
No Artificial Ingredients,  
Free From

### Authentic & Familiar

Cooking Style; Authentic;  
Taste of Time; Ethnic

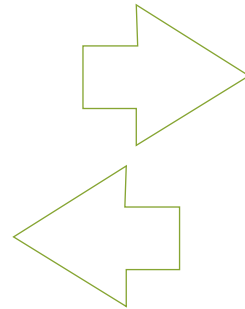


### Pleasure & Indulgence

New Taste; Fine Dining;  
Patisserie and  
Coffeehouse Experiences

### Fresh & Invigorating

Taste w/out Compromise;  
Fresh; Healthy Halo;  
Natural Mood



## Nutrition

### Free From

Food Intolerance;  
Low/No/Reduced Lactose;  
Gluten Free; Clean/Cleaner Label

### Better For You

Reduced Sugar;  
Salt and Fat;  
Balanced Choice



### Good For You

Protein Fortification; Carbohydrate  
Quality; Healthy Lipids;  
Micronutrient Fortification;  
Naturally Good For You

### Tailored For You

Infant and Toddler; Performance  
and Healthcare Nutrition;  
Weight Management



# Kerry Bakery

# Kerry Bakery

At Kerry we have a dedicated bakery team with application expertise. We can provide bespoke and innovative solutions in line with market trends.



Unrivalled  
range of  
technologies  
across the  
food industry

Globally  
integrated  
team

Sensory  
testing

Consumer  
and market  
insight

# Kerry Bakery Technologies



We lead our customers to a better understanding of taste & nutrition



- Food Protection & Fermentation
- Enzymes
- Emulsifier & Lipids
- Dairy Taste
- Sweet and Savoury Taste
- Pre and Post Bake Fillings
- Texture Systems
- Glazes & Coatings
- Pre and Post Bake Inclusions
- Functional Nutrition (Protein/Fibre)
- Protein Technology

# Top Trends in Bakery



## Better for You

Government health targets, wellness bloggers and consumer concerns are driving the demand for **sugar and fat reduction** across the food industry



## Premiumisation

Consumers are opting for quality over quantity leaving plenty of room for products that are **artisan, indulgent and multisensorial**



# Sugar Reduction Solutions

*Designed to reduce sugar while maintaining great taste*

**Application:** Cakes, Cookies, Muffins, Biscuits

**Features:**

- Blend of Kerry fibres for bulk replacement and improved texture
- Emulsifiers for flow and texture
- Biobake™ enzymes
- TasteSense™ for flavor modulation – declared as natural flavor

**Benefits:**

- Reduce sugar by up to 30%
- Texture, appearance, volume and flavor of standard product maintained
- Potential fibre claim (recipe dependent)





Leading to Better

# Bakery

Kerry Emulsifier Systems (KES)



# Emulsifiers

*Designed to improve processing characteristic and enhance product quality*

**Application:** Bread, Cake, Cake Mixes, Donuts, Muffins

## **Features:**

- Full range of emulsifiers and emulsifier systems
- PHO free available
- RSPO certified or non-palm available
- Halal & Kosher certified

## **Benefits:**

- Improved nutrition without loss of eating quality
- Improves volume of baked goods
- Improves flour tolerance
- Provides crumb softening in bread
- Improved aeration, volume & texture in cakes
- Extends shelf-life in bread & cakes
- Provides emulsion stability, aeration & texture in cake mixes

# Kerry emulsifiers manufacturing **locations**



**Zwijndrecht (NL)** Mono-and diglycerides  
Distilled monoglycerides  
LACTEM  
DATEM  
Polyglycerol esters  
Stearoyl lactylates



**Palm (SG)**



**Sunflower**



**Rapeseed**



**Penang (MYS)** Mono-and diglycerides  
Distilled monoglycerides  
Acetoglycerides  
Polyglycerol esters  
Stearoyl lactylates  
Propylene glycol esters



**Palm (MB)**



- ✓ Kosher and Halal certified
- ✓ FSSC 22 000 & PAS 220 certified
- ✓ Full member of RSPO
- ✓ State of the art technology



# Wide range of emulsifiers – wide variety of choices

Product name	E / INS number	Kerry brand name
Mono-diglycerides	E471	ADMUL MG
Distilled Monoglycerides	E471	MYVEROL
Acetic acid ester of mono and diglycerides	E472 a	MYVACET
Lactic acid ester of mono and diglycerides	E472 b	ADMUL GLP
Diacetylated tartaric acid ester of mono and diglycerides	E472 e	ADMUL DATEM
Polyglycerol esters of fatty acid	E475	ADMUL PGE
Propylene glycol esters of fatty acid	E477	MYVEROL P
Polyglycerol polyricinoleate	E476	ADMUL WOL
Stearoyl lactylates	E481 – 482	ADMUL SSL / CSL
Polysorbates	E432 – 435	ADMUL T
Sorbitan esters	E491 – 495	ADMUL S
Sponge cake emulsifiers	Various	ADMUL Emulsponge
Blends of emulsifiers	Various	Myvatex

# Kerry emulsifiers for bakery products

## **DATEM (E472e):**

- ADMUL DATEM 1939 (1<sup>st</sup> Gen)
- ADMUL DATEM 1955 (2<sup>nd</sup> Gen)
- ADMUL DATEM 2177 (3<sup>rd</sup> Gen)
- ADMUL DATEM 1916 (Liquid)

## **Distilled monoglycerides (E471):**

- Myvatex MxTex (Fine particle)
- Myvatex MxTex NP (Fine particle Non-palm)
- Myvatex Mighty Soft range

## **SSL / CSL (E481/482)**

- ADMUL SSL 2012
- ADMUL SSL 1078
- ADMUL CSL 2010



# Emulsifiers for Bakery and Fine bakery

- Emulsifiers have the following properties in Bakery and Fine bakery goods
  - ✓ Aeration
  - ✓ Fat reduction
  - ✓ Emulsification
  - ✓ Anti-staling (shelf-life improvement)
  - ✓ Crumb softness
  - ✓ Dough stability

## Fine bakery emulsifiers

- **Distilled mono-glycerides & mono diglycerides (E471)**
- Polyglycerol esters of fatty acid (E475)
- Propylene glycol esters of fatty acid (E477)

## Bakery emulsifiers

- Sodium stearoyl lactylate (E481)
- Diacetylated tartaric acid ester of mono and diglycerides (E472e)

# Why use monoglycerides in Bread?

- Monoglycerides delivers in bread the following benefits:
  - Stronger dough
  - Improved dough development
  - Finer cell structure
  - Reduced balling at slicing
  - Reduced blisters on baguettes
  - Increase Softness
  - Anti-staling properties



# Understanding **functionality** parameters of monoglycerides

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## Parameters

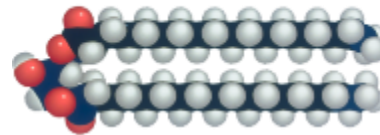
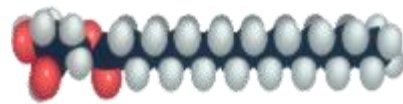
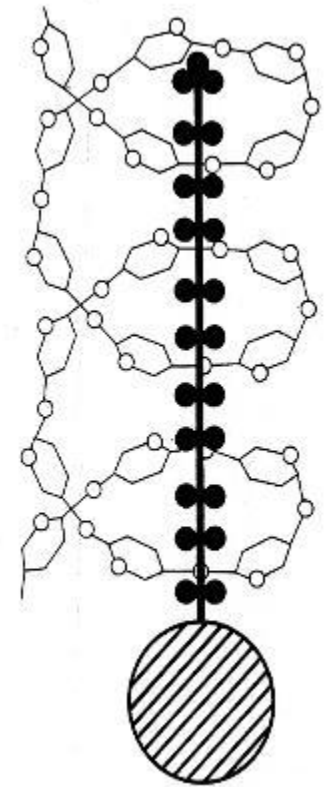
**Monoglyceride content**

**Dispersibility** (Powder & Hydrates)

**Vegetable oil source** (palm vs. non-palm emulsifiers)

# Monoglyceride and starch interaction

- Monoglyceride is the only functional component (through its chemical structure) that interacts with amylose (starch).
- Monoglycerides delays starch retrogradation through intimate interaction with  $\alpha$ -helix



Product	Monoglyceride (%)	Diglyceride (%)	Triglyceride (%)
Admul MG 40-04	45	45	10
Admul MG 60-04	60	35	5
<b>Myverol 18-04 K</b>	<b>95</b>	<b>5</b>	<b>-</b>

# Emulsifier **dispersibility** in dough and batter

**Hydrated** monoglyceride (paste) show best functionality because their surface area is 700 times larger vs. powdered monoglyceride

**Powder** monoglyceride are less functional, but **Fine powder** (large surface: volume ratio) results in fast hydration, and thus almost same efficacy

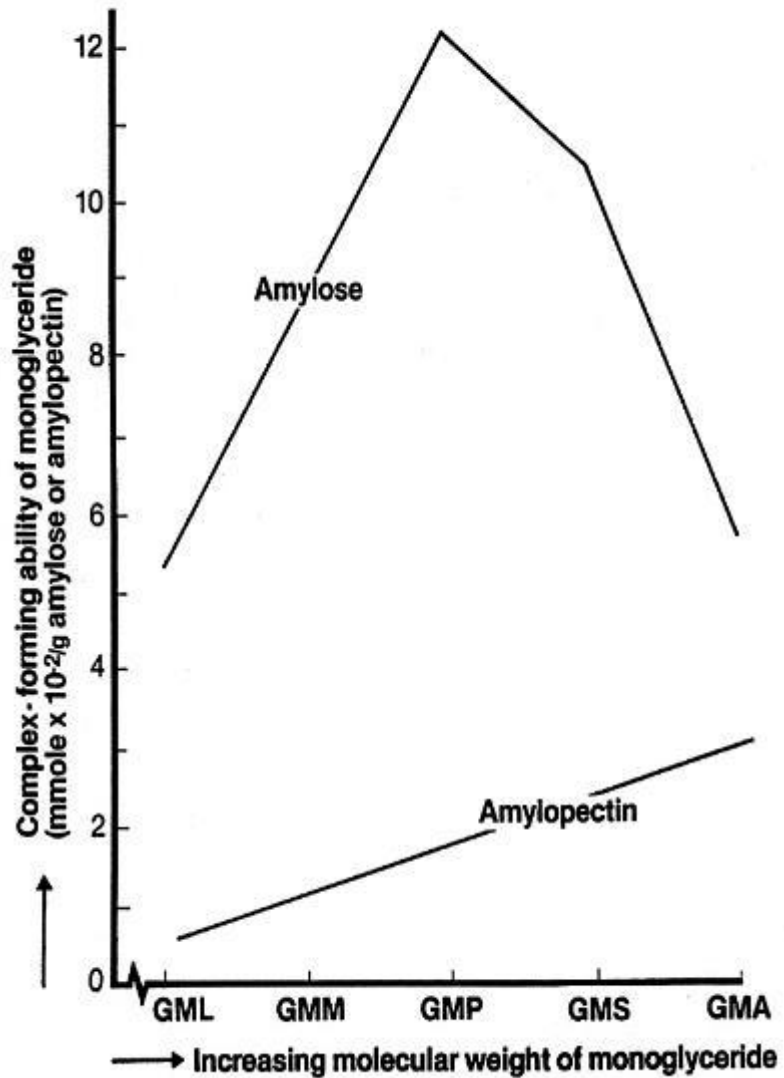
Product	Monoglyceride (%)	Source	IV	Particle size
Myverol 18-04 K	95	Palm	Max 3	350
Myverol 18-04 PK	95	Palm	Max 3	150
Myvatex MxTex	95	Palm	Max 3	75

# Raw material determines functionality of emulsifiers



Product	Monoglyceride (%)	Source	IV	Particle size
Myverol 18-04 K	95	Palm	Max 3	350
Myverol 18-08 NP	95	RP / SF	Max 3	350





Product	Source	C16	C18	MP (°C)
Myverol 18-04 K	Palm	50	50	67
Myverol 18-08 NP	RP / SF	10	90	70

Legendijk & Pennings et al. 1970

# Linking emulsifier **functional** parameters to performance

## Parameters

Monoglyceride content

Particle size

Vegetable oil source

## Conclusion

Distilled monoglycerides (>95%)

Small particle size (<75  $\mu\text{m}$ )

Palm

