



Driving Non-Dairy Innovation with Enzymes

Explore Unlimited Possibilities

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BRIDGE2FOOD
NORTH AMERICA

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Plant-Based Drinks: From Trend to a Daily Choice

Global Market Value (2024)



€21.2 B

Market Value Growth (2023 - 2024)



+ 7.1%

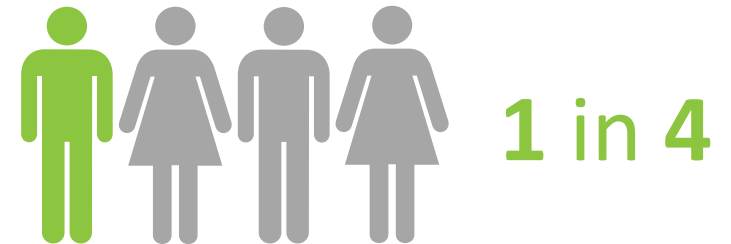
New Product Launches Growth (last 5 years)



+8.67%



- A solution for millions who are lactose-intolerant or dairy-sensitive.
- A lower environmental footprint
- Growing interest in flexitarian, vegan, and plant-forward diets.
- Wide range of flavors, and functional benefits.



consumers globally say that “**organic**” is the clean label aspects which is the most important to them.

Innova Trend Survey 2024 (Average of 11 countries)

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UNLIMITED™

Introducing **PLANTS UNLIMITED™**

Compliant with Organic Labelling Standards



PG 500

Aids in protein stability and prevents curdling of plant-based beverages in applications without acidity regulator



Veramax™ G3

Creates natural sweetness in cereal-based non-dairy beverages without increasing sugar content



Veramax™ G2

Controls sweetness level of cereal-based non-dairy beverages



Other Amylases

Aids in production of cereal-based non-dairy beverages

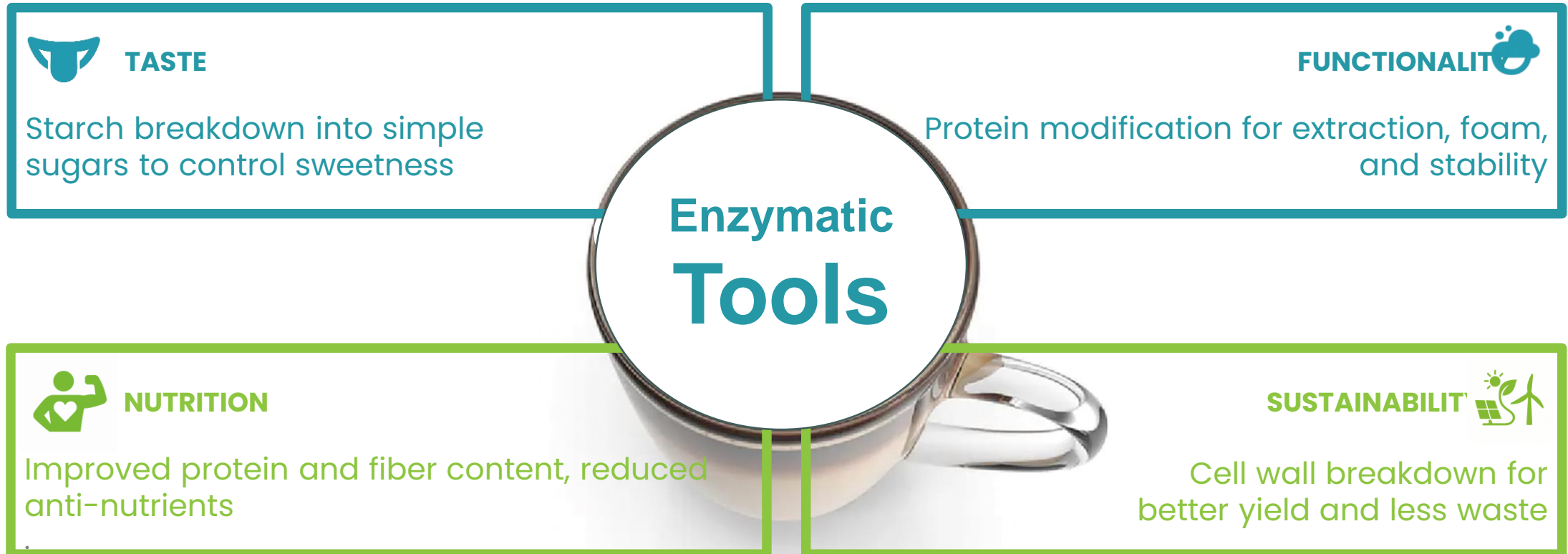


Cheesemax™ PB

Modifies plant-based proteins to aid in creating cheese with melt and stretch

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Enzymes in practice



Enzymes for Barista-Style Beverages



Curdling in Non-Dairy Beverages

Understanding the issues faced by consumers

Consumers report curdling of plant-based milk, especially when added to coffee and tea.

From rice milk and soy milk to almond, hazelnut and coconut milk, all of them seemed to curdle.

[Source](#)

Every time I make iced coffee with oat milk, it curdles. What am I doing wrong? [Source](#)

*Why does my soy milk **always separate** when I add it to hot tea? It's ruining my drink. [Source](#)*

*This almond milk curdled **immediately** when I added it to my coffee. Very disappointing. [Source](#)*

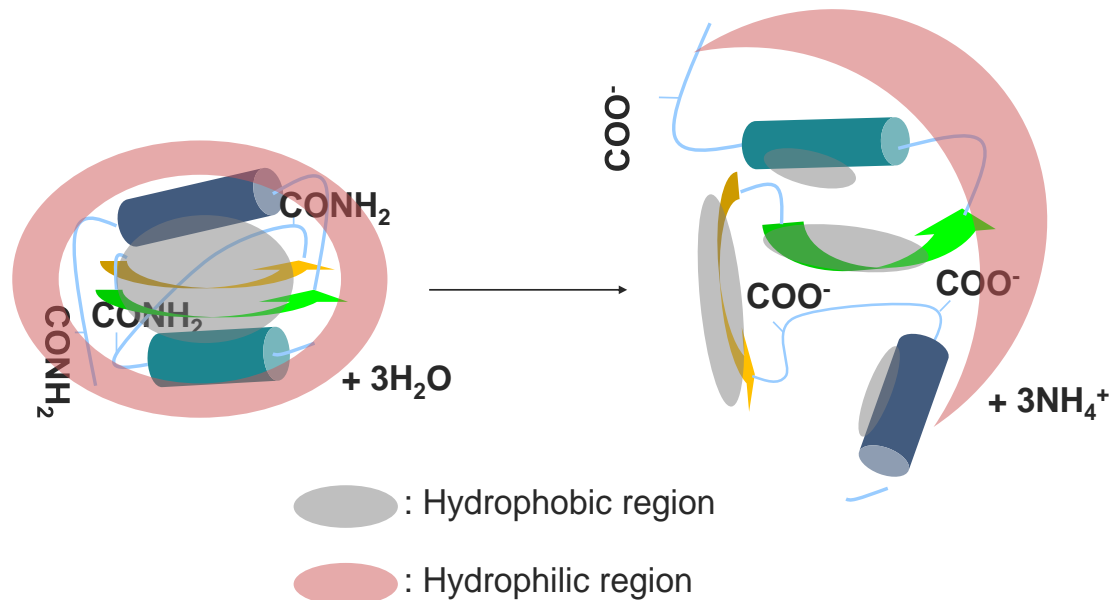
*I've been having **trouble getting a good froth** with soy milk; it often curdles when added to coffee.*

[Source](#)

Protein-Glutaminase “Amano” 500 (PG-500)

A Unique Protein-Acting Enzyme

Deamidation of side-chain amide of glutamine



PG-500 is not a protease

- Catalyses protein deamidation
- Increases intra-/intermolecular repulsion
- Promotes protein unfolding

Functional benefits

- Improved solubility, emulsification, and foaming
- No bitter peptides formed (unlike proteases)
- Simple reaction and easy to scale industrially

Wide range of applications
(Over 70 patents by Amano)

Almond Drink

No More Curdling of Non-Dairy Beverages in Coffee

ENSURING SMOOTH, STABLE DRINKS EVERY TIME

Solution: PG500 enzyme stabilises plant proteins, preventing separation and delivering a smooth, café-quality experience

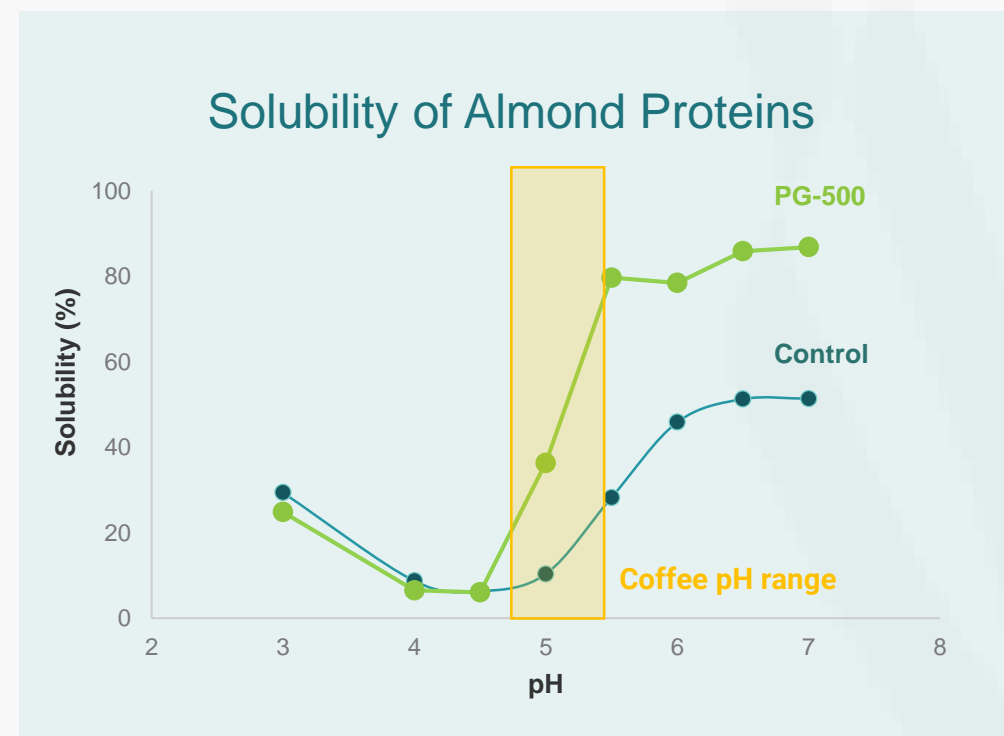
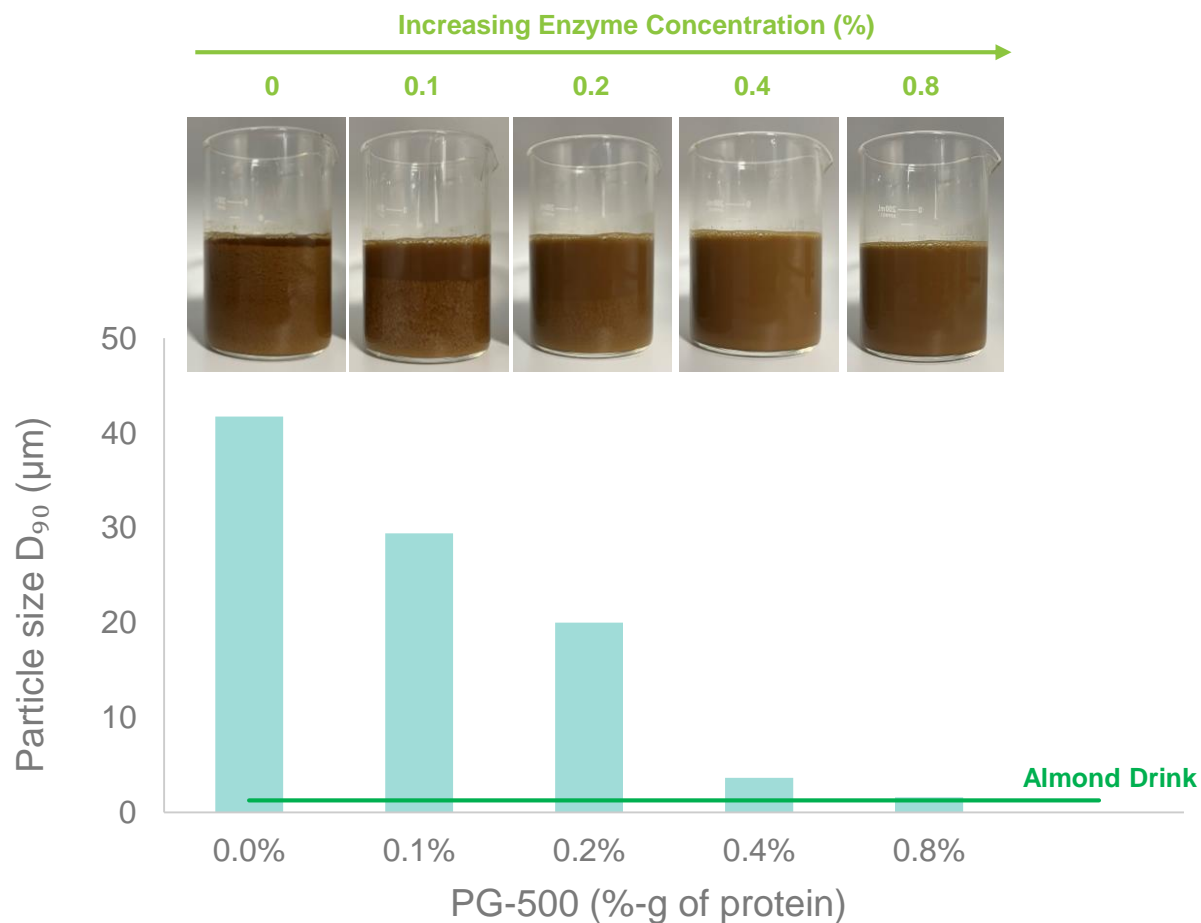


Control

PG-500

Protein-Glutaminase “Amano” 500 (PG-500)

A Unique Protein-Acting Enzyme



No More Curdling of Non-Dairy Beverages in Coffee

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Stability in Coffee—No Matter the Plant Base

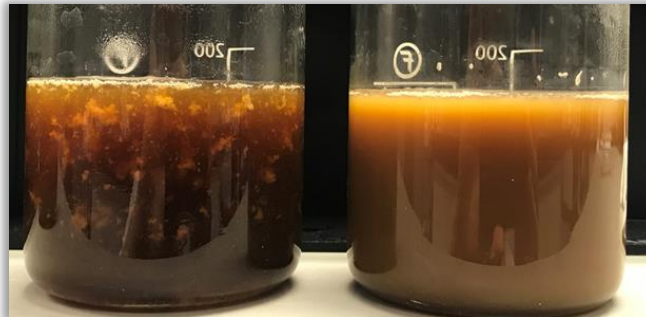
Hemp drink* (protein content 1.0%)



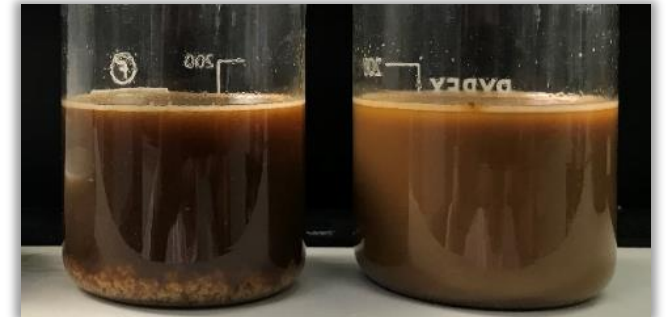
Soy milk* (protein content 3.6%)



Peanut drink* (protein content 2.0%)



Pea drink* (protein content 3.2%)



anti-curdling effect based on 2% instant coffee* solution (control vs enzyme-treated sample)

Perfect Foam, Every Time

High-Quality Foam in Plant-Based Drinks

PG500 enzyme helps retain higher protein content in the final product while improving protein solubility — key factors that contribute to enhanced foam quality and stability in barista-style applications

Almond Drink



PG-500

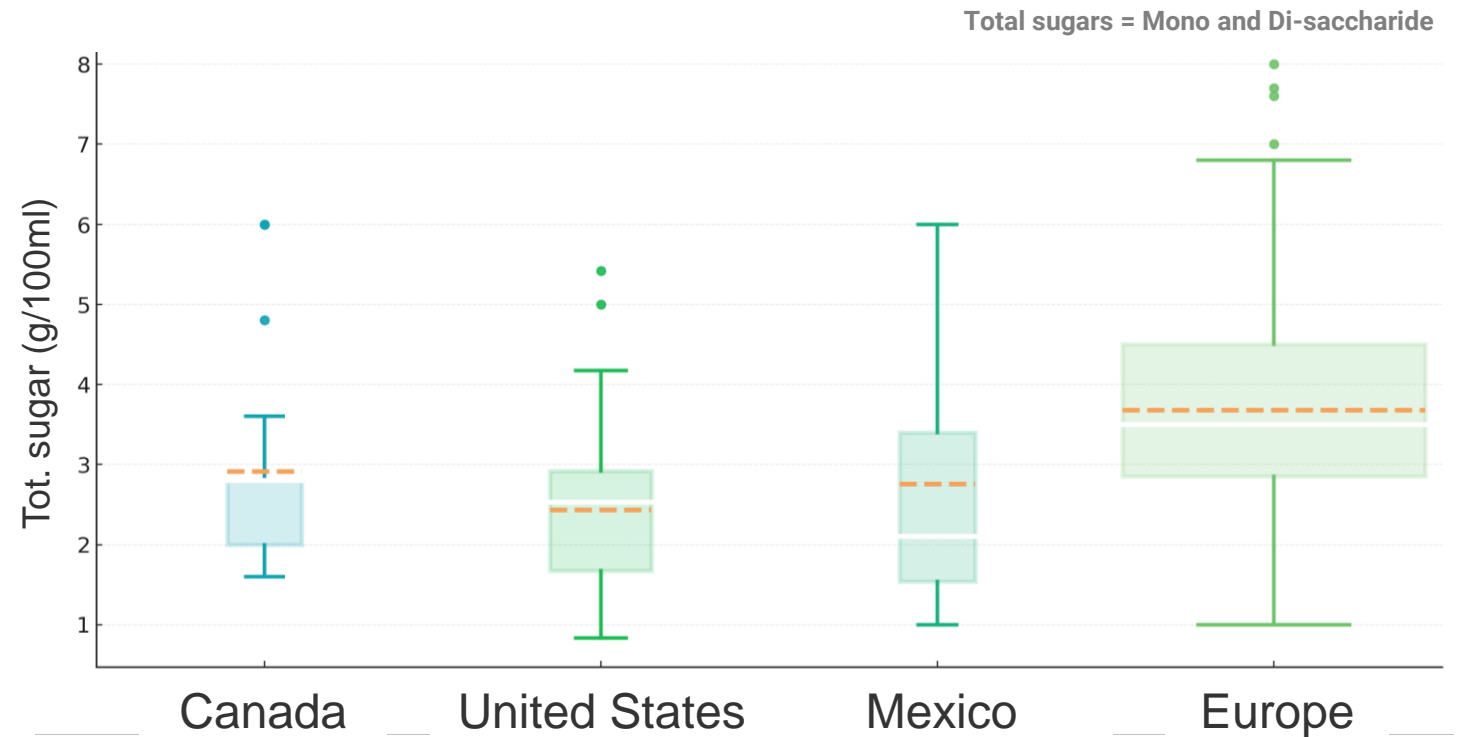
Control



Master the Art of Sweetness

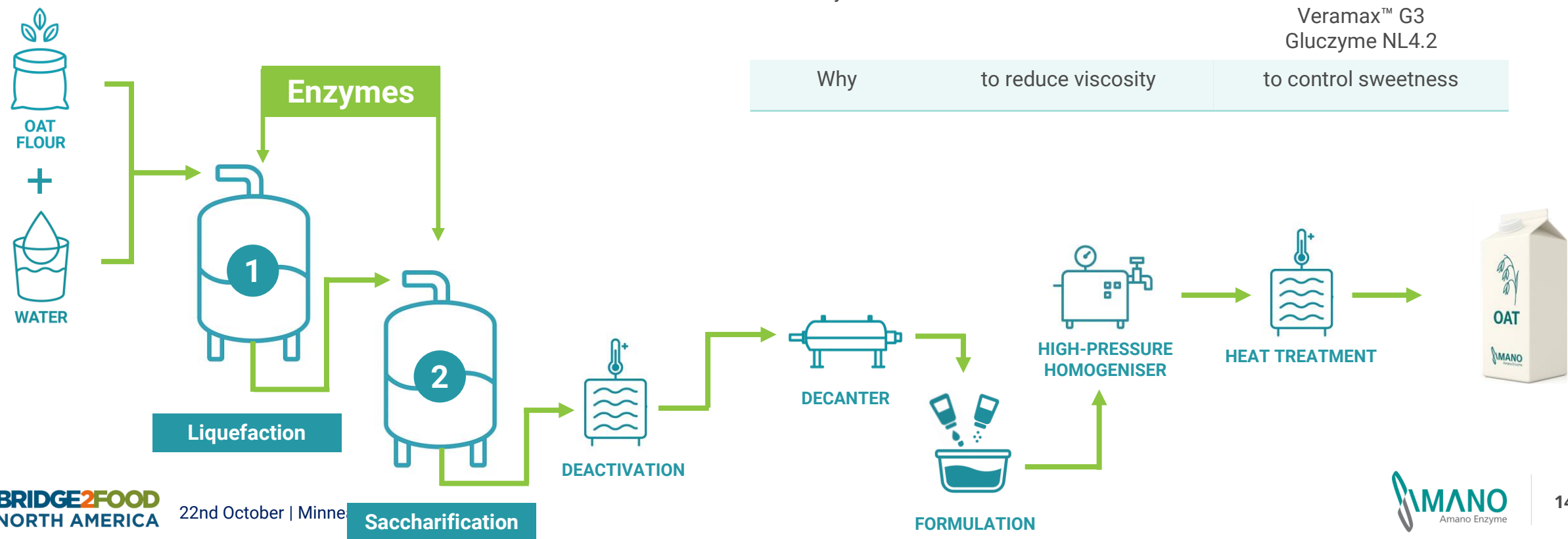
Designing Taste for Every Market

Sugar Levels in Oat Drinks by Market



Sugars in oat drinks comes from starch breakdown

Carbohydrates: 65-75% (of which 60% starch)
Protein: 12-15%
Oil: 5-8%



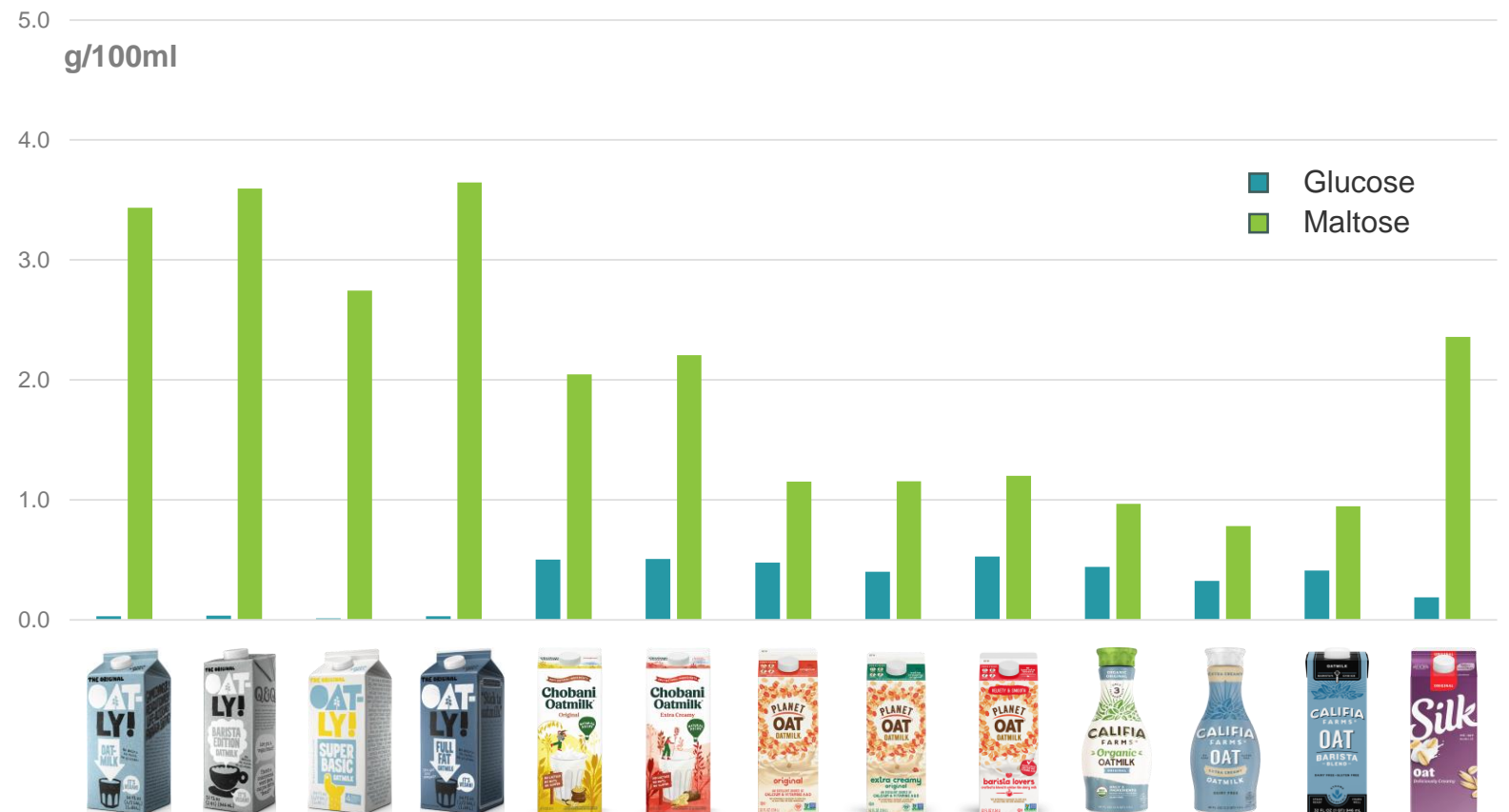
	Liquefaction	Saccharification
Purpose	Breaking starch into shorter chains	Converting starch into simple sugars
Enzyme	Kleistase E5NAC	Veramax™ G2 Veramax™ G3 Gluczyme NL4.2
Why	to reduce viscosity	to control sweetness

Sugar Profile

Plant-based drinks manufacturers are increasingly customising sugar profiles to enhance sweetness and flavor, aligning with consumer preferences in their target markets

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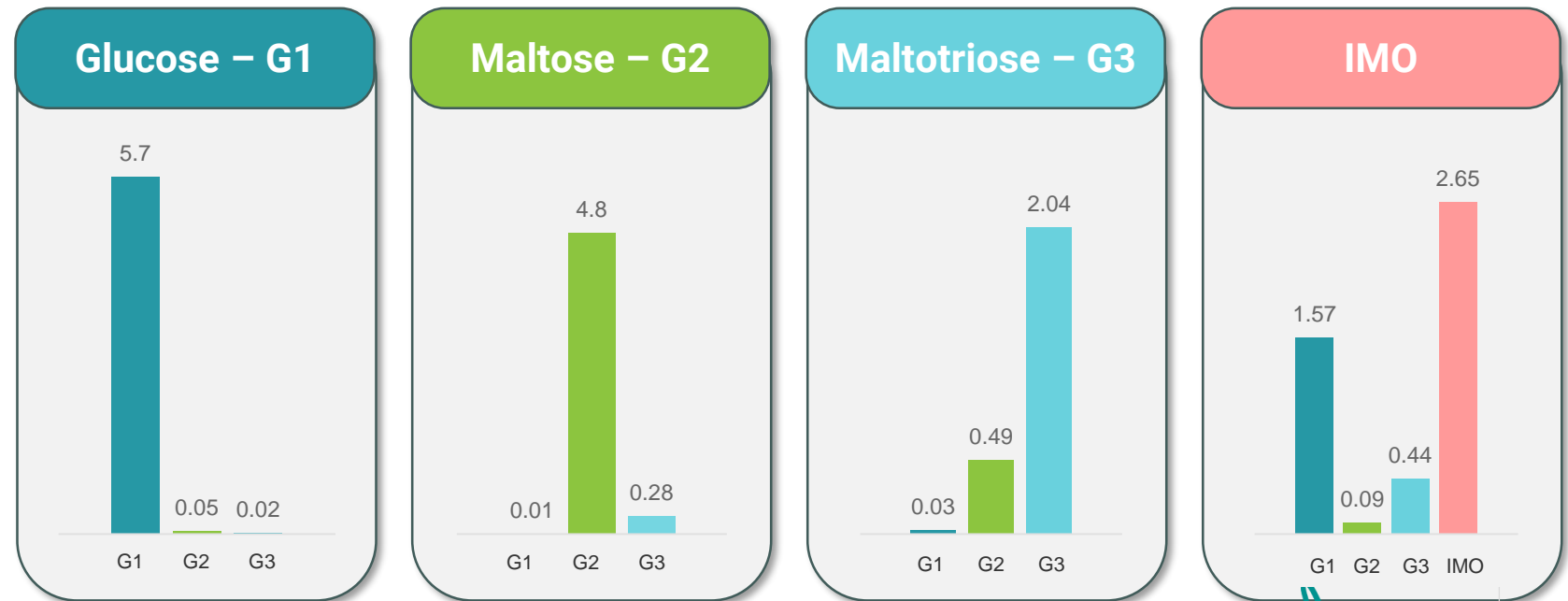
Maltose Leads Among Major Brands



Sugar profile by design

Designing Sugar Profiles with Precision

Enzymes enable the precise design of sugar composition, optimise sweetness, and unlock new flavor dimensions with sugars like maltotriose and isomaltooligosaccharides.



We can design your custom sugar profile with precision

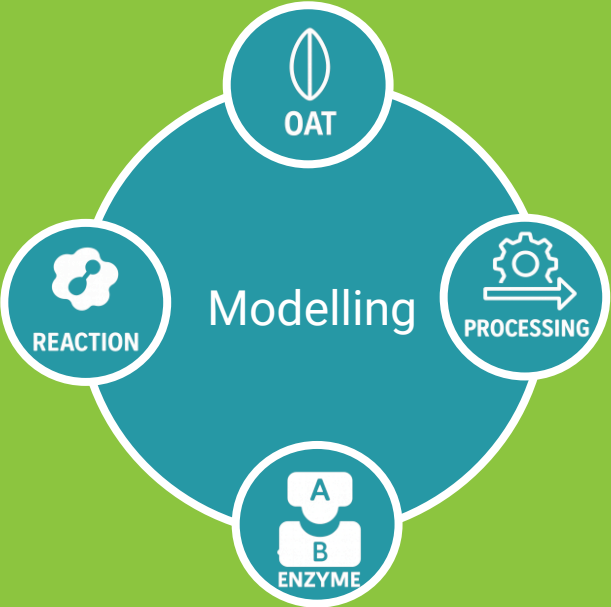
Customer needs



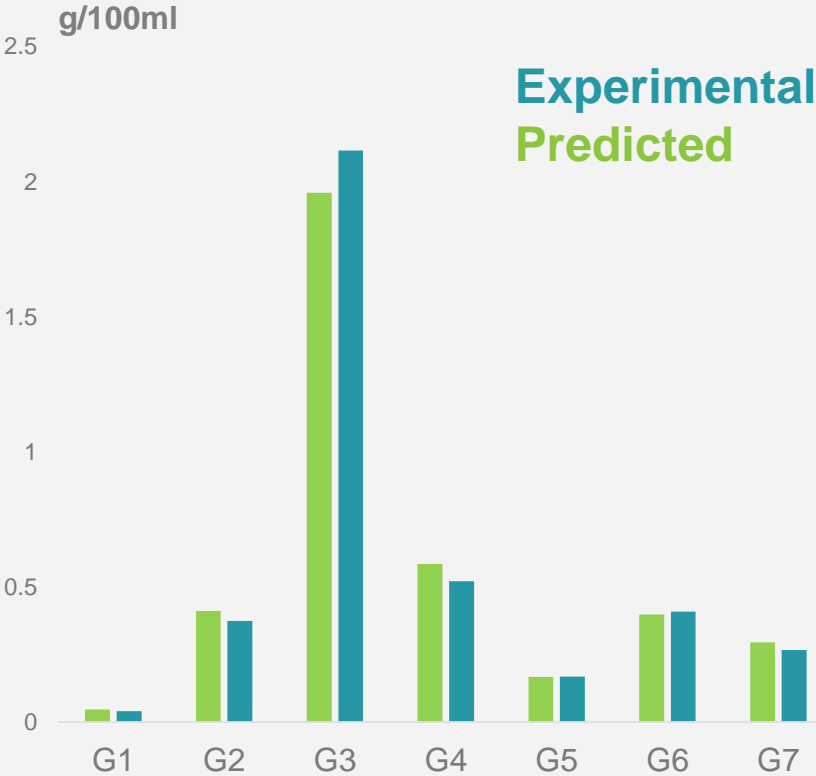
Market trend

Targeted Sugar composition

Data driven formulation



Enzyme Tool



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**No Sugars
No Compromises**



CONSUMER CONCERN:

Low-Sugar and Sugar-Free Options Are Watery

Understanding the issues faced by consumers

Online consumer reviews about low-sugar and sugar-free products currently on the market.

Consumers report watery texture and lack of flavor as primary concerns.

*"Very weak - I shook the carton before opening but it was still extremely **watery** and flavourless."*

*"I purchased this as part of a promotion. I don't think I would buy again. **Not sweet enough** and not good in cereal or hot drinks."*

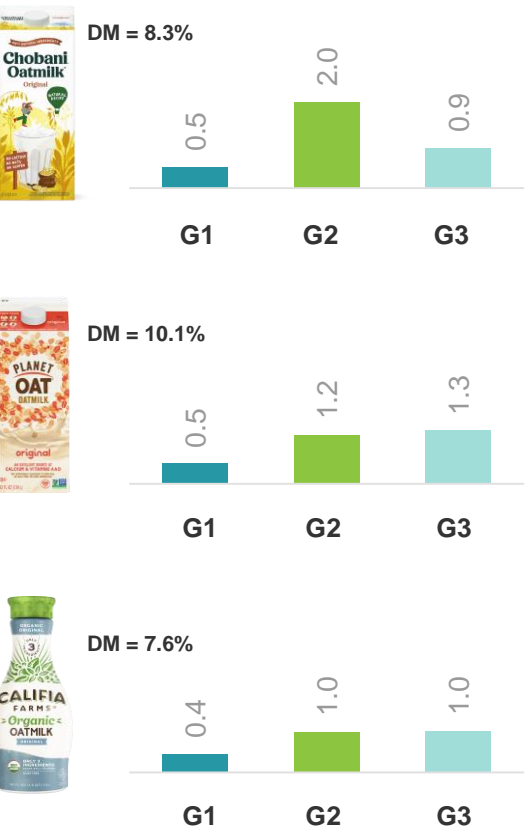
*"While this has low sugar, I do not see the need to add a lot of sunflower oil to the mix as the **taste is not pleasant** when heated or added to hot coffee. It tastes like burnt oil."*

*"Not good, **very watery** and **tasteless**—its not good. It's way too watery and it's flavorless."*

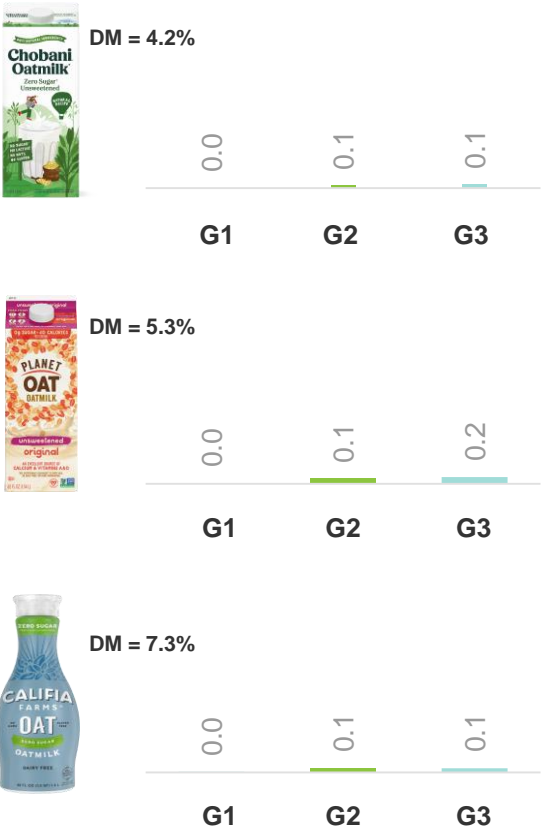
*"This was my first time tasting a non milk product. I tried [a No Added Sugar Oat Milk] with my regular cereal. It looked like slightly **watery milk**. There wasn't really a taste other than a slight sweetness. I prefer milk to non milk substitutes so I would not switch to Oak Milk."*

Standard vs. No Sugars: What's Really Inside?

STANDARD



No SUGARS



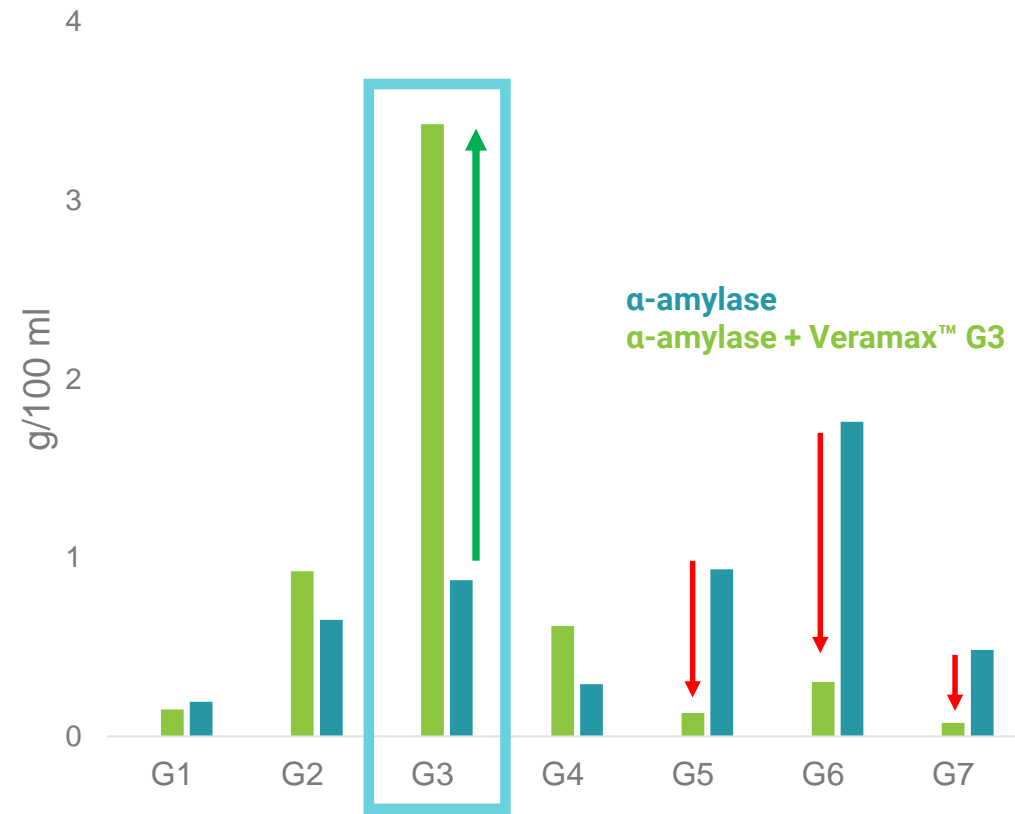
Products labeled “no sugars or unsweetened” contain less than 0.2% sugar by weight.

Achieving this requires careful control over the enzymatic reaction and, in some cases, may also involve reducing the oat content in the final formulation.

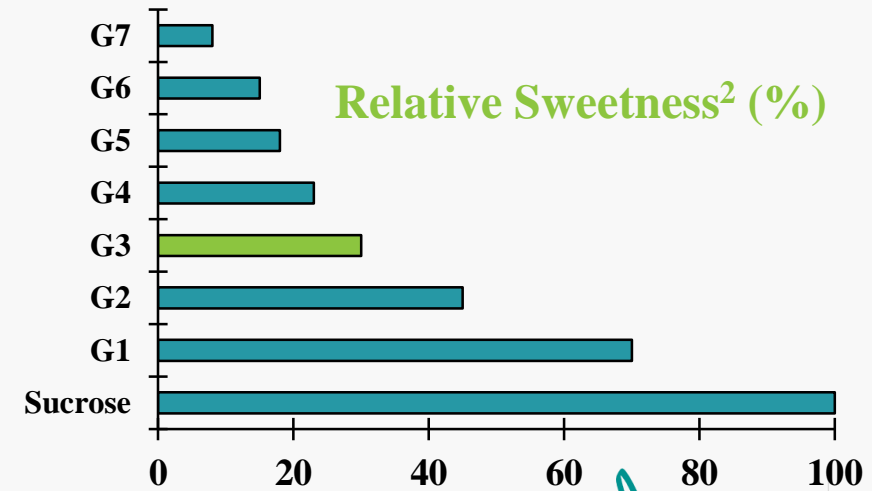
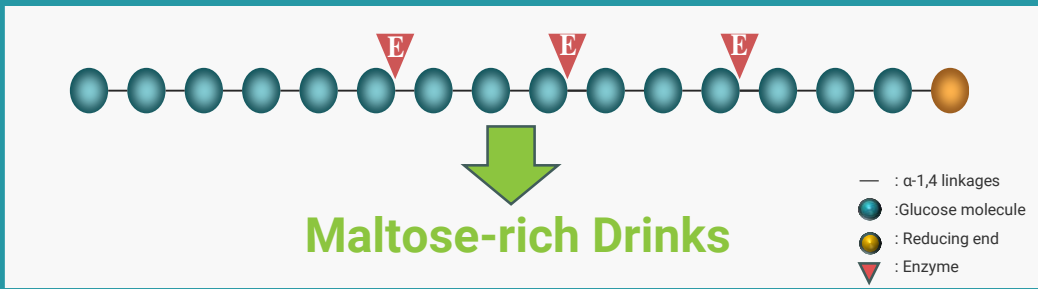
G1= Glucose; G2= Maltose ; G3 = Maltotriose – g/100ml
DM = Dry Matter

Veramax™ G3

Maltotriose-forming amylase

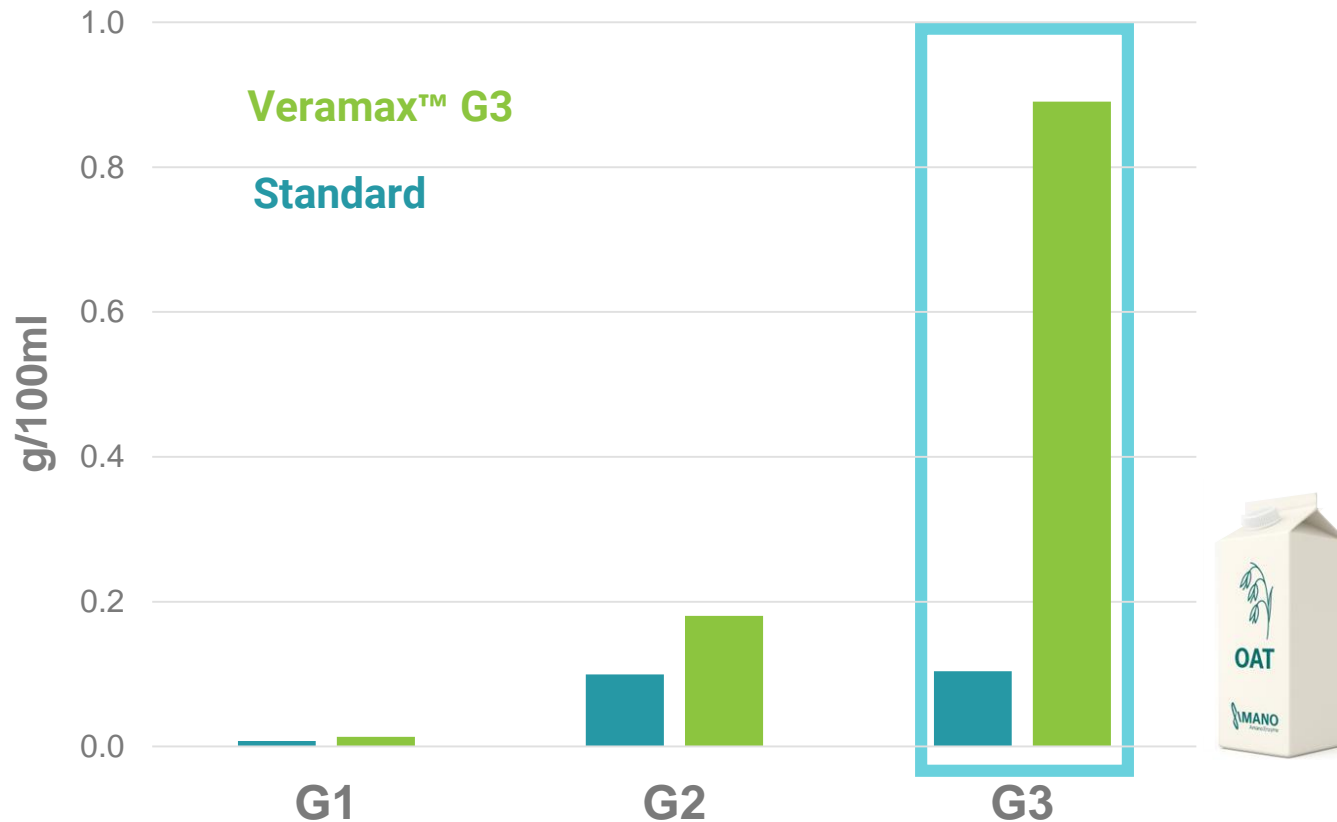


It produces maltotriose by (endo-type) hydrolysis of α -1,4 starch molecules

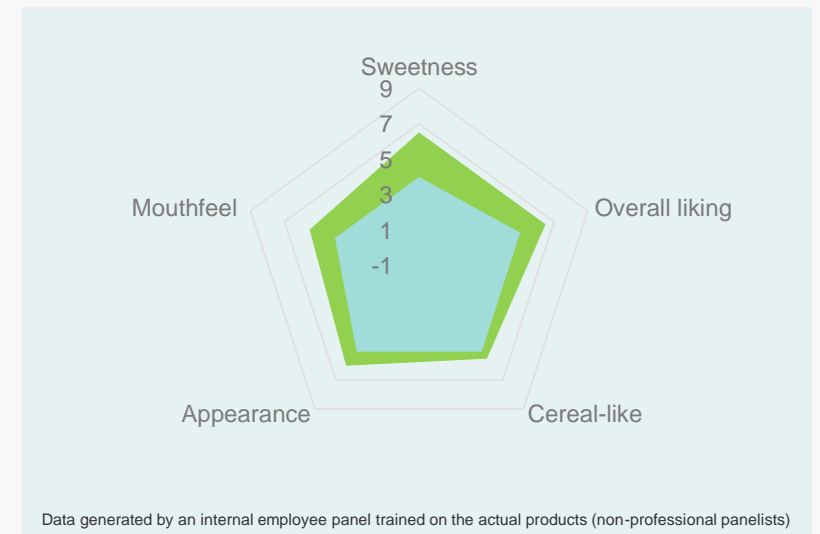


Veramax™ G3

Enzyme Tool for No-Sugars Innovation



Veramax™ G3 produces maltotriose, enhancing sweetness without the need of adding flavour, while meeting the 'No sugars' label requirement.



KEY TAKEAWAYS

Enzymes like PG-500 and Veramax drive tailored innovation — from sugar optimization to protein enhancement — all non-GM compliant.

Nature still holds the key. The more we understand our raw materials—and the enzymes that interact with them—the better and more effective our products will be.

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About Us

Established in 1899 in Japan, a country rich in fermentation culture, Amano Enzyme now manufactures and sells enzyme solutions for customers all over the world.

THE AMANO SOLUTION

As one of the leading global enzyme manufacturers, Amano can assist you with solutions for your plant-based dairy products.

Our enzymes help improve key features from flavor to functionality and get your non-dairy milks, cheeses and butter to market faster.



1899

Ennosuke Amano started a household medicine distribution business



1948

Established Amano Pharmaceutical Co., Ltd. and started enzyme production



1960

Inaugurated General Enzyme Research Center

1996

Shifted resources to enzyme business



2000

- Changed corporate name to Amano Enzyme, Inc.
- Focus on speciality enzymes

2000

Opened Gifu R&D Center



2024

Began exploring speciality enzymes for every industry

**Delivering
innovation for
over 120 years**

A Global Network – From Japan to the World

Amano has a global network with our headquarters, 3 plants and Innovation Centre in Japan, as well as overseas operations across 5 regions



Amano Enzyme
Manufacturing
(China)



Amano Enzyme
(Japan)



Amano Enzyme USA
(USA)



Amano Enzyme
Manufacturing
Shanghai Branch
(China)



Amano Enzyme
Asia Pacific
(Thailand)



Amano Enzyme
Europe
(UK)



Shaping the Future of Plant-based Dairy

Explore Unlimited Possibilities.

Discover how Amano Enzyme's solutions can transform your products.

