

Bridge2Food: Next Generation Plant-based Drinks: Exceptional foam, higher protein, and great beverage stability

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Novonesis

Next Generation Plant-based Drinks

With 100+ years of innovation as our foundation,
we will keep delivering transformative solutions



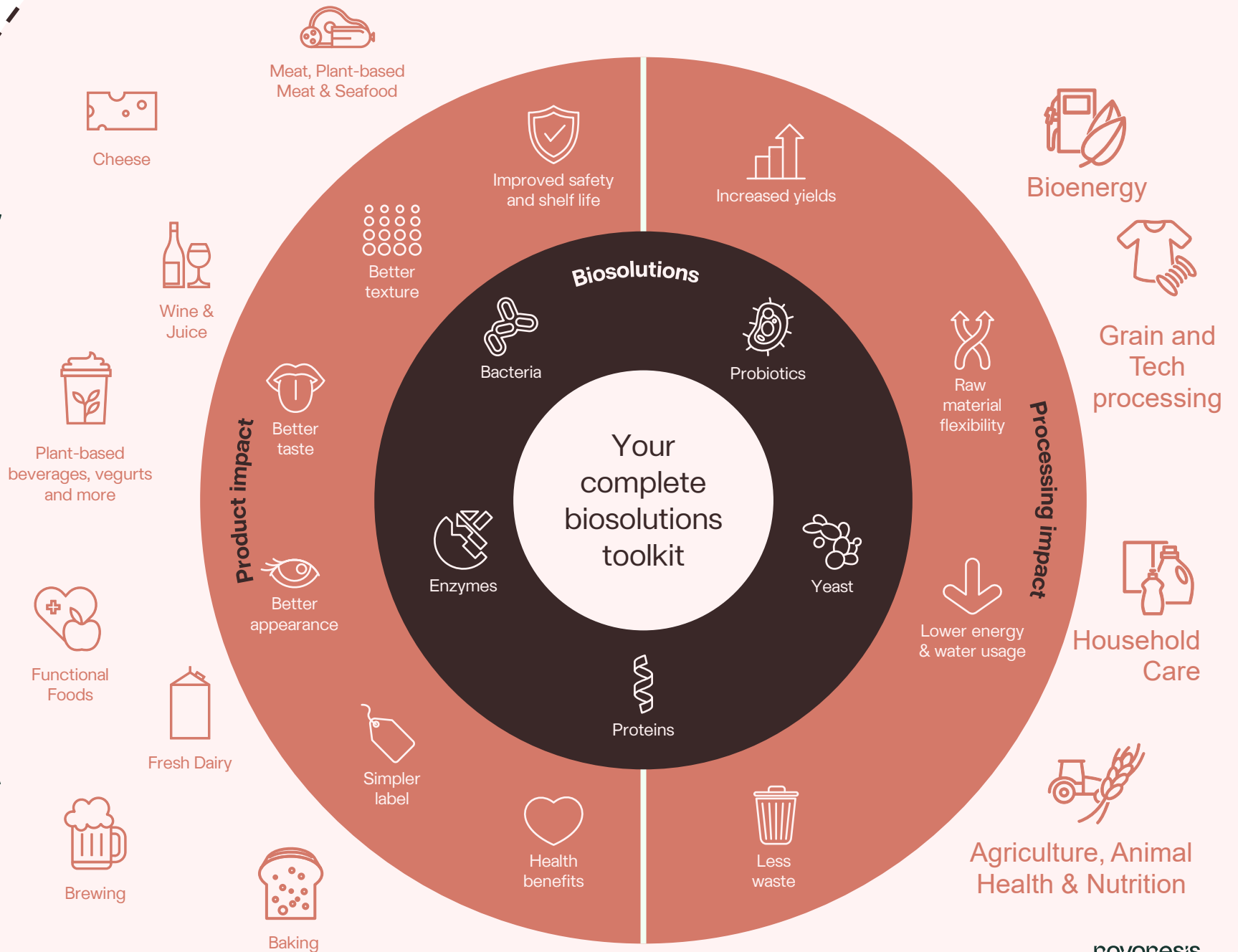
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Purely dedicated to biology

Biosolutions are tiny but mighty enzymes and microbes.

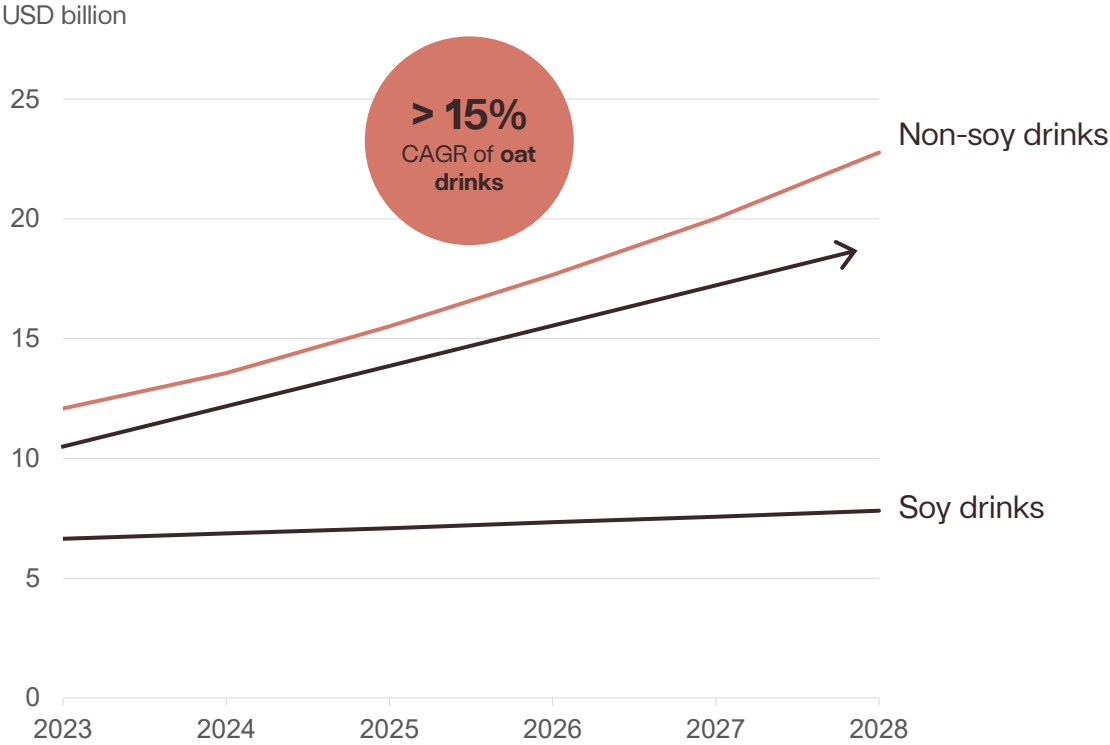
The right combination helps transform your products, your processes and your impact on the planet.

Broad application impact



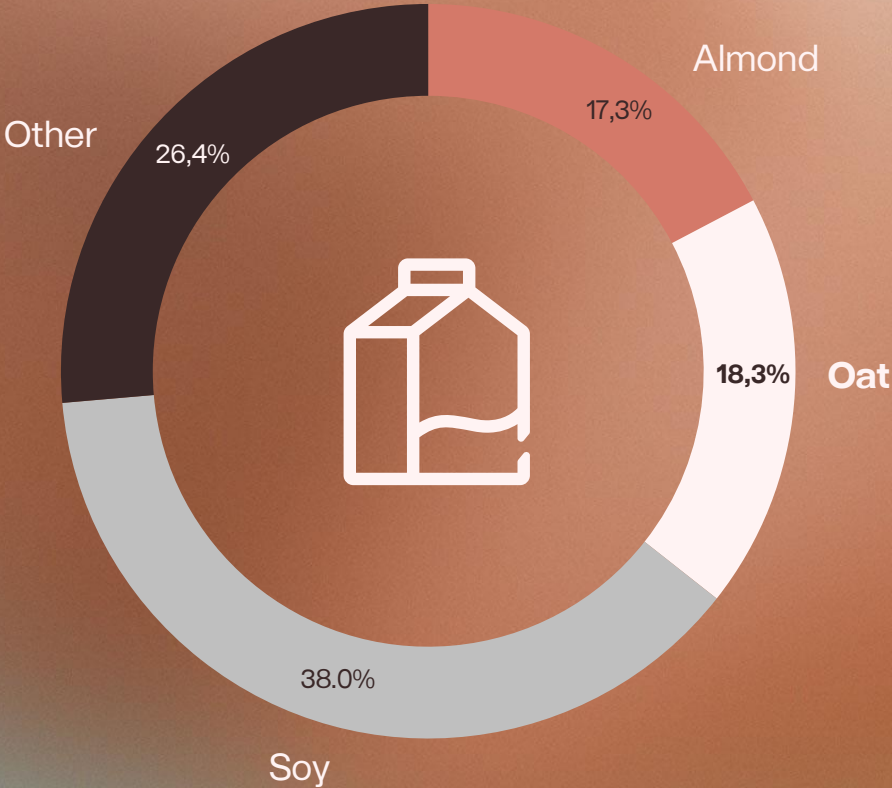
Plant-based drinks market and consumer insights

Plant-based drinks enjoy high growth. Oat accounts for 18%



Plant-based drinks, retail value RSP (USD billion)

Source: Euromonitor, 2024



Plant-based drinks retail value RSP, sum of 2020-2023, by substrate,

Source: Euromonitor, Mintel, Novonesis analysis, 2024

Attributes, important to ...% of plant-based drinks consumers



57%
Foaming in coffee



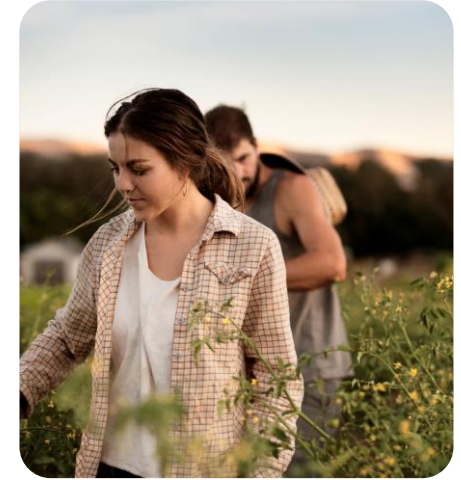
73%
Healthy twist



70%
Coffee stability



68%
Pay premium for
higher protein

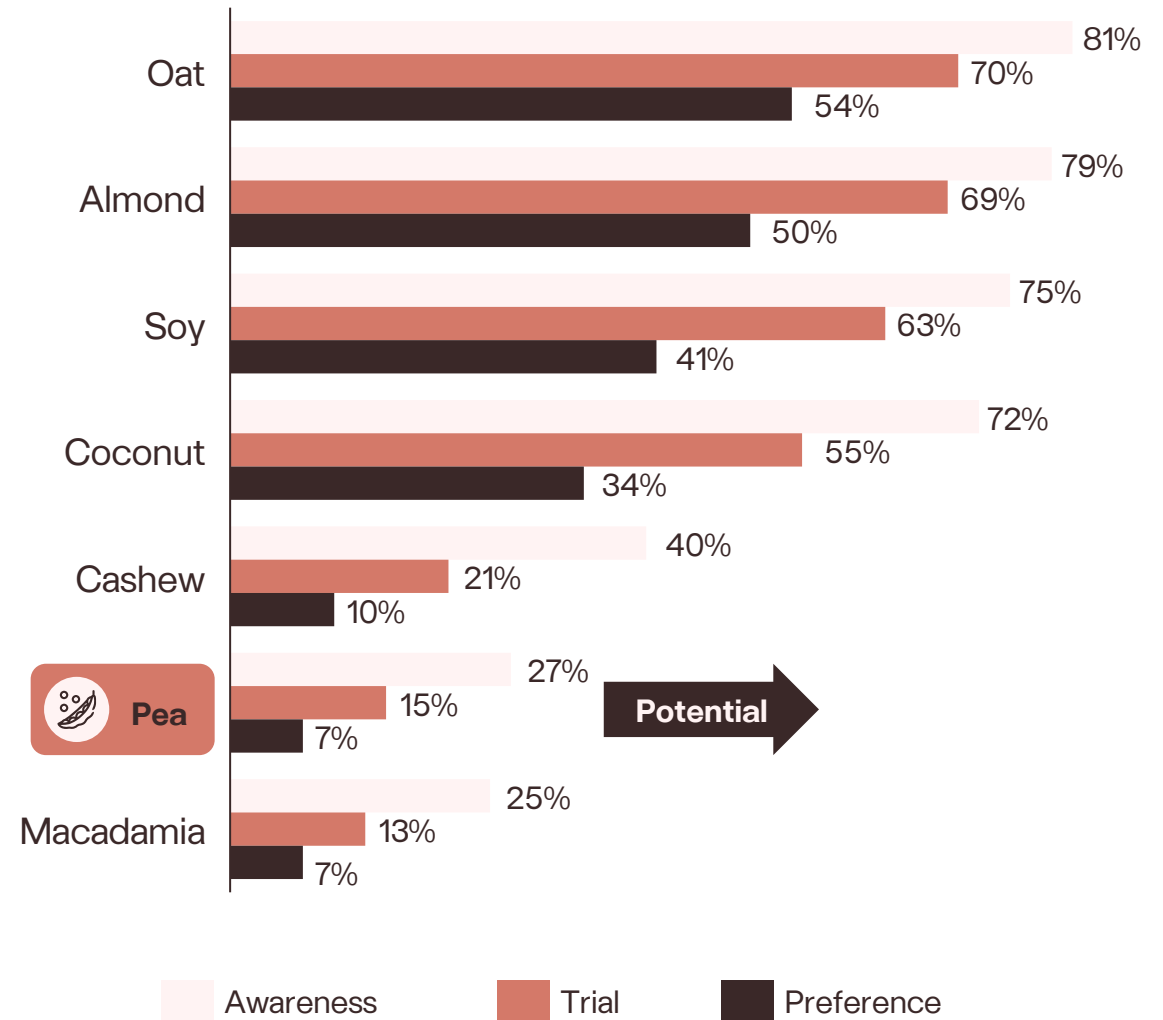


85%
Environmental
impact

Plant-based drinks are on a journey with consumers:
 Available in the store →
 Awareness → Trial →
 Preference

- Pea protein drinks are at an early point in the journey.
- As more consumers become aware of them and try them, more will prefer them.
- Just like with oat drinks 10-20 years ago.

→ Awareness – Trial – Preference of plant-based drink types



Fix foaming and coffee stability – or risk losing customers!



Commercial oat drink

Poor foaming



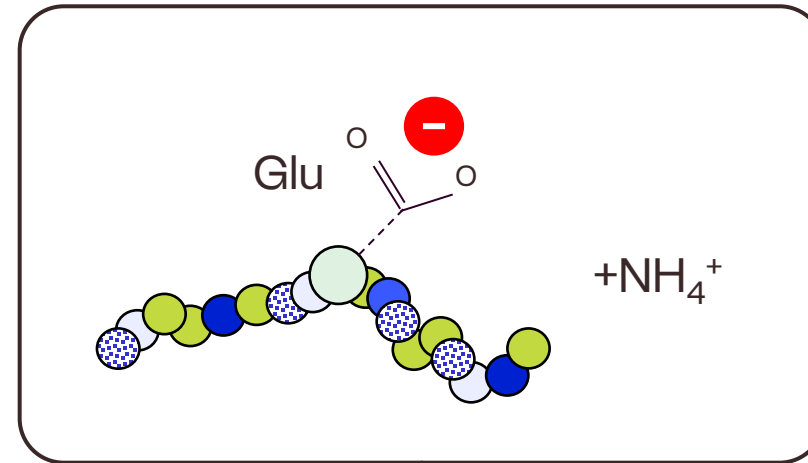
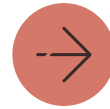
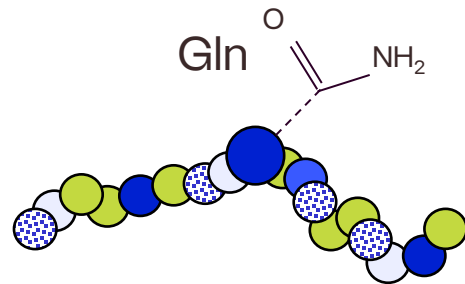
Pea protein drink

Poor coffee stability

The Innovation and Technical Insights

Vertera[®] Velvet is a Protein Deamidase (Protein Glutaminase). Modify proteins without taste impact

Mode of action



- Higher negative charge → Higher Solubility and Functionality
- Protein chain stays intact → No Off-notes

Process conditions

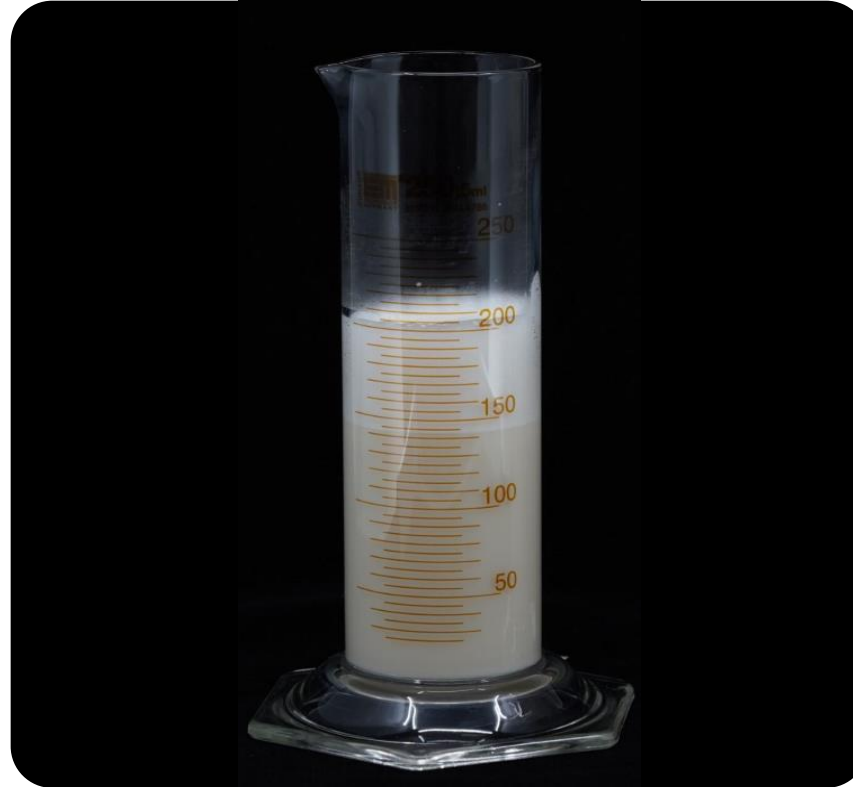
Enzyme is active at most conditions relevant for food processing 40-70°C and pH 6-9

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Vertera[®] Velvet + Vertera[®] Rise: Oat drinks with great Barista foam

Oat drinks:
Great Barista foam

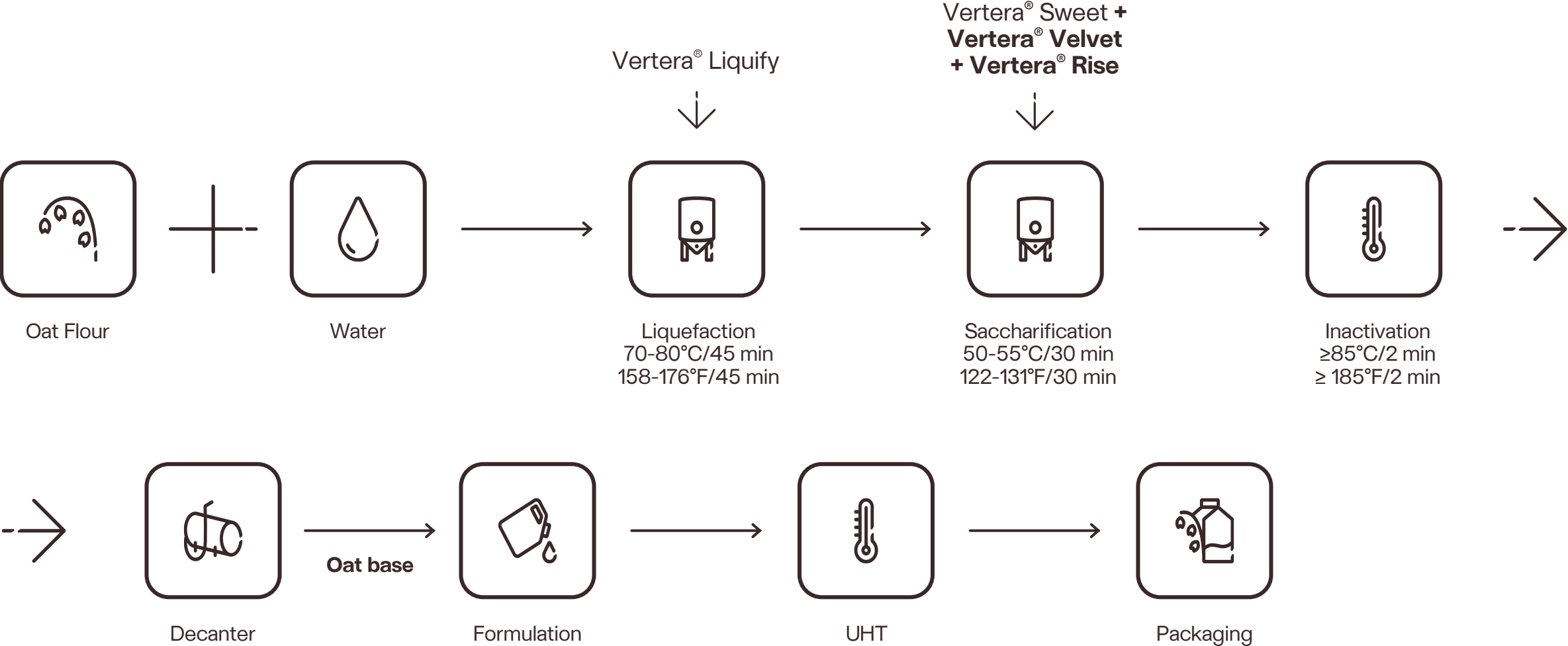


Control



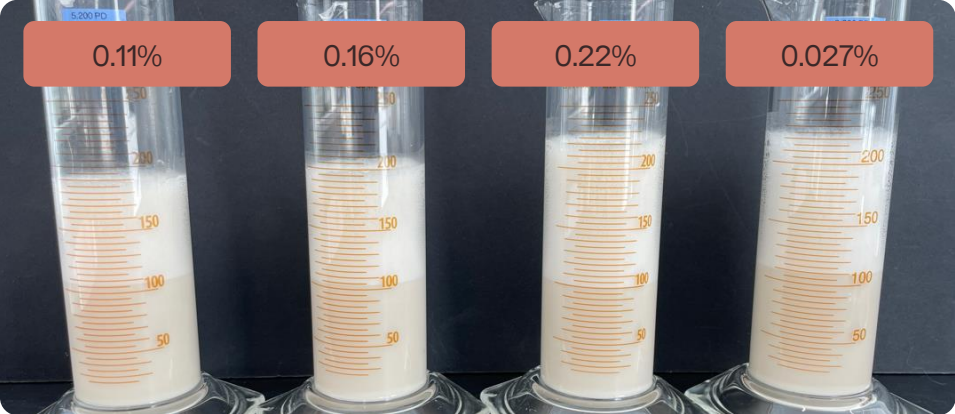
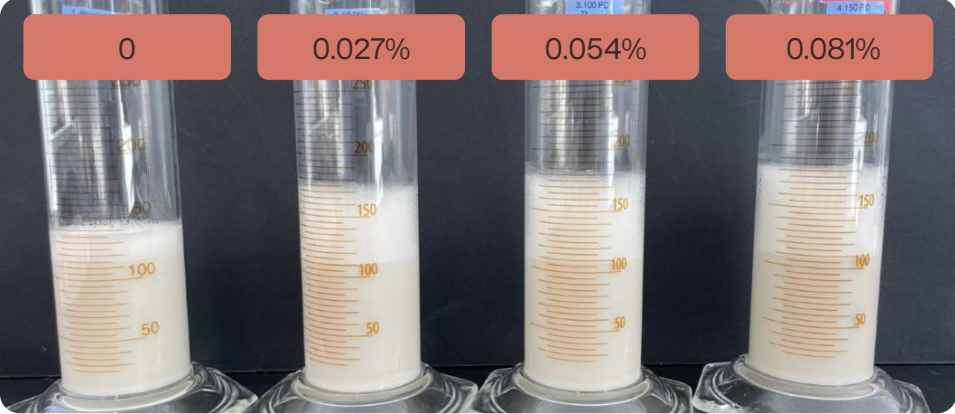
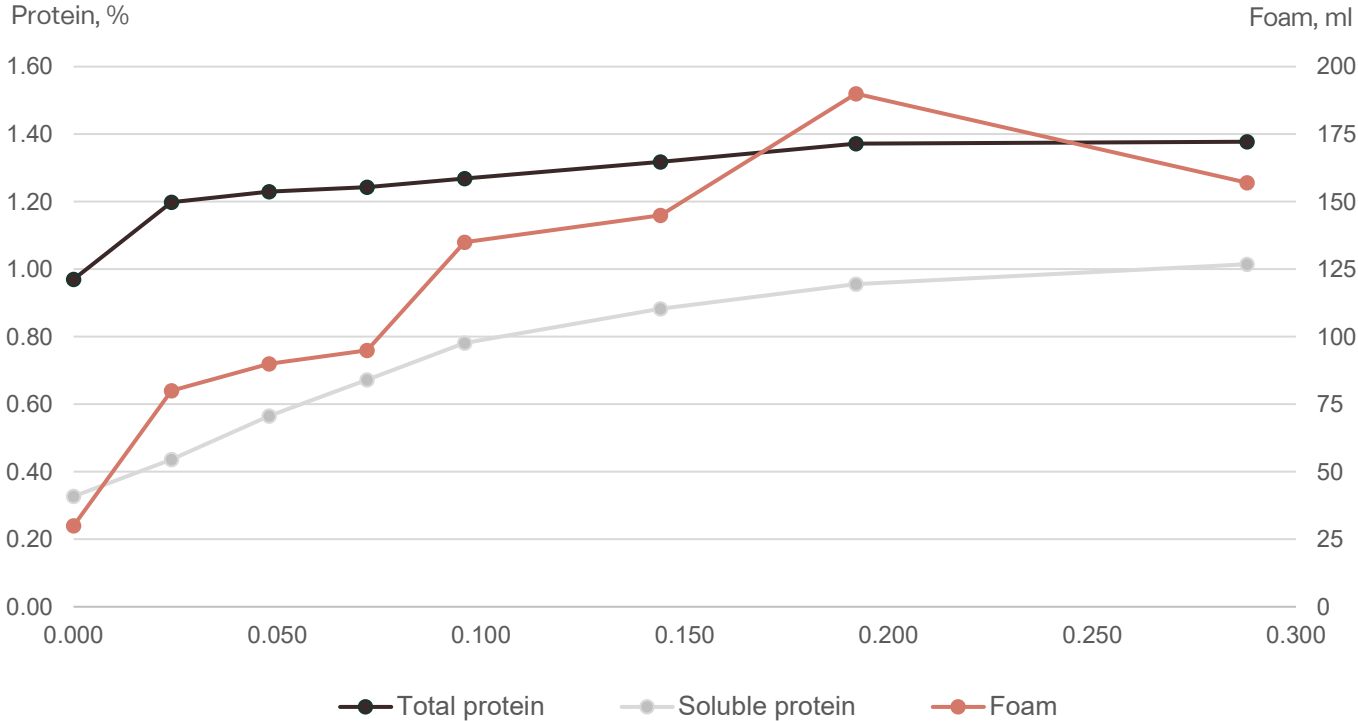
Vertera[®] Velvet + Vertera[®] Rise

2-step Oat Beverage Process



Combining Vertera[®] Velvet and Vertera[®] Rise leads to increase of total and soluble protein as well as foam

Vertera[®] Velvet dose, % w/w on flour
 Vertera[®] Rise dose 0.007% w/w on flour



Application Recommendations – using Vertera[®] Velvet & Vertera[®] Rise in oat beverages

Benefit:

- Increase soluble protein X1.2-2
- Increase total protein X2.5-4.5
- Improved foaming X2.5-6

Dosage of Vertera[®] Velvet:

- 0.048-0.144% Vertera[®] Velvet + 0.007% w/w Vertera[®] Rise, temp: 55°C
- 2-step oat process, 15-30% oat flour, added to second step, max temp in saccharification: 55°C
- 1- oat process, 15-30% oat flour, 55°C. If running at >55°C use Vertera[®] Educe

Pea protein drinks example

Plant based
drinks
Great stability
in coffee

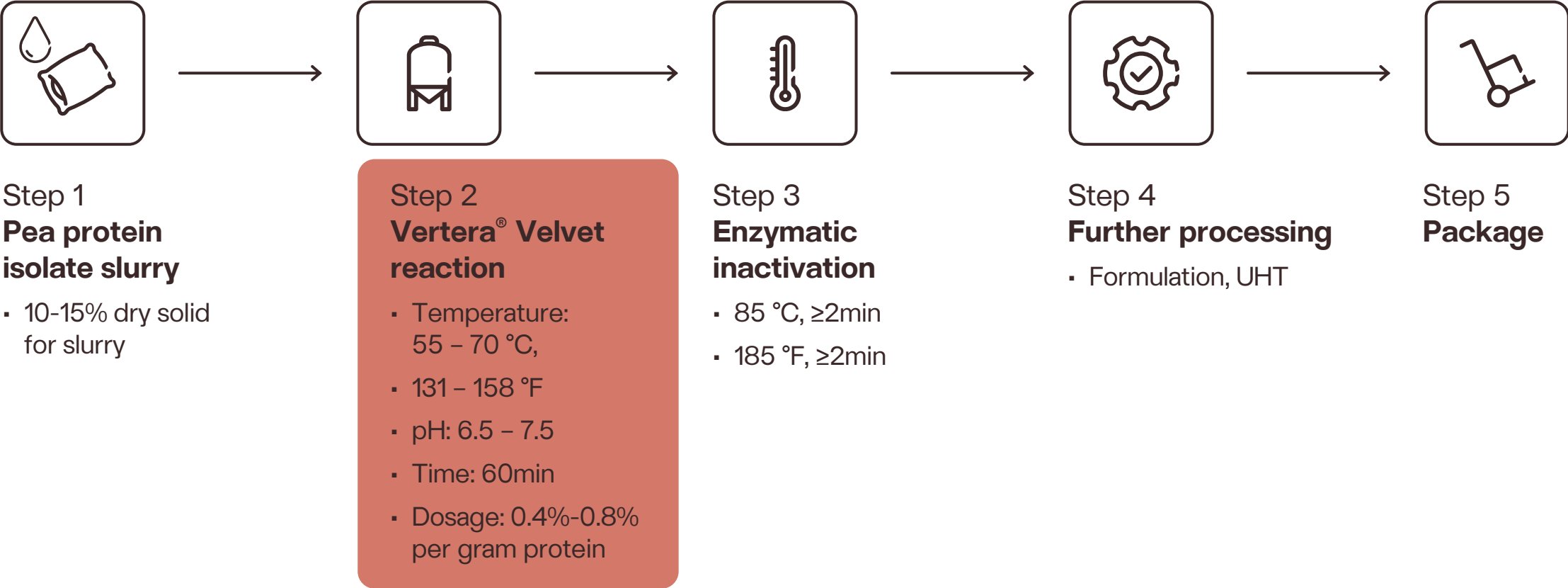


Control



Vertera® Velvet

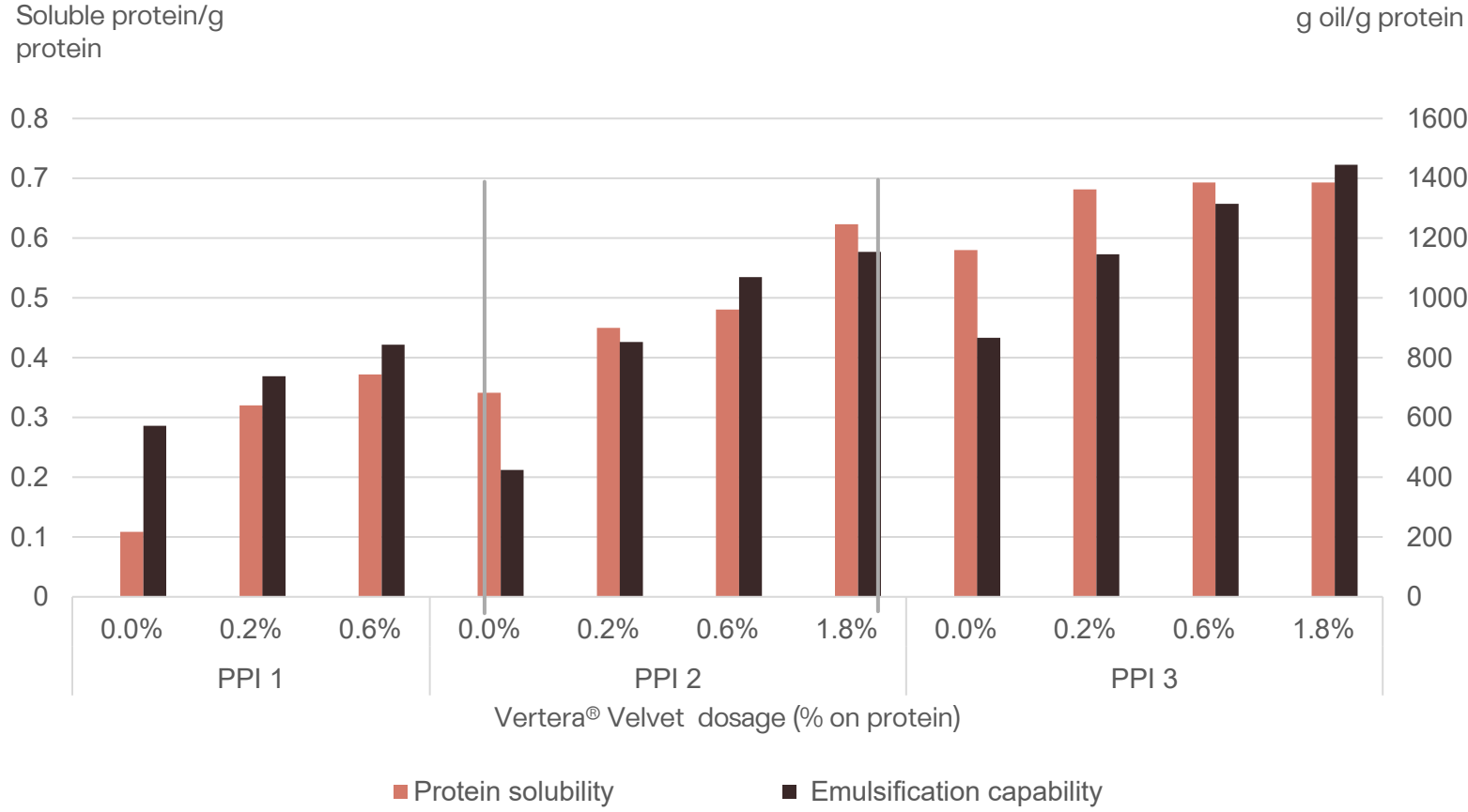
Pea protein beverage production



Vertera[®] Velvet could improve pea protein functionality, making it more suitable for beverage application

Emulsification enhancement

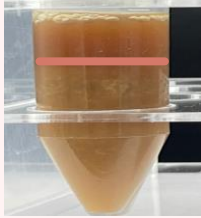
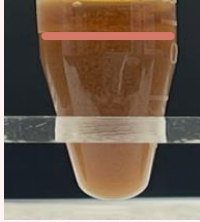







Solubility improvement



Achieve coffee stability with any commercial pea protein with Vertera® Velvet

Vertera® Velvet dosage (% on protein)

All samples are 2% protein and 0.4% phosphate

		0%	0.2%	0.6%	2%
Commercial pea protein isolates	PPI 1				
	PPI 2				
	PPI 3				

2% protein, 2.5% fat, 0.1% NaCl, 0.4% K₂HPO₄ pea protein drink is made in lab with Thermomixer and pasteurization applied for sterilization and enzyme inactivation. Formulation (salt, fat and phosphate) was done after enzyme inactivation.

Application Recommendations – adding Vertera[®] Velvet in plant protein drink

Benefit:

- Improves protein stability in hot acid drink.
- Increases protein solubility with/without phosphate salts.
- Enhances protein emulsification capability

Dosage:

0.6% per gram protein, working range: 0.4-1.2% on protein

Process:

Optimal dry matter 10-15%, 55-70°C (131-158°F), pH 6.5-7.5, while mixing for 1 hour.

Next Generation Plant-based Drinks:

great foam, stability in coffee,
smooth texture, protein,
fewer ingredients, sustainable



Thank
you