

ROQUETTE Pea Protein (NUTRALYS® S85F) and Pea Protein Hydrolysate (NUTRALYS® H85) Characterization of Physical Properties and Fermentation Performance Evaluations

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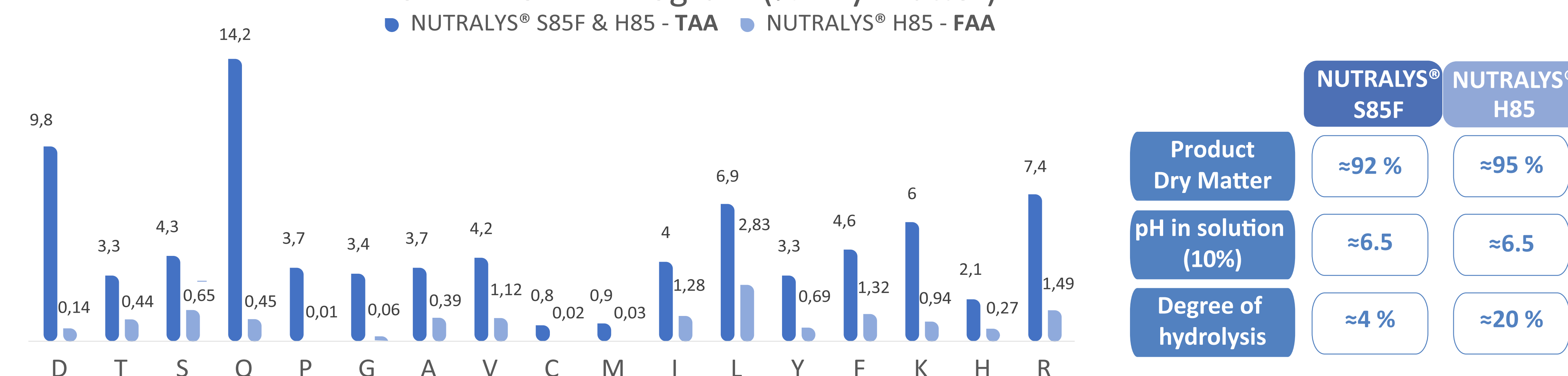
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INTRODUCTION

As a sustainable, non-GMO vegetable resource with no major allergen concerns, pea protein is well situated to meet growing consumer demands. Due to wide-ranging acceptance and compatibility with increasing regulatory restrictions, pea protein is rapidly gaining acceptance for use in food, beverage, probiotic, nutraceutical, and fermentation applications. ROQUETTE has developed two pea proteins (NUTRALYS® S85F), and a lower viscosity/reduced **foaming** pea protein hydrolysate (NUTRALYS® H85), specifically as nitrogen sources for fermentation applications. In this presentation, we will share physical properties for both NUTRALYS® S85F and NUTRALYS® H85, along with fermentation **performance** data generated from models using *B. subtilis*; *S. cerevisiae*; *E. coli*; *L. delbrueckii*; and *C. glutamicum* for cell growth and overall cell viability.

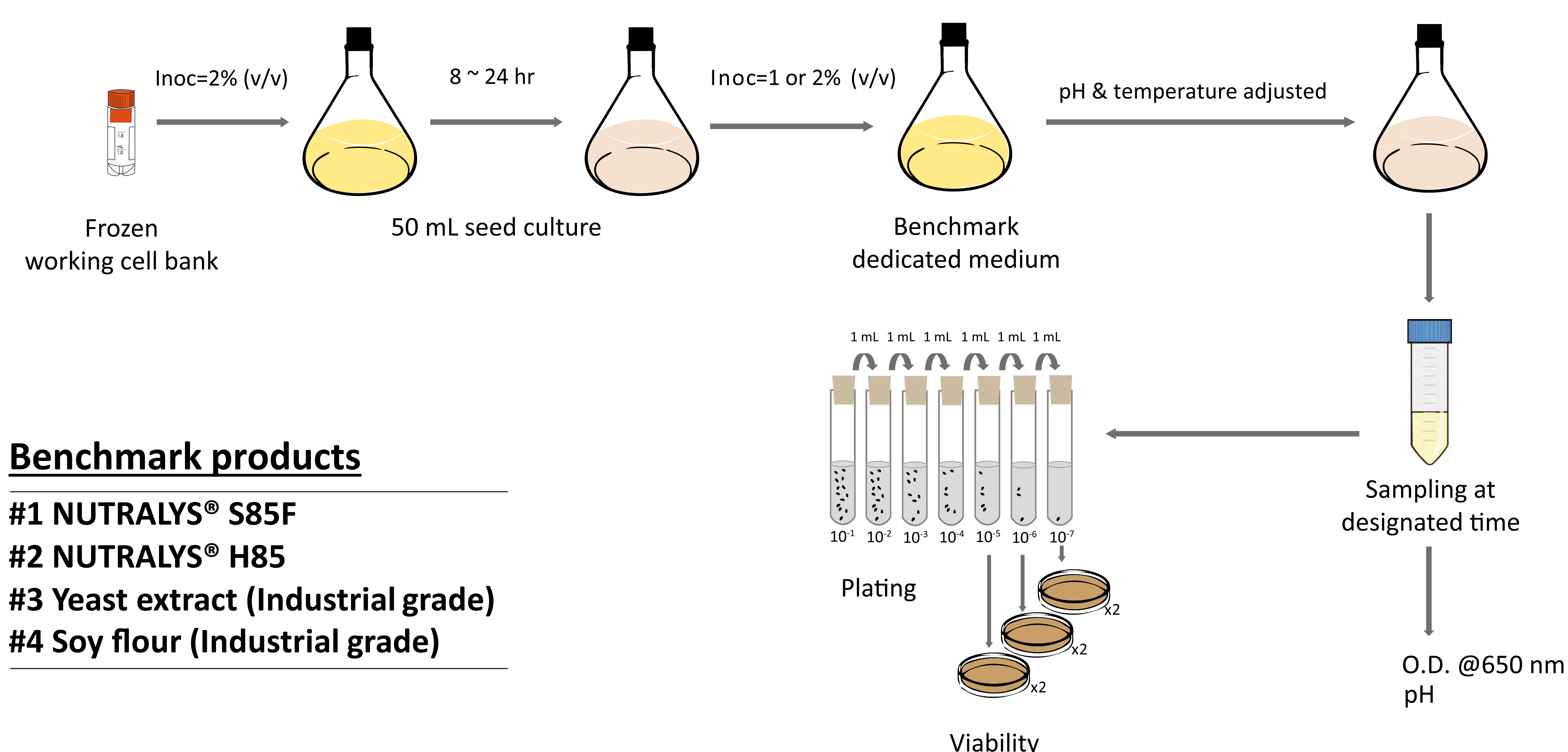
PRODUCT SPECIFICATIONS

NUTRALYS® Aminogram (% Dry Matter)



OBJECTIVES

To evaluate and demonstrate the physical property improvements and **performance** characteristics of Roquette pea protein (NUTRALYS® S85F) and pea protein hydrolysate (NUTRALYS® H85) as alternative nitrogen sources for industrial fermentation applications, compared to typical protein sources such as, yeast extract and soy flour.

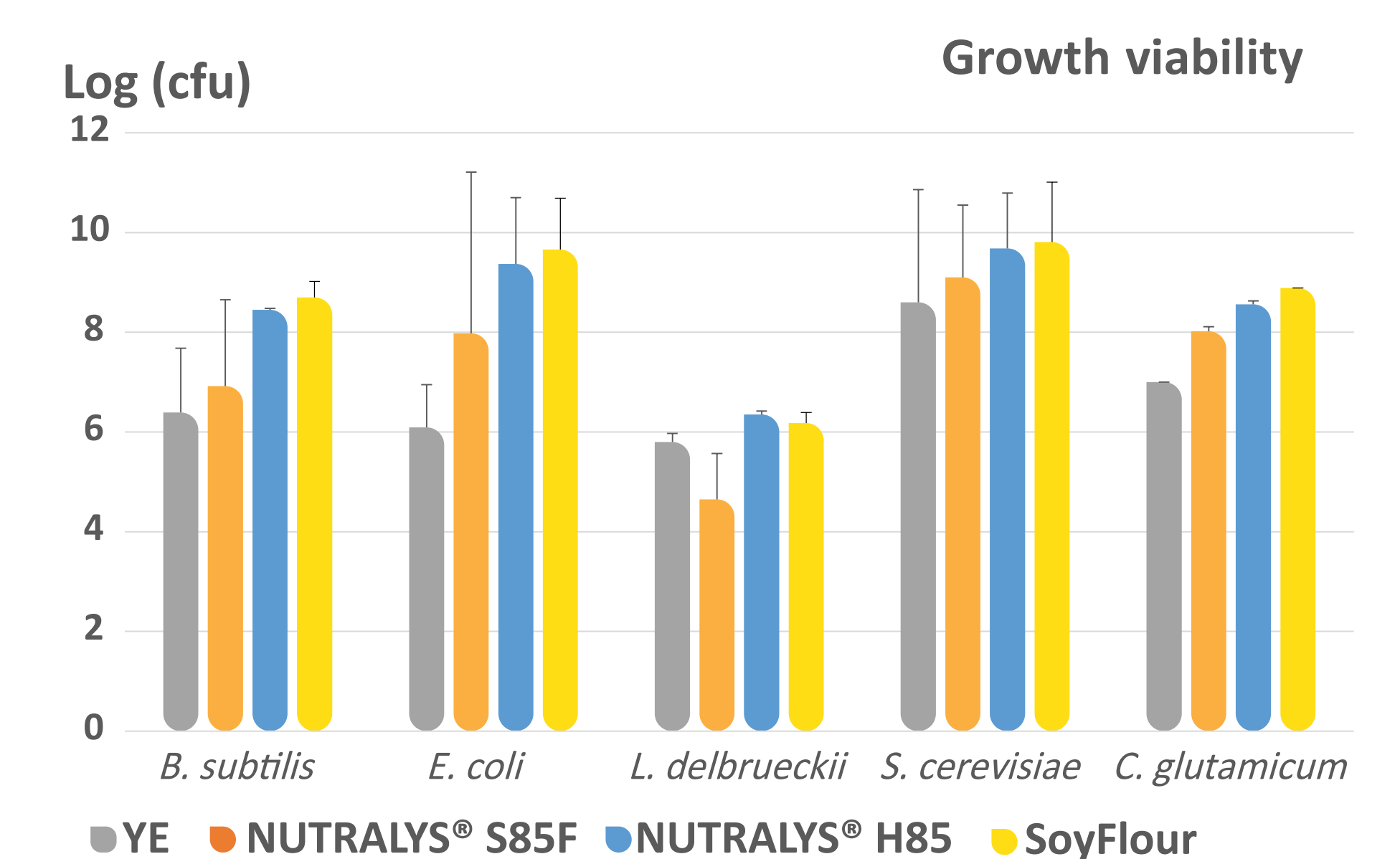
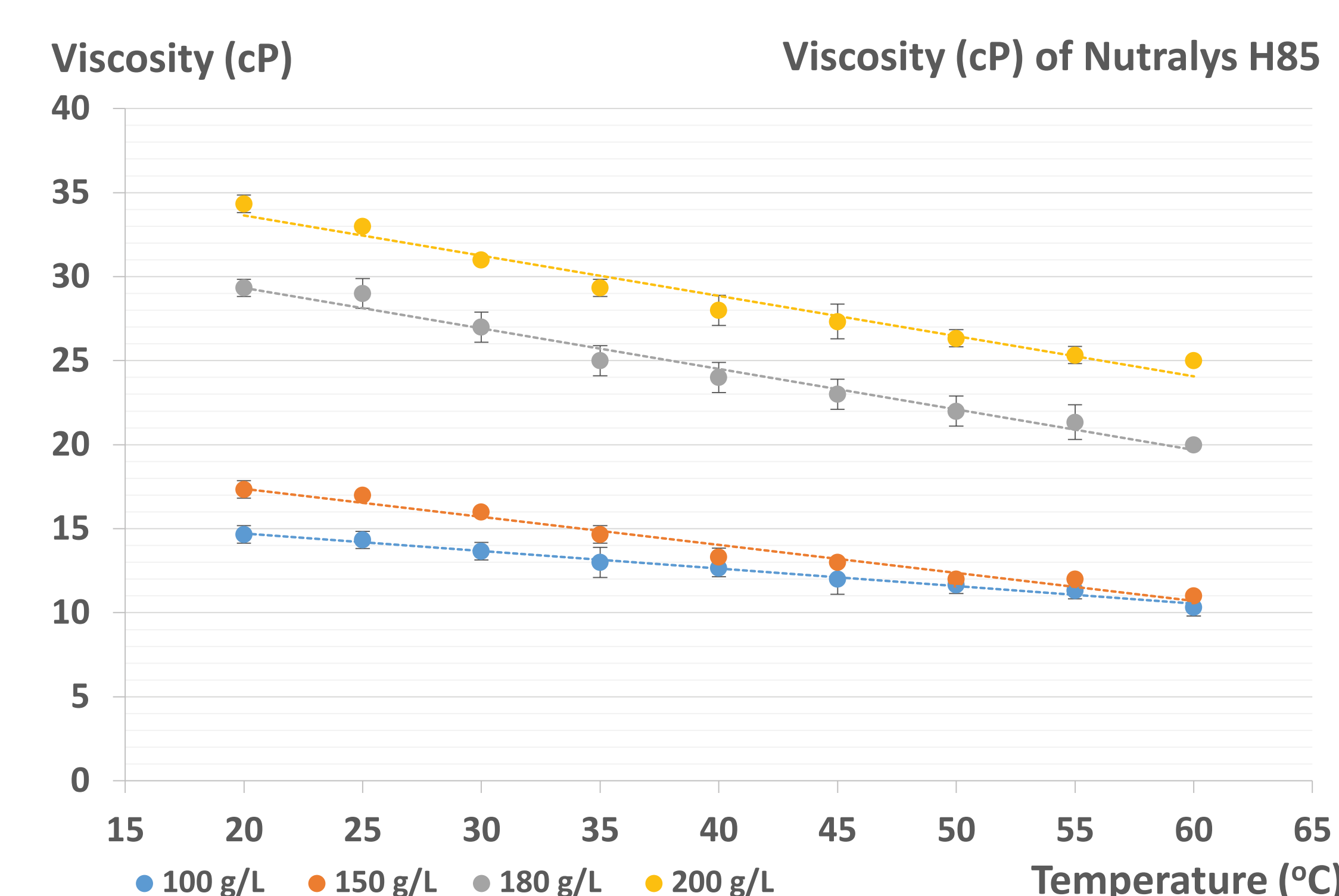
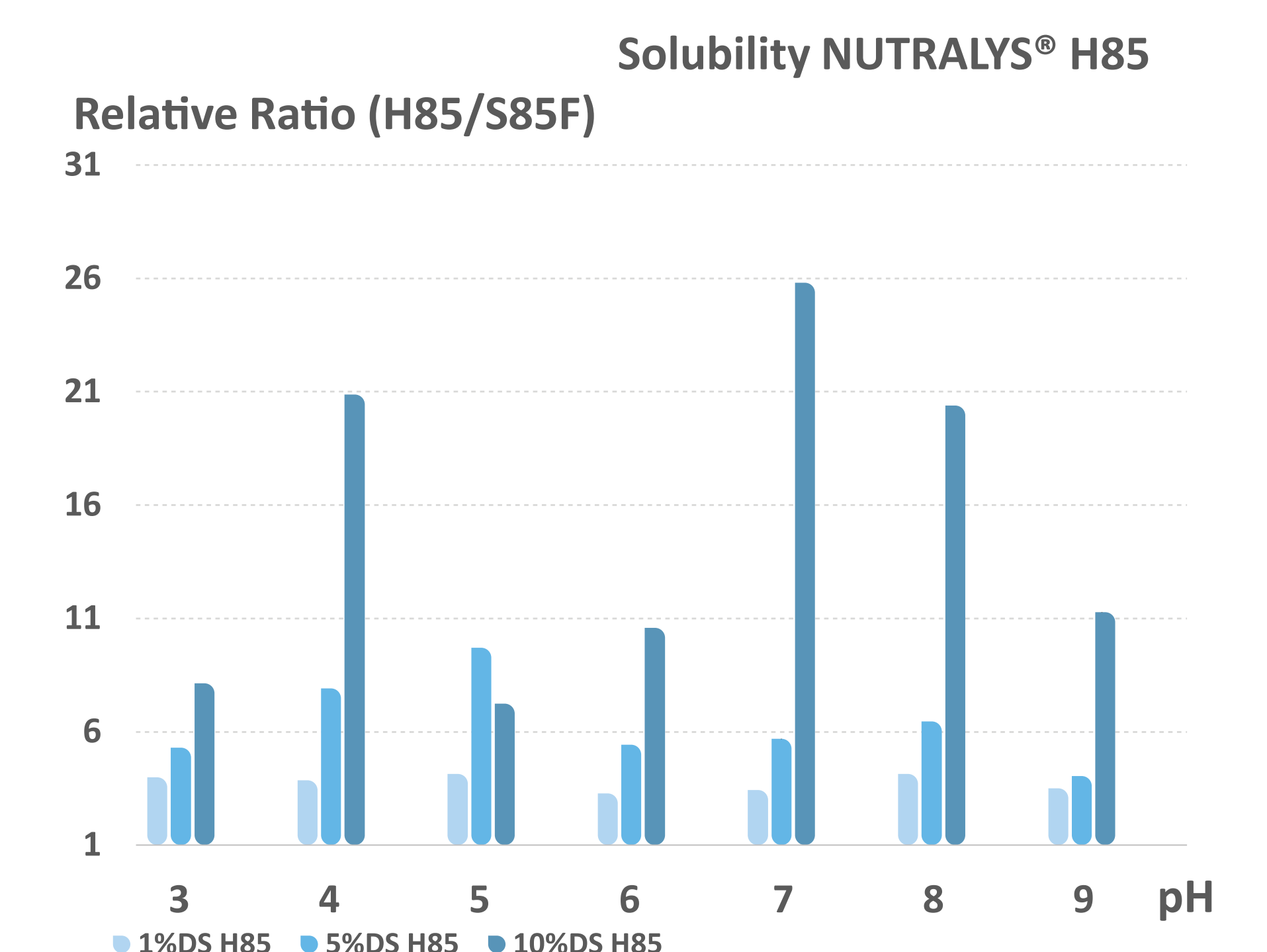
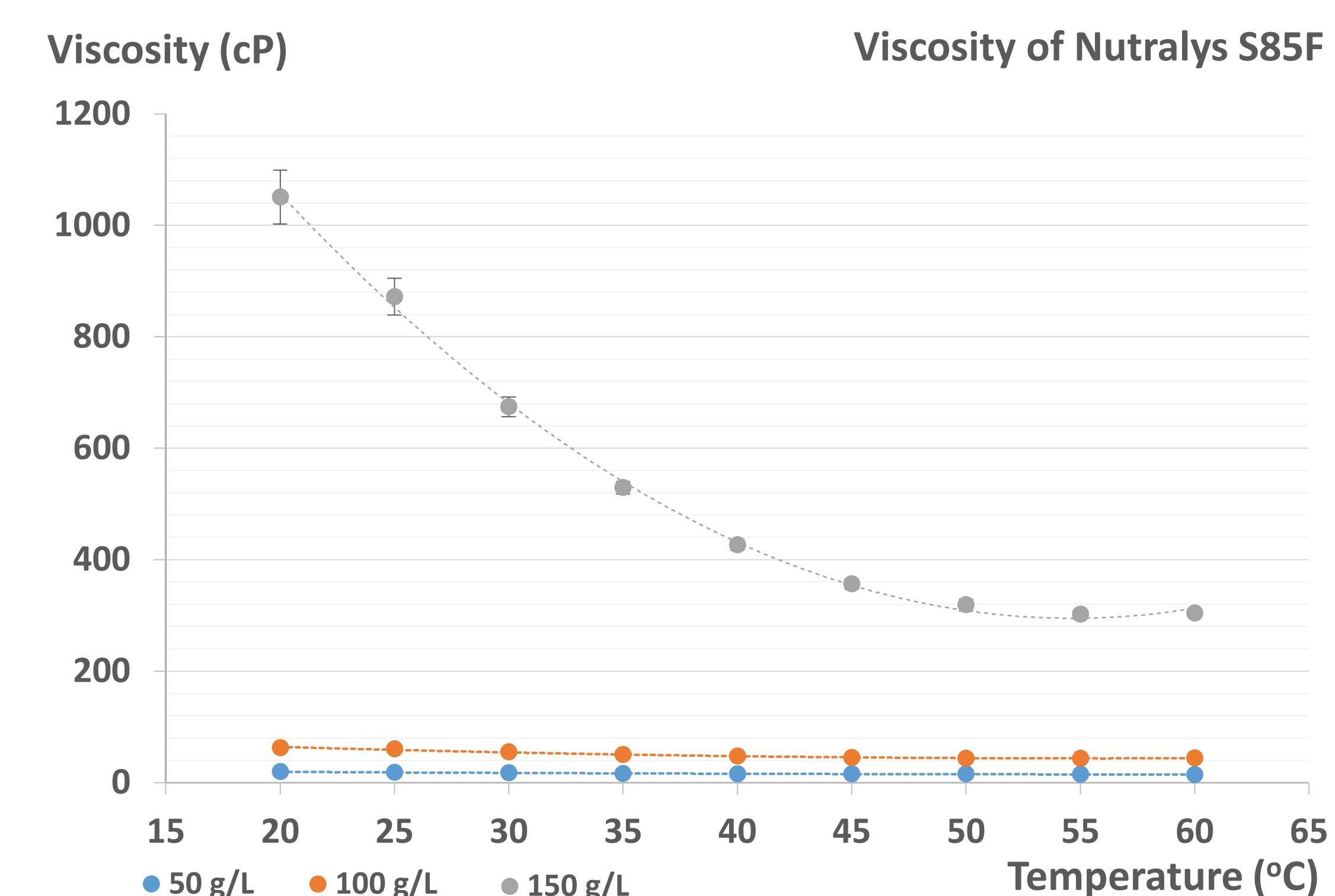


Cultivation media

Microbials	Seed medium	Nitrogen (g/L)	Dextrose (g/L)	Salts	pH
#1. <i>B. subtilis</i>	Nutrient broth	2.5	100	PBS**/CaCl ₂	7.0
#2. <i>E. coli</i>	Terrific broth	2.5	60	PBS/MgSO ₄	7.2
#3. <i>L. delbrueckii</i>	MRS	2.5	40	PBS/MgSO ₄	6.5
#4. <i>S. cerevisiae</i>	Nutrient broth	2.5	10	PBS/CaCl ₂ /NaCl	4.8
#5. <i>C. glutamicum</i>	Terrific broth	2.5	60	PBS/MgSO ₄ /MnSO ₄ /NaCl	7.0

**PBS: Phosphate Buffered Salin

RESULTS AND DISCUSSION



1.The viscosity of pea protein-NUTRALYS® H85 is significantly reduced when compared to NUTRALYS® S85F, due to protein hydrolysis. Additionally, less **foaming** and lower viscosity concerns were observed for NUTRALYS® H85 even at 200 g/L concentration between 20°C to 60°C.

2.The overall **solubility** of pea protein hydrolysate, NUTRALYS® H85, increased 3 to 4 fold, compared to NUTRALYS® S85F due to protein hydrolysis. Data indicates less than 10% **solubility** of NUTRALYS® S85F(5% DS,) compared to ~45% **solubility** of NUTRALYS® H85 (5% DS,). This improvement in **solubility**, as a result of hydrolysis, indicates a broad range of free amino nitrogen, peptide nitrogen, and complex nitrogen present in NUTRALYS® H85 make it ideal for many industrial fermentation applications.

3.Heat sterilization leads an increase in insoluble the particle size, potentially due to swelling, but no color change or degradation was observed.

4.The cell growth and viability data demonstrated comparable **performance** and potential advantages for ROQUETTE NUTRALYS® H85 as fermentation nitrogen source in comparison to current commercially available industrial soy flour and yeast extract.

CONCLUSION

The data obtained demonstrated significant viscosity reduction for the pea protein hydrolysate and demonstrated comparable **performance** and potential advantages when using ROQUETTE NUTRALYS® H85 as fermentation nitrogen source in comparison to current commercially available industrial soy flours and yeast extracts.

Based on the **performance** and product characteristic data collected NUTRALYS® S85F & NUTRALYS® H85 demonstrated comparability with typical commercial protein sources. NUTRALYS® S85F & NUTRALYS® H85 offer a non-GMO, non-allergen solution for fermentation applications, and serve as excellent nitrogen source options for a wide range of fermentation applications.

*Summer intern from University of Nebraska