



APPLICATION NOTE

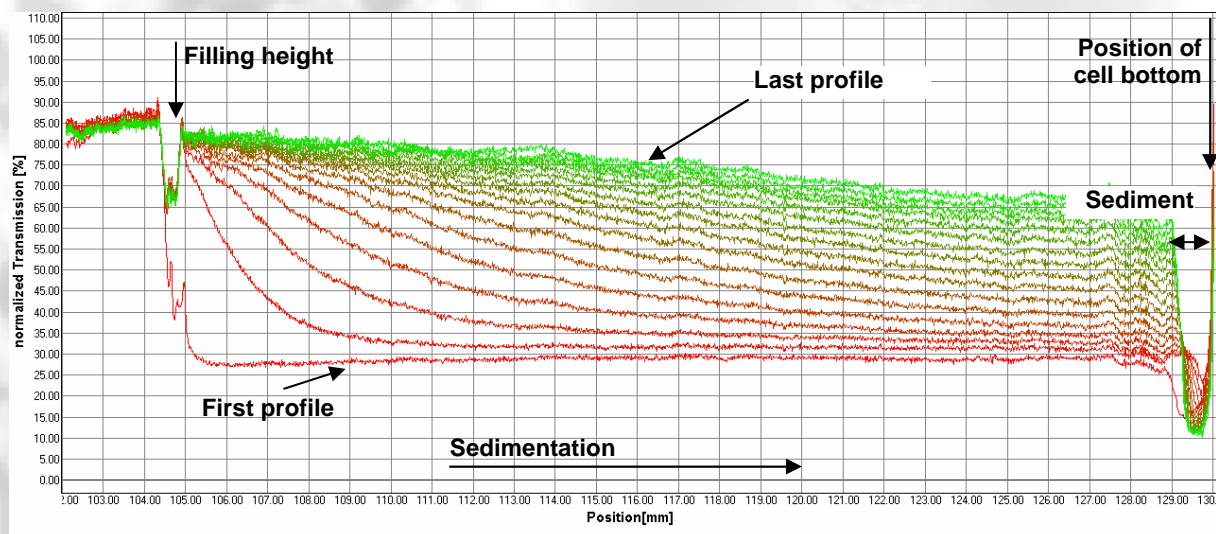
FAST STABILITY RANKING OF WHEY DRINKS

Introduction

For a successful positioning on the market for whey drinks innovative product concepts are required. Functional whey drinks feature e.g. additives like peptides. Exotic flavours are designed and introduced. The new products meet the same requirements for stability and shelf life from retailers and end-consumers as for existing whey drinks. The qualitative and quantitative characterization of the demixing behaviour of different whey drinks is performed by analytical centrifugation using STEP[®]-technology. The fast and direct stability ranking is provided.

Measurement

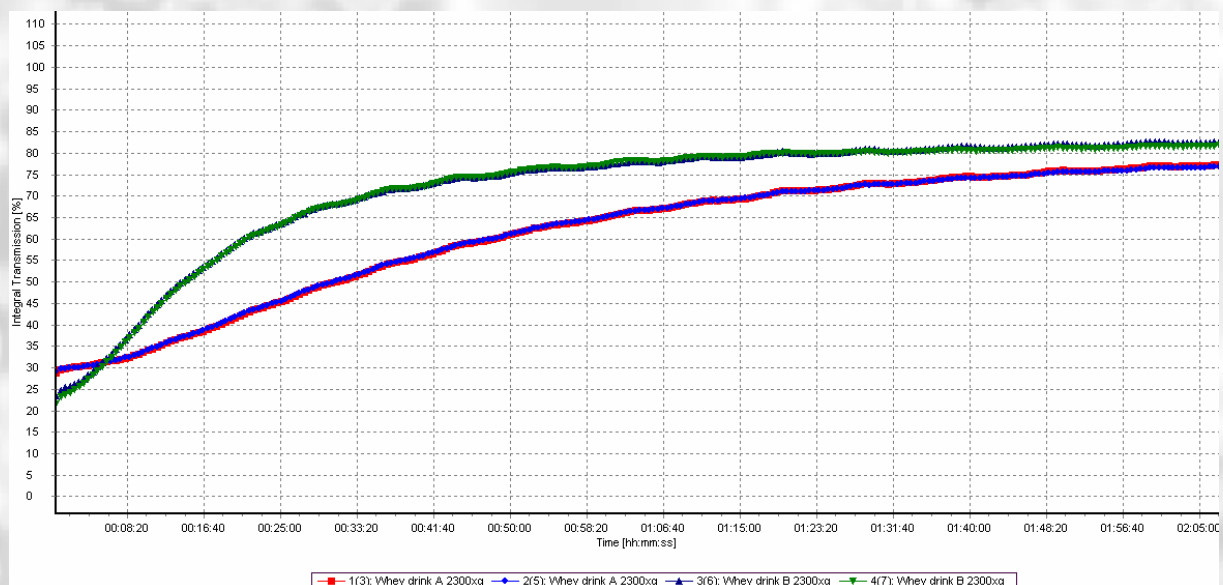
The evolution of the transmission profiles is shown on the following example.



Whey drink A, Evolution of transmission profiles with time at 2300 xg, 10 °C, each 15th profile displayed

The separation process is characterized by a very polydisperse sedimentation (no sharp front), particles move with different speed. During storage segregation may occur (sedimentation of larger particles or solids with higher density). Within the range from 129-130 mm the sediment is detected here.

Fast stability ranking by Integral Transmission at 2300 xg



Separation kinetics for the range 108-120 mm, 2300 xg, 10 °C

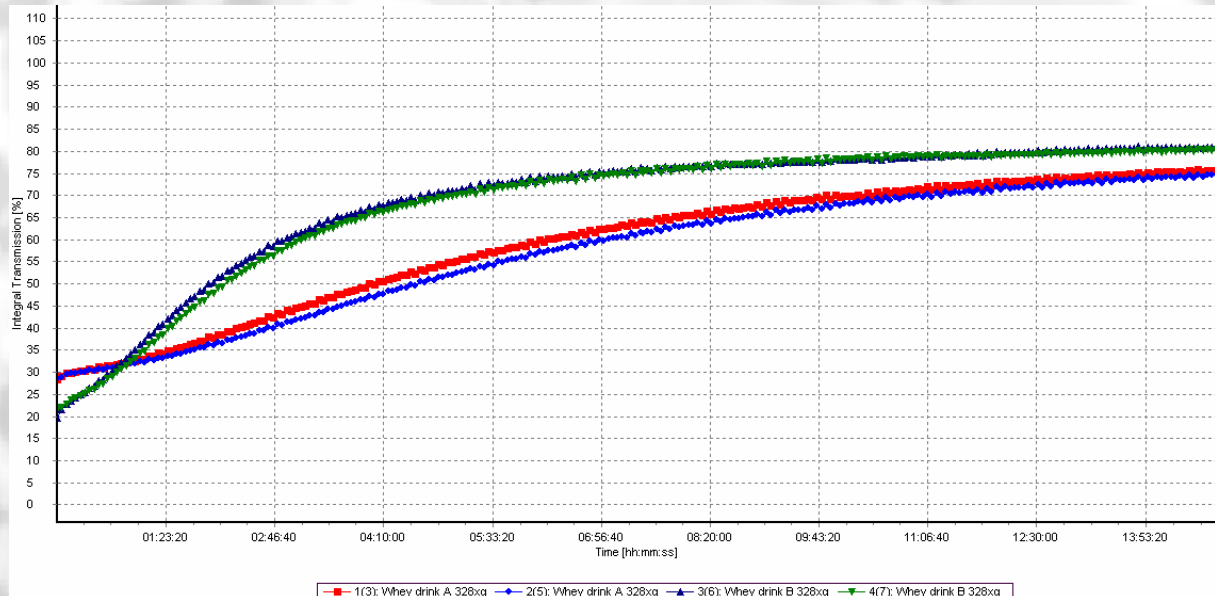


APPLICATION NOTE FAST STABILITY RANKING OF WHEY DRINKS

The demixing stability respectively the differences between both whey drinks are obtained within the first 10 minutes of the measurement at 2300 xg. The higher the slope within the initial range of the Integral transmission curves ≤ 10 min, the higher the clarification speed of the sample, the lower its demixing stability. Sample A is more stable against demixing than sample B.

Repeat determination proves the excellent reproducibility.

Stability ranking by Integral Transmission – Comparison at 328 xg



Separation kinetics (Change of transmission with time) for the range 108-120 mm, 328 xg, 10°C

The measurement at lower centrifugal acceleration (328 xg) but equivalent longer time (14 h) exhibits the same principal behaviour but a slightly lower degree of demixing for both whey drinks. Slight shear-thinning behaviour is indicated. The demixing stability of the whey drinks is obtained in less than 60 minutes of the measurement at 328 xg.

References

- Velocity distribution of whey drinks, Particle size distribution according to ISO 13318, Application note L.U.M. GmbH
- STEP-Technology see www.lum-gmbh.com/pages/technology.htm
- Determination of stability, consolidation and particle size distribution of liquid or semi-liquid food products by multisample analytical centrifugation, D. Lerche, T. Sobisch, T. Detloff, Proceedings ISFRS 2006, 221-225
- Shelf life prediction of liquid food products based on multisample analytical centrifugation, D. Lerche, T. Sobisch, S. Kuechler, 601-602