



REHYDRATION KINETICS AND STABILITY OF MILK POWDER



INTRODUCTION

In dairy industry, milk is often dehydrated. Indeed, milk powder has a longer shelf life than liquid milk, does not require refrigeration and as a result is easier to transport. However, dehydration must not alter milk properties; consequently, it is important to check if the rehydrated milk has the same properties than the native milk. Another aspect is to measure the rehydration kinetics in order to optimize rehydration process. In this note, we propose a method to assess the kinetics and the efficiency of rehydration of milk powder. The stability of rehydrated milk powder is also assessed.

METHOD

To achieve this goal, milk protein concentrate was rehydrated during 6 hours. During rehydration, sample was taken every 10 minutes and backscattering level was analysed with Turbiscan LAB. The results were compared to backscattering level of the sample before dehydration. Rehydration is completed as soon as backscattering level of native and rehydrated milk are equivalent.

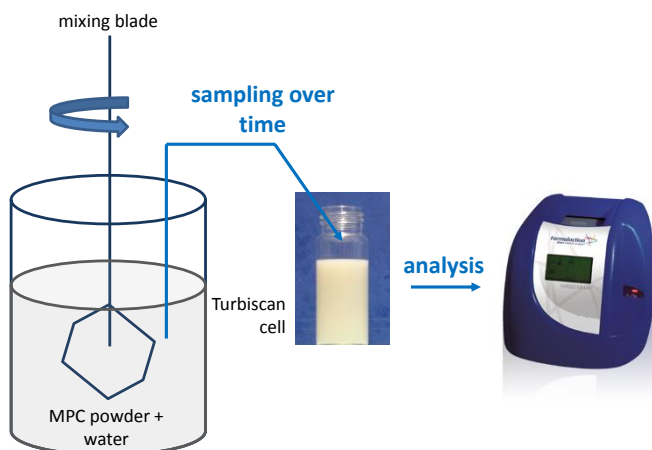


Figure 1: Schematic representation of the measurement method.

RESULTS

Rehydration kinetics

Figure 2 displays the evolution of backscattering level with time for the rehydrated milk. Results are compared to the backscattering level of the native milk.

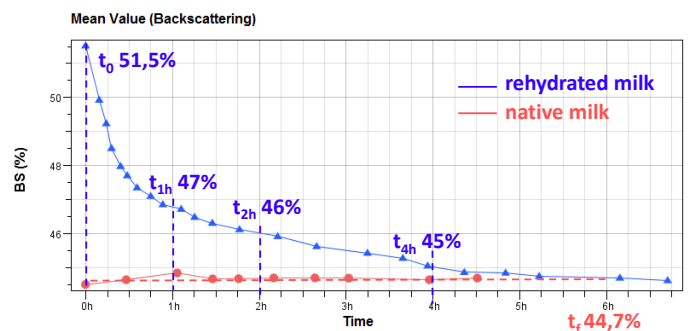


Figure 2: Mean value of the backscattering signal as a function of time for the rehydrated and the native milk.

This graph shows that immediately after rehydration, the rehydrated milk has a much higher backscattering level than the native one (51.1% vs 44.7%). Then, the backscattering level of the rehydrated milk decreases until it reaches the level of the native milk, i.e. same concentration and same particle size.

The rehydration is completed after 4 hours of mixing. However, it is interesting to note that the rehydration process is not linear. Indeed, at the beginning of the rehydration, the backscattering level decreases fast. After 1 hour of mixing, the signal is already down to 47%, which means in other words that 2/3 of the rehydration process is achieved within an hour.