

RESULTS

The profiles obtained with the apparatus show different kinds of backscattering variations :

- × a backscattering decrease at the bottom of both samples (*Figure 1* and *2*), which is characteristic of a decrease of the concentration of dispersed particle in this area (clarification).

- × a backscattering increase at the top of both samples (*Figure 1* and *2*), which is significant of a layer formation of fat droplets (creaming).

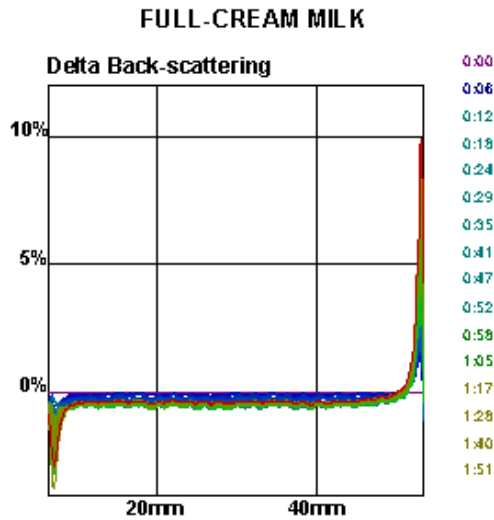


Figure 1

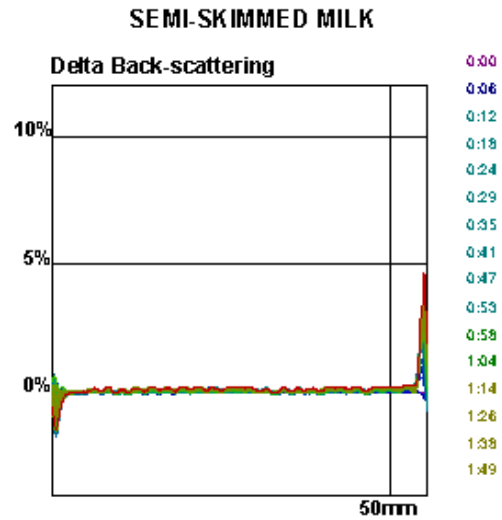


Figure 2

To compare the creaming phenomenon, we have followed the variation of the backscattering at the top of both samples as function of time (*Figure 3*).

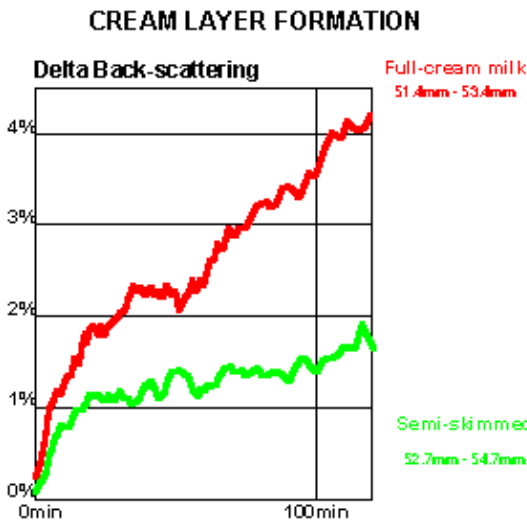


Figure 3

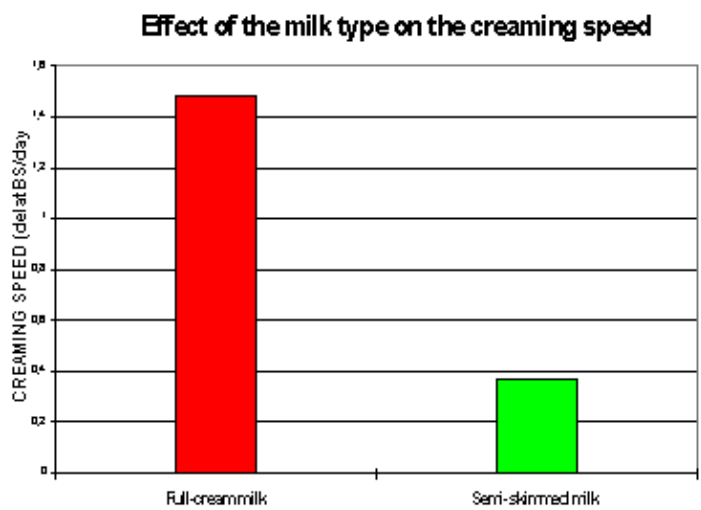


Figure 4

The calculation of the slope of these curves between 20 and 120 minutes gives the rate of cream layer formation as a function of the milk type (*Figure 4*).

The creaming process of the fat droplets appears 4 times faster for the full-cream milk than the semi-skimmed. In other words, the intensity of the creaming phenomenon depends directly on the fat content of the milk.

CONCLUSION

The Turbiscan Classic is able to detect particle migration phenomena in a few hours. Therefore it can be used to control the stability of milk.

Effect of Fat Content on the Creaming of Milk

INTRODUCTION

Milk is a colloidal dispersion of particles (droplets of fat, micelles of proteins ...) in an aqueous phase. Industrial treatments produce milks of different types (skimmed, concentrated, full-cream,...). For example, the technique of separation of the fat content by centrifugation produces the cream (which will be transformed into butter) and the skimmed milk. The final fat content of the milk depends on the centrifugation intensity.



The **Turbiscan Classic** enables to analyse the stability of these products as a function of the fat content concentration in suspension.

We have performed a set of experiments to compare the macroscopic stability of two different milks full-cream and semi-skimmed.

SAMPLE PREPARATION AND EXPERIMENT PLAN

Two different milks from the same supplier were analysed :

- × a full-cream milk (36% fat content)
- × a semi-skimmed milk (15% fat content)

Sample number	2	Analysis temperature	20°C
Analysis volume	6 ml	Analysis duration	2 hours

The first curve obtained was selected as a reference. The traces show the evolution of the backscattered light intensity (% , Y-axis) on the tube height (mm, X-axis) as a function of time (last curve in red).