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RESULTS

From analysis of the raw data corresponding to the middle of the sample (*Figure 1*), we can see that the backscattering decreases, which indicates the coalescence of foam bubbles (ie, decrease of mean interfacial area). The increasing area of the peak in the difference spectrum (*Figure 2*) signifies progressive liquid drainage.

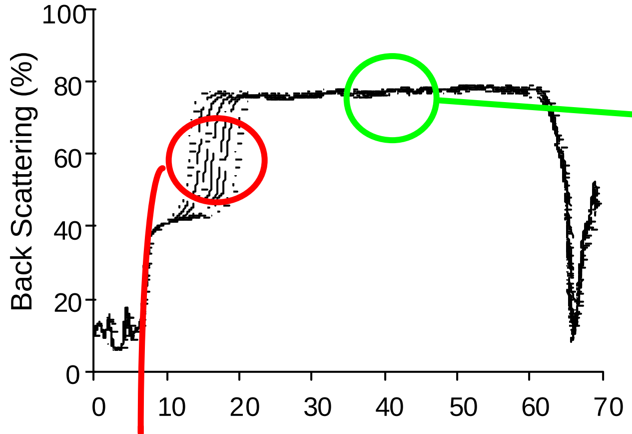

Figure 1. Raw data

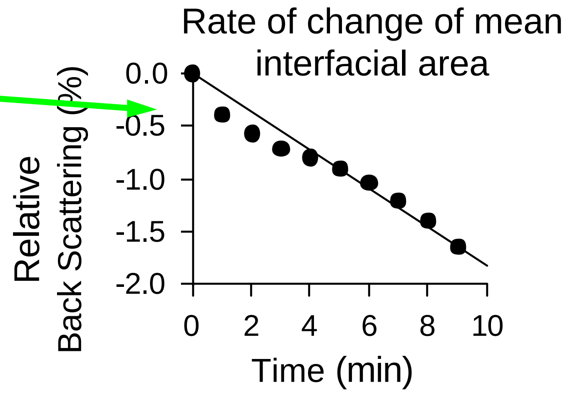

Figure 3

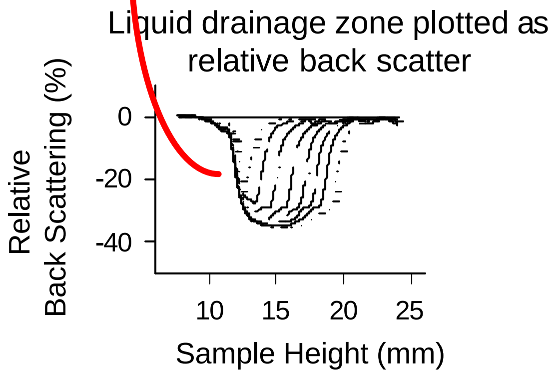

Figure 2. Data in reference

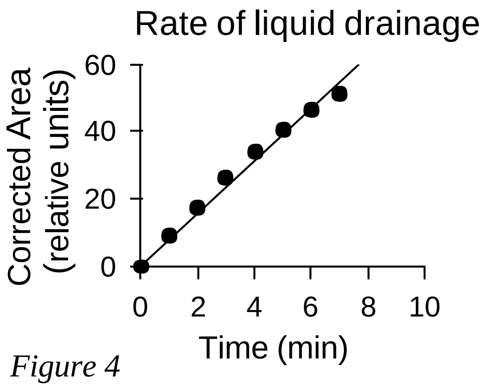

Figure 4

Using the above method, the change rate of both mean interfacial area and liquid drainage occurring at the middle and bottom of the foams, respectively, were monitored for the 6 food ingredients.

Rates were calculated after standardisation of the data to zero at t=0 (*Figure 5*).

Results showed that the rates of foam drainage were usually less than that of bubble coalescence however the reverse trend was observed for SMP. In particular, the TMP exhibited unusual behaviour in which relatively rapid bubble coalescence was not accompanied by significant liquid drainage.

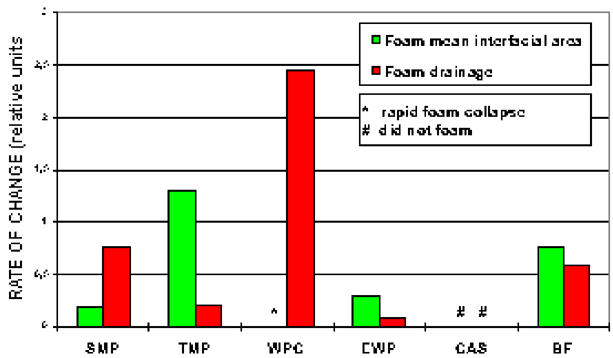

Figure 5

The **Turbiscan Classic** thereby allowed resolution and measurement of respective rates of liquid drainage and bubble coalescence processes in foams formed from selected ingredients.

CONCLUSION

The Turbiscan Classic shows great potential as a tool for characterising the properties and stabilities of foams formed using food ingredient systems, and also studying the mechanisms responsible for the instability of such foams.

ACKNOWLEDGEMENT

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Use of the Turbiscan for Measuring Foam Stability Properties of Food Ingredients

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INTRODUCTION

Measuring functional properties of food ingredients is a key factor in developing various products.

Methods for measuring properties such as foam and emulsion stability are usually empirical, poorly sensitive in their ability to differentiate test samples, and unable to yield information about mechanisms which underpin them.

We present here preliminary data illustrating application of the **Turbiscan Classic**, for measuring foam stability.

The study shows a comparison of the foam stability properties of selected food ingredients.

SAMPLE PREPARATION AND EXPERIMENT PLAN

Total milk protein (TMP, TP=83.4%), whey protein concentrate (WPC, TP=70.5%) and egg white powder (EWP, TP=75.8%) were obtained from commercial sources. Skimmed milk powder (SMP, TP=75.8%), caseinate (CAS , TP=75.2%) and β-lactoglobulin-enriched protein powder (BF, TP=78.8%) were prepared in pilot facilities at Food Science Australia.
True protein was determined by the difference between Kjeldahl total and non-protein nitrogen.
Foams were prepared using a blender (Braun) with whisk attachment, after dissolution of samples to 100 mg/g true protein. Samples volumes, corresponding to a height of 6 cm, were analysed in the Turbiscan at ambient temperature by scanning at 1 minute intervals for 10 minutes.

A typical profile (eg, SMP) of intensity of back-scattering light (%, Y-axis) versus tube height (mm, X-axis) as a function of time is shown in *Figure 1*. Events occurring in the liquid drainage zone are represented in difference mode with the curve at t=0 selected as the reference (*Figure 2*).