



NEW INSIGHTS INTO THE SOLUBILITY OF COCOA POWDER

Research into the solubility and stability of cocoa powders in aqueous systems shows the potential for development of improved manufacturing and a range of new products.

To be able to develop the next generation of cocoa products, the industry faces two challenges;

- improving the solubility of the cocoa powders in water,
- increasing the stability of cocoa powders in aqueous systems.

The project investigated:

- which cocoa components determine the solubility of cocoa powders,
- which cocoa components determine the viscosity and surface tension of cocoa products,
- the effects of processing steps on the formation of cocoa powders,
- the behaviour of these cocoa powders in aqueous systems.

This successful project is important for **manufacturers and producers**; the results have clear implications for processing now, and could lead the way to a new range of products in the future.

Results showed that:

- the solubility of cocoa powders was limited by the dense cell wall material,
- cocoa particles, fat and pectins determined the extent of thickening,
- processing clearly influenced solubility,
- alkalization improved the solubility of cocoa powders.

<i>Design rules for processing low and high solubility, low and high viscosity and low and high thickening cocoa powders</i>					
	Temp-alk	Time-alk	Conc-alk	Temp-roast	Time-roast
Low solubility	Low	Short	Low	High	Long
High solubility	High	Long	High	Low	Short
Low viscosity	High	Long	Low	High	Long



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	Temp-alk	Time-alk	Conc-alk	Temp-roast	Time-roast
High viscosity	Low	Short	High	Low	Short
Low thickening	High	Long	Low	High	Long
High thickening	Low	Short	High	Low	Short

Cocoa powders were produced in the pilot plant with a difference in solubility of between 21% and 51% when processed in different ways.

Recommendations:

- Further optimisation of processing conditions. (For example high pressure treatment, or treatment with industrial enzymes.)
- Further investigation of the role of other ingredients for the thickening of products.

The results of the project are clearly described in the final report. The report is available in electronic form from Barry Callebaut.

An article 'Solubility of cocoa powders in relation to composition and alkalization', has been written. It is planned to submit the article to the magazine Food Science.

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