Kilned Malt Method

Scope
- Predict quality potential of a finished malt.

Rapid Visco Analyser
The Rapid Visco Analyser (RVA) is a cooking stirring viscometer with ramped temperature and variable shear profiles optimized for testing viscous properties. The instrument includes international standard methods as well as full flexibility for customer tailor-made profiles. Combining speed, precision, flexibility and automation, the RVA is a unique tool for product development, quality and process control and quality assurance.

Description
This application describes the use of an RVA to rapidly estimate the quality potential of a finished malt. For a given cultivar, malts of known milling potential are tested and the results used to derive linear correlations between viscogram data ($\log_e$ peak area, $\log_e$ time to peak) and malting quality measurements. Malts of the same cultivar but of unknown potential are then tested under the same conditions, and the measurements from the viscogram compared to those of the known samples to indicate the malting potential.

Close relationships between the time to peak, peak area and final viscosity of the malt viscogram and the Coarse Concentrated Hot Water Extract (CCHWE), Fine Hot Water Extract (FHWE) and Cold Water Extract (CWE) have been demonstrated. Some relationships have been demonstrated under both autolytic and enzyme-inhibited conditions.

The method is first used to establish the malting potential calibration for the variety of interest. To do this, a number of malts varying in known malting potential for the selected variety are tested. From the viscograms, the peak viscosity, time to peak, breakdown, peak area, holding strength and final viscosity are measured. These parameters are fitted as dependent variables against conventional measures of malting quality using standard regression techniques. The $\log_e$ transformation may be used as appropriate. The most highly correlated viscogram parameters may subsequently be measured in malts of unknown potential for the same variety, using the regression equation to predict the potential malting quality of the sample. Good correlations using $\log_e$ time to peak and $\log_e$ peak area have been demonstrated.

Method
Fifteen-minute pasting profile.

Sample Preparation:
7.00 g ground grain at 14% moisture and 21.0 ml distilled water.

Profile

Time	Type	Value
00:00:00	Temp	50°C
00:00:00	Speed	960 rpm
00:00:10	Speed	160 rpm
00:01:00	Temp	50°C
00:04:42	Temp	90°C
00:09:12	Temp	90°C
00:14:12	Temp	50°C
00:15:00	End	
Idle Temperature: 50 ± 1°C		
Time Between Readings: 4 s		

Measure
PTi: Time to peak (min)
Calculate $\mathrm{Log}_e(\mathrm{PTi})$

The $\mathrm{Log}_e(\mathrm{PTi})$ is the RVA Malt Potential Index. Peak viscosity, breakdown, peak area, holding strength and final viscosity may also be recorded. The test should be commenced within 30 sec of adding the sample to the water.

Usually autolytic conditions are used in the test to indicate amylase activity. However, good correlations have also been obtained under enzyme-inhibited conditions to indicate residual starch, using 100 μmol AgNO3 per gram of barley.

Considerable additional information can be gained by analyzing the sample post-viscography for soluble components. At the conclusion of a test, each slurry can be diluted to a standard grist to liquid ratio, then clarified by filtration or centrifugation. Measurement of total soluble solids, soluble protein, β-glucan or other components of interest can be carried out on the "extract".