WATER ACTIVITY OF RAISINS

Dimitris Polymatidis
Project Manager
SCIENTIFIC ENTERPRISES LTD

Raisins were probably discovered by accident many thousands of years ago when the sun dried grapes on the vine. Ancient civilizations found them to be flavoursome and nutritious, but best of all, they could be stored and transported without degradation. The key to the quality of raisins is the drying process and the moisture content. If the raisin is too dry, its nutritional value and flavour are diminished, too wet and the raisin degrades very quickly and will not survive storage or transportation.

The measurement of the moisture content of raisins is a challenging task due to two main problems.

1. Raisins are a mixture of complex sugars and volatile substances. The process of heating the sample during weight loss on drying analysis may also remove other substances and hence affect the value of moisture content obtained.

2. Raisins have a semi permeable skin that does not allow for fast exchange of water molecules between the flesh of the raisin and its surrounding environment.

As a result, measurement of moisture content is very time consuming and inaccurate, so Dr Chaniotakis of the Laboratory of Analytical Chemistry at the University of Crete (Greece) has described an analysis protocol, which solves these problems and provides fast, accurate and repeatable measurements.

Methodology:

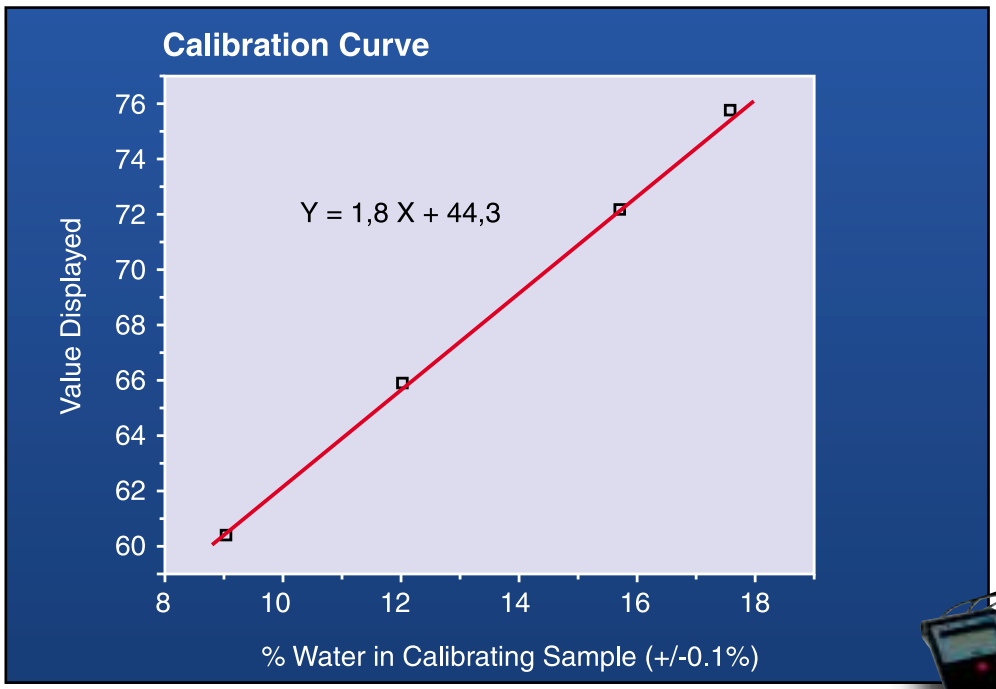
For each type of raisin it is necessary to prepare a Sorption Isotherm, which is a graph or calibration curve, which plots moisture content against water activity.

Moisture content is determined at several points with a Karl Fischer Titrator using a Hydranal 5 reagent.

Corresponding values of water activity are obtained using a ROTRONIC AWVC measurement station to measure the raisin samples. Sample preparation is critical; the skin of the raisin needs to be cut, but not removed, and Dr. Chaniotakis uses a specially designed tool.

The two sets of measurements are then plotted as a graph.

By routine measurement of water activity using ROTRONIC equipment and the Sorption Isotherm data, moisture content can be determined. With fast results and simple operation, non-skilled personnel in production and quality control departments can use this measurement whenever moisture checks are necessary to maintain the highest levels of raisin quality.



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