"How much water does a watermelon actually contain?"

A children's TV show presents a Sartorius moisture analyzer

The MA150: the winning combination of ease of operation and a proven, space-saving footprint for daily routine use in the lab.

Equation for calculating the moisture content:

$$Moisture = \frac{Mass_{Fresh} - Mass_{Dry}}{Mass_{Fresh}}$$

$$Amount\ of\ water = Moisture \cdot Initial\ mass$$

$Mass_{Fresh}$: 10.213 g
$Mass_{Dry}$: 0.895 g

$$\frac{(10.213\ g - 0.895\ g)}{10.213\ g} \cdot 100\% = 91.2\%$$

Initial mass = whole melon = 7.7131 kg

$$\frac{91.2\%}{100\%} \cdot 7.7131\ kg = 7.03\ kg$$

Which equates to 7.03 liters

Why are there holes in cheese? How does toothpaste get its stripes? These and many other intriguing questions have been answered since 1971 in the weekly children's TV series "Die Sendung mit der Maus," which airs under "Mouse TV" in its English-dubbed version in nearly 100 countries. This makes it one of the most internationally successful German TV shows of all times. A permanent part of the program includes "Stories about things" in which technology, nature or workflows of everyday life, some of which are highly complex, are explained in simple terms.

One "story about things" shown in September 2008 dealt with the question of "How much water does a watermelon actually contain?" In searching for an idea to vividly demonstrate how to measure the water content of a watermelon, the producers of the West German public broadcaster WDR became aware of Sartorius "moisture balances." With the equipment and support of Sartorius employees, some of whom were willing to stand in front of a camera to carry out the watermelon experiment, a "story about things" lasting around five minutes was filmed to be shown on TV.

This part of the program demonstrated how an entire watermelon was weighed on an appropriately large-sized Sartorius scale first, then how a small slice was cut from the watermelon. This slice was placed on the sample pan inside the MA150 moisture analyzer, also weighed by the analyzer and dried by the analyzer's infrared lamp. A time-lapse sequence showed the drying process that normally lasted several minutes in just a few seconds, delivering exciting pictures of the changes that the flesh of this fruit and the rind underwent. At the end of the measurement, the MA150 again determined the weight of the dried slice of melon. A simple equation (see left box) shows how the percentage of evaporated water is calculated from the moist and dry weight of the slice, and converted into the weight of the entire melon. The result: a watermelon weighing around 9.5 kg (about 21 lb) contains just over 7 liters (nearly 2 U.S. gallons) of water!

The MA150 moisture analyzer lent itself ideally to this experiment. In particular, as the moisture analyzer provides a winning combination of ease of operation and fast and accurate measurement results, it enabled the film team to produce footage of this scientific experiment that was short and factual, yet easy for all viewers to understand. In this way, Sartorius was able to help the mouse and all its friends answer one more puzzling question posed by everyday life.

You may view this entire series as a podcast in German by accessing the link on the WDR site: http://www.podcast.de/episode/865396/Die_Sendung_mit_der_Maus%3A_21.09.2008%2C_Wassermelone

Reader Service Code: 343