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What is the best way to heat left overs in the microwave experiment. Plus the new Vantage Connect Weather Station.

Mad March is in full swing, we have a swag of new products on the website including the new battery catalogue with batteries available from AAA's to Power Tool, Laptop batteries to Specialised Industrial Batteries. There are over 4000 types of batteries, if you need anything in particular contact us - customer-service@instrumentchoice.com.au.

Many of us use the microwave daily to reheat food, have you wondered how to get it heated the fastest or how to get a more consistent heat through the food? Our scientists test some theories below.

A recent addition to the Instrument Choice stable from Davis Instruments is the Vantage Connect allowing you to monitor the weather remotely as long as there is the Telstra GSM network available where the station will be located. Place the station on the farm and you can easily monitor conditions from the city or the other side of the world. Our article below explains what this setup can do.

Please remember if you have any questions regarding tests you need to conduct or specific instrumentation please give us a call on 1300 737 871.

Until next month…
Tyson Grubb

Product of the month: RemoteAccess-WS-Kit

This kit is an ideal solution if you wish to know the local weather conditions from remote locations, such as vacation or rental homes, ranches, orchards, farms, vineyards and fire hazard areas that lack power or a person to monitor the weather.

Experiment to test the best way to heat left overs in the microwave.

Microwaves have been in use in kitchens around the world for over 50 years, but despite the many years of use, getting consistent heating throughout food is still out of grasp for most microwave users. In this week's experiment we will be looking at different ways of heating food to get the most consistent results so you can make the most of your lunch break.

Equipment used
Microwave
Room temperature mashed potato – 4 standard serves
Waterproof food safety thermometer - 0560-1113
Food safety infrared thermometer - Testo 830-T1

Method
Standard portions of mashed potato were prepared and arranged on a plate as per the methods below and the temperature of each portion was measured. Each portion was then microwaved at full power (except test 4) for 2 minutes. The internal temperature of each portion was then measured at 4 points using the probe thermometer, and the surface temperature was measured using the Testo infrared thermometer. The results were recorded in tabular format.

Test method 1. Food mounded in middle of plate

Test method 2. Food placed in ring shape with an empty centre


ON
OFF
HOLD
MAX-MIN


ON
OFF
HOLD
MAX-MIN


testo

Test method 3. Food was spread uniformly flat at a depth of approximately 2cm

Test method 4. Same shape as method 1 but microwaved for twice as long at half power

Results
Each of the samples under test started at within 0.3°C of each other. After microwaving, test method 1 gave the highest average temperature reading at 64.5°C and test method 3 gave the lowest average temperature reading at 52.9°C. Test methods 2 and 4 gave lower average temperatures, however they had much less variation in temperature between different areas of the food. Test method 4 had an average temperature of 59.5°C which was 5°C below test method 1, however, the variation was only 2.2°C across the 4 sample points on method 4 which means it gave the most consistent heating results. Test method 2 was a close second place, giving a higher average temperature (62.1°C) than method 4, but it suffered from greater variation of 5.9°C.

	Starting temp	Temp 1	Temp 2	Temp 3	Temp 4	Average probe temp	Biggest temp difference	Surface temp
Test method 1	24.0°C	67.1°C	73.2°C	58.3°C	59.4°C	64.5°C	14.9°C	45°C
Test method 2	23.8°C	64.2°C	63.8°C	57.9°C	62.5°C	62.1°C	5.9°C	60.2°C
Test method 3	24.1°C	50.1°C	52.3°C	51.0°C	58.3°C	52.9°C	8.2°C	56.8°C
Test method 4	24.0°C	58.4°C	59.7°C	59.2°C	60.6°C	59.5°C	2.2°C	46.8°C

Table 1. Temperature readings before and after microwaving

The surface temperature results also gave some interesting results. In each case, the surface temperature measured was lower than the highest internal temperature. For test method 1 there was a maximum difference of 28.2°C between the highest probe temperature and the surface temperature. Test method 2 had the most consistent readings between the surface temperature and the internal probe temperatures with a maximum difference of 4°C.

Discussion and conclusions
The results from the above tests show that microwaves can be used to consistently heat left overs. Test method 4 gave the most consistent temperature readings with the downside of taking twice as long as the other methods. Test method 2 gave slightly more variable results than test method 4, but it was twice as fast and less variable than the other methods.

So, if time is an issue, arranging your leftovers in a ring shape on the plate before microwaving is the best method of heating your leftovers. If you have more time available to you, halving the power and microwaving for twice as long will give the most consistent heating.

The New Vantage Connect - Access Your Weather Data Remotely With GSM.

For this month's article we will profile the recently released Davis Vantage Connect. It has become a popular choice for a number of customers that need a standalone setup and wish to access weather information when they are not onsite.

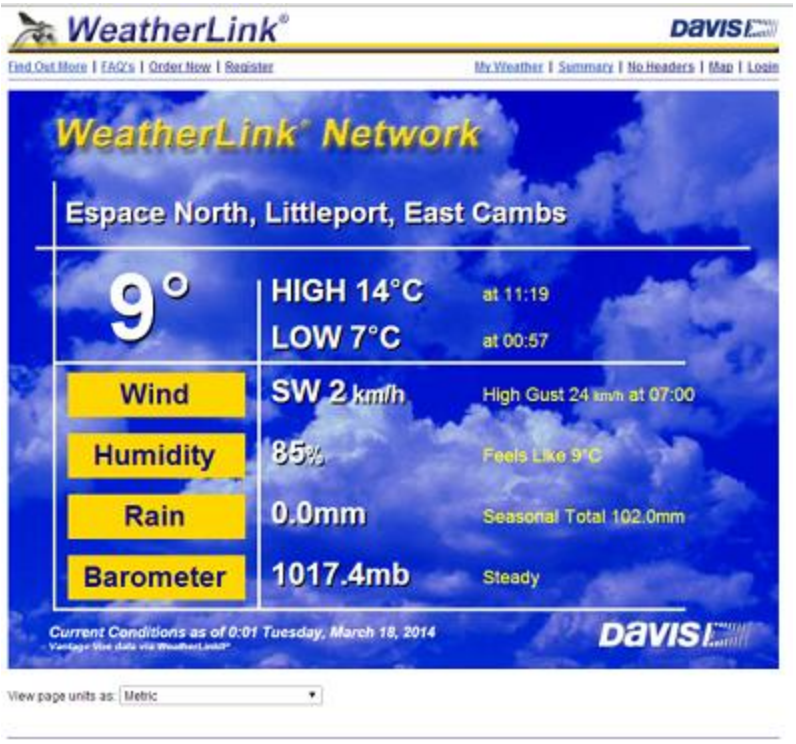
The Vantage Connect transmits weather data from the Davis range of integrated sensor suites including the Vantage Pro2 IC6322AU, IC6323AU, IC6327AU, IC6328AU or Vantage Vue IC6357AU via the Telstra GSM network to the internet

In its simplest form it will transmit data from a Vantage Vue or Vantage Pro2 ISS. However, it also offers the ability to have additional stations added such as the temperature/humidity stations, temperature stations, anemometer transmitter kit or the leaf & soil moisture/temperature station in various configurations as defined in the table below.

Vantage Connect at a Glance		Wireless	Cabled
Can listen to up to 8 transmitters		Yes	No
Maximum number of integrated sensor suites (ISS)		1	1
Maximum number of Anemometer/Sensor Transmitter kits		1*	0
Maximum number of Wireless Leaf & Soil Moisture/ Temperature stations		1**	0
Maximum number of Temperature stations		3	0
Maximum number of Temperature/Humidity stations		2	0
Stored memory capacity:	5-Minute Update Interval	1 month	1 month
	15-Minute Update Interval	3 months	3 months
	60-Minute Update Interval	1 year	1 year
Compatible with repeaters		Yes	No

* When used to extend Vantage Pro2 anemometer from the ISS. Otherwise, 0.
** Can use 2 only if one is leaf wetness and one is soil moisture.

This solar powered, cellular based unit combines four components of a conventional remote weather station into a single assembly. It combines the receiver (replacing the Envoy or console), data logger, cellular modem and self-contained solar power supply (with rechargeable battery for overnight and low-light operation) and uploads weather information to the Davis Weatherlink.com server on a 5, 15 or 60 minute interval (depending on the plan selected). This information can then be accessed via a webpage or App for iPhone, iPad or Android. An image of the webpage to see what the data would look like with your own Connect installation is shown below:



This is particularly handy for farms, vineyards, orchards, or areas that lack a person to monitor the weather. It also allows the user to program alarms for various conditions so that if certain conditions are met an alarm signal will be sent to the Weatherlink.com server. The account can then be setup to send an email alerting you of the breach. All configuration is also conducted remotely via your Weatherlink.com account including transmitter channel settings, alarm settings, and units meaning you don't need to make specific trips to change a setting or setup additional alarms.

If you would like to discuss the Vantage Connect setup further with your current ISS or would like to discuss a complete setup please feel free contact one of our friendly Scientists via email or phone on 1300 737 871

Thank you

from everyone at Instrument Choice - stay tuned for next months issue.

Contact us.

Our experts are happy to help and discuss your project.
Call **1300 737 871** or write an email to customer-service@instrumentchoice.com.au

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