MEAT TRAC

Fast, Accurate Fat and Moisture Testing



CEM

Tomorrow's Science Today

easy as 123



1 Test for moisture with the SMART Turbo.



2 Roll the sample and place it in a Trac Tube.



3 Insert into the NMR chamber for analysis.



Precise results in 8 seconds.



MEAT Trac

The most accurate and affordable fat and moisture analyzer available. CEM's MEAT Trac is a high performance fat and moisture analyzer specifically designed for meat and meat products, giving you a more accurate, cost-effective alternative to NIR. MEAT Trac quickly provides accurate fat and moisture determinations to help you fully optimize your process, saving time and money by reducing or eliminating out-of-specification product.

- 8 second fat test
- Easy to use
- More accurate than NIR
- No costly calibration maintenance
- No recalibration due to formulation changes
- No solvents
- Meets the requirements of Official AOAC Method 2008.06

MEAT Trac utilizes a combination of proven microwave drying and NMR technologies to provide unmatched performance, stability, and accuracy.

SMART Turbo Microwave Moisture/Solids Analyzer

The SMART Turbo provides rapid, accurate moisture/solids analysis for a broad range of products. The system's patented IntelliTemp™ Temperature Control ensures that all moisture is completely removed without overheating the sample for better precision.

FINISHED PRODUCTS CHICKEN PORK MEAT PORK PRE-BLENDS RAW MATERIALS BEEF HOTDOGS SAUSAGE HAMBURGER

MEAT Trac Methods

Create a new method in an hour or less!

Creation of a new method only requires 3 samples, not the tens, hundreds, or even thousands required by NIR. CEM offers application assistance, but chances are you probably will not need it, as method creation is very simple.

1. Run your sample.
2. Enter the reference value.
3. Run a duplicate sample.
4. Repeat steps 1-3 for the other two reference points.

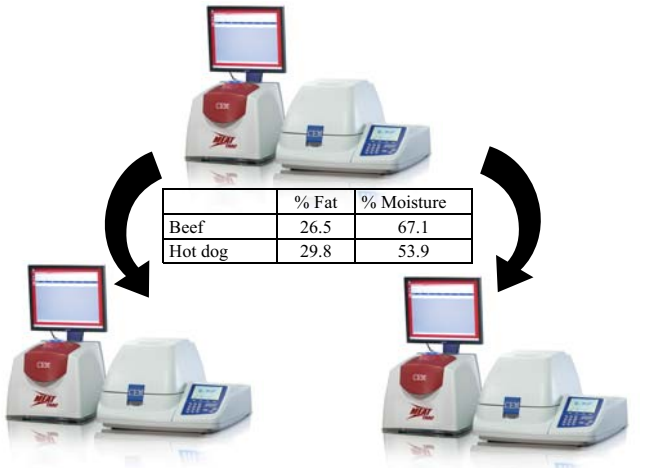
Congratulations! You have created a method.
Repeat steps 1-3 to validate method



Application notes for the starting moisture parameters for a variety of samples can be downloaded from the CEM website at www.cem.com/download28.html.

Easy Method Transfer

The MEAT Trac has standard methods that are included with the instrument. Simply select from a list of methods and start analyzing without additional calibration. Custom methods are also available. Contact our applications support group and we can e-mail them to you directly. Combine this with the incredible stability of the MEAT Trac and you have a remarkably easy-to-use instrument that you never have to re-calibrate.



	% Fat	% Moisture
Beef	26.5	67.1
Hot dog	29.8	53.9

	% Fat	% Moisture
Beef	26.3	67.5
Hot dog	29.5	53.7

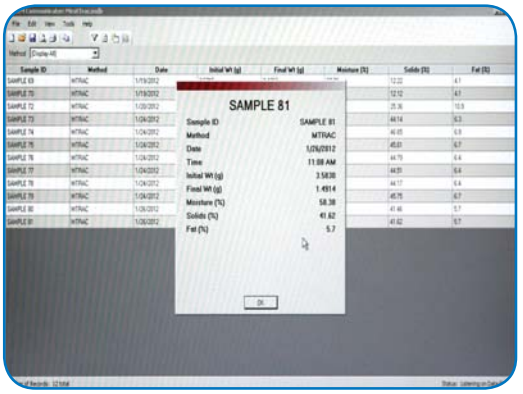
	% Fat	% Moisture
Beef	26.7	67.3
Hot dog	29.9	53.7

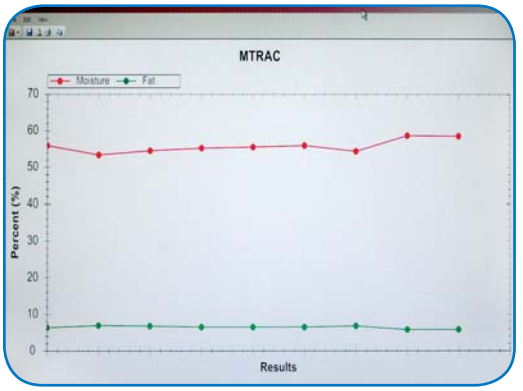
Once a method is developed on a PARENT unit; it can be copied to a CHILD unit and used immediately. You get the same results whether you are transferring methods across the lab or across the ocean.

Communicator

The MEAT Trac can be operated using the built-in controls and the data analyzed using CEM's Communicator Software. Communicator is a convenient way to collect, analyze, and report data. The simple interface is easy to learn and use.

- Stores data in a Microsoft Windows® Access® database
- Data is immediately available to others in your organization
- Export to other applications
- Customized reports & graphs
- Print or electronically transfer labels, charts, load sheets & reports







MEAT Trac vs NIR

Up to 1,000 samples for calibration or 3?

Would you rather calibrate your system using thousands of samples or just three? Depending on the sample, NIR systems can require anywhere from 10 to 1,000 samples to calibrate the system. This is due to the fact that NIR (near infrared) technology uses a beam of light to measure qualities on the surface of a sample. Typically, NIR units are calibrated by using samples with known, but varying, levels of moisture and fat. The analyzer records the patterns of light reflected from these samples and a computer "model" is generated for that particular type of sample. After these standards are calibrated, samples placed in the system have their patterns of reflectance compared to the standards. The computer then predicts what the fat and moisture should be based on the sample's "resemblance" to the samples originally used to calibrate the system.

CEM's MEAT Trac utilizes NMR; the same technique used in medicine is called an MRI. Just as doctors can see what is happening inside your body more clearly from viewing an MRI scan than just by looking at you, MEAT Trac can give you greater accuracy than NIR. The MEAT Trac uses a magnetic pulse to measure fat and moisture throughout the sample, not just on the surface, providing results that are more accurate. Unlike NIR systems, changes in the color or texture of a sample do not affect the system's results. With only three samples needed to calibrate a method, you will be on your way to optimizing your process fast.

Single Method – Multiple Sample Types

Fat Analysis of Hot Dogs			
Product Name	Ingredients	Soxhlet	MEAT Trac
Beef Frank 1	Beef	28.97	28.6
Beef Frank 2	Beef	28.42	28.3
Beef Frank 3	Beef	25.04	25.5
Beef Frank Lite	Beef with Starch Extenders	12.43	12.2
2 Meat Frank 1	Pork, Turkey	30.51	30.5
2 Meat Frank 2	Pork, Turkey	26.61	26.7
3 Meat Frank	Turkey, Pork, Beef	27.14	27.5
3 Meat Frank Lite	Turkey, Pork, Beef with Starch Extenders	15.77	15.9

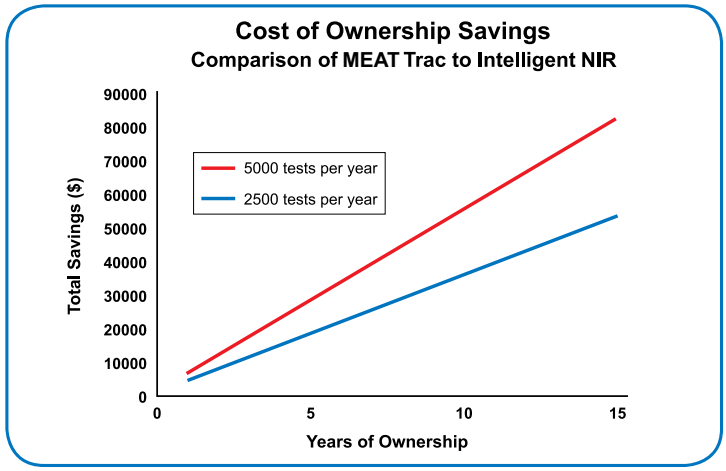
COST OF OWNERSHIP

Standard NIR systems require validation and calibration maintenance, which can be quite expensive because they require anywhere from 10 to 1,000 samples to calibrate the system.

Once created, calibrations on the MEAT Trac are set for the life of the system and they are robust enough to stand up to reformulations. No recalibration needed. Because the MEAT Trac directly measures the moisture and fat in each and every sample, methods do not need to be changed or updated.

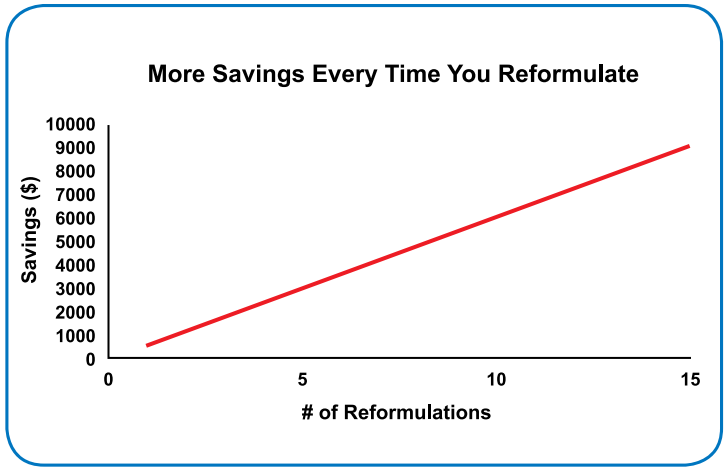
Save money every time you use the MEAT Trac

Based on calibration maintenance and monthly validation (as recommended by the system manufacturer), the cost over time of the MEAT Trac is substantially lower than other competitive systems.



Reformulate with Ease

MEAT Trac's robust technology provides accurate results when you reformulate without having to calibrate the system, saving you time and money.







High Performance NMR Technology

NMR directly measures fats and oils. Unlike indirect methods, which only measure the surface of a sample, NMR detects fats and oils throughout the sample, yielding an accurate analysis that is independent of sample uniformity and not affected by changes in color and texture.

Versatility

MEAT Trac offers the ultimate in versatility for meat products and can be used for raw meats, pre-blends, and cooked or finished products. Use the MEAT Trac:

- at line or in the QA/QC lab;
- to calibrate NIR or other indirect methods; and,
- as a reference.

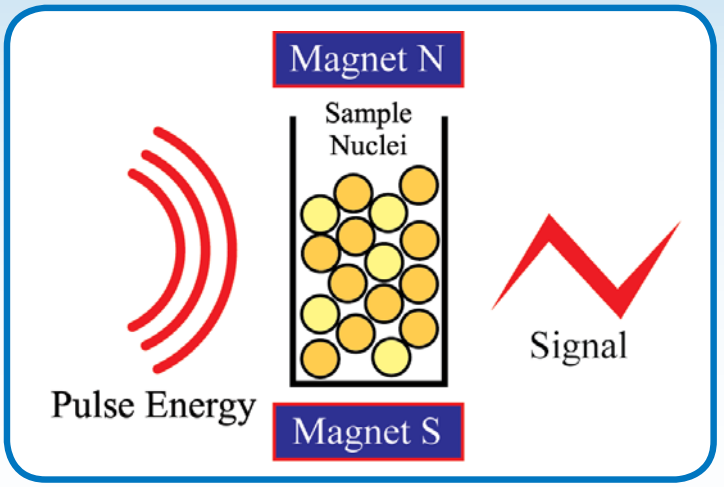


Accurately determine moisture and fat in raw beef in 3 ½ minutes and in hot dogs in less than 2 ½ minutes!

What is NMR & How Does It Work?

NMR quantifies fats and oils in samples and eliminates the need for time-consuming extractions and solvents. Nuclear Magnetic Resonance (NMR) is the same technique as Magnetic Resonance Imaging (MRI), which has been widely used in the medical profession for years to image the human body.

CEM combines microwave drying with NMR to accurately measure fats. The SMART Turbo removes all of the water molecules from the sample eliminating signal interference and allowing the NMR to accurately measure the amount of fat content in a wide variety of food products.



The word "nuclear" in the term refers to the instrument's ability to analyze the nuclei of the sample's atoms. NMR technology does not generate or use ionizing radiation.



How accurate are your results?

For more than 30 years, the meat industry has depended on CEM systems for fast, accurate fat and moisture results that were AOAC compliant. We have taken that knowledge base and built it into the new MEAT Trac to give you an easier to use, more cost-effective system for accurate meat analysis. Compliant with AOAC Official Method 2008.06, the system's results are more accurate than NIR or any other indirect method and safer than Soxhlet.



MOISTURE DETERMINATION

CEM MEAT Trac			
Sample Type	**Reference Value (AOAC 950.46)**	**MEAT Trac[1] (AOAC Method 2008.06)**	**Difference (%)**
Beef	67.31	67.1	0.2
Pork	60.07	60.1	0.0
Chicken	74.99	74.7	0.3
Turkey	74.67	74.4	0.3
Hot Dog	54.03	53.9	0.1
Average Difference +/- 0.2%			

INTELLIGENT NIR			
Sample Type	**Reference Value (AOAC)**	**NIR (AOAC Method 2007.04)**	**Difference (%)**
Beef	65.23	62.30	2.93
Pork	61.17	60.51	0.66
Chicken	73.75	73.48	0.27
Turkey	73.85	73.69	0.16
Hot Dog	63.29	62.17	1.12
Average Difference +/- 1.03%			

FAT DETERMINATION

CEM MEAT Trac			
Sample Type	**Reference Value (AOAC 960.39)**	**MEAT Trac[1] (AOAC Method 2008.06)**	**Difference (%)**
Beef	26.56	26.5	0.1
Pork	22.30	22.3	0.0
Chicken	2.91	2.9	0.0
Turkey	1.00	1.0	0.0
Hot Dog	29.79	29.8	0.0
Average Difference +/- 0.0%			

INTELLIGENT NIR			
Sample Type	**Reference Value (AOAC 981.10)**	**NIR (AOAC Method 2007.04)**	**Difference (%)**
Beef, HF	29.30	29.99	0.69
Pork	22.25	21.99	0.26
Chicken	3.17	3.25	0.08
Turkey	1.48	1.89	0.41
Hot Dog	15.39	15.05	0.34
Average Difference +/- 0.36%			

[1] Values for MEAT Trac determined using AOAC methods; data reported by MEAT Trac System.

FINISHED PRODUCTS CHICKEN PORK MEAT PORK PRE-BLENDS RAW MATERIALS HOTDOGS BEEF SAUSAGE HAMBURGER



Rapid Analysis
Turbo Technology for the fastest moisture analysis
NMR analyzes fat in 8 seconds

Never Recalibrate
All operators and all shifts get the same results

Customized Software
Specifically written for meat products

Compact NMR
State-of-the-art neodymium magnet

Test Precision to 0.1%

Excellent Precision
With proprietary IntelliTemp™ temperature feedback system

Stores 100 Methods & 300 Test Results

Simple User Interface

Onboard Printer



System Specifications

Moisture/Solids Range	0.01% to 99.9% in liquids, solids, and slurries 0.01% resolution
Fat Range	0.1% to 99.9% in liquids, solids, and slurries 0.1% resolution
Data Entry Keypad with menu-driven software	
Balance Capacity	100 grams, 0.1 mg readability
Program/Data Storage	100 methods and 300 results
Standard Software	Software with proprietary Turbo Technology and IntelliTemp™ temperature controlled drying
Display	Built-in black and white VGA screen (320 x 240) 17" Flat panel, color LCD display
Accessory Ports	4 USB, 1 Ethernet, 2 RS-232, 1 parallel port
Standard Printer	Internal impact printer
Instrument Dimensions	
SMART Turbo	22 in (w) x 23 in (d) x 15 in (h) 56 cm (w) x 59 cm (d) X 37 cm (h)
SMART Trac II Magnet	14 in (w) x 14 in (d) x 13 in (h) 36 cm (w) x 36 cm (d) X 33 cm (h)
SMART Trac II Processor	12 in (w) x 13 in (d) x 16 in (h) 30 cm (w) x 33 cm (d) x 41 cm (h) Processor may be located up to 9'8" (3 m) away from the magnet.
Weight	
SMART Turbo	55 lbs (25 kg)
SMART Trac II Magnet	110 lbs (50 kg)
SMART Trac II Processor	37 lbs (17 kg)
Ambient Air Temperature	Temperature must be maintained between 15 °C and 30 °C. For optimum stability and performance, the ambient temperature should not vary more than 5 ° C/day.
Current	
Voltage	100-240 V (50-60 Hz)
Power	800 VA maximum. UPS recommended, if power is not reliable.
SMART Turbo	10 amps (110-127 V, 60 Hz); 5 amps (220-240 V, 50/60 Hz 10 amps (100 V, 50/60 Hz); 5 amps (200-208 V, 50/60 Hz)
SMART Trac II Magnet & Processor Power Conditioner Requirements	6.3 amps (100-240 V, 50/60 Hz) 2.1 kVA 120 V, 60 Hz 1.8 kVA 240 V, 50Hz
RF Pulse Generator	Pulse Power 300 W nominal. Pulse times variable in 100 ns increments, Transmit and receive phases selectable 0°, 90°, 180° and 270°. Nominal 90° pulse imes 3 ms (10 mm probe) and 4.5 ms (18 mm probe)
Magnet	Permanent, thermally stabilized, 0.55 T (23.4 MHz proton)
Patents	6,548,303 6,548,604 7,125,721 7,220,591

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