

A SIMPLE RECIPE  
FOR FOOD SAFETY  
AND QUALITY

Adulterant Screen Solutions

  
**PerkinElmer**<sup>®</sup>  
*For the Better*



YOUR MOST IMPORTANT  
INGREDIENT IS  
PEACE OF MIND



## Protecting the Food Supply, One Ingredient at a Time

### Liquid milk

Economic adulteration can be underhanded (cane sugar) or actually dangerous (urea). Testing can help ensure your milk is pure and healthful.

### Powdered milk

Saying the word “melamine” can strike fear in food producers everywhere – but there are scores of other ways powdered milk can be contaminated. So your solution needs to deal with known and unknown threats.

### Olive oil

Hazelnut oil, sunflower oil, soybean oil, corn oil, rapeseed oil, even olive pomace oil can be added to extra virgin olive oil – and can pass some routine screenings.

### Honey

Is it pure honey, or has it been “sweetened” by adding high-fructose corn syrup or rice syrup? High-sensitivity screening can help you test for purity.

### Spices

When you're paying for pure Italian saffron, you can't settle for inferior product dyed with Sudan Red. Adulterant Screen can help prevent suppliers from using dyes to intensify color.

### Maple syrup

It's a luxury product, and you pay for purity. But maple syrup can be adulterated with other relatively inexpensive sugars to boost sweetness – and profits.

### Nutraceuticals

A product recall can shake the public's confidence in an emerging market, so producers are verifying ingredient purity and integrity through cost-effective, highly reliable FT-IR solutions.

# THE CONFIDENCE THAT COMES FROM SAFETY AND AUTHENTICITY

For food and nutraceuticals producers, nothing is as important as your brand. And to protect it, you need to know that the ingredients in your food products are nutritious, safe, and authentic.

But with the cost of raw ingredients steadily increasing, the temptations of economic adulteration can be strong. Some adulterants – rice syrup in honey, apple juice in pomegranate juice, lower grade olive oils masquerading as extra virgin – simply make for an inferior end product. But others – ethylene glycol in cough syrup, urea in milk powders, even melamine in candies – can be downright dangerous. And these substances and more can find their way into the food products and nutraceuticals your customers rely on every day.

That's what Adulterant Screen™ based solutions are designed to prevent.

With Adulterant Screen software on our FT-IR and NIR systems, everyone in your lab can easily add extra safeguards and perform pass/fail screening for adulterants and authenticity, with no sample preparation and no scientific background required, in a minute or less. Setup is simple, too, with customizable workflows and powerful results visualization features that you can add to your existing materials verification processes. And it works alongside the nutritional parameters you may be already testing for.

Adulterant Screen solutions: Helping you guard against the next major food threat. And the next.

# WHO KNEW SCREENING FOR ECONOMIC ADULTERANTS COULD BE THIS SIMPLE?



Adulterant Screen takes a novel approach to adulterant detection, with sophisticated algorithms that combine chemometric modeling and residuals analysis to detect both targeted and nontargeted economic adulterants. And it does it with high sensitivity – and without costly quantitative calibration development.

What's more, it's an approach that prepares you for tomorrow's threats through simple system updates that sensitize the Adulterant Screen system to suspected adulterants – so you're always prepared for the next big adulteration threat.

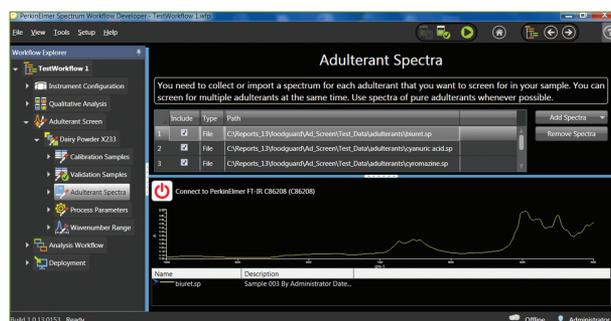
## Targets the knowns, screens for everything else

Most food producers are concerned about particular adulterants in their ID verification testing. In addition to detecting abnormalities in routine identity confirmation, Adulterant Screen software can detect both targeted and nontargeted threats with statistical probabilities and semiquantitative amount estimates.

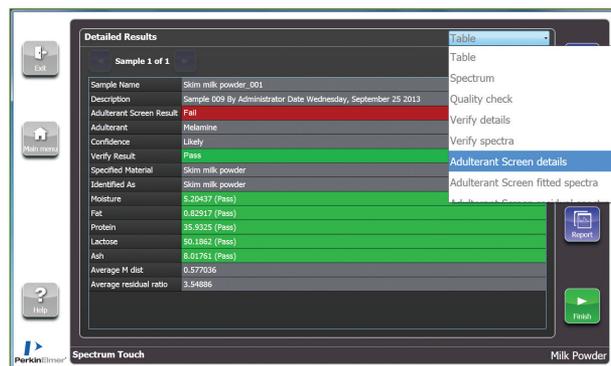
It allows you to identify targeted adulterants with utmost sensitivity. Using a principal components model to handle spectral variability of acceptable samples, Adulterant Screen software gives fewer false negatives – and a high degree of confidence in your results. Plus, proprietary statistical residuals analysis detects relevant abnormal spectral components that could be due to adulterants.

## The simple way to test for all your parameters

With Adulterant Screen, you can detect for known and unknown adulterants right alongside your normal materials verification and quantitative measurements – and that goes a long way toward increasing confidence in your ingredients' purity and authenticity. All you need are spectra of pure materials and any pure threat you want to target – the software builds the model that includes acceptable batch-to-batch variability and is sensitive to the targeted threat.



Create Adulterant Screen methods to run from standard instrument software or include as separate executable routines



Incorporate adulterant screening alongside existing quantitative and ID protocols



## Method development made easy

Methods are easily run on basic instrumentation software, while the Spectrum™ Touch interface can guide everyone in your lab through the procedures. And they can be easily combined with other standard materials identification methods or quantitative analysis to produce comprehensive, consolidated reports on threat levels.

You can also easily define your own workflow with easy-to-follow instructions using our Spectrum Workflow Developer module. The software uses Spectrum Touch to provide a powerful tool for faster, simpler, and more complete workflow development. The result is optimized workflows and shorter timelines for implementation and transfer of IR and NIR methods. When a new threat emerges, you can update your method to be sensitive to it – with no coding required.

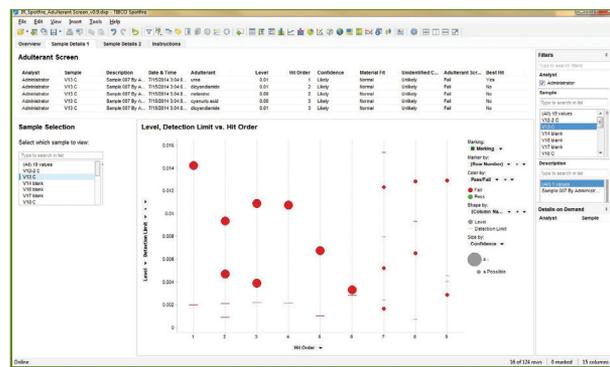


Spectrum Touch software

## Results the way you want to see them

Adulterant Screen lets you see levels of detected adulterants, along with statistical estimates. Semiquantitative concentration estimates are provided without having to do quantitative development – so you can detect levels without complex individual calibrations.

When combined with TIBCO Spotfire® software, you have the tools to visualize batch trends and abnormal batches, and relate your results to other metadata such as supplier information, for much better threat preparedness.



View results trending or drill-down for additional information with TIBCO Spotfire® results dashboards



# IT'S A PLATFORM THAT'S BUILT ON TRUST

To discern the widest range of adulterants, Adulterant Screen software runs on our complete line of highly sensitive, easy-to-operate FT-IR and NIR systems. Screening for known and unknown adulterants can be challenging, because of the need to identify minor spectral dissimilarities in very complex spectra. So for best results, you need a stable spectrometer platform combined with software and methodologies that are optimized with your specific products in mind.

Best-in-class hardware and innovative, intuitive software designed for ingredient screening across the supply-chain-integrity landscape: That's what sets Adulterant Screen on our FT-IR and NIR systems apart from the rest.



Spectrum Two

## Spectrum Two: Infrared that goes wherever the adulterants are

Simple yet powerful, compact and rugged: The Spectrum Two™ system is the spectrometer of choice for everyday screening, inside and outside the lab setting. It breaks new ground in operational simplicity, combining outstanding performance with low-maintenance design, and its spectral quality and analytical performance are perfect for a wide variety of applications – from raw materials identification to analysis of formulated food and nutraceuticals products. And its unique OpticsGuard™ humidity shield protects the instrument from the effects of harsh environments, with long-life desiccant for maximum uptime.

## Tailored for whatever work you do

With exceptional signal-to-noise ratio, advanced electronics, and optimized sensitivity, the Spectrum Two and Frontier systems ensure superior spectra – no matter what the adulterant you're screening for. What's more, these systems deliver a host of other high-performance features and sampling accessories, including:

- Single-reflection ATR accessory designed for mid-IR, enabling highly reproducible analysis of solids, liquids, and pastes – with no sample preparation required. (Also can withstand repetitive cleaning and is scratch-resistant, even with highly abrasive samples.)
- Innovative NIRA2 NIR reflectance accessory (for the Frontier system), delivering ultimate spectral fidelity with sample-spinner options for inhomogeneous or granular materials
- Fixed-mirror-pair interferometer that requires no dynamic alignment, along with a simple, noncritical bearing for unmatched longevity and reliability
- Atmospheric Vapor Compensation™ technology with advanced digital-filtering algorithm to compensate for CO<sub>2</sub> and water absorptions in real time – with no purging
- Absolute Virtual Instrument™ with gas-phase spectra for accurate calibration – data can be transferred precisely between instruments, wherever they're located
- No-compromise optical design for exceptional sensitivity
- Built-in intelligence to control and monitor measurements and alert for potential errors
- Precision-engineered, zero-alignment sampling accessories to reduce measurement inconsistencies



Frontier

## Frontier: Superior detection – today and tomorrow

Our powerful and adaptable Frontier™ system meets all your biggest detection challenges today – and is flexible and expandable enough to meet the next big food fraud threat. With automated range switching, mid-, near-, and far-IR techniques are readily available. And with excellent signal-to-noise ratio and photometric performance, you get optimal spectral performance and sensitivity – a configurable platform that delivers dependable, consistent, trouble-free operation.

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