

# COMPREHENSIVE SOLUTIONS FOR DAIRY ANALYSIS



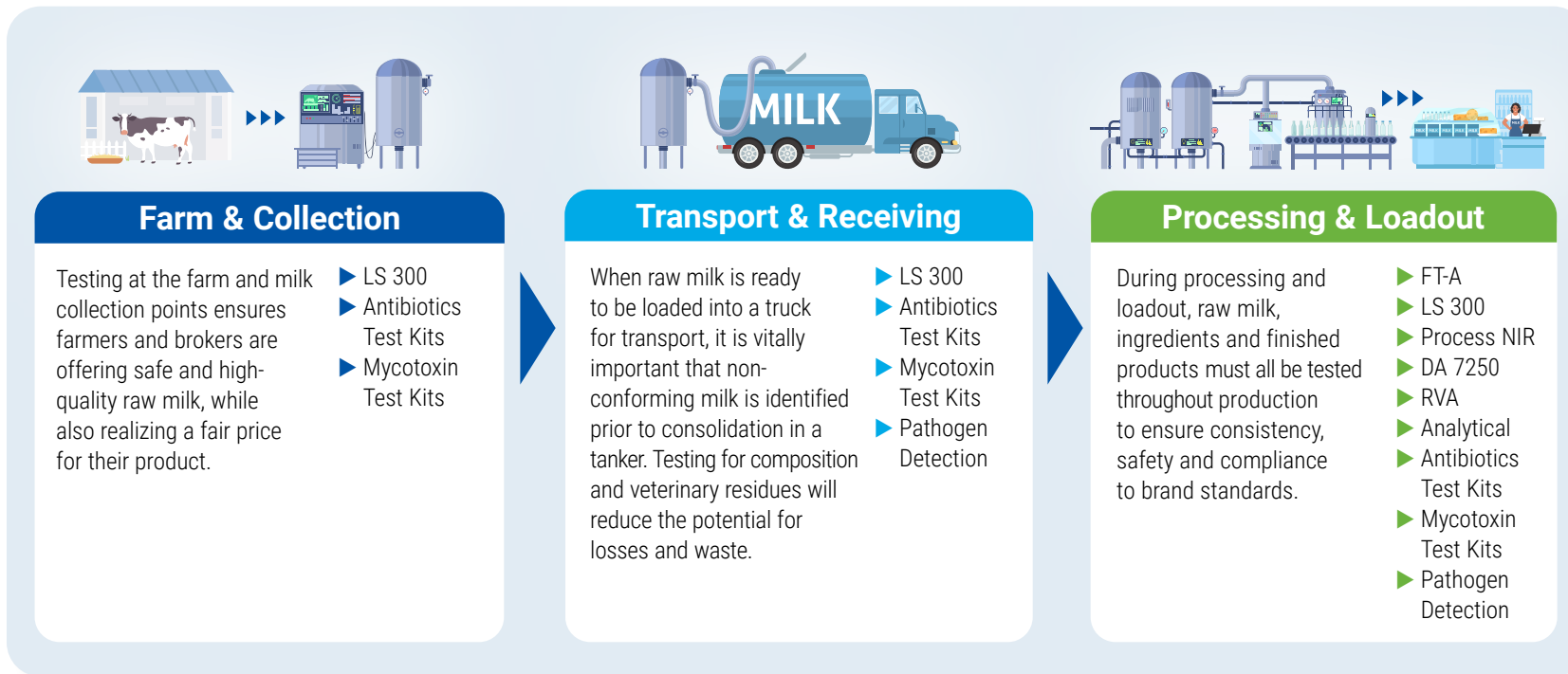
Technology You Can Trust. Expertise You Can Count On.



# Complete Dairy Solutions

Today's dairy farmers, processors, and inspectors work diligently to develop and deliver safe, high-quality, consistent products – but at the same time, ingredient quality and safety, market dynamics, and employee skill levels are in constant flux. That's why it's more important than ever to have reliable, precise, efficient analytical solutions you can depend on throughout the dairy manufacturing process – from collection to transport, from processing to loadout. Solutions that comply with internationally recognized standards like IDF, ISO, ICAR, and AOAC, so you know your products are safe, wholesome, and nutritious.

**PerkinElmer: Your single source for innovative dairy testing solutions, delivering trusted technology, reliable support, and committed expertise.**





**SAFETY**



# Detection of Antibiotics

Whether you work in the lab or in the field, you can empower your team with user-friendly, cost-effective testing technologies to quickly detect even the smallest traces of antibiotics. Ensure the safety of your dairy products with our best-in-class antibiotics testing solutions.

## AuroFlow™ Lateral Flow Kits

Detect a broad range of antibiotics in raw, commingled cow's milk at or below the sensitivities required to adhere to EU and CODEX standards for beta-lactam antibiotics, major tetracyclines and sulfonamides – the most common antibiotics found in cow's milk. They're fast, cost effective, and easy to use in a lab or in the field, and they don't require additional equipment.

## QuickSTAR™ Horizon™ Strip Reader

An innovative, patented, and robust handheld lateral flow testing system that can deliver qualitative and quantitative results. The device's cutting-edge technology enables rapid, reliable results, increasing testing throughput and efficiency. Its user-friendly interface allows seamless navigation through the preprogrammed test types, while its rechargeable battery ensures uninterrupted operation.

## MaxSignal® ELISA Kits

Highly sensitive tools that use specific antibodies to bind and quantify veterinary drugs in dairy samples. These ISO 9001-certified, user-friendly kits are highly accurate, cost-effective, and have a wide dynamic range, and they can be used in labs or on-site for rapid screening.

## Dynex DS2 Automated

This automated ELISA processor allows you to improve your workflow, reduce technician time, and boost your testing capacity. By processing two 96-well plates simultaneously, in just an eight-hour shift you can obtain results for up to 558 samples.



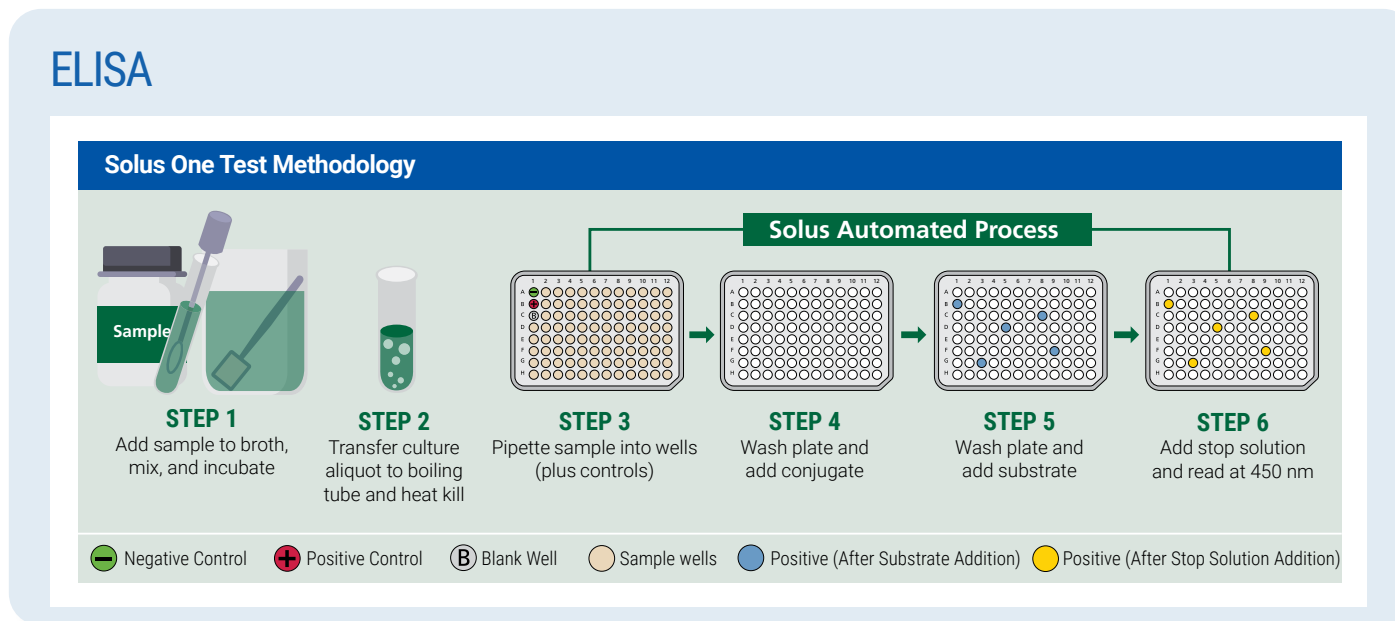


# Detection of Pathogens

To ensure safety, food must be tested for the presence of contaminating pathogens throughout its production and manufacturing journey. That's the idea behind our Solus Pathogen Detection Kits.

Solus and Solus One® kits use proprietary antibodies and are designed, manufactured, and tested to deliver best-in-class performance. Alongside our ELISA kits we also provide tried and tested media solutions to complete all parts of the pathogen detection workflow. Post enrichment, our kits deliver negative or presumptive positive results within two hours. Our DS2 instrumentation enables assay processing to become fully automated – from start to finish – providing a system that allows high throughput for increased efficiency and productivity.

Immunoassay kits are AOAC and ISO 16140 (AFNOR) approved for detection of Salmonella, Listeria species, and E. coli O157 in 96- and 480-well formats. Our Solus One kits deliver next-day detection of Salmonella and Listeria.



# Hygiene Testing

Milk processing operations need to develop robust cleaning programs to prevent contamination of raw materials and finished products. Our portfolio of simple, fast count plates helps you stay confident in your hygiene testing programs.



## MicroFast Microbial Count Plates

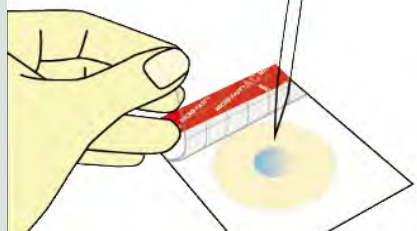
For a quantitative alternative to agar preparation hygiene monitoring, MicroFast™ count plates are a fast, easy, sustainable solution for busy processing operations. They contain a thin film of dry rehydratable culture media, epoxy resin, and a color indicator to enable the visual count and differentiation of bacterial, yeast, and mold colonies.

### BROCHURE

Our count plates are perfect for detection of coliforms, yeast, mold, Staphylococcus, and E. Coli.

#### Reliable Results in Three Steps

##### 1. INOCULATION



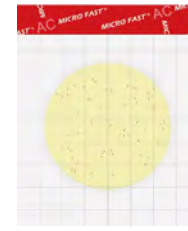
Lift the top film and add sample.

##### 2. INOCULATION



Incubate the plates following the instruction for use.

##### 3. INTERPRETATION



Count the colonies.



QUALITY



# Proximate Analysis

Monitoring the nutritional composition of dairy products and ingredients along the value chain helps ensure fair pricing, safety, and quality of finished products. Fourier-transform infrared (FTIR) spectroscopy is widely used in proximate analysis across the value chain because of its robustness, accuracy, and ease of use in production facilities.



## LactoScope FT-A Analyzer

The LactoScope™ FT-A is our most versatile midinfrared analyzer, capable of testing both animal and plant-based milks, creams, whey, concentrates, ice creams, yogurt mixes, and much more. Innovations such as our homogenizer and Dynascan™ interferometer let you test the most challenging dairy products, with typical accuracy under 0.8% CV for liquid milk and measuring time of 30 seconds.

- ▶ **Integrated Homogenizer and Sample Preheater**  
Standardize the temperature and particle size of fat globules before measurement for optimal performance on a wide range of samples, including viscous creams and yogurts.
- ▶ **Patented Dynascan Interferometer**  
Fixed-mirror-pair design doesn't require dynamic alignment to compensate for errors.
- ▶ **Automatic Clean Cycles and Zeros**  
Maintains the sample pumping unit and the measuring cell in optimal conditions, improving overall reliability and accuracy of the instrument.
- ▶ **NetPlus™ Cloud Solution**  
Enables remote configuration and monitoring and can easily be set up in a master/satellite network.





# Proximate Analysis

The LactoScope™ 300 system incorporates the latest mid-infrared technology for quick measuring time of liquid dairy products. Designed for use in milk intake centers and labs alike, the instrument's modular construction minimizes the vibration of the FTIR bench, and its integrated design provides efficient use of bench space. The LactoScope 300 delivers low cost of ownership, minimum downtime, and worldwide support for all its users.



## LactoScope 300 Analyzer

For fast in-lab testing of raw and processed milk, cream, and whey for fat, protein, lactose, solids, solids-not-fat, and adulterants, the LactoScope 300 FTIR analyzer combines performance, accuracy, ease of use, and speed to keep your lab running smoothly. It delivers results in less than 45 seconds.

### ▶ Detect Adulterants at Early Intake

Screen for targeted and nontargeted adulterants in milk early in the intake stage, preventing contaminated milk from entering the value chain.

### ▶ Measure Dairy Quality

Identify levels of fat, protein, lactose, solids, and solids-not-fat in milk, whey, and cream to optimize finished product quality and margins.

### ▶ Control Your Process

Monitor quality levels during processing to ensure the consistency of end products, eliminating under- and over-processing; improve yields by quickly optimizing settings based on results.

### ▶ Verify Finished-Product Quality

Ensure liquid end products meet specifications.



# At-Line and Process Monitoring

Whether you're looking for at-line or in-process measurements, our systems enable real-time monitoring to maximize margins, while reducing product waste and ensuring standardization. Our diverse library of proven calibrations for raw materials, intermediates, and finished goods enables continuous monitoring of moisture, protein, fat/oil, ash, starch, fiber and sugars, offering the advantage of transferring at-line calibrations to the in-process instruments. Plus, our core diode array technology provides durability, stability, and accurate measurement of moving products and the ability to track process changes.



## DA 7250 At-Line NIR

The DA 7250™ at-line standalone system is ideal for analyzing solid and semisolid dairy products. Its simple operation using open-faced disposable analysis cups lets you efficiently analyze yogurt, cheese, spreads, and sauces in just six seconds. And the sanitary design limits surfaces, crevices, and other places where food material can adhere, for easy cleaning.

## DA 7350 In-Line NIR

The DA 7350™ is an advanced, rugged, versatile in-line NIR instrument that can be mounted on pipes, conveyors, and mixers; at entrances and outputs of product streams; before and after dryers; before packaging; and at other critical points in the process. Results can be integrated into process control systems for automated or manual adjustment of processes.



## DA 7440 On-Line NIR

The DA 7440™ on-line NIR system can be utilized in many situations where dairy products such as cheese or dairy powders are transported on open conveyor belts. And by integrating the instrument into the SCADA system, you can see the results in a familiar operating environment.



# Ingredient Performance Analyzer

Our Rapid Visco™ Analyser (RVA) measures performance by subjecting a sample to a repeatable, reproducible cycle of temperature and mixing, generating a real-time stream of viscosity measurements plotted over time – like a performance fingerprint for that ingredient. Because the RVA allows you to measure how things hydrate, gel, and respond to shear, heat, and cold, it's an ideal tool for dairy powders, stabilizer components and blends, processed and natural cheeses, and yogurt. The RVA requires very little operator input and zero cleanup, and it comes with a huge library of stock methods. It's also programmable, allowing you to get the best possible descriptive power from a custom performance analysis.



## RVA 4800

The RVA can even be used as a miniature pilot plant to mimic real-world manufacturing and preparation processes such as heating, cooling, and mixing.



**ANALYTICAL**



# Monitoring for Trace and Heavy Metals

Trace and heavy metals can be present in both raw milk and finished dairy products. So monitoring is critical to ensuring products contain the vital nutrients customers expect, while excluding potentially dangerous metals – whether introduced in animal feed, in the production process, or at packaging and transport.



## PinAAcle AA

Our PinAAcle™ flame AA spectrometers offer advanced analytical capabilities, with cutting-edge fiber optics to maximize light throughput, plus an eight-lamp mount and automated flame and burner assembly optimization for enhanced productivity.



## Avio 220 Max ICP-OES

The Avio® 220 Max delivers the most efficient operation, reliable data, and the lowest argon consumption of any ICP-OES. It's the fastest ICP startup, delivers superior sensitivity and resolution, and it has the widest linear range with dual viewing.



## NexION 2200 ICP-MS

The NexION® 2200 features proprietary technologies that deliver the highest performance for your biggest challenges. And its precision measurement capability, fast turnarounds, and Extended Dynamic Range technology make it ideal for dairy analysis.



# Chromatography

Chromatography enables identification and quantification of a wide range of constituents and contaminants in dairy samples. It can be used as a standalone analytical technique or as part of a confirmatory analysis for other techniques, such as lateral flow or ELISA. Our complete portfolio of GC, GC/MS, LC, and LC/MS/MS instrumentation balance ease of use with performance to deliver the accuracy you need – without the complication.



## GC 2400 Platform

Our GC 2400™ platform is built for identifying and profiling fatty acids, adulterants, and flavorings in dairy products. Innovative technology enables real-time access to data on the go, with smart connectivity, simplified operations, and sustainability features.

## LC 300 HPLC and UHPLC

Our LC 300™ HPLC and UHPLC systems streamline your processes with easy, trouble-free operation, while delivering fast, reliable results for a wide range of analyses, such as lactose, cholesterol, lactic acid fermentation, and dyes.

## QSight LC/MS/MS

For routine quantitative mycotoxin and pesticide analyses, the QSight® LC/MS/MS system delivers lower cost per analysis, higher throughput, and decreased sample prep time – all in a compact form factor.





# APPLICATIONS





# Real-World Analyses: Milk and Cream

Efficient production of high-quality dairy products requires full control of incoming milk quality. This puts high demands on milk analyzers to meet multiple, often conflicting criteria. So fast, accurate analysis, ease of use, and robustness are key.

## Application Note: Analyzing Raw Milk

Ensuring safety and product composition at collection centers and processing helps ensure the quality and consistent finished products – and equitable payment to farmers for their raw milk. The LactoScope 300 analyzer is ideal for fast, accurate scanning of raw milk, cream, and whey for proximate values and adulterants.



## Application Note: Identifying Quality Parameters

Monitoring proximate values and accurate standardization enables the verification of process control and adherence to legally prescribed standards, while also maximizing margins through the reduction of waste. The LactoScope FT-A can achieve efficient process control on products ranging from raw liquid milk to highly viscous creams.



## Application Note: Analysis of Micronutrients

Micronutrients can be present naturally or added to fortify milk, reflecting market demands or regulatory requirements. For producers, the ability to monitor nutrients quickly and accurately is key to quality control. Our Avio 220 Max ICP-OES analyzes milk samples for micronutrients over a wide range of concentrations.





# Real-World Analyses: Milk and Cream

Efficient production of quality dairy products requires full control of incoming milk quality. This puts high demands on milk analyzers to meet multiple, often conflicting criteria. So fast, accurate analysis, ease of use, and robustness are key.

## Application Note: Analyzing Plant- Based Milks

In plant-based milk production, the same plant grown in different climates or by different cultivars can give noticeable differences in the constituent concentrations. So the efficient production of high-caliber plant-based milk products requires full control over intermediate and final product quality.



## Application Note: Determination of Antibiotics and Veterinary Drugs

Accurate quantitative analysis of antibiotics and veterinary drug residues in milk is a critical component of safety programs. As dairy processors and laboratories need to monitor a wide range of regulated antibiotic classes, having an instrument with the flexibility to analyze both polar and nonpolar compounds is key. Our QSight LC/MS/MS system offers reliable detection of veterinary residues in milk and other liquid dairy products.



## Application Note: High- Throughput Screening for Aflatoxin M1

ELISA assays are widely used for the detection of aflatoxin M1 in milk for regulatory conformance owing to their high sensitivity, selectivity, and ease of use. Here we show the accuracy and precision of the MaxSignal Aflatoxin M1 ELISA kit, with data showing the limits of detection (LOD) and demonstrating the variability between performance of manual ELISA and DS2 automated ELISA assays.



# Real-World Analyses: Cheese

Measuring the compositional and functional characteristics of cheese ensures you achieve optimal margins throughout production, while also creating the consistent, high-quality finished products your customers demand. Our solutions give you fast, efficient proximate measurements, and our rheological instrumentation lets you evaluate ingredient and raw material performance, saving time and money through reduced packaging scrap and rework.

## Application Note: Cheese Melt Method

Processed cheese quality depends on performance of natural cheese, dairy solids, and other functional ingredients. Because of the natural variability in component performance and the high cost of rework, processed cheese manufacturers use our Rapid Visco Analyser (RVA) to ensure optimal performance and reduce rework and waste.



## Application Note: Lactose Analysis in Milk and Cheese

Lactose analysis is especially important to the many individuals suffering from lactose intolerance, typically caused by a shortage of the enzyme lactase in the intestines. Our HPLC systems can quantify lactose down to 0.005% in milk and cheese using an easy sample preparation and refractive index detector.



## Application Note: Compositional Analysis in Cheese

Quick, accurate analysis of moisture, fat, protein, salt, and pH ensures product quality, helps optimize processes, and leads to significant savings. The DA 7250 is ideally suited for analysis of the components in cheese with very high accuracy in only six seconds.



# Real-World Analyses: Butter

As with cheese and other solid and semisolid dairy products, monitoring the production of butter helps dairy processors ensure quality and profitability. Strict requirements for fat content in butter require close monitoring throughout processing to confirm appropriate and profitable levels of fat in finished products.



## Case Study: Optimizing Moisture Content in Butter Production

Solerac, a large Belgian dairy cooperative, purchased two in-line NIR systems to continuously monitor moisture content in their production of butter, meeting EU regulations for maximum moisture content (16%). The company was able to fully amortize their investment in one year through cost savings with the normalization and optimization of moisture levels in their products.



## Application Brief: Analyzing Butter Fat, Moisture, and Salt

Accurately controlling fat, moisture, and salt content in butter and spreads enables you to obtain the best margins possible on your products. With our DA 7250 benchtop NIR instrument, you can achieve multicomponent analyses of butters and spreads in only six seconds, with optional disposable Petri dishes for fast cleanup between samples.



# Real-World Analyses: Dairy Powders



Whether testing ingredient dairy powders for routine proximate values or monitoring baby formula for heavy metals contamination, ensuring the safety and quality of milk powders is essential throughout the value chain.

## Application Brief: Analysis of Dairy Powders

Production plants and ingredient purveyors need to control the components of dairy powders, including moisture, fat, lactose, alkaline, and ash, so they can deliver better formulations and meet functional and compositional requirements. Our DA 7250 benchtop NIR instrument is well suited for analysis of powders, having overcome many sample preparation obstacles.



## Case Study: Optimizing Milk Powder Production

Belgian dairy Solarec leveraged two in-line NIR systems, one placed at their milk powder separator and another after a spray dryer, to continuously monitor proximate values throughout production. The investment allowed the company to increase average moisture content in their whole milk powders by 0.2%, while still maintaining strict quality specifications.



## Application Brief: Elemental Analysis of Milk Powder

The elemental capabilities and dynamic range of ICP-MS make it ideal for food material analysis, including complex dairy powders. Both low-level contaminants and macro-level nutritional elements can be quantified using the NexION series ICP-MS and NIST® 1549 nonfat milk powder samples.



# Real-World Analyses: Yogurts, Ice Creams, and Condensed Milk

The complex nature of yogurts, ice cream bases, and condensed milk demand an analysis regimen that balances flexibility, accuracy, and robustness, testing for parameters such as total solids, moisture, fat, and protein in solid and semisolid dairy products.

## Application Note: Analysis of Yogurt Using the DA 7250

Monitoring fat and dry-matter content is especially important for yogurt manufacturers and can have a significant impact on your customers' taste perceptions. The DA 7250 benchtop NIR instrument offers an efficient and accurate analysis of yogurt, with or without fruit, in under 10 seconds.



## Application Note: Analysis of Sweetened Condensed Milk

Sweetened condensed milk is widely produced as a product itself or as an ingredient in other foods. So ensuring proper and consistent quantities of total solids, fat, and sucrose is key to quality and profitability. The DA 7250 benchtop NIR's innovative technologies, including its ability to analyze total solids in this complex matrix, make it ideal for sweetened condensed milk analysis.



## Application Note: Analysis of Ice Cream Mixes

As with sweetened condensed milk, monitoring butterfat and total solids in ice cream bases can enable consistent quality and safeguard profitability. Older, cumbersome NIR instrumentation had limited use in ice cream production, while our DA 7250 system delivers six-second analysis of ice cream bases without homogenization.





**SUPPORT**



# Support: How and When You Need It

Today's lab managers face a variety of challenges, from tighter schedules to increased workloads and budget control to teams with varying levels of familiarity with lab equipment. We help you overcome the obstacles to your success.

OneSource® Laboratory Services offer scalable, flexible options for labs of all sizes, for PerkinElmer and non-PerkinElmer equipment.

From service contracts and performance maintenance, compliance qualification and validation, training, descriptive analytics, and interactive dashboards to asset management and comprehensive concierge laboratory services – with OneSource, you can explore what suits you best.





# Our Capabilities at a Glance

	Safety									Compositional				Functional	
	Antibiotics <sup>1</sup>	Aflatoxin M1	Pasteurization Verification	Pathogens <sup>2</sup>	Adenosine Triphosphate	Pesticide Residues	Adulterants	Spoilage Organisms <sup>3</sup>	Heavy Metals	Proximates	Sugars	Fatty Acids	Metals/Minerals	Ingredient Performance	Mini-Pilot Plant
AuroFlow Lateral Flow	X	X	X	X		X	X								
MaxSignal ELISA	X	X	X			X	X								
Solus ELISA				X											
Dairy Antibiotics Spore High-Throughput (DASH) Kit	X														
MicroFast Count Plates								X							
Avio Max ICP-OES									X				X		
NexION ICP-MS									X				X		
PinAAcle AA									X				X		
QSIght LC/MS/MS	X	X				X									
GC 2400						X						X			
LC 300 HPLC		X									X				
LactoScope 300							X		X						
LactoScope FT-A									X						
DA 7250									X						
DA 7350									X						
DA 7440									X						
Rapid Visco Analyser														X	X

1 - Antibiotics Including: Beta-lactams, tetracyclines, sulfonamides, Fluoroquinolones, and aminoglycosides.

2 - Pathogens including: Salmonella, Listeria spp, Listeria Monocytogene, E.coli O157, Staphylococcus aureus.

3 - Spoilage Organisms including: Aerobic count plate, coliforms, yeast & mold, Staphylococcus aureus, Bacillus cereus, Enterobacteriaceae.





For more information visit



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35146