

appliedbiosystems



Meeting today's diagnostic needs—  
innovating for tomorrow's challenges

**ThermoFisher**  
SCIENTIFIC

# Passion. Applied.

Focusing on customer needs and animal health

At Thermo Fisher Scientific, our passion drives us to innovate and improve conditions for farm animals and the people who care for them.



## Keeping animals healthy

Timely diagnosis of just one sick animal can save an entire herd and preserve the livelihood of the producer. Our solutions allow customers to better monitor and control economically significant diseases in farm animals. Laboratories also count on our innovative diagnostic solutions to provide veterinarians and producers the critical information they need to help ensure the well-being of their herd, reputation, and profitability.

When animal diseases are detected and controlled at an early stage, the spread of zoonotic diseases to humans may be prevented. Also, as the world population grows, control of zoonotic diseases can help secure the food supply chain to feed a hungry planet, making the world healthier.



## A cleaner environment

A healthy animal tends to require fewer resources than an unhealthy one. Our diagnostic solutions contribute to maintaining animal health, which may lead to improved efficiencies and better use of resources, helping customers make the world cleaner.

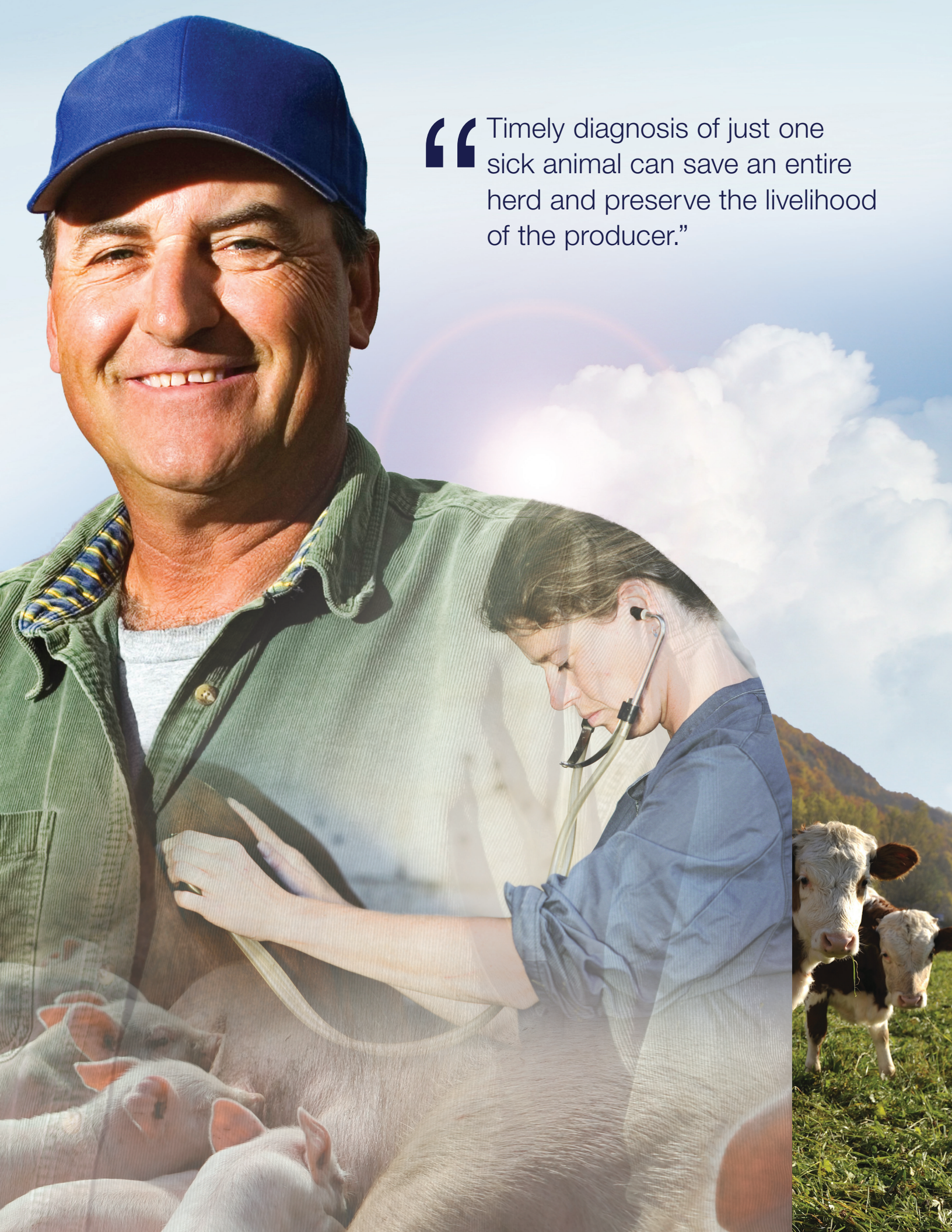


## Safety is paramount

Sick animals need medical treatment, and the first line of treatment can be the use of antibiotics. Proper diagnosis of disease with our solutions helps target the right treatment for animals and may help reduce the development of antibiotic resistance.

In addition, monitoring the health of animals at slaughterhouses assists in food safety. Our preharvest solutions are used by producers to help prevent the spread of zoonotic diseases, which helps ensure the safety of the food source and helps customers make the world safer.





“ Timely diagnosis of just one sick animal can save an entire herd and preserve the livelihood of the producer.”



**Foot-and-mouth disease (FMD)**—with the addition of the PrioCHECK™ FMDV Type Asia1 and FMDV Type A ELISA test kits to the PrioCHECK™ FMDV NS and Type O kits, we offer the most extensive portfolio of proven solutions for FMD virus detection.

**Trichomoniasis (Trich)**—the VetMAX™ -Gold Trich Detection Kit is the first USDA-approved, real-time PCR test to detect *Trichomonas foetus*. Trich is a sexually transmitted disease that causes embryonic loss and infertility, resulting in significant economic loss within the cattle industry due to open (nonpregnant) and late-calving cows.

**Q fever**—we have the most extensive portfolio of diagnostic PrioCHECK™ ELISA and VetMAX™ real-time PCR kits enabling the detection and quantification of *Coxiella burnetii* in sheep, goats, and cattle. These products also help countries manage Q fever and its zoonotic risk.



**Avian influenza (AI)**—the VetMAX™ -Gold AIV Detection Kit is the first USDA-licensed PCR-based kit for the detection of AI virus. It significantly improves outbreak detection, especially in import/export poultry products.

**Swine influenza (SI)**—we offer two USDA-licensed VetMAX™ -Gold real-time PCR kits for SI virus screening and subtyping to global pork producers for the rapid detection of this highly contagious viral infection of pigs.

# Diagnostics. Applied.

Delivering advanced monitoring tools for farm animal health

Better diagnostics support animal health. Our advanced diagnostics solutions emphasize testing for prevalent species diseases such as bovine tuberculosis and preharvest testing at slaughterhouses. In addition, we provide workflow optimization tools from sample to result, including:

- ELISA and real-time PCR diagnostic kits for major diseases in farm animals
- Extraction and nucleic acid purification kits for use with a variety of matrices
- Master mix options that help to optimize testing

These diagnostic solutions have been rigorously developed to perform efficiently and conveniently even in the most challenging situations. Applied Biosystems™ products deliver a high level of value, reliability, and feature-rich solutions.

## Prevalent species disease testing

Whether you test using high-throughput or low-throughput methods, or if throughput suddenly increases during an outbreak, we provide solutions that are rapid, simple to run, and highly reliable.

More than 200 solutions are available to detect the most economically important diseases for cattle, swine, poultry, small ruminants, and aquaculture, including tests for:

- Bovine viral diarrhea virus
- *Mycobacterium avium* subspecies *paratuberculosis* (MAP)
- Bluetongue virus
- Ruminant abortion and respiratory pathogens
- Swine respiratory pathogen infections such as PRRSV, SIV, PCV2, and *M. hyopneumoniae*
- Porcine coronaviruses
- Classical swine fever virus
- African swine fever virus
- Avian influenza virus
- And many more



### Testing in the slaughterhouse

Our comprehensive portfolio of preharvest diagnostic tests offers a wide range of assays for risk-based testing. Blood samples taken at the abattoir are tested for antibodies against zoonotic pathogens such as *Toxoplasma*, *Salmonella*, *Trichinella*, hepatitis E virus, and *Mycobacterium avium* subspecies *avium* or *hominissuis* infections, helping ensure adequate food safety by communicating information back from the individual tested animal to the farm. Our tests are fast, accurate, and easy to use, and we're continually expanding and updating our portfolio based on customer needs and regulatory requirements. These solutions include meat inspection testing to help ensure the safety of the animal food source at harvest.

### Bovine tuberculosis tests

Bovine tuberculosis (bTB) is a major infectious disease that affects the lungs and lymph nodes of ruminants, and can spread from animals to humans in aerosols or through the consumption of unpasteurized dairy products from an infected animal. A world free of bovine tuberculosis may be realized when an appropriate combination of diagnostic tools is used.

We offer solutions that are at the forefront of bovine tuberculosis diagnostics—their performance has been recognized by a variety of authorities worldwide such as the World Organisation of Animal Health (OIE), Friedrich-Loeffler-Institut (FLI), and the US Department of Agriculture (USDA). Our portfolio is the only source for all official OIE-prescribed bTB tests. This comprehensive portfolio of bTB diagnostic solutions includes tuberculin purified protein derivatives for cattle skin tests, as well as interferon- $\gamma$  tests (Applied Biosystems™ BOVIGAM™ assays), which can be used separately or in combination with skin tests to enable objective, highly reliable results. The Applied Biosystems™ BOVIGAM™ TB Kit is the only bovine tuberculosis, interferon- $\gamma$  *in vitro* assay that is OIE-registered and has been validated by the OIE as the primary, stand-alone test for screening and confirmation in bTB-infected areas. The Applied Biosystems™ VetMAX™ M. tuberculosis Complex Real-Time PCR Kit can then be used to confirm suspicious results.



# Diagnostics. Applied.

Optimized workflow from sampling to results

Our comprehensive portfolio of diagnostic solutions provides a wide range of sample collection products, nucleic acid extraction kits, and analysis assays, including ELISA and real-time PCR kits.



## Real-time PCR workflow

### Samples

A wide range of sample types such as blood, serum, milk, tissue, organ, semen, and oral and nasal fluid samples can be used and analyzed with real-time PCR for direct pathogen detection.



## Serology workflow

### Samples

A wide range of sample types such as blood, serum, and milk can be used for the detection of antibodies against a specific pathogen.





### Nucleic acid extraction and purification

The Applied Biosystems™ MagMAX™ CORE Nucleic Acid Purification Kit, combined with Thermo Scientific™ KingFisher™ instruments, assists laboratories in obtaining high-quality nucleic acids with flexible and easy-to-use protocols.



### Amplification and detection of pathogens

Applied Biosystems™ VetMAX™ real-time reagents and kits are designed for fast and reliable amplification, detection, and quantification of RNA and DNA.



### Diagnostic results

Real-time PCR tests help prevent disease, confirm a clinical disease diagnosis, and determine the cause of death in animals. Real-time PCR testing is also a key tool during the early stages of infection when antibodies have not been produced.



### Detection of pathogens using antibodies

Applied Biosystems™ PrioCHECK™ ELISA kits are highly sensitive and specific tests that help identify antibodies against a specific antigen in an animal's blood or milk.



### Diagnostic results

ELISA tests help monitor the health of the herd, manage disease circulation, and help ensure the safety of the animal food source at harvest.



“ Proven veterinary diagnostic solutions validated and approved by reference institutes worldwide.”



# Quality. Applied.

Validated diagnostic solutions that provide reliable, rapid answers when you need them most

In keeping with our commitment to deliver the highest-quality diagnostic solutions, we provide a variety of products that are officially recognized by organizations around the world.

- Licenses
- Validations
- National registrations
- OIE registration

## ISO certification

Our Manufacturing sites are ISO 9001 certified.

## Our USDA-licensed solutions

Where applicable, production in USDA-licensed facilities allows us to ship kits to the US. Our VetMAX real-time PCR detection kits are USDA-approved and can be used to detect *Tritrichomonas foetus* in bulls, persistent infection of bovine viral diarrhea virus in cattle, MAP/Johne's disease in beef and dairy cattle, and influenza in pigs. Our kits are:

- Manufactured by qualified operators in an inspected facility with a controlled environment using qualified raw materials and validated processes
- Validated in the laboratory and in the field, and found to be suitable for their intended purpose
- Reviewed by the Center for Veterinary Biologics prior to serial release and for approval of material or process changes
- Subjected to postmarket surveillance

## Other national licensure processes

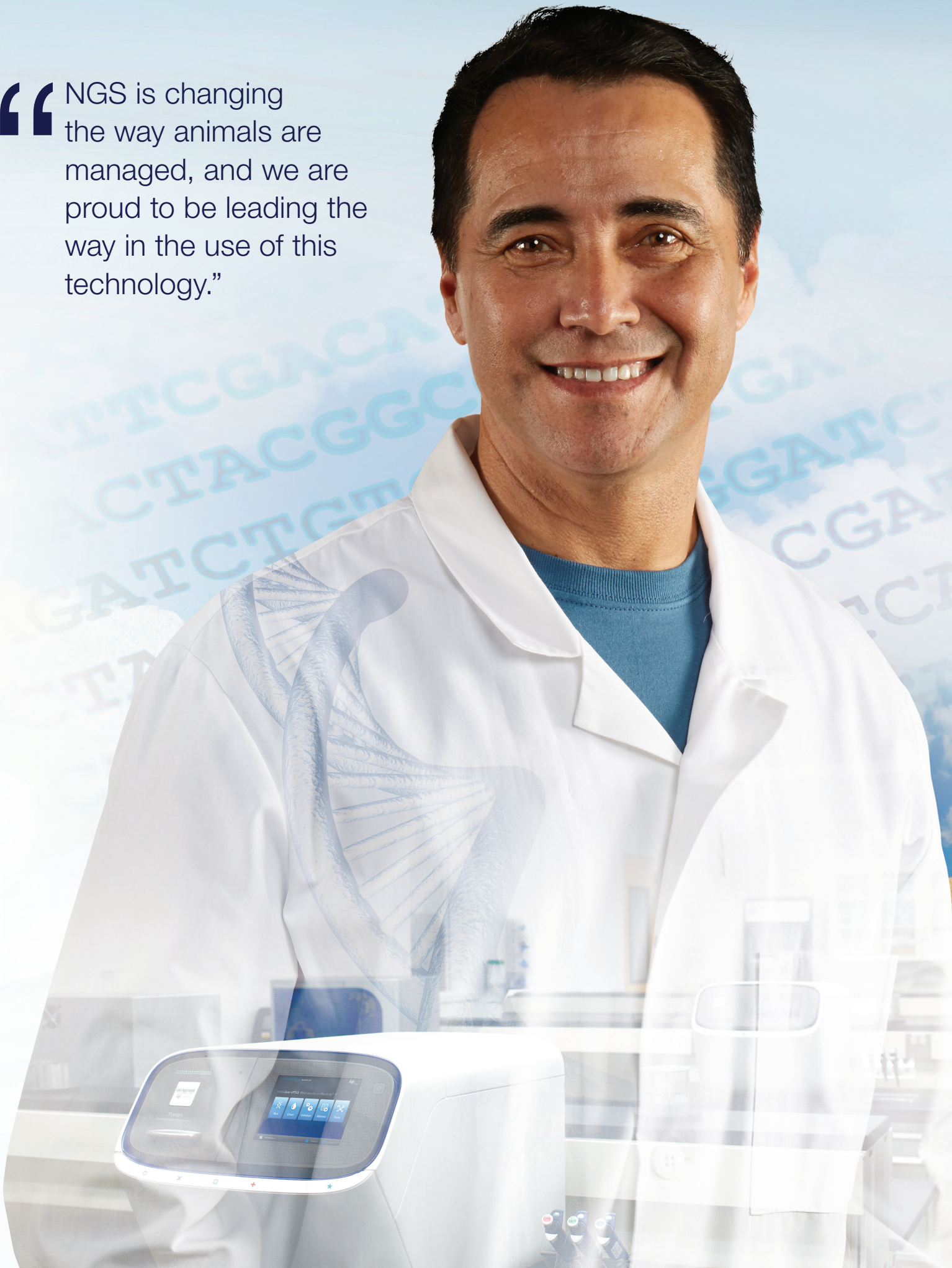
The majority of our veterinary *in vitro* diagnostics have been approved through different governmental licensure agencies such as the Friedrich-Loeffler-Institut (FLI) for Germany, ANSES for France, Sciensano for Belgium, and the Department of Agriculture Fisheries and Food (DAFF) for Ireland.

## OIE approval

The World Organisation for Animal Health is an intergovernmental agency that conducts a wide range of missions to improve animal health and welfare worldwide. Products that successfully pass the organization's stringent evaluation process receive an OIE registration. Our OIE-validated BOVIGAM TB Kit is the only bovine tuberculosis, interferon- $\gamma$  *in vitro* assay approved by the OIE for cattle, sheep, goats, and buffaloes. Our Prionics-Check WESTERN Kit for BSE detection in cattle is the gold standard of rapid BSE testing and is used as a confirmatory test by most National Reference Laboratories across Europe.



“ NGS is changing the way animals are managed, and we are proud to be leading the way in the use of this technology.”



# Innovation. Applied.

Diagnostic solutions to meet the challenges of today and tomorrow

Laboratory professionals, veterinarians, and livestock producers need fast, precise answers as a base to act upon. We work to remain at the forefront of innovation so we can help provide those answers. While we will continue to offer superior nucleic acid purification kits, ELISA testing, and PCR assays for disease diagnostics and monitoring, we are also leading the way with next-generation sequencing (NGS) and genotyping by sequencing (GBS) solutions for the livestock and animal health markets.

Health can be improved by early detection and also with the help of DNA selection/breeding improvements. Our genotyping solutions support genetic improvement in livestock for breeding purposes. This works for any animal species, as well as to preserve endangered species.

We are successfully using the power of whole-genome sequencing on the Ion Torrent™ platform to identify and characterize newly emerging pathogenic organisms. At the same time, we are employing this information to develop new and improved real-time PCR assays for more sensitive and quicker detection.

Additionally, we are leveraging NGS technology to offer a more economical and flexible alternative to traditional DNA microarrays for genotyping animals for improved breeding programs. NGS for GBS applications is becoming an increasingly important, cost-effective, and unique tool for association studies and genomics-assisted breeding in a range of animal species, including those with complex genomes that lack a reference sequence.



# Commitment. Applied.

Developing and supporting diagnostic solutions that make a meaningful difference in our customers' lives

Diagnostic laboratory professionals, veterinarians, and livestock producers all over the world partner with us to access our unrivaled experience and comprehensive portfolio of innovative diagnostic tools and services. We help address the most economically important farm animal diseases of today while driving innovations to meet the animal health challenges of tomorrow. This includes a superior combination of real-time PCR and ELISA diagnostic kits, universal sample prep solutions, and master mixes that are supported by a global network of dedicated manufacturing and customer service specialists.

## **Support**

Our global presence includes locations in Austin, Texas, US; Lyon, France; Schlieren, Switzerland; Lelystad, the Netherlands; and Vilnius, Lithuania. In addition, we operate a global network of manufacturing sites and strategic distribution points for greater efficiency.

Highly trained technical support and service professionals are available to assist customers from locations in North America, Latin America, Europe, the Middle East, Africa, and Asia. These global resources are leveraged to facilitate collaborations that support the animal health industry. Our solutions for farm animals are available in more than 100 countries worldwide.

## **A dedicated focus on the customer**

We collaborate with our customers to develop solutions for real-world animal diagnostic applications, accelerating animal health monitoring and surveillance to help ensure the wellness of farm animals. Our tools help increase productivity and accuracy, enabling laboratories to deliver results with a short turnaround time and, ultimately, improving animal diagnostics to help producers maintain their livelihoods and run their businesses efficiently and profitably.

Our customers find that our diagnostic solutions can help make a meaningful difference in their professional lives and for the farm animals in their care. Veterinary professionals know they can draw on our experience of participating in global innovation projects, scientific conferences, and legislative meetings. They can choose from our portfolio of robust and reliable diagnostic solutions in order to confidently overcome the wide-ranging challenges they face today, and they can count on the innovations we'll develop for the challenges of tomorrow.





“ We collaborate with our customers to develop solutions for real-world animal diagnostic applications.”

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For more information about our solutions,  
go to [thermofisher.com/animalhealth](https://thermofisher.com/animalhealth)

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