From Farm to Fork – from Sample to Result

innuDETECT Food Analysis Solutions

analytikjena
An Endress+Hauser Company

Food Analysis Solutions

In order to reach sufficient results, including highest standards, as well as reproducibility and precision, molecular biology brought to the lab by workflow solutions and aligned chemistry offer an alternative to traditional protocols in food authenticity testing and microbiology.

Sample preparation

- Powerful thermal shaking and homogenization
- Manual or automated extraction options
- Extreme efficient lysis buffer and improved binding of the nucleic acids to isolation basis
- Elution of high quality nucleic acids with flexible volumes

PCR setup

- Lyophilized master mixes enable an easy PCR setup, minimize errors and improve efficiency
- Pipetting robots for high or low throughput

Convincing real-time PCR

- Ideal amplification on the high-performance real-time PCR thermal cycler qTOWER^3
- Perfect aligned chemistry of the innuDETECT assays
- Wide product range for animal species identification of e.g. goat, beef, pork and turkey or to control microbiological risks of *Salmonella*, *Listeria* or *E.coli*.

innuDETECT Food Analysis Solutions

From Farm to Fork – from Sample to Result

Analytik Jena's solutions minimize the time required to obtain results, reduce costs and improve risk management for our customers.

Electrophoresis and BioImaging

Real-Time PCR and Target-Specific Assays

PCR Devices, Reagents and Consumables

Liquid Handling and Automation

UV/Vis Spectrophotometry

Manual or Automated Nucleic Acid Isolation

DC-Technology® for Efficient Nucleic Acid Isolation

Regardless of the final application within food analysis and testing there is one common challenging requirement: sample preparation. With the creation of the patented Dual-Chemistry-(DC-) Technology®, Analytik Jena provides an innovative platform technology that proves itself through superior chemistry.

The heart of DC-Technology® is the discovery that efficient binding of DNA to a mineral solid phase can also occur without a high salt concentration. Instead, a combination of chaotropic and non-chaotropic salts is used, enabling the development of optimized lysis and binding buffers.

Nothing changes for users with regard to hardware and work organization; the routines stay the same. However, in many cases, an improvement in quality and quantity is noticed – and this applies especially with complex starting materials, such as present in food analysis.

Choose from manual or automated extraction options - all Analytik Jena isolation procedures combine a very fast lysis step with a high efficient binding of the nucleic acids to mini and MIDI spin filters or to magnetic particles applying the InnuPure® C16 *touch*. Alternatively, use Analytik Jena's 3rd generation technology called SmartExtraction to benefit from easy processing as well as outstanding results in terms of yield, DNA quality, and efficiency.

Kits for Manual Nucleic Acid Isolation

Spin Filter Based Separation

The isolation procedure consists of lysis of starting material, binding the DNA on the surface of a spin filter column, washing of the bound nucleic acids and final elution. All steps are performed by means of a table top centrifuge.

- innuPREP Kits - for fast and efficient isolation of DNA from diverse kinds of starting materials, such as meat products
- blackPREP Kits - specialized kits for isolation of more complex starting materials such as chocolate or to purify pathogens following stomacher enrichment in order to achieve a maximum yield and high quality of DNA
- PME Kits - Polymer Mediated Enrichment is applied to purify nucleic acids from samples with very low DNA content that is highly degraded

Kits for Automated Nucleic Acid Isolation

Magnetic Particle Based Separation

Developed for the InnuPure® C16 *touch* systems, a variety of innuPREP-IPC16 extraction kits are available. Based on the proven separation of nucleic acids bound to magnetic particles, excellent results with high purity and yields from diverse food samples are guaranteed, ranging from meat to dairy products, ready-made meals to nuts, chocolate to salami, yogurts to gummy bears. The kits ensure the final eluate to be free of proteins, nucleases and carryover of food components that inhibit subsequent downstream analysis in food science.

Optimized protocols are provided for different food product categories, providing quick processing speeds and minimal hands-on time.

- Optimized to magnetic particle based isolation of nucleic acids
- Including all needed reagents and plastic ware for direct extraction
- Minimal hands-on time required

SmartExtraction

We Change the Way to Prep

SmartExtraction combines the best of two worlds: The DC-Technology® and an intelligent pipette tip. Based on adsorption of nucleic acids to modified surfaces within the tip (Smart Surface), the technology yields much greater quantities of extracted nucleic acids compared to magnetic particle technology – all while greatly reducing the amount of prep time needed.

SmartExtraction not only makes the entire workflow considerably faster and much easier – it is also in line with keeping the trend toward automating processes to the fullest possible extent. Although the procedure consists of nothing more than pipetting up and down, DNA quality and efficency is superior. Given appropriate starting materials, its tremendous binding capacity makes the technology suitable for extracting large amounts of DNA.

- Simple procedure, extremely easy to automate
- Universally applicable in all varieties of liquid-handling systems using a 1 ml-pipetting head
- Superb yields in terms of both quality and quantity
- Quick routines specially designed for high-throughput applications

Selection Chart for Extraction

For DNA extraction, we offer a number of different kits for different matrices. Choose the optimal manual or automated extraction method for your sample matrix.

Sample type	innuPREP DNA Mini Kit	blackPREP Food DNA I Kit innuPREP Bacteria DNA Kit	blackPREP Food DNA II Kit	PME Gelatin DNA Kit	innuPREP DNA Kit – IPC16	innuPREP Food DNA Kit – IPC16	innuPREP Bacteria DNA Kit – IPC16	smart DNA prep (a)	smart Bacteria DNA prep (a)
	Manual extraction				Automated extraction				
Animal species identification									
Bread mix			✔			✔			
Cheese			✔			✔			
Chips			✔			✔			
Chocolate			✔			✔			
Crispbread			✔			✔			
Corn Flaces			✔			✔			
Dairy products (Liquid)			✔			✔			
Fruit gums				✔					
Gelatin				✔					
Herbals			✔			✔			
Instant soups			✔			✔			
Jams				✔		✔			
Ketchup			✔			✔			
Marshmallow				✔					
Mashed potatoes			✔						
Mayonaise			✔						
Minced meat, mixed	✔	✔			✔			✔	
Processed meat	✔	✔			✔			✔	
Unprocessed meat	✔	✔			✔			✔	
Wheat grits			✔			✔			
Food-borne pathogen detection									
Bacterial cell pellets		✔					✔		✔
Processed food samples			✔					✔	

PME Gelatin DNA Kit

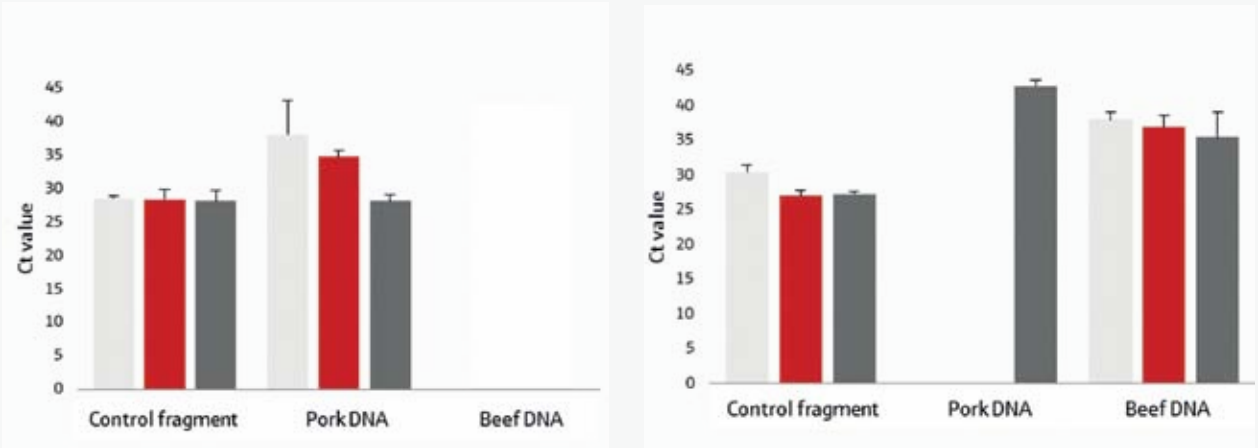
- Highly efficient enrichment and extraction of DNA from gelatin and gelatin containing foods
- Novel, patented technology: Polymer Mediated Enrichment (PME)
- Extremely easy-to-handle
- Superior results compared to conventional extraction

Product specifications

Starting materials	▪ Gelatin powder or plate up to 0.5 g ▪ Gelatin containing food up to 1 g	Storage/ Stability	12 months at room temperature
Extraction time	Approximately 2 hours including dissolving and lysis steps		

Efficient DNA extraction from a complex starting material

Extraction of DNA from gelatin and gelatin containing products is extraordinary challenging due to the complex nature of the starting material and presence of very low or fragmented DNA content. The PME Gelatin DNA Kit was especially developed to meet these demands. Within the application example below gelatin powder (left) and halal certified gummy bears (right) were investigated using three different extraction methods: magnetic particles, spin filter and PME. Following extraction with the PME Gelatin DNA Kit, highest yields of enriched DNA were achieved in terms of reduction in Ct value following identification of both pork and beef species using real-time PCR.



DNA of gelatin powder (left) and halal certified gummy bears (right) were extracted using magnetic particels (light grey), spin filter (red) and PME (dark grey) and checked for a control fragment, Pork DNA and Beef DNA via real-time PCR expressed in Ct values.


InnuPure C16 touch

Animal Species Identification

Assurance of optimal food quality and meeting international standards are important challenges in the foodstuff industry. This includes identification of non-declared constituents from animal origin as well as compliances with religious laws.

Background

The adulteration/substitution of food has always been a concern for various reasons such as public health, religious factors, wholesomeness, and unhealthy competition in the food market. Consumer should be protected from these practices by detection of food adulterations and accurate animal species identification using modern, quick and specific analysis. One of the most convenient method for the identification of animal species in processed food products is species definition by their genetic information, manifested as DNA. This includes determination of origin of gelatin in gummy bears, types of meat in minced meat, or even the identification of pork traces in rice. For identification of closely related animal species, real-time PCR has been proven as reliable, precise and fast approach, having the potential to create quantitative results.

innuDETECT product line

The novel TaqMan®-based innuDETECT Species ID Assays enable a highly sensitive analysis for most domestic animal species, including specific applications such as mammals and birds i.e., for analysis of vegan food or halal testing.
A universal kit setup and uniform PCR protocols of all innuDETECT Species ID Assays allow parallel analysis of multiple targets using the FAM channel of real-time PCR platforms. Lyophilized master mixes make the daily use easy and secure. Real-time PCR results are highly reproducible and ideal with regard to efficiency and slope. Furthermore, the included artificial internal control (IC) can be used as extraction as well as amplification control, and will be detected within the HEX channel.

The assays provide an absolute limit of detection of 1 pg DNA per PCR reaction, or relatively expressed by 0.005 % of DNA in other animal species (total DNA ratio). The realigned portfolio for identification of beef, pork, goat, turkey, sheep, camel and many other targets is completed by the innuDETECT Halal Multiplex Assay. The screening system enables the highly specific multiplex analysis of donkey/horse DNA (FAM channel) and pork DNA (HEX channel) in samples of diverse starting materials. Also available is the innuDETECT Halal Assay providing detection of pork, horse and donkey DNA in three separate reactions in order to reach maximum sensitivity.

innuDETECT Species ID Assays

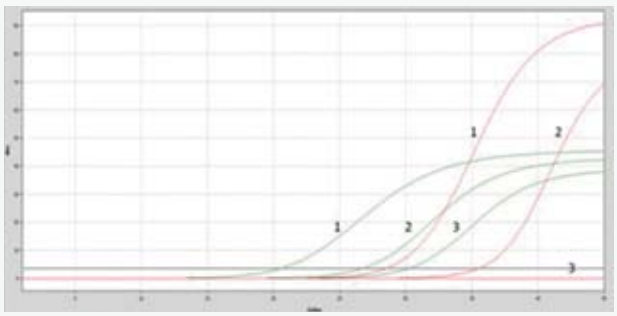
- Test systems for e.g. pork, beef, horse, goat, sheep, turkey, chicken, donkey, mammal & bird, and fish DNA
- Verified for applications following manual or automated nucleic acid extraction from diverse food matrices
- Identification with extra high sensitivity
- Lyophilized master mixes for easy PCR setup, to minimize errors, for improved efficiency, and to save time
- Fast analysis due to optimized PCR chemistry: assay times of only 1 h

Product specifications

Target	Mitochondrial species gene	Detection time	1 h on all major real-time PCR instruments
Detection principle	▪ Real-time PCR (TaqMan®) ▪ Target DNA (FAM); Internal Control (HEX)	Sensitivity	▪ Absolute detection limit: DNA amount of 1 pg/PCR reaction ▪ Relative limit: Detection 0.005 % total DNA ratio
Selected starting materials	Total DNA isolated from ▪ Dairy products ▪ Gummy bears ▪ Ready-made meals	Storage/Stability	12 months at -22 to -18 °C

It's about the choice of PCR targets

It is well known that sensitivity of PCR assays can be improved when the primer target is a multicopy gene, such as a mitochondrial gene rather than genomic targets. The example below shows 100-fold increased sensitivity of amplification of beef DNA using the innuDETECT Beef Assay in comparison to conventionally used genomic target. The result shows a confirmatory technique with high sensitivity and specificity even for the detection of very low copy samples when addressing a mitochondrial gene rather than a genomic one.

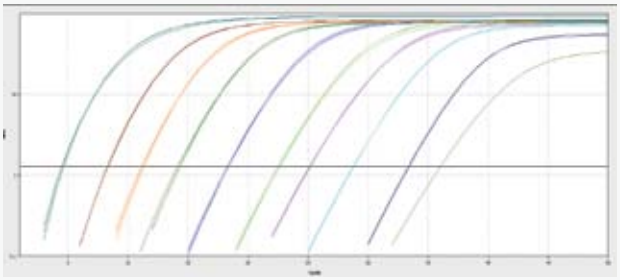


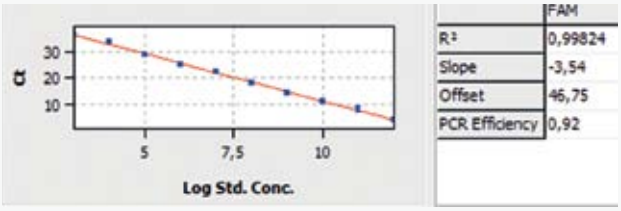
No.	DNA [pg/µl]	Ct GFAP	Ct Cyt B
1	6000	28,6	20,6
2	60	35,5	26,8
3	6	-	30,3

Left: Plot of amplification of beef DNA using a genomic target (GFAP; red) in comparison to the innuDETECT Beef Assay (Cyt B; green).
Right: Concentrations of target applied and detected Ct values.

Wide linear range

Reliable and reproducible results in real-time PCR are prerequisite for trustworthy analysis in food sciences. Typically, assays should have a linear dynamic range from ten up to 10^9 copies. The example below shows successful amplification of artificial DNA over 10 orders of magnitude using the innuDETECT Pork Assay on qTOWER³.



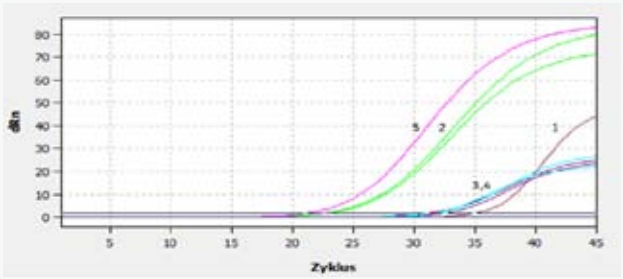


Left: Detection of dilution series of target DNA (starting concentration 10^9 copies/µl) using the FAM channel.
Right: Standard line and parameters given by qPCRsoft.

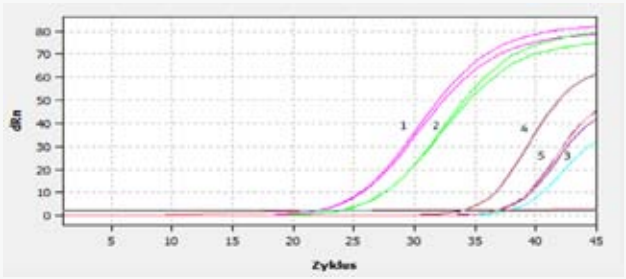
Traceability of food

The innuDETECT Cheese Assay allows parallel analysis of cow, goat and sheep DNA in three separate reactions. DNA of different cheese kinds were extracted using the innuPREP Food DNA Kit-IPC16.

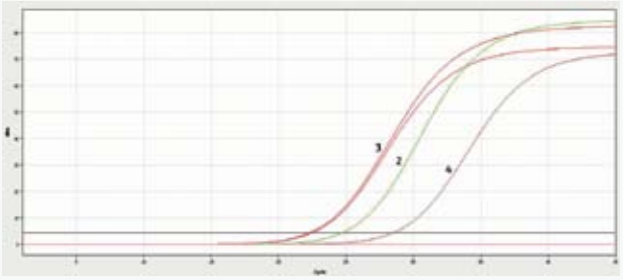
Real-time PCR results presented below identify the actual species of five different cheeses that were investigated with respect to the milk source and were compared against what was declared on the original packaging.



Amplification plot for cow DNA



Amplification plot for goat DNA



Amplification plot for sheep DNA

		Detected origin		
No.	**Declared milk**	**Goat**	**Sheep**	**Cow**
1	Goat	x		x
2	Goat, sheep, cow	x	x	x
3	Sheep	x	x	x
4	Buffalo	x	x	x
5	Cow	x		x

Real-time PCR results presented as amplification plots (FAM channel) of five different cheese kinds that were investigated with respect to the origin of milk from cow, goat and sheep. The summary in the table shows four out of five cheeses tracing back other origins of milk than declared on the package.

innuDETECT Halal & Halal Multi Assay

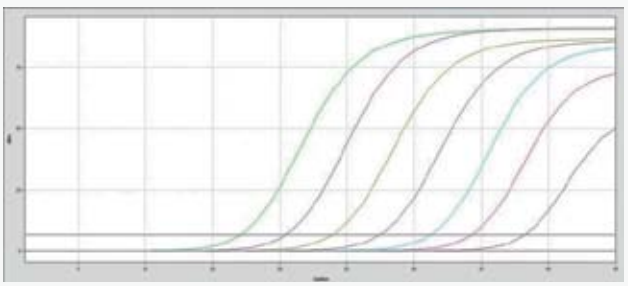
- innuDETECT Halal Multiplex Assay: multiplex assay for differentiation of pork and horse/donkey DNA in one reaction
- innuDETECT Halal Assay: 3 tube duplex assay for highly-sensitive identification of pork, horse and donkey DNA in separate reactions
- Verified for applications following manual or automated nucleic acid extraction
- Lyophilized master mixes: for convenient shippment at room temperature

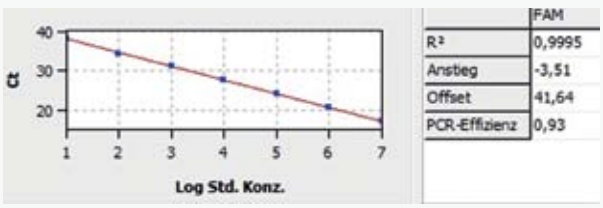
Product specifications

Target	Mitochondrial species gene	Detection time	1 h on all major real-time PCR instruments
Detection principle	▪ Real-time PCR (TaqMan®) ▪ innuDETECT Halal Assay: Target (FAM); Internal Control (HEX) ▪ innuDETECT Halal Multiplex Assay: Horse/ Donkey (FAM); Pork (HEX); Internal Control (Cy5)	Sensitivity	▪ innuDETECT Halal Assay: 1 pg DNA/PCR reaction ▪ innuDETECT Halal Multiplex Assay: 10 pg DNA/ PCR reaction
Selected starting materials	Total DNA isolated from ▪ Meat and sausage products ▪ Fruit gums (e.g. gummy bears and marshmallows) ▪ Fruit snacks ▪ Yogurts and dips	Storage/ Stability	12 months at -18 to -22 °C

From sample to result - workflow solution

Analytik Jena's solution of automated nucleic acid extraction on InnuPure C16® *touch* including the universal applicable innuPREP Food DNA Kit-IPC16 allows outstanding sample preparation on the basis of pre-filled, sealed reagent plastics. The data below shows, also processed food, such as horse salami, is no challenge for the device. High quality DNA was amplified over 7 orders of magnitude applying the innuDETECT Halal Assay (Primer/Probe Mix Horse) on the qTOWER³.



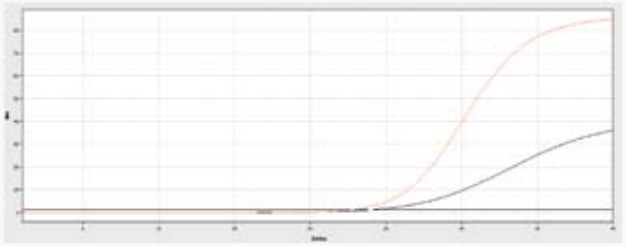


	FAM
R²	0,9995
Anstieg	-3,51
Offset	41,64
PCR-Effizienz	0,93

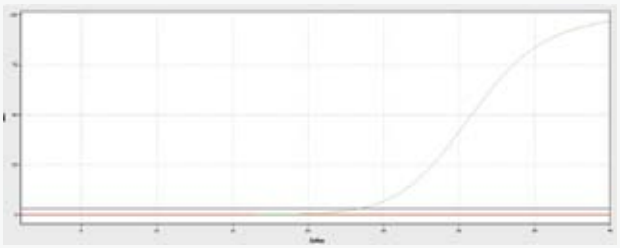
Left: Amplification plot of detected horse DNA (13 ng/PCR reaction to 13 fg/PCR reaction) using the FAM channel.
Right: Standard line and qPCR quality parameters given by qPCRsoft.

One reaction – multiple answers

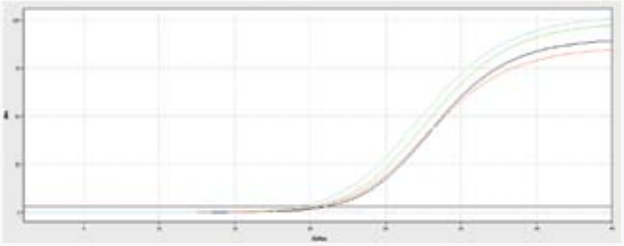
Multiplexing enables to consistently test for more and detect more. The qualitative multiplex assay reliable differentiated - both in terms of true positives and true negatives - closly related species independent of the sample type. Application of the innuDETECT Halal Multiplex Assay with DNA extracted from horse salami (innuPREP Food DNA Kit – IPC16), DNA obtained from a donkey swab (innuPREP DNA Mini Kit) and commercially available pork DNA (Novagen, USA). DNA extracted from chicken meat (innuPREP DNA Mini Kit) served as negative control (blue).



Amplification plot of horse/donkey DNA (FAM channel)



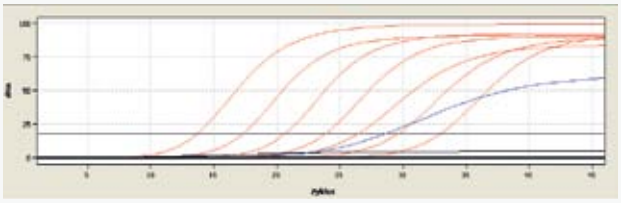
Amplification plot of pork DNA (HEX channel)



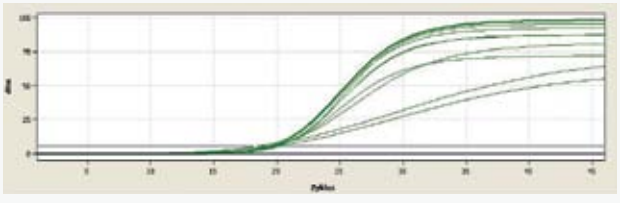
Amplification plot of internal control DNA (Cy5 channel)

innuDETECT Quantification Tool

The innuDETECT Animal Quantification Tool is an additional tool enabling semi-quantification of target DNA while using all assays of "innuDETECT Animal Species ID Assay" product line, including the innuDETECT Halal & Halal Multiplex Assay. The tool can be used as positive control for all assays as well as for determination of target DNA amounts in samples. The innuDETECT Animal Quantification Tool was used to the determine the amount of pork DNA in an unknown sample. The standard curve achieved on the basis of given target amounts enables to quantify unknown samples.



Detection of standards (red) in comparison to the unknown sample (blue) using the FAM channel



Amplification of internal control (HEX channel). Signal may decline in presence of high standard/target concentrations.

Sample	Ct	Copies/reaction
STD-1	13,7	10^7
STD-2	17,3	10^6
STD-3	20,6	10^5
STD-4	23,9	10^4
STD-5	26,5	10^3
STD-6	29,7	10^2
STD-7	33,1	10
Sample	28,7	229

Food-Borne Pathogen Detection

Food-borne diseases encompass a wide spectrum of illnesses and are a growing public health problem worldwide. They are the result of ingestion of foodstuffs contaminated with microorganisms. That may occur at any stage in the process, from food production to consumption.

Background

The most common clinical presentation of foodborne disease takes the form of gastrointestinal symptoms. However, such diseases can also cause other symptoms, such as multiorgan failure or even cancer, as a result of the consumption of contaminated foodstuffs. Thus, foodstuff contamination represents a considerable burden of disability as well as mortality.

Access to sufficient amounts of safe and nutritious food is the key to sustaining life and promoting good health. Diarrheal diseases are the most common illnesses resulting from the consumption of contaminated food, causing 550 million people to fall ill and 230 000 deaths every year. Food safety, nutrition and food security are inextricably linked. Unsafe food creates a vicious cycle of disease and malnutrition, particularly affecting infants, young children, the elderly and the sick.

Nowadays, food supply chains cross multiple national borders. Good collaboration between governments, producers and consumers helps to ensure food safety. In this context, all along the food chain microbiological risks must be controlled by applying sufficient analytical technologies. From “farm to fork”, food safety is a key issue today.

innuDETECT product line

Are you looking for fast and highly sensitive tools for identifying and quantifying microorganisms? Thanks to the development in molecular biology techniques Analytik Jena’s solution minimize the time-to-result, reduce hands-on-time and decrease the costs in order to meet today’s high levels of quality in daily lab routines. Benefit from the novel TaqMan®-based innuDETECT Pathogen Assays enabling a highly sensitive analysis for most commonly occurring pathogens in food inspection settings.

DNA extraction using our novel SmartExtraction technology and subsequent application of Analytik Jena's innuDETECT Pathogen Assays, based on lyophilized master mixes, make the daily use easy and secure. Real-time results are highly reproducible and ideal with regards to efficiency and slope. Furthermore, the included artificial internal control can be used as extraction as well as amplification control and will be detected within HEX channel.

innuDETECT Pathogen Assays

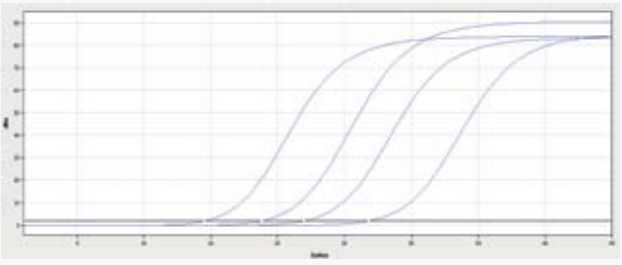
- Test systems for highly sensitive, real-time detection of bacterial food-borne pathogens
- Verified for application following manual or automated nucleic acid extraction after standard cultivation
- Internal control included
- Utilizes an optimized real-time chemistry enabling fast analysis in 1 h

Product specifications

Target	Genus specific DNA sequence	Detection time	1 h
Detection principle	▪ Real-time PCR (TaqMan®) ▪ Target DNA (FAM); Internal Control (HEX)	Sensitivity	5 DNA copies/PCR
Starting materials	DNA from pathogens after standard culturing	Storage/ Stability	12 months at -22 to -18 °C

A smart solution for foodborne pathogens

Faster extraction of food-borne pathogens? SmartExtraction is Analytik Jena's novel solution of automated nucleic acid extraction of *Listeria*, *Salmonella* and *E.coli* or *Campylobacter* on InnuPure C16® *touch*. Data below shows successful DNA extraction applying the Smart Bacteria DNA prep (a) and subsequent amplification of *Salmonella spp.* (DSM 17058) with innuDETECT Salmonella spp. Assay. Following overnight standard enrichment a serial 1:10 dilution of the culture was established and analyzed. Results are available within 4 hours.

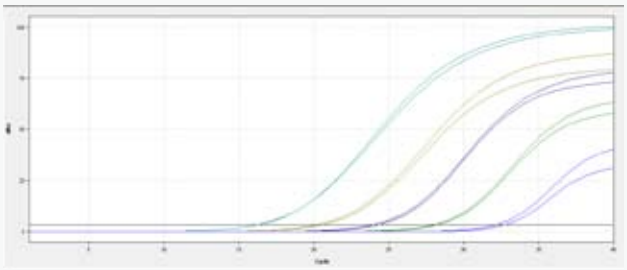


No.	cfu/ml	Ct value
1	$8{,}3 \cdot 10^8$	14,08
2	$8{,}3 \cdot 10^7$	19,03
3	$8{,}3 \cdot 10^6$	22,22
4	$8{,}3 \cdot 10^5$	27,27

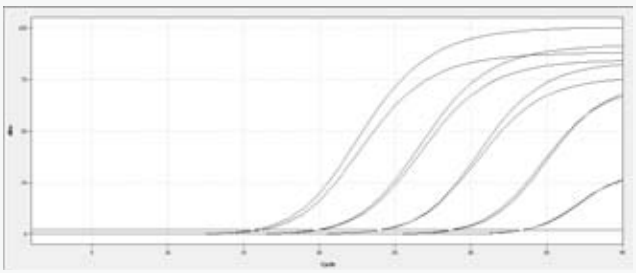
Left: Amplification plot of *Salmonella* DNA on qTOWER³ following SmartExtraction on InnuPure® C16 *touch*.
Right: Concentrations of pathogen after standard culturing (1 ml used for extraction) and detected Ct values.

Performance of the innuDETECT Pathogen Assays

Following overnight standard enrichment of *Listeria monocytogenes* (DSMZ 20600) and *E.coli* (DSMZ 8579) 1 ml of each culture (10^8 cfu/ml) was extracted applying the innuPREP Bacteria DNA Kit. Subsequent 1:10 dilution series were prepared and analyzed using the innuDETECT Listeria spp. Assay as well as the innuDETECT E.coli O157 Assay.



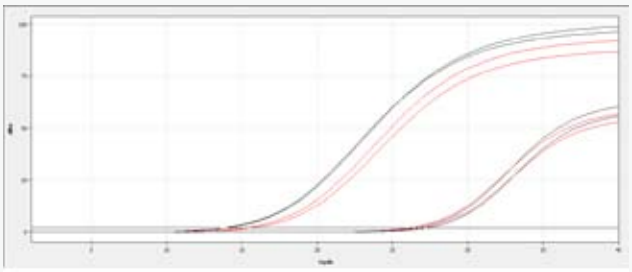
Amplification plot of a DNA dilution series prepared from *Listeria monocytogenes* (10^8 to 10^4 cfu/ml) following manual extraction and real-time PCR analysis using qTOWER³.



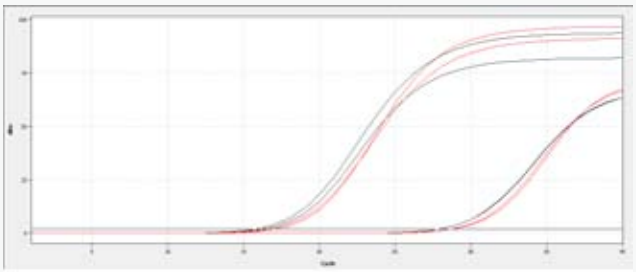
Amplification plot of a DNA dilution series prepared from *E. coli* (10^8 to 10^4 cfu/ml) following manual extraction and real-time PCR analysis using qTOWER³.

Excellent real-time PCR results - Independent of the choosen extraction method

No matter if conventional spin filter-based separation or SmartExtraction is used for sample preparation, superior results in terms of yield, DNA quality, and efficiency for real-time PCR can be expected. The feasibility study below shows comparable results for extraction of *Listeria monocytogenes* (DSMZ 20600) and *E.coli* (DSMZ 8579) following extraction using the innuPREP Bacteria DNA Kit vs. the smart Bacteria DNA prep (a) automated on the InnuPure® C16 *touch*. For both extraction methods 1 ml of culture was extracted and analysed using the innuDETECT Listeria spp. and innuDETECT E. coli O157 Assay.



Amplification plot of DNA prepared from *Listeria monocytogenes* (10^8 and 10^5 cfu/ml) following manual extraction (red) versus SmartExtraction (black) and final real-time PCR analysis using qTOWER³.



Amplification plot of DNA prepared from *E. coli* (10^8 and 10^5 cfu/ml) following manual extraction (red) versus SmartExtraction (black) and final real-time PCR analysis using qTOWER³.

Order Information

Manual Extraction

Order number	Product	Quantity
845-KS-1040010	**innuPREP DNA Mini Kit**	10 reactions
845-KS-1040050		50 reactions
845-KS-1040250		250 reactions
845-KS-6000010	**innuPREP Bacteria DNA Kit**	10 reactions
845-KS-6000050		50 reactions
845-KS-6000250		250 reactions
845-BP-3200010	**blackPREP Food DNA I Kit**	10 reactions
845-BP-3200050		50 reactions
845-BP-7100010	**blackPREP Food DNA II Kit**	10 reactions
845-BP-7100050		50 reactions
845-IR-0007010	**PME Gelatin DNA Kit**	10 reactions
845-IR-0007050		50 reactions

Automated Extraction

Order number	Product	Quantity
845-IPP-2016016	**innuPREP DNA Kit – IPC16**	16 reactions, 8 reactions per plate
845-IPP-2016096		96 reactions, 8 reactions per plate
845-IPS-2016016		16 reactions, 1 reaction per strip
845-IPS-2016016		96 reactions, 1 reaction per strip
845-IPP-5716016	**innuPREP Food DNA Kit – IPC16**	16 reactions, 8 reactions per plate
845-IPP-5716096		96 reactions, 8 reactions per plate
845-IPS-5716016		16 reactions, 1 reaction per strip
845-IPS-5716096		96 reactions, 1 reaction per strip
845-IPP-5516016	**innuPREP Bacteria DNA Kit – IPC16**	16 reactions, 8 reactions per plate
845-IPP-5516096		96 reactions, 8 reactions per plate
845-IPS-5516016		16 reactions, 1 reaction per strip
845-IPS-5516096		96 reactions, 1 reaction per strip
845-ASS-2008016	**smart DNA prep (a)**	16 reactions, 1 reaction per strip
845-ASS-2008096		96 reactions, 1 reaction per strip
845-ASP-2008016		16 reactions, 8 reactions per plate
845-ASP-2008096		96 reactions, 8 reactions per plate
845-ASP-2096096		1 x 96 reactions, reagent plates
845-ASS-5508016	**smart Bacteria DNA prep (a)**	16 reactions, 1 reaction per strip
845-ASS-5508096		96 reactions, 1 reaction per strip
845-ASP-5508016		16 reactions, 8 reactions per plate
845-ASP-5508096		96 reactions, 8 reactions per plate
845-ASP-5596096		1 x 96 reactions, reagent plates

Order Information

Animal Species Identification

Order number	Product	Quantity
845-IDF-0010024	**innuDETECT Pork Assay**	24 reactions
845-IDF-0010096		96 reactions
845-IDF-0020024	**innuDETECT Beef Assay**	24 reactions
845-IDF-0020096		96 reactions
845-IDF-0030024	**innuDETECT Horse Assay**	24 reactions
845-IDF-0030096		96 reactions
845-IDF-0040024	**innuDETECT Goat Assay**	24 reactions
845-IDF-0040096		96 reactions
845-IDF-0050024	**innuDETECT Sheep Assay**	24 reactions
845-IDF-0050096		96 reactions
845-IDF-0060024	**innuDETECT Chicken Assay**	24 reactions
845-IDF-0060096		96 reactions
845-IDF-0070024	**innuDETECT Turkey Assay**	24 reactions
845-IDF-0070096		96 reactions
845-IDF-0080024	**innuDETECT Donkey Assay**	24 reactions
845-IDF-0080096		96 reactions
845-IDF-0090024	**innuDETECT Mammal & Bird Assay**	24 reactions
845-IDF-0090096		96 reactions
845-IDF-0100024	**innuDETECT Fish Assay**	24 reactions
845-IDF-0100096		96 reactions
845-IDF-0110024	**innuDETECT Cheese Assay** (3 tube duplex for beef, sheep and goat)	24 reactions
845-IDF-0110096		96 reactions
845-IDF-0110096	**innuDETECT Halal Assay** (3 tube duplex for pork, horse and donkey)	24 reactions
845-IDF-0120096		96 reactions
845-IDF-0130024	**innuDETECT Halal Multiplex Assay**	24 reactions
845-IDF-0130096		96 reactions
845-IDF-0140100	**innuDETECT Animal Quantification Tool**	24 reactions
845-IDF-0140200		96 reactions

Food-Borne Pathogen Detection

Order number	Product	Quantity
845-IDF-0029024	**innuDETECT Listeria spp. Assay**	24 reactions
845-IDF-0029096		96 reactions
845-IDF-0021024	**innuDETECT Listeria monocytogenes Assay**	24 reactions
845-IDF-0021096		96 reactions
845-IDF-0022024	**innuDETECT Salmonella spp. Assay**	24 reactions
845-IDF-0022096		96 reactions
845-IDF-0023024	**innuDETECT Salmonella enterica Assay**	24 reactions
845-IDF-0023096		96 reactions
845-IDF-0024024	**innuDETECT Campylobacter spp. Assay**	24 reactions
845-IDF-0024096		96 reactions
845-IDF-0025024	**innuDETECT Shiga Toxin 1 Assay**	24 reactions
845-IDF-0025096		96 reactions
845-IDF-0026024	**innuDETECT Shiga Toxin 2 Assay**	24 reactions
845-IDF-0026096		96 reactions
845-IDF-0027024	**innuDETECT E. coli O157 Assay**	24 reactions
845-IDF-0027096		96 reactions
845-IDF-0028024	**innuDETECT E. coli O104 Assay**	24 reactions
845-IDF-0028096		96 reactions

Overall Support

A global network of product, application and service specialists work hand-in-hand to help you fulfill your daily demands.

We support you with:

- Choosing the best extraction method for your food sample matrices
- Setting up instruments and accessories according to your individual demands
- Offering ongoing support, training and service worldwide

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