



LoopDeetect Food Safety range

Genetic amplification detection method

Instructions for use

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Loop Dee Science World Wide
100 rue Philippe LIVRY-LEVEL
14760 Bretteville-sur-Odon (France)



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Definitions

DNA (Deoxyribonucleic acid): A long molecule composed of a sequence of nucleotides. The composition of the nucleotide sequence is specific to each species but varies between individuals.

Primers: Short sequences of DNA or RNA used in gene amplification assays to define the regions of genetic material to be duplicated.

RNA (Ribonucleic Acid): A molecule with a structure very similar to that of DNA. RNA is synthesised by a living organism based on DNA. The detection of RNA makes it possible to identify a living organism.

Control interface: LoopiX Cloud software or LoopiX App, a computer or smartphone solution enabling control of the LoopiX® automated system

RT-LAMP (Reverse transcription Loop-mediated isothermal amplification): An in vitro gene amplification technique in molecular biology, similar to PCR, designed to amplify a genetic sequence at a constant temperature.

Master Mix: A ready-to-use solution containing the various reagents in optimal concentrations for performing a LAMP analysis.

PCR (Polymerase chain reaction): An in vitro gene amplification technique used in molecular biology, the aim of which is to replicate a portion of the genetic sequence of the target of interest in large numbers.

Important information

This manual is the property of Loop Dee Science World Wide. Any copying or reproduction of this manual without the prior authorisation of Loop Dee Science World Wide is prohibited. All users must read this manual carefully before use in order to familiarise themselves with all the information provided with the kits.

The kits offered by Loop Dee Science World Wide are molecular biology kits based on:

- Isothermal amplification technology – an innovative technology for the amplification of DNA and RNA, enabling the amplification and detection of target genetic material within a short analysis time.
- Magnetic bead technology – a technology enabling the capture and purification of genetic material through various wash buffers, thereby optimising the performance of the analyses.

No claims or representations are intended to provide information for the diagnosis, prevention or treatment of any disease.

To achieve optimal results, it is necessary to strictly follow the operating procedure and recommendations for use.

The kits in the LoopDeetect Food Safety range are validated and declared compliant by Loop Dee Science World Wide, solely in conjunction with the products, reagents and equipment recommended and tested by Loop Dee Science World Wide.

Description of symbols

Symbols	Descriptions
	Refer to the instructions for use
	Manufacturer's name and address
	Date of manufacture
	Product batch number
	Expiry date
	Sufficient contents for <i>n</i> tests
	Storage temperature limit
	Product reference
	Keep away from moisture
	Store away from light and direct heat
	Single use only
	RUO (Research Use Only) device. Not for use in human diagnostics
	Sterilised by irradiation
	Sterilised with ethylene oxide
	Toxic, irritant, sensitising, narcotic
	Flammable

Available resources

Before use, the user must have read and understood all the user manuals for the equipment and products used as part of the protocol. The user manuals are available online at the following address: loopdeescience.com/downloads

Instructions specific to the LoopDeetect AOAC kits are also available online at the following address: loopdeescience.com/downloads

Detailed protocols are provided to assist the user in carrying out the analyses. It is essential to consult the instructions before handling the equipment. These protocols are available online at the following address: loopdeescience.com/downloads

The choice of protocol depends in particular on the type of matrices, the user and the equipment used. The various protocols available are outlined in the [protocol description](#). The support teams are available to assist users in selecting the protocol best suited to their needs.

Description of the kits and packaging

These kits are intended for professionals in the food and feed industries, collectively referred to as the 'agri-food sector' (producers, processors, distributors, and caterers), as well as for food testing laboratories and hygiene specialists.

They are intended for use in self-monitoring, in accordance with current practices in the agri-food sector.

The kits are suitable for various types of applications:

- Surface swabbing.
- Confirmation of colonies from a Petri dish culture
- Analysis of food or environmental samples in culture media: "milieu"

Sampling kit

Kit	Kit content
Surface sampling kit with S1 collection tube (pack of 50)	50 swabs 50 S1 collection tubes (Sampling tubes S1)
Surface sampling kit with S1 collection tube without swabs (pack of 50)	50 S1 collection tubes (Sampling tubes S1)

Proteinase K Kit

The **Proteinase K (PK) kit** is an optional supplementary kit required for the analysis of certain specific matrices. The appropriateness of using the PK protocol **must be determined in advance, depending on the type of matrices to be analysed**. PK minimises inhibition by degrading the proteins present in the sample.

Kit	Kit content
Protéinase K kit (for 50 reactions)	5 tubes de proteinase K PK

Centrifugation kit

The **centrifugation kit** is an optional add-on kit required for the analysis of certain specific matrices (matrices containing solid residues, such as powders, dust, etc.). The appropriateness of using the centrifugation protocol **must be determined in advance, depending on the type of matrices to be analysed**. Centrifugation allows the separation of solid and liquid components in the samples, thereby limiting the presence of elements that could affect the performance of the analysis.

Kit	Kit content
Centrifugation kit (for 50 reactions)	50 C1 separation columns (C1 collection tube)

Purification kits

Purification kits enable the extraction of bacterial DNA and RNA from samples taken from environmental or food matrices, for analysis using LoopDeetect detection kits.

They are based on an extraction technology using functionalised magnetic beads capable of capturing the genetic material present in the sample. The extraction protocol consists of four steps:

1. **Lysis**: breaking down bacterial cell walls to release the genetic material.
2. **Binding**: capture of DNA/RNA by the functionalised beads.
3. **Wash(es)**: removal of impurities.
4. **Elution**: recovery of the genetic material.

Kits and descriptions	Kit content	
Purification kit Plus (PFS+) pack of 50 This kit enables the manual extraction and purification of genetic material from swabs taken from environmental or food matrices.	50 PFS+ Lysis tubes L1 (Lysis buffer) 50 PFS+ Binding tubes B2 (Binding tubes) 50 PFS+ Wash tubes W3 (Wash buffer) 50 PFS+ Wash tubes W4 (Wash buffer) 50 PFS+ Wash tubes W5 (Wash buffer) 50 PFS+ Elution tubes E6 (Elution buffer) Liquid transfers can be carried out using two options:	
	Option 1	3 boxes of P1000 tips
	Option 2	50 x 3.5 mL transfer pipettes 50 x 6 mL transfer pipettes 50 cotton swabs
PurifiX® 8 Purification kit Plus pack of 50 This kit enables the extraction and purification of genetic material from environmental or food matrices using the PurifiX® 8 purification system.	50 PFS+ Lysis tubes L1 (Lysis buffer) 50 PurifiX® 8 purification strips 28 PurifiX® 8 magnetic rods combs	
PurifiX® 10 Purification kit Plus pack of 50 This kit enables the extraction and purification of genetic material from environmental or food matrices using the PurifiX® 10 purification system.	50 PFS+ Lysis tubes L1 (Lysis buffer) 50 PurifiX® 10 purification strips 28 PurifiX® 10 magnetic rods combs	

LoopDeetect Detection Kits

LoopDeetect kits enable the detection of a specific bacterial target in environmental (food industry surfaces) and food samples. When used with the LoopiX® automated system, they amplify a specific region of DNA or RNA from the target bacterium or bacterial genus via an isothermal reaction. These kits are intended for qualitative analysis only.

They are supplied as lyophilised reagents, packaged in a conical tube under a protective atmosphere. Each tube contains:

- An amplification mastermix
- A set of primers specific to the target being sought
- A reaction protection system

LoopDeetect kits are designed to be used exclusively with the LoopiX® automated system.

Kit name	Kit content
LoopDeetect <i>Salmonella spp.</i> (pack of 50)	- 50 reaction tubes R1 (clear tube / white pouch)
LoopDeetect <i>L.monocytogenes</i> (pack of 50)	- 50 reaction tubes R1 (clear tube / grey pouch)
LoopDeetect <i>L.spp</i> (pack of 50)	- 50 reaction tubes R1 (clear tube / black pouch)
LoopDeetect <i>Escherichia coli</i> (pack of 50)	- 50 reaction tubes R1 (clear tube / gold pouch)
LoopDeetect <i>Enterococcus faecalis</i> (pack of 50)	- 50 reaction tubes R1 (clear tube / grey pouch) - 50 dilution buffer tubes D2

Positive controls

The positive controls supplied by Loop Dee Science consist of linear or plasmid DNA targeting the same region amplified by the corresponding LoopDeetect kits. They are intended for use as external quality controls for the entire system (LoopiX® automated system + LoopDeetect kit).

Please note: positive controls are not standard solutions; they should be treated as purified positive samples during handling.

Instructions for use:

- The positive control is compatible only with the corresponding LoopDeetect detection kit.
- It enables validation of the entire analytical workflow, from the instrument to the interpretation of the result.

We recommend using this control in the following cases:

- Upon receipt of each new batch of LoopDeetect kits,
- When qualifying a new LoopiX® analyser,
- For the accreditation of a new operator,
- As a periodic control, according to the frequency of use defined by the user,
- To validate the compatibility of different matrices with the method (inhibition control).

Name of positive control	Kit content	Related kit
LoopDeetect <i>Salmonella</i> +	- 1 positive control (yellow tube / red pouch) - 1 sampling tube (S1)	LoopDeetect <i>Salmonella</i> spp.
LoopDeetect <i>Listeria</i> +	- 1 positive control (yellow tube / red pouch) - 1 sampling tube (S1)	LoopDeetect <i>L.monocytogenes</i> LoopDeetect <i>Listeria</i> spp.
LoopDeetect <i>Escherichia coli</i> +	- 1 positive control (yellow tube / red pouch) - 1 sampling tube (S1)	LoopDeetect <i>Escherichia coli</i>
LoopDeetect <i>Enterococcus faecalis</i> +	- 1 positive control (yellow tube / red pouch) - 1 sampling tube (S1)	LoopDeetect <i>Enterococcus faecalis</i>

Materials and equipment

Depending on the protocol being carried out, certain items of equipment may be required:
Please contact your distributor for information on the various items of equipment.

Application	Product identification
All applications	- LoopiX® device
All applications	- Fixed-volume 25µL pipette (or variable-volume 10–100µL pipette) - Variable pipette 100–1000 µL
All applications	- Suitable 100 µL or 1000 µL filter tips
Extraction	Magnetic rack
Extraction	PurifiX® 8 device
Extraction	PurifiX® 10 device
Centrifugation	Benchtop centrifuge

General handling precautions

This procedure involves the use or detection of pathogenic microorganisms and/or their metabolic products. All necessary precautions must be taken.

Before handling, please observe the following precautions to ensure reliable sample collection and handling. These precautions are essential to guarantee the quality of the analyses and must be followed systematically.

- Never mix components from different kits.
- Samples may contain potentially infectious biological agents; handle them with care.
- Certain chemicals in the purification kits present risks. Safety data sheets (SDS) are available on request. Always wear appropriate personal protective equipment (PPE): gloves, goggles, lab coat and face mask.

Health and Safety Guidelines

- The kits are not suitable for human diagnostic use.
- The products and the LoopiX® automated system must be used strictly in accordance with the instructions for use. Loop Dee Science World Wide accepts no liability in the event of misuse or failure to follow the manufacturer's instructions.
- Before use, clean, disinfect and tidy work surfaces thoroughly.
- Follow laboratory hygiene rules and implement a one-way system to prevent contamination.
- Strictly follow the kit instructions: storage conditions, sample type, order of steps, incubation times, and agitation and sampling times.
- Do not use expired kits (expiry date indicated on the label).

Sampling

- If the surface is damp, there is no need to moisten the swab.
- Ensure a large sampling area is covered and use the entire length of the swab, rotating it with your fingers whilst rubbing the surface vigorously to dislodge bacteria.
- After sampling, analyse the samples as quickly as possible; otherwise, transport and store the samples in their original tubes at a temperature between +1°C and +5°C.

Proteinase K

- The PK tube contains liquid proteinase K (a respiratory sensitiser). Avoid inhaling dust or vapours.
- After use, the PK tube must be immediately returned to its packaging and stored away from light, heat and moisture.

Centrifugation

- Balance the centrifuge as much as possible before starting a cycle.
- Follow the centrifuge's operating and safety instructions.

Sample lysis and purification

- Lysis buffer **L1** contains chaotropic salts, including guanidine hydrochloride (**toxic and irritating**).
- The lysed sample must be analysed within two hours.

- Homogenise the purified sample by suction-and-discharge before sampling.
- Tube **B2** must remain open throughout the procedure, particularly during the drying step.
- **B2** tubes contain chaotropic salts and ethanol (**toxic and flammable**).
- The wash buffers in the purification kits also contain ethanol (**flammable**).
- After extraction, analyse the samples promptly. For long-term storage, collect the eluate and store it in a clean 1.5 mL tube at -20°C.

Preparation of the reaction tube

- Do not open the sachet containing the lyophilisate or positive control until you are ready to use it.
- Check that the lyophilisate pellet is at the bottom of the tube. If necessary, tap the tube gently.
- Ensure that the tube and its contents are intact:
- Do not use if the sachet is damaged (torn, poorly sealed).
- Do not use if the contents are pinkish in colour or sticky.
- Never store lyophilised or dehydrated tubes outside their original sachet.

Analysis

- Place the 25 µL sample directly onto the pad at the bottom of the tube, ensuring there are no air bubbles. Tap the tube gently if necessary to remove any air bubbles.
- During the test, never unplug, open or interrupt the LoopiX® before the process has finished.
- A reaction tube must never be used for a second analysis, as this may produce a false result. If necessary, repeat the procedure from the sample collection stage.
- After use, never open the reaction tube to avoid contaminating the work environment and the risk of errors in future analyses.
- At the end of the analysis, dispose of the reaction tube and any used consumables immediately to prevent contamination.
- At the end of the analysis, clean all items used (equipment, work area, devices, etc.) using an alcohol-based solution and an absorbent cloth.

Materials et equipments

- Regularly check the condition and volume accuracy of your pipettes. Replace them if they are damaged (e.g. from impact or a fall) or if you have any doubts.
- Never perform an analysis with an empty LoopiX® or an empty tube, as this may damage the device.
- Never perform a purification cycle with a device without a protective consumable, as this may damage the device's magnetic rods.
- Carry out all procedures at a temperature between +15°C and +25°C.
- Reagents are for single use only and must be disposed of after use (see section '[Disposal – Waste management](#)').

Quality control

All manufactured products are produced in accordance with our quality system, from the receipt of raw materials through to the marketing of the finished product. Each batch undergoes quality control assessments and is only released for sale if it meets the acceptance criteria predefined by Loop Dee Science World Wide.

Storage et stability

- All kits are valid for 12 months from their date of manufacture and may be used until the expiry date indicated on each kit.
- All reagents contained in the kits are for single use only.
- For LoopDeetect kits, ensure that all reagents are stored in a cool, dry place at a temperature between 2 and 25°C.
- Keep the reagents away from any source of heat (radiators, windows exposed to sunlight, etc.).
- If the room temperature cannot be controlled, store the kits in the fridge.
- The reaction tube (R1) has a very short shelf life once removed from its pouch. It is therefore recommended to open the pouch just before use.
- For Purification kits, ensure that all reagents are stored in a cool, dry place at a room temperature between 15 and 25°C.
- Keep reagents away from any source of heat (radiators, windows exposed to sunlight, etc.).

Disposal – Waste management

- Hazardous laboratory, chemical or biological waste must be handled and disposed of in accordance with all local, regional and national regulations.
- Aluminium sachets can be recycled.

Technical Support

Loop Dee Science World Wide provides customer support for all technical and service-related queries and issues concerning the LoopDeetect range. For assistance, please contact our support and assistance team:

Technical Support Address:	Loop Dee Science 100 rue Philippe LIVRY-LEVEL 14760 Bretteville-sur-Odon (France)
Telephone:	+33 (0)2 31 73 07 91 (9h00 à 17h00 / Heure de Paris)
Email :	support@loopdeescience.com
Website :	https://www.loopdeescience.com

Description of the protocols

Detailed protocols are available via the following link: loopdeescience.com/downloads

All LoopDeetect protocols are suitable for use in:

- Surface swabbing,
- Confirmation of colonies from Petri dish cultures,
- Analysis of food or environmental samples in culture media,

Standard protocol

The standard LoopDeetect protocol is suitable for most applications. It consists of five steps:

1. Sample collection
2. Lysis
3. Purification
4. Amplification
5. Result

Protéinase K protocol

The use of the proteinase K (PK) protocol should be determined according to the type of matrix. It consists of five stages:

1. Sample collection
2. Lysis with PK
3. Purification
4. Amplification
5. Result

Centrifugation protocol

Whether to use the centrifugation protocol depends on the type of matrix. It consists of six stages:

1. Sample collection
2. Lysis
3. Centrifugation
4. Purification
5. Amplification
6. Result

PK and centrifugation protocol

Whether to use the protocol involving PK and centrifugation depends on the type of matrix. It consists of six stages:

1. Sample collection
2. Lysis with PK
3. Centrifugation
4. Purification
5. Amplification
6. Result

Document history / Version tracking

Version	Date	Comments
1.0	Jan-23	Initial public review
2.0	Juin-23	Changes to operating procedures; spelling corrections
2.1	Nov-23	Changes to product references and packaging – changes to operating procedures.
2.2	Mai-24	Changes to links Addition of LoopiX Cloud
2.3	Juin-24	Change to tube nomenclature: C becomes S Changes to protocols.
3.0	Oct-24	Merger of all instructions for kits in the Food Safety range Changes to protocols Changes to tube nomenclature
4.0	Dec-24	Merger of instructions for Loopdeetect SAL, LMO and LIS kits following the inclusion of MgSO ₄ Changes to protocols Changes to tube nomenclature
5.0	Mars-25	Inclusion of protocols for ECO and EFA analyses Integration of the PFS+ protocol
6.0	Juin-25	Complete revision of protocols Complete revision of flowcharts Corrections
7.0	Nov-25	Update of protocols following improvements to the E. coli kit Update of protocol flowcharts following improvements to the E. coli kit
8.0	Mar-26	Update of protocols Division of the general instruction leaflet into versions according to specific requirements (PK, centrifuge, etc.) Update of protocol names and diagrams. Splitting of protocols and instructions
8.1	Juin-26	Clarification of protocol involving PK and centrifugation Clarification of safety precautions.