

Food Safety and Quality Reference Guide

BIO-RAD

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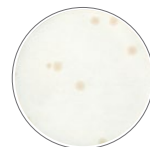
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Preparation of Dilutions

Total Flora



Bacteria



PCA

ISO 6887-1:1999

Preparation of test samples, initial suspension, and tenfold dilutions for microbiological examination

Part 1: General rules for preparation of dilutions for microbiological examination

m g or v ml of sample
+
 $9 \times m$ g or $9 \times v$ ml of
Tryptone Salt or
Buffered Peptone Water
(and following dilutions)



Dilution 10^{-1}



(and following dilutions)

ISO 4833:2003

General guidance for the enumeration of microorganisms

Colony-count technique at 30°C

Initial suspension
and/or
tenfold dilutions



PCA



 30°C
72 hr

Enumeration

Ordering Information

Catalog # Description

Buffered Peptone Water Broth

Ready to use

3554179	225 ml x 6 bottles
3555795	3 L x 4 bags
3555790	5 L x 2 bags

Dehydrated

3564684	500 g
---------	-------

Plate Count Agar (PCA)

Ready to use

3554459	100 ml x 6 bottles
3554457	200 ml x 6 bottles
3563989	90 mm x 20 dishes

Dehydrated

3564475	500 g
---------	-------

Tryptone Salt Diluent

Ready to use

3555754	9 ml x 25 tubes
3555756	90 ml x 6 bottles
3555796	3 L x 4 bags

Dehydrated

3564544	500 g
---------	-------

Escherichia coli

ISO Standards

ISO 16649-1:2001

Horizontal method for the enumeration of β -glucuronidase-positive *E. coli*

Part 1: Colony-count technique at 44°C using membranes and 5-bromo-4-chloro-3-indolyl β -D-glucuronide

Sample/initial suspension

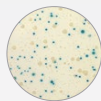
Dilutions

MMGA with membrane

Resuscitation



Room temperature
15 min and 37°C
4 ± 1 hr



TBX



44°C
18–24 hr

Direct enumeration

ISO 16649-2:2001

Horizontal method for the enumeration of β -glucuronidase-positive *E. coli*

Part 2: Colony-count technique at 44°C using 5-bromo-4-chloro-3-indolyl β -D-glucuronide

Sample/initial suspension

Dilutions



2x*



TBX



44°C
18–24 hr

Direct enumeration

* Please refer to ISO 7218:2007.

ISO/TS 16649-3:2005

Horizontal method for the enumeration of β -glucuronidase-positive *E. coli*

Part 3: Most probable number technique using 5-bromo-4-chloro-3-indolyl β -D-glucuronide

Sample/initial suspension



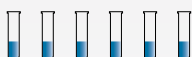
Add 10 ml to each of 3 tubes of double strength MMG



Subsequent dilution. Add 1 ml to each of 3 tubes of single strength MMG



37°C
24 ± 2 hr



Subculture each tube presenting yellow coloration on a dish of **TBX**



44°C
20–24 hr



Each tube showing blue colonies on **TBX** should be considered positive



Calculate the most probable number from the number of positive tubes at each dilution

ISO 7251:2005

General guidance for detection and enumeration of presumptive *E. coli*

Most probable number technique

Sample/initial suspension



Tryptose Lauryl Sulfate



Single concentration



or* Double concentration



37°C
24–48 ± 2 hr

EC Medium



44°C
24–48 ± 2 hr

Peptone Water



44°C
48 ± 2 hr

Indole test reading and calculation

* For detection method only.

Escherichia coli



E. coli



Other Coliforms



Total Coliforms

RAPID'E.coli 2

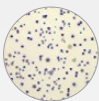
Alternative Method

RAPID'E.coli 2 Enumeration of *E. coli*



Sample/initial suspension

Dilutions



RAPID'E.coli 2



37 or 44°C
18–24 hr

Direct enumeration of typical colonies*

Ordering Information

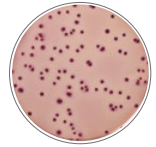
Catalog #	Description
Buffered Peptone Water Broth	
Ready to use	
3554179	225 ml x 6 bottles
3555795	3 L x 4 bags
3555790	5 L x 2 bags
Dehydrated	
3564684	500 g
EC Medium Broth	
Dehydrated	
3564764	500 g
Kovacs Reagent (for Indole Detection)	
3555313	15 ml x 2 bottles
Peptone Water (Indole Free) Broth	
Ready to use	
3554180	9 ml x 25 tubes
Dehydrated	
3564334	500 g
RAPID'E.coli 2 Agar	
Ready to use	
3555297	200 ml x 6 bottles
3555299	100 ml x 6 bottles
Dehydrated	
3564024	500 g
TBX Agar	
Ready to use	
3555309	100 ml x 6 bottles
Dehydrated	
3564035	500 g
Tryptose Lauryl Sulfate Broth	
Dehydrated	
3564774	500 g
Tryptone Salt Diluent	
Ready to use	
3555754	9 ml x 25 tubes
3555756	90 ml x 6 bottles
3555796	3 L x 4 bags
Dehydrated	
3564544	500 g

* Enumeration of typical colonies for *E. coli* and coliforms at 37°C; *E. coli* at 44°C.

Coliforms



Coliforms



VRBL

ISO Standards

ISO 4831:2006

Horizontal method for the detection and enumeration of coliforms

Microbiology of food and animal feeding stuffs

MPN technique

ISO 4832:2006

Horizontal method for the enumeration of coliforms

Microbiology of food and animal feeding stuffs

Colony-count technique

Sample

Dilutions

Tryptose Lauryl Sulfate

Single concentration

or*

Double concentration



30 or 37°C
24–48 ± 2 hr



30 or 37°C
24 ± 2 hr

BGBLB



30 or 37°C
24 hr (+24 hr)



Reading (gas +)

Sample/initial suspension

Dilutions



2x*



VRBL



30–37°C
24 ± 2 hr

Enumeration of characteristic colonies and confirmation for atypical colonies

Coliforms

- Diameter ≥0.5 mm
- Purple with or without a red zone of precipitated bile

* For detection method only.

* Please refer to ISO 7218:2007+A1:2013.

Coliforms



E. coli



Other Coliforms



Total Coliforms

RAPID'*E.coli* 2

Alternative Method

RAPID'*E.coli* 2

Enumeration of coliforms



Sample/initial suspension

Dilutions



RAPID'*E.coli* 2



37°C
18–24 hr

Direct enumeration of typical colonies*

Ordering Information

Catalog # Description

Brilliant Green Bile Lactose Broth (BGBLB)

Ready to use
3578024 10 ml x 25 tubes

Buffered Peptone Water Broth

Ready to use
3554179 225 ml x 6 bottles
3555795 3 L x 4 bags
3555790 5 L x 2 bags

Dehydrated
3564684 500 g

RAPID'*E.coli* 2 Agar

Ready to use
3555297 200 ml x 6 bottles
3555299 100 ml x 6 bottles

Dehydrated
3564024 500 g

Tryptose Lauryl Sulfate Broth

Dehydrated
3564774 500 g

Tryptone Salt Diluent

Ready to use
3555754 9 ml x 25 tubes
3555756 90 ml x 6 bottles
3555796 3 L x 4 bags

Dehydrated
3564544 500 g

Violet Red Bile Lactose (VRBL) Agar

Ready to use
3554799 100 ml x 6 bottles

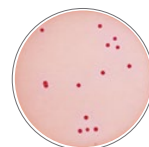
Dehydrated
3564594 500 g

* Enumeration of typical colonies for *E. coli* at 44°C; for *E. coli* and coliforms at 37°C.

Enterobacteriaceae



Enterobacteriaceae



VRBG

ISO Standards

ISO 21528-1:2004

Horizontal methods for the detection and enumeration of *Enterobacteriaceae*

Microbiology of food and animal feeding stuffs

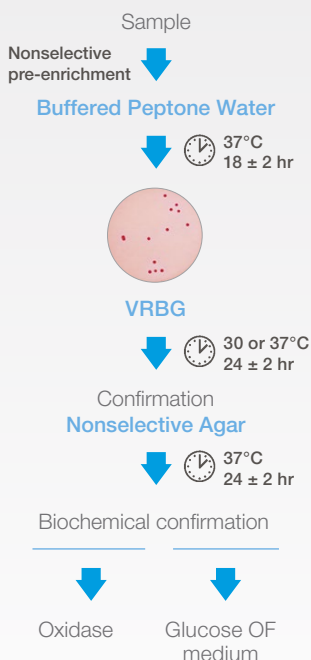
Part 1: Detection and enumeration by MPN technique with pre-enrichment

ISO 21528-2:2004

Horizontal methods for the detection and enumeration of *Enterobacteriaceae*

Microbiology of food and animal feeding stuffs

Part 2: Colony-count technique



* Please refer to ISO 7218:2007.

Ordering Information

Catalog #	Description
Buffered Peptone Water Broth Ready to use	
3554179	225 ml x 6 bottles
3555795	3 L x 4 bags
3555790	5 L x 2 bags
Dehydrated	
3564684	500 g
EE Broth Dehydrated	
3564794	500 g
Nutrient (2.8%) Agar Ready to use	
3554478	8 ml x 25 tubes
Dehydrated	
3564484	500 g
Violet Red Bile Glucose (VRBG) Agar Ready to use	
3554239	100 ml x 6 bottles
Dehydrated	
3564584	500 g

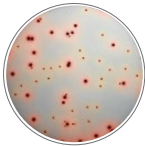
Enterobacteriaceae



Enterobacteriaceae



Non-
Enterobacteriaceae



RAPID Enterobacteriaceae

Alternative Method

RAPID Enterobacteriaceae Enumeration of Enterobacteriaceae



Sample/initial suspension

Dilutions



RAPID Enterobacteriaceae



⌚ 37* ± 1°C
24 ± 2 hr

Direct enumeration**

Ordering Information

Catalog #	Description
RAPID Enterobacteriaceae Agar	
Ready to use	
3554012	200 ml x 6 bottles
Dehydrated	
3564004	500 g
Tryptone Salt Diluent	
Ready to use	
3555754	9 ml x 25 tubes
3555756	90 ml x 6 bottles
3555796	3 L x 4 bags
Dehydrated	
3564544	500 g

* Alternatively, a temperature of 30 or 35°C can be chosen.

** Suitable with an automatic plate counter.

Salmonella

ISO Standard

ISO 6579:-1:2017

Microbiology of the food chain —

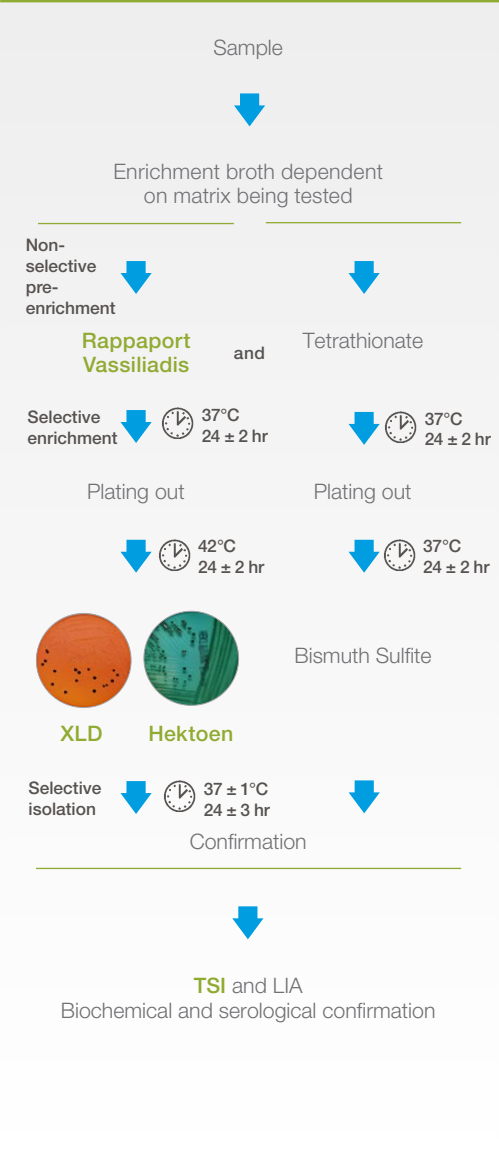
Horizontal method for the detection, enumeration, and serotyping of *Salmonella*

Part 1: Detection of *Salmonella* spp.

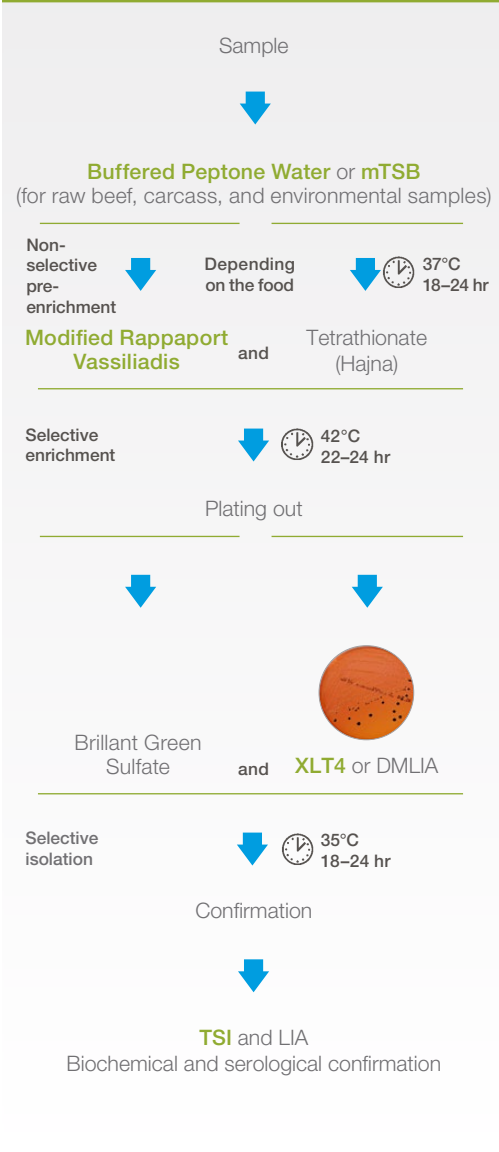


Salmonella

FDA-BAM Salmonella Protocol



FSIS Salmonella MLG Protocol

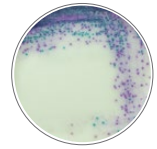




Salmonella
spp.



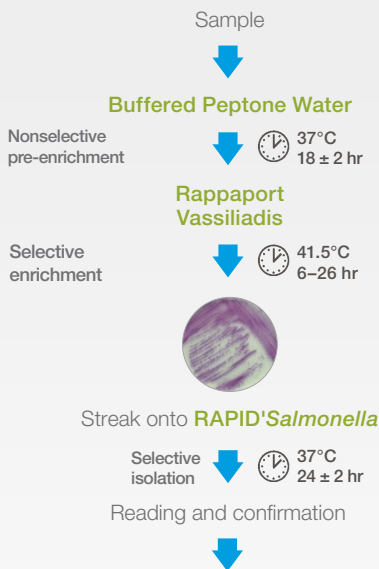
Other
Enterobacteriaceae



RAPID *Salmonella*

Alternative Methods

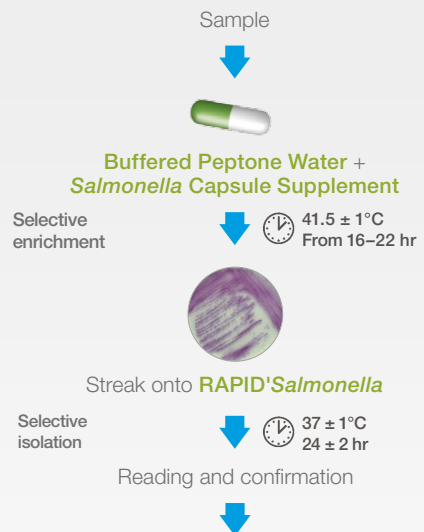
RAPID *Salmonella* Double Enrichment Protocol Detection of *Salmonella* spp.



Standard Tests

- or Oxidase/**OMNI-O/ONPG**
- or **iQ-Check *Salmonella* II**

RAPID *Salmonella* Short Protocol Detection of *Salmonella* spp.



Standard Tests

- or Oxidase/**OMNI-O/ONPG**
- or **iQ-Check *Salmonella* II**
- or ***Salmonella* Latex Test**
- or ***Salmonella* Confirm Latex Test**

Salmonella

Alternative Method

iQ-Check *Salmonella* II Real-Time PCR Kit

Detection of *Salmonella* spp.



Ordering Information

Catalog # Description

Antiserum *Salmonella* Omnivalent OMNI-O (A60)

3560781 3 ml dropper bottle

Brilliant Green (Kristensen) Agar Dehydrated

3564464 500 g

Buffered Peptone Water Broth Ready to use

3554179 225 ml x 6 bottles

3555795 3 L x 4 bags

3555790 5 L x 2 bags

Dehydrated

3564684 500 g

Hektoen Agar

Ready to use

3563894 90 mm x 20 dishes

Dehydrated

3564284 500 g

iQ-Check *Salmonella* II Kit

3578123 94 reactions

iQ-Check *Salmonella* Enteritidis Kit

3578142 94 tests

iQ-Check *Salmonella* Typhimurium Kit

12004306 94 samples

Muller Kauffmann Tetrathionate Novobiocin (MKTTN) Broth

Ready to use

3556140 10 ml x 50 tubes

Dehydrated base

3564714 500 g

Modified Semi-Solid Rappaport Vassiliadis (MSRV) Medium

Ready to use

3556139 200 ml x 6 bottles

Dehydrated

3564325 500 g

Catalog # Description

Novobiocin Supplement

Dehydrated

3564610 1 g

Nutrient (2.1%) Agar

Dehydrated

3564485 500 g

ONPG Test

3553822 Set of 50 disks

RAPID[®] Salmonella Agar

Ready to use

3563961 90 mm x 20 dishes

3563963 90 mm x 120 dishes

Dehydrated

3564705 500 g

RAPID[®] Salmonella

Supplement

3564709 enough for 2.5 L
x 100 capsules

3564710 enough for 250 ml
x 100 capsules

3564712 enough for 100 analyses
x 1 pkg

Rappaport Vassiliadis Soy

(RVS) Broth

Ready to use

3555773 10 ml x 25 tubes

Dehydrated

3564324 500 g

Salmonella Latex Test

Detection of groups B to E and G

3556710 75 tests

Salmonella Confirm Latex Test

3556711 50 tests

Catalog # Description

Selenite-Cystine Broth

Complete medium

3555746 10 ml x 25 tubes

Triple Sugar Iron (TSI) Agar

Dehydrated

3564384 500 g

**Xylose Lysine Desoxycholate
(XLD) Agar**

Ready to use

3541751 90 mm x 20 dishes

Dehydrated

3569124 500 g

Xylose Lysine Tergitol 4

(XLT 4) Agar

Ready to use

3563654 90 mm x 20 dishes

Visit bio-rad.com/antisera for a complete list of our *Salmonella* antisera.

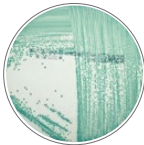
Cronobacter spp.



Cronobacter
spp.



Other
Enterobacteriaceae



RAPID'Sakazakii

ISO Standard

ISO/TS 22964:2017
Microbiology of the food chain —
Horizontal method for the
detection of *Cronobacter* spp.

Sample preparation
Weigh 10 g or 10 ml of
the test portion in 90 ml
Buffered Peptone Water

↓ 34–38°C
18 ± 2 hr

Selective enrichment
Transfer 0.1 ml
into 10 ml of CSB

↓ 41.5°C
24 ± 2 hr

Streak onto CCI

↓ 41.5°C
24 ± 2 hr

Transfer 1 to 5 colonies
on **Nonselective Agar**

↓ 34–38°C
21 ± 3 hr

Biochemical confirmation

FDA-BAM *Cronobacter* spp. Protocol

Sample

↓ 36°C
24 ± 2 hr

1:10

Buffered Peptone Water

↓ 40 ml

Centrifuge 3,000 x g for 10 min
Decant supernatant
Resuspend pellet in 200 µl PBS

↓

Spread and
streak plates
100 µl

↓
DFI agar R&F agar PCR

Incubation ↓ 36°C
18–24 hr

Typical colonies from each
plate are confirmed with real-time
PCR and other techniques

Alternative Method

RAPID'Sakazakii Short Protocol



Sample preparation
Weigh *m* g of the test portion
in *v* ml
Buffered Peptone Water

↓ 37°C
18 ± 2 hr



Streak onto
RAPID'Sakazakii

↓

Reading and confirmation

↓

Standard Tests

or **iQ-Check Cronobacter**

Alternative Method

iQ-Check *Cronobacter* spp. Real-Time PCR Kit

Detection of *Cronobacter* spp.



Environmental sample

Infant formula

Buffered Peptone Water



Supplemented
Buffered Peptone Water



Buffered Peptone Water



Bacterial lysis and DNA extraction



Real-time PCR amplification and detection with
iQ-Check *Cronobacter* spp.



Automatic results analysis and interpretation

Confirmation of positive result with **RAPID'Sakazakii**

Ordering Information

Catalog # Description

Buffered Peptone Water Broth

Ready to use

3554179	225 ml x 6 bottles
3555795	3 L x 4 bags
3555790	5 L x 2 bags

Dehydrated

3564684	500 g
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iQ-Check *Cronobacter* spp.

3578137	96 tests
---------	----------

RAPID'Sakazakii Agar

Ready to use

3563971	90 mm x 20 dishes
---------	-------------------

Dehydrated

3564976	500 g
---------	-------

Trypto-Casein Soy Agar (TSA)

Ready to use

3563884	90 mm x 20 dishes
3555947	200 ml x 6 bottles
3555944	8 ml x 25 inclined tubes

Listeria monocytogenes

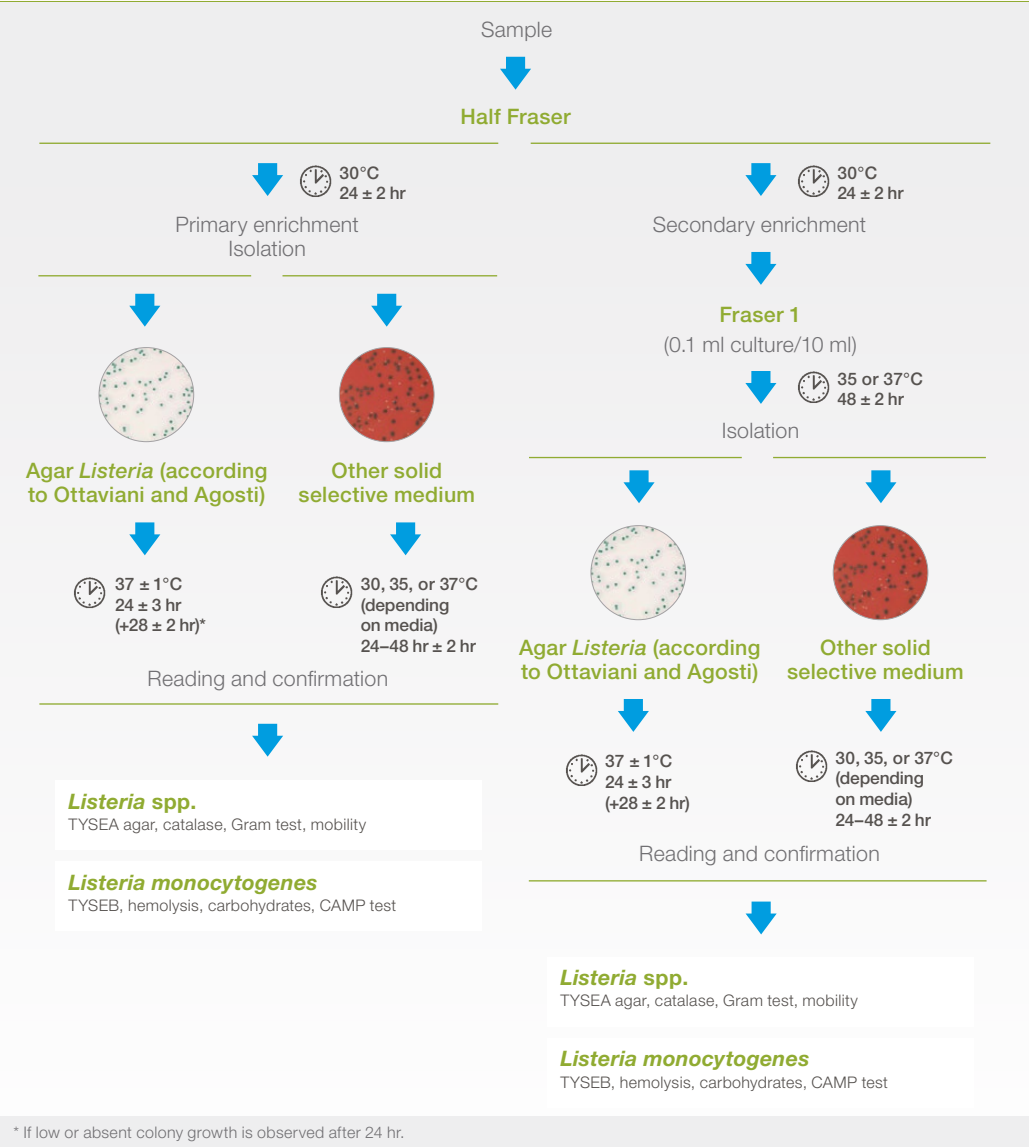
ISO Standard

EN ISO 11290-1/A1:2005

Horizontal method for the detection and enumeration of *L. monocytogenes*

Microbiology of food and animal feeding stuffs

Part 1: Detection method



ISO Standard

EN ISO 11290-2/A1:2005

Horizontal method for the detection and enumeration of *L. monocytogenes*

Microbiology of food and animal feeding stuffs

Part 2: Enumeration method

Sample

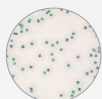
Dilution



Half Fraser without LiCl
and selective supplement
or Buffered Peptone Water



30 ± 2°C
1 ± 5 min



Agar Listeria (according to
Ottaviani and Agosti)



37°C
24 ± 3 hr
(+24 ± 3 hr)

Enumeration and confirmation tests



Listeria spp.

TYSEA agar, catalase, Gram test, mobility

Listeria monocytogenes

TYSEB, hemolysis, carbohydrates, CAMP test

Ordering Information

Catalog # Description

AL (Agar *Listeria* according to Ottaviani and Agosti) Agar
Ready to use

3563695	90 mm x 20 dishes
3563965	90 mm x 120 dishes

Dehydrated base

3564043	500 g
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Base in vials (to be supplemented)

3555200	237.5 ml x 6 bottles
3564041	10 vials

Supplement 2

3564042	10 vials
---------	----------

Buffered Peptone Water

Ready to use

3554179	225 ml x 6 bottles
3555795	3 L x 4 bags
3555790	5 L x 2 bags

Dehydrated

3564684	500 g
---------	-------

Half Fraser

Complete medium

3555797	225 ml x 6 bottles
3555794	3 L x 4 bags

Dehydrated base

3564604	500 g
---------	-------

Supplement

3564616	10 vials
---------	----------

Fraser 1

Complete medium

3554569	10 ml x 25 tubes
---------	------------------

Dehydrated base

3564604	500 g
---------	-------

Supplement

3564615	10 vials
---------	----------

Palcam Agar

Dehydrated base

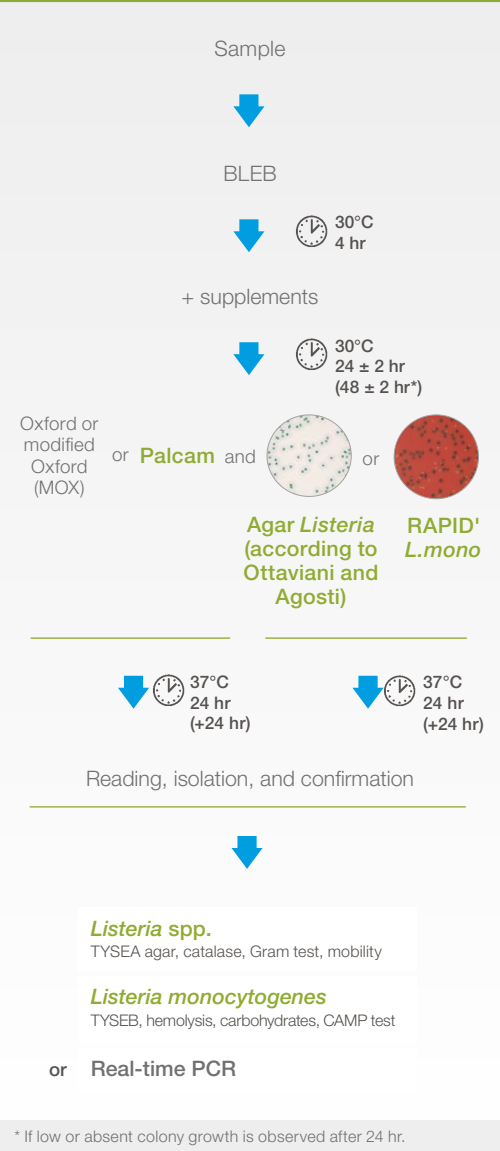
3564754	500 g
---------	-------

Supplement

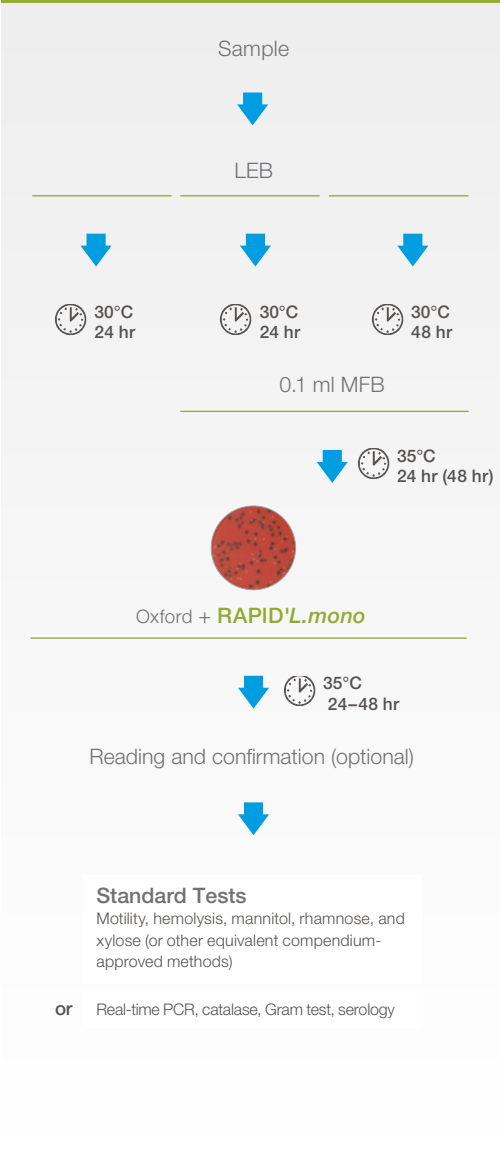
3564752	10 x 500 ml
---------	-------------

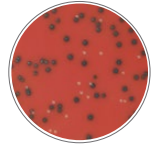
Listeria monocytogenes

FDA-BAM *Listeria monocytogenes* Protocol



Health Canada *Listeria monocytogenes* Protocol MFHPB-30



*L. mono**L. ivanovii**L. innocua**L. welshimeri*RAPID'*L.mono*

Alternative Methods

RAPID'*L.mono*

Detection of *Listeria monocytogenes*



Sample



Half Fraser



30°C
24 ± 2 hr



Isolation on RAPID'*L.mono*



37°C
24 ± 2 hr

Reading and confirmation



Standard Tests

TSYEB, hemolysis, carbohydrates, CAMP test

or **iQ-Check *Listeria monocytogenes* II**

or **Rhamnose Test**

RAPID'*L.mono*

Enumeration of *Listeria monocytogenes*

Sample

Resuscitation



Buffered Peptone Water



20°C
1 hr



Isolation on RAPID'*L.mono*



37°C
24 ± 2 hr

Direct enumeration

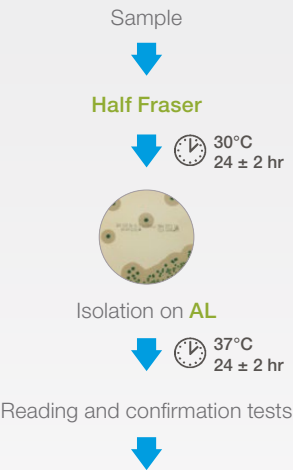
Listeria monocytogenes



AL (Agar *Listeria* according to Ottaviani and Agosti)

Alternative Methods

AL (Agar *Listeria* according to Ottaviani and Agosti) Detection of *Listeria monocytogenes*



Standard Tests

TSYEB, hemolysis, carbohydrates, CAMP test

or Spot on **RAPID[®]L.mono**

Gram test, catalase

or **iQ-Check *Listeria monocytogenes* II**

or **Rhamnose Test***

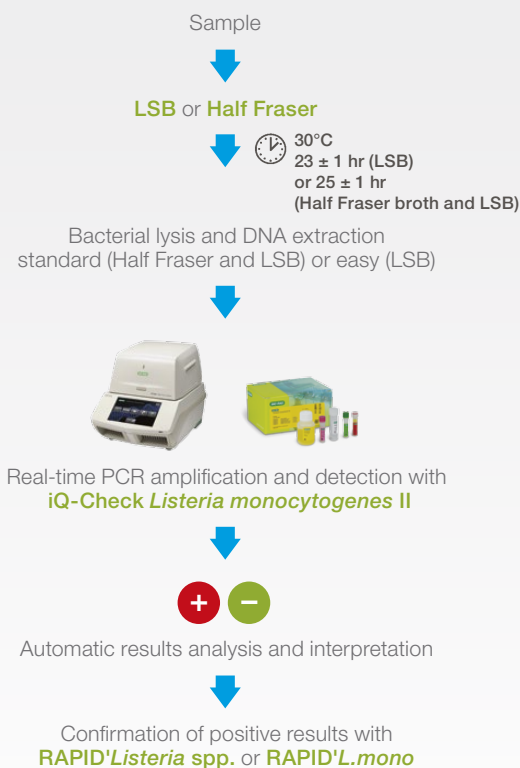
AL (Agar *Listeria* according to Ottaviani and Agosti) agar Enumeration of *Listeria monocytogenes*



* Not included in NF validation scope.

Alternative Method

iQ-Check *Listeria monocytogenes* II Real-Time PCR Kit Detection of *Listeria monocytogenes*



Ordering Information

Catalog # Description

Buffered Peptone Water Broth Ready to use

3554179	225 ml x 6 bottles
3555795	3 L x 4 bags
3555790	5 L x 2 bags

Dehydrated

3564684	500 g
---------	-------

iQ-Check

***Listeria monocytogenes* II Kit**

3578124	96 tests
---------	----------

***Listeria* Special Broth (LSB)**

Ready to use

3555703	225 ml x 6 bottles
3555793	5 L x 2 bags

Dehydrated

3564703	500 g
3564753	5 kg

RAPID'*L.mono* Agar

Ready to use

3563964	90 mm x 120 dishes
3563694	90 mm x 20 dishes
3555294	Kit: 190 ml agar + 2 suppl.

Dehydrated base

3564293	500 g
---------	-------

Supplement 1

3564294	10 vials
---------	----------

Supplement 2

3564746	10 vials
---------	----------

Rhamnose Test

3553669	28 tests
---------	----------

Listeria spp.



Listeria spp.



RAPID'Listeria spp.

Alternative Methods



RAPID'L.mono
Detection of *Listeria* spp.

Sample

↓

Half Fraser

↓  30°C
24 ± 2 hr



Isolation on **RAPID'L.mono**

↓  37°C
(24 hr)
48 hr

Reading and confirmation tests

↓

Standard Tests
TYSEA, Gram test, catalase

or **iQ-Check *Listeria* spp.**



RAPID'Listeria spp.
Detection of *Listeria* spp.

Sample

↓

Half Fraser or UVM

↓  30°C
24 ± 2 hr



Isolation on **RAPID'Listeria spp.**

↓  37°C
24 ± 2 hr

Reading and confirmation tests

↓

Standard Tests: Gram test, catalase

or **Spot on RAPID'L.mono:** Gram test, catalase

or **Spot on Palcam**

or **iQ-Check *Listeria* spp.**

Alternative Methods

AL (Agar *Listeria* according to Ottaviani and Agosti) Detection of *Listeria* spp.



Sample



Half Fraser



30°C
24 ± 2 hr



Isolation on **AL**



37°C
24 ± 2 hr

Reading and confirmation tests



Standard Tests

or **iQ-Check *Listeria* spp.**

or Streak on **Palcam**

iQ-Check *Listeria* spp. Real-Time PCR Kit Detection of *Listeria* spp.



Sample



LSB or Half Fraser



30°C
23 ± 1 hr
or 25 ± 1 hr

Bacterial lysis and DNA extraction
standard or easy protocol



Real-time PCR amplification and detection with
iQ-Check *Listeria* spp.



Automatic results analysis and interpretation



Confirmation of positive results with
RAPID[®] *Listeria* spp. or **RAPID[®] *L.mono***

Listeria spp.

Ordering Information

Catalog # Description

Half Fraser

Ready to use

3555797 225 ml x 6 bottles
3555794 3 L x 4 bags

Dehydrated base

3564604 500 g

Supplement

3564616 10 vials

iQ-Check *Listeria* spp. Kit

3578113 96 tests

***Listeria* Special Broth (LSB)**

Ready to use

3555703 225 ml x 6 bottles
3555793 5 L x 2 bags

Dehydrated

3564703 500 g
3564753 5 kg

RAPID*Listeria* spp. Agar

Dehydrated base

3564744 500 g

Supplement 1

3564745 10 vials

Supplement 2

3564746 10 vials

Catalog # Description

RAPID*L.mono* Agar

Ready to use

3563964 90 mm x 120 dishes
3563694 90 mm x 20 dishes
3555294 Kit: 190 ml agar + 2 suppl

Dehydrated base

3564293 500 g

Supplement 1

3564294 10 vials (10 x 500 ml medium)

Supplement 2

3564746 10 vials (10 x 500 ml medium)

AL (Agar *Listeria* according to Ottaviani and Agosti)

Agar plates

3563695 20 x 90 mm

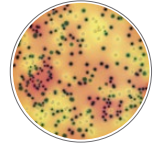
Dehydrated base

3564043 500 g

Supplement 2

3564042 10 vials

Shiga Toxin–Producing *Escherichia coli* (including O157:H7)

*E. coli* O157:H7Other *E. coli*RAPID'*E.coli* O157:H7

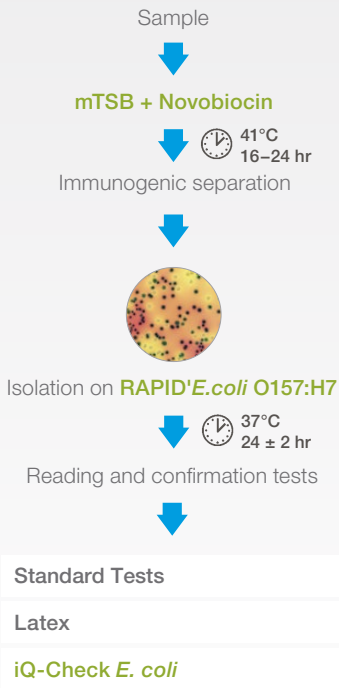
Alternative Methods

RAPID'*E.coli* O157:H7

Detection of *Escherichia coli* O157:H7

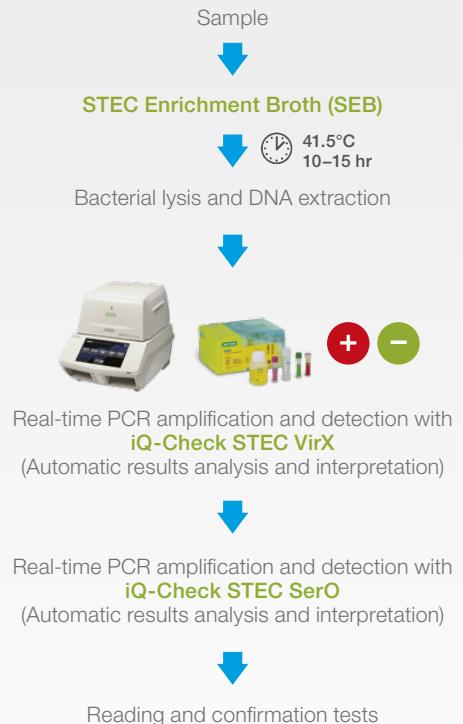


RAPID'*E.coli* O157:H7 can also be used as a second medium in the ISO 16654 standard.



iQ-Check STEC VirX and SerO Real-Time PCR Kits

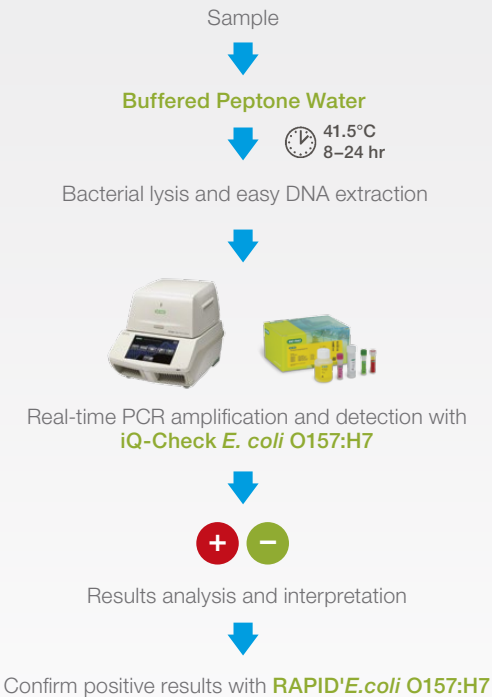
Detection and isolation of non-O157 Shiga toxin–producing *E. coli* (STEC) from ground beef



Escherichia coli O157:H7

Alternative Method

iQ-Check *E. coli* O157:H7 Real-Time PCR Kit Detection of *Escherichia coli* O157:H7



Ordering Information

Catalog # Description

Buffered Peptone Water Broth Ready to use

3554179	225 ml x 6 bottles
3555795	3 L x 4 bags
3555790	5 L x 2 bags

Dehydrated

3564684	500 g
---------	-------

iQ-Check *E. coli* O157:H7 Kit

3578114	96 tests
---------	----------

iQ-Check STEC SerO

3578140	32 tests
---------	----------

iQ-Check STEC VirX

3578139	96 tests
---------	----------

mTSB Broth

Ready to use (containing novobiocin)

3555426	225 ml x 6 bottles
---------	--------------------

Dehydrated base

3564426	500 g
---------	-------

Novobiocin Supplement

Dehydrated

3564610	1 g
---------	-----

RAPID'E.coli O157:H7 Agar

Dehydrated base

3564748	100 g
---------	-------

STEC Enrichment Broth (SEB)

Dehydrated base

3564001	500 g
---------	-------

3564002	5 kg
---------	------

Selective STEC Supplement

3564005	1 g
---------	-----

Campylobacter spp.

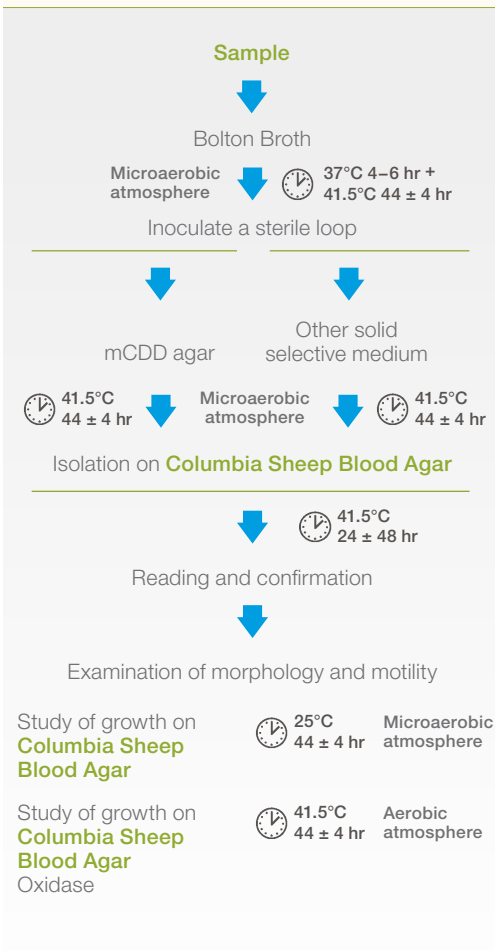
ISO Standards

ISO 10272-1:2006

Horizontal method for detection and enumeration of *Campylobacter* spp.

Microbiology of food and animal feeding stuffs

Part 1: Detection method

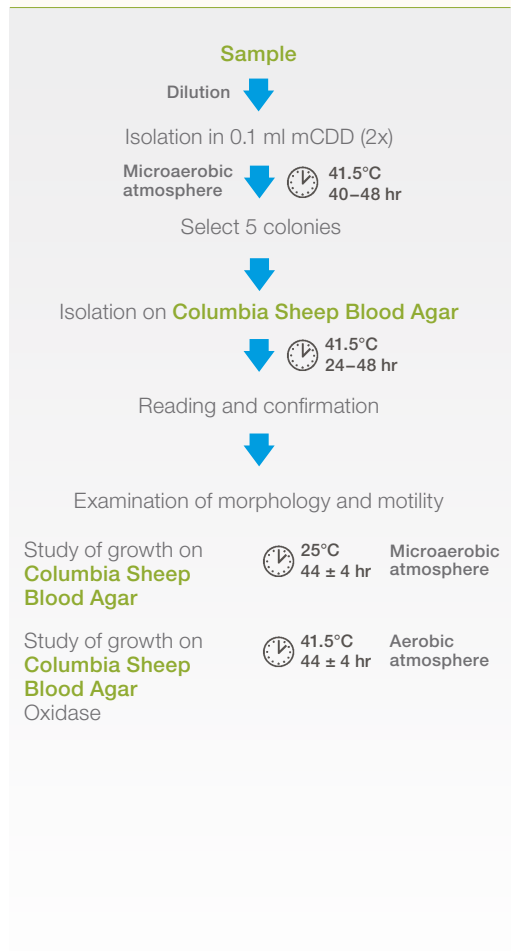


ISO/TS 10272-2:2006

Horizontal method for detection and enumeration of *Campylobacter* spp.

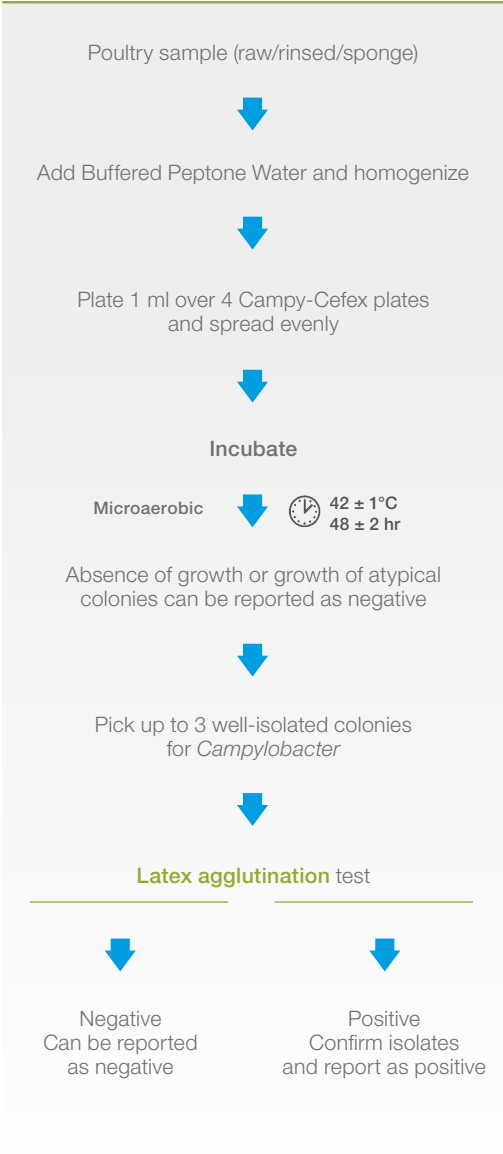
Microbiology of food and animal feeding stuffs

Part 2: Enumeration method



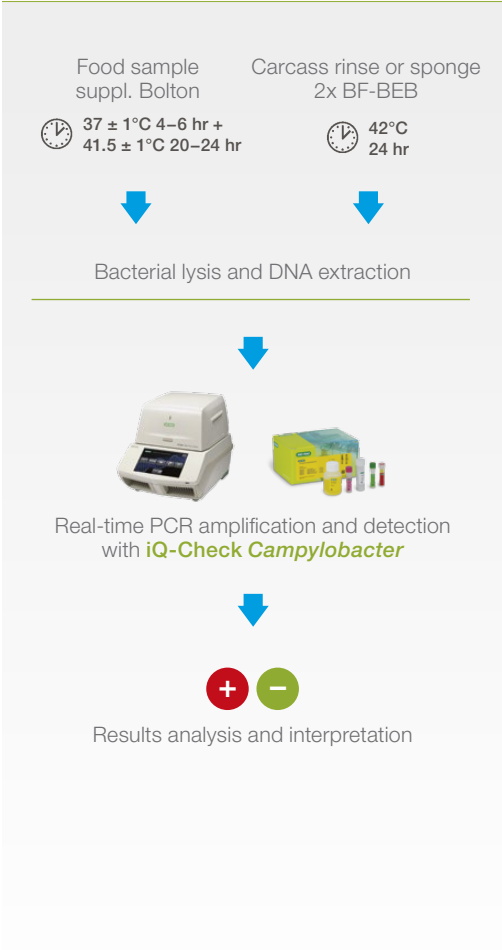
Campylobacter spp.

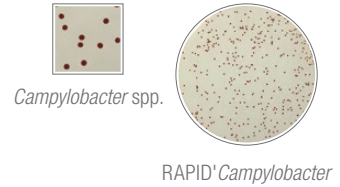
FSIS *Campylobacter* spp. Direct Plating Protocol



Alternative Method

iQ-Check *Campylobacter* spp. Real-Time PCR Kit Detection of *C. jejuni*, *C. coli*, and *C. lari*





Alternative Methods

RAPID' *Campylobacter* spp.

Detection of *Campylobacter* spp.

Sample enrichment



Preston broth



41.5 ± 1°C
24 ± 2 hr



Isolation on **RAPID' *Campylobacter***

Microaerobic
atmosphere



41.5 ± 1°C
24–48 hr

Reading and confirmation tests



Standard Tests

or ***Campylobacter* Confirm Latex**

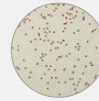
or **iQ-Check *Campylobacter***

RAPID' *Campylobacter* spp.

Enumeration of *Campylobacter* spp.



Suspension/dilution



Isolation on **RAPID' *Campylobacter***

Microaerobic
atmosphere



41.5 ± 1°C
(24 hr)
48 hr

Reading and confirmation tests



Standard Tests

or ***Campylobacter* Confirm Latex**

or **iQ-Check *Campylobacter***

Campylobacter spp.

Ordering Information

Catalog # Description

Buffered Peptone Water Broth
Ready to use

3554179 225 ml x 6 bottles
3555795 3 L x 4 bags
3555790 5 L x 2 bags

Dehydrated

3564684 500 g

Confirmation

3563784 Columbia sheep blood agar,
 90 mm x 20 dishes
3554164 Physiologic sterile water (0.85%),
 9 ml x 25 tubes
3554154 Sterile distilled water,
 9 ml x 25 tubes
3564297 *Campylobacter* Confirm Latex Kit,
 50 tests

iQ-Check *Campylobacter* Kit

3578135 96 tests

RAPID*Campylobacter* Agar
Dehydrated base

3564295 500 g

Supplement

3564296 10 vials (10 x 400 ml)

Tryptone Salt Diluent
Ready to use

3555756 90 ml x 6 bottles
3555754 9 ml x 25 tubes
3555747 9 ml x 100 tubes
3555796 3 L x 4 bags

Dehydrated

3564544 500 g

Staphylococcus aureus

ISO Standards

ISO 6888-1/A1:2004

Horizontal method for the enumeration of coagulase-positive *Staphylococci* (*S. aureus* and other species)

Technique including confirmation of colonies

Sample/initial suspension
and following dilution



Baird-Parker



35 or 37°C
24 ± 2 hr
(+ 24 ± 2 hr)**

Enumeration



Confirmation
Brain Heart Infusion



35 or 37°C
24 ± 2 hr

Rabbit Plasma



35 or 37°C
4–6 hr or 24 hr

Coagulation reading

Typical *Staphylococci* form gray to black colonies with a surrounding clear halo and a white opaque zone.

ISO 6888-2/A1:2003

Horizontal method for the enumeration of coagulase-positive *Staphylococci* (*S. aureus* and other species)

Technique using rabbit plasma fibrinogen agar medium

Sample/initial suspension
and following dilution



**Baird-Parker for RPF
+ RPF sup.**



35 or 37°C
18–24 hr and 48 hr

Direct enumeration of
typical coagulase-positive
Staphylococci

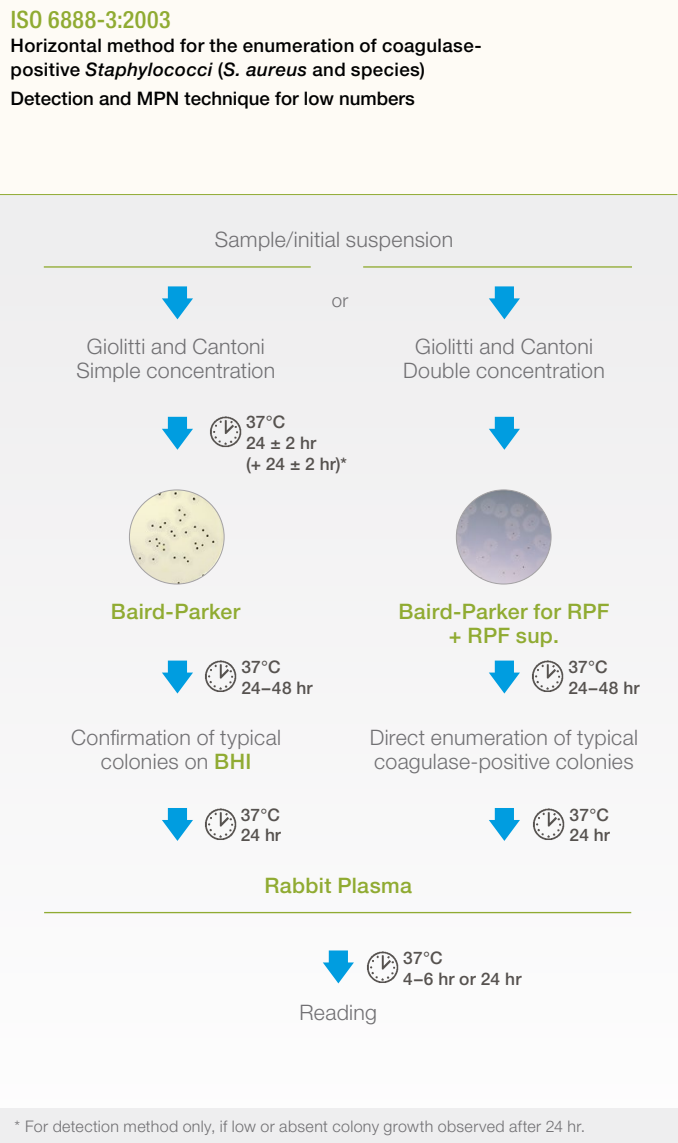
* Please refer to ISO 7218:2007.

** If low or absent colony growth observed after 24 hr.

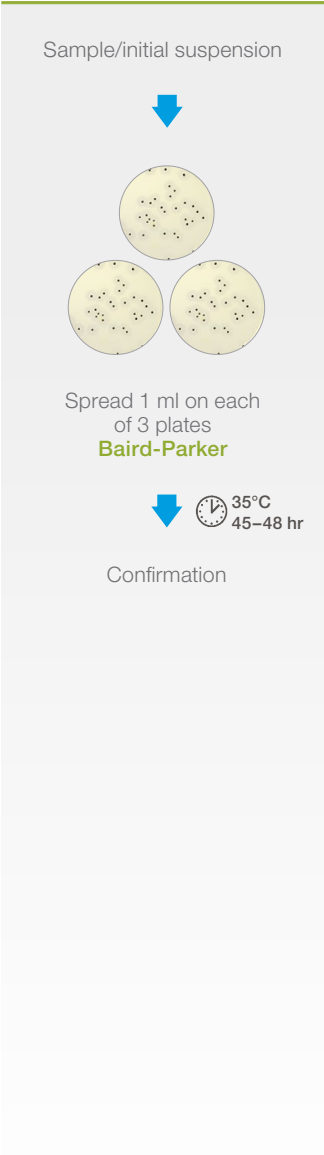
* Please refer to ISO 7218:2007.

Staphylococcus aureus

ISO Standard



FDA BAM *S. aureus* Protocol



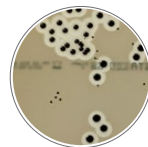
* For detection method only, if low or absent colony growth observed after 24 hr.



Staphylococcus
coagulase-positive



Staphylococcus
coagulase-negative



RAPID'Staph agar

Alternative Method

RAPID'Staph

Enumeration of coagulase-positive *Staphylococci*



Sample/initial suspension



RAPID'Staph



37°C
24 ± 2 hr

Enumeration and confirmation



Pastorex™ Staph Plus

or Spot on **Baird-Parker for RPF**

Ordering Information

Catalog # Description

Additives

Egg yolk with potassium tellurite

3554201 5 ml x 1 vial

3554205 25 ml x 1 bottle

Sulfamethazine solution (0.2%)

3562682 2.5 ml x 1 vial

Baird-Parker Agar

Complete medium

3563991 90 mm x 20 dishes

Base

3564814 500 g

Baird-Parker for RPF Agar

Complete medium

3578618 90 ml x 6 bottles

+ 6 vials of suppl.

356-3996 90 mm x 20 dishes

Dehydrated base

3564814 500 g

RPF Supplement

3564618 10 x 500 ml

Brain Heart Infusion (BHI) Broth

Ready to use

3553664 10 ml x 25 tubes

Dehydrated

3564014 500 g

Pastorex Staph Plus Latex

3556356 50 tests

3556353 5 x 50 tests

Rabbit Plasma

Freeze-dried

3556352 Pack for 20 reactions

Staphylocoagulase Broth

53544 9 ml x 25 tubes

RAPID'Staph Agar

Ready to use

3563960 90 mm x 20 dishes

Dehydrated base

3564704 500 g

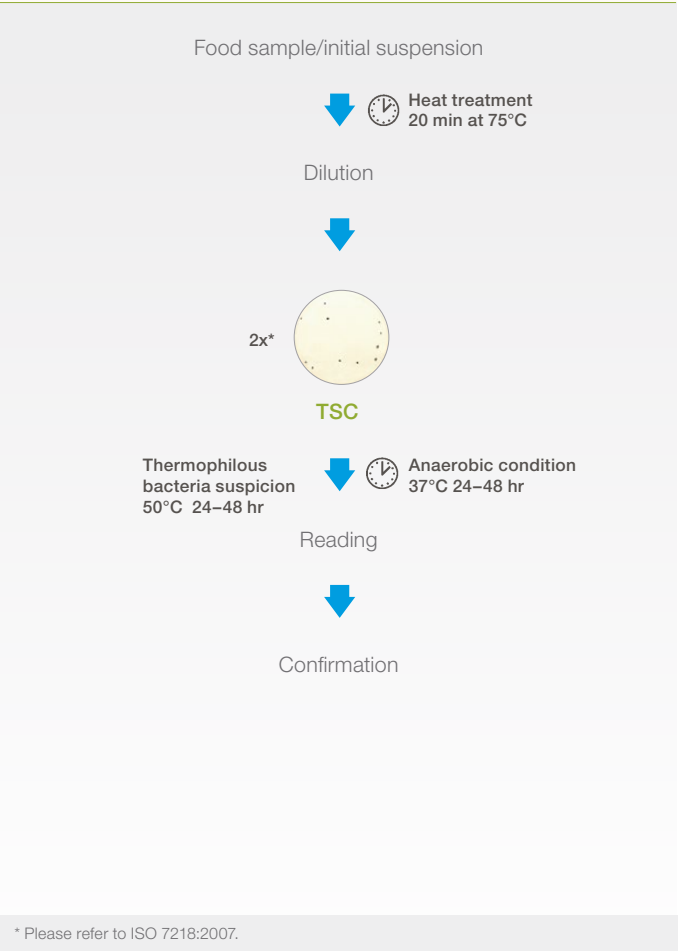
Sulfite-reducing bacteria

ISO Standard

ISO 15213:2003

Horizontal method for the enumeration of sulfite-reducing bacteria growing under anaerobic conditions

Microbiology of food and animal feeding stuffs



Clostridium perfringens



Clostridium perfringens



TSC

ISO Standard

ISO 7937:2005

Horizontal method for the enumeration of *Clostridium perfringens*

Colony-count technique

Food sample/initial suspension



2x*

TSC

(add D-cycloserine)

Anaerobic condition   37°C
20 ± 2 hr

Enumeration of typical black colonies

Confirmation of 5 isolated colonies with

Thioglycolate + Resazurin

  37°C
18–24 hr

Lactose Sulfite

  37°C
18–24 hr

Mobility Nitrate

  37°C
18–24 hr

Lactose Gelatine

  46°C
24 hr

  37°C
18–24 hr

  37°C
18–24 hr

C. perfringens
black precipitate/gas +

C. perfringens
red coloration/gas +

C. perfringens
yellow/gas +

Ordering Information

Catalog # Description

Lactose Sulfite Broth

Base

3564914 100 g

Columbia Sheep Blood Agar

Ready to use

3563784 90 mm x 20 dishes

Dehydrated base

3564674 500 g

Thioglycolate + Resazurin Broth

Ready to use

3563613 10 ml x 25 tubes

Dehydrated

64084 500 g

TSC without D-Cycloserine Agar — Base Medium

Ready to use (to be supplemented)

3554419 100 ml x 6 bottles

Dehydrated base

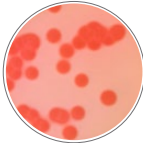
3569644 500 g

* Please refer to ISO 7218:2007.

Bacillus cereus



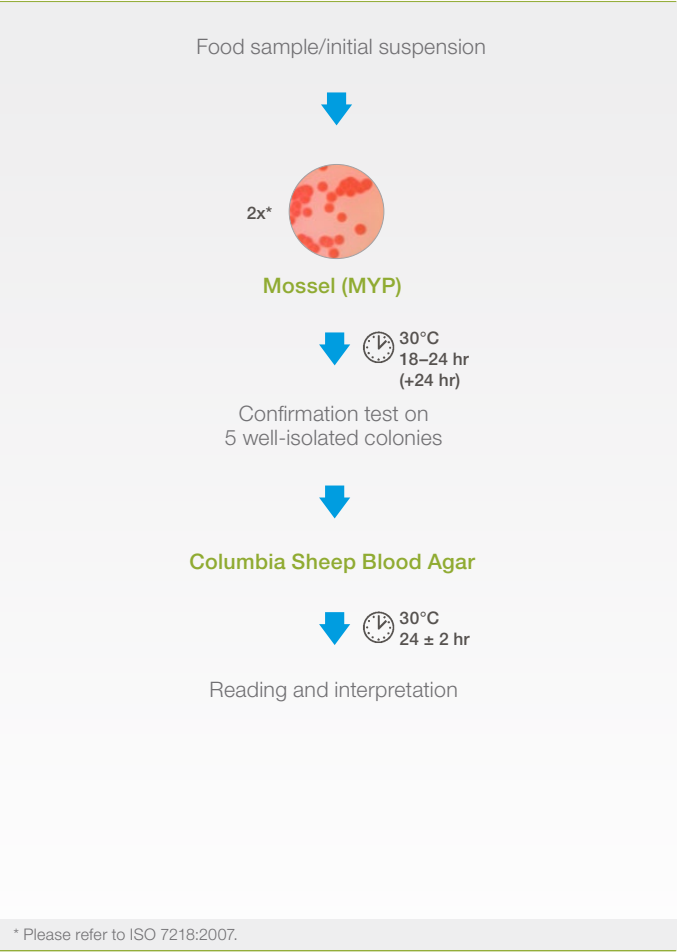
Bacillus cereus



Mossel (MYP)

ISO Standard

ISO 7932:2005
General guidance for the enumeration of *B. cereus*
Colony-count technique at 30°C



* Please refer to ISO 7218:2007.

Shigella

ISO Standard

ISO 21567:2005

Horizontal method for the detection of *Shigella* spp.

Food sample/initial suspension



Shigella Broth + **Novobiocin**
pH 7 ± 0.2



41°C
16–20 hr

Plating out



MacConkey



XLD



Hektoen



37°C
20–24 hr
(+48 hr)*



37°C
20–24 hr
(+48 hr)*



37°C
20–24 hr
(+48 hr)*

Spot on typical colonies on **Nutrient (2.1%)**



37°C
20–24 hr

Biochemical and serological confirmation

Ordering Information

Catalog # Description

Hektoen Agar

Ready to use

3563894 90 mm x 20 dishes

Dehydrated

3564284 500 g

MacConkey + Crystal Violet Agar

Ready to use

3563617 90 mm x 20 dishes

Dehydrated

3569084 500 g

Novobiocin Supplement

Dehydrated

3564610 1 g

Nutrient (2.1%) Agar

Dehydrated

3564485 500 g

Mossel Agar

(Mannitol Egg Yolk Polymixin)

Dehydrated

3569604 500 g

Xylose Lysine Desoxycholate (XLD) Agar

Ready to use

3541751 90 mm x 20 dishes

Dehydrated

3569124 500 g

* If low or absent colony growth observed after 24 hr.

Validations



AOAC



NF VALIDATION*



Health Canada



NordVal

iQ-Check Real-Time PCR Methods

<i>Campylobacter</i> spp.	✓			
<i>Cronobacter</i> spp.		✓		
<i>E. coli</i> O157:H7	✓	✓		
<i>Listeria monocytogenes</i>	✓	✓	✓	✓
<i>Listeria</i> spp.	✓	✓	✓	
<i>Salmonella</i> spp.	✓	✓	✓	✓
STEC 7 major O-groups**	✓			
STEC virulence genes**	✓			

RAPID[®]Chromogenic Methods

<i>Campylobacter</i> spp.		✓		
Coliforms	✓	✓	✓	✓
<i>Cronobacter</i> spp.		✓		
<i>Escherichia coli</i>	✓	✓	✓	✓
<i>E. coli</i> O157:H7	✓	✓		
<i>Listeria monocytogenes</i>				
Detection	✓	✓	✓	✓
Enumeration		✓		✓
<i>Listeria</i> spp.	✓	✓		
<i>Salmonella</i> spp.	✓	✓		✓
<i>Staphylococcus aureus</i>	✓	✓		

* Alternative analytical methods for agrifood — <http://nf-validation.afnor.org/en>

** USDA No Objection Letter

✓ Approved

Summary

	Meat, Poultry, and Fish Products	Dairy Products	Processed Foods	Fruits and Vegetables	Environment	Water and Wine Beverages
<i>Bacillus cereus</i>	C			C		
<i>Campylobacter</i>	R iQ	R iQ			R iQ	
<i>Clostridium perfringens</i>	C					C
Coliforms	R	R	R	R		R
<i>Cronobacter sakazakii</i>		R iQ			R iQ	
<i>Enterobacteriaceae</i>	R	R	R	R	R	R
<i>Escherichia coli</i>	R	R	R	R	R	R
<i>E. coli</i> O157:H7	R iQ	R iQ	R iQ	R iQ	R iQ	R iQ
STEC	iQ	iQ	iQ	iQ	iQ	iQ
<i>Lactobacillus</i>	C	C				
<i>Listeria</i> spp.	R iQ	R iQ	R iQ	R iQ	R iQ	R iQ
<i>L. monocytogenes</i>	R iQ	R iQ	R iQ	R iQ	R iQ	R iQ
<i>Pseudomonas aeruginosa</i>	C				C	C
<i>Salmonella</i> spp.	R iQ	R iQ	R iQ	R iQ	R iQ	R iQ
<i>S. Enteritidis</i>	iQ	iQ	iQ	iQ	iQ	iQ
<i>S. Typhimurium</i>	iQ	iQ	iQ	iQ	iQ	iQ
<i>Staphylococcus aureus</i>	R	R	R	R	R	
Yeasts and molds	C	C	C	C	C	C

C Classical media

iQ iQ-Check Real-Time PCR method

R RAPID[®] Chromogenic method

Quality and Certification

Our quality policy, which is the result of our dedicated efforts to food and water environmental and surface testing, is based on a constant commitment to improvement.

Within the scope of the CE labeling process for all of its medical diagnostic activities, a number of Bio-Rad sites received ISO 13485 certification in 2002. Bio-Rad's ISO 9001 version 2000 certification is also maintained for all of its activities.

United States Department of Agriculture (USDA) and Food and Drug Administration (FDA) inspections have confirmed Bio-Rad's quality systems' and products' compliance with U.S. regulatory standards.

Production

From the delivery of raw materials right up to marketing of the finished products, Quality Assurance applies to every product manufactured by Bio-Rad. Each batch of finished products undergoes strict quality-control testing and is marketed only if it complies with acceptance criteria.

All documentation relating to the production and quality control of a given batch is archived.

Distribution

Stock is maintained in a temperature-controlled environment with barcode readings of code, batch, expiration date, product status, commercial validity, and country authorization verified at each step in product storage and distribution.

Normally, products are transported at room temperature. Bio-Rad takes shipping-related stress conditions into account when developing reagents. This allows reagents to be carried via standard shipping services. For those rare instances when a product's performance cannot be guaranteed under these conditions, Bio-Rad offers specialized methods of transport.

Traceability

All Bio-Rad products can be traced electronically, making it possible to identify the customer(s) linked with a specific product and/or batch or serial number.

As part of the company's "reagent vigilance," this traceability makes it possible to inform clients when there's a problem with a particular batch or lot number, to indicate any actions to be taken based on the results, and, where applicable, to recall a given product.

Documents and Certificates

Technical Data Sheets

For more information about our products, please refer to the technical data sheets.

Depending on the products, our technical sheets include:

- Applications of the product
- Corresponding standard references
- Product description
- Presentation or type(s) of packaging offered
- Stock status
- Typical formula
- Necessary product(s) or material(s) that are not supplied
- Detailed protocols
- Special precautions for use
- Quality controls indicating test strains and expected results

All of our technical data sheets are available on our website.

Quality Control Certificates

These certificates have been established for every product and indicate all the control tests carried out on the finished product, the expected specifications, and the results obtained.

These documents can be consulted online and can be downloaded in PDF format by using a product code and batch number.

Website address

foodscience.bio-rad.com

Safety Data Sheets

These are established by our Department of Regulatory Affairs for every product containing hazardous substances and are recorded in the product reference information. These safety data sheets are available upon request.

Certificates of Health and Origin

These documents, available during audit, are delivered to us by our suppliers for peptones of animal origin when they are elements in the composition of a product.

Bio-Rad's thermal cyclers and real-time thermal cyclers are covered by one or more of the following U.S. patents or their foreign counterparts owned by Eppendorf AG: U.S. Patent Numbers 6,767,512 and 7,074,367.

BIO-RAD

**Bio-Rad
Laboratories, Inc.**

Life Science
Group

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Canada 1 905 364 3435 **China** 86 21 6169 8500 **Czech Republic** 420 241 430 532
Denmark 45 44 52 10 00 **Finland** 358 09 804 22 00 **France** 33 01 47 95 69 65
Germany 49 89 31 884 0 **Hong Kong** 852 2789 3300 **Hungary** 36 1 459 6100
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Portugal 351 21 472 7700 **Russia** 7 495 721 14 04 **Singapore** 65 6415 3188
South Africa 27 (0) 861 246 723 **Spain** 34 91 590 5200 **Sweden** 46 08 555 12700
Switzerland 41 026674 55 05 **Taiwan** 886 2 2578 7189 **Thailand** 66 2 651 8311
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