diagnostics
with passion

sifin

Test Reagents for Bacteriology

Product information for serotyping

Salmonella diagnostics | Shigella diagnostics | Yersinia diagnostics | Coli diagnostics

Are you looking for the serological confirmation of suspicious colonies?

FOR SALMONELLA, SHIGELLA, YERSINIA AND COLI DIAGNOSTICS



Are you looking for the serological confirmation of suspicious colonies?

sifin diagnostics gmbh offers a comprehensive line of specific test reagents for serotyping in clinical and veterinary diagnostics. Our tests are based on monoclonal antibodies. This leads to a strong and specific agglutination without cross reaction.

All our antibodies have been developed in-house and are manufactured in our company. Our products are offered as ready-to-use reagents in dropper bottles or as bulk to IVD companies.

Our portfolio comprises:

- Salmonella diagnostics
- Shigella diagnostics
- Yersinia diagnostics
- Coli diagnostics

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Bacteriological Test Reagents

DIAGNOSTICS WITH PASSION



What are test reagents?

Test reagents are used to provide serological evidence of and to serotype pathogenic Entero-bacterales from test material of human and other origin in microbiological diagnostics.

If the bacterial strain being tested has an antigen corresponding to the detection range of the test reagent, this antigen is bound to the specific antibody when they are mixed together. As a result of the antigen-antibody reaction, significant visible agglutination of the strain is observed.

After propagating on selective or selective-indicator culture media, any suspect colonies are investigated using biochemical methods.

The serological identification starts with the omnivalent or the polyspecific test reagents. It must be noted that bacteria from the culture media with inhibitory additives can show weakened reactions.

The test reagents are absorbed immunosera from rabbits or a mixture of absorbed immunosera from rabbits and monoclonal antibodies or they contain monoclonal antibodies only.

Group specific test reagents

They enable allocation to the serological O groups.

Monospecific test reagents

The serotype is identified using the monospecific test reagents.

Control antigens

They are used to check the agglutinability of test reagents and for quality control when carrying out the slide agglutination test.

Application and storage

The products must be stored at 2-8 °C. Under these conditions, they can be used until the specified date. After the initial opening and dissolving in the stated quantity of distilled water, lyophilisates must be well sealed using the supplied screw pipettes and then stored at 2-8 °C. They are ready to use after rehydration. The shelf lives of the rehydrated products are specified in the relevant IFU. The products can only be used until the date stated on the label, however.

The products are preserved by adding sodium azide or other declared substances. To prevent bacterial contamination, the bottles should be sealed after use and stored again at 2-8 °C.

Certified Quality Management System in accordance with DIN EN ISO 9001 and DIN EN ISO 13485

All products are medical products. They meet the definitions and requirements of the Directive (EU) 2017/746 (IVDR) and therefore carry the CE label.

Introduction

Guidelines for laboratory diagnostics

This brochure provides you with practical information for using the products as well as the necessary scientific background.

Cultivation

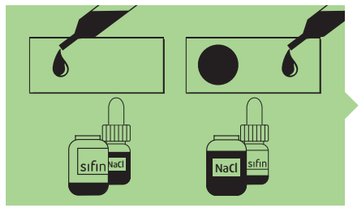
The samples must be cultivated on culture media appropriate for the material being tested.
For some test materials, enrichment on selective or non-selective culture media may be required.

Biochemical identification

Biochemical identification of colonies with suspect morphology on cultivation
Polytropic differentiation medium, e.g. Kligler, or commercial identification systems

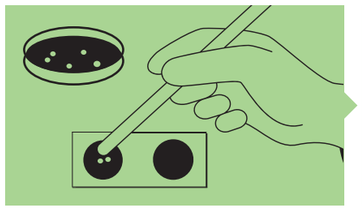
Before starting the serotyping, it is necessary to biochemically confirm the group to which the isolate belongs. For this purpose, alternative procedures (e.g. MALDI mass spectroscopy: MALDI-TOF) can also be used, presuming that the suitability of the procedure has been verified.

Test material and methodology



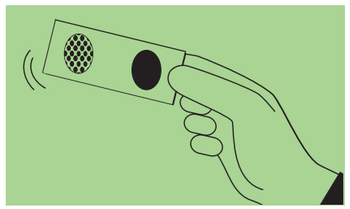
Addition of reagent
Place 1 drop of test reagent on a slide.

Addition of NaCl
Then place 1 drop of NaCl as negative control on the same slide.



Addition of the sample
A little bacterial mass is rubbed into a drop of **test reagent** on a slide (here on the left) and also in the **negative control NaCl** (right) to form a homogeneous, slightly milky suspension.

The examination material (sample) was previously incubated on non-selective culture medium for approx. 16-20 hours at 35-37 °C.



Evaluation of the results
The slide is held in front of a light source (against a black background) and the result read with the naked eye.

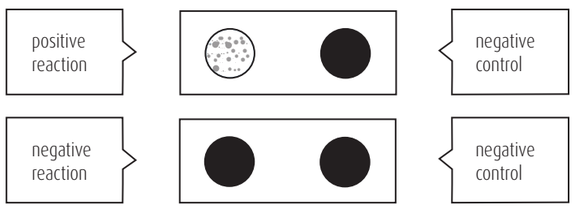
Positive reaction: Visible agglutination after 1 to 20 swirls (here on the left).

Negative reaction: The negative control with physiological saline solution remains milky-cloudy (here on the right).

In exceptional cases, selective culture media may have a negative effect on the agglutinability of the bacteria. By removing the Nutrient or Blood Agar and the Kligler culture medium, this problem is avoided. To exclude spontaneous agglutination, a negative control must be carried out using physiological saline instead of the test reagent.

Evaluation

The test can only be evaluated if the negative control remains milky-opaque.



Positive: Visible agglutination after the sample has been tilted back and forth less than 20 times. In a strongly positive reaction, agglutination (coarsely or finely flocculent) appears as soon as the bacterial mass is mixed in. In a weakly positive result, agglutination only appears after the slide has been tilted back and forth 10-20 times.

Negative: If the suspension remains milky-opaque or the reaction begins to occur only after the slide has been tilted back and forth more than 20 times, the result is negative.

Salmonella Diagnostics

DIAGNOSTICS WITH PASSION



Agglutination for professionals

Salmonellosis is a classic food contamination. The serovar *S.* Enteritidis is spread primarily in eggs or food and preparations containing eggs that have not been adequately heated, particularly if these foods contain raw eggs, e.g. ice cream. *Salmonella* are also often spread via raw meat or meat products that have not been heated or heated only inadequately, e.g. poultry, minced meat (www.rki.de). But other foods are also affected, such as arugula salad.

The genus *Salmonella* is a member of the Enterobacterales. All *Salmonella* are obligate pathogens. *S.* Typhi and *S.* Paratyphi (A, B, C) induce cyclic infectious disease. These typhoid *Salmonella* are rare in industrial countries and are generally imported infections. In contrast, non-typhoid *Salmonella* are one of the most common causes of bacterial gastroenteritis in humans. The infection is caused by ingesting the pathogen by mouth.

Contents

- Basics
- Salmonella laboratory
- Important antigens for serotyping
- Test reagents for serotyping

Overview

- Flowchart for the serotyping
- Test reagents for screening
- Coverage of O-Group Pools
- Coverage of H-Phase Pools
- Determination of the O groups
- Determination of the O antigens
- Anti-Salmonella O
- Anti-Salmonella Vi
- Anti-Salmonella H
- Control antigens
- Examples of serotyping
- Salmonella scheme



Salmonella Diagnostics

Principles

Salmonella are ubiquitous Gram-negative, rod-shaped, oxidase-negative, facultative anaerobic, non-sporulating bacteria that usually form colonies with a diameter of 2 to 4 mm on solid culture media.

Biochemical tests enable differentiation of the two species *Salmonella enterica* and *Salmonella bongori* with *S. enterica* further divided into 6 subspecies:

- *Salmonella enterica* ssp. *enterica*
- *Salmonella enterica* ssp. *salamae*
- *Salmonella enterica* ssp. *arizonae*
- *Salmonella enterica* ssp. *diarizonae*
- *Salmonella enterica* ssp. *houtenae*
- *Salmonella enterica* ssp. *indica*

The internationally authoritative foundation used to classify Salmonella is the **White-Kauffmann-Le Minor scheme**. The WHO Collaborating Centre for Reference and Research on *Salmonella* at the Institut Pasteur in Paris is responsible for regularly updating the 'Antigenic formulae of the *Salmonella* serovars' which forms the basis of the allocation of the serovar names and antigen formulae to isolates of *Salmonella* species.

Salmonella laboratory diagnostics

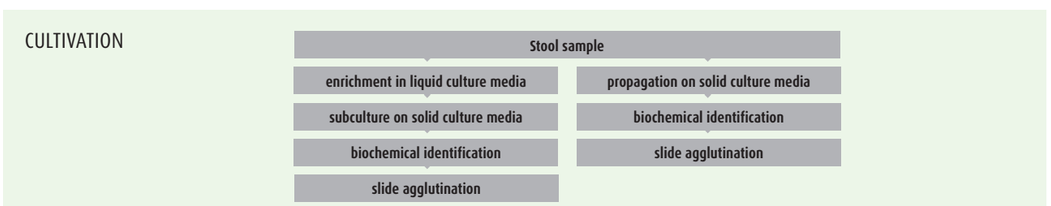
Laboratory diagnostics for non-typhoidal (enteritic) and typhoidal Salmonella include pathogen detection from stool, blood, or other suitable samples, as well as serological testing for typing. The following information refers only to direct pathogen detection.

Test material

- **Specimens of faecal origin**
  stool, rectal swab
- **Specimens of extraintestinal origin**
  blood, urine, liquor, punctates, swabs, lymph nodes, bone marrow
- **Other specimens**
  vomit, food leftovers

Cultivation

Example for stool samples



Biochemical identification

Before starting the serotyping, it is necessary to biochemically confirm the group to which the isolate belongs. For this purpose, alternative procedures (e.g. MALDI mass spectroscopy: MALDI-TOF) can also be used, presuming that the suitability of the procedure has been verified.

Serotyping

The *Salmonella* genus is characterised by exceptionally high serological diversity. There are currently more than 2600 serovars known. Identifying the serovar (*Salmonella* with an individual combination of several antigens) is considered very important because this provides information about the diagnosis of the pathogen (e.g. *S.* Typhi, *S.* Paratyphi), the frequency and distribution of the serovars and the sources of infection and transmission routes. The serotyping is used to identify the presence or absence of specific O antigens, H antigens and the Vi antigen in an isolate that has been confirmed as *Salmonella*. **Generally, the O antigens are first identified followed by the H antigens.** For biphasic strains, both H phase antigens must be identified. If only one phase can be identified, the swarming inhibition method must be used to induce the second phase. For optimum formation of the Salmonella H antigens, swarm agar is suitable (see phase induction). If the Vi antigen is present, it may mask evidence of the presence of O antigens. To detect O antigens, it may therefore be necessary to heat an antigen suspension of the isolate for 60 minutes at 100 °C or 15 minutes at 120 °C. This leads to destruction of the capsular antigen. The serovars are classified on the basis of the White-Kauffmann-Le Minor scheme.

Antigens for serotyping

O antigens

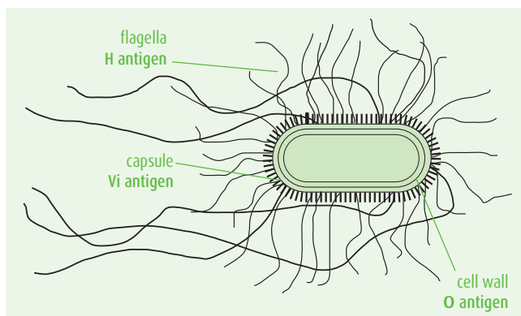
The O antigens are localised in the **cell wall** of the bacteria and are a component of the lipopolysaccharide (LPS). The LPS is made up of the lipid A, the core polysaccharide and the O-specific chain that represents the O antigen. The O antigens are made up of repeating units of oligosaccharides (3 to 8 monosaccharides). They are usually heat stable. The individual O antigens differ in their sequences and the type of bonds between the individual monosaccharides. Amongst the O antigens there are group-specific antigens that give the O group its name (e.g. O:2, O:4, O:9) and O antigens that may exist in addition to the group-specific antigen and that further characterise the corresponding serovar (e.g. O:5, O:27, O:20). **The serotyping is always started by identifying the O antigens:** the antigen characteristic for the group is first identified and then other O antigens follow if necessary.

H antigens

The *Salmonella* have, with few exceptions, peritrichous flagella and are thus motile. These **flagellae** are made up of a protein (flagellin) and are the H antigens. Due to their proteinaceous nature, they are heat labile. The specificity of the many H antigens is determined by the amino acid composition and sequence as well as the tertiary structure. **Most *Salmonella* can form flagellar proteins with two different structures (biphasic strains) that are referred to as phase 1 H antigens and phase 2 H antigens.** Both phases may be present in one culture or only one of the two may be more pronounced. In general, the H antigens develop best on swarm agar. The serotyping of a *Salmonella* serovar is only complete once both H antigens (applies to biphasic strains) have been identified. If, however, only one phase can be detected, the strain must be 'forced' to form the other phase. The methods used to achieve this are described in the chapter on using the H test reagents.

Vi antigen

The **capsular antigen** of the *Salmonella* species is the **Vi antigen**, which is only present in S. Typhi, S. Paratyphi C and very rarely in S. Dublin. The Vi antigen is a polysaccharide but it is heat labile due to the presence of acetyl groups. The special feature of this antigen is that it can mask the **O antigen** because it is a capsular antigen. Only the destruction of the capsular antigen by boiling enables O agglutination of the corresponding strain. The H agglutination is not inhibited by the capsular antigen. It must be carried out on the native strain without boiling.

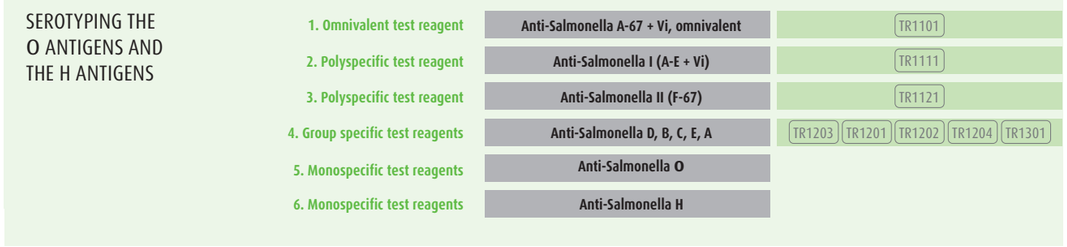


Test reagents for serotyping

The serotyping has been carried out for decades using a range of polyvalent, group-specific and monospecific test reagents. The antigen analysis using antisera with known antibodies is referred to as the Gruber test and is carried out qualitatively on a slide (slide agglutination test). These test reagents are still prepared around the world based on animal immunosera (pAb). Since 1994 sifin diagnostics gmbh has produced a number of test reagents for serotyping *Salmonella* based on internally developed monoclonal antibodies (mAb). sifin diagnostics gmbh currently has more than 118 mAb for preparing Anti-Salmonella test reagents: 75 mAb Anti-Salmonella O for 66 products and 43 mAb Anti-Salmonella H for 28 products.

Performance of serodiagnostics

Flowchart for the serotyping



1. The **Anti-Salmonella A-67 + Vi** test reagent is used for serological evidence of Salmonella O antigens using the slide agglutination test for the confirmation of *Salmonella* spp.
2. The **Anti-Salmonella I** test reagent is used to classify isolates that agglutinate with the omnivalent test reagent into **groups A to E**.
3. The **Anti-Salmonella II** test reagent is used to classify isolates that agglutinate with the omnivalent test reagent but not Anti-Salmonella I into **groups O:11 (F) - 67**.
4. The **Anti-Salmonella D, B, C, E, A** group-specific test reagents are used to identify the serogroup of *Salmonella* that agglutinates with the omnivalent test reagent and/or the polyspecific test reagent Anti-Salmonella I. They exclusively agglutinate *Salmonella* of the declared serogroup.
5. Monospecific test reagents **Anti-Salmonella O**: The Anti-Salmonella monospecific test reagents are used either to identify the group-specific O antigens and thus to allocate an isolate to the appropriate group in the White-Kauffmann-Le Minor scheme or to detect additional O antigens if they are required for identifying or verifying the serovar.
6. Monospecific test reagents **Anti-Salmonella H**: For serotyping Salmonella, it is necessary to identify the H antigen(s) as well as the O antigens. For biphasic strains the H antigens of both phases must be identified. The Anti-Salmonella H test reagents are used to identify or verify the H antigens or H antigen complex of Salmonella strains according to the White-Kauffmann-Le Minor scheme with the help of the slide agglutination test. It enables identification of the serovar.

Benefits of monoclonal antibodies

- ✓ Monoclonal antibodies are each made up of an absolutely uniform antibody population. The population is uniform in terms of the immunoglobulin class, specificity, avidity and heat stability. These very extensively investigated properties of the particular monoclonal antibody remain unchanged throughout all the manufacturing steps.
- ✓ They can be standardised and adjusted to a precisely reproducible antibody concentration whereby a consistent quality across different batches is guaranteed.
- ✓ Monoclonal antibodies lead to rapid and significant agglutination for all the serovars that have the homologous antigen, regardless of other antigens or partial antigens that may be present.
- ✓ Monoclonal antibodies are free of additional antibodies.
- ✓ The production of monoclonal antibodies is independent of immunoserum donors. They are produced using biotechnology by harvesting cell culture supernatants containing antibodies.
- ✓ Antibody specificities that cannot be produced by polyclonal means e.g. O:3, O:13, H:1, H:e, H:**I**, H:n) can also be isolated as monoclonal antibodies.

Test reagents used for the confirmation

Test material

For the slide agglutination test using polyvalent, group-specific and monospecific test reagents, start with a subculture of the suspect colony or colonies, preferably on non-selective or Kligler Agar, alternatively for screening also on selectivity level 1 and 2 agar.

Before starting the serotyping, it is necessary to confirm biochemically that the isolate belongs to the *Salmonella* genus. For this purpose, alternative procedures (e.g. MALDI mass spectroscopy: MALDI-TOF) can also be used, presuming that the suitability of the procedure has been verified.

Anti-Salmonella A - 67 + Vi, omnivalent

The test reagent is used for the confirmation of bacteria in the *Salmonella* genus. It must rapidly and significantly agglutinate all *Salmonella*, that is, a negative result must indicate the absence of *Salmonella* with a high likelihood. Due to this high requirement for sensitivity, limitations on the specificity are unavoidable. Non-specific positive results are possible due to antigen relationships or identities.

Many cross-reactions based on an antigen relationship may be excluded by using monoclonal antibodies. Antigen identities, however, are also detected if monoclonal antibodies are used. This includes, e.g. certain serovars of *E. coli* and *Citrobacter* spp., some *Proteus* spp. and occasionally *Hafnia alvei* strains. The *Salmonella* antigens O:30, O:35, O:43 and O:50 are known to cross-react with *E. coli* O antigens and the *Salmonella* antigens O:4, O:7 and O:8 cross-react with *Citrobacter* O antigens. *E. coli* strains can generally be differentiated from *Salmonella* due to the lactose fermentation and the lack of formation of H_2S. The exceptions are the lactose-negative *E. coli* strains.
Lactose-negative *Citrobacter* strains that form H_2S often cannot be differentiated from *Salmonella* by means of their colony morphology. They can also be agglutinated by the omnivalent test reagent as a result of an antigen relationship or identity. Biochemical methods such as the PYRase, lysine decarboxylase or KDN tests must be used for differentiation. Cross-reactions with all serovars of *Shigella flexneri* and with *Shigella sonnei* (S and F form) are excluded.

Procedure: slide agglutination | Storage: 2...8 °C | Preservative: sodium azide 0.9 mg/ml

Art. No.	Product	Description	Liquid | Lyo.	Packing
TR1101	**Anti-Salmonella A - 67 + Vi, omnivalent**	A mixture of monoclonal antibodies in the form of cell culture supernatants. Contains all antibodies against the group-specific Salmonella O antigens. Detects all *Salmonella* in groups A to 67 and the Vi antigen. Used for the confirmation of *Salmonella* spp.	liquid	1 ml
TR1101-01			liquid	5 ml

Anti-Salmonella I (A - E + Vi)

The test reagent is used to classify isolates that agglutinate with the omnivalent test reagent into groups A to E.
For isolates from human test material, it can be used instead of the omnivalent test reagent as an orienting examination of suspect colonies for the presence of bacteria in the *Salmonella* genus because about 98 % of the *Salmonella* serovars isolated from humans can be allocated to groups A to E. Due to antigen identities or relationships, cross-reactions with Anti-Salmonella I, e.g. with *Citrobacter* spp., *Proteus* spp., *E. coli* or *Hafnia alvei*, are possible.

Procedure: slide agglutination | Storage: 2...8 °C | Preservative: sodium azide 0.9 mg/ml

Art. No.	Product	Description	Liquid | Lyo.	Packing
TR1111	**Anti-Salmonella I (A - E + Vi)**	A mixture of monoclonal antibodies in the form of cell culture supernatants. Agglutinates salmonellae of the groups O:2 (A) to O:1,3,19 (E_4). *Salmonella* from groups O:11 (F) to O:67 are not agglutinated.	liquid	1 ml
TR1111-01			liquid	5 ml

Anti-Salmonella II (F - 67)

The Anti-Salmonella II test reagent is used to classify isolates that agglutinate with the omnivalent test reagent but not Anti-Salmonella I into groups O:11 (F) - 67.

Due to antigen identities or relationships, cross-reactions with Anti-Salmonella II, e.g. with *Citrobacter* spp., *Proteus* spp., *E. coli* or *Hafnia alvei*, are possible.

Procedure: slide agglutination | Storage: 2...8 °C | Preservative: sodium azide 0.9 mg/ml

Art. No.	Product	Description	Liquid | Lyo.	Packing
TR1121	**Anti-Salmonella II (F - 67)**	A mixture of monoclonal antibodies in the form of cell culture supernatants. Agglutinates salmonellae of the groups O:11 (F) to O:67. Does not contain any antibodies against Salmonella from groups O:2 (A) to O:1,3,19 (E_4). The test reagent is ready-to-use after dissolving in 1 ml or 5 ml distilled water.	lyophilised	1 ml
TR1121-01			lyophilised	5 ml

Anti-Salmonella Poly-H Phase 1 & 2

The test reagent is used for serological evidence of the presence of the H antigens of *Salmonella* strains.
Cross-reactions with other genera in the *Enterobacteriaceae* family could not be demonstrated with this test reagent.
Positive serological results alone are not evidence of the presence of *Salmonella*. Allocation to the *Salmonella* genus by biochemical means is therefore necessary. A negative result does not exclude the presence of *Salmonella* with absolute certainty.

Procedure: slide agglutination | Storage: 2...8 °C | Preservative: sodium azide 0.9 mg/ml

Art. No.	Product	Description	Liquid | Lyo.	Packing
TR1141	**Anti-Salmonella Poly-H Phase 1 & 2**	Contains antibodies covering H-antigens or complexes: a, b, c, d, E, G, i, k, L, r, y, z, z_4, z_6, z_{10}, z_{29}, z_{35}, z_{38}, z_{41}, H:1. Antibodies that detect complex antigens, such as Anti-H:E, -H:L or -H:1, detect all combinations of the antigens H:e, H:**l** or H:1.	liquid	1 ml
TR1141-01			liquid	5 ml

Antigen detection for A - 67 + Vi, A - E + Vi, F - 67

Test Reagent	Agglutination of a *Salmonella* isolate	
Anti-Salmonella A - 67 + Vi, omnivalent	+	+
Anti-Salmonella I (A - E + Vi)	+	–
Anti-Salmonella II (F - 67)	Examination not required.	+
Result	**Group A-E**	**Group F-67**
Frequency	common	rare

Coverage of O-Group Pools

O-Group Pool test reagents (alternative to Anti-Salmonella I or Anti-Salmonella II)

O group pool test reagents can be used as an alternative to Anti-Salmonella I or Anti-Salmonella II for initial allocation of suspect *Salmonella* isolates from test material of human or other origin (e.g. food or environmental samples) to seven different O group pools. If the isolated strain has a *Salmonella* antigen corresponding to the detection range of the O group pool test reagent, this is bound to the specific antibody when they are mixed together. As a result of the antigen-antibody reaction, significant visible agglutination of the strain is observed.

Testing with the O group pool test reagents Anti-Salmonella OMA and Anti-Salmonella OMB, which detect about 98 % of the Salmonella, is then carried out. If a strain does not agglutinate with these two test reagents, it should be tested with the Anti-Salmonella Vi (REF TR1316). If the reaction to this test is negative, the strain should be agglutinated with the O group pool test reagents Anti-Salmonella OMC, Anti-Salmonella OMD, Anti-Salmonella OME, Anti-Salmonella OMF and Anti-Salmonella OMG. Further serological differentiation must be carried out with the White-Kauffmann-Le Minor scheme. Due to antigen identities or relationships, cross-reactions with O-Group Pool test reagents, e.g. with *Citrobacter* spp., *Proteus* spp., *E. coli* or *Hafnia alvei*, are possible.

Procedure: slide agglutination | Storage: 2...8 °C | Preservative: sodium azide 0.9 mg/ml

Art. No.	Product	O-Groups	Liquid | Lyo.	Packing
TR1151	**Anti-Salmonella OMA**	(A, B, D, E, L)	liquid	1 ml
TR1151-01			liquid	3 ml
TR1161	**Anti-Salmonella OMB**	(C, F, G, H)	liquid	1 ml
TR1161-01			liquid	3 ml
TR1170	**Anti-Salmonella OMC**	(I, J, K, M, N, O, P)	liquid	1 ml
TR1171	**Anti-Salmonella OMD**	(Q, R, S, T, U, V, W)	liquid	1 ml
TR1172	**Anti-Salmonella OME**	(X, Y, Z, 51, 52, 53)	liquid	1 ml
TR1173	**Anti-Salmonella OMF**	(54, 55, 56, 57, 58, 59)	liquid	1 ml
TR1174	**Anti-Salmonella OMG**	(60, 61, 62, 63, 65, 66, 67)	liquid	1 ml
TR1316	**Anti-Salmonella Vi**		liquid	1 ml

Coverage of H-Phase Pools

H-Phase Pool test reagents

The test, using polyspecific H-Phase Pool test reagents Anti-Salmonella HMA, Anti-Salmonella HMB or Anti-Salmonella HMC, enables the identification of the most common H-antigens or H-antigen complexes of *Salmonella* strains. Furthermore the presence of the antigen complex H:1 should be tested by Anti-Salmonella H:1 (REF TR1437, TR1437-01).

Procedure: slide agglutination | Storage: 2...8 °C | Preservative: sodium azide 0.9 mg/ml

Art. No.	Product	H-Antigens	Liquid | Lyo.	Packing
TR1181	**Anti-Salmonella HMA**	(a, b, c, d, i, z_{10}, z_{29})	liquid	1 ml
TR1181-01			liquid	3 ml
TR1183	**Anti-Salmonella HMB**	(E, G)	liquid	1 ml
TR1183-01			liquid	3 ml
TR1185	**Anti-Salmonella HMC**	(k, y, z, L, Z_4, r)	liquid	1 ml
TR1185-01			liquid	3 ml

Determination of the O groups

Group specific test reagents Anti-Salmonella

Mixtures of monoclonal antibodies of the corresponding specificities in the form of cell culture supernatants. For identification of the serogroup of *Salmonella* spp. that agglutinate with the omnivalent test reagent and/or the polyspecific test reagent Anti-Salmonella I or alternatively with the O group pool test reagents. They exclusively agglutinate *Salmonella* of the declared serogroup.

According to the frequency of the reported serovars, the group-specific test reagents should be used in the following order:

1. Anti-Salmonella Group D
2. Anti-Salmonella Group B
3. Anti-Salmonella Group C
4. Anti-Salmonella Group E
5. Anti-Salmonella O:2 corresponds to Anti-Salmonella Group A

Procedure: slide agglutination | Storage: 2...8 °C | Preservative: sodium azide 0.9 mg/ml

Art. No.	Product	Description	Liquid | Lyo.	Packing
TR1201 TR1201-01	**Anti-Salmonella Group B**	Records all antigen combinations of group O:4 (B). Salmonella in group B are verified using Anti-Salmonella Group B (O:4,5,27). All possible antigen combinations for this O group are detected. A cross-reaction with strains in group D_3 (O:9,12,46,27) via O:27 is theoretically possible. Strains from this group are very rare, however. Anti-Salmonella O:4 can be used instead of Anti-Salmonella Group B. Cross-reactions with other Salmonella are excluded.	liquid liquid	1 ml 5 ml
TR1202	**Anti-Salmonella Group C**	Records all strains of group O:7 (C_1) and O:8 (C_2-C_3). Salmonella in group C are verified using Anti-Salmonella Group C (O:7,8). The mixture of the two monoclonal antibodies Anti-Salmonella O:7 and Anti-Salmonella O:8 enables detection of all strains in group C. Unlike polyclonal test reagents, cross-reactions with strains from groups O:6,14 (H) and O:18 (K) via the O:6 antigen are excluded.	liquid	1 ml
TR1203 TR1203-01	**Anti-Salmonella Group D**	Records all strains of group O:9 (D_1), O:9,46 (D_2) and O:9,46,27 (D_3). Salmonella in group D are verified using Anti-Salmonella Group D (O:9,Vi). The test reagent detects all possible antigen combinations for this group. Because the presence of the Vi antigen can inhibit the ability of *S.* Typhi to agglutinate due to anti-O:9, Anti-Salmonella Group D contains anti-Vi as well as anti-O:9. The presence of these antibodies means a reaction with *S.* Paratyphi C (O:6,7,Vi; group C) is possible. Serotypes in group D_2 can also contain the factors O:3 and O:10, the latter very weakly. Phage conversion due to ε_{15} and ε_{34} is possible as in group E. These serovars then react with the homologous antibodies of group E. Cross-reactions with Salmonella from other groups are excluded.	liquid liquid	1 ml 5 ml
TR1204	**Anti-Salmonella Group E (O:3 complex)**	Records all strains of group O:3,10; O:3,15; O:3,15,34 (E_1) and O:1,3,19 (E_4). Group O:3,10 also includes the previous groups O:3,15 (E_2) and O:3,15,34 (E_3). Salmonella in group E are verified with Anti-Salmonella Group E. The test reagent can also react with serovars from group D_2 (O:9,46) because these can have low levels of the antigen O:3 (and O:10) and for the same reason can also occur after lysogenisation of the antigen O:15 or the antigens O:15 and O:34 (see Group D).	liquid	1 ml

Determination of the O antigens

The Anti-Salmonella monospecific test reagents are used either to identify the group-specific O antigens and thus to allocate an isolate to the appropriate group in the White-Kauffmann-Le Minor scheme or to detect additional O antigens if they are required for identifying or verifying the serovar.

The test reagents are monoclonal antibodies, test sera or a mixture of monoclonal antibodies and test serum. Monoclonal antibodies are produced from cell culture supernatants of hybridoma cell lines that secrete antibodies against the corresponding *Salmonella* antigens. The test sera are sera from immunised rabbits from which non-specific agglutinins are removed by absorption.

The test reagents for rare specificities are lyophilised and are ready to use after dissolving in 1 ml distilled water.

The possible antigen combinations in the O groups, the O antigens to be identified by serotyping and the required test reagents are indicated, as well as the frequency expected for the antigen combination in isolates from the corresponding group.

Group O:2 (A)

Possible antigen combinations: 1,2,12 and 2,12 (antigen O:1 is induced by phage conversion and is therefore underlined)
The group-specific antigen O:2 must be identified. It is not necessary to identify antigen O:12 and where applicable antigen O:1.
Anti-Salmonella O:2 detects all strains in group A.

Group O:4 (B)

Possible antigen combinations: O:4,12; O:1,4,12; O:4,5,12; O:1,4,5,12; O:4,12,27; O:1,4,12,27.
Antigens O:4, O:5 and O:27 must be identified; it is not necessary to identify antigen O:12 and where applicable antigen O:1.
Anti-Salmonella O:4 detects all strains in group B regardless of the antigen combination.
Anti-Salmonella O:5 detects all strains in group B, provided they have antigen O:5.
Anti-Salmonella O:27 detects all strains in group B, provided they have antigen O:27.

Antigen detection for O:4, O:5, O:27

Test Reagent	Agglutination of a *Salmonella* isolate		
Anti-Salmonella O:4	+	+	+
Anti-Salmonella O:5	+	–	–
Anti-Salmonella O:27	Examination not required because the antigens O:5 and O:27 do not occur together.	+	–
Result	**O:4,5,12**	**O:4,12,27**	**O:4,12** This result can also occur in strains that generally have antigen O:5, e.g. *S.* Typhimurium O:5- (early variant Copenhagen).
Frequency in the O group	common	rare	rare

Group O:7 (C_1) and Group O:8 (C_2-C_3)

Possible antigen combinations: O:6,7; O:6,7,Vi; O:6,7,14; O: 6,8; O:8; O:8,20.
Antigens O:7, O:8 as well as O:20 and O:6 in group C_2-C_3 must be identified.

Anti-Salmonella O:7 detects all strains in group C_1.
The O:6 antigen from group C_1 is the partial antigen O:6_2; it does not have to be identified.

Anti-Salmonella O:8 detects all strains in group C_2-C_3.

Anti-Salmonella O:6_1 is used to analyse serovars from groups C_2-C_3 for the absence or presence of the antigen O:6 (strains with antigen O:6,8).
The O:6 antigen from group C_2-C_3 is the partial antigen O:6_1.
Note: Does not include the antigen O:6_2 from the group O:7 (C_1). Does not agglutinate antigen O:6,14 (H).

Anti-Salmonella O:20 is used to differentiate the strains in the group C_2-C_3 by detecting the antigen O:20 (strains with antigen O:8,20).
If the result with Anti-Salmonella O:6_1 and Anti-Salmonella O:20 is negative, the strain only contains O:8.

Antigen detection for O:7, O:8, O:6_1, O:20

Test Reagent	Agglutination of a *Salmonella* isolate			
Anti-Salmonella O:7	+	–	–	–
Anti-Salmonella O:8	Examination not required.	+	+	+
Anti-Salmonella O:6_1	Examination not required.	+	–	–
Anti-Salmonella O:20	Examination not required.	Examination not required, because the antigens O:6 and O:20 do not occur together.	+	–
Result	**O:6,7**	**O:6,8**	**O:8,20**	**O:8**
Frequency in the O group	common	common	rare	very rare

Group O:9 (D_1), Group O:9,46 (D_2) and Group O:9,46,27 (D_3)

Possible antigen combinations: O:9,12; O:9,12,Vi; O:1,9,12; O:9,46, (extremely rare: O:1,9,12,46,27).
The antigens O:9, O:46, Vi, (O:27) must be identified. For isolates that showed a positive result for the Anti-Salmonella Group D, the agglutination may be caused by anti-O:9 and/or anti-Vi.

Anti-Salmonella O:9 detects all strains in group D regardless of the antigen combination. The agglutination can be inhibited by a very highly developed Vi antigen. With a negative result with Anti-Salmonella O:9 and a positive result with Anti-Salmonella Vi, the indicated procedure must be used.

Differentiation within group D is carried out using the following test reagents:

Anti-Salmonella O:46 detects all strains in group D_2 (O:9,46) and does not react with the strains in group D_1 (O:9,12). Strains in group D_3 are not agglutinated or only weakly agglutinated. Serovars in group D_3 are characterised by a positive result with Anti-Salmonella O:9 and **Anti-Salmonella O:27**.

Antigen detection for O:9, Vi, O:46, O:27

Test Reagent	Agglutination of a *Salmonella* isolate				
Anti-Salmonella O:9	+	+	–	+	+
Anti-Salmonella Vi	–	+	+	–	–
Anti-Salmonella O:46	–	Examination not required.	Examination not required.	+	+/–
Anti-Salmonella O:27	–	Examination not required.	Examination not required.	–	+
Result	**O:9,12**	**S. Typhi S. Dublin**	**S. Typhi, S. Paratyphi C or S. Dublin** *)	**O:9,46**	**O:9,12,46,27**
Frequency in the O group	very common	rare	rare	very rare	extremely rare

*) **S. Typhi, S. Paratyphi C or S. Dublin:** Inhibition of the O agglutination due to a highly developed Vi antigen. From the pure culture of the isolate, a suspension is prepared in isotonic sodium chloride solution that is heated for 60 min at 100 °C or 15 min at 120 °C.
This destroys the Vi antigen. If the reaction of the sediment with Anti-Salmonella O:9 after centrifugation is positive, the serovar is *S.* Typhi or *S.* Dublin. With a negative reaction with Anti-Salmonella O:9, the serovar must then be tested with Anti-Salmonella O:7.
With a positive result with O:7, the serovar can only be *S.* Paratyphi C.

Group O:3,10 (E_1) and Group O:1,3,19 (E_4)

Possible antigen combinations: O:3,10; O:3,15, O:3,15, 34, O:1,3,19 (extremely rare: O:1,3,10,19; O:1,3,15,19). The antigens O:10, O:15, O:19 and O:34 must be identified.

Anti-Salmonella O:10 detects all strains in group E_1 (O:3,10) that have not been converted by the phages ε_{15} or ε_{15} and ε_{34}. The test reagent does not react with the strains in group E_1 after phage conversion (previously groups E_2 and E_3) because the antigen O:10 can no longer be detected after lysogenisation. Strains from group E_4 are not agglutinated unless they have the antigen O:10 (e.g. *S.* Chittagong, O:1,3,10,19).

Anti-Salmonella O:15 detects all strains in group E_1 after conversion by the phages ε_{15} or ε_{15} and ε_{34} (previously groups E_2 and E_3). The test reagent does not react with the strains in group E_1 (O:3,10). Strains from group E_4 are not agglutinated unless they have the antigen O:15 (e.g. *S.* Dessau, O:1,3,15,19).

Anti-Salmonella O:19 detects all strains in group E_4. The test reagent does not react with the strains in group E_1 (O:3,10; O:3,15, O:3,15, 34).

Anti-Salmonella O:34 detects all strains in group E_1 after conversion by the phages ε_{15} and ε_{34} (previously group E_3). It does not react with the strains O:3,10 or O:3,15 and strains in group E_4 but does cross-react with the Salmonella antigens $O:12_2$, O:28 and O:55 and can therefore only be used to differentiate serovars within group E_1. Serovars in group D_2 (O:9,46) can have the antigens O:3 and O:10, as well as O:15 and O:34 due to phage conversion by ε_{15} and ε_{34}, and then react with the homologous antibodies from group E.

Antigen detection for O:10, O:15, O:34, O:19

Test Reagent	Agglutination of a *Salmonella* isolate					
Anti-Salmonella O:10	+	–	–	–	+	–
Anti-Salmonella O:15	Examination not required.	+	+	–	Examination not required.	+
Anti-Salmonella O:34	Examination not required.	–	+	Examination not required.	Examination not required.	–
Anti-Salmonella O:19	–	–	Examination not required.	+	+	+
Result	**O:3,10**	**O:3,15**	**O:3,15,34**	**O:1,3,19**	**O:1,3,10,19**	**O:1,3,15,19**
Frequency in the O group	common	rare	rare	very rare	extremely rare	extremely rare

Monospecific test reagents Anti-Salmonella O

Procedure: slide agglutination | Storage: 2...8 °C | Preservative: sodium azide 0.9 mg/ml

Art. No.	Product	Description	Liquid | Lyo.	Packing
TR1301	**Anti-Salmonella O:2**	Detects all strains in group A. Possible antigen combinations: 1,2,12 and 2,12 (antigen O:1 is induced by phage conversion and is therefore underlined). The group-specific antigen O:2 must be identified. It is not necessary to identify antigen O:12 and where applicable antigen O:1.	liquid	1 ml
TR1302 TR1302-01	**Anti-Salmonella O:4**	Detects all strains in group B regardless of the antigen combination. Possible antigen combinations: O:4,12; O:1,4,12; O:4,5,12; O:1,4,5,12; O:4,12,27; O:1,4,12,27. The antigens O:4, O:5 and O:27 or antigens O:1 and O:12 must be determined.	liquid liquid	1 ml 5 ml
TR1303 TR1303-01	**Anti-Salmonella O:5**	Detects all strains in group B, provided they have antigen O:5.	liquid liquid	1 ml 5 ml
TR1304	**Anti-Salmonella O:6_1**	Group C_2-C_3 Used to analyse serovars from group C_2-C_3 for the absence or presence of the antigen O:6 (strains with antigen O:6,8). The O:6 antigen from group C_2-C_3 is the partial antigen $O:6_1$.	lyophilised	1 ml
TR1305	**Anti-Salmonella O:7**	Detects all strains in group C_1. The O:6 antigen from group C_1 is the partial antigen $O:6_2$; it does not have to be identified.	liquid	1 ml
TR1306	**Anti-Salmonella O:8**	Detects all strains in group C_2-C_3.	liquid	1 ml
TR1307 TR1307-01	**Anti-Salmonella O:9**	Detects all strains in group D regardless of the antigen combination. The agglutination can be inhibited by a very highly developed Vi antigen.	liquid liquid	1 ml 5 ml
TR1308	**Anti-Salmonella O:10**	Group E_1 and Group E_4 Detects all strains in group E_1 (O:3,10) that have not been converted by the phages ε_{15} or ε_{15} and ε_{34}. Does not react with the strains in group E_1 after phage conversion (previously groups E_2 and E_3) because the antigen O:10 can no longer be detected after lysogenisation. Strains from group E_4 are not agglutinated unless they have the antigen O:10 (e.g. *S.* Chittagong, O:1,3,10,19).	liquid	1 ml
TR1323	**Anti-Salmonella O:11**	Group F	lyophilised	1 ml
TR1325	**Anti-Salmonella O:13**	Group G	lyophilised	1 ml
TR1309	**Anti-Salmonella O:14**	Group H Detects only the O:14 antigen in the H group but not that of the C_1 group.	lyophilised	1 ml
TR1310	**Anti-Salmonella O:15**	Group E_1 Detects all strains in group E_1 after conversion by the phages ε_{15} or ε_{15} and ε_{34} (previously groups E_2 and E_3). Does not react with the strains in group E_1 (O:3,10). Strains from group E_4 are not agglutinated unless they have the antigen O:15 (e.g. *S.* Dessau, O:1,3,15,19).	liquid	1 ml

Art. No.	Product	Description	Liquid | Lyo.	Packing
TR1328	**Anti-Salmonella O:16**	Group I	lyophilised	1 ml
TR1329	**Anti-Salmonella O:17**	Group J	lyophilised	1 ml
TS1330	**Anti-Salmonella O:18**	Group K	lyophilised	1 ml
TR1311	**Anti-Salmonella O:19**	Group E_4 Detects all strains in group E_4. Does not react with the strains in group E_1 (O:3,10; O:3,15, O:3,15,34).	liquid	1 ml
TR1312	**Anti-Salmonella O:20**	Used to differentiate the strains in groups C_2-C_3 by detecting the antigen O:20 (strains with antigen O:8,20). If the result with Anti-Salmonella $O:6_1$ and Anti-Salmonella O:20 is negative, the strain only contains O:8.	liquid	1 ml
TR1331	**Anti-Salmonella O:21**	Group L	lyophilised	1 ml
TS1332	**Anti-Salmonella O:22**	Group G	lyophilised	1 ml
TR1335	**Anti-Salmonella O:25**	Group H	lyophilised	1 ml
TR1313	**Anti-Salmonella O:27**	Group B and Group D_3 Detects all strains in group B and D_3, provided they have antigen O:27.	liquid	1 ml
TR1336	**Anti-Salmonella O:28**	Group M	lyophilised	1 ml
TR1339	**Anti-Salmonella O:30**	Group N	lyophilised	1 ml
TR1314	**Anti-Salmonella O:34**	Group E_3 Detects all strains in group E_1 after conversion by the phages ε_{15} and ε_{34} (previously group E_3). Does not react with the strains O:3,10 or O:3,15 and strains in group E_4 but does cross-react with the Salmonella antigens $O:12_2$, O:28 and O:55 and can therefore only be used to differentiate serovars within group E_1. Serovars in group D_2 (O:9,46) can have the antigens O:3 and O:10, as well as O:15 and O:34 due to phage conversion by ε_{15} and ε_{34}, and then react with the homologous antibodies from group E.	liquid	1 ml
TR1341	**Anti-Salmonella O:35**	Group O	lyophilised	1 ml
TR1344	**Anti-Salmonella O:38**	Group P	lyophilised	1 ml
TR1345	**Anti-Salmonella O:39**	Group Q	lyophilised	1 ml
TR1346	**Anti-Salmonella O:40**	Group R	lyophilised	1 ml
TR1347	**Anti-Salmonella O:41**	Group S	lyophilised	1 ml
TR1348	**Anti-Salmonella O:42**	Group T	lyophilised	1 ml
TR1349	**Anti-Salmonella O:43**	Group U	lyophilised	1 ml
TR1350	**Anti-Salmonella O:44**	Group V	lyophilised	1 ml
TR1351	**Anti-Salmonella O:45**	Group W	lyophilised	1 ml

Art. No.	Product	Description	Liquid | Lyo.	Packing
TR1315	**Anti-Salmonella O:46**	Group D_2 Anti-Salmonella O:46 detects all strains in group D_2 (O:9,46) and does not react with the strains in group D_1 (O:9,12). Strains in group D_3 are not agglutinated or only weakly agglutinated.	liquid	1 ml
TR1353	**Anti-Salmonella O:47**	Group X	lyophilised	1 ml
TR1354	**Anti-Salmonella O:48**	Group Y	lyophilised	1 ml
TR1355	**Anti-Salmonella O:50**	Group Z	lyophilised	1 ml
TR1356	**Anti-Salmonella O:51**		lyophilised	1 ml
TR1357	**Anti-Salmonella O:52**		lyophilised	1 ml
TR1358	**Anti-Salmonella O:53**		lyophilised	1 ml
TR1359	**Anti-Salmonella O:54**		lyophilised	1 ml
TR1360	**Anti-Salmonella O:55**	Reacts with some strains of the group O:59.	lyophilised	1 ml
TR1361	**Anti-Salmonella O:56**		lyophilised	1 ml
TR1362	**Anti-Salmonella O:57**		lyophilised	1 ml
TR1363	**Anti-Salmonella O:58**		lyophilised	1 ml
TR1364	**Anti-Salmonella O:59**		lyophilised	1 ml
TR1365	**Anti-Salmonella O:60**		lyophilised	1 ml
TR1366	**Anti-Salmonella O:61**		lyophilised	1 ml
TR1367	**Anti-Salmonella O:62**		lyophilised	1 ml
TR1368	**Anti-Salmonella O:63**		lyophilised	1 ml
TR1369	**Anti-Salmonella O:65**		lyophilised	1 ml
TR1370	**Anti-Salmonella O:66**		lyophilised	1 ml
TR1371	**Anti-Salmonella O:67**		lyophilised	1 ml

Monospecific test reagent Anti-Salmonella Vi

The test reagent is used to identify the Vi antigen according to the White-Kauffmann-Le Minor scheme. It does not contain any additional antibodies.
Procedure: slide agglutination | Storage: 2...8 °C | Preservative: sodium azide 0.9 mg/ml

Art. No.	Product	Liquid | Lyo.	Packing
TR1316	**Anti-Salmonella Vi**	liquid	1 ml

Determination of the H antigens

The test reagents are monoclonal antibodies, test sera or a mixture of monoclonal antibodies and test serum.
Monoclonal antibodies are produced from cell culture supernatants of hybridoma cell lines that secrete antibodies against the corresponding *Salmonella* H antigens. The test sera are sera from immunised rabbits from which non-specific agglutinins are removed by absorption.

For serotyping *Salmonella*, it is necessary to identify the H antigen(s) as well as the O antigens. For biphasic strains the H antigens of both phases must be identified. The Anti-Salmonella H test reagents are used to identify or verify the H antigens or H antigen complex of *Salmonella* strains according to the White-Kauffmann-Le Minor scheme with the help of the slide agglutination test. It enables the identification of the serovar.

Anti-Salmonella H:E, Anti-Salmonella H:L and Anti-Salmonella H:1 detect all possible combinations of the antigen H:e (e,h; e,n,x; e,n,z_{15}; e,n,x,z_{15}), the antigen H:**I** (**I**,v; **I**,w; **I**,z_{13}; **I**,z_{28}; **I**,z_{13},z_{28}) or the antigen H:1 (1,2; 1,5; 1,6; 1,7).

Anti-Salmonella H:g detects all possible combinations of the G complex provided they contain the antigen H:g (z.B. f,g; f,g,s; f,g,t; g,m; g,m,s; g,p; g,q; g,s,t; g,t; g,z_{51}). To verify all serovars that contain antigens in the G complex, that is, including the antigen H:m,t, Anti-Salmonella H:g,m must be used.

The correspondingly labelled products Anti-Salmonella H can also be used with biphasic strains for induction of the unverifiable H phase (Sven Gard swarming inhibition method).

Anti-Salmonella H:E, H:g, H:I and H:1 inhibit all possible antigen combinations of the antigens H:e, H:g, H:**I** and H:1.
The lyophilised test reagents are ready to use after dissolving in 1 ml or 5 ml distilled water according to the declaration.

To verify the H antigens in the slide agglutination test, cultures on slant agar (e.g. Kligler culture medium) are suitable, ensuring the microbial material is collected from the lower, moist area of the slant agar. If verification of the H antigen is not successful, the strain must be inoculated on **Swarm Agar** (TN1702) for better characterisation of the flagellar antigens.

Sequence of testing using the Anti-Salmonella H test reagents

By identifying the O antigens the group of the isolate is determined. The sequence for the testing of the H antigens is determined by the epidemiologically more common serovars.

Example: For an isolate from group O:4 (B) and a positive reaction with Anti-Salmonella O:5, the presence of S. Typhimurium is most likely. Consequently, testing is first done with Anti-Salmonella H i and Anti-Salmonella H:1. If only one of the two antigens can be identified, phase induction must be carried out (see below).

With a negative result, Anti-Salmonella H:g (or Anti-Salmonella H:g,m) corresponding to the common serovars S. Derby (4,12:f,g:[1,2]) or S. Agona (4,12:f,g,s:[1,2]) must be used for testing.

With a negative result, other Anti-Salmonella H products must be used for analysis according to the frequency of the serovars. It must be noted that S. Typhimurium also commonly occurs as monophasic variants (1,4,[5],12:i:-).

Art. No.	Product	Description	Packing
TN1702	**Swarm Agar**	Enables salmonellae to swarm well, which promotes improved formation of the H-antigens. 1 tube contains 10 ml culture medium.	20 tubes

Swarm Agar
Art. No. TN1702

If verification of the H antigen is not successful, the strain must be inoculated on Swarm Agar for better characterisation of the flagellar antigens.



Phase induction

For biphasic strains that are only present in one H phase, the **Sven Gard swarming inhibition method** must be carried out to induce the 2nd phase. The Anti-Salmonella H test reagents suitable for phase induction are indicated in the table below.

Classical Sven Gard method
1. Mix 0.1 ml **Anti-Salmonella H** test reagent with 10 ml liquefied **Swarm Agar (TN1702)** (cooled to 40...45 °C) in a 6 cm diameter petri dish.
2. After the agar has solidified, **sprinkle the plate** with approx. **100 µl distilled water** and apply the strain at a single point in the centre of the dish.
3. Incubate the dish with the agar layer face down overnight at **35 to 37 °C**.
4. For the slide agglutination test, collect material from the edge of the dish. If the phase induction is not successful, the inhibition procedure must be repeated.

Simplified modified procedure
We recommend the following simplified method:
1. Prepare a dish (6 cm diameter) with 10 ml solidified **Swarm Agar (TN1702)**, add **0.1 ml Anti-Salmonella H** drop by drop and spread across the surface with a sterile glass spatula.
2. Then **inoculate the centre of the dish** and incubate as described above.
3. After **16 to 20 hours**, the strain that swarms can be used to identify the second, uninhibited H phase.

The simplified method usually enables the second phase to be identified at the first attempt. It also has the advantage of permitting swarm agar plates to be prepared and stored in advance and to be used as required for improving the expression of the H antigens or for the phase induction. The Anti-H products listed above as suitable for phase induction have been tested in this modified procedure and deliver results that are at least as good as in the classic method and in some cases, significantly better.

Special features

The test reagents against the complex antigens Anti-H E, Anti-H:g, Anti-H:L and Anti-H:1 are suitable for phase induction with strains possessing all possible antigen combinations in their respective complex. Thus Anti-Salmonella H:1 can be used to inhibit H:1,2, H:1,5, H:1,6 and H:1,7 with the same sucess as the polyclonal test reagent Anti-Salmonella H:1,2. The same applies for Anti-Salmonella H:E instead of Anti-H:e,h or Anti-Salmonella H:e,n,x, Anti-Salmonella H:L instead of Anti-Salmonella H:**I**,v etc.

Monospecific test reagents Anti-Salmonella H

Procedure: slide agglutination | Storage: 2...8 °C | Preservative: sodium azide 0.9 mg/ml

Art. No.	Product	Description	Phase induction	Liquid | Lyo.	Packing
TR1401	**Anti-Salmonella H:a**	mAb, H:a	x	liquid	1 ml
TR1402	**Anti-Salmonella H:b**	mAb, H:b	x	liquid	1 ml
TR1403	**Anti-Salmonella H:c**	mAb, H:c	x	liquid	1 ml
TR1404	**Anti-Salmonella H:d**	mAb, H:d	x	liquid	1 ml
TR1405	**Anti-Salmonella H:E**	mAb, H:e,h; H:e,n,x; H:e,n,z_{15}; H:e,n,x,z_{15}	x	liquid	1 ml
TR1405-01			x	liquid	5 ml
TR1407	**Anti-Salmonella H:f**	mAb, H:f,g; H:f,g,s; H:f,g,t		lyophilised	1 ml
TR1406	**Anti-Salmonella H:g**	mAb, all antigen combinations of the H:G complex except H:m,t e.g. H:f,g; H:f,g,s; H:f,g,t; H:g,m; H:g,m,s; H:g,p; H:g,p,u; H:g,q; H:g,s,t; H:g,t; H:g,z_{51}	x	liquid	1 ml
TR1406-01			x	liquid	5 ml

Art. No.	Product	Description	Phase induction	Liquid | Lyo.	Packing
TR1408	**Anti-Salmonella H:g,m**	mAb, all antigen combinations of H:G complexes, incl. H:m,t: e.g. H:f,g; H:f,g,s; H:f,g,t; H:g,p; H:g,p,u; H:g,q; H:g,s,t; H:g,t; H:g,z_{51} bzw. H:g,m; H:g,m,s,t; H:m,t	x	liquid	1 ml
TR1408-01			x	liquid	5 ml
TR1409	**Anti-Salmonella H:h**	mAb, H:e,h		liquid	1 ml
TR1410	**Anti-Salmonella H:i**	mAb, H:i	x	liquid	1 ml
TR1410-01			x	liquid	5 ml
TR1411	**Anti-Salmonella H:k**	mAb, H:k	x	lyophilised	1 ml
TR1412	**Anti-Salmonella H:L**	mAb, H:**l**,v; H:**l**,w; H:**l**,z_{13}; H:**l**,z_{28}; H:**l**,z_{13},z_{28}	x	liquid	1 ml
TR1412-01			x	liquid	5 ml
TS1413	**Anti-Salmonella H:m**	pAb, H:g,m; H:g,m,s; H:g,m,s,t; H:g,m,q; H:g,m,p,s; H:g,m,t; H:m,p,t,u; H:m,t		lyophilised	1 ml
TR1438	**Anti-Salmonella H:n**	mAb, H:e,n,x; H:e,n,z_{15}; H:e,n,x,z_{15}	x	liquid	1 ml
TS1414	**Anti-Salmonella H:p**	pAb, H:g,m,p,s; H:g,p; H:g,p,s; H:g,p,u; H:m,p,t,u		lyophilised	1 ml
TS1415	**Anti-Salmonella H:q**	pAb, H:g,q; H:g,m,q		lyophilised	1 ml
TR1416	**Anti-Salmonella H:r**	mAb, H:r	x	liquid	1 ml
TS1417	**Anti-Salmonella H:s**	pAb, H:f,g,s; H:g,m,s; H:g,m,s,t; H:g,p,s; H:g,s,t		lyophilised	1 ml
TS1418	**Anti-Salmonella H:t**	pAb, H:m,t; H:f,g,t; H:g,m,t; H:g,m,s,t; H:g,t; H:g,s,t; H:m,p,t,u		lyophilised	1 ml
TS1419	**Anti-Salmonella H:u**	pAb, H:g,p,u; H:m,p,t,u		lyophilised	1 ml
TS1420	**Anti-Salmonella H:v**	pAb, H:**l**,v		lyophilised	1 ml
TS1421	**Anti-Salmonella H:w**	pAb, H:**l**,w		lyophilised	1 ml
TS1422	**Anti-Salmonella H:x**	pAb, H:e,n,x; H:e,n,x,z_{15}		lyophilised	1 ml
TR1423	**Anti-Salmonella H:y**	mAb, H:y	x	liquid	1 ml
TR1424	**Anti-Salmonella H:z**	mAb, H:z Identifies H:z in Subspecies I, II and III	x	liquid	1 ml
TS1425	**Anti-Salmonella H:z_4,z_{23}**	pAb, H:z_4,z_{23}; H:z_4,z_{24}; H:z_4,z_{32}; H:z_4,z_{23},z_{32}		lyophilised	1 ml
TS1426	**Anti-Salmonella H:z_6**	pAb, H:z_6		lyophilised	1 ml
TR1427	**Anti-Salmonella H:z_{10}**	mAb, H:z_{10}	x	liquid	1 ml
TS1428	**Anti-Salmonella H:z_{15}**	pAb, H:e,n,z_{15}; H:e,n,x,z_{15}		lyophilised	1 ml
TR1440	**Anti-Salmonella H:z_{23}**	mAb, H:z_4,z_{23}; H:z_4,z_{23},z_{32}		lyophilised	1 ml

Art. No.	Product	Description	Phase induction	Liquid | Lyo.	Packing
TS1429	**Anti-Salmonella H:z_{24}**	pAb, H:z_4,z_{24}		lyophilised	1 ml
TS1449	**Anti-Salmonella H:z_{28}**	pAb, H:**l**,z_{28}; H:**l**,z_{13},z_{28}		lyophilised	1 ml
TS1430	**Anti-Salmonella H:z_{29}**	pAb, H:z_{29}		lyophilised	1 ml
TS1431	**Anti-Salmonella H:z_{32}**	pAb, H:z_4,z_{32}		lyophilised	1 ml
TR1445	**Anti-Salmonella H:z_{35}**	mAb, H:z_{35}	x	lyophilised	1 ml
TR1447	**Anti-Salmonella H:z_{38}**	mAb, H:z_{38}	x	lyophilised	1 ml
TR1448	**Anti-Salmonella H:z_{41}**	mAb, H:z_{41}	x	lyophilised	1 ml
TR1437	**Anti-Salmonella H:1**	mAb, H:1,2; H:1,5; H:1,6; H:1,7; H:1,2,7; H:1,5,7	x	liquid	1 ml
TR1437-01			x	liquid	5 ml
TR1433	**Anti-Salmonella H:2**	mAb, H:1,2		lyophilised	1 ml
TR1433-01				lyophilised	5 ml
TS1434	**Anti-Salmonella H:5**	pAb, H:1,5		lyophilised	1 ml
TR1435	**Anti-Salmonella H:6**	mAb, H:1,6		lyophilised	1 ml
TS1436	**Anti-Salmonella H:7**	pAb, H:1,7		lyophilised	1 ml

Control antigens for Anti-Salmonella test reagents

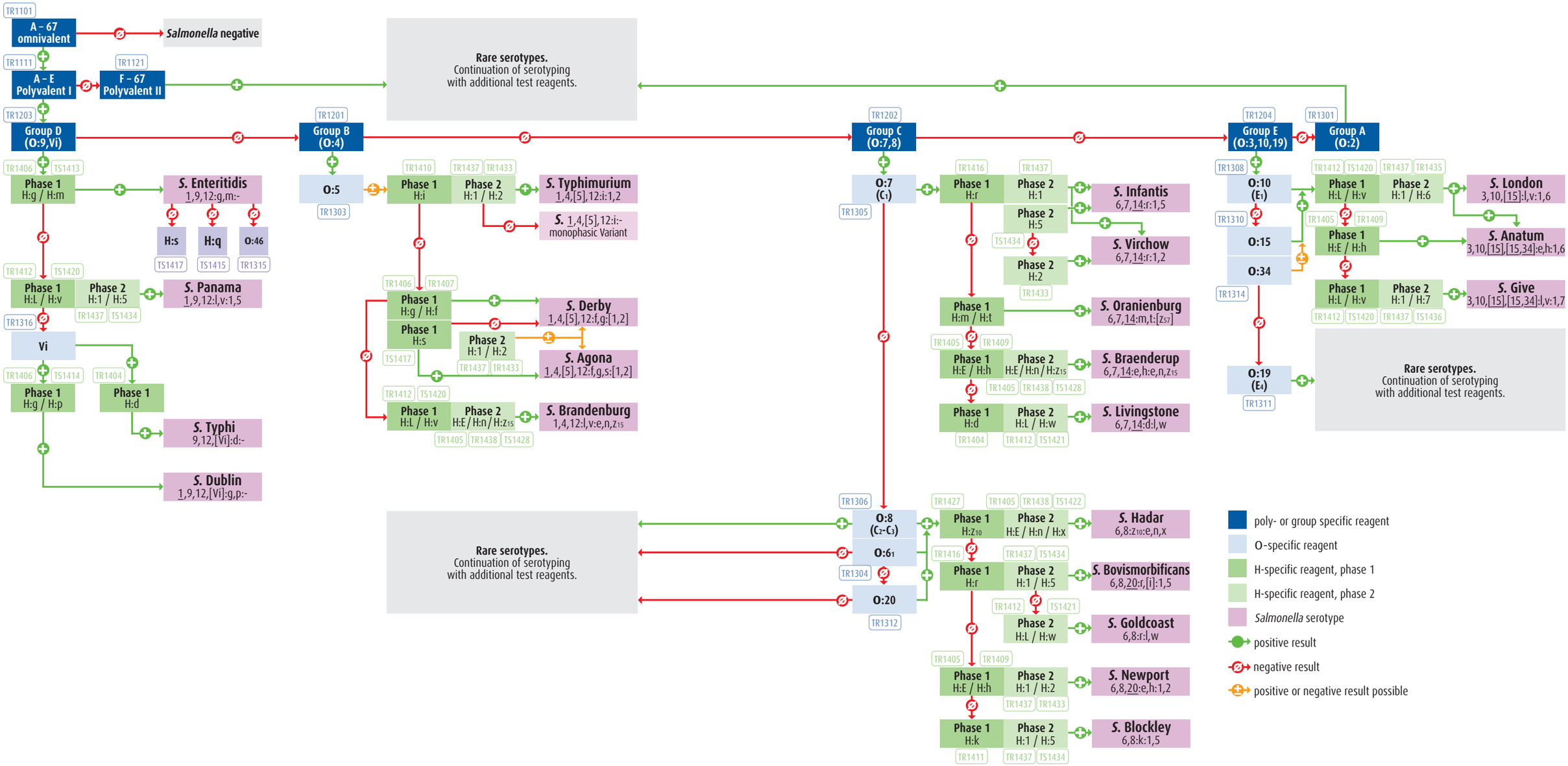
The control antigens are used to check the agglutinability of the Anti-Salmonella test reagents and for quality control when carrying out the slide agglutination test.

Procedure: slide agglutination | Storage: 2...8 °C | Preservative: 0.5 % formalin

Art. No.	Product	Description	Liquid | Lyo.	Packing
TS1501	**Control antigen Salmonella Paratyphi A-OH**	2,12:a:[1,5] (Usually occurs as a monophasic variant.)	liquid	5 ml
TS1502	**Control antigen Salmonella Paratyphi B-OH**	1,4,[5],12:b:1,2	liquid	5 ml
TS1503	**Control antigen Salmonella Paratyphi C-OH**	6,7,[Vi]:c:1,5 (Use TS1507 for Vi)	liquid	5 ml
TS1504	**Control antigen Salmonella Typhi-OH**	9,12, [Vi]:d- (Use TS1507 for Vi)	liquid	5 ml
TS1505	**Control antigen Salmonella Typhimurium-OH**	1,4,[5],12:i:1,2 (Often occurs as a monophasic variant.)	liquid	5 ml
TS1506	**Control antigen Salmonella Enteritidis-OH**	1,9,12:g,m:-	liquid	5 ml
TS1507	**Control antigen Salmonella Vi**		liquid	5 ml

Salmonella scheme

Workflow
for the use of sifin test reagents



Slide agglutination
according to the White-Kauffmann-Le-Minor Scheme

Examples of Serotyping

Suspected *S.* Enteritidis

Antigen detection

Test Reagent	Agglutination of a *Salmonella* isolate		
Anti-Salmonella A-67 + Vi, omnivalent	+		
Anti-Salmonella I (A-E + Vi)	+		
Anti-Salmonella Group D (O:9, Vi)	+		
Anti-Salmonella O:9	+		
Anti-Salmonella O:46	–		
Anti-Salmonella H:s	–		
Anti-Salmonella H:q	–		
Result of O antigen determination	**Suspected *S.* Enteritidis** O:9 (D_1)		
Anti-Salmonella H:g[1)]	+	+	–
Anti-Salmonella H:m (monospecific)	+	–	
Result antigen formula	***S.* Enteritidis** 1,9,12:g,m:-		
Anti-Salmonella H:p (monospecific)		+	
Result of antigen formula		***S.* Dublin** 9,12,[Vi]:g,p:-	
Anti-Salmonella H:L[2)]			+
Anti-Salmonella H:v (monospecific)			+
Anti-Salmonella H:1[3)]			+
Anti-Salmonella H:5 (monospecific)			+
Result of antigen formula			***S.* Panama** 1,9,12:l,v:1,5

[1)] A positive result with Anti-Salmonella H:g proves that antigen H:g is present. H:m,t cannot be present. Using Anti-Salmonella H:g,m instead of Anti-Salmonella H:g in this example would be inappropriate, since Anti-Salmonella H:g,m records all combinations of antigen H:g including antigen H:m,t. A positive result using Anti-Salmonella H:g,m does not prove that H g,m is present.

[2)] A positive result with Anti-Salmonella H:L proves that antigen H:**l** is present and is thus equivalent to the test with the polyclonal test reagent Anti-Salmonella H:**l**,v, which does not react with H:**l**,v only, but with all combinations of antigen H:**l**.

[3)] Anti-Salmonella H:1 agglutinates all antigen combinations of the H:1 complex (H:1,2, H:1,5, H:1,6, H:1,7). An additional testing of the present antigen combination is possible with the monospecific test reagents Anti-Salmonella H:2, Anti-Salmonella H:5, Anti-Salmonella H:6 and Anti-Salmonella H:7.

Suspected *S.* Typhimurium

Antigen detection

Test Reagent	Agglutination of a *Salmonella* isolate					
Anti-Salmonella A-67+ Vi, omnivalent	+					
Anti-Salmonella I (A-E + Vi)	+					
Anti-Salmonella Group D (O:9, Vi)	+					
Anti-Salmonella Group B (O:4,5,27)	+					
Anti-Salmonella O:5	+		–			
Result of O antigen determination	**Suspected *S.* Thyphimurium** O:4,5		**Suspected *S.* Thyphimurium** O:4			
Anti-Salmonella H:i	+	–	+	–	–	
Anti-Salmonella H:1[1)]	+	–	+	–		
Anti-Salmonella H:2	+	–	+	–		
Result of antigen formula	***S.* Typhi-murium O5+** 1,4,5,12:i:1,2	***S.* 1,4,5,12:i:-** monophasic variant	***S.* Typhi-murium O5-** 1,4,12:i:1,2	***S.* 1,4,12:i:-** monophasic variant		
Anti-Salmonella H g oder Anti-Salmonella H g,m [2)]					+	+
Anti-Salmonella H:f					+	+
Anti-Salmonella H:s					–	+
Result of antigen formula					***S.* Derby** 1,4,12:f,g:-	***S.* Agona** 1,4,12:f,g,s:-

[1)] See note on Anti-Salmonella H:1, suspected *S.* Enteritidis

[2)] A positive result with Anti-Salmonella H:g proves that antigen H:g is present. Antigen H:m,t cannot be present. In this example, instead of Anti-Salmonella H:g, it would be possible to use Anti-Salmonella H:g,m, which records all combinations of antigen H:g including antigen H:m,t. The subsequent agglutination with Anti-H:f excludes H:m,t.

Strains with H:m,t can be easily identified with Anti-Salmonella H:m and Anti-Salmonella H:t.

In general, we recommend the use of Anti-Salmonella H:g if an H antigen in the G complex is suspected because a positive result verifies the present of antigen H:g.

Result in almost no time at all

Rapid detection of suspect Salmonella isolates.



Do you have any question on how to use the products?
Our test scheme for salmonella serotyping is available on request.
Simply call us or contact us through our e-mail.

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Shigella Diagnostics

DIAGNOSTICS WITH PASSION



Fantastic test reagents for *Shigella* diagnostics

Shigella enteritis or shigellosis is an infection of the intestines induced by *Shigella*. It is spread by contaminated water or food. It can also be transmitted by flies in some cases. *Shigella* are divided into four species:

1. *Shigella dysenteriae*
2. *Shigella flexneri*
3. *Shigella boydii*
4. *Shigella sonnei*

Contents

- Polyspecific test reagents
- Monospecific test reagents
- Control antigens
- Shigella scheme



Shigella Diagnostics

Polyspecific test reagents Anti-Shigella

Serological detection of *Shigella* strains using the slide agglutination test. The test reagents are lyophilised and must be dissolved in 1 ml or 5 ml distilled water before use.

Procedure: slide agglutination | Storage: 2...8 °C | Preservative: sodium azide 0.9 mg/ml

Art. No.	Product	Description	Liquid | Lyo.	Packing
TR1811 TR1811-01	**Anti-Shigella I Group B + D**	Contains antibodies against *S. flexneri*, type 1 to 6, group 3,4 (y), 6 and 7,8 (x) and *S. sonnei* S and F form (phase I and II). Contains no antibodies against *S. dysenteriae* and *S. boydii*. Mixture of monoclonal antibodies in the form of cell culture supernatants and immunosera from rabbits.	lyophilised lyophilised	1 ml 5 ml
TS1821 TS1821-01	**Anti-Shigella II Group A**	Contains antibodies against *S. dysenteriae*, type 1 to 10. Contains no antibodies against *S. flexneri, S. boydii* and *S. sonnei*. Test reagent is prepared from immunosera from rabbits.	lyophilised lyophilised	1 ml 5 ml
TS1831	**Anti-Shigella III Group C**	Contains antibodies against *S. boydii*, type 1 to 15. Test reagent is prepared from immunosera from rabbits.	lyophilised	1 ml
TS1901	**Anti-Shigella flexneri Group B**	Contains antibodies against *S. flexneri* type 1 - 6 and group 3,4 (y), 6 and 7,8 (x). Contains no antibodies against *S. dysenteriae, S. boydii* and *S. sonnei.* Test reagent is prepared from immunosera from rabbits.	lyophilised	1 ml

Quality assurance made easy:

Suitable control antigens can be found on page 34!

Monospecific test reagents Anti-Shigella

Used to determine the serotype by serological detection of the *Shigella* O antigens. They are prepared from immunosera from rabbits or from monoclonal antibodies (cell culture supernatant from hybridoma cell lines). Lyophilisates must be dissolved in 1 ml distilled water before use.

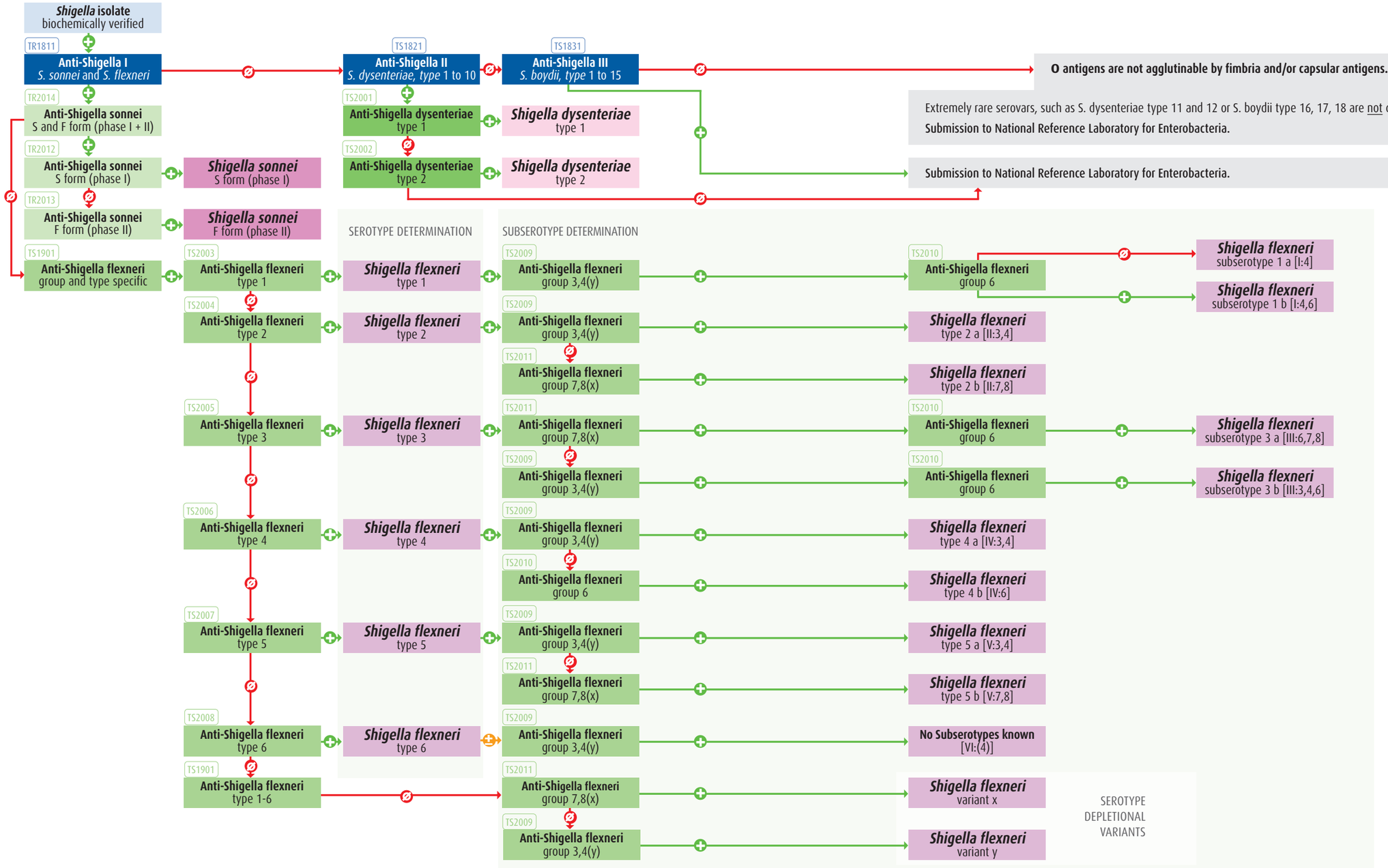
Procedure: slide agglutination | Storage: 2...8 °C | Preservative: sodium azide 0.9 mg/ml

Art. No.	Product	Description	Liquid | Lyo.	Packing
TS2001	**Anti-Shigella dysenteriae type 1**	monospecific	lyophilised	1 ml
TS2002	**Anti-Shigella dysenteriae type 2**	monospecific	lyophilised	1 ml
TS2003	**Anti-Shigella flexneri type 1**	monospecific	lyophilised	1 ml
TS2004	**Anti-Shigella flexneri type 2**	monospecific	lyophilised	1 ml
TS2005	**Anti-Shigella flexneri type 3**	monospecific	lyophilised	1 ml
TS2006	**Anti-Shigella flexneri type 4**	monospecific	lyophilised	1 ml
TS2007	**Anti-Shigella flexneri type 5**	monospecific	lyophilised	1 ml
TS2008	**Anti-Shigella flexneri type 6**	monospecific	lyophilised	1 ml
TS2009	**Anti-Shigella flexneri group 3,4 (y)**	monospecific	liquid	1 ml
TS2010	**Anti-Shigella flexneri group 6**	monospecific	lyophilised	1 ml
TS2011	**Anti-Shigella flexneri group 7,8 (x)**	monospecific	lyophilised	1 ml
TR2012	**Anti-Shigella sonnei S form**	phase I, monospecific	lyophilised	1 ml
TR2013	**Anti-Shigella sonnei F form**	phase II, monospecific	lyophilised	1 ml
TR2014	**Anti-Shigella sonnei S form and F form Group D**	phase I and phase II, monospecific	lyophilised	1 ml

Shigella scheme

Workflow

for the use of sifin test reagents



Slide agglutination

O antigens are not agglutinable by fimbria and/or capsular antigens.

Extremely rare serovars, such as S. dysenteriae type 11 and 12 or S. boydii type 16, 17, 18 are not detected:
Submission to National Reference Laboratory for Enterobacteria.

Submission to National Reference Laboratory for Enterobacteria.

Taxonomy

Shigella genus

O-serogroup A = *Shigella dysenteriae*
13 serotypes

O-serogroup B = *Shigella flexneri*
8 serotypes with different subgroups

O-serogroup C = *Shigella boydii*
18 serotypes

O-serogroup D = *Shigella sonnei*
1 serotype, 2 forms: phase I and II
Loss of the virulence plasmid in phase II

polyspecific reagent
Shigella sonnei serotype
Shigella flexneri serotype
Shigella dysenteriae serotype
positive result
negative result
positive or negative result possible

Control antigens for the Anti-Shigella test reagents

The control antigens are used to check the agglutinability of the Anti-Shigella test reagents and for quality control when carrying out the slide agglutination test.

Procedure: slide agglutination | Storage: 2...8 °C | Preservative: 0.5 % formalin

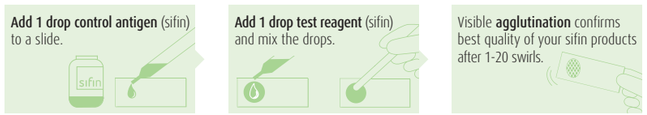
Art. No.	Product	Description	Liquid | Lyo.	Packing
TS1510	**Control antigen Shigella flexneri**	S. *flexneri* type 1b, 2a, 3a, 4a	liquid	2 ml
TS1511	**Control antigen Shigella dysenteriae**	S. *dysenteriae* type 1, 2, 3, 7	liquid	2 ml
TS1512	**Control antigen Shigella boydii**	S. *boydii* type 1, 2, 5, 8	liquid	2 ml
TS1513	**Control antigen Shigella sonnei**	S. *sonnei* S-form (phase I) S. *sonnei* F-form (phase II)	liquid	2 ml

Fields of application for quality control

The conduct of laboratory tests requires a quality assurance system in accordance with the generally accepted state of medical science to maintain the required quality, safety and performance when using in vitro diagnostics. The reliability of the results obtained must be ensured. In compliance with the guidelines of the German Medical Association for Quality Assurance of Laboratory Tests (RiliBÄK), we present our control antigens:
They are used to check the agglutinability of sifin test reagents Anti-Shigella to ensure the quality of the test procedure using slide agglutination.
They are intended exclusively for the quality control of serological typing when using sifin test reagents.

Control antigen Shigella flexneri	**TS1510**	**Control antigen Shigella dysenteriae**	**TS1511**	**Control antigen Shigella boydii**	**TS1512**	**Control antigen Shigella sonnei**	**TS1513**
Anti-Shigella I	TR1811 TR1811-01	Anti-Shigella II	TS1821 TS1821-01	Anti-Shigella III	TS1831	Anti-Shigella I	TR1811 TR1811-01
Anti-Shigella flexneri	TS1901	Anti-Shigella dysenteriae type 1	TS2001			Anti-Shigella sonnei S-form (phase I)	TR2012
		Anti-Shigella dysenteriae type 2	TS2002			Anti-Shigella sonnei F-form (phase II)	TR2013
						Anti-Shigella sonnei S-& F-form (phase I & II)	TR2014

Flowchart



Yersinia Diagnostics

DIAGNOSTICS WITH PASSION



Serotyping according to your taste

Yersiniosis is a gastroenteritis usually spread in food that is caused by infection with the bacterium *Yersinia enterocolitica*. Yersiniosis is a zoonotic disease, that is, an infection that is transmitted from animal to human.

The natural reservoirs of the pathogen *Y. enterocolitica* are animals of various species with pigs considered the primary reservoir for human pathogenic *Y. enterocolitica* serotypes. Transmission is primarily via food (www.rki.de).

Contents

- Monospecific test reagents
  Anti-Yersinia enterocolitica O



Yersinia Diagnostics

Monospecific test reagents Anti-Yersinia enterocolitica O

The test reagents are used to identify the serovar of *Yersinia enterocolitica* strains isolated from test material of human or other origin by means of slide agglutination. If the *Yersinia enterocolitica* strain contains an antigen covered by the test reagent's range of specificity, this antigen will be bound when mixed with the specific antibody.

The antigen-antibody reaction results in clearly visible agglutination of the strain. The test reagents are absorbed sera from immunised rabbits. Agglutinins against heterologous *Yersinia enterocolitica* serotypes and against selected representatives of other Enterobacterales were removed from the test sera by absorption.

The test reagents are lyophilised and must be dissolved in 1 ml distilled water before use.

Procedure: slide agglutination | Storage: 2...8 °C | Preservative: sodium azide 0.9 mg/ml

Art. No.	Product	Description	Liquid | Lyo.	Packing
TS1701	**Anti-Yersinia enterocolitica O 3**	monospecific	lyophilised	1 ml
TS1704	**Anti-Yersinia enterocolitica O 5**	The pathogenic serovar O:5,27 and the non-pathogenic serovar O:5 cannot be differentiated. This issue can be clarified biochemically, for example, using biovar identification.	lyophilised	1 ml
TS1705	**Anti-Yersinia enterocolitica O 8**	monospecific	lyophilised	1 ml
TS1703	**Anti-Yersinia enterocolitica O 9**	monospecific	lyophilised	1 ml

Course of the test

Biochemical identification of the *Y. enterocolitica* species is followed by biovar- and serotyping for epidemiological purposes.

In this regard, biotyping for orientation in distinguishing between pathogenic and non-pathogenic *Y. enterocolitica* strains is necessary. Serotyping with the Anti-Yersinia enterocolitica is above all useful for the subsequent sub-grouping within the biovars 2, 3, 5 and 1B. According to the epidemiological frequency of the incidence of the biovar/serotype combinations, the O-antigens should be tested in the sequence O 3, O 9; O 5 and O 8.

Coli Diagnostics

DIAGNOSTICS WITH PASSION



Here you'll find genuine products only

The natural habitat of *E. coli* is the intestines of animals and humans. *E. coli* is therefore an indicator organism for faecal contamination of drinking water, swimming water and foods (www.infektionsnetz.at).

Contents

- Polyspecific test reagents Anti-Coli
- Monospecific test reagents Anti-Coli
- Veterinary medicine: young poultry
- Veterinary medicine: young cattles
- Veterinary medicine: young pigs



Coli Diagnostics

Polyspecific test reagents Anti-Coli

The test reagents are intended for use in the serological detection of the serovar *E. coli* strains isolated from test material of human or other origin, using slide agglutination. They are prepared from immunosera from rabbits and monoclonal antibodies of the corresponding specificity in the form of cell culture supernatants. The test reagent reacts with *E. coli* strains, which contain antigens of the specificity named in the declaration.
There is the possibility of cross-reactions with other *E. coli* antigens or other *Enterobacteriaceae* due to related antigens.
The test reagents are lyophilised and must be dissolved in 1 ml or 5 ml distilled water before use, acc. to the amount given on the label.

Procedure: slide agglutination | Storage: 2...8 °C | Preservative: sodium azide 0.9 mg/ml

Art. No.	Product	Description	Liquid | Lyo.	Packing
TS2111	**Anti-Coli I**	Contains antibodies against O 26:K 60, O 44:K 74, O 114:K90, O 125:K 70, O 142:K 86, O 158:K - Does not contain antibodies with specificity for Anti-Coli II and Anti-Coli III	lyophilised	1 ml
TS2111-01			lyophilised	5 ml
TR2121	**Anti-Coli II**	Contains antibodies against O 55:K 59, O 86:K 61, O 91:K -, O 111:K 58, O 119:K 69, O 126:K 71, O 127:K 63, O 128:K 67 Does not contain antibodies with specificity for Anti-Coli I and Anti-Coli III	lyophilised	1 ml
TR2121-01			lyophilised	5 ml
TR2131	**Anti-Coli III**	Contains antibodies against O 25:K 11, O 78:K 80, O 103:K -, O 118:K -, O 124:K 72, O 145:K -, O 157:K -, O 164:K - Does not contain antibodies with specificity for Anti-Coli I and Anti-Coli II	lyophilised	1 ml
TR2131-01			lyophilised	5 ml

Monospecific test reagents Anti-Coli

The test reagents are used for the serological detection and serovar determination of isolated *E. coli* strains from human test material or other origin by slide agglutination and Widal reaction (confirmation test). Agglutination procedures are considered only to provide an indication but not verification of pathogenicity. For unequivocal allocation of *E. coli* isolates to pathogenic groups, it is necessary to determine the virulence factors (source: R. Prager, H. Tschäpe, Mikrobiologie 17 (2007), 213-219). The test reagents are produced from immune sera from rabbits and monoclonal antibodies of the relevant specificity in the form of cell culture supernatant. The test reagents are lyophilised and must be dissolved in 1 ml distilled water before use.

Procedure: slide agglutination | Storage: 2...8 °C | Preservative: sodium azide 0.9 mg/ml

Art. No.	Product	Liquid | Lyo.	Packing
TS2201	**Anti-Coli O 25:K 11**	lyophilised	1 ml
TS2202	**Anti-Coli O 26:K 60**	lyophilised	1 ml
TS2203	**Anti-Coli O 44:K 74**	lyophilised	1 ml
TS2204	**Anti-Coli O 55:K 59**	lyophilised	1 ml
TR2205	**Anti-Coli O 78:K 80**	lyophilised	1 ml
TS2206	**Anti-Coli O 86:K 61**	lyophilised	1 ml
TS2222	**Anti-Coli O 91:K -**	lyophilised	1 ml
TS2216	**Anti-Coli O 103:K -**	lyophilised	1 ml
TS2207	**Anti-Coli O 111:K 58**	lyophilised	1 ml
TS2208	**Anti-Coli O 114:K 90**	lyophilised	1 ml
TS2220	**Anti-Coli O 118:K -**	lyophilised	1 ml
TS2209	**Anti-Coli O 119:K 69**	lyophilised	1 ml
TR2210	**Anti-Coli O 124:K 72**	lyophilised	1 ml
TS2211	**Anti-Coli O 125:K 70**	lyophilised	1 ml
TS2212	**Anti-Coli O 126:K 71**	lyophilised	1 ml
TS2213	**Anti-Coli O 127:K 63**	lyophilised	1 ml
TS2214	**Anti-Coli O 128:K 67**	lyophilised	1 ml
TS2215	**Anti-Coli O 142:K 86**	lyophilised	1 ml
TS2221	**Anti-Coli O 145:K -**	lyophilised	1 ml
TR2218	**Anti-Coli O 157:K -**	lyophilised	1 ml
TS2219	**Anti-Coli O 158:K -**	lyophilised	1 ml
TS2217	**Anti-Coli O 164:K -**	lyophilised	1 ml

Note

A confirmation test according to Gruber-Widal is needed in the event of positive agglutination with one or more monospecific OK test reagents.

E. coli relevant to veterinary medicine

Coli diagnostics in young poultry

The test sera are used to test for the presence of type-specific antigens with *Escherichia coli* isolates from poultry. They are used as evidence of antigens to the cell surface of the *E. coli* isolate (O antigens) using slide agglutination (serotyping). A culture of the isolate at room temperature (18...26 °C) encourages the formation of the O antigen. These specificities are also identified in humans as extraintestinal pathogenic *E. coli* (ExPEC) variants.

Procedure: slide agglutination | Storage: 2...8 °C | Preservative: sodium azide 0.9 mg/ml

Art. No.	Product	Description	Liquid | Lyo.	Packing
TR2311	**Anti-Coli A**	polyspecific (O 1, O 2, O 18, O 78) serological detection of O 1, O 2, O 18 or O 78 antigen.	lyophilised	1 ml
TS2401	**Anti-Coli O 1**	monospecific	lyophilised	1 ml
TS2402	**Anti-Coli O 2**	monospecific	lyophilised	1 ml
TS2403	**Anti-Coli O 18**	monospecific	lyophilised	1 ml
TR2205	**Anti-Coli O 78:K 80**	monospecific	lyophilised	1 ml

Coli diagnostics in young cattles

The test sera are used to test for the presence of type-specific antigens with *Escherichia coli* isolates from cattles (serotyping). They are used as evidence of antigens to the cell surface of the *E. coli* isolate (O antigen, K antigen and F antigen) using slide agglutination. The F 5 (K 99) antigen is often not formed in sufficient quantities on standard culture media. We therefore recommend the use of Minca Agar (sifin Minca Agar, modified and sifin Minca Supplement) when culturing to promote the formation of the fimbrial antigen F 5 (K 99).

Procedure: slide agglutination | Storage: 2...8 °C | Preservative: sodium azide 0.9 mg/ml

Art. No.	Product	Description	Liquid | Lyo.	Packing
TS2601	**Anti-Coli C**	polyspecific (O 9:K 35, O 101:K 28, O 101:K 30, O 101:K 32) Contains antibodies directed against the *E. coli* types listed as monospecific (TS2611, TS2612, TS2613, TS2614) and the fimbrial antigen F 5 (K 99).	liquid	1 ml
TS2615	**Anti-Coli F 5 (K 99)**	monospecific	liquid	1 ml
TS2611	**Anti-Coli O 9:K 35**	monospecific	liquid	1 ml
TS2612	**Anti-Coli O 101:K 28**	monospecific	liquid	1 ml
TS2613	**Anti-Coli O 101:K 30**	monospecific	liquid	1 ml
TS2614	**Anti-Coli O 101:K 32**	monospecific	liquid	1 ml
TR2205	**Anti-Coli O 78:K 80**	monospecific	lyophilised	1 ml
TN1722	**Minca Agar, modified**	see also ready-to-use culture media		4 x 100 ml
TN1040	**Minca Agar, modified**	see also dehydrated culture media		500 g
TN1334	**Minca Supplement**	see also supplements		12 x 1 vial

Flow chart for young cattles

Original cultivation most helpful on Minca Agar with the addition of Minca Supplement

Slide agglutination with cultivated E. coli colonies

Screening with polyspecific Anti-Coli C

Serotyping with monospecific test sera

Frequent pathogens: coli diarrhoea in calves

Serotyping with monospecific Anti-Coli O 78:K 80

Frequent pathogens: coli sepsis in calves

Coli diagnostics in young pigs

The test sera are used to test for the presence of typespecific antigens with *Escherichia coli* isolates from pigs. They are used as evidence of antigens to the cell surface of the *E. coli* isolate (O antigen, K antigen and F antigen) using slide agglutination (serotyping).

Procedure: slide agglutination | Storage: 2...8 °C | Preservative: sodium azide 0.9 mg/ml

Art. No.	Product	Description	Liquid | Lyo.	Packing
TS2701	**Anti-Coli P**	polyspecific (O 8:K 87, O 138:K 81, O 139:K 82, O 141:K 85, O 147:K 89, O 149:K 91) Contains antibodies directed against the *E. coli* types (TS2711, TS2712, TS2713, TS2714, TS2715, TS2716) and fimbrial antigen F 4 (K 88).	liquid	1 ml
TS2717	**Anti-Coli F 4 (K 88)**	monospecific	liquid	1 ml
TS2711	**Anti-Coli O 8:K 87**	monospecific	liquid	1 ml
TS2712	**Anti-Coli O 138:K 81**	monospecific	liquid	1 ml
TS2713	**Anti-Coli O 139:K 82**	monospecific	liquid	1 ml
TS2714	**Anti-Coli O 141:K 85**	monospecific	liquid	1 ml
TS2715	**Anti-Coli O 147:K 89**	monospecific	liquid	1 ml
TS2716	**Anti-Coli O 149:K 91**	monospecific	liquid	1 ml

Flow chart for young pigs

Cultivation on non-selective culture medium with the addition of sheep or horse blood

Slide agglutination with cultivated E. coli colonies

Screening with polyspecific Anti-Coli P

Serotyping with monospecific test sera

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