Swarm Agar

Medium for detection of H-phases of *Salmonella,* according to ISO 6579-3.

TYPICAL FORMULA	(g/l)
Meat Extract	5.0
Yeast Extract	1.0
Trypto-Casein Soya Broth	30.0
Glucose	1.0
Sodium Desoxycholate	0.35
Agar	7.0
Final pH 7.6 ± 0.2	

DESCRIPTION

Swarm Agar is a soft nutrient-rich medium used for determining the H-phases of *Salmonella* with the Sven Gard method.

The medium is compliant with the requirements in the ISO/TR 6579-3 for serotyping *Salmonella*.

PREPARATION

Melt the content of a tube in a water bath at 100°C (with the cap loosened) until completely dissolved. Then screw the cap and check the homogeneity of the dissolved medium, if it is the case turning the tube upside down. To the melted medium (10 ml), cooled at 47-50°C, add the specific anti-H Salmonella serums for phase inversion, corresponding to the previously-determined phase (see below for more details). Mix with circular movements, avoiding foam formation, and aseptically pour onto Petri dishes with a diameter of 55 mm.

PRINCIPLE

Salmonella nomenclature distinguishes between two species: *Salmonella bongori* and *Salmonella enterica*. The main specie, *Salmonella enterica*, is divided into six subspecies: I (*S. enterica* subsp. *enterica*), II (*S. enterica* subsp. *salamae*), IIIa (*S. enterica* subsp. *arizonae*), IIIb (*S. enterica* subsp. *diarizonae*), IV (*S. enterica* subsp. *houtenae*) and VI (*S. enterica* subsp. *indica*). Various serovars can be identified within each subspecie. They are characterised by their somatic ("O"), flagellar ("H") and capsular ("Vi") antigens which all together define the antigenic formula of a given serovar (serotype or ser).

The general procedure for serotyping an unknown *Salmonella* isolate is based on determining the antigenic formula with rapid slide agglutination test using specific sera raised primarily against the somatic ("O") or flagellar ("H") antigens; the serum raised against the "Vi" antigen is useful for the Dublin serotype. It is highly advisable to first identify the family, genus, species and subspecies based on morphological and biochemical traits before determining the serovar.

Salmonella generally have two types of H antigens (phase 1 or the specific phase and phase 2 or the non-specific phase). Some cultures are monophasic and may be directly H typed, whereas the second phase in a diphasic culture is determined with a phase inversion method like that of Sven Gard.

TECHNIQUE

Agglutination with H-antisera is performed after agglutination with the O-antisera. Once the first H antigen is identified, a phase inversion on the isolate is performed to force the organism to repress its dominant H phase and express the second phase. Phase 2 is determined by adding the phase 1 corresponding phase inversion antiserum to Swarm Agar which allows the bacteria that express the phase 2 H antigens to swarm. The procedure for detection of H antigens is described in more details below.

- Test the isolate with a polyvalent H antiserum.
- When the isolate is positive (agglutination) for a group, identify the H antigens by performing sequential tests of the monovalent H antisera for that group.
- When a phase 1 H antigen is determined, <u>use the Sven Gard method as follow</u>:
- Add 2 drops of specific phase inversion antiserum (corresponding to the flagellar phase already determined) to a Petri dish (55 mm) and mix with 10 ml Swarm Agar (maintained as soft agar at 47-50°C).
- Allow the medium to solidify on a levelled table.
- Inoculate the strain at a single point in the centre of the dish.
- Incubate the inoculated plate at 36 ± 2°C for 18-21 h.
- After incubation, take a culture at periphery of the invasion zone (swarm) of the Swarm Agar.
- Start testing again by using the H polyvalent antisera.
- If there is no agglutination, the serotype contains only one phase.
- If one of the groups shows agglutination, define the specific H phase by using the relevant H monovalent antisera.

INTERPRETATION OF RESULTS

Report the (full) name and, whenever possible, also the antigenic formula that has been determined by referring to the White–Kauffman–Le Minor scheme.

STORAGE

10-25°C away from light, until the expiry date on the label or until signs of deterioration or contamination are evident.

WARNING AND PRECAUTIONS

The product does not contain hazardous substances in concentrations exceeding the limits set by current legislation and therefore is not classified as dangerous. It is nevertheless recommended to consult the safety data sheet for its correct use. The product is designed for professional use only and must be used by properly trained operators.

DISPOSAL OF WASTE

Disposal of waste must be carried out according to the national and local regulations in force.

REFERENCES

1. ISO/TR 6579-3:2014. Microbiology of the food chain — Horizontal method for the detection, enumeration and serotyping of *Salmonella* – Part 3: Guidelines for serotyping of *Salmonella* spp.

PRODUCT SPECIFICATIONS

NAME
Swarm Agar

PRESENTATION
Glass tubes containing semi-solid medium

STORAGE
10-25°C

PACKAGING

Ref.	Content	Packaging
26488	100 x 10 ml tubes	100 tubes in cardboard box

pH OF THE MEDIUM
7.6 ± 0.2

USE
Swarm Agar is used during serotyping of *Salmonella* to demonstrate the inapparent H antigen phase of diphasic isolates according to the Sven Gard method

TECHNIQUE
Refer to technical sheet of the product

APPEARANCE OF THE MEDIUM
Amber, clear

SHELFLIFE
2 years

QUALITY CONTROL

1. Control of general characteristics, label and print

2. Sterility control
   7 days at 22 ± 2°C, in aerobiosis
   7 days at 35 ± 2°C, in aerobiosis

3. Microbiological control
   Incubation Conditions: 36 ± 2°C / 18-21 h
   (Swarm Agar without serum)

Microorganism		Specification
Salmonella Typhimurium	ATCC® 14028	Good growth, intensive swarming

TABLE OF SYMBOLS

LOT	Batch code	⊗	Do not reuse	🏭	Manufacturer	⧗	Use by	🍷 Fragile, handle with care
REF	Catalogue number	🌡	Temperature limitation	∑▽	Contains sufficient for <n> tests	👁	Caution, consult instruction for use	

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