

BAIRD-PARKER Agar

(Staphylococcus Selective Agar Base acc. to BAIRD-PARKER)

For the isolation and enumeration of *Staphylococcus aureus* in foods and pharmaceutical materials according to BAIRD-PARKER (1962).

This culture medium complies with the recommendations of the United States Pharmacopeia XXVI (2003), the European Pharmacopeia II, the International Organization for Standardization (ISO) (1977, 1984), the International Dairy Federation (Internationaler Milchwirtschaftsverband) (1978) and the DIN Norms 10163 and 10178.

Mode of Action

This medium contains lithium chloride and tellurite to inhibit the growth of accompanying microbial flora, whereas pyruvate and glycine selectively stimulate the growth of staphylococci.

Staphylococcus colonies show two characteristic features when grown in this opaque medium (opaque, because of its egg-yolk content)

- characteristic zones and rings are formed as a result of lipolysis and proteolysis,
- reduction of tellurite to tellurium produces a black colouration.

The egg-yolk reaction and tellurite reduction are usually found to occur together with a positive coagulase reaction and can thus serve as an index for the latter.

STADHOUDERS et al. (1976) recommend that egg-yolk should be replaced with blood plasma, if coagulase-positive staphylococci are to be detected directly.

SMITH and BAIRD-PARKER (1964) recommend the addition of sulfamethazine to suppress the growth and swarming of *Proteus* species.

Typical Composition (g/litre)

Peptone from casein 10.0; meat extract 5.0; yeast extract 1.0; sodium pyruvate 10.0; glycine 12.0; lithium chloride 5.0; agar-agar 15.0.

Also to be added:

Egg-yolk tellurite emulsion 50ml; if required, sulphamethazine 0.05 g/l.

Preparation

Suspend 58 g in 0.95 litre, autoclave (15 min at 121 °C). Cool to 45-50 °C, mix in 50 ml Egg-yolk Tellurite Emulsion and, if required, 50 mg sulfamethazine/litre. Pour plates.

pH: 6.8 ± 0.2 at 25 °C.

The plates are opalescent and yellowish-brown in colour.

The ready-to-use culture medium can be stored in the refrigerator (approx. 4 °C) for up to 1 month.

Experimental Procedure and Evaluation

Dilute the sample material and spread thinly on the surface of the culture medium.

Incubation: 24-48 hours at 35 °C aerobically.

Appearance of Colonies	Microorganisms
Black, shiny, convex colonies 1-5 mm in diameter with a narrow, white edge surrounded by a clear zone 2-5mm wide. Opaque rings within the clear zones only appear after 48hours of incubation	<i>Staphylococcus aureus</i>
Black, shiny, irregular shape. Opaque zone develop around the colonies after 24hours.	<i>Staphylococcus epidermis</i>
Growth sometimes: Very small, brown to black, nor clear zones.	Micrococci
Dark brown, dull, clear zones sometimes appear after 48hours.	<i>Bacillus</i> species
White, no clear zones	Yeasts

Literature

- BAIRD-PARKER, A.C.: An improved diagnostic and selective medium for isolating coagulase positive Staphylococci. - *J. Appl. Bact.*, **25**; 12-19 (1962).
- DIN Deutsches Institut für Normung e.V.: Nachweis Koagulase-positiver Staphylokokken. Referenzverfahren für Milchpulver. - **DIN 10178**.
- DIN Deutsches Institut für Normung e.V.: Nachweis Koagulase-positiver Staphylokokken. Referenzverfahren für Milchpulver. - **DIN 10163**.
- European Pharmacopeia II, Chapter VII, 10.
- Internationaler Milchwirtschaftsverband; Nachweis Koagulase-positiver Staphylokokken (Referenzmethode). - **Internationaler Standard 60 A** (1978).
- NISKANEN, A., a. AALTO, M.: Comparison of selective media for coagulase-positive enterotoxigenic *Staphylococcus aureus*. - **Appl. Envir. Microbiol.**, **35**; 1233-1236 (1978).
- SMITH, B.A., a. BAIRD-PARKER, A.C.: The use of sulfamethazine for inhibiting *Proteus* spp. on Baird-Parker's isolation medium for *Staphylococcus aureus*. - *J. Appl. Bact.*, **27**; 78-82 (1964).
- STADHOUDERS, J., HASSINGS, F., a. VAN AALSTEN-VAN MAREN, N.O.: A pour-plate method for the detection and enumeration of coagulase-positive *Staphylococcus aureus* in the BAIRD-PARKER Medium without egg-yolk. - **Netz. Milk Dairy J.**, **30**; 222-229 (1976).
- United States Pharmacopeia XXVI, Chapter "Microbial limit Tests", 2003.
- ISO/FDIS: Microbiology of food and animal feeding stuffs - Horizontal method for the enumeration of coagulase-positive staphylococci (*Staphylococcus aureus* and other species) - Part 1: Technique using Baird-Parker agar medium. **ISO 6888-1** (2003).

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Ordering Information

Product	Merck Cat. No.	Pack size
BAIRD-PARKER Agar (Staphylococcus Selective Agar Base acc. to BAIRD- PARKER)	1.05406.0500	500 g
Bactident® Catalase	1.11351.0001	1 x 30 ml
Egg-yolk tellurite Emulsion	1.03785.0001	10 x 50 ml



Staphylococcus aureus
ATCC 25923

Quality control (spiral plating method)

Test strains	Inoculum (cfu/ml)	Recovery rate (%)	Black colonies	Clear zones round the colonies
<i>Staphylococcus aureus</i> ATCC 25923	10^3 - 10^5	≥ 70	+	+
<i>Staphylococcus aureus</i> ATCC 6538	10^3 - 10^5	≥ 70	+	+
<i>Staphylococcus epidermidis</i> NCTC 11047	10^3 - 10^5	Not limited!	+ / -	-
<i>Enterococcus hirae</i> ATCC 8043	10^3 - 10^5	Not limited!	+ / -	-
<i>Bacillus subtilis</i> ATCC 6051	$> 10^5$	≤ 0.01		
<i>Escherichia coli</i> ATCC 8739	$> 10^5$	≤ 0.01		
<i>Proteus mirabilis</i> ATCC 29906	10^3 - 10^5	Not limited!	brown-black	-
<i>Pseudomonas aeruginosa</i> ATCC 9027	$> 10^5$	≤ 0.01		
<i>Salmonella typhimurium</i> ATCC 14028	$> 10^5$	≤ 0.01		