Technical Data Sheet

NutriSelect® prime
Plate Count Agar halal acc. ISO 4833, ISO 17410 and FDA-BAM

Ordering number: 1.04324.0500

For the determination of the total microbial content from food and animal feed, water and other materials.

Plate Count Agar is also known as PCA, Standard Methods Agar (SMA), Tryptone Glucose Yeast Extract (TGE, TGYE) Agar and as Casein-Peptone Dextrose Agar.

This culture medium complies with the specifications given by EN ISO 4833-1 and EN ISO 4833-2, ISO 17410, FDA-BAM Medium M124, AOAC 940.36, GB 4789.2, GB 4789.43, APHA and SMWW.

The Halal Certificate is issued by Halal Quality Control (HQC) according to Reference Halal Standards: JAKIM MS 1500:2019, MUI HAS 23000, OIC/SMIIC1:2019, GSO 2055-1.

This culture medium is released by the quality control laboratory of Merck KGaA, Darmstadt, Germany. The laboratory is accredited by the German accreditation authority DAkkS as registered test laboratory D-PL-15185-01-00 according to DIN EN ISO/IEC 17025 for the performance testing of media for microbiology according to DIN EN ISO 11133.

Mode of Action

This culture medium does not contain any inhibitors or indicators and it is relatively rich in its nutrients. The enzymatic digest of casein (tryptone) is a nitrogen source containing a high level of free amino acids and yeast extract primarily supplies the B-complex vitamins.
Glucose provides an energy source for the growth of bacteria whilst agar is the solidifying agent.

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Typical Composition

APHA specifies no composition for Plate Count Agar.

Specified by ISO 4833-1, ISO 4833-2, ISO 17410		Specified by FDA-BAM Medium M124, SMWW, AOAC 940.36, GB 4789.2, GB 4789.43		NutriSelect® prime Plate Count Agar halal acc. ISO 4833, ISO 17410 and FDA-BAM	
Enzymatic digest of casein	5.0 g/l	Tryptone	5.0 g/l	Enzymatic digest of casein*	5.0 g/l
Yeast extract	2.5 g/l	Yeast extract	2.5 g/l	Yeast extract	2.5 g/l
Glucose, anhydrous	1.0 g/l	Dextrose (Glucose)	1.0 g/l	D(+)Glucose anhydrous**	1.0 g/l
Agar	9-18 g/l	Agar	15.0 g/l	Agar-Agar***	14.0 g/l
Water	1000 ml/l	Water	1000 ml/l	Water	n/a
pH at 25 °C	7.0 ± 0.2	pH at 25 °C****	7.0 ± 0.2	pH at 25 °C	7.0 ± 0.2

* Enzymatic digest of casein is equivalent to Tryptone.
** ISO 4833-1 and ISO 4833-2 specify Glucose anhydrous (1 g/l).
ISO 17410, SMWW, GB 4789.2 and GB 4789.43 specify Glucose (1 g/l).
Glucose is equivalent to the term Dextrose.
*** Agar-Agar is equivalent to other different terms of agar.
**** GB 4789.2 specifies pH 7.0 ± 0.2 before autoclaving, GB 4789.43 specifies pH 7.2 ± 0.2 before autoclaving.

Preparation

Dissolve 22.5 g in 1 l of purified water. Heat in boiling water and agitate frequently until completely dissolved. Autoclave (15 min at 121 °C). Cool the medium, mix well and use it according to the intended application.

If the medium is to be used immediately for poured plate technique, cool it to 44-47 °C in a water bath before use. Use the molten medium as soon as possible, it should not be retained for more than 4 h, as specified by EN ISO 4833-1 and EN ISO 11133.

If the medium is used for surface plating technique, allow the prepared medium to equilibrate at room temperature if it was stored at a lower temperature. There should be no visible moisture on the plates before use. When moisture is present, the plates should be dried for the minimum time required to remove visible moisture, following the procedure as described by EN ISO 11133.

The dehydrated medium is a powder with brown colour.

The prepared medium is clear and yellowish to yellowish-brown. The pH value at 25 °C is in the range of 7.0 ± 0.2.

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Experimental Procedure and Evaluation

Depend on the purpose for which the medium is used.

Incubate the inoculated plates under aerobic conditions, e.g. acc. to:

- EN ISO 4833-1 and EN ISO 4833-2 at (30 ± 1) °C for (72 ± 3) h,
- ISO 17410 at (6.5 ± 1) °C for 10 days,
- FDA-BAM Chapter No. 3 at (35 ± 1) °C for (48 ± 2) h
- SMWW 9215 at 35 °C for (48 ± 3) h,
- GB 4789.2 at (36 ± 1) °C for (48 ± 2) h.

Storage

Store at +15 °C to +25 °C, dry and tightly closed. Do not use clumped or discolored medium. Protect from UV light (including sun light). For *in vitro* use only.

According to EN ISO 4833-2, self-prepared plates can be stored at +2 to +8 °C in the dark and protected against evaporation for up to four weeks. Self-prepared bottled medium can be stored at (5 ± 3) °C in the dark for no longer than three months according to EN ISO 4833-1.

Quality Control

Control strains	Incubation	Reference medium	Method of control	Expected results
Staphylococcus aureus ATCC® 6538 [WDCM 00032]	72 ± 3 h at 30 ± 1 °C, aerobic	Tryptic Soy Agar (TSA)	Quantitative by pour plating	Recovery rate ≥70 %
Staphylococcus aureus ATCC® 25923 (WDCM 00034)				
Escherichia coli ATCC® 8739 [WDCM 00012]				
Escherichia coli ATCC® 25922 [WDCM 00013]				
Bacillus subtilis ATCC® 6633 [WDCM 00003]				
Staphylococcus aureus ATCC® 6538 [WDCM 00032]	24 ± 2 h at 36 ± 1 °C, aerobic	Tryptic Soy Agar (TSA)	Quantitative by pour plating	Recovery rate ≥70 %
Staphylococcus aureus ATCC® 25923 (WDCM 00034)				
Escherichia coli ATCC® 8739 [WDCM 00012]				
Escherichia coli ATCC® 25922 [WDCM 00013]				
Bacillus subtilis ATCC® 6633 [WDCM 00003]				

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Control strains	Incubation	Reference medium	Method of control	Expected results
Pseudomonas fluorescens ATCC® 13525 (WDCM 00115)	up to 10 days at 6.5 ± 1 °C, aerobic	Tryptic Soy Agar (TSA)	Quantitative by surface plating	Recovery rate ≥70 %
Yersinia enterocolitica subsp. *palearctica* DSM 13030 (WDCM 00216)				
Lactococcus lactis ATCC® 19435 [WDCM 00016]	72 ± 3 h at 30 ± 1 °C, aerobic	Tryptic Soy Agar (TSA)	Quantitative by surface plating	Recovery rate ≥70 %
Listeria monocytogenes ATCC® 19118				
Lactobacillus acidophilus ATCC® 4356 [WDCM 00098]				

Please refer to the actual batch related Certificate of Analysis.

The performance tests are in accordance with the current version of EN ISO 11133, ISO 17410 and GB 4789.28.

Literature

AOAC (2005): Official Method 940.36 Culture Media for Eggs and Egg Products. Microbiological Methods. AOAC International, Rockville, MD, USA.

APHA (2015) Compendium of Methods for the Microbiological Examination of Foods. 5th ed. American Public Health Association, Washington, D.C.

APHA (2004) Standard Methods for the Examination of Dairy Products. 17th ed. American Public Health Association, Washington, D.C.

FDA-BAM (2021) Chapter No. 3: Aerobic Plate Count. U.S. Food and Drug Administration - Bacteriological Analytical Manual.

FDA-BAM (2018): Media Index for BAM - BAM Medium M124: Plate Count Agar (Standard Methods). Food and Drug Administration - Bacteriological Analytical Manual.

ISO International Standardisation Organisation. Microbiology of the food chain - Horizontal method for the enumeration of microorganisms - Part 1: Colony count at 30 °C by the pour plate technique + Amendment 1: Clarification of scope. EN ISO 4833-1:2013/Amd1:2022.

ISO International Standardisation Organisation. Microbiology of the food chain - Horizontal method for the enumeration of microorganisms - Part 2: Colony count at 30 °C by the surface plating technique + Correction 1 + Amendment 1: Clarification of scope. EN ISO 4833-2:2013/Corr1:2014/Amd1:2022.

ISO International Standardisation Organisation. Microbiology of food, animal feed and water - Preparation, production, storage and performance testing of culture media + Amendment 1 + Amendment 2. EN ISO 11133:2014/Amd1:2018/Amd2:2020.

ISO International Standardisation Organisation. Microbiology of the food chain - Horizontal method for the enumeration of psychrotrophic microorganisms. ISO 17410:2019.

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SMWW (2018) Standard Methods Committee of the American Public Health Association, American Water Works Association, and Water Environment Federation. 9215 Heterotrophic Plate Count. In: Standard Methods For the Examination of Water and Wastewater. Lipps WC, Baxter TE, Braun-Howland E, editors. Washington DC: APHA Press.

National Health and Family Planning Commission of the People's Republic of China. China Food and Drug Administration. National Standard of the People's Republic of China. National food safety standard — Food microbiological examination: Food microbiological examination: Determination of aerobic plate count. GB 4789.2-2016.

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Corry, J.E.L., Curtis, G.D.W. and Baird, R.M. (2012): Plate Count Agar (PCA). In: Handbook of Culture Media for Food and Water Microbiology, pp. 870-872. Royal Society of Chemistry, Cambridge, UK.

Ordering Information

Product	Cat. No.	Pack size
NutriSelect® prime Plate Count Agar halal acc. ISO 4833, ISO 17410 and FDA-BAM	1.04324.0500	500 g

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