2× YT Agar

Double-Strength Yeast Tryptone Agar — Rich Medium for High-Density E. coli Growth

Catalogue Number: AS-1395

Application	Medium Type	Typical pH	HS Code
High-density E. coli & recombinant	Non-selective solid agar medium	7.0 ± 0.2 at 25 °C	3821.00.00

Overview

2× YT Agar (Double-Strength Yeast Tryptone Agar) is a nutrient-rich, non-selective solid culture medium designed to support rapid and high-density growth of bacteria, particularly *Escherichia coli* used in molecular biology and recombinant DNA workflows.

Compared to standard LB or YT media, 2× YT Agar contains higher concentrations of yeast extract (10.0 g/L) and tryptone (16.0 g/L), providing an increased supply of peptides, amino acids, vitamins, and growth factors. This enhanced formulation results in larger colonies, faster growth, and improved plasmid yield in cloning, expression, and phage-related applications.

Comparison — 2× YT vs LB vs SOB

Component	2× YT (AS-1395)	LB Miller (AS-1267)	SOB
Tryptone	16.0 g/L	10.0 g/L	20.0 g/L
Yeast Extract	10.0 g/L	5.0 g/L	5.0 g/L
NaCl	5.0 g/L	10.0 g/L	0.5 g/L
Agar	15.0 g/L	15.0 g/L	15.0 g/L
Total solids	46.0 g/L	40.0 g/L	40.5 g/L
Best for	High-density, fast growth	Standard routine	High-efficiency transformation

Principle of the Medium

Tryptone (16.0 g/L)	Pancreatic digest of casein — high-concentration source of peptides, amino acids, nitrogen, and carbon for rapid E. coli growth
Yeast Extract (10.0 g/L)	Double-strength supply of B-vitamins, trace elements, nucleotides, coenzymes, and growth factors to sustain high cell density
Sodium Chloride (5.0 g/L)	Maintains osmotic balance compatible with most laboratory E. coli strains
Agar (15.0 g/L)	Solidifying agent providing a firm, clear growth surface for colony isolation and antibiotic selection

Typical Composition (per litre)

Component	CAS Number	Function	Amount
Tryptone (Pancreatic Digest of Casein)	73049-73-7	High-level nitrogen, carbon, amino acids	16.0 g
Yeast Extract	8013-01-2	Double-strength vitamins, growth factors	10.0 g
Sodium Chloride	7647-14-5	Osmotic balance	5.0 g
Agar	9002-18-0	Solidifying agent	15.0 g

Total per litre: 46.0 g | Final pH: 7.0 ± 0.2 at 25 °C

Key Features & Benefits

- Double-strength tryptone and yeast extract for enhanced bacterial growth and biomass yield
- Supports larger colonies and faster growth than standard LB medium
- Ideal for high-density E. coli culture prior to protein induction (IPTG)
- Improved plasmid yield per colony due to enriched nutrient environment
- Suitable for antibiotic-supplemented selection plates
- Compatible with all standard E. coli K-12 and B strains
- Widely used in phage display, M13 phage propagation, and panning workflows

Applications

Molecular Biology & Genetics

- High-density cultivation of E. coli for cloning and plasmid propagation

- Growth of recombinant and expression strains (BL21, Rosetta, ArcticExpress)
- Pre-induction culture growth prior to IPTG addition for protein expression
- Antibiotic selection plates — ampicillin, kanamycin, chloramphenicol
- Blue–white screening with X-gal and IPTG supplementation

Phage & Protein Expression Work

- Bacteriophage propagation — M13, lambda, T4 phage
- High-density bacterial lawns for plaque assays
- Phage display library screening (panning on agar)
- Protein expression studies requiring high biomass

Research & Teaching Laboratories

- Routine bacterial culture where fast growth is required
- Demonstration of nutrient-rich vs minimal media growth rates
- Microbial physiology and growth kinetics studies

Preparation Instructions

1. Suspend 46.0 g of dehydrated medium in 1 litre of purified or demineralised water.
2. Heat with agitation until completely dissolved.
3. Verify and adjust pH to 7.0 ± 0.2 if required using 1 M NaOH or 1 M HCl.
4. Sterilise by autoclaving at 121 °C for 15 minutes.
5. Cool to 50–55 °C.
6. Add filter-sterilised antibiotics or supplements aseptically if required.
7. Mix gently and pour 20–25 mL per 90 mm sterile Petri dish.
8. Allow to solidify on a level surface before use.

Note: Do not overheat. The slightly higher solidification temperature (50–55 °C vs 45–50 °C for LB) is recommended to prevent premature solidification. Add heat-sensitive supplements only after cooling.

Common Antibiotic Selection Concentrations

Antibiotic	Working Concentration	Stock Concentration	Storage
Ampicillin	100 µg/mL	100 mg/mL in water	−20 °C
Kanamycin	50 µg/mL	50 mg/mL in water	−20 °C

Chloramphenicol	25 µg/mL	25 mg/mL in ethanol	−20 °C
Tetracycline	12.5 µg/mL	12.5 mg/mL in ethanol	−20 °C, protect from light
Gentamicin	10 µg/mL	10 mg/mL in water	−20 °C

Incubation & Typical Growth

Inoculate by surface spread or pour plate. Incubate aerobically at 37 °C for 12–18 hours. Colonies on 2× YT Agar are typically larger and more vigorous than on LB medium due to the enriched nutrient content.

Organism	Expected Result	Incubation
E. coli K-12 DH5α	Good growth — large cream colonies, >3 mm	37 °C, 12–16 h
E. coli BL21(DE3)	Vigorous growth — suitable for expression work	37 °C, 12–16 h
E. coli TOP10	Good growth — high-efficiency cloning	37 °C, 12–16 h
E. coli XL1-Blue	Good growth — M13 phage compatible	37 °C, 12–16 h
Salmonella typhimurium ATCC 14028	Good growth	37 °C, 18–24 h

Storage & Stability

Dehydrated powder	Store at 15–30 °C in a cool, dry, tightly closed container
Protect from	Moisture, direct light, and extreme temperatures
Prepared plates (no antibiotics)	2–8 °C, inverted, up to 4 weeks
Prepared plates (with antibiotics)	2–8 °C, use within 1–2 weeks
Shelf life (dehydrated)	As per labelled expiry date
Do not use if	Contamination, colour change, or cracking of agar surface observed

Quality & Compliance

Manufactured under controlled conditions for batch-to-batch consistency. Performance tested against ATCC reference organisms prior to release. Compatible with protocols described in Sambrook & Russell (Molecular Cloning), Current Protocols in Molecular Biology, and phage display methodologies (Barbas et al., Phage Display: A Laboratory Manual, CSHL Press).

Customs & Trade Information

HS / AHECC Code	3821.00.00
Description	Prepared culture media for the development or maintenance of microorganisms
Country of Origin	Australia

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