Northeast Laboratory Services

P.O. Box 788
Waterville, Maine 04903-0788
RT. 137, China Road
Winslow, Maine 04901

Administrative Offices
Phone: 207-873-7711
Fax: 207-873-7022

Customer Service
Phone: 1-800-244-8378
Fax: 207-873-7022

TECHNICAL PRODUCT INFORMATION

CYSTINE TRYPTIC AGAR [CTA] w/ or w/o CARBOHYDRATES

Catalog No:

T1400 Control (w/o Carbohydrates)

T1410 CTA w/DEXTROSE	T1440 CTA w/MALTOSE
T1420 CTA w/FRUCTOSE	T1445 CTA w/MANNITOL
T1430 CTA w/LACTOSE	T1450 CTA w/SUCROSE
T1435 CTA w/XYLOSE	T0340 CTA w/SORBOSE
T0350 CTA w/INULIN	T0355 CTA w/SORBITOL

INTENDED USE:

CTA with carbohydrates is a semi-solid medium suitable for the determination of fermentation reactions of fastidious microorganisms. CTA medium without carbohydrates is suitable for maintenance of organisms, and for detection of motility.

HISTORY/SUMMARY:

CTA medium has been accepted for the determination of carbohydrate utilization for a number of fastidious organisms, particularly *Neisseria* species and anaerobes. It has also been reported useful in fermentation studies of yeast. As a maintenance medium without carbohydrates, it supports the growth of organisms such as *Neisseria, Pasteurella, Streptococci, Brucella, Corynebacteria* and others. Motility can be detected in the semisolid medium when inoculated by stab line.

PRINCIPLES:

The base medium is free of carbohydrates and meat extracts. It contains Cystine and Casein Peptone as nutrients for the growth of fastidious organisms. Phenol red is added as an indicator of fermentation reactions. Carbohydrates are usually incorporated in the medium in 1% final concentrations. If a microorganism is inoculated in the medium containing a carbohydrate, and is capable of fermenting it, the medium indicator will turn from orange red to yellow. The acid does not easily diffuse through the medium because of the agar concentration present in the formulation. The medium when incubated in the presence of air might show an alkaline shift (deeper reddish color). Gas production can be detected by breaks in the agar. If using CTA for differentiation of *Neisseria* species, one must keep in mind that metabolism of dextrose by these organisms is oxidation rather than fermentation, therefore, acid production may be slight and easily neutralized by alkaline by-products, a result of the breakdown of peptone.[1]

FORMULA:

CYSTINE TRYPTIC AGAR

Component per liter of purified water	Amount
Pancreatic Digest of Casein	20.0 g
L-Cystine	0.5 g
Sodium Chloride	5.0 g
Sodium Sulfite	0.5 g
Agar	2.5 g
Phenol Red	0.017 g
Carbohydrate	1 % of final conc.

Final pH: 7.3 ± 0.2 at 25°C

PRECAUTIONS:

This medium is for In Vitro Diagnostic Use and when inoculated should be handled with caution, by adequately trained personnel under the supervision of a microbiologist. Media showing signs of deterioration or contamination must not be used.

STORAGE:
This medium should be stored at 2 to 8°C. Adequate storage prolongs the life and quality of this product. Freezing and overheating will cause severe deterioration of the medium. Media should not be used beyond expiration date. The expiration dates apply to unopened tubes adequately stored.

SPECIMEN COLLECTION:
CTA Medium with added carbohydrates is used to further identify pure isolates. Direct inoculation of this medium with clinical specimens will produce erroneous results.

Standard procedure should be used for primary isolation of the organism in question. It is also necessary to establish the purity of the culture prior to inoculation.

PROCEDURE:
Use only fresh pure cultures for fermentation and motility testing. (Do not use organisms from a primary selective plate.)

1. Loosen caps, boil, tighten caps and cool before use.
2. Fermentation procedure for facultative and anaerobic organisms:
    a. Inoculate medium with a needle by stabbing approximately four times to about ½ the depth of the medium with growth from the selected pure test culture.
    b. Incubate at 33-37°C aerobically or anaerobically depending on the organism.
    c. Observe daily for 7 days for acid production

Fermentation test procedure for *Neisseria*:

1. Prepare a pure culture of the organism to be tested. (Do not use organisms from a primary selective plate.)
2. Using an inoculating loop or swab:
    a. Inoculate the top ½ inch of medium with a heavy inoculum.
    b. Gently mix inoculum into medium.
    c. Replace cap loosely.
    d. Incubate at 35°C *without* added CO_2.
    e. Examine tubes at 18 to 24 hours, 48 hours, and 72 hours for growth and acid production [yellow indicator].
    f. Confirm purity of inoculum showing positive [acid reaction] by preparing a gram stain.

PERFORMANCE TEST:

CARBOHYDRATE REACTIONS (for *Neisseria* species)

Organism Base	DEXTROSE	SUCROSE	MALTROSE	LACTOSE	FRUCTOSE
Neisseria Meningitis	+	-	+*	-	-
Neisseria gonorrhoeae	+*	-	-	-	-
Neisseria sicca	+	+	+	-	+
Neisseria lactamica	+	+	+	+ (slow)	-

+ = Acid production, yellow reaction (90% of strains positive)
- = No acid production (90% of strains negative)
* = Acid production may be weak or absent with some strains

GROWTH/MOTILITY REACTIONS (with and without added carbohydrates)
Motility is displayed by outward growth from the inoculation stab line.
Nonmotile organisms grow along the stab line and surrounding medium remains clear.

ORGANISMS	GROWTH	MOTILITY
Neisseria gonorrhoeae	+	-
Listeria monocytogenes	+	+
Streptococcus pyogenes	+	-

QUALITY CONTROL:
It is recommended that the laboratory confirm the performance characteristics of this media. Careful selection of test organisms must be made so maximum information on product suitability is obtained.

LIMITATIONS:
CTA requires a heavy inoculum.
Prolonged incubation may lead to changes in the pH indicator or abnormal lactose/sucrose reactions with Neisseria pathogens.
Neisseria species usually produce acid only in the area of stabs (upper third). If a strong acid reaction (yellow color) is throughout the medium, a contaminating organism may be present.
Confirm the Neisseria organism with a gram stain and oxidase test.

REFERENCES:
1. Difco & BBL Manual 2003, Pages 119-121
2. GIBCO Products for Microbiology Technical Manual, 1993. P.105-108.