PRODUCT SPECIFICATION SHEET

Dextrose Tryptone Agar (DM599)

Intended Use
Dextrose Tryptone Agar (DM085) is used for the detection and enumeration of mesophilic and thermophilic aerobic organisms in foods.

Product Summary and Explanation
The National Canners Association specified the use of Dextrose Tryptone Agar for isolating "flat sour" organisms from food products in the 1930s,[1] "Flat sour" spoilage of canned foods is mainly caused by *Bacillus coagulans* (*Bacillus thermoacidurans*). Bacterial growth results in a 0.3-0.5 drop in pH, while the ends of the can remain flat. Inadequate heat processing is commonly responsible for flat-sour spoilage since spores of mesophilic bacteria are moderately resistant to moist heat. *Bacillus stearothermophilus* is the typical species responsible for this type of spoilage.[2,3] *Bacillus coagulans* (*Bacillus thermoacidurans*, a soil organism) is frequently isolated from flatsour spoilage of canned tomato and dairy products. Dextrose Tryptone Agar is also useful for enumeration of mesophiles and thermophiles in cereal and cereal products, dehydrated fruits, vegetables and spices.[4]

Dextrose Tryptone Agar is also recommended by Tanner[5] for the examination of canned food, sugar, and starch for thermophilic bacteria of the Bacillus stearothermophilus type (i.e. `flat-sour' spoilage bacteria). It is recommended by The American Public Health Association[6] for the enumeration of mesophilic and thermophilic aerobic bacteria in sweetening agents used in frozen dairy foods. The National Canners Association[7] recommends it for determination of the total plate and `flat-sour' count of thermophilic bacteria spores in ingredients, such as sugar and starch. Also, The American Public Health Association[8] specifies the use of Dextrose Tryptone Agar for the enumeration of mesophilic organisms and `flatsour' spores in sugars, starches and other complex carbohydrates; and for the enumeration of `flatsour' thermophiles in cereals and cereal products, dehydrated fruits and vegetables, and spices. Baumgartner and Hersom[9] used this media for the examination of low and medium-acid canned food (above pH 4.5) for `flat-sour' thermophiles, mesophilic aerobes, and facultative anaerobes.

Principles of the Procedure
Casein enzymic hydrolysate provides essential nutrients to the organisms. Dextrose serves as an energy source by being the fermentable carbohydrate while bromo cresol purple is a pH indicator. Acid producing organisms produce yellow colonies. The plates should be incubated at 55°C for 48 hours in a humid incubator.

Ingredients	Gms / Liter
Casein enzymic hydrolysate	10.00
Dextrose	5.00
Bromocresol purple	0.04
Agar	15.00
Final pH: 6.7 ± 0.2 at 25°C	
Formula may be adjusted and/or supplemented as required to meet performance specifications	

Precautions
1. For Laboratory Use only.
2. IRRITANT. Irritating to eyes, respiratory system, and skin.

Directions
1. Suspend 30.04 grams of the medium in one liter of distilled water.
2. Heat if necessary, to dissolve the medium completely.
3. Autoclave at 121°C, 15 psi pressure, for 15 minutes / validated cycle.
4. Mix well and pour into sterile Petri plates.

Quality Control Specifications

Dehydrated Appearance	Light yellow to greenish yellow homogeneous free flowing powder

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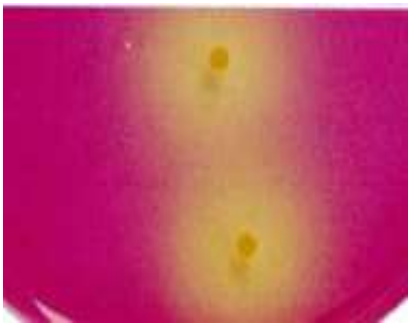
Prepared Medium	Purple coloured, clear to slightly opalescent gel forms in Petri plates
Reaction of 3.0% Solution	pH 6.7 ± 0.2 at 25°C
Gel Strength	Firm, comparable with 1.5% Agar gel

Expected Cultural Response: Cultural characteristics observed after an incubation at 35 - 37°C for 18 - 48 hours.

Sr. No.	Organisms	Inoculum (CFU)	Growth	Recovery	Colour of colony
1.	*Bacillus brevis ATCC 8246*	50-100	good-luxuriant (with /without dextrose fermentation)	50-70%	yellow
2.	*Bacillus coagulans ATCC 8038*	50-100	good-luxuriant	50-70%	yellow
3.	*Bacillus stearothermophilus ATCC 7953*	50-100	good-luxuriant	50-70%	yellow

The organisms listed are the minimum that should be used for quality control testing.



Dextrose Tryptone Agar (DM085)
Bacillus coagulans ATCC 8038-yellow colonies

Test Procedure

The instructions given below are included only as an indication of the mode of use of Dextrose Tryptone Agar, and will vary according to the original sample and the exact purpose of the investigation. For more exact details of technique it is advisable to Refer appropriate references for specific procedures.

Enumeration of Mesophiles:

1. Pipette dilutions of the sample to be tested, into each of petri-dishes,
2. Cover and mix the inoculum with sterile Dextrose Tryptone Agar and incubate for 72 hours at 32°C.
3. Count the total number of colonies, with separate totals for acid producing (yellow halo) and non-acid producing colonies.

Enumeration of `flat-sour' Thermophiles:

1. Inoculate as above and incubate for 48 hours at 55°C.
2. `Flat-sour' colonies (e.g. Bacillus stearothermophilus) are typically round, 2±5mm in diameter, with an opaque centre, and surrounded by a yellow zone in contrast with the purple medium.
3. Incubation at 55°C must be carried out under humid conditions e.g. wrapped dishes or in a high humidity environment.

Results

Acid-producing organisms, such as "flat-sour" thermophiles, form yellow colonies due to dextrose fermentation

Storage

Store the sealed bottle containing the dehydrated medium at 10 - 30°C. Once opened and recapped, place container in a low humidity environment at the same storage temperature. Protect from moisture and light.

Expiration

Refer to the expiration date stamped on the container. The dehydrated medium should be discarded if not free flowing, or if the appearance has changed from the original color. Expiry applies to medium in its intact container when stored as directed.

Limitations of the Procedure
Due to varying nutritional requirements, some strains may be encountered that grow poorly or fail to grow on this medium.

Packaging
Product Name : Dextrose Tryptone Agar
Product Code : DM085
Available Pack sizes : 100gm / 500gm

References

1. National Canners Association. 1933. Bacterial standards for sugar.
2. Gordon R. E., Haynes and Pang C. H. N., 1973, The Genus Bacillus, Agriculture Handbook No. 407, U.S. Department of Agriculture, Washington, D.C.
3. Hersom A. C., and Hulland E. D., 1964, Canned Foods, An Introduction to Their Microbiology, (Baumgartner) 5th Ed. Chemical Publishing Company, Inc. New York, N.Y.
4. Downes F. P. and Ito K., (Eds.), 2001, Compendium of Methods for the Microbiological Examination of Foods, 4th Ed., APHA, Washington, D.C.
5. Tanner F. W. (1944) `The Microbiology of Foods' 2nd ed., Garrard Press, Champaers pp. 762±763 and 1127±1128.
6. American Public Health Association (1972) Standard Methods for the Examination of Dairy Products. 13th Edn. APHA. Washington DC.
7. National Canners Association (1968) Laboratory Manual for Food Canners and Processors. Vol.1. p 13.
8. American Public Health Association (1976) Compendium of Methods for the Microbiological Examination of Foods. APHA.
   Washington DC.
9. Baumgartner J. G. and Hersom A. C. (1956) `Canned Foods' 4th ed., Churchill Ltd., London, pp. 229±230 and 247.

Further Information
For further information please contact your local MICROMASTER Representative.

MICROMASTER LABORATORIES PRIVATE LIMITED
Unit 38/39, Kalpataru Industrial Estate,
Off G.B. Road, Near 'R-Mall' , Thane (W) – 400607. M.S. INDIA.
Ph: +91-9320126789/9833630009/981991103
Email: sales@micromasterlab.com

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