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THE STANDARDS INSTITUTION OF ISRAEL

Instruction for Use
*NOVA*STREAK Microbial Contamination Monitoring Device (Cat. No. BD-507)
Violet Red Bile Agar (VRBA) and Plate Count Agar (PCA)

INTENDED USE

NOVASTREAK MCMD BD-507 is a convenient semi-quantitative screening culture device for sampling and assessing microbial contamination of food and dairy products, industrial fluids and surfaces of sanitary importance. A unique streaking mechanism permits the isolation of single colonies even when the original bacterial population of the sample was as high as 10^7 organisms per milliliter. *NOVASTREAK* MCMD BD-507 is intended for use in the food industry.

SUMMARY AND EXPLANATION

NOVASTREAK MCMD BD-507 comprises a plastic paddle with two types of agar attached back-to-back, housed in a closed transparent plastic tube. A ring with elongated prongs is attached to the end of the paddle so that there are prongs on each side of the slide. The ends of the prongs are dipped into the liquid sample. Upon re-insertion into the plastic tube, the prongs are prevented from moving and the agar surfaces are inoculated with the sample as the paddle passes over the prongs. The result is a series of streaks of decreasing bacterial concentration, which permits isolation of single colonies even when the original bacterial population of the sample was as high as 10^7 organisms per milliliter. *NOVASTREAK* MCMD BD-507 can be used to monitor microbial growth wherever the potential may exceed 10^2 microorganisms in ml of sample. *NOVASTREAK* MCMD BD-507 unit consists of two different agar modifications: Violet Red Bile Agar (VRBA) and Plate Count Agar (PCA), attached back-to-back on a plastic sampling paddle, which is permanently fastened to the cap for comfort of handling during use.

SAMPLING

SAMPLE TYPE	MATERIAL TO BE TESTED	PROCEDURE	READING
Liquid samples	Milk (raw and pasteurized)	Dip sampling procedure	Compare with Colony Density Chart No. 2
	Industrial water (waste, recycled, cooling or process water), dairy products (starter cultures, sour cream, yogurt and other fermented products)	General streaking procedure	Compare with Colony Density Chart No. 1
Viscous and friable samples	Syrups, pastes and dehydrated products (vegetables, fruit, egg powder, milk powder, powdered soups, instant desserts, cocoa, etc.)	Dilute 1:1 or 1:10 in sterile water with following General streaking procedure	Compare with Colony Density Chart No. 1 and multiply the result by 2 or 10
Solid samples	Raw material, frozen and chilled products (meat, fish and sea food products)	Homogenize and suspended 1:1 or 1:10 in sterile water with following general streaking procedure	Compare with Colony Density Chart No. 1 and multiply the result by 2 or 10
Surfaces	Utensils, work surfaces	Touch surface with paddle for several seconds	Compare with Colony Density Chart No. 3

GENERAL PROCEDURE

A. STREAKING SAMPLING

1. Unscrew the *NOVASTREAK* MCMD cap. Pull the paddle out. Do not touch any part but the cap.
2. Hold the paddle vertically and dip the white prongs into the sample up to about half of their length (see below).
3. Return the paddle to its container in a quick, continuous and vertical motion and tighten cap.
4. Transport the tube to laboratory for incubation and examination
5. Before incubation, loosen cap one-half turn.
6. Incubate the entire container at (35°C±2°C) for 18-24 hours in a vertical position.
7. Interpret the results by simple visual comparison of bacterial growth on the agar surface with Colony Density Chart No. 1 provided. **No actual colony counting is necessary.**

B. DIP SAMPLING (DIPSLIDE TECHNIQUE)

1. Unscrew the *NOVASTREAK* MCMD cap. Pull the paddle out. Do not touch any part but the cap.
2. Immediately return the paddle to the tube (in order to move the prongs out of the way) and then pull the paddle out again.

3. Dip the culture paddle into a diluted/undiluted sample or pour the sample over agar surfaces, if the volume of sample is not adequate to fully immerse the agar surfaces.
4. Replace inoculated culture paddle in its protective NOVASTREAK MCMD vial and close cap.
5. Transport *NOVASTREAK* MCMD vial to laboratory for incubation and examination.
6. Place inoculated *NOVASTREAK* MCMD vial upright in incubator (35°C±2°C) for 18-24 hours. Before incubation, loosen cap one-half turn.
7. Interpret the results by simple visual comparison of bacterial growth on the agar surface with Colony Density Chart No. 2 provided. **No actual colony counting is necessary.**

C. SURFACE CONTACT SAMPLING

1. Unscrew the *NOVASTREAK* MCMD cap. Pull the paddle out. Do not touch any part but the cap.
2. Immediately return the paddle to the tube (in order to move the prongs out of the way) and then pull the paddle out again.
3. Gently touch the agar faces onto the surface to be tested. The agar should remain in contact for about 20 seconds.
4. Replace inoculated culture paddle in its protective NOVASTREAK MCMD vial and close cap.
5. Transport *NOVASTREAK* MCMD vial to laboratory for incubation and examination.
6. Place inoculated *NOVASTREAK* MCMD vial upright in incubator (35°C±2°C) for 18-24 hours. Before incubation, loosen cap one-half turn.
7. Interpret the results by simple visual comparison of bacterial growth on the agar surface with Colony Density Chart No. 3 provided. **No actual colony counting is necessary.**

MATERIALS PROVIDED

CAT. No	REAGENTS	COLOR OF REAGENTS	EXPECTED TYPES OF MICROORGANISMS
BD-507	**Side 1:** Violet Red Bile Agar (VRBA) **Side 2:** Plate Count Agar (PCA)	Agar Color: Purple Agar Color: Yellow	Total Coliforms Count Total Bacterial Count

CLASSICAL COMPOSITION (g/liter)

1. **Violet Red Bile Agar (VRBA):** Pancreatic digest of Gelatin 7; Yeast extract 3; Bile salts mixture 1.5; Lactose 10; Sodium chloride 5; Agar 15; Neutral red 0.03; Crystal violet 0.002; MUG (4-methylumbeliferyl-beta-D-glucuronide) 0.1.
2. **Plate Count Agar (PCA):** Pancreatic digest of Casein 5; Yeast extract 2.5; Dextrose 1; Agar 15 .

APPLICATION FIELDS

MATERIAL TO BE TESTED	TYPE OF MICROORGANISMS		
	Total Coliforms Count	Total Bacterial Count	Yeast & Molds
Water (waste, recycled, cooling or process water)	•	•	•
Raw Milk	•	•	
Dairy Products (pasteurized milk, starter cultures, sour cream, yogurts and other fermented dairy products)	•	•	•
Meat, fish, sea food (raw material, frozen and chilled products)	•	•	
Surfaces	•	•	•
Syrups, pasts and dehydrated products (vegetables, fruit, egg powder, milk powder, powdered soups, instant desserts, cocoa, etc.)	•	•	•

MATERIAL REQUIRED BUT NOT PROVIDED

Incubator (35 ± 2°C)
Incubation Stand

WARNING AND PRECAUTIONS

1. For *In Vitro* Diagnostic Use.
2. Use aseptic technique and established laboratory procedure in handling and disposing of infectious material.

STORAGE

1. Store *NOVASTREAK* MCMD at 2-8°C up to 6 months, refer to product label.
2. Protect contents from direct light to ensure product stability through the expiration date, shown on the tube cap or packaging label.

KIT CONTENTS

REAGENTS	EXPECTED RESULTS
Violet Red Bile Agar (VRBA) is a selective medium for the detection of coliform organisms in water, milk, and other materials of sanitary importance. The medium is selective due to the presence of inhibitors, bile salts and crystal violet. Differentiation of enteric microorganisms is achieved by the combination of lactose and the neutral red indicator. Colorless or pink-to-red colonies are produced depending on the ability to ferment lactose.	Lactose fermenters are rose-red in color and generally surrounded by a halo of precipitated bile. *E. coli* colonies are entire edged, 1mm or more in diameter. *E. aerogenes* are larger, often mucoid and pinkish. Lactose non-fermenters produce colorless colonies. Enterococci occasionally grow to produce rose colonies pinpoint in size
Plate Count Agar (PCA) is also known as Standard Methods Agar. This medium contains casein hydrolyzate, dextrose and yeast extract. It is recommended for the isolation and enumeration of bacterial and fungal microorganisms of milk and other dairy products and may be used to determine the sanitary quality of foods, water and other materials.	A variety of bacterial and fungal species appearing as contaminants in dairy and other food products will show good growth, including lactobacilli and staphylococci.

DISPOSAL

The used *NOVASTREAK* MCMD is disposed by standard methods of biohazard disposal.

EXPIRATION DATE

1. The expiration date applies to the product in its intact container when stored as directed.

2. Do not use *NOVASTREAK* MCMD exhibiting any of the following characteristics: discoloration, dehydration, wrinkling or shrinkage of an agar surface, microbial growth prior to inoculation or an atypical cultural response in Quality Control procedures.

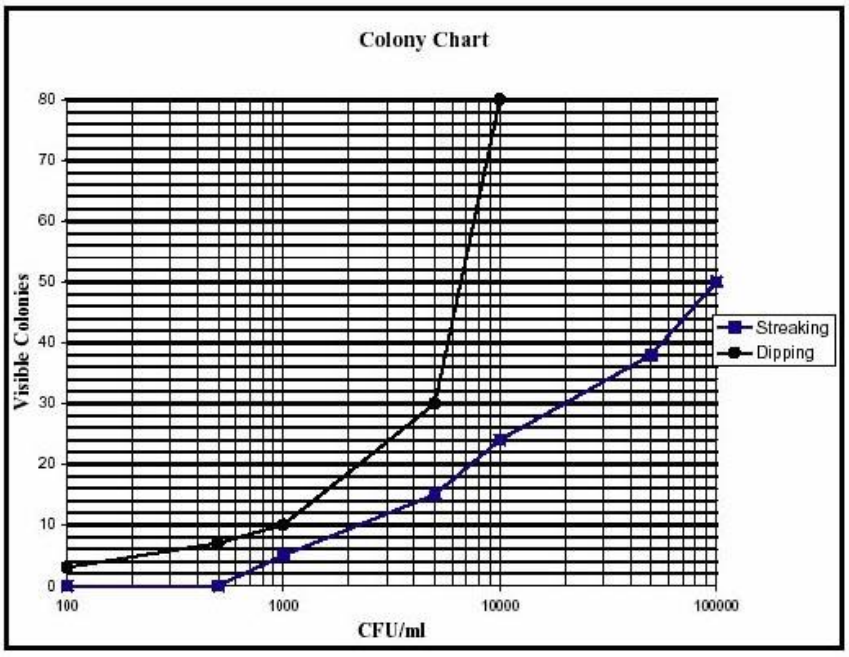
INCUBATION CONDITIONS

REAGENTS	OBJECT	TEMPERATURE (°C)	PRELIMINARY RESULTS (Hrs)	FINAL RESULTS (Hrs)
PCA	Total Bacterial Count	35-37	18	48
VRBA	Total Coliforms Count	35-37	18	24

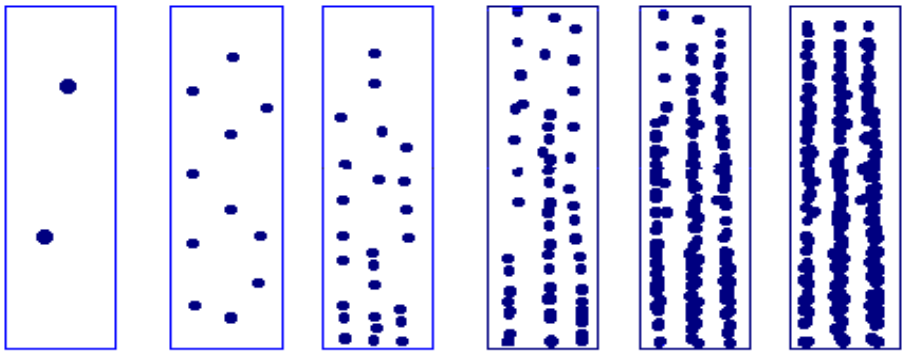
INTERPRETATION OF RESULTS

1. BACTERIAL COUNT

If more than 200 colonies grow on the *NOVASTREAK* MCMD, the growth may become semi-confluent and the presence of more than 100,000 bacteria per ml is indicated. If fewer than 20 colonies are counted, less than 10,000 bacteria per ml is indicated.



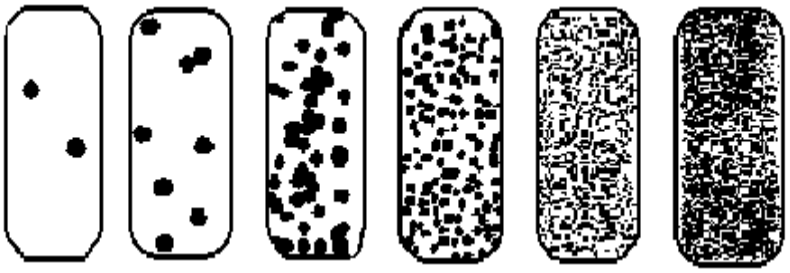
COLONY DENSITY CHART No. 1 FOR SAMPLING BY STREAKING



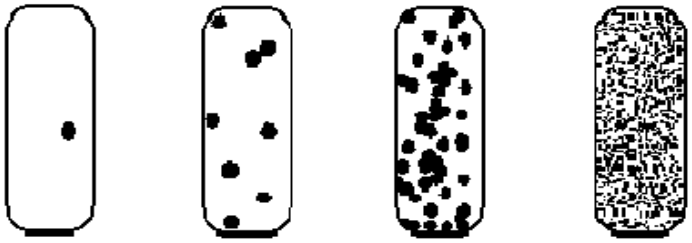
Colonies	<10	10-24	25-50		>50	
CFU/ml	10^3	10^4	10^5	10^6	10^7	10^8

COLONY DENSITY CHART No. 2 FOR TOTAL GROWTH BY DIP SAMPLING

10^2 10^3 10^4 10^5 10^6 10^7



COLONY DENSITY CHART No. 3 FOR TOTAL GROWTH BY SURFACE CONTACT SAMPLING



CLEAN

MODERATELY CLEAN (up to 10 CFU)

MODERATELY CONTAMINATED

CONTAMINATED (confluent growth)

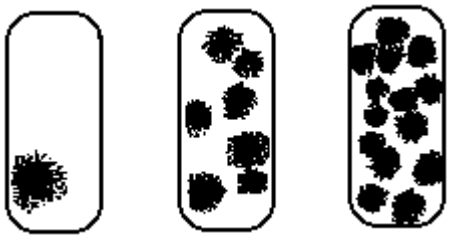
COLONY DENSITY CHART OF YEAST GROWTH BY SURFACE CONTACT SAMPLING

LIGHT CONTAMINATED (up to 1 colony)

MODERATELY CONTAMINATED (up to 10 CFU)

HEAVILY CONTAMINATED (confluent growth)

COLONY DENSITY CHART OF MOLD GROWTH BY SURFACE CONTACT SAMPLING



LIGHT CONTAMINATED (up to 1 colony) | **MODERATELY CONTAMINATED (up to 10 CFU)** | **HEAVILY CONTAMINATED (confluent growth)**

2. COLONIES MORPHOLOGY

Preliminary identification of the microorganisms made on the base of type and color of the colonies.

ORGANISMS	VRBA (Agar Color: Purple)	PCA (Agar Color: Yellow)
E. coli	Red	White
Coliforms	Red or pink	White
S. typhimurium	Colorless	White
C.albicans	No growth	White

QUALITY CONTROL

Violet Red Bile Agar (VRBA):

1. **Identity Specifications:** (1) sterility of media: as per sterility test of Standard Operating Procedures;(2) physical appearance: Reddish purple, slightly opalescent; 3) pH of media: pH 7.4±0.2; (4) weight of media: 3.15±0.1g;
2. **Cultural Response:** (5) inoculate challenged media with the following microorganisms (as per inoculation procedure of Standard Operating Procedure):

Microorganisms	ATCC no.	Growth	Appearance
Salmonella typhimurium	14028	Growth	Colorless colonies
Escherichia coli	25922	Growth	Rose to red colonies
Staphylococcus aureus	25923	Inhibition	None
Shigella flexneri	12022	Growth	Colorless colonies

Plate Count Agar (PCA):

1. **Identity Specifications:** (1) sterility of media: as per sterility test of Standard Operating Procedures; (2) physical appearance: Light amber, slightly opalescent, no precipitate; 3) pH of media: pH 7.0±0.1; (4) weight of media: 3.15±0.1g;
2. **Cultural Response:** 5) inoculate challenged media with the following microorganisms (as per inoculation procedure of Standard Operating Procedure):

Microorganisms	ATCC no.	Growth	Appearance
Salmonella typhimurium	14028	Growth	Gray-white colonies
Escherichia coli	25922	Growth	Gray-white colonies
Staphylococcus aureus	25923	Growth	White colonies
Candida albicans	26790	Growth	White colonies