



# H<sub>2</sub>S- Strip Test

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# **H<sub>2</sub>S- STRIP TEST**

- **EASY TO PERFORM**
- **USER-FRIENDLY**
- **SCREENING TEST**
- **SUITABLE FOR HANDLING  
BY UNTRAINED PERSONNEL**
- **FOR COMMUNITY PARTICIPATION**
- **AS A SCREENING TEST IN MONITORING OF  
RURAL DRINKING WATER SOURCES**
- **LOW-COST RAPID TEST**

# TEST PRINCIPLE

- **H<sub>2</sub>S- PRODUCING ORGANISMS (BACTERIA) ARE INVARIABLY PRESENT IN FECES.**
- **THERE IS A VERY STRONG CORRELATION BETWEEN PRESENCE OF H<sub>2</sub>S- PRODUCING BACTERIA AND FECAL POLLUTION OF WATER.**
- **BY DETECTING THE PRESENCE OF H<sub>2</sub>S- PRODUCING BACTERIA IN WATER SAMPLES, FECAL POLLUTION OF SUCH WATERS CAN BE DEDUCED**

## COMPOSITION OF H<sub>2</sub>S-STRIP MEDIUM\*

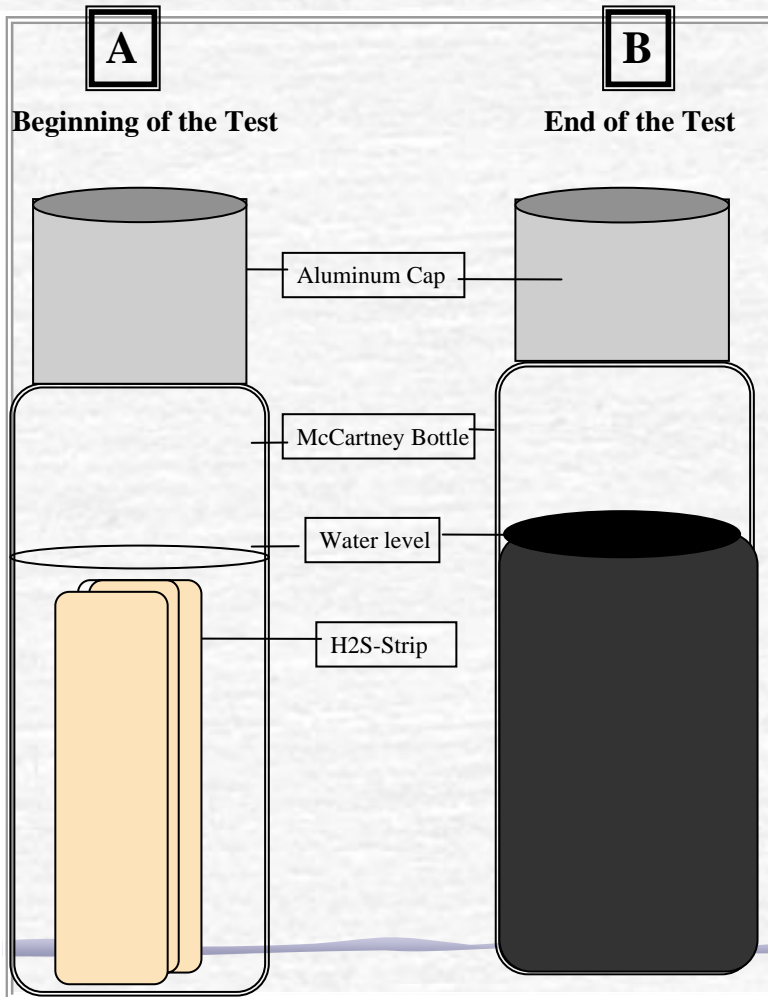
- |  |     |        |
|--|-----|--------|
| • Peptone                              | ... | 20 g   |
| • Dipotassium Hydrogen PO <sub>4</sub> | ... | 1.5 g  |
| • Ferric Ammonium Citrate              | ... | 0.75 g |
| • Sodium thiosulphate                  | ... | 1 g    |
| • Teepol                               | ... | 1 ml   |
| • L- Cystiene HCl                      | ... | 0.25 g |
| • Water                                | ... | 50 ml  |

\* Concentrated 20x

## **PREPARATION OF H<sub>2</sub>S- STRIP VIALS**

- **About 80 cm<sup>2</sup>, folded tissue paper strip is soaked with 1 ml of concentrated medium;**
- **Inserted into clean and washed McCartney bottles with metal caps, and dried at 50<sup>0</sup> C in a hot-air oven.**
- **Bottles containing the impregnated paper strips are then sterilized by autoclaving at 15 lb/in<sup>2</sup> , for 15 minutes. Store in a cool place.**

# H<sub>2</sub>S- STRIP TEST: PROCEDURE



- 1 **Fill the vial with water to be tested, up to the arrow mark, and replace the cap.**
- 2 **Keep in a warm place, preferably 30-37<sup>0</sup> C, for 24-36 hr.**
- 3 **Observe for blackening of the contents.**
- 4 **If turns black, it is likely that water is not fit for drinking.**

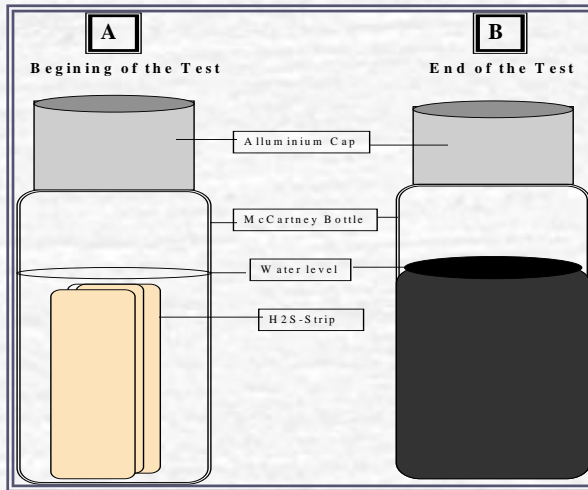
# **ADVANTAGES OF H<sub>2</sub>S- STRIP TEST**

- **NO NEED TO MEASURE THE VOLUME OF WATER TO BE TESTED**
- **NO NEED TO DECHLORINATE THE WATER SAMPLE**
- **END POINT IS VERY CLEAR (DEVELOPMENT OF BLACK COLOUR)**
- **NO INCUBATOR NECESSARY**
- **TEST STARTS IMMEDIATELY; WHILE IN THE CONVENTIONAL TEST THE SAMPLE HAS TO REACH THE LABORATORY**

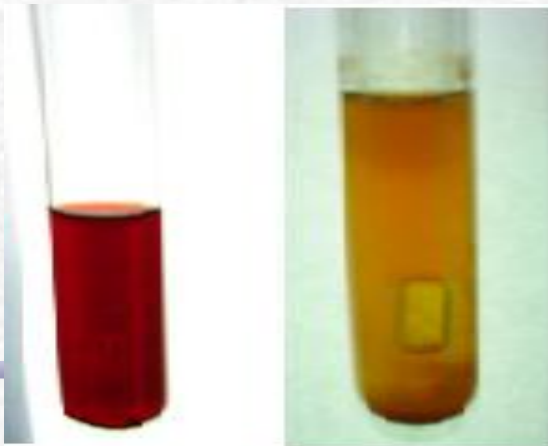
# **DISADVANTAGES**

- **In principle, does not conform to the conventional standards of bacteriological testing of water samples.**
- **At the best, it is a screening test.**
- **Purely qualitative, “PRESENCE- ABSENCE” test.**
- **May not work in cold ambient temperatures.**

# H<sub>2</sub>S- STRIP TEST vs MTFT



FERMENTATION TUBES



- Target organisms are different - H<sub>2</sub>S Producers X *E. coli*
- MTFT meets the absolute standards of conventional water testing X H<sub>2</sub>S-S is at best, a SCREENING TEST only; does not meet the standards of conventional water testing.
- MTFT is both qualitative and quantitative test X H<sub>2</sub>S-S is only a qualitative P/A test.
- H<sub>2</sub>S-S cannot replace MTFT; it can only supplement conventional water testing in a rural scenario.

**REPORT OF R&D STUDY ON  
H2S TEST FOR DRINKING WATER**  
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Rajiv Gandhi National  
Drinking Water Mission,  
Min. of Rural Development  
Dept. of Drinking Water Supply  
Govt. of India,

And



UNICEF, Delhi

**REPORT OF R&D STUDY ON  
H2S TEST FOR DRINKING WATER**

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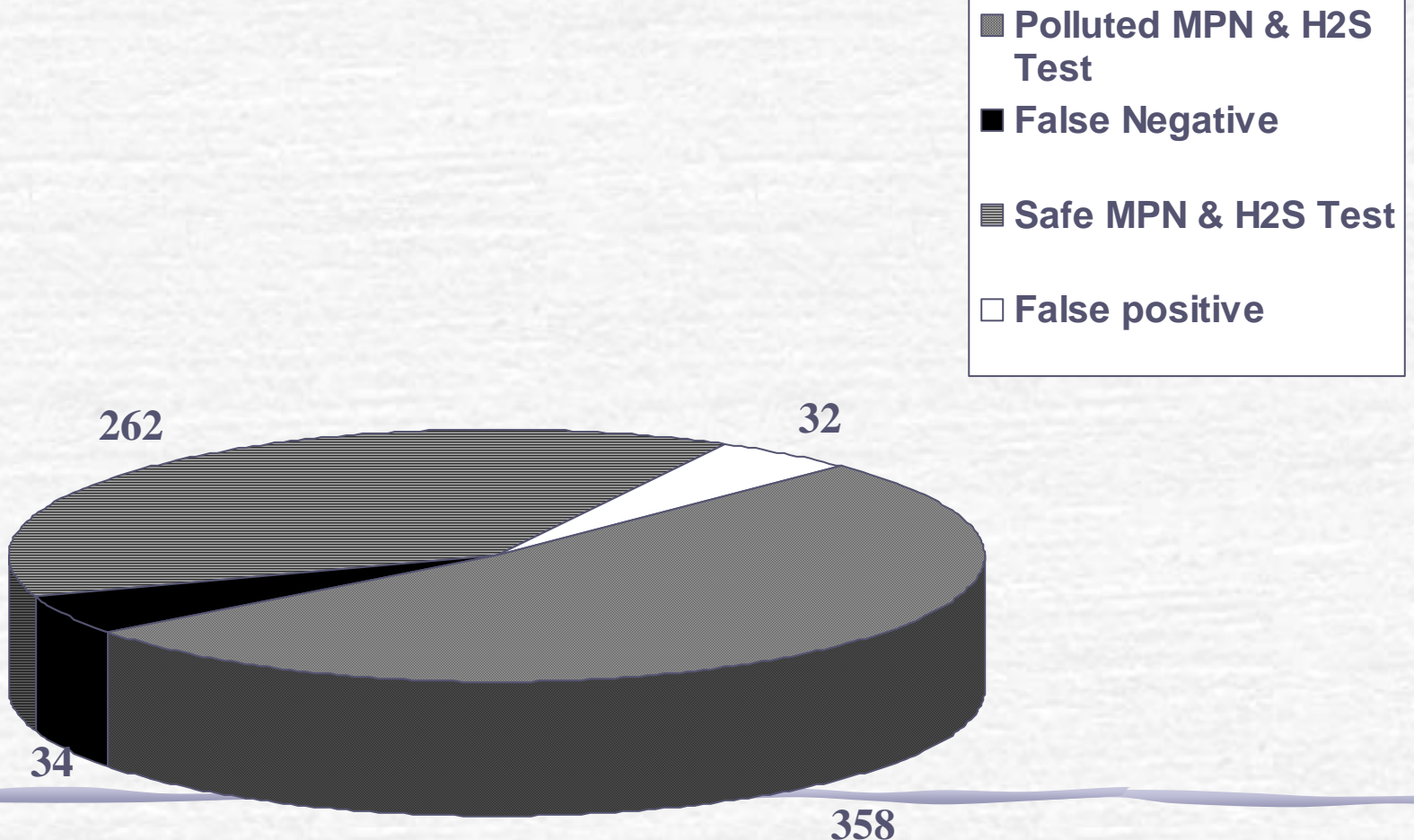


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# Comparison of H<sub>2</sub>S Test with MPN (MTFT) Test

Sample Size = <b>686</b>		MPN Test	
		<b>Polluted</b>	<b>Safe</b>
<b>H<sub>2</sub>S Test</b>	<b>Polluted</b>	<b>358</b> (True Positive) <b>a</b>	<b>32</b> (False Positive) <b>b</b>
	<b>Safe</b>	<b>34</b> (False Negative) <b>c</b>	<b>262</b> (True Negative) <b>d</b>

# PERFORMANCE: MPN vs H<sub>2</sub>S TEST



# Sensitivity, Specificity, Predictive value and Efficiency of H<sub>2</sub>S Method

$$\text{Sensitivity: } \frac{\underline{a}}{a + c} \times 100 = 91.32\%$$

$$\text{Specificity: } \frac{\underline{d}}{b + d} \times 100 = 89.1\%$$

$$\text{Predictive value for +ve: } \frac{\underline{a}}{a + b} \times 100 = 91.8\%$$

$$\text{Predictive value for -ve: } \frac{\underline{d}}{c + d} \times 100 = 88.5\%$$

$$\text{Efficiency (accuracy): } \frac{\underline{a+d}}{a+b+c+d} \times 100 = 90.4\%$$

# Test Vials



# Test Results



**POSITIVE**

**NEGATIVE**