Fluorocult® E. coli 0157:H7 Agar

Selective agar for the isolation and differentiation of enterohemorrhagic (EHEC) Escherichia coli 0157:H7-strains from foodstuffs.

Description

Four different intestinal-pathogenic E. coli types are presently known: besides the infant-pathogenic (EPEC), the enterotoxin-forming (ETEC), and the entero-invasive (EIEC) E. coli types, in 1982 the so-called enterohemorraghic (EHEC) 0157:H7 E. coli strains were first detected following the ingestion of hamburgers in the United States. Enterohemorrhagic E. coli lead to the formation of toxins - following their passage from the intestine into the blood circulation - resulting in life-threatening extraintestinal complications in the form of the hemolytic uremic syndrome (HUS) and thrombotic-thrombocytopenic purpura (TTP) in 3-20 % of all cases. Due to the in many cases severe nature of the clinical symptoms and the high contagiousness of the pathogens, the detection of EHEC is constantly gaining more and more clinical relevance.

In contrast to most other E. coli strains, E. coli 0157:H7 shows the following characteristics:

- **No sorbitol-cleavage capacity within 48 h.**
- **No formation of glucuronidase (MUG-negative/no fluorescence).**

Mode of Action

Sodium deoxycholate inhibits the growth of the Gram-positive accompanying flora for the greater part. Sorbitol serves, together with the pH indicator bromothymol blue, to determine the degradation of sorbitol which, in the case of sorbitol-positive microorganisms, results in the colonies turning yellow in colour. Sorbitol-negative strains, on the other hand, do not lead to any change in the colour of the culture medium and thus proliferate as greenish colonies. Sodium thiosulfate and ammonium iron(III) citrate result in black-brown discolouration of the agar for colonies, in the presence of hydrogen-sulfide-forming pathogens, precipitating iron sulfide.

Proteus mirabilis in particular, which displays biochemical properties similar to those of E. coli 0157:H7, can thus be very easily differentiated from E. coli 0157:H7 on account of the brownish discolouration. 4-methylumbelliferyl-β-D-glucuronide (MUG) is converted into 4-methylumbelliferone by β–D-glucuronidase- forming pathogens; 4-methylumbelliferone fluoresces under UV light. The activity of β-D-glucuronidase is a highly specific characteristic of E. coli. In contrast to most E. coli strains, E. coli 0157:H7 is not capable of forming β-D-glucoronidase. When irradiated with long-wave UV light, no fluorescence is formed.

Typical Composition (g/litre)

Peptone from casein 20.0; meat extract 2.0; yeast extract 1.0; sorbitol 10.0; ammonium iron(III) citrate 0.5;

4-methylumbelliferyl-β-D-glucuronide 0.1; sodium chloride 5.0; bromothymol blue 0.025; sodium thiosulfate 2.0; sodium deoxycholate 1.12; agar-agar 13.0.

Preparation

Suspend 55 g in 1 litre of demin. water and autoclave (15 min at 121 °C).

pH: 7.4 ± 0.2 at 25 °C.

The plates are clear and blue-green.

Incubation: 24 h at 35 °C aerobically.

Literature

SZABO, R.A., TODD, E.C., EAN, A.: Method to isolate E. coli 0157:H7 from food. **- J. Food Prot., 10**; 768-772 (1986).

Ordering Information

Product	Merck Cat. No.	Pack size
Fluorocult® E. coli 0157:H7 Agar	1.04036.0500	500 g
Laurylsulfate Broth	1.10266.0500	500 g
UV Lamp (366 nm)	1.13203.0001	1 ea

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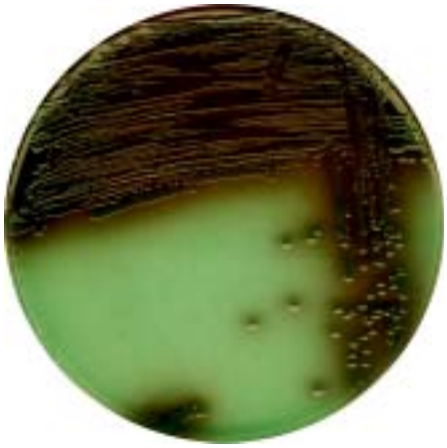
Quality control

Test strains	Growth	Colony colour	MUG	Sorbitol
Escherichia coli 0157:H7 (427 – 36/89)	good / very good	colourless	-	-
Escherichia coli ATCC 25922	fair / good	yellow	+	+
Proteus mirabilis ATCC 14273	good / very good	brown	-	-
Shigella sonnei ATCC 11060	good / very good	colourless	+	-
Enterobacter aerogenes ATCC 13048	good / very good	yellow	-	+
Salmonella typhimurium ATCC 14028	good / very good	yellow with black centre	-	+
Enterococcus faecalis ATCC 19433	none			

Escherichia coli ATCC 25922



Proteus mirabilis ATCC 14273