

# Esculin/Agar

355-4314

## DEFINITION

Medium used for the investigation of hydrolysis of esculin by *Enterobacteria* in the analysis of food products.

## PRINCIPLE

The principle of the medium relies on the ability of certain bacteria to hydrolyze esculin by breaking the glucoside bond, releasing glucose and esculetin. By virtue of its phenol function, esculetin produces a black-colored reaction with ferric salts.

## PRESENTATION

### Ready-to-use

4.5 ml x 30 tubes

code 355-4314

## STORAGE

- Ready-to-use: + 2°C to 8 °C.
- Expiration date and batch number are shown on the package.

## THEORETICAL FORMULA

Peptone	10 g
Ferric ammonium citrate	1 g
Esculin	1 g
Agar	8 g
Distilled water	1,000 ml
Final pH (25°C) = 7.4 ± 0.2	

## OTHER PRODUCTS REQUIRED (NOT SUPPLIED)

- Distilled water

## EQUIPMENT REQUIRED (NOT SUPPLIED)

(non-exhaustive)

- Scales
- Sterile weighing bags
- Grinder
- Sterile Pasteur pipettes (code 355-0751)
- Thermostatically-controlled incubator or incubating room, precise to ± 1°C
- All usual laboratory equipment.

## PROTOCOL

### Inoculation and incubation

Inoculate the medium by means of a central injection using a Pasteur pipette loop loaded with bacterial culture (the cap does not have to be screwed down tightly).

Incubate at a suitable temperature: 37°C, 30°C or 22°C. Observe over 5 days.

## READING AND INTERPRETATION

- Blackening: positive reaction.
- No blackening: negative reaction. (If necessary, compare with a tube of non-inoculated medium).

## PERFORMANCES / QUALITY CONTROL OF THE TEST

The growth performances of the media are verified with the following strains:

STRAINS	Results after 24h culture at 37°C
<i>Enterococcus faecalis</i> <i>var zymogenes</i> ATCC 29212	Growth + Esculin +
<i>Klebsiella pneumoniae</i> ATCC 13883	Growth + Esculin +
<i>Staphylococcus aureus</i> ATCC 25923	Growth + Esculin -
<i>Pseudomonas aeruginosa</i> ATCC 27853	Growth + Esculin -

## QUALITY CONTROL OF MANUFACTURER

Every product manufactured and marketed by Bio-Rad is subject to a quality-assurance procedure at all stages, from the reception of raw materials to the marketing of the end-product. Each batch of finished product undergoes quality control and is marketed only if it satisfies the acceptability criteria.

Documentation relative to the production and control of each batch is kept on file.

Table: Interpretation of results on esculin agar

+	Generally +	+ later (blackening after 3-4 days)	d (variable reactions depending on strains)	Generally -	-
					<i>Erysipelothrix rhusiopathiae</i>
					Other streptococci staphylococci
	<i>Flavobacterium</i> <i>Xanthomonas</i>	<i>Ps.</i> <i>Pseudomallei</i>			Other <i>Pseudomonas</i> <i>Alcaligenes</i> <i>Alteromonas</i>
<i>Y. pseudotuberculosis</i> <i>Y. pestis</i> <i>K. pneumonia</i> <i>K. oxytoca</i> <i>E. aerogenes</i> <i>Serratia marcescens</i>	<i>Kl. Ozaenae</i> <i>Serratia liquefaciens</i>	<i>Levinea malonatica</i> <i>Levinea amalonatica</i>	<i>E. coli</i> <i>Alkalescens dispar</i> <i>Hafnia alvei</i> <i>E. cloacae</i> <i>E. agglomerans</i> <i>Proteus vulgaris</i> <i>Proteus rettgeri</i>	<i>Y. enterocolitica</i> <i>Citrobacter K. rhinoscleromatis</i>	<i>Salmonella</i> <i>Shigella</i> <i>Edwardsiella</i> <i>Providencia</i> <i>Proteus mirabilis</i> <i>Proteus morganii</i>
			<i>Aeromonas</i>		<i>Vibrio</i>

### KEY WORDS

Esculin / *Enterobacteria* / Food products /  
Detection / Hydrolysis / Glucose / Esculetin /  
Ferric salts / Medium.