

Medium	Usage	Procedure	Interpretation	Notes
Phenylalanine Agar	Test for Deamination of Phenylalanine to Phenylpyruvic acid	Add approx. 1/2 dropperful FeCl <sub>3</sub> solution.  FeCl <sub>3</sub> will react with phenylpyruvic acid.	Dark green color in slant region = + reaction. No dark green color in slant region = - reaction.	For differentiation of enteric bacteria based on ability to produce phenylpyruvic acid from phenylalanine.  With rare exceptions, only the Proteus group of enterics ( <i>Proteus</i> , <i>Providencia</i> and <i>Morganella</i> ) will give + result.
Lactose Fermentation Broth	Test for Fermentation of Lactose.	Observe the tubes for yellow color due to acid from fermentation. (Gas may or may not be present, but it would be expected for a coliform.)	Any yellow color in the tube = + reaction. (Also record gas if present in Durham tube.) Purple color of entire tube = - reaction.	The appearance of a whitish color in the bottom half of the tube is due to reduction of the pH indicator and is not an indication of acid.
MR-VP Broth	Methyl Red (MR) Test	Add approx. 1/2 dropperful of methyl red reagent. DO NOT MIX (allow to form layer at top).	Red color = + reaction. Yellow color = - reaction. Orange color = "equivocal" reaction.	Methyl red is a pH indicator. Red color indicates mixed-acid fermentation; pH dropped & remained at or below 4.4. Yellow color indicates butanediol fermentation; pH dropped, then rose to 6.2 or above as some acid was converted to neutral products.
	Voges-Proskauer (VP) Test	Add 12 drops of alpha-naphthol reagent and 4 drops of 40% KOH. Wait 10-30 min.	Red color = + reaction. Yellowish color = - reaction.	Red color indicates presence of neutral products (acetoin and/or 2,3 butanediol) that are indicative of butanediol fermentation. Yellow color indicates mixed-acid fermentation.
Motility Indole Ornithine (MIO) Medium	Test for Motility	Observe for cloudiness (growth away from stab line).	Cloudiness = + reaction. No cloudiness = - reaction.	Most enterics are motile by peritrichous flagella; two major exceptions are <i>Klebsiella</i> and <i>Shigella</i> .
	Test for Ornithine Decarboxylation	Observe the lower 2/3 (anaerobic region) of the medium.  Growth must be present in the anaerobic region of the medium.	Gray, blue or purple color = + reaction. Yellow color = - reaction.	Gray, blue or purple color indicates the acid from glucose fermentation has been overneutralized by the alkaline product of ornithine decarboxylation (see notes below for Lysine Decarboxylase Broth). Yellow color indicates acid produced from glucose fermentation.
	Test for Indole Production	Add approx. 1/2 dropperful of Kovacs reagent.	Red ring at top of the medium = + reaction. No red ring at top of the medium = - reaction.	Many enterics produce indole from the breakdown of tryptophan.
Simmons Citrate Agar	Test for the Utilization of Citrate	Observe slant region for pH indicator results.	Bright blue color = + reaction. No bright blue color = - reaction.	Citrate is provided as the sole carbon and energy source in the medium. If the enteric is able to utilize citrate, an alkaline reaction occurs, causing the brom-thymol blue indicator to turn a bright blue color.
Decarboxylase Control Broth	Control for Lysine Decarboxylase Broth	Observe the tubes.  All enterics should be able to grow in this medium!	Yellow color = + reaction. Somewhat Purple color = - reaction.	Yellow color indicates glucose fermentation and the production of acid. Somewhat purple color indicates no growth in the medium.
Lysine Decarboxylase Broth	Test for the decarboxylation of lysine. This medium can be adapted to test for decarboxylation of other amino acids such as ornithine, arginine, glutamic acid and histidine.	Observe the tubes.	Gray, blue or purple color (a color darker than control) = + reaction. Yellow color = - reaction.	Decarboxylation is an anaerobic process that will result in an alkaline reaction that overneutralizes acid produced from fermentation of the glucose in this medium.