Mac Conkey Agar (MAC) (Merck):

selective and differential media used for the isolation and differentiation of Gram-negative bacteria, particularly the family *Enterobacteriaceae.*

MacConkey agar is used for the differentiation of lactose fermenting Gram-negative bacteria, that includes *Escherichia coli* and *Klebsiella*.

Composition:

Ingredients	Grams/Litre
Peptone	17.0
Proteose peptone	3.0
Lactose	10.0
Bile salts	1.5
Sodium chloride	5.0
Neutral red	0.03
Crystal violet	0.001
Agar	13.5
Final pH 7.0 ± 0.2	

Figure 38: MacConkey agar with LF (colonies colouress) and non-LF colonies uncolouress. Source:https://en.wikipedia.org/wiki/File:MacConkey_agar_with_LF_and_LF_colonies.jpg

Figure 39: Mac Conkey Agar (MAC) before sampling

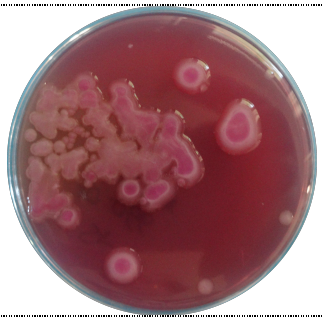

Figure 40: MAC Agar: *Enterobacteriacea* colonies after sampling and incubation.

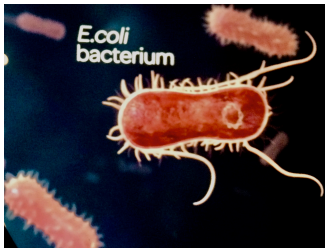

Figure 41: Coloured scanning electron micrograph (SEM). (Source: https://www.micropia.nl/en/#gref)

Crystal violet at a concentration of 0.0001% (0.001 g per litre) is included when needing to check if Gram-positive bacteria are inhibited.

Using neutral red pH indicator, the agar distinguishes those Gram-negative bacteria that can ferment the sugar lactose (LF) from those that cannot (non-LF) fermentation.

By utilizing the lactose available in the medium, Lac+ bacteria such as *Escherichia coli*, *Enterobacter* species and *Klebsiella* species (Kl pnuemoniae, Kl. Ozaenae, Kl. oxytoca) owill produce acid, which lowers the pH of the agar below 6.8 and results in the appearance of pink colonies. The bile salts precipitate in the immediate neighbourhood of the colony, causing the medium surrounding the colony to become hazy.

Cetrimide Agar contact plates (VWR Chemicals):

selective medium for *Pseudomonas aeruginosa* isolation.

Composition:

Ingredients	Grams/Litre
Gelatin Peptone	20.0
Magnesium chloride	1.4
Potassium sulfate	10.0
Glycerol	10.0
Cetrimide	0.3
Agar	13.6
Final pH 7.0 ± 0.2	

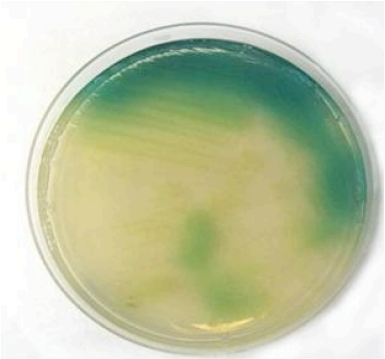

Figure 42: Cetrimide Agar with Pseudomonas aeruginosa colonies
Source: https://microbiologyinfo.com/cetrimide-agar-composition-principle-uses-preparation-and-colony-morphology/

Figure 43: Cetrimide agar before sampling

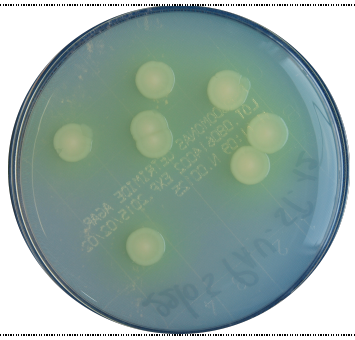

Figure 44: Cetrimide Agar: *Pseudomonas species* colonies after sampling and incubation.

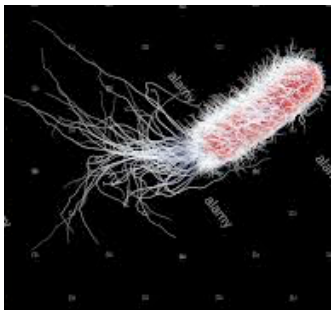

Figure 45: Coloured scanning electron micrograph (SEM).
(Source: http://www.alamy.com/stock-photo-pseudomonas-aeruginosa-bacterium-computer-illustration-p-aeruginosa-103461858.html)

Cetyltrimethylammonium bromide (Cetrimide) is the selective agent and inhibits most bacteria by acting as a detergent. When in contact with bacteria, causes the release of nitrogen and phosphorous from the bacterial cell other than *Pseudomonas aeruginosa.*

Pseudomonas are motile (one or more polar flagella), rod shaped and aerobic, Gram-negative, non-fermentative bacteria.

The typical bacteria size in 0.5 – 1.0 x 1.5 – 5.0 µm.

For the detection of Pseudomonas is used the catalase test and the oxidase test (positive result).

Another know feature associated with Pseudomonas species (Pseudomonas aeruginosa, P. fluorescens, P. putida) is the secretion of pyoverdin (fluorescein, a siderophore), a fluorescent yellow-green pigment under iron-limiting conditions [134].