Kligler hajna

- **Mode of Action**
  - Degradation of sugar and accompanying acid production are detected by the pH indicator phenol red, which changes its color from red-orange to yellow, on alkalinization it turns deep red.
    - 1 Slope for aerobic use of Lactose
    - 2 Glucose anaerobic use in the butt
    - 3 gaz production
  - Thiosulfate is reduced to hydrogen sulfide by several species of bacteria, the hydrogen sulfide reacts with an iron salt to give black iron sulfide
    - 4 H2S production

- **Four properties in a single tube**

- **Typical Composition (g/litre)**
  - Peptone from casein 15.0
  - Peptone from meat 5.0
  - Meat extract 3.0
  - Yeast extract 3.0
  - Sodium chloride 5.0
  - Lactose 10.0
  - D(+)glucose 1.0
  - ammonium iron(III) citrate 0.5 / sodium thiosulfate 0.5
  - phenol red 0.024
  - agar-agar 12.0.

- **Experimental Procedure and Evaluation**
  Streak the pure culture under investigation on the sloped surface and inoculate the butt of the same tube by a central stab. Incubation: up to 20 hours at 37 °C.

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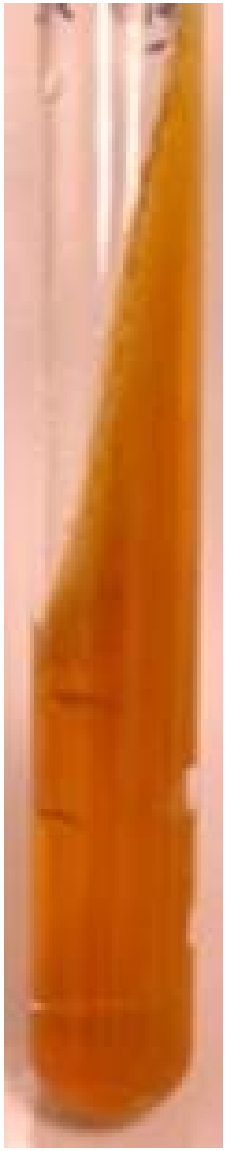
- Principe :
  - Glucose is present in the agar the butt :
    - after few hours all the tube is yellow… for enterobacteriaceae…
    - For glucose positive acid produces in anaerobic conditions still in the butt… butt still yellow
    - for glucose negative strain… butt red
  - Gas disruption of the agar in the butt
  - After use of glucose, if the strain
    - is lactose positive… acidification of the slope : still yellow
    - is lactose negative… should grow using decarboxylation of aa presents in peptone… alkalinisation on the slope : red
  - If the strain produce H2S …black
    - Acid sensitive

t:0

Lac-
Glu+
H2S-
Gaz -

Lac-
Glu+
H2S+
Gaz -



Lac+
Glu+
H2S-
Gaz +

Lac+
Glu+
H2S-
Gaz +

Test strain	*Growth*	*Butt*	*Slant surface*
Escherichia coli ATCC 25922	**good / very good**	**yellow**	**yellow**
Citrobacter freundii ATCC 8090	**good / very good**	**yellow and black**	**yellow**
Enterobacter cloacae ATCC 13047	**good / very good**	**yellow**	**yellow**
Shigella flexneri ATCC 12022	**good / very good**	**yellow**	**red**
Salmonella typhimurium ATCC 14028	**good / very good**	**yellow and black**	**red**
Salmonella enteritidis ATCC 13076	**good / very good**	**yellow and black**	**red**
Proteus mirabilis ATCC 14153	**good / very good**	**yellow and black**	**red / black**
Proteus vulgaris ATCC 13315	**good / very good**	**yellow and black**	**yellow**