

## Poster

# Filtración de E. coli: metodología, implantación, control de calidad y análisis tecno-económico



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## ABSTRACT

With the rise of human population and environmental awareness, water quality its becoming an important issue because public and environmental health protection requires safe drinking water (Rompré et al., 2002). E. coli is a gram-negative, rod-shaped bacteria that belongs to the family Enterobacteriaceae. The presence of E. coli in water represents an indicator of fecal contamination, since its natural habitat is in the intestines of warm-blooded animals. Therefore, E coli is used as a fecal indicator bacterium granting the importance of quantitatively assesing it for efective water control and ensuring the safety of water resources (Qazi et al., 2024).

Even though there are many different methods for E. coli detection with new ones being researched nowadays, not every method is certified to be used in a laboratory for quality control. Currently, three type of assays are used for susch purpose, which are based on the employment of culture media (COMPASS cc AGAR and RAPID'E.coli 2+ supplement water testing) or colorimetry and fluorimetry (Colilert-18/Quanti-Tray) (NF Validation, 2024).

For culture media, membrane filter technique is widely approved as a procedure for monitoring drinking water microbial quality. This method consists of filtering a water sample in a sterile filter with 0,45µm pore size which is then incubated in a culture media to count the colonies on the filter.

In order to be accredited, a laboratory for water quality must follow a proccess called validation where an external organization confirms if they method is being done effectively or not with a quality control experiment. This experiment consists on inoculating a known quantity of bacteria to check if they can detect a similar number after the method. After being accredited, this research must be conducted with a frequency decided by the laboratory to test whether they are correctly applying the method.

On the other hand, even if membrane filtration technique is a viable way of detecting E. coli, it has disadvantages like its inability to recover stressed or injured coliforms. Therefore, new techniques are being researched and will probably be implemented in the near future. This makes a techno-economical analysis important to determine the practical implanatation of some of this new methods.

## REFERENCES

- Qazi, R.A., Aman, N., Ullah, N., Jamila, N. and Bibi, N. (2024) *Recent advancement for enhanced e. Coli detection in electrochemical biosensors*. Microchemical Journal, 196, 109673
- NF Validation (2024, 21 february). <https://nf-validation.afnor.org/en/water-analysis/escherichia-coli-coliform-bacteria-water-human-consumption/>
- Rompré, A., Servais, P., Baudar, J., De Roubin, M.-R. and Laurent, P. (2002) *Detection and enumeration of coliforms in drinking water: current methods and emerging approaches*. Journal of Microbiological Methods, 49, 1, pp. 31-54