Training Workshop on Water Monitoring Network and Early Warning System

16-19 August 2021

Virtual-SESRIC, Ankara - Turkey

Introduction of QCC-LABS

Lebanese University, Tripoli, Lebanon

مختبرات غرفة التجارة والصناعة والزراعة في طرابلس ولبنان الشمالي

LABORATORIES OF CHAMBER OF COMMERCE INDUSTRY & AGRICULTURE of Tripoli and North Lebanon

الجامعة اللبنانية

UNIVERSITE LIBANAISE

Learning Objectives

- Introduction of QCC-LABS
- Introduction of Industrial Development & Research Agro-Agri Center (IDRAC)
- The Latest Technology for Microbiological Water Tests

QCC

Quality Control Center

Research & Development

LABORATORIES

مختبرات غرفة التجارة والصناعة والزراعة

LABORATORIES OF CHAMBER OF COMMERCE INDUSTRY & AGRICULTURE

of Tripoli and North Lebanon في طرابلس ولبنان الشمالي

مركز التطوير الصناعي وأبحاث الغذاء

INDUSTRIAL DEVELOPMENT & RESEARCH ALIMENTARY CENTER

IDRAC CENTER - TRIPOLI - LEBANON . مركز إدراك - طرابلس - لبنان

Quality Control Center LABORATORIES

Our Vision

To become a Prominent and up-to-date Advisory & Research Center for Food and Non Food products in the Region.

Our Mission

- Provide Reliable Analyses
- Developing a Marketable Products
- Assist the Productive Community in Sustaining Their Operations Thereby Contributing to Economic Growth.
- Ensure Quality Services to Meet Customer Expectations
- Support and Incubate Students and Entrepreneurs
- Create National and International Network with R&D Centers

Our Core Values

- Customer and Consumer Satisfaction
- Accuracy of Results
- Continued Technical Upgrading of Equipments and methods
- Capacity Building of Staff
- Conformity with National and International Standards
- Transparency, Confidentiality, Integrity & Social Responsibility

QCC LABORATORIES Departments

قسم الفحوصات الجرثومية

Microbiological Lab

QCC LABORATORIES Departments

قسم التحاليل الكيميائية

Chemistry Lab

QCC LABORATORIES Departments

Molecular Biology Lab

مختبر علم الأحياء الجزيئي

Flour Grain, Feed & Dairies Lab
مختبر الطحين والحبوب والعلف والالبان
Testing of Feed and Dairy Products
PUSH
QCC LABORATORIES
Departments

QCC LABORATORIES Departments

Pesticides Residues Lab

مختبر متبقيّات المبيدات

QCC LABORATORIES Departments

Environmental Lab

مختبر البيئة

QCC LABORATORIES Departments

Quality of Packaging Lab

مختبر جودة الاغلفة

QCC LABORATORIES Departments

Toys Lab

مختبر الألعاب

QCC LABORATORIES Departments

Soil Lab

مختبر التربة

QCC LABORATORIES Departments

Calibration & Gold Lab

مختبر المعايرة والذهب

QCC LABORATORIES

Recognized by:

- ✓ The Ministry of Economy and Trade
- ✓ Customs Authorities
- ✓ Ministry of Public Health
- ✓ Ministry of Agriculture
- ✓ Municipalities

Trainings

Food chain and water

Theoretical → Technical → Practical

GMP/GHP

HACCP

ISO 22000

Accredited ISO 17025
Since 2012

ANAB

CERTIFICATE OF ACCREDITATION

ANSI-ASQ National Accreditation Board
500 Montgomery Street, Suite 625, Alexandria, VA 22314, 877-344-3044

This is to certify that

QCC Laboratories-CCIAT: Quality Control Center Laboratories
Chamber of Commerce, Industry & Agriculture in Tripoli & North Lebanon
Bchara El Khoury Boulevard-CCIAT Building
Tripoli, Lebanon

has been assessed by ANAB
and meets the requirements of international standard

ISO/IEC 17025:2005

while demonstrating technical competence in the field(s) of

TESTING

Refer to the accompanying Scope(s) of Accreditation for information regarding the types of tests to which this accreditation applies.

AT-1714
Certificate Number

ANAB Approval

Certificate Valid To: 08/29/2016
Version No. 001 Issued: 09/21/2015

ilac-MRA ANAB

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (*refer to joint ISO-ILAC-IAF Communiqué dated January 2009*).

IDRAC Center

Industrial Development & Research
Agro-Agri Center

مركز ادراك سلامة الغذاء

مركز التطوير الصناعي وابحاث الزراعة الغذاء

IDRAC Center Services

1) Honey Collection & Filling Center

IDRAC Center Services

2) Olive Oil Collection & Filling Center

IDRAC Center Services

3) Olive Oil & Food Tasting Laboratories

IDRAC center Services

4) Distillation & Essential Oils Production

IDRAC center services

5) Dairy products (Lebanese Qishta) Production

IDRAC Center Services

6) Drying Fruits & Vegetables

Hot Drying

IDRAC Center Services

6) Drying Fruits & Vegetables

Freeze Drying

IDRAC Center Services

7) Food Filling and Packaging

IDRAC Center Services

8) Lebanese Ice Cream Production

10) Central Kitchen

IDRAC Center Services

10) Lebanese Soap Production

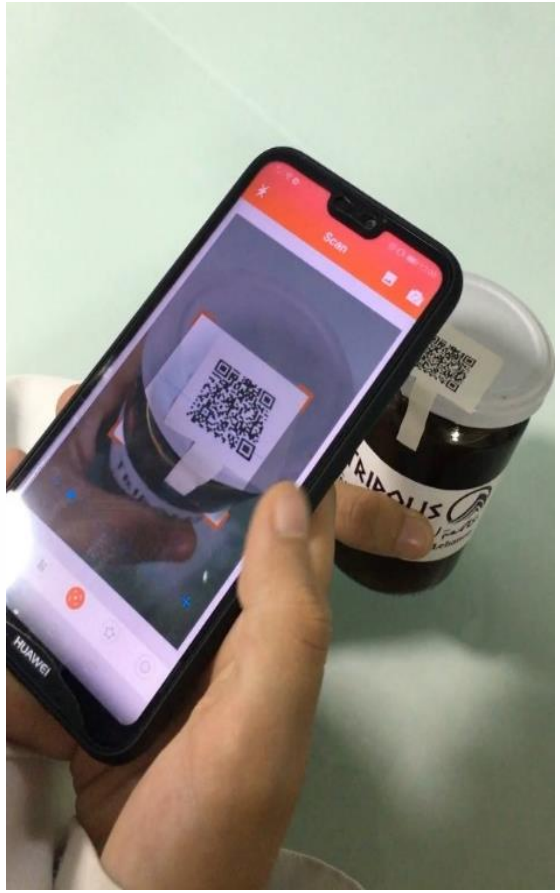
IDRAC Center Services

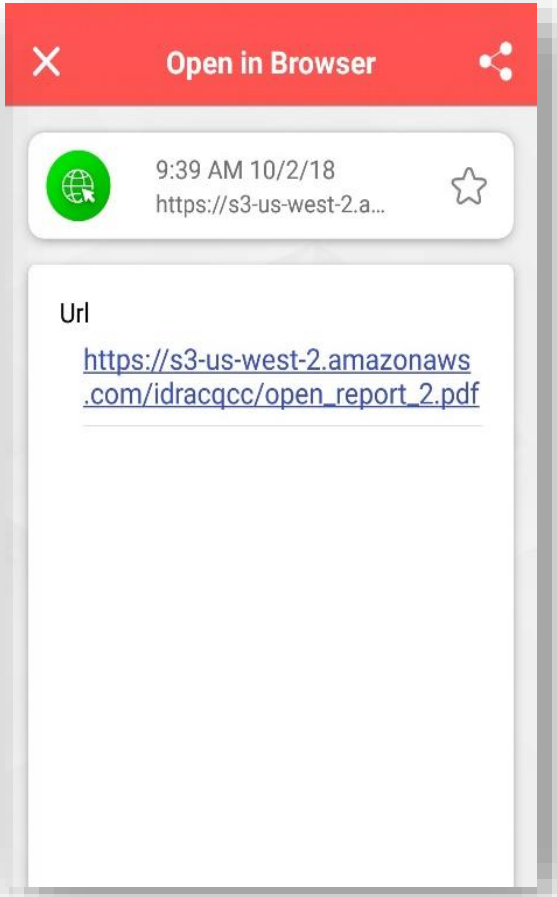
10) Lebanese Soap Production

IDRAC Center Services

12) QR Code Traceability System

for Honey, Olive Oil, Distillates, Dried Fruits and others



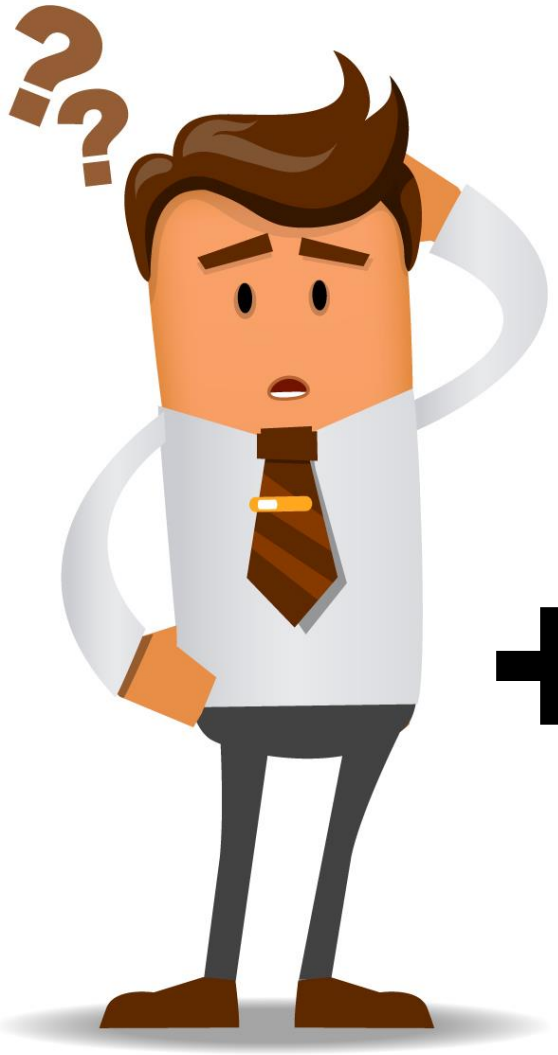


Innovated and Developed &
Marketable Products
Farmer
Honey
Olive Oil
Trader
IDRAC center

مَركَز التَطوير الصِناعِي وأَبحاث الغِذاء

INDUSTRIAL DEVELOPMENT & RESEARCH ALIMENTARY CENTER

IDRAC CENTER - TRIPOLI - LEBANON • مَركَز إِدراك - طَرابلس - لُبنان



+

- Research & Development
- Innovation
- Industrial Incubator
- Entrepreneurship

=

مَركَز التَطوير الصِناعِي وأَبحاث الغِذاء

INDUSTRIAL DEVELOPMENT & RESEARCH ALIMENTARY CENTER

IDRAC CENTER - TRIPOLI - LEBANON . مَركَز إدراك - طَرابلس - لُبنان

Researches at IDRAC Center

Research Axes:

1. **Essential Oil Extraction From Natural Herbs & Plant:** Used as natural food and non food preservative (antimicrobial activities).

2. **Natural Substances Extracted From Lactic Acid Bacteria**: Used as natural food preservatives (antimicrobial activities).

3. **Food Innovation and Creation**: New recipes, prolongation of shelf life, Processed food, dried fruits & herbs and others.

مَركَز التَطوير الصِناعِي وأَبحاث الغِذاء

INDUSTRIAL DEVELOPMENT & RESEARCH ALIMENTARY CENTER

IDRAC CENTER - TRIPOLI - LEBANON . مَركَز إدراك - طَرابلس - لُبنان

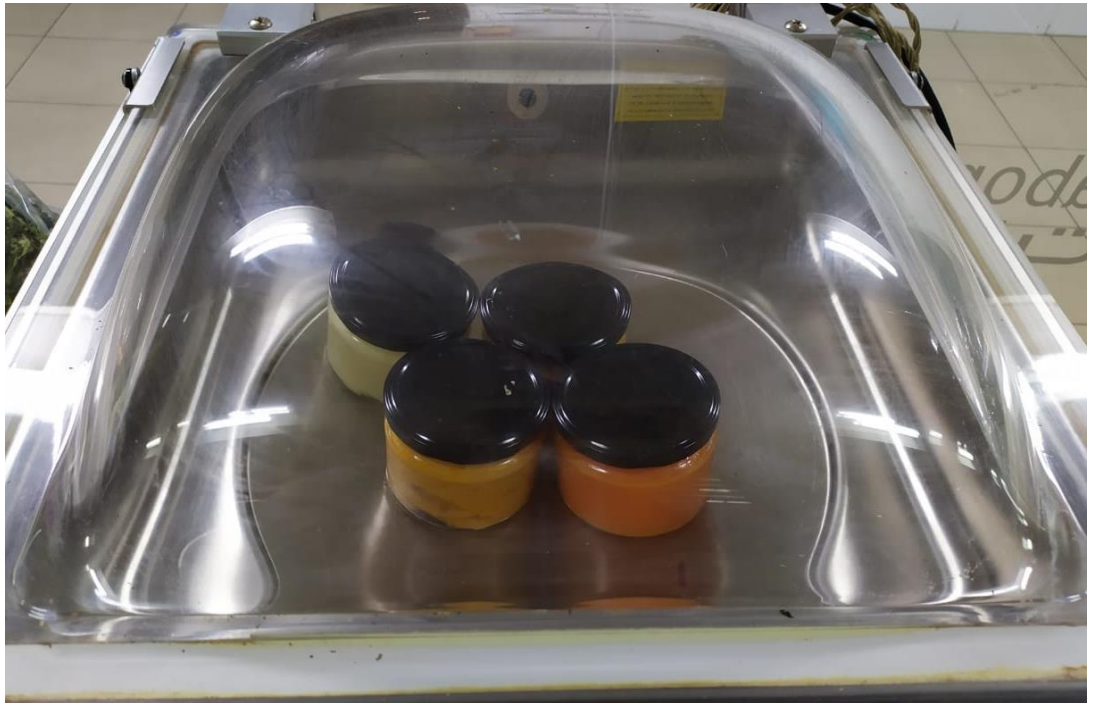
Current Researches at IDRAC center **2020-2021**

Current 20-21

1) Producing of Lebanese Baby Foods and Evaluation of its shelf life

Current 20-21

1) Producing of Lebanese Baby Foods and evaluation of its shelf life



Current 20-21

2) Producing of Lebanese Infusion Herbs and Determination of its Shelf Life and Organoleptic Properties

Current 20-21

2) Producing of Lebanese Infusion Herbs and Determination of its Shelf Life and Organoleptic Properties

Current 20-21

3) Producing of Natural Powder Colorant and Natural Juice from Beet Root by Using Freeze Drying Technique

Our STRATEGY

Business Incubator

الجامعة اللبنانية
UNIVERSITE LIBANAISE

Academia

Product or Method Development

Product or Method

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The Latest Technology for Microbiological Water Tests

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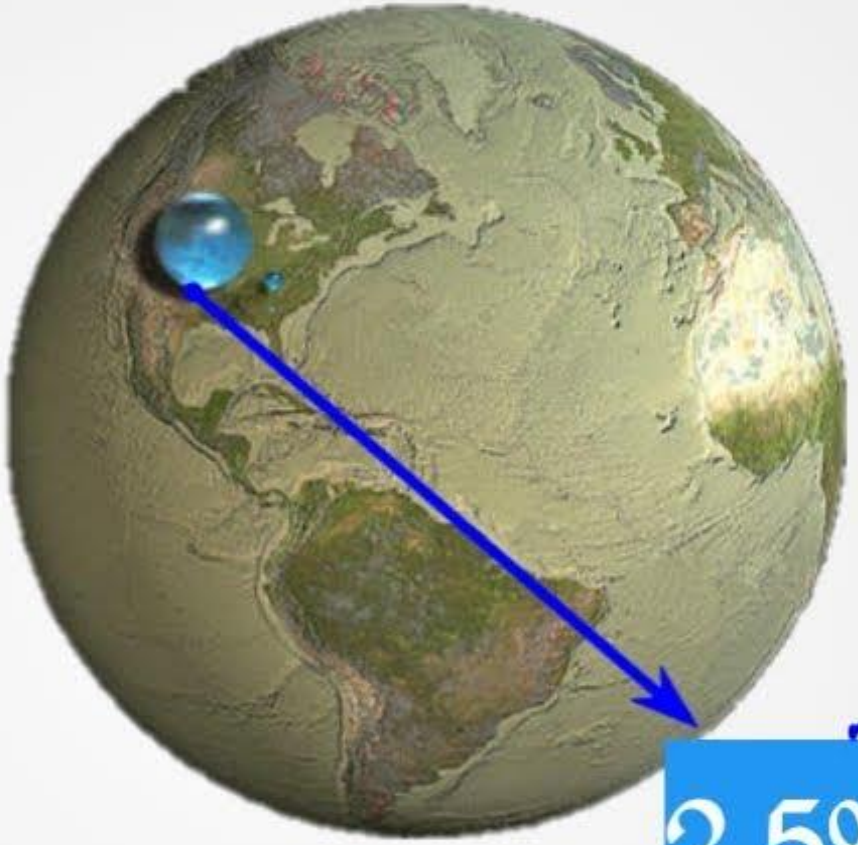
الجامعة اللبنانية

UNIVERSITE LIBANAISE

Freshwater makes up a very small fraction of the earth's water

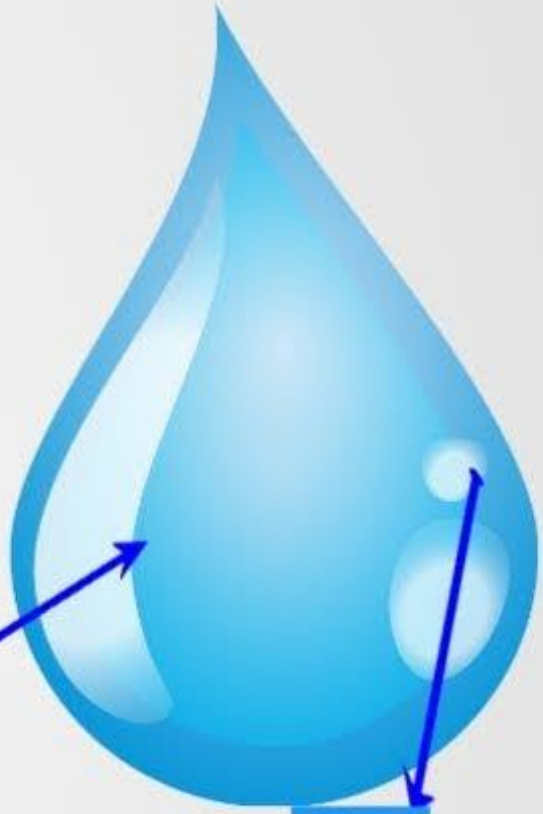
71%

Percentage of the earth's surface covered in water



2.5%

Freshwater



1%

Available freshwater

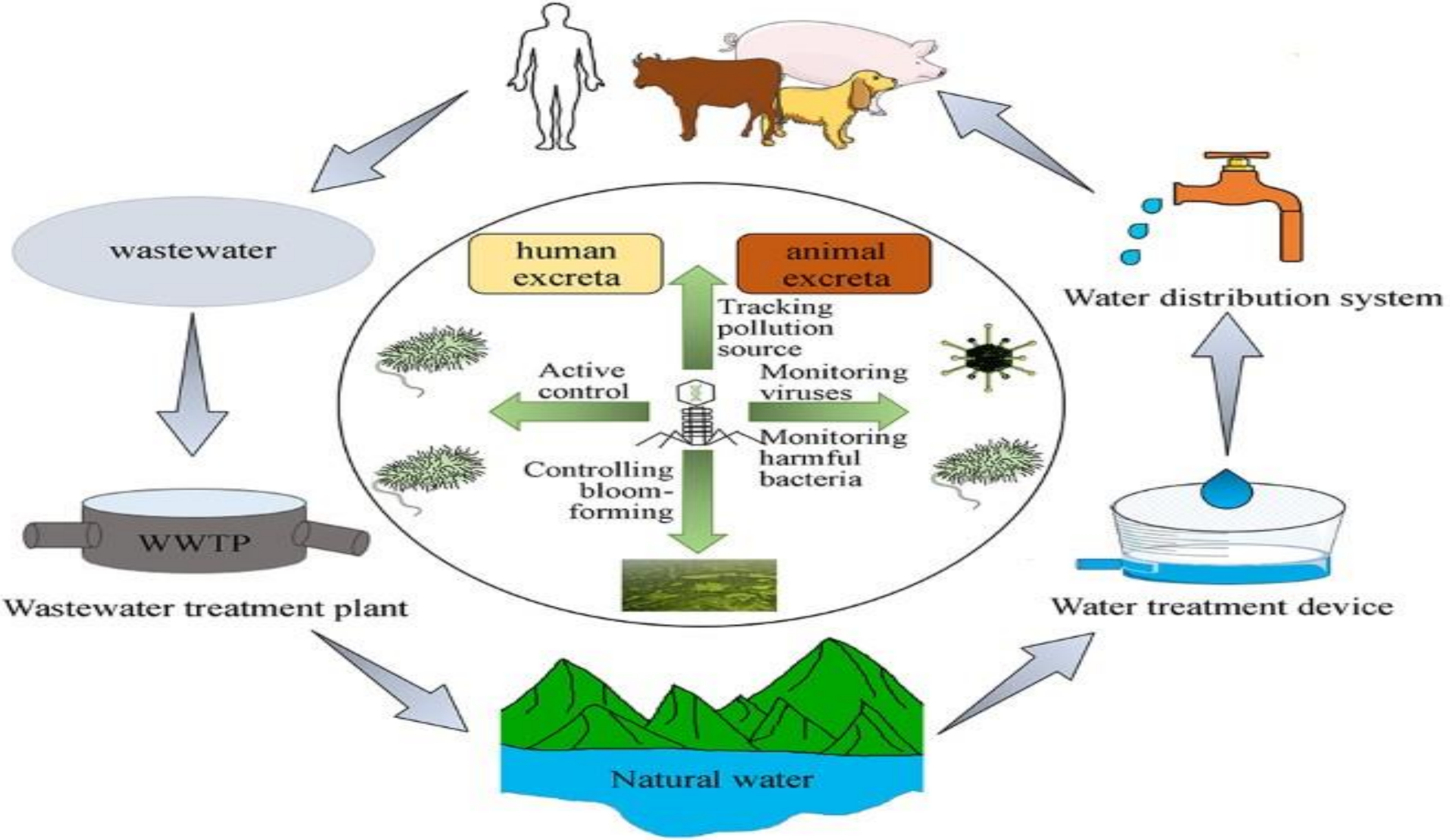
" ... and we made of water every living thing,
will they not then believe ??!! "

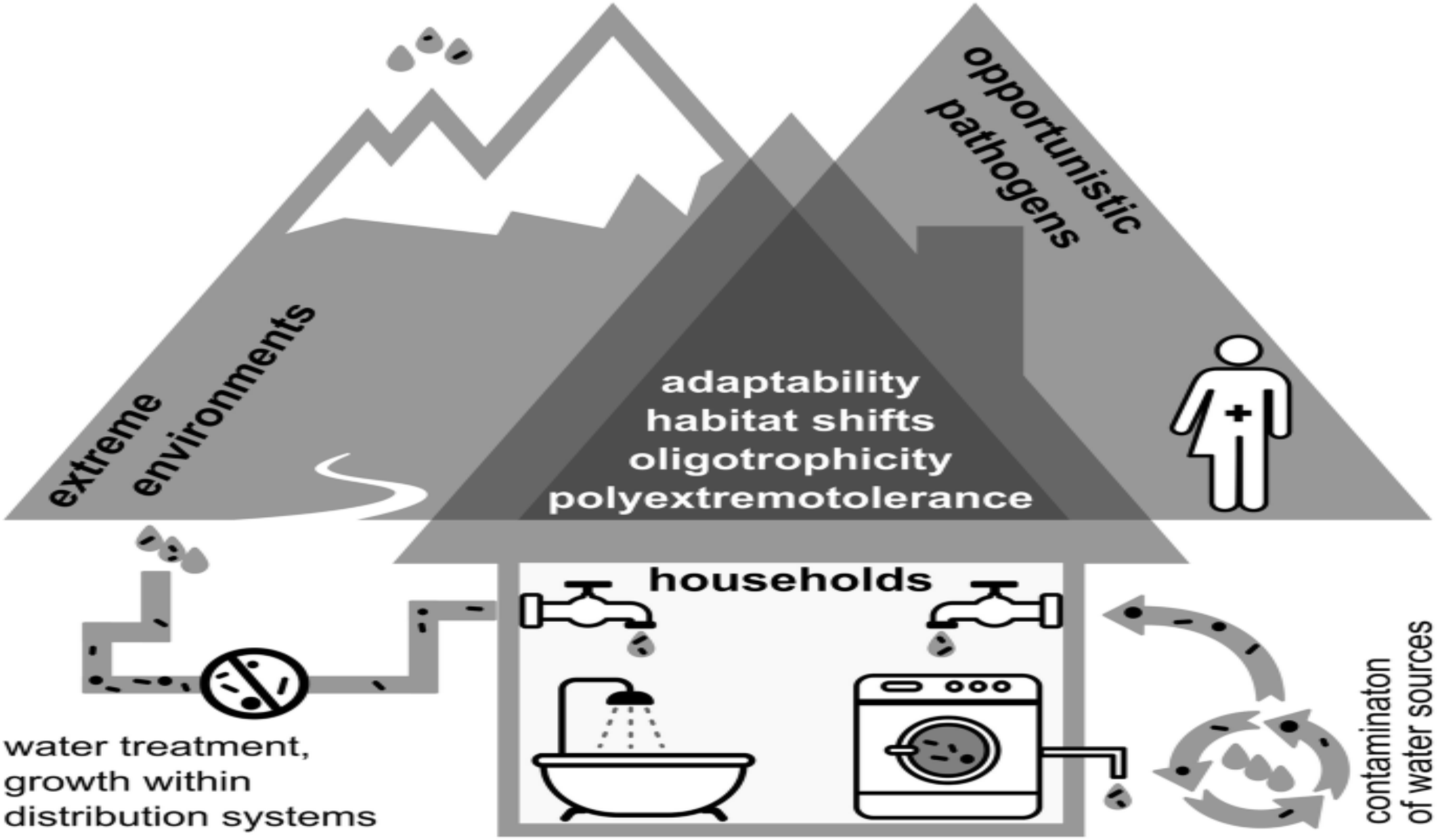
surat Al-anbiyaa

﴿ وَجَعَلْنَا مِنَ الْمَاءِ كُلَّ شَيْءٍ حَيٍّ أَفَلَا يُؤْمِنُونَ ﴾

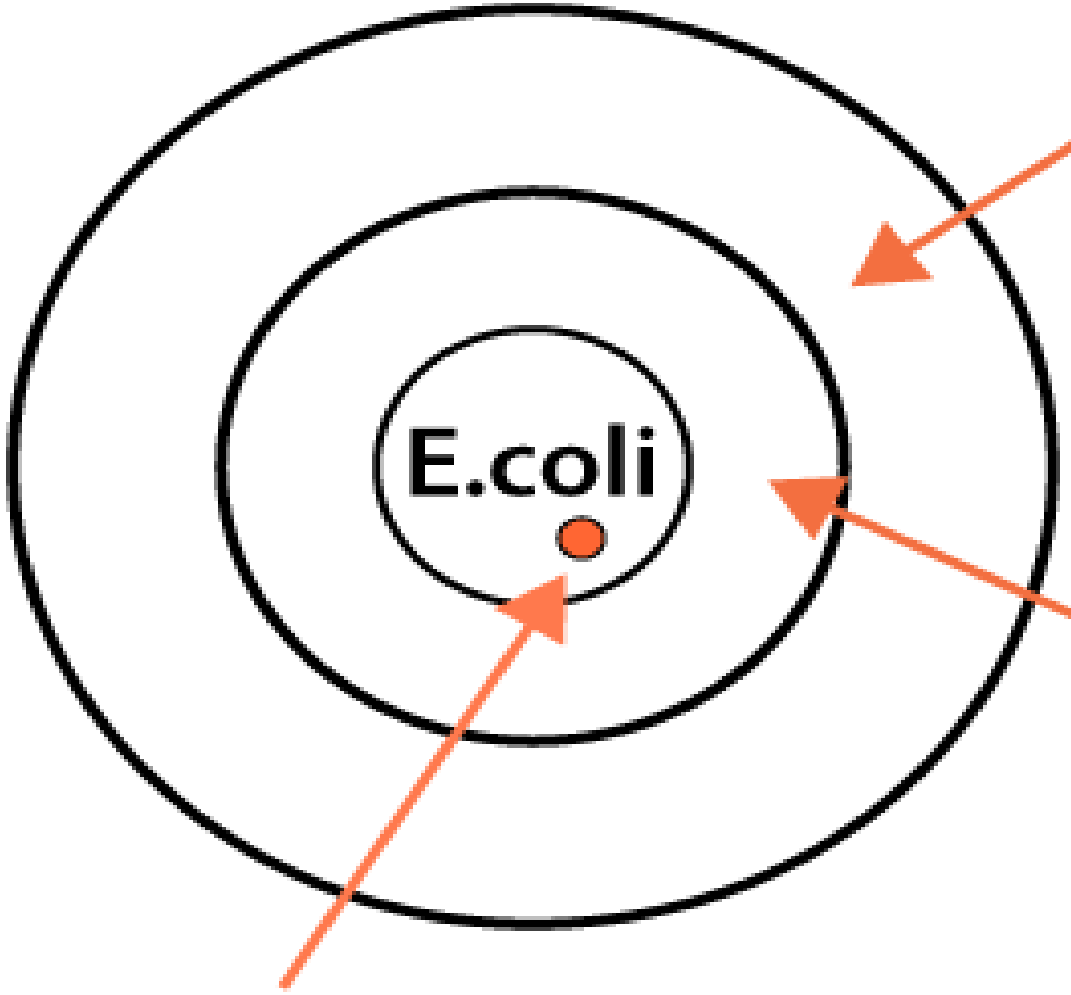
سورة الأنبياء

Source of Microbial Pollution in Water


wastewater
human excreta
animal excreta
Tracking pollution source
Active control
Monitoring viruses
Monitoring harmful bacteria
Controlling bloom-forming
Water distribution system
WWTP
Wastewater treatment plant
Water treatment device
Natural water


extreme environments
opportunistic pathogens
adaptability
habitat shifts
oligotrophicity
polyextremotolerance
households
water treatment, growth within distribution systems
contaminaton of water sources

Total Coliform, Fecal Coliform and E.coli



Total Coliform

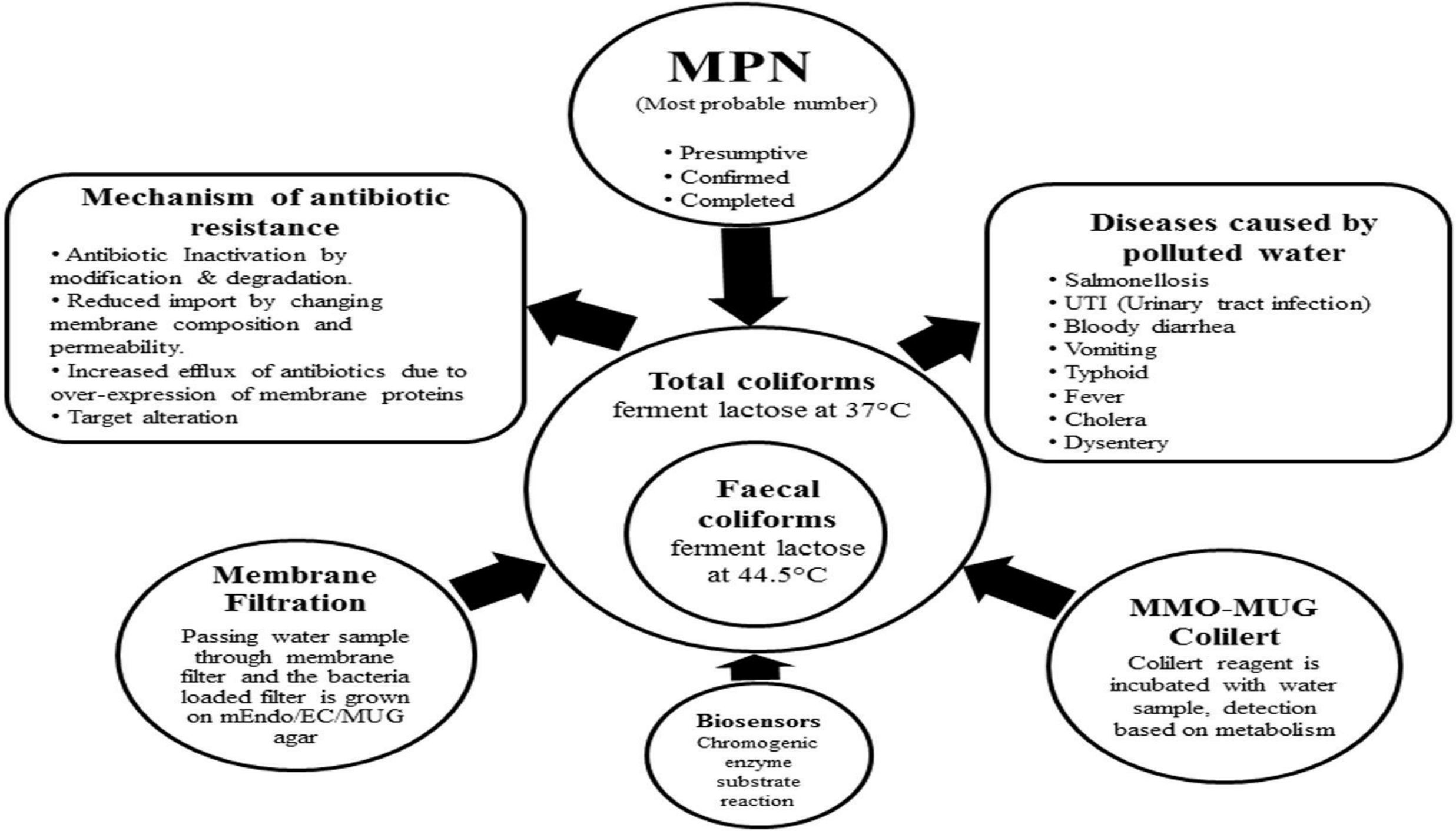
Total Coliform =
Environmental Contamination

Fecal Coliform

Fecal Coliform + E.coli =
Fecal Contamination

E.coli 0157:H7

Water testing


MPN
(Most probable number)
• Presumptive
• Confirmed
• Completed
Mechanism of antibiotic resistance
• Antibiotic Inactivation by modification & degradation.
• Reduced import by changing membrane composition and permeability.
• Increased efflux of antibiotics due to over-expression of membrane proteins
• Target alteration
Diseases caused by polluted water
• Salmonellosis
• UTI (Urinary tract infection)
• Bloody diarrhea
• Vomiting
• Typhoid
• Fever
• Cholera
• Dysentery
Total coliforms
ferment lactose at 37°C
Faecal coliforms
ferment lactose at 44.5°C
Membrane Filtration
Passing water sample through membrane filter and the bacteria loaded filter is grown on mEndo/EC/MUG agar
Biosensors
Chromogenic enzyme substrate reaction
MMO-MUG Colilert
Colilert reagent is incubated with water sample, detection based on metabolism

QCC LABORATORIES Departments

قسم الفحوصات الجرثومية

Microbiological Lab

Traditional Water Testing

Sampling

a) Wear gloves

b) Flush

c) Collect water (>200 mL) under the flow in sterile containers

Storage and transportation

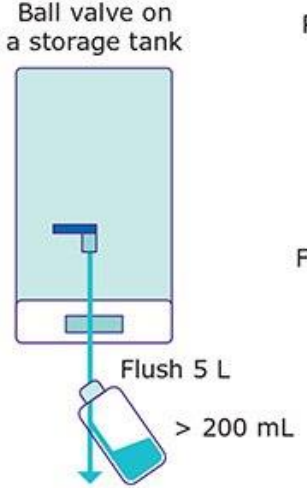
a) Minimize storage time. Store at 4 °C.

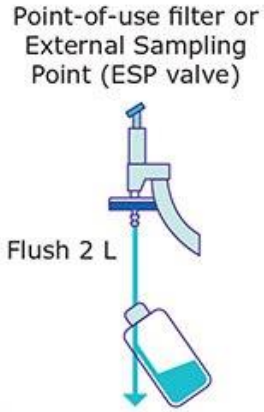
b) Ship sample in temperature-controlled conditions

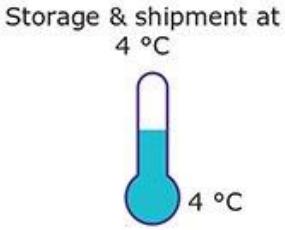
Culture

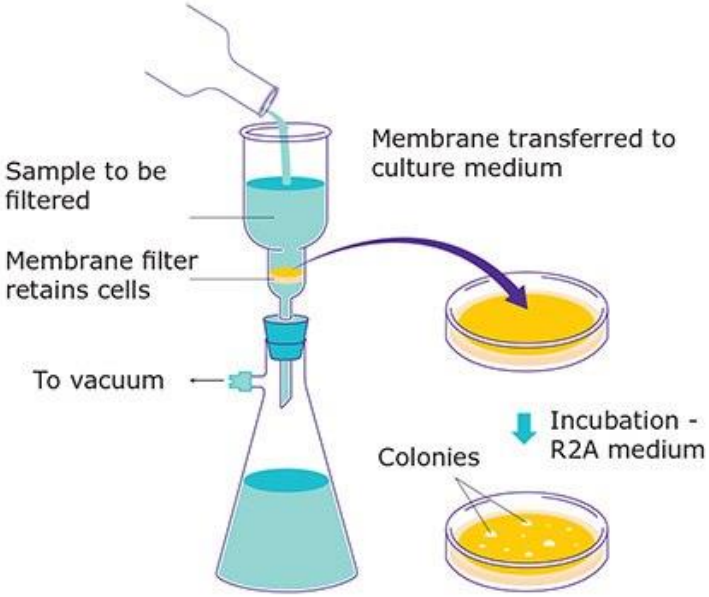
a) Filter sample

b) Culture on R2A medium in duplicate 3-5 days at 30 °C









TEMPO Technique:

- TEMPO is a fully automated enumeration system that tests quality indicators in food products and environmental samples within your laboratory.

- Connected to your LIMS, TEMPO provides objective results and ensures data traceability with minimal preparation time.
- Accuracy and efficiency matter.

- Let TEMPO automate your food safety testing.

- Quality indicator enumeration of total viable counts, coliform counts, generic *E. coli*, and *Enterobacteriaceae*, lactic acid bacteria and *Staphylococcus aureus*, yeast and molds, and *Bacillus cereus* for food and environmental samples

TEMPO FEATURES & SPECS

- bioMérieux innovates by proposing specific culture media which allow rapid bacterial growth. bioMérieux miniaturized the Most Probable Number (MPN) method with 16 tubes in a single consumable, the TEMPO card.

- The card, at the heart of the TEMPO system, offers the precision of the 16-tube MPN method without the usual tedious preparation.

- Each medium contains a fluorescent indicator based on the formula of traditional culture media and bioMérieux’s expertise in bacteriology.

- Each well in the card corresponds to a dilution tube and the size of the well corresponds to 1 to 3 levels of dilution.

- After distribution of the culture media-sample mixture in the wells of the card, the bacteria multiply during incubation and metabolize the culture media.

- According to the number and size of the positive wells (fluorescent or non-fluorescent), the TEMPO system uses statistical methods to calculate the number of microorganisms present in the initial sample.

- The final result is expressed in CFU/ml

IDEXX offers water microbiology test kits for all your needs.

The Products:

Colilert® The leading test method for coliforms and *E. coli* in countries around the world
Colilert®-18 Confirmed test results for coliforms and *E. coli* in just 18 hours
Colisure® Definitive results in 24 hours and up to 48 hours, offering maximum workflow flexibility
Enterolert® Rapid test for detection and quantification of enterococci
Quanti-Tray® An easy quantification method for Colilert, Colilert-18, Colisure and Enterolert

U.S. EPA-Approved and included in Standard Methods for the Examination of Water and Wastewater.

The Benefits:

Easy A few simple steps, with minimal training and no media preparation
Rapid Under one minute hands-on time, results in as few as 18 hours
Accurate Eliminates the subjective interpretation found in traditional methods
Cost effective 20–50% less expensive than traditional methods[2]

For more information, visit **idexx.com/water**
or in the US and Canada, call **1-800-321-0207**

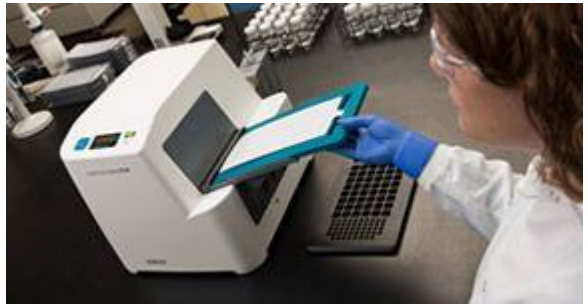
IDEXX

ISO 9001:2000 CERTIFIED

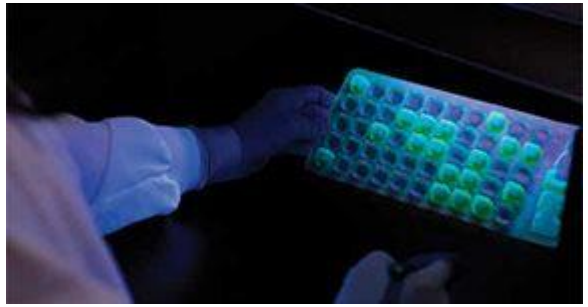
One IDEXX Drive
Westbrook, Maine 04092 USA

IDEXX LABORATORIES

Step1: Pour into Quanti-Tray (counts from 1–200) or Quanti-Tray/2000 (counts from 1–2,419)



Step 2:seal in Quanti-Tray Sealer and place in 35°C ± 0.5°C incubator for 24 hours (in other countries, the temperature requirement may be different per regulatory requirements).



Step 3: **Quanti-Tray**—Read results:

•Yellow wells = total coliforms
•Yellow/fluorescent wells = *E. coli*
•Count positive wells and refer to MPN table

Overview

Proven

- U.S. EPA-approved, 24-hour test for drinking, wastewater and source waters.
- International approvals include AOAC, IBWA, and EBWA.
- Millions of tests performed worldwide every year.

Easy

- Ease of use simplifies training.
- Unit-dosed packaging eliminates media preparation.
- No repeat testing due to clogged filters or heterotrophic interference.
- Quality Control (QC) procedure can be done in 15 minutes.

Rapid

- Less than 1 minute of hands-on time.
- Detects coliforms and *E. coli* simultaneously in 24 hours or less.
- No confirmations needed.
- No glassware cleaning or colony counting.

Accurate

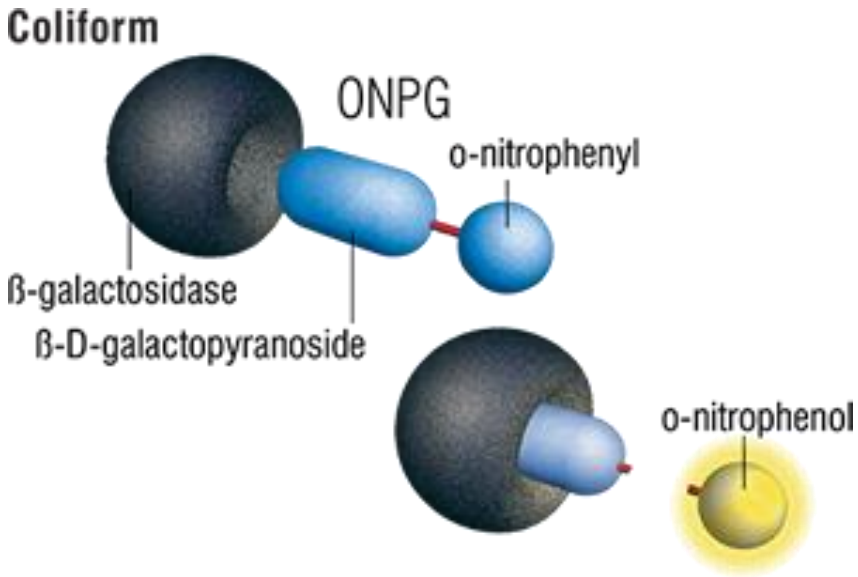
- Identifies *E. coli* specifically, eliminating unnecessary public notification due to non-target organisms.
- Suppresses up to 2 million heterotrophs per 100 mL.
- Eliminates the subjective interpretation found in traditional methods.
- Detects a single viable coliform or *E. coli* per sample.

Economical

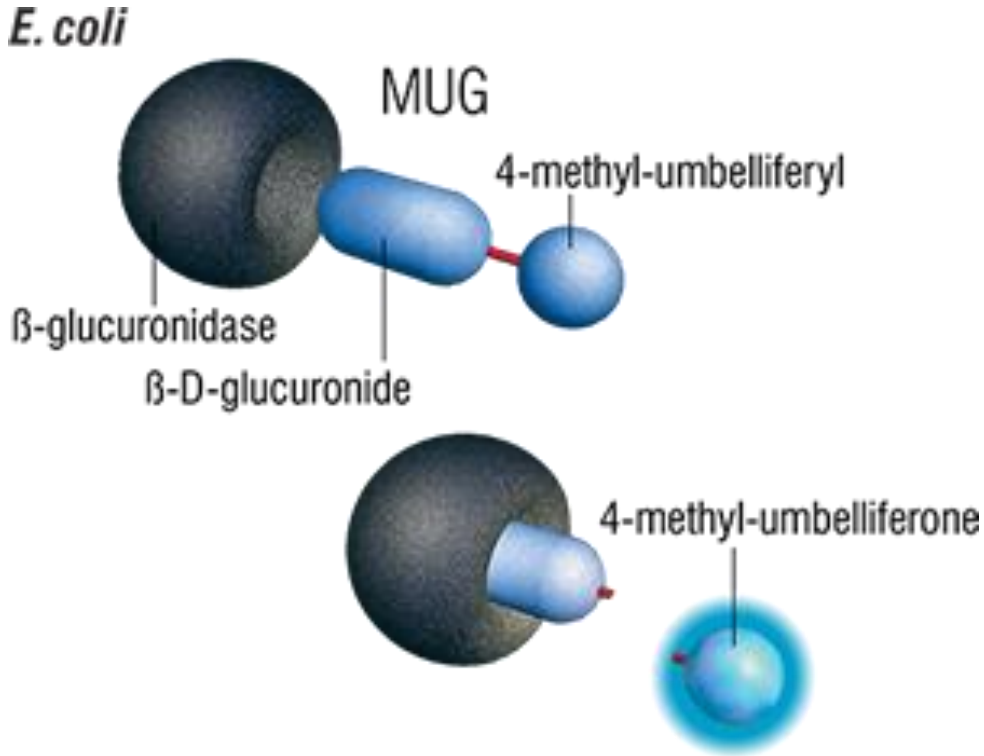
- Minimizes evening and weekend work.
- Up to 12-month shelf life at room temperature.
- Flexible
- Can be used for presence/absence (P/A) or quantification testing with Quanti-Tray and Quanti-Tray/2000.
- The Colilert Test is also available predispensed in 10mL Most Probable Number (MPN) tubes.

Science

- The Colilert Test uses proprietary Defined Substrate Technology (DST) to simultaneously detect total coliforms and *E. coli.* Two nutrient-indicators, ONPG and MUG, are the major sources of carbon in Colilert and can be metabolized by the coliform enzyme β-galactosidase and the *E. coli* enzyme β-glucuronidase, respectively.
- As **coliforms** grow in the Colilert Test, they use β-galactosidase to metabolize ONPG and change it from colorless to yellow.



- ***E. coli*** use β-glucuronidase to metabolize MUG and create fluorescence. Since most non-coliforms do not have these enzymes, they are unable to grow and interfere. The few non-coliforms that do have these enzymes are selectively suppressed by the Colilert Test's specifically formulated matrix.



National Partners

الجمهورية اللبنانية
وزارة الصحة العامة

الجمهورية اللبنانية
وزارة الاقتصاد و التجارة

الجمهورية اللبنانية
وزارة الصناعة

وزارة الزراعة

DOUANES LIBANAISES
الجمارك اللبنانية

إتحاد بلديات المنية

إتحاد بلديات الفيحاء

إتحاد بلديات
قضاء زغرتا

مؤسسة المقاييس و المواصفات اللبنانية - ليبنور
Lebanese Standards Institution - Libnor

LIBNOR
Lebanese Standards Institution
Co-creating Responsibility

الجامعة اللبنانية
UNIVERSITE LIBANAISE

ECOLE DOCTORALE - SCIENCES ET TECHNOLOGIE
CENTRE AZM POUR LA RECHERCHE EN BIOTECHNOLOGIE ET SES APPLICATIONS

Lebanese University
Faculty of Public Health

جامعة اليمامة
UNIVERSITY OF BALAMAND

Université Saint-Joseph de Beyrouth
جامعة القديس يوسف في بيروت
USJ
1875

USEK
UNIVERSITÉ SAINT-ESPRIT
DE KASLIK

1866
AUB
American University of Beirut
الجامعة الأميركية في بيروت

جامعة بيروت العربية
BEIRUT ARAB UNIVERSITY

International Partners

INRA

Université de Lille

World Health Organization

ISO International Organization for Standardization

CODEX ALIMENTARIUS International Food Standards

FAO Food and Agriculture Organization of the United Nations

care®

UNDP

EUROPEAN UNION

UNIDO

USAID FROM THE AMERICAN PEOPLE

UKaid from the British people

International Partners

SESRIC

INWRDAM
WATER DIPLOMACY

خمسون عاما

متحدون من أجل السلم والتنمية
UNITED FOR PEACE AND DEVELOPMENT
UNIS POUR LA PAIX ET LE DEVELOPPEMENT
2019 - 1969

TRIPOLIS
عاصمة لبنان الاقتصادية
Thank You!!!