Chlorine free drinking water without infectious diseases in the Netherlands

17 MLN People
120 liter per person per day
60% groundwater
40% surface water
No chlorine disinfection or residual

Prevent carcinogenic effects from disinfection by products (DBP’s)
Avoid taste and odor issues
Quantitative Microbial Risk Assessment (QMRA)

Sufficient treatment steps to ensure water is safe

Monitoring
Pilot experiments
Modeling
Research
Stochastic calculation of health risk
Protect water during distribution

Minimal leakage (2%-4% non-revenue water)
Always pressurize >2 Bar 24/7
Repairs or works: strict working procedures for hygiene
Rapid quality analysis for E. coli
Prevent growth of opportunistic pathogens (e.g. Legionella)

Minimize food availability for bacteria (AOC)
Manage temperature in buildings (<25°C)
Regular water quality check of vulnerable locations (e.g. Hospitals)
Water reuse: new challenges

- Sustainability and environment (LCA)
- Legislation and regulations
- Water treatment technologies
- Health and safety
- Reuse in agriculture or industry
- Subsurface water storage
Different context, same principles

GENERATE AND SHARE KNOWLEDGE ON SAFE WATER FOR ALL
KWR WATERCYCLE RESEARCH INSTITUTE
BRIDGING SCIENCE TO PRACTICE
THANK YOU FOR YOUR ATTENTION

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ARG routes

ANIMAL HUSBANDRY → AGRICULTURE → FISH CULTURE → TRADE AND EXPORT → CONSUMPTION → ME, FAMILY, PETS → FAUNA

GLOBALISATION → HEALTHCARE

MANURE → DWTP → WWTP