**Ques-2- Reduction of water born disease by inserting UV lamp in water tank**

Ultraviolet water disinfection technology is a chemical-free, efficient, and highly effective method of destroying waterborne microbiological contamination, making water safe for drinking and food preparation.

The UV lamp kills any microorganisms present in the stored water so that you get clean and safe drinking water. As a result, even if you are on a short vacation you don’t need to empty the storage tank.

#### There are many benefits of using UV water purification systems, here are just a few:

* No need to handle potentially dangerous chemicals (chlorine)
* Virtually immediate disinfection (no contact tanks like chlorine)
* Low power consumption Environmentally friendly (no disinfection by-products)
* No moving parts to wear out or replace UV does not change the taste or odour of the water
* Lower equipment investment verses other disinfection options Simple maintenance (with proper pre-treatment).

#### Chemical vs. Physical Disinfection of Contaminated Water

* Disinfection is defined as “The act of disinfecting, using specialized cleansing techniques that destroy or prevent growth of organisms capable of infection.”
* Disinfection is a considered a 4-log reduction or equivalent to a 99.99% reduction
* There are generally two methods specifically for the disinfection of water:
  + CHEMICAL Disinfection: chlorine, ozone, iodine, bromine
  + PHYSICAL Disinfection: UV light, boiling, fine filtration

#### Chemical Water Disinfection

* If using chemical disinfection a chemical must be added in order to destroy the microorganisms present
* One method of chemical disinfection that we are most aware of is chlorination – specifically of our drinking water
* How does chlorination work?
  + Using a chemical such as chlorine will not only target bacteria but it will also change the taste of the water, the smell, the pH as well as possibly form disinfection by-products (i.e. trihalomethanes)

#### Physical Water Disinfection

* Physical disinfection does not require anything to be added to the water
* This method of disinfection targets the microorganism only
* Boiling, filtration, ultraviolet disinfection
* When the contaminated water is boiled only the microorganisms are targeted killing them as the temperature increases
* When the contaminated water is fine filtered specific microorganisms are removed depending on their size and the rating of the filter (i.e. Crypto)
* If UV light sterilization is applied only the microorganisms are targeted through DNA inactivation
* Using any of the above physical methods will not change the taste, odour or chemical makeup of the water
* One of the simplest and most effective ways to disinfect drinking water is by using UV disinfection

#### Effect of UVC Light on Microorganisms

* Once microorganisms are exposed to UVC light they are rendered ‘inactive’ and can no longer replicate – meaning they can no longer produce colonies
* In the above picture on the left an agar plate is smeared with an untreated water sample, incubated & analyzed for colony growth
* The agar plate on the right has been smeared with a water sample that has been exposed to UV treatment – no colony growth occurred following incubation



