



ARKANSAS PRODUCE SAFETY

Microbial Water Quality Profile (MWQP): How to Interpret Your Lab Results

After you collect and send your water samples to a water testing laboratory, you will receive results from the lab that describe the number of generic *E. coli* present in your water sample.

IMPORTANT DEFINITIONS

Geometric Mean (GM): GM is a measure of the central tendency of your water quality distribution.

Statistical Threshold Value (STV): STV is a measure of variability of your water quality distribution, derived as a model-based calculation approximating the 90th percentile using the lognormal distribution.

Colony-Forming Unit (CFU): CFU is a measure in microbiology to estimate the number of viable microbial cells present in a sample.

Microbial Die-Off: A period of time during which a large part of the microbial population naturally dies due to environmental conditions, such as sunlight (UV irradiation), temperature, desiccation, humidity, starvation, or competition.

Calculate the GM and STV

The next step is to **calculate the GM and the STV from the number of generic *E. coli* present in your water samples.** Your results may include a number for generic *E. coli* and another number for Total Coliforms. Be sure to use the number of generic *E. coli* to calculate GM and STV.

Since these calculations can be complicated, it is recommended to **use a tool that will do the math for you.** Two of these **free and easy-to-use** calculation tools are the [Arizona State University's Ag Water app](#) and the [Western Center for Food Safety's Excel tools](#). **The Ag Water app** is an app that you can download on a smartphone or tablet, or you can access it online. This app allows you to add multiple water sources (ponds and wells) to create MWQPs for each one. It will calculate your GM, STV, and die-off interval (if necessary). Each water source will be saved in the app, and you can print your results to keep them in your records. For a step-by-step guide on how to use this app, view their [tutorials](#).

The Western Center for Food Safety's Excel tools function similarly, except that they are in an Excel document rather than an app. There are two Excel sheets, one for untreated ground water and one for untreated surface water. The GM, STV, and die-off interval (if necessary) will be automatically calculated for you as you enter your water test result values.

For more information on how to calculate the GM and STV, please see the [Produce Safety Alliance Geometric Means, Statistical Threshold Values, and Microbial Die-Off Rates document](#).

Compare your results to the standard values and use corrective actions if needed

Once you calculate your GM and STV, compare them to the standard values outlined in the Food Safety Modernization Act (FSMA) Produce Safety Rule (PSR). For more information, see the [Microbial Water Quality Profile \(MWQP\): How-to Guide](#). The GM should be equal to or less than 126 CFU/100 mL water, and the STV should be equal to or less than 410 CFU/100 mL water.

If your values are higher than the standard values, you should implement one of the following corrective actions:



1. Apply a time interval between the last irrigation and harvest for microbial die-off. The longer the time between the last application of contaminated water and harvest, the greater the chance that microbial populations have decreased. By applying a time interval for die-off, the original calculated GM and STV will decrease based on expected rates of microbial die-off in the field (0.5 log per day for up to four consecutive days). A log reduction for die-off may also be used during other post-harvest steps (during storage or during a microbial removal process such as commercial washing) as long as a scientifically validated die-off or removal rate with supporting documentation is used. Both tools listed above calculate the die-off interval for you.



2. Re-inspect your entire water system, identify problems, make necessary changes, and confirm effectiveness.



3. Treat your water chemically in accordance with the FSMA PSR.

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