HOW TO CONDUCT A FIELD TEST OF FOODSERVICE WATER TREATMENT SYSTEMS

Laboratory tests and certifications are valuable, but sometimes field tests are needed to select the system that is best for specific places or uses. Field tests are easier to do than lab tests, because fewer things have to be controlled, and there is never any question of whether the results are relevant to the "real world."

Location: The main problem in field testing is finding more than one test site (one for each competing system) that all uses the same water supply and have similar sales volumes. Other things to look for are unusual traffic patterns or heavy construction (the vibrations can increase water turbidity and the rate of filter clogging), extra pumps or storage tanks, differences in length and size of service lines between the filtration systems and the equipment, and location of any check-valves or pressure reducers. Make the competing installations as identical as possible.

Equipment: When installing the test equipment, be sure to include pressure gauges before and after, unless they're already part of the systems. If possible, include a water meter to record total water use. Otherwise, you will have to keep an accurate record of syrup and coffee containers to help estimate gallonage. Each installation will require an extra coarse prefilter placed after the fine-filter, preferably with a see-through pressure vessel, to show any episodes of channeling and dumping when the system starts to clog. You will need a standard measuring container and a watch with a second-hand to calculate flow rate. Finally, you'll need a basic chemical test kit for disinfectant chlorine—one that measures both "free chlorine" and "total chlorine." It is best if all water-using equipment at all test sites is freshly cleaned and delimed at the start of the test.

Testing: First, decide on the pass/fail criteria -- the cut-off point for chlorine bleed-through (detectable? 0.5 ppm? what?), or pressure drop (25 psi? 40?), or evidence of dumping showing up on the final filter, or when the icemaker shuts down, or whatever. At the start and at every check thereafter, record the date, time, and measure of total water volume used (the meter reading or the syrup count). Try to be regular and consistent in recording data: always check the same things on all systems, and set a schedule, like every Thursday afternoon. It is also useful to include several special checks at peak rush times, to measure performance under stress.

Interpreting the Results: You should look for three things: performance, consistency, and value.

Performance for chlorine reduction is usually pretty clear-cut and easy to see. Pressure drop (influent pressure minus the pressure at the system outlet or point-of-use while the water is flowing) may change slowly and consistently or be erratic. A sudden decrease is a sign of dumping, which should show up on the final filter. Flow rate is related to pressure drop, and any instance of cavitation of the carbonator pump is evidence of insufficient flow.

Consistency refers mostly to the possibility of channeling and dumping of dirt and sediment that has already been collected inside the filter. It is both disgusting and dangerous, and it must not be tolerated.

Value is performance (in the largest sense) divided by cost, and that should be the total volume of water of a certain consistent quality divided by the net cost of all replacement filter cartridges used during the test. The net cost is cartridge cost minus maintenance costs on icemakers, coffeemakers, etc. This is where the hard choices come, when you decide what's important: What is the value of a system that removes chlorine well but not turbidity, or vice-versa, regardless of cost? Is an excellent but costly system better if it saves more money in the long run? Is excellent performance that may literally save lives (removal of parasites) of any monetary value, or is your water treatment system decision based entirely on the "bottom line"?

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