

CALIFORNIA RECLAIMED WASTEWATER COMMENTS

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Office of Regulations
Department of Health Services
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RE: Water Recycling Criteria (R-13-95)

Safe Tables Our Priority is a nonprofit, grassroots organization consisting of victims of foodborne illness, family, friends and concerned individuals who recognize the threat pathogens pose in the U.S. food supply. S.T.O.P.'s mission is to prevent unnecessary illness and loss of life from pathogenic foodborne illness. We count among our members victims of *E. coli* O157:H7 contaminated meat, lettuce and apple juice; hepatitis A contaminated strawberries; *Vibrio vulnificus* in oysters; *Salmonella* contaminated poultry and eggs; and *Campylobacter* contaminated poultry. In all of these cases, the dangers of potentially contaminated products were known to government. And in all of these cases, inadequate efforts by government to warn consumers failed to protect them from life threatening illnesses. We appreciate this opportunity to comment on California State Department of Health Service's Proposed Criteria for Water Recycling.

S.T.O.P.'s chief concern in addressing water recycling is the potential for contamination of human food and water by pathogens. We strongly support DHS setting strict standards for the processing and application of wastewater. Our concerns lie in four categories:

- I. Use of Euphemisms
- II. Insufficient categorization of food and animal feed crops
- III. Lack of science supporting that secondary wastewater is sufficiently disinfected of pathogens.
- IV. Testing for pathogens

I. USE OF EUPHEMISMS

S.T.O.P. is concerned that Department of Health Service's adoption of the terms "recycled" and "recycling" as replacements for the terms "reclaimed" and "reclamation" has been strongly encouraged by industry in an attempt to "market" new applications of reclaimed wastewater to consumers. By adopting such euphemisms, the Department of Health Service's further's industry's interests and not that of California citizens. Consumers who would not tolerate the use of

reclaimed wastewater in applications related to food crops might not recognize that "recycled water" is, by DHS' definition, the same thing.

We strongly urge that before DHS makes changes to terms that have been used for many years in the public debate over water and waste safety that it conduct focus group research into the potential confusion these new terms cause for consumers. New terms that do not clarify issues for consumers but rather obscure the real nature of the issues, should not be adopted. This is the purpose of California's Plain English rules. On page two of the Notice of Proposed Rulemaking for Recycled Water, the Plain English description of recycled water is given as: "cleaned sewage."

II. INSUFFICIENT CATEGORIZATION OF FOOD AND ANIMAL FEED CROPS

In the Proposed Criteria under Section 60304 "Use of Recycled Water for Irrigation," DHS defines specific categories of foods, food products, and feed that are required to be treated with differing levels of treated and untreated wastewater. For each type of wastewater, these are:

Disinfected tertiary recycled water

- "Food crops, including all edible root crops, where the recycled water comes into contact with the edible portion of the crop

Disinfected secondary-2.2 recycled water

- "...food crops where the edible portion is produced above ground and not contacted by the recycled water."

Disinfected secondary-23 recycled water

- "Pasture for animals producing milk for human consumption."

Undisinfected secondary recycled water

- "Orchards where the recycled water does not come into contact with the edible portion of the crop."

- "Vineyards where the recycled water does not come into contact with the edible portion of the crop"

- "Fodder and fiber crops and pasture for animals not producing milk for human consumption."

- " Seed crops not eaten by humans."

- "Food crops that must undergo commercial pathogen-destroying processing before being consumed by humans"

The section ends with point e: "*No recycled water used for irrigation, or soil that has been irrigated with recycled water, shall come into contact with the edible portion of food crops eaten raw by humans unless the recycled water complies with subsection (a),*" i.e. disinfected tertiary recycled water.

If DHS will not require that wastewater be disinfected to the same level as drinking water for irrigation of food and feed crops, S.T.O.P. strongly urges that California mandate the use of disinfected tertiary wastewater in the irrigation of all food and feed crops, and at an absolute minimum, disallow the use of any undisinfected water on any food or animal crops.

The Need for At Least Disinfected Tertiary Water in Orchards and Vineyards

In indicating that it will allow undisinfected wastewater for irrigation of orchards, DHS has made a key assumption: that orchard products will not come into contact with the water supply or the ground that undisinfected wastewater may have contaminated. Yet, orchards have been the cause of multiple foodborne illness outbreaks, specifically those where unpasteurized juice has been the ultimate vehicle. In several of these outbreaks, fruit picked up off the orchard floor has been strongly implicated as the method of contamination.(1) While there are presently no rules that prohibit the use of drop apple or oranges in unpasteurized juice, the prevalence of outbreaks suggests that the practice is fairly common and that DHS prohibitions against such use would be largely ineffective.

Using pathogen-contaminated water for even low-lying irrigation in an orchard will result in the dispersion of pathogens throughout the orchard or vineyard floor. S.T.O.P. has identified at least three other ways in which pathogens from undisinfected wastewater might be transferred to orchard or vine-bearing fruit for human consumption.

First, workers walking through the orchard and climbing ladders to pick orchard fruit will transfer pathogen-laden soil to the rungs of the ladders with their shoes. From there, hands used to climb the rungs can pick up pathogens(2) and then transfer the pathogens directly to the picked fruit. In addition to the increased risk of crop contamination, farm workers face the potential of increased health risks if handling crops in areas irrigated with undisinfected wastewater in this manner.

Second, flies can transfer a pathogen such as E. coli O157:H7 to a "clean" piece of fruit.(3) Thus, flies which would be naturally attracted to undisinfected water or contaminated soil on the orchard floor could result in contaminated tree fruit.

Third, pilot studies have been conducted that indicate that some pathogens may form sporified forms which can exist under dry conditions for a long time. In dust, these can be blown onto orchard or vineyard bearing fruit.(4) Thus, "dry" soil contaminated by undisinfected wastewater in the vicinity of orchards represents a threat to fruit that might otherwise not come into contact with the ground.

In short, there are multiple venues by which previously uncontaminated orchard or vineyard foodstuffs can come into contact with soil laden with pathogens if undisinfected water is used in their vicinity. S.T.O.P. therefore argues that orchards and vineyards must have the same protection from the use of undisinfected wastewater as other types of crops.

The Need for At Least Disinfected Tertiary Water in Seed Crops Not Eaten By Humans

California's distinction between seed crops eaten by humans and those consumed by food animals is also misguided. Specifically, at a meeting in September, 1999 sponsored by the U.S. Food and Drug Administration the produce subcommittee of the National Advisory Committee on the Microbiological Criteria for Foods found that there was no evidence of industry growing alfalfa seed specifically intended for alfalfa for cattle vs. alfalfa seed for alfalfa sprouts for humans.(5) Contamination by animal-harbored pathogens such as Salmonella and E. coli O157:H7 in these seeds has proven to be a serious issue, causing thousands of identified cases of illness worldwide and at least 10 separate outbreaks since 1995.(6) The problem has caused particular concern because once the seed is contaminated, there is no effective way to eliminate the pathogens from the seed by means known today without killing the germinating capabilities of the seed. In short, unless DHS plans to enforce a distinction that is not presently observed by the seed industry, it is imperative that all seed crops be grown with the safest water available today for food crops with the expectation that they may be consumed by humans.

In addition, it is critical to note that at present, a key potential source of present contamination in alfalfa seeds is hypothesized to be the use of untreated animal wastewater as irrigation and fertilizer for alfalfa. It is believed possible that when the combine harvests alfalfa, it churns up contaminated soil and pebbles which mix the pathogens into the seed.(7) In short, irrigating seed crops with undisinfected water is likely to lead to the spread of pathogens in humans through human food consumption.

The Need for At Least Disinfected Tertiary Water in all Fodder and Fiber Crops and Pasture

Both animals producing milk and animals destined for human consumption can become infected through eating pathogen-contaminated foodstuffs, whether fodder, fiber or pasture. E. coli O157:H7 has been shown to survive in grass-rooted soil for up to 130 days after initial contamination.(8) While DHS has drawn a distinction between pasture for animals producing milk and other animals in its proposed water recycling rule, it is critical that DHS include pasture for all animals that ultimately produce or become a food themselves in the same category with those that produce milk and that this category be assigned the highest available disinfection.

Under DHS' proposed distinction it is possible that an organism very deadly to humans could become part of irrigation water for cattle feed. The feed would thus become contaminated, and the cattle would then consume the organism. With the prevalent use of subtherapeutic antibiotics in feed animals, the organism would become antibiotic resistant within the animal. As a result of contamination in slaughter, the animal's meat would become contaminated and then fed back to humans producing a very virulent, antibiotic resistant reaction. Indeed, the overuse of subtherapeutic antibiotics in feed animals is generally considered to be the cause of antibiotic resistant strains of bacteria which are presently showing up in humans. The best way to prevent this from recurring with human pathogens is to keep human pathogens from getting into animals that become or produce food for people. Using the safest water available today would dramatically reduce the likelihood of this scenario. We strongly urge the use of at least disinfected tertiary water for all fodder, fiber and pasture crops for food producing animals.

The Need for At Least Disinfected Water in Foods that Undergo Commercial Pathogen-Destroying Processing

Current FDA and USDA performance standards for the reduction and elimination of pathogens are based on criteria established by scientific subcommittees based on the *likelihood* of a food coming into contact with pathogens. These committees have not considered that these foods could be irrigated with human-pathogen contaminated waste water. Indeed, though they attempt to set a standard of safety for elimination methods such as irradiation and pasteurization, committee members work from a premise that they need only establish a level that would cover most reasonable contamination. Scientifically, most "Commercial Pathogen-Destroying" processes can be overwhelmed if the incoming levels of contamination are too high, i.e. a 5-log reduction on a food containing 10-logs of organisms will still leave 5 logs of organisms. In addition, specific human pathogens such as E. coli O157:H7 require very few organisms to produce life threatening illness, less than 10 organisms and potentially as little as a single organism. It is therefore absolutely essential that DHS not presume that commercial processes will eliminate contamination caused by undisinfected waste water without specific science that shows how much contamination is being introduced to the food through its irrigation water in addition to the loads initially estimated by federal advisory committees. Anything less would be set up a vicious cycle of revisions to federal performance standards to incorporate DHS wastewater irrigation as a potential source of significant human pathogen contamination.

The Need for At Least Disinfected Water in Crops Grown Above Ground

For all the reasons described above justifying that orchards and vineyards must have at least disinfected tertiary waste water, it is imperative that crops grown between the ground and trees also be irrigated with, at a minimum, disinfected tertiary water. In addition, crops grown closer to but not "on" the ground are subject to potential contamination through splatter. Does DHS deem peas or tomatoes crops grown above or on the ground? The distinction is very fine when some of a crop may grow above ground while a few pieces of edible food touch the ground. While intended to address this problem, point e does not introduce real safeguards that address a worker who picks peas determining whether this or that vegetable or fruit was actually touching the ground.

In Summary

While DHS has attempted to categorize foods by risk associated with the potential for contamination from irrigation, science indicates this may be a false distinction. For the purposes of human and animal health, it is critical that DHS reevaluate its categories to accurately assess the harm wastewater pathogens might bring to California citizens through our food supply.

III. LACK OF SCIENCE SUPPORTING SECONDARY WASTEWATER

S.T.O.P. is very concerned that in California's support for the application of waste water to food and feed crops, California has little scientific support indicating that

secondary "recycled" water has been rendered sufficiently pathogen reduced. Indeed, S.T.O.P. is still looking for data to support the safety of tertiary reclaimed wastewater beyond a very recent report: "Estimating the safety of wastewater reclamation and reuse using enteric virus monitoring data," (Tanaka, Asano, Schroeder, Tchobanoglous; Water Environment Research, Jan/Feb 1998). S.T.O.P. strongly urges that California act to restrict the use of wastewater on food and feed crops until such time as it has data proving that different levels of wastewater has been sufficiently pathogen-reduced.

IV. TESTING FOR PATHOGENS

S.T.O.P. strongly supports testing of wastewater for pathogens if DHS plans to allow the application of wastewater that is not treated for pathogens up to drinking water quality standards to food and feed crops. Testing should support DHS' assertion that the wastewater has been sufficiently reduced to contain non-harmful levels of pathogens.

V. IN CONCLUSION

As an organization of individuals that have been tragically affected by foodborne illness, we want California to know that we believe that it must act cautiously in its allowances granted to the wastewater industry. The public's trust in water regulations would waiver dramatically should California under regulate and by underregulating, create widespread and repeated foodborne illness outbreaks. Likewise, the spectre of California creating virulent strains of pathogens by undermining our current public sanitation system and enabling a feedback loop of antibiotic resistant organisms is alarming. As consumers, we expect every justified precaution to be taken.

Laurie Girand
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Mother of Anna

Nancy Donley
President
Mother of Alex (1987-1993)

ENDNOTES

- (1) CDC description of unpasteurized juice outbreaks given by Dr. Patricia Griffin, CDC, at FDA Juice Safety Meetings, 12/16/96.
- (2) Mark McAfee, McAfee Apple Gardens Field HACCP Experience, 9/97.
- (3) Wojciech Janisiewicz, Applied and Environmental Microbiology, 1/99
- (4) Dale Hancock, Description of study entitled "Possible Escherichia coli contamination of apples via airborne dust from feedlots." in e-mail to Bert Bartleson, 12/11/96.
- (5) Sprout Meetings, Washington, DC; 9/28-9/29/98.
- (6) Dr. Jeff Farrar, Food and Drug Branch, California Department of Health Services
- (7) Ibid., Sprout Meetings.
- (8) Dr. Andy Maule, CAMR (Center for Applied Microbiology and Research), Porton Down, England