

## How well are you managing risk?

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**March 1, 2019** - An important senior management responsibility involves assessing potential threats to an organization, identifying areas of concern and developing mitigation plans. Risk levels are determined by the likelihood of an event occurring, the extent of potential damage and the financial impact.

With food safety, risk management takes on a whole new meaning because our consumers' health and well-being are at stake. That's why food safety audit schemes, Food Safety Modernization Act regulations and Leafy Greens Marketing Agreement metrics all have requirements to assess risk and to take steps to minimize pathogen contamination. Center for Produce Safety research provides a wide set of foundational science that can and is being utilized to improve our knowledge of food safety risks.

Some food safety risks are straight-forward to deal with. For example, in our last article, a CPS research project showed that risk of animal intrusion onto farms is low, but vigilance needs to be maintained to monitor for any signs of fecal contamination and destroying crops that may be contaminated. A much more challenging situation occurs when animals are in close proximity to farms. Scientific research is still focused on understanding how pathogens can move onto fresh produce production areas (PPAs). It's known that environmental factors play a significant role, but more research is needed to understand when crops are at risk and what strategies are needed to mitigate those risks.

Animal production areas (APAs) range from grazing land with few animals to large concentrated animal feeding areas (CAFOs). Pathogen movement can potentially come from surface water runoff, by seepage into groundwater, by wind and by rainfall, among other factors.

A relevant CPS research project, Bioaerosols from cattle production areas: evaluation of proximity and airborne transport on leafy green crop contamination 2012, was led by Elaine D. Berry from USDA ARS. This study found that airborne transport of total E. coli was verified in plot locations at 200, 400 and 600 feet distant from CAFO locations. Decreases in concentrations were observed as distance from the CAFO increased. In other words, the farther fresh produce production is located away from CAFOs the better. Recent changes to the LGMA metrics to increase the buffer zone from 400 to 1,200 feet are supported by research done in several CPS research projects.

Another CPS research project underway — Establishment of vegetative buffer zones to reduce the risk of STEC and Salmonella transmission from animal operations to fresh produce on co-managed farms, led by Siddhartha Thakur from North Carolina State University — has already confirmed that pathogens can move from animal production areas to fresh produce areas. The next step is to determine whether vegetative buffer zones can reduce the risk of animal proximity to fresh produce production areas.

For growers, there are no silver bullet solutions that can eliminate all risk. But CPS has a considerable amount of research available on “predictive tools” to help minimize risk — for example, the CPS project Validation of geospatial algorithms to predict the prevalence and persistence of pathogens in produce fields to improve GAPs led by Martin Wiedmann from Cornell University.



This work showed how GIS models can be used to predict increased risk of pathogens in produce production areas. One of the recommendations is to wait 24 hours after irrigation and rain events before harvesting crops to significantly reduce the risk of pathogen contamination.

Other than predictive modelling, how can growers know whether their crops are contaminated or not? Taking test samples of fresh produce to determine if pathogens are present is problematic, as sample size is very small compared to the overall crop size. Recently, the CPS announced a new challenge grant called GRABIT (Grower's Risk Assessment Biomarkers Investigative Tool). \$500,000 is available in funding for technology innovators who can come up with a tool that detects evidence of chronic or acute transfer factors from an animal production area. These biomarker factors may include items such as animal hair, bacteria from animals, and other chemicals that may act as indicators that pathogens may be present on crops. Using this tool to take samples with immediate feedback will help with assessing risk of planting and harvesting crops.

Another exciting development is the recent CPS Rapid Response - Yuma valley project. With the generous offer from Vic Smith (JV Smith Farms), a section of farming land has been set aside for researchers to study romaine production under real world conditions. The project will focus on water treatment, persistence of microbial contamination and sampling protocols for the detection of indicators and pathogens. Stay tuned for the results!

For growers, risk management requires ongoing assessments of any animal productions areas in close proximity, monitoring changes in environmental conditions, and using CPS research knowledge and tools available. Senior management must be engaged with their food safety experts to fully understand how their company's food safety risks are being managed. In the next article I'll discuss risk factors related to water quality.

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