

A Healthier California through Improved Food and Drinking Water Security

Food security

Food security is access by all people at all times to enough food for an active, healthy life.¹ Food security definitions may also incorporate access to culturally relevant foods and/or the social acceptability of food access, for example without resorting to emergency food supplies, scavenging, or stealing.² Historically, food security has focused on sufficient caloric intake, however, in the past 30 years, due to the rise of diet-related disease, there is increasing attention to nutritional quality of food not simply quantity.³

By contrast, food insecurity is the disruption of food intake or eating patterns due to lack of money or other resources. Reducing household food insecurity is a priority in the U.S. Department of Health and Human Services Healthy People 2030 objectives.

In the U.S. 10.5% of households were food insecure in 2020, however, food insecurity is not evenly distributed across communities.

Unemployment and poverty have statistically significant effects on food insecurity. In addition, racism has been shown to impact food insecurity independent of poverty or socioeconomic status.⁴ Food justice movements and scholarship seeks to put an end to racial or class-based inequities in the food system and to emphasize the self-determination and resilience of communities impacted by historical and systemic racism and classism. Communities that experience higher rates of food insecurity than the general population include: Hispanic, Black, and Native American households; households with incomes near or below the Federal poverty line; households with children, especially households headed by single individuals or women; people living alone; people with disabilities; and households in principal cities and rural areas.¹ In addition, there is evidence that sexual minorities, in particular bisexual women, experience higher rates of food insecurity than heterosexuals.⁵



SNAP/EBT at farmers markets
Photo: CFHL, UCCE SLO

Drinking water security

Similar to food security, there are a variety of considerations in defining drinking water security. Key elements that define household drinking water security are assured drinking water quality (safety and appeal), quantity or adequacy, reliability, and affordability.⁶ Additional factors including water governance, effects of structural racism and socio-cultural attitudes and practices can also impact drinking water security.⁷

Should we define food and water security more broadly?

Food sovereignty is the right of peoples to healthy and culturally appropriate food produced through ecologically sound and sustainable methods, and their right to define their own food and agriculture systems ([Declaration of Nyeleni, 2007](#)) Food sovereignty impacts many Californians including farm and food producers seeking a living wage, and native communities seeking access to land and waterways.

Unlike food security, drinking water security, has until recently received little attention in the U.S. and is poorly quantified.⁸

“Water security is a powerful concept that is still in its early days in the field of nutrition. Given the prevalence and severity of water issues and the many interconnections between water and nutrition, we argue that water security deserves attention commensurate with its importance to human nutrition and health.”⁸

In 2012, California recognized a [Human Right to Water](#). To realize this right, researchers propose the concept of “effective access” to water: that drinking water must be safe, appealing, affordable, and readily accessible.⁹ Education and promotion are needed to counter distrust of tap water, pervasive in many sectors,¹⁰ as well as to help Californians understand the impacts, on both human and planetary health, of beverage choice and the benefits of tap water.⁹

Faces of California food and drinking water insecurity:

- Asian and Latino immigrants without legal permanent resident status experience higher rates of food insecurity¹¹
- Native Americans are often overlooked in standard research on food insecurity¹²
- Disadvantaged rural food-producing communities report lack of access or transportation to grocery stores¹³
- Rural areas in which drought, agricultural practices, or lack of effective community water systems impact drinking water safety, availability and affordability¹⁴
- Households with substandard¹⁵ or no plumbing¹⁶
 - Homeless individuals and families who lack access to tap water
- Households with high levels of utility debt and/or service shutoff
 - Exacerbated by pandemic economic fallout: Californians have accumulated nearly \$1 billion in water-bill related customer debt since March 2020¹⁷

Food and water insecurity are unevenly distributed across California and tend to hit our rural and agricultural areas hardest



Food insecurity in California
Source: Feeding America [map](#)



Water systems compliance with safety standards
Source: CA State Water Resource Control Board [Exceedance/Compliance Status of Public Water Systems](#)

Food and water security matter to health

Food insecurity is correlated with a range of poor health outcomes. In children, researchers have shown an association with birth defects, anemia, cognitive problems, anxiety, depression, suicide ideation, asthma, higher risk of hospitalization and poorer oral health. In adults and seniors, studies show increased rates of mental health problems, diabetes, hypertension, hyperlipidemia, and oral health problems¹⁸. In addition, food insecurity has been correlated with poorer diet quality and has been shown to impact overweight or obesity in

Poor health impacts California:

- In 2019, 26% of adults in California suffered from obesity ([CDC](#)). If current trends continue, adult obesity in California is [projected to rise](#) to 41.5% by 2030
- Diabetes-related morbidity and mortality costs California over \$30B annually ([CDC](#)).
- Dental problems make California school children miss more than 800,000 days of school annually ([CDPH](#)), costing them instructional time and the state about \$30M/year in average daily attendance funding ([LAO](#))

women and some children¹⁹. While the mechanisms by which food insecurity might cause these negative health outcomes are not always clear, the correlations are consistent and compelling and require more work in understanding all of the contributing factors to food insecurity and related health outcomes and their direct and indirect cost burdens.

Drinking water can directly harm health when groundwater (and thus well water) is contaminated by agricultural fertilizers or pesticides, when the water utility is in violation of safety standards, or when tap water is contaminated by lead leached from building plumbing. Indirect impacts of water insecurity relate primarily to beverage choices when drinking water is not – or is perceived as not – safe and appealing, and specifically when this leads to consumption of sugar-sweetened beverages

(SSBs). The health harms of excessive intake of added sugars (and particularly liquid sugars in SSBs) make choosing water in place of SSBs a public health priority. Extensive evidence links SSB consumption to an

increased risk of myriad negative health outcomes including type 2 diabetes and other metabolic problems, obesity, cardiovascular diseases, dental decay, and some cancers. Choosing water in place of SSBs not only reduces these risks and the associated burdens of direct and indirect health care costs, but also confers health benefits (notably when the water is fluoridated to prevent dental decay).⁹

Additionally, there are important equity and environmental reasons to care about beverage choice. Water insecurity causes and outcomes are rife with disparities, and so long as tap water is safe, using it for drinking is also a wise economic choice. Tap water exerts a smaller environmental impact than other beverages. Moving into the future, we anticipate that increased heat from climate change will only increase the need for effective access to drinking water in schools, parks, and other community locations.²⁰

In the face of rapidly increasing climate change, supporting the health of all people through improved food and drinking water security, will build a population more resilient to the impacts of climate change.

UC ANR Opportunities to build food and water security

Food and water security are of significant importance to human health and are transdisciplinary issues that will require collaboration with communities and across sectors including economics, agriculture, medicine, nutrition, public health, public policy, education and social work.

Recent ANR community based participatory research to address food and water security:

- With Native Americans in northern California to address issues of food insecurity and food sovereignty¹²
- In the [San Joaquin Valley to understand Latinx families' barriers to participation](#) in school meal programs shows the need for improved communications and desire for more fresh and local produce
- With youth to document the need for [improved access](#) to drinking water in school settings and strategies to increase consumption.

Located in communities across California, UC ANR is well situated to foster transdisciplinary collaboration around solving food and water security issues that impact our most disadvantaged communities by bringing together community knowledge and expertise with the agricultural and human health resources of the university. ANR can increase research in and with underserved and disadvantaged communities to support place-specific knowledge and ground-truthing when large-scale population surveys may overlook water and food insecurity issues in areas that experience disparities and have specific policy or programming needs or solutions.¹³

Examples of how UC ANR can lead by coalescing a broad network of stakeholders, experts, community leaders/members and policymakers to research and pilot strategies to improve food and water security:

- Partnerships fostered by ANR can develop model “greening” (climate resilience) projects that incorporate many health elements including local food production, nutrition education, enhanced shade, solar energy generation, groundwater restoration, drinking water access points and civic engagement, in locations such as schoolyards, and as buffer zones between community housing and agricultural production zones.



Municipal tap water in the city of San Joaquin.
Photo: Angel Santiago Fernandez-Bou

- Develop and disseminate educational resources and teach on safe water practices, e.g., agricultural practices to prevent groundwater contamination; proper septic tank processes for householders; tap water safety knowledge and practices (e.g., appropriate filtration methods); healthy beverage choices
- Support SNAP accessibility, outreach, and impacts. SNAP is one of the most effective means of alleviating food insecurity and reducing poverty. SNAP also stimulates local economies. However, California has one of the lowest SNAP participation rates among likely eligible people in the nation.
- Work with underserved and under-researched local communities, such as LGBTQ individuals, to document, understand and co-develop solutions to food or drinking water insecurity.

Building food and drinking water security in California

ANR Assets

- Statewide presence, based in communities
 - Can identify and bring together stakeholders, foster relationships and partner long-term
- UC cross-sector expertise: ANR specialists, advisors, community educators, campus faculty

ANR Needs

- Envision and build out ANR to foster and incentivize division-wide integration
- Provide supports to transdisciplinary and community-led engagement
- Institutionalize supports for trans-sector engagement (interpreters, proactive outreach and relationship-cultivation, communication platforms, funding for community leaders)
- Build programs focused on food/water security as defined by disadvantaged communities

Potential outcomes for California

- Improved understanding of food/water security based on community knowledge and experience
- Reduced food/water insecurity, esp. in disadvantaged communities
- Reduced healthcare costs
- Increased stakeholder engagement with ANR
- Increased investment in food/water projects in underserved communities
- Improved climate change resilience and quality of life

Potential outcomes for ANR

- Increased capacity to inform public policy with interdisciplinary and community-informed evidence
- Enhanced ability for ANR advisors and specialists to spearhead interdisciplinary research; coordinate food/water and community resilience activities, education, engagement, across silos and disciplines
- Increased connections with other UC partners, CSUs and Community Colleges facilitate engagement in these topics together and utilize ANR networks and expertise

The Power of ANR

This concept note highlights critical needs and issues in food and water security in California. Investments are needed to help UC ANR foster stronger, more resilient communities through outreach, research and technical skills in natural resources, agriculture, nutrition, youth development and community health. The UC ANR network is embedded with county governments and communities throughout California. When at its best, this provides communities equitable access to the extensive research of the University of California and provides the University with access to the extensive expertise and knowledge embedded in communities. UC ANR evaluates and develops practices, disseminates new research and innovations through trainings and guidance documents, provides coordination and capacity for local and state-level collaborative implementation and policy efforts, and helps identify and promote appropriate policies. UC ANR has the potential to leverage its network of professionals to provide guidance, expertise, and coordination on food and drinking water security issues throughout the state.

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