**Condition Change: UC ANR contributed to increased workforce retention and competency**

**Issue**

California requires a highly skilled workforce to remain competitive, prosperous, and an innovative global leader. A Pew Research Center study projects that U.S. job growth will increase as it has in the past 35 years in occupations that require higher levels of education, training, and experience. A qualified workforce is needed especially in youth education and obesity prevention, two areas in which California ranks among the worst in the country. Additionally, California is the largest agricultural producer in the U.S., thus education and training must be provided to enhance agricultural productivity and capacity to innovate.

**Methods**

UC ANR’s extensive network links campuses and communities across California to develop information and tools needed to train workers within educational settings and urban, agricultural, and natural resource communities.

A team of Agriculture Experiment Station scientists at the UC Davis location built a database of pest management practices in citrus production by combining data gathered by farmers, independent Pest Control Advisors, and the California Department of Pesticide Regulation. The project was designed to generate improvements in the pest management practices of California’s citrus growers and the pest management consultants they hire. The scientists were able to use the data to make recommendations to them regarding choices of effective and non-disruptive pesticides (Jay Rosenheim). Additionally, at the Agriculture Experiment Station located at Kearney Agricultural Research and Extension Center, a scientist is working with a UC Cooperative Extension (UCCE) Emeritus Integrated Pest Management (IPM) Advisor to develop an online decision-support tool that mines information from the UC IPM Statewide Program’s Pest Management Guidelines and presents management options for multiple pests in cotton, citrus, alfalfa, and almond. The tool guides Pest Control Advisors in thinking through pest control decision-making and lists alternatives and mitigation for those pests. A report documents the decision-making process which can serve as an IPM plan for farms (Lori Berger, Peter Goodell).

UCCE academics provided oversight, leadership, and guidance for the statewide implementation of the UC 4-H Youth Development (UC 4-H) statewide program, which conducts research and extends new knowledge to youth development professionals (UC 4-H). UCCE academics trained after school staff and teen teachers in 4-H Water Wizards, computer science, and experiential learning methods (Marianne Bird; Fe Moncloa; Car Mun Kok).

One UCCE academic was a collaborator on a project funded by Bechtel Foundation Common Measures to develop and pilot test a Lesson Study Model as a strategy for professional development and program improvement as an effort for program sustainability and quality (Car Mun Kok). Similarly, one multi-state research project evaluated the application of Lesson Study, an iterative and educator-centered approach to professional development, in youth development settings. The total number of participants in this study was 18 educators at 21 sites, which included clubs and schools. Findings from this research revealed the potential for Lesson Study to improve data-driven decision-making, content knowledge, lesson planning, and implementation among UCCE educators, adult 4-H volunteers, and 4-H teens (Martin Smith).

One UCCE academic collaborated with the UC Gill Tract Community Farm to guide research, management, fundraising and experiential learning programming at the farm. The farm gets over 4,000 public visitors every year and delivers more than 20 workshops to at least 200 gardeners and farmers annually about food, nutrition, and climate justice (Jennifer Sowerwine).

One UC ANR academic with the Nutrition Policy Institute provided evaluation capacity building as well as developed the Eating and Activity Tool for Students (EATS). It is an evaluation tool that includes borrowed validated measures as well as new specific measures designed to measure outcomes of interest for CalFresh Healthy Living (CFHL) implementing agencies in the areas of fruit and vegetable consumption, sugar-sweetened beverage and water consumption, and physical activity practices (Amanda Linares).

As a result of UC ANR research and extension efforts, participants learned skills and adopted strategies to improve workforce competency.

**Outcomes**

**Participants learned about and applied new evidence-based information in youth education programs.**

* In Sacramento County, 13 after school staff trained in 4-H Water Wizards adopted the curricula and delivered it to 278 students. Results from this year's Water Wizards evaluation were especially strong as all sites in the student survey demonstrated significant increases in knowledge on post test scores. The assessment reveals that youth increase their understanding about water, and that after school staff grow in confidence delivering 4-H Water Wizards. (Marianne Bird)
* Santa Clara County teen teachers and out of school time staff who received 4-H computer science program training reported increased confidence to teach the material to younger children (100% of 92 teens trained) and increased understanding (98% of 10 out of school staff trained). (Fe Moncloa)
* In Lake, Mendocino, Sonoma, Humboldt, and Del Norte Counties, 40 educators who received 4-H trainings reported an increased understanding of the value of inquiry and experiential learning, the difference between hands-on and experiential learning, utilizing inquiry and experiential learning methods, and knowing to ask open and closed questions. Participants also reported learning about teamwork, supporting diverse learning methods, and using simple materials to facilitate learning. (Car Mun Kok)
* Qualitative findings from the Lesson Study research project revealed improvements in educators' knowledge and skills, including content knowledge, lesson planning, teaching practice, and social connections. (Martin Smith)

**Participants applied new evidence-based information in youth education programs.**

* Santa Clara County teen teachers and out of school time staff adopted the best practices and curriculum by delivering 4-H computer science programs to 393 children from diverse backgrounds as result of receiving training. (Fe Moncloa)
* Two groups comprising of 22 4-H teen teachers in Lake and Mendocino Counties reported that Lesson Study, including discussing, reflecting, and project planning, were useful in guiding their lesson preparation and delivery. They reported being able to use those in their own projects. (Car Mun Kok)

**Participants learned new skills in agricultural production.**

* At the UC Gill Tract Community Farm, workshop participants were observed during hands-on activities increasing knowledge and skills related to food and soil safety and learning hands-on skills related to integrated pest management, building soil health, developing crop plans, learning principles of agroecology and regenerative farming. In addition, 30 UC Berkeley undergraduate and graduate student interns and 12 high school students annually have spent at least one semester sharpening their skills in agroecology and food justice, which contributes to building the next generation of food system leaders. (Jennifer Sowerwine)

**Participants applied program planning and evaluation skills to federal and state nutrition program requirements.**

* Adoption of the information-sharing platform was observed as local health departments engaged in more dialogue (21 new conversations in 2019) around SNAP-Ed local evaluation work, strategies, troubleshooting, and requests for technical assistance to complete nutrition program implementation requirements. (Amanda Linares)
* The EATS tools were immediately embraced by other CFHL state implementing agencies, and in 2020 has been adopted by CFHL, UC and Catholic Charities as their youth evaluation tool of choice, which makes it the preferred tool to measure youth behavioral outcomes from CFHL programming statewide. (Amanda Linares)

These measured outcomes demonstrate changes in learning and improvements in how participants work. Youth development professionals, nutrition educators, decision-makers, growers, and land managers learned cutting-edge skills that increase workforce retention and competency. In 2019, California unemployment was 4.0%, a 0.1% decrease from the previous year. In addition, developing a more qualified landscape management and agricultural production workforce contributes to poverty reduction for smallholders and other marginalized groups, which then also facilitates interaction with commercial markets. In this way, UC ANR contributes to the public value of developing a qualified workforce for California.