Healthy Families & Communities Strategic Plan

Healthy Families & Communities Strategic Initiative Panel Members: Dave Campbell, Zhe Chen, Pat Crawford, Richard Enfield, Sharon Junge, Keith Nathaniel, Connie Schneider, Martin Smith and Sheri Zidenberg-Cherr.

Background

In 2009, the Division finalized the Strategic Vision: 2025. The document was the first step in a strategic planning process for ANR to provide the scientific and technological breakthroughs California needs to compete in a global economy, ensure a safe nutritious food supply, conserve natural resources, and keep Californians healthy. Nine multidisciplinary, integrated initiatives were identified, which represent the best opportunities for ANR's considerable infrastructure and talent to seek new resources and new ways of partnering within and outside UC to find solutions for California.

Healthy Families and Communities (HFC) was one of the four Strategic Initiatives identified for immediate Division work. A panel of nine members identified HFC issues where ANR can focus significant resources to have meaningful impact over the next five years. A draft plan was presented and discussed at length by over 100 attendees at the HFC Strategic Issue Conference, August 24-26, 2010 at UCD. A second draft, which synthesized comments from the conference, was posted in September. Additional feedback from the final posting resulted in a small set of potentially researchable questions which will integrate research and extension within the initiative umbrella.

Specific areas of inquiry were thoughtfully chosen using the following criteria:

- Maximizes ANR strengths and resources,
- Be highly visible,
- Multidisciplinary with coordinated outcomes,
- Can attract increased outside funding,
- Builds on existing research and best practices,
- Support science-based decision-making and public policy, and
- Use integrative approaches to connect with the other three initiatives.

Three major areas of inquiry were identified:

- Issue 1: Promoting Healthy Behaviors for Childhood Obesity Prevention
- Issue 2: Youth Science Literacy
- Issue 3: Promoting Positive Youth Development

Within each of these three narrowed areas of inquiry, the panel further defined and refined the focus emphasizing:

- The urgency of addressing the issue and its relevance to California.
- UC ANR's role and competitive advantage or unique ability to address the proposed areas of inquiry.
- UC resources and readiness to immediately tackle the issues.
- Inquiry questions and sub-questions that would result in impactful outcomes and policy relevant results and products.
- Methods and approaches for framing the research.
- Areas for immediate work in synthesizing existing research.
- Potential outputs and products that could be generated if the area of inquiry and approach were adopted for study.
- Criteria that could be used at the individual, organizational or community levels to measure if initiative work made a significant impact.

Context of Our Work

Cooperative Extension's historic mission is to foster developmental leadership in communities. The goal of this tradition has been to help local citizens exercise leadership that gives them a meaningful voice in the way their lives, families, and communities are run. The strategic initiatives we are proposing build on sound technical knowledge and a research-base, but will be more successful to the extent they become integral to a broader community development process. Whatever their particular area of expertise, Cooperative Extension Advisors and Specialists create public value by catalyzing community change—building strategic partnerships, developing long-term relationships, facilitating networks, and providing focus and direction for community coalitions. These community development activities will become increasingly important as we work in local areas to promote healthy lifestyles, science literacy, and positive youth development.

Research and education aimed at changing individual behaviors must be complemented by a deliberate focus on the community structures and policy choices which facilitate or impede needed changes. So, for example, nutrition education work must be joined with efforts to improve access to healthy foods or to providing parks and amenities that promote physical fitness. Youth must be seen not just as objects of programs but as contributors whose voice can help cities design parks, adjust public transit schedules, make decisions about school policies, etc. The common underlying theme is the importance of developing citizen leaders who can take advantage of expert knowledge while attempting to realize broadly held community values.

Support Materials

In the process of identifying the three areas of inquiry, considerable research and best practices were reviewed. Specifically, the Strategic Vision 2025 and the supporting white papers and other documents were the first part of the panel review process. As the three areas of inquiry began to emerge, the three panel sub-groups were asked to identify the supporting literature which documented the urgency of the issue, as well as a brief summary of the research and best practices that could inform our issue identification, research agenda, and approaches to addressing the issues.

In the Appendices these are identified as:

- Appendix A – Research to Build Upon: Promoting Healthy Behaviors for Childhood Obesity Prevention
- Appendix B – Research to Build Upon: Youth Science Literacy
- Appendix C – Research to Build Upon: Promoting Positive Youth Development

Additionally, each panel sub-group was asked to graphically present their proposed area of inquiry using a logic model format which would identify the inputs, activities, planned outputs, and intended outcomes at the individual, organizational, and community levels.

The three logic models are identified in the appendices as:

- Appendix D – Logic Model - Promoting Healthy Behaviors for Childhood Obesity
- Appendix E – Logic Model – Youth Science Literacy
- Appendix F – Logic Model – Promoting Positive Youth Development

HFC Conference (8/24-26/10) attendees also provided considerable insight and discussion on a range of topics which support the development, implementation and successful attainment of the planned objectives and outcomes of the HFC Strategic Initiative and supporting areas of inquiry. These comments were considered and summarized by the panel and the SI leader.

Finally, a critical element for successful implementation of all four of the UC ANR Strategic Initiatives is the deployment of ANR personnel to address these issues. With ANR's aging workforce, high numbers of recent and impending retirements, past and current budget restraints, and internal restructuring thoughtful consideration must be given to immediate and future position allocations at all levels of the organization. Coinciding with the recent call for new positions, a preliminary and non-exhaustive list of positions is recommended for consideration to better assure attainment of the HFC Strategic Initiative goals.

This recommendation can be found in the Appendices:

- Appendix G – HFC SI Preliminary Discussion of Position Allocations

In the following narrative are detailed descriptions of each of the three areas of inquiry identified by the Healthy Families and Communities Strategic Initiative Panel:

- Issue 1: Promoting Healthy Behaviors for Childhood Obesity Prevention
- Issue 2: Youth Science Literacy
- Issue 3: Promoting Positive Youth Development

Healthy Families and Communities Strategic Initiative
Area of Inquiry 1: Promoting Healthy Behaviors for Childhood Obesity Prevention

An Urgent Problem for California

As a result of the pediatric obesity epidemic and consequent serious complications and risks for premature illness, the current generation of US children may be the first to have shorter life spans than their parents (Ebbeling, C.B et al, 2002). Nearly one-third of California's school children (measured in 5th, 7th, and 9th grades) were classified as overweight/obese (Madsen, K.A., 2010). Although rates of childhood obesity and overweight are increasing at alarming rates for all children, low income and ethnic minority children are at especially high risk (Centers for Disease Control and Prevention, 2008). Furthermore, the effects of obesity are detrimental to our state and national economies as well as to individuals. California leads the nation in health care costs associated with obesity; the cost to the state of overweight, obesity and physical inactivity was assessed at $41.2 billion in 2006, predicted to rise to $52.7 billion by 2011 (California Center for Public Health Advocacy, 2009).

Over the last decade, factors associated with childhood obesity have been identified and some strategies to reduce risk have been developed. Experts agree that the solution to this health care crisis is a combination of education and environmental interventions to promote healthy eating and active lifestyles at the individual, family and community levels. However, while most programs have focused primarily on giving children information and encouraging them to change their behaviors, it has become increasingly clear that children's behaviors are strongly influenced by their environment—that is, the types of food and opportunities for physical activity available at home, at school and in the larger community—and that meaningful and sustainable behavior change is unlikely to occur unless these environments support it. Especially needed is the identification of community change strategies that are most successful at promoting and sustaining healthier dietary and physical fitness lifestyles in children, including coordinated school programming and agricultural- based nutrition education.

Evidence-based strategies for change at both the individual behavioral and institutional program and policy levels should be documented and models tested for effectiveness with clear definitions of success. Wellness strategies, positive youth development methodologies, and critical thinking skills will be incorporated into programs within this issue area to engage students, staff and families.

UC ANR's Role

The University of California's Division of Agriculture and Natural Resources (ANR) is recognized nationally and internationally for its leadership and scholarship in addressing child nutrition. UC ANR was the first in the nation to dedicate a Cooperative Extension (CE) specialist to this urgent issue. The UC Atkins Center for Weight and Health, co-founded by the CE childhood obesity specialist, is a national leader in the obesity prevention movement. Additionally, the recently established UC Davis Department of Nutrition Center for Nutrition in Schools is also a catalyst for this work. Campus-based researchers on UC Berkeley and UC Davis campuses have joined with county-based advisors to investigate and evaluate a range of childhood obesity issues, in a variety of settings including childcare, school, after-school, community, worksite, and health care venues. To have the greatest impact, it is critical to embrace and capitalize on the strengths provided by the

diversity inherent to the UC/ANR organization. Of utmost importance is the strength provided by the collaborative efforts among colleagues in community and child development, sustainable food systems, medicine, nursing, education and science literacy to successfully address issues that directly impact the nutrition and health status of California's population. Known also for its distinguished history of effective collaboration with diverse public and private partners, CE professionals and staff are poised to create and evaluate comprehensive school and community interventions in counties across California. County-based NFCS advisors provide leadership to innovative community interventions and deliveries using these as learning-laboratories for developing and extending new educational programs to combat childhood obesity. CE's strengths in nutrition education and its impressive array of resources and partners are important steps toward instituting a wide variety of obesity prevention efforts that will have sufficient dose and intensity to change the BMI trajectories of children living in the targeted communities and translating the results of this work into policy relevant recommendations.

UC Resources

- UC Faculty, Specialists and Advisors: Research and education expertise is extensive in numerous topics relevant to child obesity including nutrition, education, agriculture, and child development and food systems.
- UC Expanded Food and Nutrition Education Programs (EFNEP) and UC Davis Food Stamp Nutrition Education Program (FSNEP), also known as SNAP Ed: Nutrition educators empower low-income participants to adopt healthy lifestyle practices. The goals include changing behaviors in practices related to nutrition food choices, safe food handling and food budgeting practices.
- UC Davis Department of Nutrition Center for Nutrition in Schools: The center supports the school community by providing research-based nutrition education programs and resources to assist students in achieving their full potential academically, socially, and physically.
- UC Berkeley Atkins Center for Weight & Health (CWH): The center works with community partners to develop and evaluate obesity prevention strategies and advises state and local policy makers on effective school and community obesity intervention strategies.
- UC 4-H Youth Development Program and 4-H Center for Youth Development: These programs conduct and promote collaborations in programming, research and evaluation between UC county cooperative extension and UC campus-based scientists to expand the understanding of youth development in the contexts of family and community.
- UC Berkeley School of Public Health: The school applies knowledge to prevent disease and promote the health of individuals and communities in California. School experts can assist with community interventions using participatory research and policy.
- UC Cooperative Extension Master Gardeners: Master Gardeners teach the public how to grow a wide variety of fruits and vegetables with sustainable practices, and link closely with UC county programs to promote safe food production, increased fruit and vegetable consumption, and encourage families to use gardening as a form of healthy recreation and exercise.
- UC Davis Children's Garden: The program supports the development and use of instructional school gardens through training, resources and networking opportunities.
- UC Agricultural Sustainability Institute (ASI): The institute provides a hub to link initiatives and education in sustainable agriculture and food systems across all UC campus and county agricultural divisions with other partners across the State of California.

- UC Davis and UC Berkeley's School of Education: These schools emphasize interdisciplinary collaboration with practitioners and community partners integrating research and practice. UC Davis Betty Irene Moore School of Nursing (SON): The school practices interdisciplinary health research and community engagement with local residents and community leaders.
- UC Davis School of Medicine: The school integrates educational practice with research and medical delivery in student-run community clinics.
- UC ANR advisors, specialists and related faculty representing the research-extension continuum.
- California 4-H Foundation, ANR Development Services and other ANR fund development resources.

Inquiry Question / 5-Year Research Agenda

Research Question: To what degree does a multifaceted, multi-level, school-centered environmental intervention targeting culturally diverse children promote healthful dietary and activity habits, reduce obesity and support more regional agriculture?

*Research Approach***:** Intervention models grounded in a socio-ecological approach to obesity prevention are deemed to be most effective. Programs that utilize a comprehensive programmatic approach integrating nutrition, health and local agriculture should be developed and evaluated for individual, family, school and community systems. This approach recognizes that health-related behaviors are influenced by a number of different factors, including education and supportive programs and policies in the key settings in which children make decisions about eating and physical activity—school, afterschool programs, and the home. Incorporating out-of-school youth programs such as 4-H, youth engagement and student leadership will be central to all intervention activities. Equally important will be the inclusion of "the family" as reinforcement for lessons learned in the school setting. Family education should thus be integral to the research activities as schools provide a unique setting for education in healthy life skills, not only to children, but to parents, families, educators, administrators, and community members.

Approaches should be built upon existing research and programs in California communities which include participatory inclusion of key stakeholders. The research will identify promising practices and lessons learned to inform nutrition, youth, health, and school administrative professionals and state and community decision makers.

Sub-questions:

1. What are the steps necessary for translating and sustaining a successful coordinated integrated nutrition, health and agriculture program into school/district policy?
2. How can a localized participatory approach address the barriers to creation of a coordinated integrated nutrition, health and agriculture program in a school/district policy?
3. Is it feasible to engage youth as leaders to improve the outcomes of a coordinated integrated nutrition, health and agriculture program in school environments?
4. How can family and community participation in agriculture-related programs (community gardens, farmers' markets, CSA (community supported agriculture) boxes, mobile markets) contribute to health outcomes in children?
5. What motivation strategies can be employed to encourage civic engagement in creating healthier communities for children?

6. How can 4H youth and Master Gardeners be actively engaged to help children to be more physically active and improve their diets?
7. How can nutrition education strategies be most effective for individual, family centered or dyad focused deliveries, especially in high-risk ethnic communities?
8. To what extent does a community campaign support school-based interventions to promote healthful eating in children?
9. What kinds of coalitions and collaboratives in urban and rural communities help sustain healthy food environments, physical activities and lifestyles in children?
10. Which local policies can be demonstrated to change children's nutrition and physical activity behaviors?
11. What community-based and individual nutrition, food or agricultural education is most successful in sustaining behavior change?
12. What is the dose of community effort needed to impact BMI?

Planning Grant for Policy Briefs to Synthesize Existing Policy Relevant Research

While the research just described is needed to fill gaps in current knowledge, policy relevant information already exists within ANR that has not been synthesized. An initial planning/research grant is proposed in order to synthesize promising practices which could be expanded into experimental designs and to establish a connection with local and state policy makers related to ANR relevant/current practices. The grant would allow a small campus-county team to systematically review existing research documents and recently published articles by ANR centers, counties and their partners. By identifying and prioritizing relevant information and research practices a series of policy briefs could then be developed to better establish strategic planning and identify where ANR would be pivotal for California's obesity and chronic disease issues.

Area of Inquiry Outputs

Research, education, and extension in the above will result in:

- Policy briefs documenting the science behind and evaluation of a multifaceted multi-level school centered environmental intervention on children's health-related behaviors and obesity
- Presentations to relevant state professional and policymaking organizations at conferences and other key events
- A white paper summarizing findings and lessons learned pertaining to each key audience, to be distributed to key stakeholders
- Several manuscripts for publication in a peer-reviewed scientific journal, summarizing findings from the process and outcome evaluations.

Based on what we learn from the process and outcome evaluations, we will fine-tune and polish the intervention materials and toolkit and create a user-friendly multimedia package that will include a training component and implementation guide. A cornerstone of all materials will be guidance not only on ***what*** to do (evidence-based goals), but also ***how*** to accomplish goals. The ultimate goal will be to disseminate recommendations and strategies for effective childhood obesity prevention programs.

How will we know if we are succeeding?

Individual Change: Children and adults will increase their ability to identify healthy food choices, follow recommended dietary guidelines, assist in meal planning, and identify personal barriers and motivators for positive nutrition, health, and fitness outcomes. Children will be nourished and physically active.

Family Change: Families will take action on key health messages by increasing family participation in nutrition related activities (planning meals, shopping for food, gardening, going to farmers' markets, eating meals together) and participating in physical activities as a family.

Organizational Change: School physical fitness and academic scores will show improvement. Family participation and youth leadership will lead to improvements in nutrition and physical fitness.

Institutional Systems Change: The proposed approach engages the entire school community: teachers, students, administrators, school food service staff, parents, and partner organizations. With positive health and academic outcomes, the work started here will serve as the beginning of a systems change that will create a movement toward normative change to promote healthful living.

Community Scale Outcomes: In five year's time, as a result of this collaborative effort:

- Population level BMI will be significantly lower in intervention versus comparison schools, as well as the proportion of high BMI youth in the intervention schools
- Youth exposed to the intervention as compared to youth in the comparison schools will have on average significantly higher fitness scores and improved dietary behaviors
- Access to healthy foods and opportunities for increased amounts of physical activity will be significantly greater in intervention as compared to comparison schools.
- School and community policies will have been put in place in intervention schools to sustain healthy food and activity environments.

Interdisciplinary Connections

Childhood obesity is a complex issue, needing multiple approaches and interdisciplinary involvement. Integrating nutrition, agriculture, youth development, parenting, and community development through a campus-county continuum is essential. Very obvious are the connections to the proposed work of the other two areas of inquiry within the HFC SI, Promoting Positive Youth Development and Youth Science Literacy. However, of equal importance is engaging in the efforts of the Sustainable Food Systems Institute, specifically with small and mid-size farms and supporting greater consumption of fresh Californian grown foods in school cafeterias. Specific research questions and sub-questions being proposed to address childhood obesity and health also relate to a healthy food supply and many production and post-harvest issues addressed in related agricultural and natural resources fields. At the home and community level UC Master Gardeners also provide additional avenues for collaboration on both research and extension activities. Essential to all UC ANR SI efforts is coalition building, community decision-making and organizational and policy development areas in which HFC can share expertise. Adult literacy issues will be revealed through this area of inquiry, which will be relevant across all ANR SIs.

UC ANR Dedication and Commitment

With dedicated and compassionate professionals and staff, current research, and the use of research and technology, UC has delivered nutrition education to California's diverse youth and families. ANR is committed to further improving California's health through a new intensified effort to prevent childhood obesity. We recognize that the devastating impact of an unchecked obesity epidemic will be felt for many decades to come and threatens the state's economy. We accept our critical role in changing behaviors in ways that will promote positive outcomes for individuals, organizations, and communities and will document its success both qualitatively and quantitatively. There is new evidence suggesting that multipronged efforts which increase the dose of nutrition and activity change in children can change their BMI and we are ready to adapt these methods and employ this knowledge in California communities. We will collaborate with youth, families, organizations, and community leaders to provide science-based assistance for strategic policy decisions benefiting all Californians. UC ANR will play a leadership role in formulating concrete recommendations for reducing childhood obesity in counties across California.

Healthy Families & Communities Strategic Initiative
Area of Inquiry 2: Youth Science Literacy

An Urgent Problem for California

Science achievement in the United States among K-12 youth has lagged behind many of their grade-level peers from other countries for many years, prompting much concern, and putting nation's economic and national security at risk. K-12 students who score below basic levels will lack the foundational knowledge and skills necessary for scientific careers and full participation in today's knowledge society (National Academy of Sciences, 2007). The issue is particularly grim for California students who as a whole scored below national averages on the NAEP assessments; only Mississippi had lower scores than California. More specifically, males outperformed females, African American and Latinos performed significantly lower than whites, and high income youth outperformed low income youth (even though high income youth did not meet national proficiency levels). Furthermore, building a foundation in science through public school instruction has not been a priority in recent years in California (Smith & Trexler, 2006), weakening the formal delivery of science education.

Increasingly, nonformal youth development programs are considered a potential venue for sparking youth's interest in science, science literacy, and reinforcing classroom learning. Two recent National Research Council's reports, *Surrounded by Science: Learning Science in Informal Environments* (2010) and *Learning Science in Informal Environments…People, Places and Pursuits* (2009), emphasize the role and value of informal experiences as provided by out-of-school youth programs, to improve science education and learning. Central to improving youth science performance is building formal and nonformal educators' capacity to facilitate effective science learning. To accomplish this requires professional development opportunities that focus on improving educators' knowledge, skills, and attitudes, factors that have been shown to have a positive influence on teaching practice (Garet et al., 2001; Guskey & Sparks; 1996, 1997). See Appendix 3 for more background information and references.

UC ANR's Role

ANR's multidisciplinary and integrated approaches provide leadership and innovation through applied research, education and service in addressing California and the nation's decline in youth science performance and achievement. Formal education cannot do it alone (National Resource Council, 2010). Nonformal education strategies and approaches, for which ANR is recognized, especially the 4-H Youth Development Program and its 4-H SET Initiative, provide innovative out-of-school models, curricula, deliveries, and professional development for effectively engaging youth in self-directed learning and discovery.

UC Resources

- Statewide 4-H Youth Development Program (4-H YDP) and 4-H Center for Youth Development (4-H YCD) with expertise in program implementation and evaluation
- Human and Community Development Department at UC Davis and associated UC ANR Specialists
- County-based 4-H Youth Development advisors, staff, volunteers and youth who provide a learning laboratory for development, delivery, and dissemination of promising practices

- Access to wide range of STEM subject expertise in the Division's multi-campus specialists, advisors and associated faculty
- California 4-H Foundation, ANR Development Services and other fund development resources.
- ANR Research & Extension Centers (most of which have facilities and other resource that can support this effort)
- UC Natural Reserve System
- Collaborations, partnerships and relations with state agencies and organizations such as California Department of Education, California Science Teachers Association (CSTA), museums and science centers
- University of California Schools and Departments of Education
- California After School Network housed at UCD
- UC Berkeley's Lawrence Hall of Science
- California State Universities and community colleges
- Other youth-serving organizations

Inquiry Questions/5-Year Research Agenda

Building on and synthesizing existing research and programs, as well as being informed by outcomes from novel research (e.g., requisite needs assessments), we propose two general issues of inquiry in the area of youth science literacy: impacts of participation in community-based programs on youth science literacy; and professional development in non-formal and formal science education. The proposed general direction of inquiry involves adapting and/or designing various programs (e.g., after school programs, summer science camps, professional development workshops and seminars), which:

- Link and integrate specific content/subject areas and real world issues associated with the UC-ANR Strategic Vision 2025 (e.g., nutrition/childhood obesity; food safety and security; sustainable food systems; water resources; climate change); and
- Target diverse populations (e.g., female and male non-formal youth and adult educators with diverse SES, race, and ethnicity). The general research issues aim to assess the impacts of participation in various programs on youth and adult science educators' content knowledge, processing skills, and attitudes toward science.

Research Question 1: What are the impacts of participation in community-based (nonformal) youth development programs on the science knowledge, science process skills, and attitudes toward science among K-12 youth?

Research Method/Approach: Adapt/Design effective non-formal science programs (e.g., summer science camps, after school programs) for youth that include workshops to train science educators. Outcome assessments will compare achievement and attitudes before and after participation of these non-formal science programs and measure possible differences between those who participate in the programs/workshops and those who do not.

Sub-questions:

What are the impacts of participation in non-formal youth science education programs on:

- Knowledge, skills, and attitudes toward science among youth?

- Interest in science careers by youth?
- Standardized test scores in science by youth?
- Choice of science coursework among high school-aged youth?
- Declared science majors among college-aged youth?
- Gender, SES, and race gaps in science achievement?

Research Question 2: What are the impacts of professional development in science on the pedagogical and content knowledge and skills of non-formal, pre-service, and in-service science educators?

Research Method/Approach: Adapting/Designing professional development programs for science educators (paid staff, volunteers, pre-service teachers, and in-service teachers) using methods and strategies drawn from the literature and measuring the impacts on participants' understanding and use of effective pedagogy, science content knowledge, and attitudes toward science.

Sub-questions:

1. What are the impacts of professional development in science on the understanding and use of inquiry-based pedagogy among non-formal science educators?
2. What are the impacts of professional development in science on the content knowledge among non-formal science educators?
3. What are the impacts of professional development in science on the understanding and use of inquiry-based pedagogy among pre-service and in-service (formal) science teachers?
4. What are the impacts of professional development in science on the content knowledge among pre-service and in-service (formal) science educators?
5. What are the impacts of professional development programs on youth science achievement?

Planning Grant for Policy Briefs to Synthesize Existing Policy Relevant Research

A long-term, overarching goal would be to develop a framework for integrating a youth science literacy component into all ANR projects that target current Initiatives. The design criteria of such a framework include: scalability, cross-content applicability, efficiency, and measurable outcomes with youth and adults. Thus, an initial planning grant is proposed in order to synthesize current best and promising practices that would inform the development and test the efficacy of an effective Youth Science Literacy Outreach Model. This grant would allow for a team of ANR academics to build, refine, and test the framework using content around existing, cross-initiative issues. More specifically, the Youth Science Literacy Outreach Model would include several components (e.g., curriculum development/adaptation and cross-initiative integration; educator professional development; evaluation; partnerships). By integrating these components into a comprehensive educational model, we would capitalize on existing research, knowledge, and materials and develop an infrastructure that can be re-used across a wide variety of high priority content areas.

Area of Inquiry Outputs

The products of the research and extension activities will include, but not be limited to:

- Curriculum materials that will guide and promote youth science literacy and further research;

- Professional development models that will advance educators' understanding and use of effective pedagogy, science content knowledge, and attitudes toward science;
- Research articles, professional conference presentations and posters, and booklets that summarize the findings/outcomes and that inform public policies;
- New external grant proposals (based on the outcomes and findings of the research) to secure further sources of funding;
- Policy briefs to promote youth science education in non-formal settings and professional development in community based programs.

How will we know if we are succeeding?

Individual change:

- Improved knowledge, skills, and attitudes toward science among California youth enrolled in community-based youth development programs.
- Improved test scores in science among California youth enrolled in community-based youth development programs.
- Improved pedagogical and content knowledge and skills among community-based science educators.
- Improved pedagogical and content knowledge and skills among pre-service science teachers.
- Improved performance by youth of all gender, SES, race, and ethnicity at proficiency levels in science achievement.

Organizational change:

- Increased enrollment in youth development programs offering science projects.
- Increased enrollment in high school science courses.
- Increased enrollment in college level science courses.
- Increased number of students who receive degrees in science related majors.
- Increased proficiency of staff and volunteers in community-based youth development programs.

Community change:

- More informed citizenry capable of making science-based decisions in all aspects of their lives.
- More effective policies promoting nonformal, informal and formal environments for science learning are adopted.
- Economic competitiveness is enhanced as a result of innovative STEM research and development.
- Social norms recognize and value science literacy and performance.

Interdisciplinary Connections

The proposed direction of inquiry is interdisciplinary in that the research issues will be connected to and integrated with other priority areas of inquiry within the HFC Initiative, including Promoting Healthy Behaviors for Childhood Obesity Prevention, and with other ANR Strategic Initiatives such as Sustainable Food Systems, Sustainable Natural Ecosystems, and Endemic and Invasive Pests and Diseases. Specific examples of youth science literacy associated with these other ANR Initiatives

include bio-security and disease traceability (Sustainable Food Systems; Endemic and Invasive Pests and Diseases), food safety and security (Sustainable Food Systems), water quality and conservation (Sustainable Food Systems and Sustainable Natural Ecosystems), and rangeland conservation and management (Sustainable Natural Ecosystems; Sustainable Food Systems).

UC ANR Dedication and Commitment

UC ANR professionals, staff and volunteers bring nearly 100 years of problem-based programming to California youth, families and communities. This research initiative draws on this rich history of success and experience and brings new knowledge, targeted research, and local science education to address the national and statewide issue of declining youth science literacy. California's future depends on an educated and engaged citizenry, capable of making informed decisions and contributing to new scientific discovery. UC ANR is committed to building leadership in youth and adults to meet these needs.

Healthy Families and Communities Strategic Initiative
Area of Inquiry 3: Promoting Positive Youth Development

An Urgent Problem for California

A unifying goal for any state is to nurture youth who enter adulthood prepared to thrive and to contribute to society through work, civic engagement, and nurture of others. We know that far too many California youth currently fail to reach their full potential. Each year, approximately 80,000 California youth do not graduate high school (California Department of Education, 2010) and approximately one of every six 16-24 year olds in the state is out of school and out of work (Benner, et.al., 2010; Lamming, Lemp, and Campbell, 2006; Sum, 2003). California needs effective strategies that reduce risky youth behaviors and promote the developmental assets that support youth development. The goal is not just youth who are problem free, but youth who are fully prepared and fully engaged (Pittman, 1991). Promoting healthy pathways to college and work are urgent concerns, not only for the individual youth and their immediate families and communities, but for the state as it seeks to replace an aging workforce and remain economically competitive in the global economy.

UC ANR's Role

Cooperative Extension's county-based 4-H YD programs across the state are at the cutting edge of positive youth development knowledge and practice. They serve large numbers of youth, helping prepare them for college, work, and life. They also provide a research laboratory to establish, refine and share effective youth development practices and to inform both policy and program implementation. UC 4-H YD advisors and program representatives establish, facilitate and participate in community networks and coalitions that promote education, training, coordination of resources, and policy improvements rooted in positive youth development theory. They provide access and entre to varied and diverse youth populations across California, helping anticipate demographic and social changes and challenges facing the state and nation.

UC Resources

- Connections and access to the resources of the Land-Grant University System as well as the National Institute of Food & Agriculture (NIFA).
- County-based 4-H Youth Development advisors, staff, volunteers and youth who provide a learning laboratory for development, delivery, and dissemination of promising practices.
- At UC Davis, ANR specialists in adolescent development, family development, and community studies.
- Collaborations with UC faculty, departments, schools and centers both within and outside of the Division of ANR.
- Statewide 4-H Youth Development Program and 4-H Center for Youth Development with resources and expertise in program implementation and evaluation.
- Experience with student internship programs that assist the existing network of Cooperative Extension advisors and communities.
- California 4-H Foundation, ANR Development Services and other ANR fund development resources.
- The UC Davis Center for Regional Change, with over $1 million in funding from Sierra Health Foundation and The California Endowment, is completing a Healthy Youth, Healthy Regions study with detailed data on youth well-being. The mapping lab at the Center has the capability to

assist with a community scorecard/mapping project that would track indicators of positive youth development at the local, regional, and/or state levels, with attention to racial, class, and geographic disparities.

- Funding from the Thrive Foundation for Youth ($1.4 million) to implement and evaluate the Step-It-Up-2-Thrive Model of positive youth development with adult volunteers in the California 4-H Program.
- California 4-H YD Program participation in the Tufts University 4-H Study of Positive Youth Development and other national studies.

Inquiry Questions/5-Year Research Agenda

Research Question: How can the 4-H YD Program and other youth development programs best promote positive youth development with demonstrated impacts on individuals, families and communities?

Research Method/Approach: We propose comparative case study research on the effectiveness of 4-H and other youth development programs in impacting positive youth development. Research conducted in a sample of California counties/communities reflecting the state's diversity and building on and synthesizing a growing body of research, including that by ANR academic staff and workgroups and by other researchers is deemed to be effective.

By positive youth development we mean *a process that prepares young people to meet the challenges of adolescence and adulthood through a coordinated, progressive series of activities and experiences, which help them to become socially, morally, emotionally, physically, and cognitively competent. It addresses the broader developmental needs of youth, in contrast to deficit-based models, which focus solely on youth problems* (National Collaboration for Youth Members, 1998). Thus, the goal is to assess whether and how existing programs promote positive youth development, and in turn, to improve important outcomes for participating youth, families, youth-serving organizations, and communities.

Sub-questions:

1. What range of programmatic approaches and community strategies are 4-H and other youth development programs employing to promote positive youth development?
2. What program and organizational factors contribute to positive youth development?
3. Which program factors or community strategies are deemed most successful by key stakeholders? Why?
4. Which approaches or strategies have done the most to impact short-term and long-term important life outcomes (e.g., grades, graduation rates, employment or higher education, healthy relationships)? Why?
5. Which strategies have done the most to impact short-and long term community vitality (levels of civic engagement, youth involvement in community service, and young people in leadership roles)? Why?
6. Which strategies have done the most to reduce inequity in youth outcomes? Why?
7. How is youth development being framed as a public issue and which framings have been most successful at motivating individual and public action as well as policy change?
8. What new public policies or implementation strategies are needed to create better youth and community outcomes?

Planning Grant for Policy Briefs that Synthesize Literature and Policy Relevant Research

While the research just described is needed to fill gaps in current knowledge, we also realize that a great deal of policy relevant information already exists in the literature and within current and past ANR research projects. To begin establishing a more vital and relevant connection with state and local policy makers, we propose that an initial planning/research grant be allocated. The grant would allow a small team to systematically review existing research documents, including the Monograph series of the 4-H Center for Youth Development, workgroup research papers, and recently published articles by ANR personnel. The goal would be to identify and prioritize policy relevant information and then develop a series of policy briefs that would convey the essence of this information to policy makers in a readily digestible form. Funding this activity at the outset of the five-year strategic initiative will have the added benefit of providing an up-to-date inventory of ANR research on positive youth development, which will aid in identifying additional data gaps and needs.

Area of Inquiry Outputs

Research, education, and extension in the above will result in:

- Program evaluations on effective implementation strategies, including the Step-It-Up-2-Thrive Model.
- Manuscripts for publication in a peer-reviewed scientific journal, summarizing findings from the process and outcome evaluations.
- Presentations to relevant state professional and policymaking organizations at conferences and other key events.
- Published results of program level or community surveys capturing individual, family, and organizational changes. GIS maps comparing communities using the Healthy Youth/Healthy Regions index of youth vulnerability/success;
- Policy briefs which document the science and draw on the above products to capture key policy relevant findings for use at community, county, and state level decision-making.

How will we know if we are succeeding?

Our work can be rigorously tested by tracking measurable changes in individuals, families, youth-serving organizations, and communities.

Individual change: Program evaluations will determine if youth in 4-H and other programs are increasing their competency, connection, character, caring, confidence, contribution and resiliency. For example, a successful program will have youth who:

- are more engaged in school, earn better grades, and are more likely to graduate;
- can identify one or more personal interests, skills, and passions and connect these to future work or civic engagement opportunities;
- face challenges with persistence;
- have less conflict in their peer relationships (e.g., reduction in bullying, less loneliness);
- have better inter-group relationships (e.g., less stereotypical language, better race relations);
- are more emotionally stable (e.g., lower rates of depression, lower rates of chronic stress);
- are physically healthier (i.e., greater social support leads to lower chronic stress which leads to better physical health);

- have a sense of purpose and are civically engaged.

Family and Organizational Change: Community surveys will assess whether more parents, caretakers, and staff/volunteers in youth serving organizations are trained in how to mentor and support thriving youth.

Community Change: Over time, and as a result of collective efforts, the achievement of positive youth development should result in an increase in the number of youth finding healthy pathways to adulthood and a corresponding decrease in the number of marginalized youth lacking access to important institutional supports. In partnership with researchers at the Center for Regional Change at UC Davis, we will work to develop and refine an index of youth vulnerability/youth success which tracks key research-based indicators, including rates of:

- high school graduation;
- youth crime (involvement with the criminal justice system);
- teen parenting;
- foster care placement;
- young adults out of school and out of work;
- youth of color graduating high school and pursuing higher education;
- youth engaged in (and leading) community service projects;
- voting.

Interdisciplinary Connections

The positive youth development approach can complement each of the proposed ANR strategic initiatives, both within and beyond the Healthy Families and Communities area. A few of the many possible connections which hold the promise of forging tighter connections among agricultural, natural resources, and human resources advisors and specialists—are:

- Collaborative projects that promote healthy behaviors and lifestyles, combining efforts to ensure that youth have access to quality food and to environments that promote physical fitness and activity with educational content around health, nutrition and fitness.
- Through a combination of relevant programmatic content with positive youth development practices, youth and young adults can be key contributors to ANR efforts related to environmental restoration and education, wildlife preservation, school and community gardens, local food systems, and small farm viability.
- Calling upon agricultural and natural resource advisors to introduce youth to scientific topics and ways of thinking as they are embodied in ANR initiatives related to climate change, land use, natural resources, food quality, animal health, etc. By emphasizing persistence and overcoming challenges, positive youth development can make an important contribution to motivating youth to improve their science literacy and develop science-related careers.

UC ANR Dedication and Commitment

As we face the next two decades of transformational change, nurturing the resilience of individuals, families, schools and communities is critical to our state's future prosperity. Researching and promoting

youth programs that foster intellectual and emotional competence, critical thinking, a problem solving orientation and persistent resourcefulness (all hallmarks of positive youth development) insures that the state's youth will enter higher education and the workforce prepared to respond to such 21st century challenges as climate change, demographic shifts, and economic competition. With caring professionals and the latest in research, UC 4-H youth development programs have served California youth, their families, and communities for nearly 100 years. The current research initiative further extends this legacy. Our commitment is to transform risk and uncertainty into positive youth development supported by thriving, resilient, adaptive communities.

Appendix A
Research to Build Upon – Promoting Healthy Behaviors for Childhood Obesity Prevention

Research to Build Upon

Issue 1: Coordinated Agriculture, Nutrition and Health-based School Approach to Childhood Obesity

Over the past decade there have been multiple studies and effort addressing obesity and in particular, childhood obesity by researchers, public health, and grassroots community organizations utilizing different approaches. In January 2010, First Lady Michelle Obama, together with the Department of Health and Human Services and the Surgeon General, launched an initiative to combat the alarming rates of childhood obesity and to promote healthy choices (U.S. DHHS, 2010a). Their recommendations include creating healthier school environments, encouraging better nutrition and more physical activity at home, and actively engaging communities in efforts to improve the health and well-being of our nation's children. Although previous studies have shown that individual components of this approach result in modest improvements in nutrition knowledge and dietary behaviors (Luepker et al., 1996; Morris, Neustadter, & Zidenberg-Cherr, 2001; Morris & Zidenberg-Cherr, 2002; Blom-Hoffman, Kelleher, Power, & Leff, 2004; McAleese & Rankin, 2007; Heneman, Junge, Schneider, & Zidenberg-Cherr, 2008), there is a belief that implementing more elements concurrently will lead to the fundamental changes needed to prevent child obesity.

Many school districts throughout California have expressed interest in "stepping outside of the box" of traditional teaching methods by incorporating agriculture, nutrition and physical activity concepts into curriculum and other segments of the school environment, such as the cafeteria and garden (Graham, Beall, Lussier, McLaughlin, & Zidenberg-Cherr, 2005.. Research examining the impact of agriculture-enhanced nutrition education revealed improvement in health behaviors of elementary school-aged children (Morris, & Zidenberg-Cherr, 2002; Blom-Hoffman, Kelleher, Power, & Leff, 2004; Graham, Beall, Lussier, McLaughlin, & Zidenberg-Cherr, 2005; McAleese, & Rankin, 2007; Heneman, Junge, Schneider, & Zidenberg-Cherr, 2008; Robinson-O'Brien, Story, & Heim, 2009).

UC ANR programs can build upon the growing body of evidence supporting agriculture-based nutrition education. Previous studies include integrating nutrition and gardening with salad bars featuring produce from local farms, food waste composting to teach children about the cycle of life and care for the environment, physical education and community-wide physical activity events that address the other piece of the obesity puzzle – energy expenditure. A total coordinated agriculture, nutrition and health-based programming has not been comprehensively developed and implemented to simultaneously address the children and families as individuals and the school and community as environmental influencers.

A recent Institute of Medicine (IOM) report provided a call to action for key stakeholders to commit to childhood obesity prevention, evaluation of policies and programs, monitoring progress, and wide dissemination of promising practices (Committee on Progress in Preventing Childhood Obesity, 2007). The committee cited work from Dr. Zidenberg-Cherr's group in nutrition education and gardening as a promising, innovative program to increase fruit and vegetable consumption through farm-to-school programs and school gardens. Other organizations also encourage creating a school environment that supports regular physical activity and healthy eating habits (Ritchie, Crawford, Hoelscher, & Sothern, 2006; U.S. DHHS, 2010b; Briggs, Fleischhacker, & Mueller, in press).

Issue 2: Creating local environments that foster healthful food and activity choices for children and their families

Paralleling the rapid rise in obesity are numerous community interventions to promote healthful food access. Many of these stem from work done within communities by local coalitions and collaboratives. Cooperative Extension Specialists created the *Children and Weight: What Communities Can Do About It* Training

Kit to help local CE Advisors gain capacity in this area (Crawford & Ikeda, 2002). For the last decade, county advisors have led local collaboratives in this effort (Espinosa-Hall, et al. 2007). Until recently outcomes from research in this area have been rarely documented or published. New work shows promising efforts from changing children's immediate environment including schools, neighborhoods, and community based institutions (Andreyeva, Blumenthal, Schwartz, Long, & Brownell, 2008; Espinosa-Hall et al., 2007; O'Toole, Anderson, Miller, & Guthrie, 2007; Crawford, 2007; Crawford, Woodward-Lopez, Rauzon, Ritchie, & Wang, 2008; Zick et al., 2009). These studies are part of the new ''built environment'' field which includes an individual's surroundings man-made, as compared with elements from the natural environment. There are numerous ways in which the built environment influences health ranging from the broad physical and social environments such as housing, transportation, and land use including the retail food environment (Centers for Disease Control and Prevention, 2007). Empirical research of articles from 1996-2007 relating the built environment to obesity revealed that current studies have not focused on both diet and physical activity and additional research is needed (Papas, Alberg, Ewing, Helzlsouer, Gary, & Klassen, 2007).

The early work done by local coalitions and community collaboratives organized to address the healthfulness of children's environment has been substantial, yet there is little evidence of their overall effectiveness. For example, as a result of active community collaborative, there has been an increase in the number of farmers' markets in California communities. Research has shown farmers' markets have increased intake of fruits and vegetable intake (Dollahite, Nelson, Frongillo, & Griffin, 2005; Ohri-Vachaspati Pm Nasu, Taggart, Konen, & Kerrigan, 2009). Yet, there is inadequate research on the impact of these markets in California's low income communities. At least one large scale, multi-component community intervention with adequate dose, intensity and reach has been shown to significantly improve children's weight status (Economos & Curtatone, 2010). Similar multi-component community interventions funded by The California Endowment (2005) and Kaiser Permanente (2010) are underway in select California communities. Cooperative Extension located in communities throughout California could provide larger coverage in communities spanning the state using lessons learned in other initiatives and building on more comprehensive community interventions. Common evaluation strategies could be employed in all intervention communities to examine community specific approaches and commonalities of success.

UC / ANR has extensive experience in applied research to develop and evaluate programs and policies to prevent obesity. Founded by Cooperative Extension Specialists, UC Berkeley Atkins Center for Weight & Health (CWH) has been a resource for community evaluation efforts and has served as evaluator for both Kaiser Permanente's Community Health Initiatives (2010) and The California Endowment's Healthy Eating and Active Living Initiatives (2005). ANR advisors have access to key community stakeholders throughout California and through the an Initiative such as this could provided needed information on the efficacy of different strategies to prevent childhood obesity at the local level. To begin, comparative case studies using a variety of community approaches to change the built environment to prevent obesity could be compared.

Issue 3: Nutrition education methods/venues for sustaining behavior change

Four of the ten leading causes of death can be attributed to poor dietary behaviors (Heron, 2007). Nutrition education is a critical element in improving dietary behaviors for obesity and disease prevention. Contento's (2008) examination of over 300 nutrition education studies showed that nutrition education is more likely to be successful when the focus is on an individual's actions and links to theory, research, and practice. Behavior outcomes are also more effective when harmonious with cultural/behavioral characteristics of a specific population (Hildebrand & Betts, 2009). The Centers for Diseases Control therefore supports the need for educators to communicate customized messages rather than to develop a one-fit all sizes nutrition education approach. The behaviors addressed should be identified from the needs, perceptions and motivations of the target audience as well as from national nutrition and health goals and research findings (Contento, et al, 1995). Further, focusing on the learner involves skills that educators may require advanced preparation and training in order to implement successfully (Kaiser, McMurdo, & Joy, 2007).

We know that nutrition education in EFNEP and FSNEP work (Hartman, McCarthy, Park, & Schuster, 1997); Chung & Hoerr, 2007); Cullen, 2009); and are cost-effective (Burney & Haughton, 2002; Rajgopal, Cox, Lambur, & Lewis, 2002. Although there has been evaluation and research about low-income audiences reached through extension (Sargent, 2006; King, & Turner, 2004; Benavente, Jayaratne, & Jones, 2009), including strategies (Luccia, Kunkel, & Cason, 2003; Miyamoto, Chun, Kanehiro, & Nakatsuka, 2006; Ontai, Williams, Lamp, & Smith, 2007; Peterson, 2008; Benavente, Jayaratne, & Jones, 2009; Steinhaus, Brunt, Pankow, Garden-Robinson, & Terbizan, 2009), there are gaps in our understanding of how to maximize and sustain this impact based on demographic characteristics such as income and nutrition-health related literacy and culture which are key elements in establishing short term and sustained behavior change, especially for California's diverse population. Research is therefore needed to document the most effective ways for nutrition professionals to deliver nutrition messages which moves the individual beyond knowledge gain and results in sustained behavior change and to identify the optimal support and training staff require in order to deliver the most impactful nutrition education (Dickin, Dollahite, & Habicht, 2005; Johnson-Taylor, Yaroch, Krebs-Smith, & Rodgers, 2007).

UC ANR has a long history of delivering and conducting research in nutrition education through EFNEP, FSNEP, and 4H. ANR workgroups have worked extensively with the target audiences for science-based curricula development, programmatic, and evaluative research. EFNEP and FSNEP routinely conduct pre-post evaluations in youth and adult programs. ANR/UC professionals are among the many recognized UC/ANR experts in evaluation and nutrition education programs with an emphasis on low-income populations (Crawford, et al, 2004; Cena et al., 2009; Gerstein et al., 2010; Gosliner et al., 2010; Ritchie, Whaley, Spector, Gomez, & Crawford, 2010; Shilts, Martin, Townsend, 2010; Wang et al., 2010).

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Appendix B
Research to Build Upon – Youth Science Literacy

Issue 1: Youth Science Literacy

Twenty-first century society has become increasingly more dependent on science. All aspects of life in today's world are impacted by science, and related political and economic decisions require sound choices made by a population that is scientifically literate (American Association for the Advancement of Science [AAAS], 1990; Jemison, 2000; Miller, 2006; Nelson, 1999). Thus, citizens of the United States need a fundamental understanding of scientific concepts and theories and require the capacity to use scientific thinking to address important societal challenges (AAAS; Miller; Nelson; Perkins-Gough, 2007). More specifically, to be scientifically literate requires that an individual is "aware that science, mathematics, and technology are interdependent human enterprises with strengths and limitations; understands key concepts and principles of science; is familiar with the natural world and recognizes both its diversity and unity; and uses scientific knowledge and scientific ways of thinking for individual and social purposes" (AAAS, p. *xvii*).

Data from assessments on student achievement in science have revealed stagnant or declining scores among the school-age population in the United States for over a decade (Baldi et al., 2007; Grigg et al., 2006; Guzmán et al., 2004; Nelson, 1999; National Science Teachers Association, 2009; Planty et al., 2008; Zinsmeister, 1998). Specific examples include data from the National Assessment of Educational Progress (NAEP) which revealed that the majority of students tested (71%) scored at the basic (31%) or below basic (40%) levels in science (McGrath, 2008), and results from the Program for International Student Assessment (PISA) 2006 showed that U.S. high school students' science scores were below the average of scores of high school students in the 30 Organization for Economic Cooperation and Development (OECD) countries and were lower than 6 of the 17 non-OECD-member countries that participated (Planty et al., 2008).

Deficits in science literacy among school-age youth in the U.S. raise serious societal concerns. Science is integral to our daily lives, to our nation's economy, and to global economies, and "…we cannot afford [a scientifically] illiterate society" (Nelson, 1999, p. 14). Furthermore, poor achievement in science among K-12 youth appears to be having visible effects in higher education. The number of college students in the U.S. who earn undergraduate degrees in science is declining and falls well below most other developed nations, thus compromising the nation's ability to train new scientists and remain scientifically competitive on a global scale (National Academy of Sciences, 2007).

Issue 2: Volunteer Development

Research has promoted non-formal education programs like 4-H as important resources to help contend with the youth science literacy problem facing the United States today. For example, Kisiel (2006) maintains that if science literacy "…is an important goal within our society, then we must consider other learning settings, in addition to school, that can contribute to this goal" (p. 396). Kress et al. (2008) state that non-formal programs represent a critical component to the youth science literacy equation and that learning that happens during out-of-school time is as important as learning that occurs in school. Carlson and Maxa (1997) concur with the importance of non-formal science education in addressing youth science literacy and identify the constructivist, interdisciplinary strategies used to teach science in such programs as important to developing an understanding of science. Constructivist strategies engage youth in science content through learner-centered methods that emphasize the development of science process skills (e.g., observing, comparing, categorizing) and help them learn science facts and concepts (Marek & Cavallo, 1997). Furthermore, non-formal learning environments help generate interest and excitement around science that encourage exploration and interactions among learners (Fenichel & Schweingruber, 2010), and non-formal programs use teaching strategies that reflect how science takes place in the real world (Carlson & Maxa).

However, in the context of non-formal education, literature has suggested there is a need to address the issue of effective professional development for non-formal educators. In 4-H, volunteers serve most commonly as non-formal educators who lead curriculum projects and activities with youth (Boyd, 2004; Stedman & Rudd, 2006), and in order for 4-H volunteers to be successful in their role as non-formal educators, they must have access to and participate in effective professional development opportunities (Hoover & Connor, 2001). Specific to implementing effective science programs in non-formal settings, recent research describes the need to develop the capacity of individuals who lead educational activities (Chi, Freeman & Lee, 2008; Noam, 2008). Non-formal educators often lack backgrounds relative to science content and pedagogy, and may not have strong facilitation skills necessary to deliver science activities effectively (Walker, Wahl & Rivas, 2005), requiring additional development.

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Appendix C
Research to Build Upon – Promoting Positive Youth Development

In giving priority to research on positive youth development, thriving behaviors, and youth and community resiliency, we are building on a major shift in youth development research over the past two decades. Prior to the new millennium, researchers, scholars and practitioners developed and designed youth programs based on a deficit model approach. That is, they considered risky youth behaviors and problems as the centerpiece of their research, writings and programs. Youth were problems to be managed, thus programs were designed to intervene and not prevent. Currently, however, youth are increasingly being viewed as assets to be developed and nurtured (positive youth development). Positive youth development helps youth develop competencies in many life dimensions, namely social connections, personal character, personal confidence and the ability to care and contribute to society (Gomez & Mei-Mei Ang, 2007). Positive youth development-is a comprehensive approach to developing young people, promoting meaningful relationships with peers and adults, healthy behaviors, leadership development, and other parallel forms of success in young people (National Research Council and Institute of Medicine, 2002). It provides youth with access to resources (i.e., people, institutions, networks) in environments that are supportive, engaging and reflective of youth as assets.

Research shows a strong relationship between involvement in positive youth development experiences and improved academic achievement (Bosworth, 2002 as cited in Gomez & Mei-Ang, 2007; Guest & Sneider, 2007). In a study conducted by Meltzer, et al (2006), the data indicated youth who participated in positive youth development programs had increased high school graduation rates as well improved college attendance.

Peter Benson and others have demonstrated a relationship between positive youth development and the prevention of self-destructive behaviors (1997, 1998, 2001, 2006, 2009). Benson assumes that youth are naturally resilient; offering sustained, healthy opportunities for youth by promoting positive youth development decreases their likelihood of participating in risky and delinquent behavior (Damon, 2004).

In addition, positive youth development is continuing to emerge and evolve into a field and practice that is multi-layered and varied. Positive youth development is being scaffold by multiple theoretical frameworks and concepts, including the theory of *resiliency* and the fairly recently developed concept of *thriving*. In her seminal and defining work on resiliency, Bonnie Benard (1991) notes that resilient youth have "the ability to bounce back successfully despite exposure to severe risks." Benard's research links this capacity to certain attributes that allow youth to overcome adversity and stress, such as social competence, problem-solving skills, autonomy and a sense of purpose and future. Previous research on positive youth development and resiliency present a compelling case for developing and creating comprehensive strategies and approaches for youth to experience in formal or non-formal educational environments. Benard lays out a clear pathway for creating healthy youth by creating and sustaining healthy environments (i.e., school, families, communities) that offer caring and support, positive expectations, and an ongoing opportunity for participation (1991, 1994).

Other researchers have examined positive youth development through the notion of thriving. According to Heck, Subramaniam and Carlos (2010), the, "concept of thriving has emerged as a new lens through which to view research, theory and practice in youth development." While the concept of thriving has existed in medical literature for many years, its application in youth development has come into view in more recent years (Heck, Subramanian, Carlos, 2010). Thriving has been defined by researchers and practitioners as both a process and a status. Bundick, Yeager, King & Damon (2010) define it as "process involving an individual interacting in a mutually beneficial way with his or her environment." Heck, Subramanian, Carlos (2010) capture it this way: "Thriving is intentional and purposeful. It connotes optimal development across a variety of life domains, such as social, academic and professional/career development, towards a positive purpose."

Moreover, thriving youth have a healthier and less pessimistic view of their futures and are more likely to lead purposeful lives and to experience "exemplary adulthood" (Benson & Scales, 2009). Research identifies the following indicators of a successfully thriving youth:

- Love of learning;
- Life skills;
- Healthy habits;
- Emotional competence;
- Social skills;
- Positive relationships;
- Spiritual growth;
- Character;
- Caring;
- Confidence;
- Persistent resourcefulness;
- Purpose

The stronger the indicator is for a young person and the more indicators she wants to achieve the more likely she will reach her ultimate life goals (Thrive Foundation, 2010).

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Appendix D
Logic Model - Promoting Healthy Behaviors for Childhood Obesity Prevention
Multi-level School-Centered Environmental Approach

Inputs	Activities	Outputs	5-Year Intended Outcomes		
			Scale / Level	**Changes in Behavior of youth, adults, families, organizations, and the community**	**Which contribute to realizing the following desired community-scale outcomes**
EFNEP 4H UC FSNEP NFCS Programs UC MG HFC YD & YL SI ANR SI UC Resources*	Engage youth in nutrition programs and 4H Healthy Living Initiative Conduct family-centered nutrition -health education Peer and adult-youth dyad Link small and medium farmers with schools/school foodservice. Youth and adult literacy assessment / education	# and characteristics of youth and adults participating # of activities # and characteristics of staff and extenders trained competency evaluation for educators/extenders # educational products best practices manuscripts	**Individual Youth and Adults Families**	*On an equitable basis, more youth and adults will:* • identify healthy food choices • follow recommended dietary guidelines • assist with meal planning • identify personal barriers and motivators for positive nutrition, health, and fitness outcomes *More families will:* • take action on key messages • increase nutrition related activities (planning meals, food shopping, gardening, eating meals together) • increase frequency of family meals • participate in physical activities together	*Developmentally sound youth who exhibit the following indicators of health:* • trends of reduced BMIs • improved fitness scores • improved academic scores • decreased prevalence of risk factors for chronic disease *...and more youth and families will:* • be empowered as community leaders and advocates for coordinated school health programs • access to healthy foods
Partners $ resources Staff time Other org	Provide extender training. Conduct ag education training to schools and	# of trainings # and profile of participants # of orgs reached School policy for	**Organizational practices and community norms**	*Within schools:* • school physical fitness and academic scores improve when coordinated nutrition and health education are integrated into math, science, social studies, and language arts • family participation becomes a predictor (statistical) of nutrition, physical fitness and academic improvement	*Among school and community providers* • regularly evaluated and evolving school policy linked to coordinated school health outcomes • increased participation by families and youth regarding school policies impacting health • activities elevate the importance of youth leadership • community partners coordinate to provide

Appendix D Logic Model - Promoting Healthy Behaviors for Childhood Obesity Prevention Multi-level School-Centered Environmental Approach					
			5-Year Intended Outcomes		
resources	communities	coordinated program best practices manuscripts		• youth leadership is a predictor (statistical) of nutrition, physical fitness and academic improvement • increase ag-related programs	support to schools and families
<u>Community Resources</u> Economic Social Physical Institutions Networks	Build/ develop community networks/ coalitions	# of network gatherings/mtgs case studies / white paper characteristics, # of adults/ youth engaged best practices	**Community systems**	*Viable school networks/ coalitions* • are established in diverse demographic and economic areas • set core community priorities and goals related to healthy living • coordinate community programs to maximize use of assets and resources • engage youth and families in meaningful ways • become institutionalized/sustained • increase adult and community literacy levels related to health and agriculture	*Systems change* • sustainable farmers markets, mobile markets, or other effective community programs for access to healthy foods • open school space usage for local neighborhoods to utilize for physical activities • regularly evaluated and evolving community health programs • local health data informs planning (key indicators: Health Fitness Scores, County Ped Surveillance; diabetes prevalence, etc.)
	Pursue policy and institutional change	# and type of policy briefs/ inst. changes environmental changes # and characteristics of youth in decision-making roles best practices			

* see UC Resources in HFC Strategic Initiative Issue narrative.

Appendix E
Youth Science Literacy Logic Model

Inputs	Activities	Outputs	5-Year Intended Outcomes		
			Scale / Level	**Changes in Behavior of Youth and Informal and Nonformal Science Educators**	**Which contribute to realizing the following desired community-scale outcomes**
<u>4H program</u> Base funding Grants Gifts Staff time Adult volunteers Youth	Engage youth in science programs	# and profile of youth participating # and nature of activities	**Individual Youth and Adults**	*Diverse youth who participate in community-based (non-formal) science programs will show:* • Increased knowledge, skills, and attitudes towards science • Improved test scores in science *Diverse non-formal science educators and pre-service teachers will show::* • Improved pedagogical and content knowledge and skills	*All youth, irrespective gender, race or ethnicity who exhibit:* • Science proficiency and competency *…and become successful adults* • economically self-sufficient • contributing to science based decision making
	Train staff, adult volunteers, community partners, and youth leaders	# and profile of staff trained # and profile of volunteers, partners , youth trained #products developed			
<u>Partners</u> $ resources Staff time Other org resources	Provide PYD training (e.g Thrive model & other models/ frameworks/ and methods)	# of trainings # and profile of participants # of orgs reached	**Organizational practices and community norms**	*Organizational increase in:* • Youth organizations offering science projects • Enrollment in high school science course • Enrollment in college level science courses • Students who receive degrees in science-related majors • Science proficiency of staff and volunteers in youth organizations	*Among community youth organization* • Quality science programming is norm • Science proficiency of non-formal educator workforce • Policies/practices ensure equal access to science programs • activities elevate the importance of youth science literacy on the community and public policy agendas
<u>Community Resources</u> Economic Social Physical Institutions	Build/ develop community networks/ coalitions	# of network gatherings/mtgs profile, # of adults/ youth engaged	**Community systems**	*Community enhancement of:* • Informed citizenry in science-based decision making • Effective policies in promoting non-formal, informal and formal science learning environments • Economic competitiveness in science innovation • Social norms that value science literacy and performance	*Systems change* • High quality youth science programs • Policies that promote youth science literacy • Youth prepared for successful careers in science • Valuing of youth science proficiency
	Pursue policy and institutional change	# and type of policy briefs/ inst. changes # and profile of youth in decision-			

Appendix E Youth Science Literacy Logic Model					
Networks			5-Year Intended Outcomes		
		making roles			

Appendix F
Positive Youth Development (Step-It-Up-2-Thrive) Logic Model (for Programmatic and Extension Activities)

Inputs	Activities	Outputs	5-Year Intended Outcomes		
			Scale / Level	**Changes in Behavior of 4H Participants and Direct Community Partners**	**Which contribute to realizing the following desired community-scale outcomes**
<u>4H program</u> Base funding Gifts Other grants Staff time Parent & other volunteers	Engage youth in 4H programs	# and profile of youth participating # and nature of activities	**Individual Youth and Adults**	*On an equitable basis, more youth can:* • identify their unique sparks • experience a supportive relationship with a caring adult that develops a growth mindset • assess their own thriving indicators • build goal management skills (goal selection, pursuit of strategies, resilience in the face of challenges)	*Developmentally sound youth who exhibit the following indicators of thriving:* • competency • connection • character • caring • confidence • contribution
	Train adult leaders/parent and community volunteers	# and profile of staff trained # and profile of parents and other volunteers trained		*Diverse adult staff and volunteers who can:* • help youth discover passions and talents • develop a growth mindset in all youth • encourage thriving behaviors • be partners as youth pursue goals	*…and become successful adults* • economically self-sufficient • healthy family and social relationships • civic engagement
<u>Partners</u> $ resources Staff time Other org resources	Provide PYD training (e.g Thrive model & other models/ frameworks/ and methods)	# of trainings # and profile of participants # of orgs reached	**Organizational practices and community norms**	*Increase in number/quality of youth serving organizations which:* • are trained in positive youth development • view youth as assets • encourage youth voice • can mobilize volunteers and mentors on behalf of youth	*Among community youth providers* • positive YD is norm • stronger youth organizations and youth development workforce • policies/practices ensure equal access • activities elevate the importance of youth on the community and public policy agendas
<u>Community Resources</u> Economic Social Physical Institutions Networks	Build/ develop community networks/ coalitions	# of network gatherings/mtgs profile, # of adults/ youth engaged	**Community systems**	*Viable networks/coalitions* • focused on specific goals • community visibility and legitimacy • engage youth • mobilize/coordinate resources • institutionalized/sustained	*Systems change* • rich menu of quality youth programs • policies that promote YD • strong youth voice in planning • more/better coordinated youth resources • local YD data informs planning (key indicators: graduation rates, out of school and out of work rates for young adults, young adult voting rates, youth and young adult crime rates)
	Pursue policy and institutional change	# and type of policy briefs/ inst. changes # and profile of youth in decision-making roles			

Appendix G
HFC SI Preliminary Discussion of Position Allocations

UC ANR has released a call for new advisor and specialist positions. These positions should address critical gaps in ANR's programmatic and geographic coverage. New advisor and specialist positions have been heavily discussed in a variety of HFC venues including the recent HFC SI Conference, HFC SI panel meetings, and programmatic gatherings such as the recent EFNEP/FNSEP advisor and specialist meeting, 4-H YDP meetings and in other Youth Family and Community (YFC) Statewide planning discussions.

Note: These are preliminary recommendations, based on discussions to date, and not intended to represent a complete listing of all high priority positions in the HFC or YFC Statewide Program areas, but rather to encourage further discussion and debate prior to the solicitation deadline of November 15, 2010.

From these discussions the following considerations/recommendations are offered.

Geographic Considerations Based on County Cluster Needs – Current administrative restructuring of ANR county-based operations has and will continue to identify programmatic or subject-matter gaps, requiring additional advisor expertise in geographic areas. In addition to county director recommendations, advisors have also identified suggestions for programmatic clustering which may or may not complement proposed administrative clusters. *Recommendation:* High priority is given to cluster needs and a minimum of one NFCS and 4-H YDP advisor be assigned to each identified cluster to provide academic leadership to the highly visible community-focused YFC programs such as EFNEP, FSNEP and 4-H YDP.

Maximize Academic Resources By Proactively Addressing YFC Program Management Issues – There is "one pot of resources" for all ANR position allocations, whether the position is an academic advisor or specialist or staff or administrative position. For YFC advisors to conduct the academic work for which they are hired, appropriate resources must be in place to manage our popular and highly valued (by county stakeholders) education/service and volunteer driven programs such as 4-H, nutrition education, and master gardener programs. *Recommendation:* Based on advisor input at the HFC conference, resources for staff programmatic positions should be considered for this resource allocation. It is fully understood, that this may mean less advisor or specialist positions would be filled, but addressing this need will substantially increase the effectiveness of the existing advisors and more than off-set the loss in new positions.

Interdisciplinary Specialist Cluster Hires – As noted throughout the *UC ANR Strategic Vision 2025* and subsequent planning documents, the issues facing California require multi-pronged, interdisciplinary science-based approaches to problem-solving. No single discipline can provide the holistic approach needed to effectively address most of the issues identified in the *Strategic Vision 2025*. In some cases, ANR may have adequate expertise in several disciplines, but missing sufficient expertise in another to appropriate address the problem. In other areas large gaps in expertise may exist because of the declining size of our ANR workforce. *Recommendation:* In the Strategic Issue areas hire a team of new specialists who bring new and complementary expertise. Example in HFC- Childhood Obesity: Landscape Design Architecture specialist addressing the built environment influences on physical activity, and a Nutrition specialist addressing nutrition education and health promotion.

Cross Disciplinary Specialist Hires – So many of the issues reviewed and identified by HFC SI panel, as probably in the other SI panels, require expertise in community development, policy development and program evaluation, beyond the expertise of existing specialists and advisors. Additionally, the administrative clustering of

counties will also require more regional planning and tackling of larger policy relevant issues. *Recommendation:* Invest in specialists that can provide expertise across all four of the strategic initiatives, especially in the areas of regional planning, public policy and program evaluation.

Cross Department, College or School Specialist Hires – Many of departments for which we draw our ANR expertise already are hiring faculty that complements the work being conducted in other departments. Other times appropriate subject expertise is needed from two departments. *Recommendation:* Hire specialists that could hold joint appointments in two departments. Example: A youth science literacy specialist housed in HCD and associated with the 4-H Center for Youth Development, but also holding perhaps a smaller appointment in another ANR science field such as plant, animal or veterinary science.