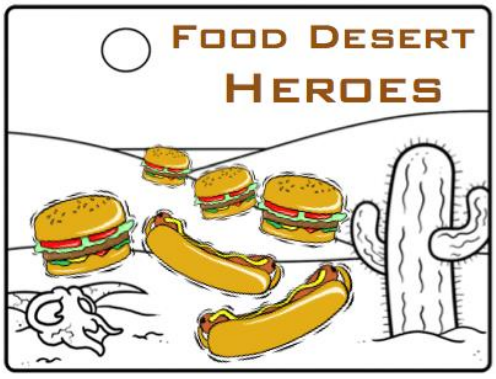
Call for Proposals

EPICS 151 Fall 2016



Food Desert Heroes (FDH)* is seeking proposals for novel technological approaches to empower individuals and families living in concentrated urban areas to grow their own supplemental supply of fresh food.

Food deserts are geographic areas where people's access to affordable, healthy food options is restricted or nonexistent due to the distance or absence of mainstream grocery stores[1]. While food deserts still have food, there is an imbalance of food choices, meaning a heavier concentration of processed, packaged foods that are high in salt, fat, sugar and devoid of nutritional value. These "fringe foods" come from fast food restaurants, convenience stores, gas stations, discount bakeries, and liquor stores[2].

It is estimated that 23.5 million people (7.4% of the total population) across the US live in food deserts[3]. Nearly half of all people in the US living in food deserts are low-income, and are commonly communities of color. Coupled with the fact that healthier foods are typically more expensive than unhealthy foods, healthy food options are often entirely beyond the monetary means of many of these communities. Even if families are receiving food stamps from the USDA's Supplemental Nutrition Assistance Program (SNAP), access to mainstream grocery stores is still restricted. In some areas like Detroit, the vast majority of food stamp retailers are convenience stores, liquor stores, and gas stations[4].

What we eat is directly correlated to our health. The US spends $150 billion annually to treat diet-related diseases annually. Occurrences of diabetes in the US have tripled over the past decade, and currently 1/3 of all children in the US are obese or overweight[5]. Consequences of long-term constrained access to healthy foods is one of the main reasons that people of color and low-income populations suffer from statistically-higher rates of obesity, type 2 diabetes, cardiovascular disease, and other diet-related conditions as compared to other populations[1].

This Call for Proposals focuses on the need to empower individuals and families living in concentrated urban areas to grow their own supply of fresh food to supplement the food they may or may not be receiving from other initiatives and organizations as well as that which they purchase.

Solution requirements

We invite proposals that present compelling solutions for an individual or small family to grow a supplemental supply of fresh food by means of a food-production system that can be implemented in small locations without direct access to ground soil (meaning seeds cannot be sown directly into the ground).

- We will prioritize sustainable, human-centered, and scalable solutions.
- The solution should be designed with a specific stakeholder group in mind, assume implementation in Golden or the surrounding areas.
- The course does not allow the time to grow and harvest crops of vegetables or raise animals to maturity. However, through research, testing, and prototyping, teams should determine the quantity, type, monetary value, and energy value of the food to be produced. **At least 3 types of food must be produced.**

- The system must be self-sustaining to increase ease of use.
- The proposal, while showcasing and quantifying the value and positive social, environmental, and other impacts, must also quantify the negative impacts. All projects involve some degree of risk, cost and time commitment. The final solution must include cost versus benefit analysis, a risk-mitigation plan and an operations and maintenance plan.
- The cost of the working prototype is not to exceed $100 and **no dimension of the working prototype may exceed 3 feet.** There is no cost limit to the final proposed solution, but the proposal must demonstrate that the solution cost (both initial capital costs and operating costs) is commensurate to the value offered.
- Safety: All prototype testing must be safe to students, and the final solution should be safe to any potential users. Absolutely **no animal testing or experimentation**, although in situ observations are highly recommended if relevant to your solution.

Out-of-scope for this Call

- Designing a community garden or other large-scale system.
- Non-technical solutions focused on political, social, or economic intervention (for example, nutrition education outreach programs to families).
- Solutions that grow plants for medicinal or recreational purposes.

Submittal

- The final design report must be accompanied by a working prototype. This prototype will likely be a smaller and less-refined version of the final solution. However, the working prototype must demonstrate the key functionality and unique features of the final solution.
- The EPICS in-class Trade Fair presentations are mandatory for all students and will provide teams with the opportunity to demonstrate their final solutions.
- Final solutions will be evaluated on:
  - Creativity and degree of effort put forth into the problem-solving process
  - Value offered by the solution (cost versus benefit)
  - Ease of use, technical feasibility, sustainability, and effectiveness (incudes safety)
  - Quality of submissions (sophistication of works-like prototype, consideration of stakeholders' perspectives, depth of report, and degree to which all claims are substantiated).

References

1. Food Empowerment Project (2016). *Food Deserts* [Online]. Available: http://www.foodispower.org/food-deserts/
2. Mari Gallagher Research and Consulting Group (2014). *Food Desert and Food Balance Community Fact Sheet* [Online]. Available: http://www.marigallagher.com/site_media/dynamic/project_files/Food-Desert-and-Food-Balance-Fact-Sheet.pdf
3. Teaching Tolerance (2016). *Food Desert Statistics* [Online]: Available: http://www.tolerance.org/sites/default/files/general/desert%20stats.pdf
4. TedxWindyCity, Mari Gallagher (2010). *Food Deserts* [Online]. Available: https://www.youtube.com/watch?v=iEWriN6kh3c
5. TedxBoston, Josh Trautwein and Daniel Clarke (2013). *Food Desert Destroyers* [Online]. Available: https://www.youtube.com/watch?v=99U9EOqLaeU

**FDH is a fictitious organization.*