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 year-round supply of fresh vegetables.

Food deserts are geographic areas where people’s access to affordable, healthy food options (especially fresh fruits and vegetables) is restricted or nonexistent due to the distance or absence of mainstream grocery stores1. Food deserts affect people in every type of community – suburban, urban, and rural – across the US2. 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 stores3.

It is estimated that 23.5 million people (7.4% total population) across the US live in food deserts4. Some areas including Virginia, Chicago, Boston, Detroit, New York, and others have closer to 20% of the total population living in a food desert5. Even Denver has neighborhoods classified as food deserts6.

Nearly half of all people in the US living in food deserts are also low-income. In fact, food deserts are most commonly found in communities of color and low-income areas. Wealthy districts and white neighborhoods tend to have about 3-4x the amount of mainstream grocery stores as compared to communities of color and low-income areas. Even the mainstream grocery stores that do exist in these latter areas are often smaller with less selection7. It is much less profitable for a mainstream grocery store to locate itself in a low-income area where residents cannot pay as much for groceries as what residents in affluent areas can pay. This is one of the main factors contributing to food deserts8.

Coupled with the fact that healthier foods are typically more expensive than unhealthy foods, especially in food deserts, healthy food options are quite often entirely beyond the monetary means of many lower-income and minority people. Also, 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 vendors that welcome SNAP customers are convenience stores, liquor stores, and gas stations7.

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 overweight8. 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 populations9. It has long been assumed that the reason these healthy disparities arise is because people of color and people living in low-income areas are generally apathetic toward their health outcomes and don’t care about eating healthy. This assumption does not take into the account the strongly negative impact that food deserts have on people’s health and the decades of poor social structure, particularly around access to healthy food8.
Food Deserts present a complex problem, which won’t be solved by a single solution. This means that every project counts, and everybody can do something to help. Fortunately, there are many current initiatives and programs in place to help alleviate the problem of food deserts: Food banks in churches, neighborhood-run community gardens, mobile fruit and vegetable markets (i.e. grocery stores in school buses), organizations that deliver fruits and vegetables to gas stations and corner marts, etc.

However, this Call focuses on the need to empower individuals and families living in concentrated urban areas to grown their own year-round supply of vegetables to supplement the fresh food they may or may not be receiving from other initiatives and organizations.

Solution requirements

We invite proposals that present compelling solutions for an individual or small family to grow vegetables year-round by means of a food-growing system that be implement indoors or small outdoor areas such as patios or porches where is access to water and sunlight but not direct access to ground soil (meaning seeds cannot be sown directly into ground soil).

- We will prioritize sustainable, long lasting, human-centered, and scalable solutions. For example, how would two neighbors link their food growing systems together?

- Six weeks is not enough time to grow and harvest a full crop of vegetables, and testing the food-growing system in the winter months is not feasible. However, teams should still have a research-based plan that clearly defines what types of vegetables can be grown in the food-growing system and when. For example, if this were to become a consumer product, what info would the user’s manual contain?

- Your Proposal, while showcasing and quantifying benefits and positive social, environmental, and other impacts, must also quantify the negative impacts.

- Working prototype cost is not to exceed $100. There is no cost limit to the final proposed solution, but the Proposal must demonstrate that your solution cost is commensurate to the value offered. This means that your working prototype might be a smaller or less-refined version of the final prototype you present in your Final Proposal. However, your working prototype must demonstrate the key functionality and features of your final prototype.

- Safety must be a key aspect of your process. All prototype testing must be safe to students, and the final prototype should be safe to any potential users. If there are safety concerns surrounding your solution, they must be articulated and addressed in your Proposal.

Out-of-scope for this Call

- Designing a community garden or other larger-scale system
- Non-technical solutions focused on political, social, or economic intervention (for example, nutrition education to families)
- Solutions that grow exotic plants that are impractical to incorporate into one’s daily diet
- Solutions that grow plants for medicinal or recreational purposes
**Submittal**

- Final Proposal is due the last day of class (Thursday, June 26).
- Final Proposal must be accompanied by a working prototype that demonstrates key functionality of your Proposed solution. Working prototype is due earlier than the Final Proposal (Tuesday, June 24).
- The EPICS Trade Show, also held the last day of class (Thursday, June 26) is mandatory for all students and will provide all teams time to demonstrate their proposed solutions.
- Proposed solutions will be evaluated on:
  - Ease of use, safety, cost versus benefits, and effectiveness
  - Degree of effort put forth into the problem-solving process
  - Quality of submissions (proposal, data and analysis, prototype, etc.)

**References**


*FDH is a fictitious organization.*