Sustainable Food

The three main categories to consider when evaluating the sustainability of food are **food origin, method of production, and company ownership**. Outlined below are factors to evaluate for each of these categories, as well as questions you should ask yourself in order to determine what to recommend to your group. The purpose of these guidelines (not only for Sustainable Food, but also for all of the other event categories listed in this document) is to help you determine what option would be the best recommendation for the group you are advising when you are conducting research on sustainable alternatives.

Food Origin:

How many miles has the food item traveled to get to Stanford? What was the probable method of transport (train, boat, overland truck shipping, plane)? Due to the nature of our distribution system in the US, most food travels by ground transport in trucks, which have high GHG (greenhouse gases – the gases in the atmosphere that cause global warming) emissions costs. Rail and water transport emit roughly a tenth of the amount of CO2 per ton-kilometer of food than trucks do, but at the same time, their journeys tend to be far longer than the journeys made by food trucks (Department of Energy, 2011). While it's a thorny issue to quantify precisely, **we err on the side of favoring local production (under 150 miles from Stanford)** because there are other benefits, such as supporting the local economy and developing relationships with sellers, that buying locally gives us, in addition to the environmental impact.

Method of Production:

Vegetables and Fruit—The primary choice is between organic and non-organic. As a general rule, **we encourage you to choose organic options**. Although it has been argued that farm size is a more reliable indicator of "sustainable practices" than "organic vs. non-organic", there are no distinct categories of farm size, nor do nearly any distributors, caterers, or grocery stores detail information about the size of the farm where their products originated. Therefore, we will utilize the "organic" classification. Organic agriculture does not have a strict definition, but the USDA classifies organic agriculture as "an ecological production management system that promotes and enhances biodiversity, biological cycles, and soil biological activity." In general, organic production practices signify a lower fossil fuel-based impact because there are no synthetic pesticides or fertilizers used as inputs into the natural system. Organic growers use integrated pest management (IPM) techniques and increase soil nutrients by adding compost and using crop rotation and cover cropping systems on their land. Another factor to consider when evaluating produce is what is in season. Produce that is out of season is either shipped from areas halfway across the world, where it is in season, or is picked before ripened and stored in industrial warehouses. In general, **encourage groups to buy organic food that is in season** (EPA, 2011). An excellent source for finding what produce is in season is the website of the Center for Urban Education about Sustainable Agriculture: http://www.cuesa.org.

Meat—Grass-fed, free-range beef is ideal, but it also usually is the most expensive. The terms "pasture-raised", "pastured", and "grass-fed" should all mean that the animal was raised outdoors on pasture and ate grasses and hay. "Grass-fed", however, has turned out to be a little misleading because an animal that is confined indoors and fed grass could be called grass-fed. Most farmers who use the term "grass-fed" raise their animals outdoors on pasture, but there is no way to ensure this unless you ask the farmer or perhaps visit the farm. Therefore, **we advocate looking for pasture-raised meat**, which is not only friendlier for the environment but also healthier than regular types of meat (Rule, 2002; Duckett, 1993).

Eggs—We encourage **looking for options labeled "organic", "free-range", "cage-free"**, and other permutations of those words.

Seafood—**Use the Monterey Bay Seafood Watch Card** (http://www.montereybayaquarium.org/cr/cr_seafoodwatch/ download.aspx) for guidelines. This is the widely accepted standard and metric for sustainable seafood consumption.

Company Ownership:

Is the food supplier and/or farm locally-owned and operated? By choosing to spend Stanford's money on certain companies rather than others, we are choosing to support those systems of production and distribution. **Supporting smaller, locally-owned and operated companies** provides monetary inputs to the local economy and supports a diversified product base in our region. It also generally is easier to form long-term, fruitful relationships with smaller companies, which helps us as a consumer to effectively communicate our needs.

Methods of Decision Analysis:
Our metric for sustainable food roughly quantifies how you should compare different types of sustainable food choices. We have put together a point system that tries to convey the significance of various factors that need to be evaluated when determining the sustainability of a food option. By quantifying the environmental value of a food option, this metric should help you measure the positive impact of foods and compare them with one another. The value of each type of food is based on data provided in "Food-Miles and the Relative Climate Impacts of Food Choices in the United States" (Weber, 2008).

Since the majority of greenhouse gas production from food comes in the production phase, our metric system's greatest focus lies here. Red meat is the worst offender, emitting nearly four times as many GHGs per kilogram as its closest rival, poultry/fish (Weber, 2008). Therefore, the biggest category in our metric system is the composition of the food itself (vegan, vegetarian, etc.). We then consider other factors, such as any certifications, local ownership, and local production (the diminished priority of these factors in comparison to the type of food is demonstrated by the points allocated to each of these categories).

Criterion	**Points Allocated**
Type of Food	Vegan – 60 Vegetarian – 50 Poultry/fish – 30 Red meat - 20
Certified (organic vegetables, grass-fed beef, Monterey Bay fish, etc.)	15 pts
Local Ownership (within 150 miles of Stanford)	15 pts
Local Production (within 150 miles of Stanford)	15 pts
Recyclable, Compostable, or Minimized Packaging	10 pts

Example Scenario:
A group is deciding between purchasing a vegan sandwich platter from Costco versus a locally-produced shrimp cocktail from a local restaurant. The sandwich platter gets 60 points for being vegan, but since it is not certified, locally-owned, locally-produced, nor specially packaged, its point total tops out there. The cocktail gets 15 points for being locally-owned and 30 points for type of meat. If the restaurant uses certified shrimp, they will get 15 points, and if the shrimp is caught locally (e.g. in Monterey Bay), they get 30 pts for local production. If the shrimp were caught in Louisiana and shipped here, the shrimp cocktail does not receive any points for local production.

Let us assume that the shrimp is non-certified but is locally-caught. Then the cocktail gets a total of 15+30+15=60 points. In this scenario, using our metrics, the shrimp cocktail and the Costco sandwiches are equally weighted. Our system provides only a rough measure, however, and it does not account for product subtleties. But it does give you as a consultant more decision power, as well as the ability to consider the price of products. If there is a tie between two products, you are encouraged to choose the less expensive one unless there is a clear and compelling reason to choose the other.

Advertising

Background:

Approximately 100 million tons of paper and paperboard have been used in the U.S. each year for the last 15 years. In 2007 there was a drop of 4% to 96.7 million tons – 640 pounds per person. The recycling rate of paper was 56.1% in 2007. This rate has grown steadily from 38.7% in 1993. The target paper-recycling rate for 2012 is 60% (EPA, 2011; American Forestry and Paper Association, 2012).

Impact assessment for printed flyers operates on two levels:

1) Overall reduction in printed pages, as compared to an event baseline (for recurring events) or a stated standard for one-time events. The target for all our consulted events is to **conduct a completely paperless advertising campaign**. However, many event organizers are strongly opposed to eliminating flyering altogether, in which case we recommend **environmentally responsible paper and printing practices**.
2) For those events that do not wish to go completely flyer-less, we assess the environmental difference between using virgin paper versus recycled content, chlorine-free paper, as well as conventional versus vegetable-based ink.
    a. **Try to buy paper that is certified as sustainable** by, for example, the Forest Stewardship Council. If the certification status of the paper is unclear, we recommend looking for recycled, unbleached paper. Buying paper made from 100% post-consumer waste is preferred, but oftentimes paper that is labeled as "recycled" includes only 30% post-consumer waste, with the difference made of virgin paper.
    b. Conventional color ink vs. vegetable-based ink—This comparison is only relevant for events that commission off-campus companies to do their printing jobs. In these cases, speak to the company directly, ask what kind of ink they use, and request to review the LCA (life-cycle analysis) for the ink and printing processes (if they have one available). **It is not always clear what kind of ink is better, so evaluate this factor on a case-by-case basis.**

T-Shirts:

Approximately 16.5 billion pounds of textile waste are produced in the US each year, of which roughly 2.5 billion pounds are collected and recycled/reused. While t-shirt advertising can be effective, we highly encourage groups to **refrain from buying new t-shirts for their events**; this is hugely energy and resource intensive. Encourage groups to reuse old shirts or to use other forms of advertising. If a group insists on buying t-shirts, recycled cotton is best (saves 20,000 liters of water/kg cotton), organic if possible. Try to **avoid fleece, wool, and especially polyester**, which is the most resource intensive option (Claudio, 2007). If a group is open to non-traditional materials, look into options like cannabis, bamboo, and recycled water bottle t-shirts, all of which are less resource hungry than traditional materials (Claudio, 2007). It is usually more difficult to find custom t-shirt manufacturers who stock these alternative materials, so focus on either **avoiding t-shirts or obtaining recycled and reused shirts**.

Purchasing Event Materials

All standard event-serving materials can be purchased through **World Centric (worldcentric.org)**. Although many groups on campus will purchase their event materials from **Green Store (greenstore.stanford.edu)**, the LCA data for items bought through Green Store (e.g. recyclable cups, BPI-certified compostable material) should be comparable to that of World Centric products. We thus will rely on World Centric's LCA data for guidance regarding what materials are most sustainable. If a group cannot purchase their materials from Green Store for whatever reason, **we encourage the purchase of BPI-certified (Biodegradable Products Institute) compostable materials over recyclable materials over biodegradable**. "Biodegradable" is an inexact term that can be used to greenwash products that actually are not very sustainable, so we recommend **staying away from products not explicitly certified as compostable or labeled as recyclable** (typically only plastic #s 1 and 2 are considered recyclable by most facilities).

Assessing the Environmental Impact of Different Materials:

By recording the number of items of each product used at a given event and then converting the quantity into the net weight of each product used, we can utilize World Centric's LCA data to calculate energy, emissions, and water used. Comparing this data to similar LCAs for "conventional" products, we estimate the net change in each product category from using a sustainable alternative rather than a conventional product; this information can help you decide what to recommend to your group (World Centric). Specialty event-specific items are treated on a case-by-case basis, and you will search for comparable LCA analyses that can be used for these items. The following products can be purchased through World Centric:

- Compostable:
  - Utensils (spoons, forks, knives)
  - Cups
  - Plates (small and large)
  - Bowls

Example:

Event A uses approximately 500 compostable cups (PLA), 350 compostable (wheat straw) plates, and 600 compostable forks and knives (also PLA). Each cup weighs 1.2 ounces=.075 lb. Each plate weighs 1.6 ounces= .1 lb. The forks and knives weigh approximately .8 ounces=.05 lb. Therefore, the total PLA used was 500*.075 + 600*.05 = 67.5 lbs. The total wheat straw used was 300*.1 = 30 lbs.

Below is a table that shows the environmental impact of using sustainable (highlighted in green) versus conventional material.

Environmental Impact Per Pound of Material Used

Material	Energy (kWh)	Emission (lb CO2 equivalent)	Water (gallons)
Ingeo PLA	5.37	1.3	8.29
GPPS (General Purpose Polystyrene)	11	2.71	16.93
Wheat Straw	0.66	0.69	13.33
Bleach Coated Paperboard	5.49	1.48	9.86

Take these environmental impact values and multiply them by the amount of each product used. For example, the total energy impact of Event A's use of PLA is: 67.5 lbs * 5.37 kWh/lbs = 362.475 kWh. Do these calculations for both the sustainable and conventional materials and compare the results. In the case of Event A, there is a savings of:

- 524 kWh energy
- 119 lbs CO_2 emissions
- 479 gallons of water

Waste Management and Landfill Diversion

Background:

Landfills are the largest source of anthropogenic methane emissions in the U.S. The EPA estimates that diverting one short ton of food waste from a landfill by composting actually produces a net decrease of .92 metric tons of carbon dioxide equivalent (CO2E) per ton of food waste (Environmental Protection Agency, 2006). In addition to causing methane generation in landfills, food waste represents a serious waste of energy; in 2007, the embedded energy of food waste amounted to 2% of US energy consumption (Cueller, 2010). This is more energy than the annual petroleum available from drilling in the outer continental shelf (Energy Information Agency, 2009). Therefore, **we recommend that groups reduce landfill waste as much as possible by recycling and composting**.

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