

Make it Last: Sustainable Agriculture and Agroecology



Module 5 Student Handouts

Instructions: It is easiest to print this document **double-sided, on the short-edge**. Print 1 copy for every 2 students in your class. Individually cut out the Brand Recognition Images from pages 2-5 into card decks. Each student group should get 1 deck (including images A-T).





Food Up!



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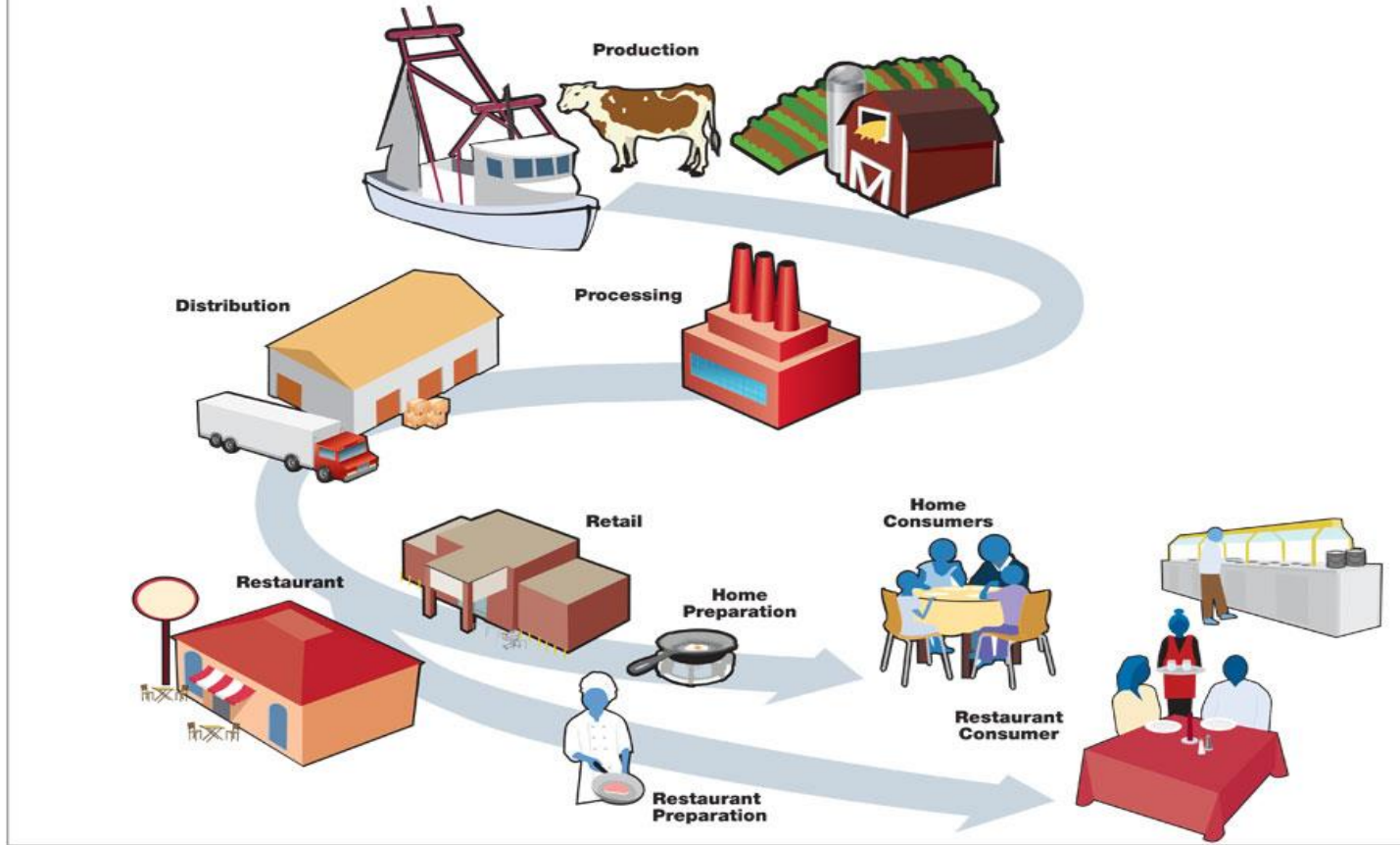


Food Up!



Maslow's Hierarchy of Needs

The Food Production Chain



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Sustainable? You Decide!

Tomatoes

When grown industrially, tomato production relies heavily on insecticides, herbicides, and fungicides, landing them on the Environmental Working Group's Dirty Dozen list, a list of produce typically grown with the most pesticides. (Prod/Env,Comm/-)

Soy Milk

The water footprint of soy milk is significantly less than cow milk. One glass of cow milk requires about 67 gallons water to produce, whereas one glass of soymilk requires about 18 gallons of water for production. (Prod/Env/+)

Tea

Using loose leaf tea, rather than tea packaged into tea bags, can reduce the carbon footprint of the tea by up to 90%.

(Cons / Env/ +)

Tomatoes

Migrant tomato workers are some of the poorest and most abused workers in the country. Not only are they regularly exposed to high amounts of pesticides, but as recently as 2008 were paid 40 cents per bucket of tomatoes, resulting in annual wages of about \$6500.² (prod/Env, Ec, Comm/-)

Soy

Much conventional (non-organic) soybean oil is extracted using hexane, a chemical that has been linked to negative neurological effects. This makes work dangerous for workers in the soy processing industry. (Proc/Comm/-)

Tea

Tea is used for gathering rituals around the world. It is used in many cultures on a daily basis for social purposes ranging from work breaks to spiritual rituals.

(Cons / Comm / +)

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Corn

The average Iowa cornfield produces enough calories to keep 14 people alive annually. However, most of our corn goes to ethanol and animal feed, so the same corn field ends up supporting the equivalent of only three people's dietary needs per year, mostly through corn syrup and animal products.⁴ (Proc, Env, -)

Corn

Much of the 5.6 million pounds of nitrogen fertilizer applied to corn annually ends up in our rivers and lakes, causing dead zones void of live fish and wildlife. The dead zone in the Gulf of Mexico is a prime example of the devastating effects of this pollution.⁴ (Prod / Env / -)

Apples

According to the Environmental Working Group, 90% of commercial apples have detectable rates of pesticide residue when they meet consumers. Apples are vulnerable to a variety of pests and diseases, creating a strong incentive for heavy pesticide use during production. (Prod / Env, Comm / -)

Corn

The industrialized world is set up to efficiently process corn into a variety of useful products, from animal feed and cornmeal to ethanol fuel and bioplastics. (Proc, Econ, Env, +, -)

Corn

Roughly 1.3 million acres of grassland and prairie were converted for corn use in the Western Corn Belt between 2006 and 2011, posing a threat to the waterways, pollinators, and biodiversity.⁴ (Prod / Env / -)

Apples

Apples are harvested in the fall and can be stored without processing for months, providing a local source of food in cold months when much less food can be grown locally. (Cons, Prod / Econ / +)

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Beef and Dairy

Much of the beef and dairy in the United States is raised in Confined Animal Feeding Operations without access to graze on outside grasses, leaving these operations to rely on corn being transported to feed the animals. This results in a much higher water and energy footprint than traditional grass grazed beef and dairy.

(Prod, Env, -)

Beef

Beef raised on pasture has a higher Omega 3 content, as well as higher levels of antioxidants, than conventionally raised beef.

Cheese

A 2,000 cow dairy produces about a quarter million pounds of manure daily. In addition to causing dead zones in lakes and rivers, the nitrate from this waste can make its way to groundwater, where many of us get our drinking water from. Water high in nitrates is a danger to pregnant women and newborn babies, and causes increased risk in colon, stomach, and kidney cancers.

Eggs

Egg laying hens are typically raised in small “battery cages” without access to the outdoors. Hens are in very close proximity, requiring the use of antibiotics to reduce diseases that flourish in crowded areas. The overuse of antibiotics has contributed to antibiotic resistance, making bacterial infections in animals and humans increasingly more difficult to treat. (Prod, Comm, -)

Edible Crickets

Although not part of the American diet today, crickets are high in protein, healthy fats, and micronutrients. Edible insects require less land, water, and feed than conventional meat, while emitting fewer greenhouse gases. They are eaten across the world and can be farmed with limited resources. Plus, many people find them delicious!

(Prod, Env, +)

Salmon

Salmon farms create crowded conditions that put pressure on surrounding ecosystems with their high generation of waste. These conditions also create a reliance on antibiotics. In 2007, Chilean salmon farms used nearly 1 million pounds of antibiotics to fight disease in unnatural farming conditions.

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Rice

Genetically modified varieties of rice have drastically increased use of pesticides and herbicides. This has increased instances of devastating human loss in agricultural communities due to increase rates of cancer, stillbirths, and birth defects.³

(Prod, Comm, -)

Coffee

The Rainforest Alliance certifies coffee to be shade grown in forests. Most industrially grown coffee is grown in the sun for faster growth, which has been a driver of severe deforestation and habitat loss in many coffee growing countries.

(Prod, Env, -)

Beef

Four companies in the United States control 80% of the US beef industry. This consolidation of the market limits access to processing facilities for small and medium sized producers and lends lobbying control over matters of labor and environmental regulations.

(Prod / Econ, Comm / -)

Rice

Introduction of genetically modified rice varieties like “Miracle Rice” has reduced global famine.

(Prod, Comm, +)

Tomatoes

Local tomatoes are often picked in abundant quantities for a short season, causing many community members to gather together for canning and freezing parties to preserve this bountiful harvest.

(Proc/Comm, Ec/ +)

Watermelon

Watermelon is very resistant to droughts, reducing the need for irrigation. Watermelon are highly dependent on an endangered honeybee population for production.

(Prod, Env, Ec / +)

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Food Packaging

40% of the plastic that we make is designed for single use. Because plastic does not completely break down, microplastics accumulate in our oceans and soils. It is estimated that 79,000 tons of plastic comprise the Great Pacific Garbage Patch in the Pacific Ocean, having devastating effects on marine wildlife.

Bananas

Bananas travel a long distance to our plates, often traveling by boat. Sea transport emits only .01 kg of CO₂ per ton of food traveling a kilometer. Air travel clocks in at 1.13 kg CO₂ / tonne km, 113 times more than boats. Out of season berries and other foods that must be transported very fresh are often shipped by air.⁸

Pork

Manure from confined animal feeding operations is highly concentrated and often used in higher amounts than necessary. The runoff of nutrients causes dead zones in waterways and dangerous nitrogen levels in groundwater. (Prod, Env, -)

Your Grocery Trip

One shopping trip by car to buy a few things can have more carbon emissions than the production, processing, and distribution of a food item.⁷ It is better to make fewer trips to the store to stock up, or even better, walk, bike, or bus to the store.

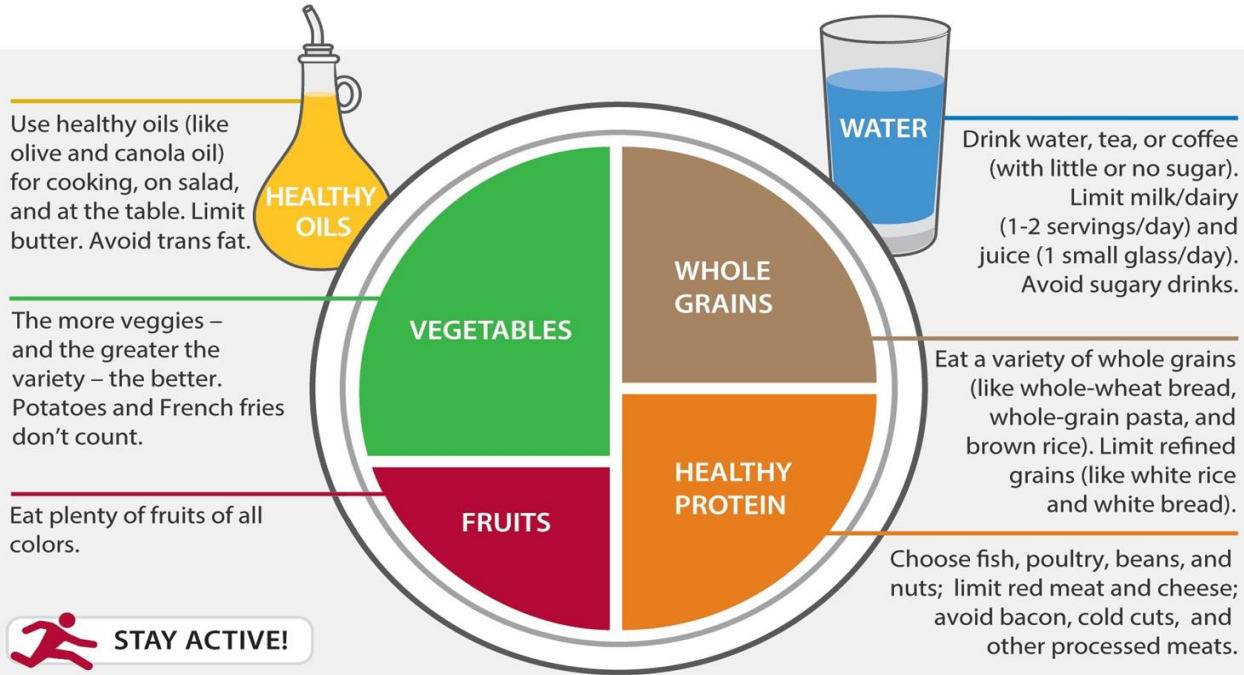
Bananas

Fairtrade International has developed a Fairtrade Minimum Price for bananas, which supports a Fairtrade Base Wage for employees on Fairtrade certified banana plantations.⁶ (Prod, Comm, Economy, +)

Spinach

Spinach and other vegetables sold at the farmer's market allow farmers to capture the entire selling price of a produce without needing to invest in a storefront or sell to a middleman.

HEALTHY EATING PLATE



Use healthy oils (like olive and canola oil) for cooking, on salad, and at the table. Limit butter. Avoid trans fat.

The more veggies – and the greater the variety – the better. Potatoes and French fries don't count.

Eat plenty of fruits of all colors.

 **STAY ACTIVE!**

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Drink water, tea, or coffee (with little or no sugar). Limit milk/dairy (1-2 servings/day) and juice (1 small glass/day). Avoid sugary drinks.

Eat a variety of whole grains (like whole-wheat bread, whole-grain pasta, and brown rice). Limit refined grains (like white rice and white bread).

Choose fish, poultry, beans, and nuts; limit red meat and cheese; avoid bacon, cold cuts, and other processed meats.



Harvard T.H. Chan School of Public Health
The Nutrition Source
www.hsph.harvard.edu/nutritionsource

Harvard Medical School
Harvard Health Publications
www.health.harvard.edu



References for *Sustainable? You Decide* Cards

NOTE: Unless numbered below, all *Sustainable? You Decide* card information is from: [FoodPrint's Real Food Encyclopedia](https://foodprint.org/eating-sustainably/real-food-encyclopedia/). <https://foodprint.org/eating-sustainably/real-food-encyclopedia/>

2. The Southern Poverty Law Center, 2008. Migrant Tomato Workers Face Chronic Abuses. Available: <https://www.splcenter.org/news/2008/04/15/migrant-tomato-workers-face-chronic-abuses>

3. Pepper, 2008. The Toxic Consequences of the Green Revolution. Available: <https://www.usnews.com/news/world/articles/2008/07/07/the-toxic-consequences-of-the-green-revolution>

4. Foley, 2015. It's Time to Rethink America's Corn System. Scientific American. Available: <https://www.scientificamerican.com/article/time-to-rethink-corn/>

6. Fairtrade International, 2021. Bananas. Available: <https://www.fairtrade.net/product/bananas>
<https://www.oregon.gov/deq/FilterDocs/PEF-FoodTransportation-ExecutiveSummary.pdf>

7. State of Oregon, Department of Environmental Quality, 2016. Executive Summary: Environmental Footprint Literature Review Food Transportation. Available:

8. Ritchie, H. 2020. Very little of global food is transported by air; this greatly reduces the climate benefits of eating local. Our World in Data. Available: <https://ourworldindata.org/food-transport-by-mode>