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## Why Does Reducing Caloric Intake Increase Sustainability?

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# WHY DOES REDUCING CALORIC INTAKE INCREASE SUSTAINABILITY?

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The increasing food needs of the vastly growing human population with the planet's limited resources is a major challenge for today's society. We as humans can use certain dietary choices to reach better sustainability (Davis, et al., 2016)

## What is a Sustainable Diet?

- Low environmental impact food (Graham et al., 2019)
- Provide healthier life for present & future generations
- Protective and respectful of biodiversity
- Culturally accessible, acceptable, economical
- Nutritionally safe and healthy
- Optimize natural and human resources (Germani, et al., 2014)

## Why Reduce Your Caloric Intake?

1. Help the cause of creating a more sustainable diet for others (future generations)
2. Live a healthier life by eating better and decreasing the amount of caloric intake in your diet
3. Help fight food shortages of other countries and reduce the greenhouse gas emissions
4. Decrease pollution and food waste (Davis et al., 2016)

## Key Assumptions

### Food Webs

- The global food system requires large amounts of water, nitrogen, CO2, and land
- Even with improved efficiencies, agriculture's environmental burden will grow
- Alternative diets, such as those that are globally adequate, and improved efficiency can reduce the food system's impacts (Davis, et al., 2016)
- Individuals with higher educational levels, especially young people, are more attentive to environmental issues, probably because they have more access to information (Barone, et al., 2018)

### Trophic Structure

- In the last 100 years, 3/4 of all plant and animal species have been lost globally, and the majority of the world's food supply comes from a dozen plant and a handful of animal species
- Due to this lack of biodiversity, which in turn lowers species richness, so species don't have a wide variety of resources and it doesn't allow for trophic level expansion
- The higher trophic levels of the food web are affected the most (such as humans) as they can only intake energy made from lower trophic levels
- Without trophic level expansion, species of all trophic levels are affected (Meyer et., 2017)

### Ecosystem Energetic's

- How choosing low environmental impact options will affect nutrient intake?
  - Meals that contain beef and cheese hold the highest environmental impact, whereas vegan dishes require the least amount of water and land (Graham et al., 2019)
  - In order to combat the growing problem of climate change and population growth, promoting food options that are low impact with a high nutritional profile will help people make more environmentally sustainable choices.

**Table 5**  
Cooked amounts of plant and animal-based foods delivering 20 g of protein.

| Food          | Grams | Ounces | Cups | T  | Calories | Limiting Amino Acids   | Leucine (g) |
|---------------|-------|--------|------|----|----------|------------------------|-------------|
| Anasazi Beans | 322   | 11.4   | 1.4  | 23 | 426      | Sulfur containing AA   | 1.2         |
| Black Beans   | 295   | 10.4   | 1.3  | 21 | 295      | Sulfur containing AA   | 1.3         |
| Chickpeas     | 294   | 10     | 1.3  | 20 | 336      | Sulfur containing AA   | 1           |
| Soybeans      | 204   | 7.2    | 1    | 14 | 268      | Complete plant protein | 2.3         |
| Lentils       | 250   | 8.8    | 1.1  | 18 | 253      | Sulfur containing AA   | 1.3         |
| Tofu          | 284   | 10     | 1.3  | 20 | 189      | Complete plant protein | 1.3         |
| Tempeh        | 306   | 10.8   | 1.4  | 22 | 265      | Complete plant protein | 2.4         |
| Edamame       | 318   | 11.2   | 1.4  | 22 | 265      | Complete plant protein | 1.2         |
| Seitan        | 408   | 14.4   | 1.8  | 29 | 270      | Complete plant protein | no data     |
| Buckwheat     | 755   | 26.6   | 3.3  | 53 | 516      | Complete plant protein | 0.4         |
| Quinoa        | 567   | 20     | 2.5  | 40 | 555      | Complete plant protein | 0.5         |
| Millet        | 748   | 26.4   | 3.3  | 53 | 683      | Lysine, threonine      | 0.8         |
| Amaranth      | 500   | 17.6   | 2.2  | 35 | 552      | Complete plant protein | no data     |
| Einkorn       | 145   | 5.1    | 0.6  | 10 | 218      | no data                | no data     |
| Emmer         | 227   | 8      | 1    | 16 | 200      | Lysine                 | 0.5         |
| Spelt         | 411   | 14.5   | 1.8  | 29 | 445      | No data                | no data     |
| Kamut         | 411   | 14.5   | 1.8  | 29 | 454      | Lysine                 | 0.8         |
| Almonds       | 227   | 8      | 1    | 16 | 575      | Methionine, Cysteine   | 2.1         |
| Peanut butter | 68    | 2.4    | 0.3  | 5  | 470      | Methionine, Cysteine   | 3.9         |
| Hemp seeds    | 57    | 2      | 0.3  | 4  | 160      | Lysine                 | 0.7         |
| Pumpkin seeds | 132   | 4.6    | 0.6  | 9  | 433      | Complete plant protein | 3           |
| Beef 15% fat  | 73    | 2.4    | 0.3  | 5  | 157      | Complete protein       | 1.7         |
| Chicken       | 91    | 3.2    | 0.4  | 6  | 100      | Complete protein       | 3.3         |
| Pork          | 73    | 2.4    | 0.3  | 5  | 152      | Complete protein       | 1.9         |
| Milk 2% fat   | 567   | 20.0   | 2.5  | 40 | 284      | Complete protein       | 0.8         |
| Eggs          | 188   | 6.4    | 0.8  | 13 | 291      | Complete protein       | 2           |
| Fish (tuna)   | 141   | 4.8    | 0.6  | 10 | 179      | Complete protein       | 3.2         |

Figure 1: Table 5 shows how plant based foods tend to have a lower amount of calories in relation to their mass than meat based products. (Davis et al., 2016)

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