WHY DOES REDUCING CALORIC INTAKE INCREASE SUSTAINABILITY?

HALEY HARDIE, PATRICK FLANNERY, JULIET DEINES, PATRYCIA MIKICIUK

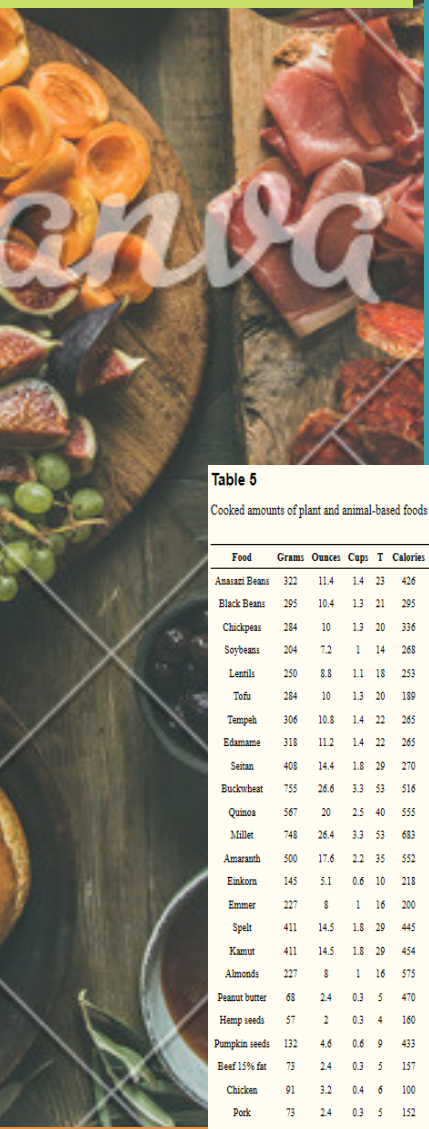
The increasing food needs of the vastly growing human population with the planet's limited resources is a major challenge for today's society. We as humans can use certain dietary choices to reach better sustainability (Davis, et al., 2016)

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, CO_2, 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	284	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	0.3
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)

Works Cited

Barone, B., Nogueira, R. M., Guimarães, K. R. L. S. L. de Q., & Behrens, J. H. (2018). Sustainable diet from the urban Brazilian consumer perspective. *Food Research International*. https://doi.org/10.1016/j.foodres.2018.05.027

Davis, K. F., Gephart, J. A., Emery, K. A., Leach, A. M., Galloway, J. N., & D'Odorico, P. (2016, May 28). Meeting future food demand with current agricultural resources. Global Environmental Change: 39: 125-132

Germani, A., Vitiello, V., Giusti, A. M., Pinto, A., Donini, L. M., & Balzo, V. D. (2014, August 4). Environmental and economic sustainability of the Mediterranean Diet. International Journal of Food Sciences and Nutrition: 65(8): 1008–1012

Graham, Fiona, et al. "Exploring the Relationship between Environmental Impact and Nutrient Content of Sandwiches and Beverages Available in Cafés in a UK University." *Sustainability (Switzerland)*, vol. 11, no. 11, 2019, doi:10.3390/su11113190.

Lehikoinen, Elina, and Arto Salonen. "Food Preferences in Finland: Sustainable Diets and Their Differences between Groups." *Sustainability*, vol. 11, no. 5, 2019, p. 1259., doi:10.3390/su11051259

Meyer N, Reguant-Closa A. "Eat as If You Could Save the Planet and Win!" Sustainability Integration into Nutrition for Exercise and Sport. Nutrients. 2017;9(4):412. doi:10.3390/nu9040412