

Reducing Calories

Healthy for You and the Environment!

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What is Sustainability?

- Sustainability is the rate of renewable resource harvest, pollution creation, and non-renewable resource reduction that can be continued indeterminately.

- Reducing daily caloric intake can improve Americans' health while facilitating environmental benefits and sustainability.

Why lower my Calories?

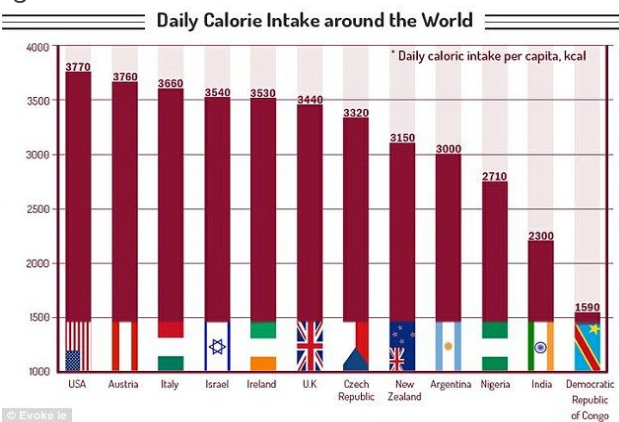
- Only ~2,200 calories are needed to supply the energy needs of the average American (Cafaro, 2006).

- These healthier, less caloric diets include reduction of red or processed meats, increase in beans, vegetables and fruits doubled, and whole grains to replace enriched white flour.

- Benefits included reduced risk of cancer, type two diabetes, obesity, and other diseases.

Current Consumption

- Over-consumption can lead to obesity and can ultimately lead to the overproduction of food that accounts for 19-29% of global greenhouse gas emission.



Daily calorie intake per capita in various countries around the World. U.S. consumes the most with 3,770 calories per day. (MailOnline MP, 2014)

Current Emission Effects

- Animal products, such as meat, fish, and dairy, account for 22%, 65%, and 70% of emissions in the diets of lower-middle, upper-middle, and high-income nations (Behrens, 2017).

- In the US, agricultural processes contribute to 90% of the total ammonia emissions, as well as 29% of methane and 72% of nitrous oxide (Committee on a Framework for Assessing Health, 2015).

Effects of Decreased Calories on Emissions

- On average, a 50% reduction in Dairy and Meat calories is required to meet health recommendations.

- With that restriction, nitrate release and ammonia emissions would be cut by 40%.

- Total annual greenhouse gas emissions would decrease by 42% and decrease CO₂ emissions by 196 million tonnes (Committee on a Framework for Assessing Health, 2015).

- Emissions from agriculture alter the environment's necessary and delicate nutrient cycles leading to decreased health in soils and ecosystems.

Agriculture and Habitat Loss

- Study of Endangered Species Act information published in the US Federal Register found habitat degradation/loss as a cause in 85% of threatened and endangered species in the US (Cafaro, 2006).

- Row-cropping and ranching are the third and fifth most prominent causes of species endangerment (Cafaro, 2006).

- Row cropping effects 38% of all endangered species (Cafaro, 2006).

-Livestock grazing was also a significant cause of habitat degradation/loss, affecting 22% of all species (Cafaro, 2006).

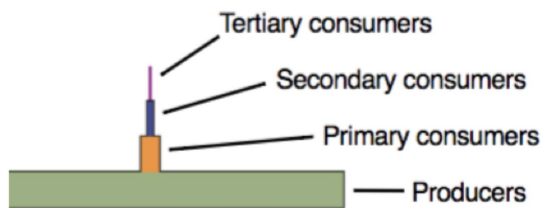
Support of Ecosystem Energetics

-The amount of energy transferred through the consumption of other organisms is limited to approximately 10%.

-Consuming less high calorie foods from organisms like cow and pig (primary consumers), and more low calorie fruits and vegetables (primary producers) puts less energetic strain on the environment.

-Producers are also required for the growth of consumers, so cutting out the energy lost between trophic levels makes ecosystems more efficient in producing food for humans.

-The figure below displays the relative amount of energy available at each trophic level.



Soil Health

-Smaller diets will reduce high demand for agricultural products.

-Long-term human impact (e.g. sealing), as well as short-term soil management (e.g. irrigation) modifies material and energy flows.

-Heavy irrigation contributes to increased runoff, the removal of nutrients from the soil due to excess water (Mursec, 2011).

-Applications of organic fertilizers required to support large amounts of agriculture are linked to nutrient pooling altering the microbial food webs leading to the potential for increased pathogens present in the soil (Mursec,2011).

Can we do this in the United States?

-Absolutely!

-High-income nations, such as the United States, have had the greatest reduction of environmental impacts due to dietary shifts, with an average reduction of -13.0%, -9.8%, and -5.7% and with the reduction of caloric intake these reductions increase to 24.7%, 8.3 -21.3%, and -17.6% (Behrens, 2017).

Negative Impacts of Calorie Restriction

-Many individuals around the world suffer from under consumption of food.

-Worldwide, an estimated two billion people (about 30% of total world population) are malnourished and 170 million children are underweight (Cafaro, 2006).

-Calorie restriction diets are only recommend actions for well-developed countries that experience over-consumption.

-The reduced need for agriculture will effect social sustainability due to a reduction in agriculture jobs.

Works Cited

Behrens, Paul. 2017. Evaluating the environmental impacts of dietary recommendations. Proceedings of the National Academy of Sciences of the United States of America.

CafaroRichard PJ. 2006. The fat of the land: Linking american food overconsumption, obesity, and biodiversity loss. Journal of Agricultural and Environmental Ethics 19(6):541-61.

Committee on a Framework for Assessing the Health, Environmental, and Social Effects of the Food System; Food and Nutrition Board; Board on Agriculture and Natural Resources; Institute of Medicine; National Research Council; Nesheim MC, Oria M, Yih PT, editors. A Framework for Assessing Effects of the Food System. Washington (DC): National Academies Press (US); 2015 Jun 17. 4, Environmental Effects of the U.S. Food System. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK305182/>

MailOnline MPfor. 2014 Aug 12. Daily calorie intake of countries across the world revealed. Daily Mail Online. <https://www.dailymail.co.uk/femail/article-2722815/Daily-calorie-intake-count-ries-world-revealed-surprise-U-S-tops-list-3-770.html>

Mursec, Mateja . Agricultural practices impact on soil quality and health : case study of slovenian irrigated or organic orchards. Earth Sciences. Université de Bourgogne, 2011. English. <NNT : 2011DJOS080>. <tel-00708232>