

Utilizing Agricultural Diversification to Address Obesity Through Diet Diversity

Pooja Tanvi Kurupati

Obesity rates in America are rapidly increasing, with the percentage of Americans classified as medically obese more than doubling over fifty years, according to the Centers for Disease Control (Centers for Disease Control). Although obesity itself hinders physicality, associate professor of environmental and occupational health at Jackson State University Dr. Akil states that obesity also directly increases chances of comorbidities, including various cardiovascular and degenerative diseases (Akil and Ahmad, 2012). This is demonstrated by how in 2016, 72% of all cause-specific deaths worldwide were from non-communicable diseases rooted in obesity, highlighting the scale at which obesity hinders health, as shown by a study done by senior researcher and author at the International Food Policy Research Institute Olivier Ecker (Ecker, 2019). This paper discusses how effective utilizing agricultural diversification to increase diet diversity would be at decreasing obesity rates. Reducing cases of obesity would not only positively impact the death rates rooted in obesity, but also the amount of deaths due to other degenerative diseases, leading to overall improved health for many Americans affected by the obesity epidemic.

According to Dr. Michael Via, endocrinologist at the Icahn School of Medicine at Mount Sinai Hospital, a large factor behind why people might gain excessive amounts of weight and struggle to lose it is because “despite excessive dietary consumption, obese individuals have high rates of micronutrient deficiencies” (Via, 2012). Micronutrient deficiencies are defined by the World Health Organization as the lack of essential nutrients required for hormonal balance in the human body (World Health Organization). Dr. Via’s argument is supported by Dr. Guardiola-Márquez, who found that 63.2% of 1732 obese American individuals showed high prevalence, and another 18.4% showed moderate prevalence of micronutrient deficiencies such as deficiencies in folic acid, vitamin D, and iron, supporting the notion that obesity and micronutrient deficiencies go hand in hand for a majority of cases studied (Guardiola-Márquez et al., 2022).

Micronutrient deficiencies can be addressed by diversifying diets. Dr. Michael Via furthers his research of micronutrient deficiencies by stating that diverse diets are essential for adequate nutrient intake, and the effects of micronutrient deficiencies are increasingly being linked to the lack of diet diversity (Via, 2012). This is supported by findings from Emile Frison, founder of the International Panel of Experts on Sustainable Food Systems, who studied the diets of Massai (Frison et al., 2006). Although these observations were gathered in Kenya, the principle of diversifying diets to combat degenerative diseases and obesity can be applied to the US, where obesity and correlating comorbidities are common. According to the USDA, the average American’s diet consists of 63% fats/grains, 25% animal products, and just 12% fruits/vegetables (United States Department of Agriculture). Increasing diet diversity would entail balancing the three categories of food consumption to better simulate the diets of the Massai Pastoralists studied by Frison. Doing this would hopefully reflect the quality of health displayed in the Pastoralist population, with fewer cases of degenerative diseases and obesity.

These findings pose the question of what can be done to increase the dietary diversity of American adults to address obesity. Emile Frison, in a paper written five years following his study in Kenya, maintained that “Diversity of diet, found on diverse farming systems, delivers better nutrition and greater health, with additional benefits for human productivity and livelihoods” (Frison et al., 2011). Diverse farming systems utilize agricultural diversity, which

according to the United Nations Food and Agriculture organization, is the variety of food groups being grown at a farm region (UNFAO, 1997). The approach of agricultural diversity goes beyond using specific foods to address deficiencies, but seeks to broaden the composition of the diet to include greater diversity in the belief that increasing diet diversity improves nutrition with micronutrients, resulting in better health (Guardiolo-Márquez et al., 2022).

Considering the benefits of agricultural diversity on health, the question of why the US has not yet shifted agricultural practices to be more diverse arises. Dr. Caroline Franck, a professor of clinical epidemiology at the University of Ottawa, argues that current agricultural subsidies encourage farmers to predominantly harvest grains at the expense of agricultural diversification. These crops are used chiefly for the production of high fructose corn syrup (HFCS), which is added into products to make them more energy dense and full of calories, decreasing the original item's nutritional value and essentially dedicating one of America's most staple crops to make an additive that is detrimental to health. Franck states that in particular, the US Farm Bill ("an omnibus, multiyear law that governs an array of agricultural and food programs" (CRS Reports, 2023) directly contributes to obesity by increasing availability of energy dense foods with HFCS as one of its main ingredients (Franck et al., 2013). This not only encourages the consumption of artificial, energy dense ingredients such as HFCS, but also leads to the increased consumption of added fats and sugars, which all contribute to America's increase in obesity rates (Franck et al., 2013).

This issue can be addressed by diversifying agriculture. Increasing agricultural diversity would entail growing more crops other than the eight staple crops specified earlier. Diversifying agriculture would also mean encouraging the revitalization and mobilization of native and traditional food systems and enacting the reintroduction into diets of native staples and non staples known to be rich sources of micronutrients (Frison et al., 2006). The food groups being grown would need to be increased, and crops that are native to the area would have to be reintroduced to farms as well in order to sustain healthy soil productivity. This method was shown to work through the Wisconsin Integrated Farming Systems Trial conducted by the College of Agricultural and Life Sciences. The system was designed to increase the growth of more native vegetables and legumes that have been almost completely eradicated in that area. Today, their farming system includes seven different legumes as well as the staple crops already being grown there (College of Agricultural and Life Sciences). In nearby towns, dietary assessment was performed everyday using a survey administered by a dietitian with the aim to track the "usual" diversity of food intake per household every day. The results indicated that households consumed an average of 1.9 more food groups than they did pre-intervention, and 2.9 more food groups one year post-intervention, showing a consistent increase over time" (Sly et al., 2022). The increase in agricultural diversity at the WIFS resulted in an increase in diet diversity among families. Similar programs being implemented at farms around the country can be presumed to have similar effects as the WIFS, demonstrating the effectiveness of diversifying agriculture with regards to diversifying diets.

A limitation to the arguments posed throughout this paper is made by Dr. Franck, who argues that for agricultural diversity to have impacts on household diets, food systems would need to change for the food to be available to a wide range of consumers. However, the WIFS experiment suggests that by utilizing more local farms, making a variety of crops accessible to consumers would be easier than current systems in place.

In summation, an effective strategy to decrease obesity rates in America is to address the micronutrient deficiencies that go hand in hand with obesity. This can be done through

diversifying agriculture by making a wider variety of nutritious crops and plants available to consumers than what is already available. By diversifying agriculture and having food groups being made available to consumers, agricultural systems would be incorporating more nutritious foods into the diet of Americans and decreasing the overconsumption of fats, grains, and artificial sugars.

References

- Access to Affordable and Nutritious Food-Measuring and Understanding Food Deserts and Their Consequences: Report to Congress.* (2009, June 25). USDA ERS. Retrieved February 29, 2024, from <https://www.ers.usda.gov/publications/pub-details/?pubid=42729>
- Akil, L., & Ahmad, A. H. (2011). Relationships between Obesity and Cardiovascular Diseases in Four Southern States and Colorado. *Journal of Health Care for the Poor and Underserved, 22*(4), 61-72. John Hopkins University Press.
- Ecker, O. (2019). Reshaping agriculture to reduce obesity. *Agriculture for Improved Nutrition: Seizing the Momentum, 3*(5).
- Franck, C., Grandi, S. M., & Eisenberg, M. J. (2013). Agricultural Subsidies and the American Obesity Epidemic. *American Journal of Preventative Medicine, 45*(3), 327-333.
- Frison, E. A., Cherfas, J., & Hodgkin, T. (2011). Agricultural Biodiversity Is Essential for a Sustainable Improvement in Food and Nutrition Security. *Food Security and Environmental Sustainability, 3*(1).
- Frison, E. A., Smith, I. F., Johns, T., Cherfas, J., & Eyzaguirre, P. B. (2006). Agricultural biodiversity, nutrition, and health: Making a difference to hunger and nutrition in the developing world. *Food and Nutrition Bulletin, 27*(2).
- Guardiola-Márquez, C. E., Santos-Ramírez, M. T., Segura-Jiménez, M. E., Figueroa-Montes, M. L., & Jacobo-Velázquez, D. A. (n.d.). Fighting Obesity-Related Micronutrient Deficiencies through Biofortification of Agri-Food Crops with Sustainable Fertilization Practices. *Biofortification and Other Modern Technologies as Tools for Plant-Based Food Improvement, 11*(24).



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- Our Story*. (n.d.). Wisconsin Integrated Cropping Systems Trial – College of Agricultural & Life Sciences. <https://wicst.wisc.edu/>
- Randall, E., Nichaman, M. Z., & Contant, C. F. (1985). Diet diversity and nutrient intake. *Journal of the American Dietetic Association*, 85(7), 830-836.
- Sly, B. C., Weir, T. L., Cunningham-Sabo, L., & Leisz, S. J. (2022). Increasing Household Diet Diversity and Food Security in Rural Rwanda Using Small-Scale Nutrition-Sensitive Agriculture: A Community-Engaged Proof-of-Concept Study. *Food Science and Human Nutrition*, 15(14).
- Via, M. (n.d.). The Malnutrition of Obesity: Micronutrient Deficiencies That Promote Diabetes. *International Scholarly Research Notices*, 2012. Hindawi. 103472
- Via, M. (n.d.). *The Malnutrition of Obesity: Micronutrient Deficiencies That Promote Diabetes*. NCBI. Retrieved February 29, 2024, from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3313629/>