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Time to Move Towards a Meatless Society

Meat consumption is rising globally at a startling rate[1]. Unfortunately, the meat industry has proved to be incredibly dangerous to the environment. The meat industry generates 5.4 billion tons of greenhouse gas (GHG) emissions each year[2]. Livestock require large amounts of land, water, and feed, and this has dire consequences for the environment. Vast areas of land are being cleared to incorporate enough farms to support the planet's growing population. In fact, agriculture is the leading cause for our current accelerated rates of extinction among species[3]. If current diet trends continue, we would have to clear a land area the size of the U.S. to accommodate the increasing meat demand[4]. It is clear we must reduce meat consumption and normalize a sustainable diet. An integrated mix of social, economic, and legal tools must be utilized to effectively curb meat consumption. It is imperative that governments, NGOs, and consumers band together to guide civilization away from the daily practice of eating meat and toward the everyday consumption of plant-based proteins.

The numbers reveal the seriousness of the problem. The meat industry generates 15% of the anthropocentric GHG emissions[5]. Ruminant meats, like beef, are responsible for 80% of these emissions[6]. Precisely, producing one pound of beef generates 14.8 pounds of CO_2[7]. Cows also emit excessive amounts of methane, a GHG that is 23 times stronger than CO_2[8]. Pound for pound, beef generates GHG's that contribute nearly 13 times more to climate change than do the gases emitted in chicken production[9]. From feed to land upkeep, water is also heavily utilized in beef production. The production of one pound of beef requires 1800 gallons of water[10]. Compare that to the 468 gallons of water necessary to produce one pound of chicken and the truly dramatic impact of beef production is made evident[11]. A decrease in global beef consumption is required to avoid exceeding the scientifically accepted 2°C target increase in global temperature[12]. However, it is not reasonable to expect citizens to give up this dietary protein. It is more feasible to persuade consumers to replace significant amounts of beef with poultry and vegetable proteins and to develop social constructs that naturally guide consumers to do so.

It is necessary to understand why humans eat meat in order to propose effective pathways towards a meatless society. Intuitively, as is the case with most food, humans eat meat for its nutritional value. Yet, research shows our motivation to eat meat exists beyond this. Historically, hunting and community meat sharing have served to strengthen relationships[13]. With the industrialization of meat processing, meat sharing was no longer necessary[14]. Now, meat is readily available in supermarkets. Widespread accessibility of meat has led to its role in social stratification[15]. Those who can afford lavish amounts of meat are middle and upper class. Furthermore, humans associate meat with hedonistic pleasure, and different cultures have developed rituals around meat eating[16]. In many parts of the globe, most dishes prepared in early family and consumer science classes feature meat as the key ingredient. Such education builds the belief that meat is central to "nutritional health, sensory experience, culture, and social relationships"[17]. A redesign of cooking courses might facilitate a reduction in meat consumption, but such a paradigm shift is dependent on the development of society as a whole[18].

Effective action on the meat front depends largely on public awareness of meat's environmental impact and subsequent consumer willingness to reduce meat consumption. A 2015 study found there is a widespread lack of awareness of the connection between meat consumption and climate change[19]. The same study found that of those consumers who recognize the impact of agriculture, many perceive personal consumption to play a minimal role in the context of global climate change[20]. Another study found consumers rated a reduction in personal meat consumption as least beneficial to the environment, even though personal diets seriously impact the environment[21]. Swapping one pound of beef each week for chicken effectively reduces an individual's yearly water footprint by 74,500 gallons of water[22]. This mismatch between personal beliefs and scientific truths is hindering widespread change. The avoidance of public dialogue around the effects of our dietary choices has created a prevalent belief that diet-related contributions to climate change are unimportant. Policymakers and NGOs have launched campaigns to reduce consumer waste and encourage conservation, yet these same organizations have shied away from promoting environmentally beneficial dietary changes[23]. This reflects widespread resistance to limiting meat consumption[24].

Meat constitutes an important meal component, one that consumers might not be willing to forgo. One study found that when presented with various food-related climate change reduction strategies, consumers were most unwilling to limit their meat consumption[25]. Fortunately, vegetarian meals typically consist of a meat substitute or protein-rich vegetables that are prepared in a similar manner as traditional meat dishes[26]. Research on consumer attitudes toward meat substitutes found that lack of familiarity and skill hamper the preparation of healthy vegetarian meals[27]. It is necessary to expand culinary education to include vegetarian meals. Clear communication from appropriate organizations is essential to increasing consumers' willingness to reduce meat consumption[28].

A comprehensive approach is crucial to effectively decrease public meat consumption[29]. This starts with raising public awareness of meat's impact on the environment. Next, social acceptance of sustainable dietary alternatives is necessary. This will garner up support for interventionist policies, such as a meat tax[30]. In order to generate awareness, trusted sources must clearly communicate the implications of meat consumption on climate change, and subsequently offer guidelines to dietary alternatives. According to a Chatham House Report, "trust in governments varies considerably between countries, but experts are consistently seen as the most reliable source of information within a country"[31]. NGOs are consistently recognized as trusted sources and, therefore, are leaders in this dietary revolution[32]. Due to the high risk of confusion, it is imperative that NGOs actively promote a consistent message that clearly communicates the seriousness of the issue[33]. As discussed earlier, the impact varies by animal and production system, and it is important for consumers to understand this[34]. The issue is complex, but the message must be simple: We must all consume less meat to curb climate change.

It is imperative that consumers have clear direction to manage dietary changes. One pathway towards widespread meat substitution is to emphasize the health benefits of a meatless diet[35]. In this strategy, consumers are encouraged to use readily available products, like eggs, as meat substitutes. This strategy guides consumers away from routinized meat eating. Another option is to make meat substitution convenient[36]. Research shows there is great potential for the substitution of meat in convenience products (i.e. pizza), where meat is already less important to the dish[37]. Additionally, portion size awareness can

facilitate a decrease in meat consumption. Eating smaller amounts of meat on a smaller number of days a week has already proved to have widespread appeal. Small portions also appeal to health-conscious consumers. These strategies ultimately steer consumers away from daily meat consumption and towards more sustainable diets.

Governments should also leverage economic and legal tactics to successfully combat climate change. A food taxation system proves to be the most promising of the various dietary-related economic policies being debated by researchers today. Specifically, a differentiated consumption tax on meat would prove most effective[38]. Such a policy would apply a heftier tax on meats that impose larger impacts on the environment. The main argument for a differentiated tax is that we stand to gain a substantial mitigation effect even by taxing ruminant meat alone. Additionally, a differentiated tax would likely gain more public acceptance than a non-differentiated tax, as consumers perceive it to be fairer[39]. Eventually, the tax could transition into a non-differentiated tax, imposing further incentive for individuals to curb their meat consumption. A related tax proposal involves taxing meat producers based on animal welfare and related living conditions[40]. In this way, producers would have an incentive to search for innovative methods of maintaining their animals in humane ways. Governments should also employ tax revenue to fund research on how to render the meat production process more sustainable[41]. The money could also be used to facilitate the transformation of farms from meat production to other types of agricultural production[42]. This system could lead to progressive transformation towards a more sustainable food system.

Overall, meat consumption has already contributed greatly to the planet's current state of climate emergency. A widespread reduction in meat consumption is urgently necessary if humans are ever going to fight climate change. In order to enable such a change, NGOs and governments on every level must come together to pursue a comprehensive strategy. Organizations should clearly communicate the critical need for dietary changes and subsequently guide consumers in managing these changes. Governments should ultimately implement a meat tax to further incentivize consumers to make sustainable dietary changes. Altogether, this comprehensive strategy will facilitate a communal movement towards a meatless society.

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