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INFORMATION SHEET:

Meat Eating and Veganism

The Challenge

Diet, human health and environmental sustainability are inextricably linked. Over the past 50 years, global dietary patterns and food production have changed considerably. Dietary trends and an interest in healthy, affordable, sustainably produced food have steadily increased in public and political agendas. Achieving healthier diets from sustainable food systems, whilst feeding a growing population is a huge challenge. It will require changes in consumer dietary patterns and food production practices and is important in achieving the United Nations (UN) Sustainable Development Goals.

The UN predicts the population to be at 9 billion by 2050, which may lead to a reduction of agricultural land through industrialisation and a greater demand for protein as wealth increases. This could result in the requirement of more food from less land, increasing intensification and potentially leading to greater environmental issues associated with agricultural production.

Today's food supply chain creates 13.7 billion metric tons of CO_2 equivalent, 26% of which comes from anthropogenic Greenhouse Gas (GHG) emissions. The farm stage represents 61% of food's GHG emissions (81% including deforestation)[1]. In the European Union, livestock dominates agricultural land use by area, with meat and dairy products having the highest global footprint of carbon, raw materials and water /kg of any food[2][3].

Many diets, particularly in the west, contain large amounts of animal produce and are often associated with health issues such as a higher risk of coronary heart disease and Type 2 diabetes. Diets high in red meat and processed food particularly, have been repeatedly cited as contributing to climate change due to the amount of energy, land and water used and pollutants and GHG emissions produced.

[1] Poore, J. and Nemecek, T. (2018). *Reducing food's environmental impacts through producers and consumers.* Science. Available from: http://science.sciencemag.org/content/360/6392/987

[2] European Environment Agency. *Agriculture and Climate Change.* Available from: https://www.eea.europa.eu/signals/signals-2015/articles/agriculture-and-climate-change

[3] Euostat. *Agriculture, Forestry and Fishery Statistics.* (2016). Available from: https://ec.europa.eu/eurostat/documents/3217494/7777899/KS-FK-16-001-EN-N.pdf/cae3c56f-53e2-404a-9e9e-fb5f57ab49e3

Impact of Diet on Health

A proposed solution to these environmental, ethical and health related concerns which is gaining increasing traction is the vegan diet. Between 2014 and 2018 the number of vegans in Great Britain quadrupled[4], however recent research shows the number of people living a vegan lifestyle in the UK in February 2019 was less than 1%[5].

Vegan and lifestyle statistics:

90%	people in Great Britain are red meat/poultry eaters 2018[6]
34%	meat eaters reduced their meat consumption in GB 2018[6]
3%	number of *vegans* in the UK population 2019[4]
>1%	number of people living a vegan lifestyle in UK 2019[4]
5%	attempted a vegan lifestyle in *Veganuary* 2019[4]
17%	took part in *Dry January* 2019[4]
10%	people eat on average a plant-based meal 3 times a week[4]
92%	of plant-based meals are eaten by non-vegans[4]

Top three perceived benefits of eating less meat, Great Britain 2018[6]:

32%	improving health
31%	saving money
25%	being better for the environment

Meat sales by volume in fresh and frozen, year October '17-18[6a]:

5%	decrease beef	9%	decrease lamb
3%	decrease pork	3%	increase poultry

Vegan diets are believed to have many health benefits, with a recent paper published by The Lancet concluding that vegan, vegetarian, pescatarian or semi-vegetarian diets have a 12% lower overall mortality risk when compared to those who regularly eat meat[6]. However, it is important to note that many pieces of research such as this which promote the effects of eating meat focus on observational correlations and have many confounding variables. For example, people who follow a restrictive diet are often more health conscious than those who do not, and so are likely to be inclined to improve other areas of their lifestyle that could reduce their risk of disease. These factors are difficult to quantify and mitigate, and therefore are questionable basis for generalised statements regarding diet and health. Recent research by LEAP (Livestock, Environment and People), found that total mortality rates were only modestly higher in people who have high intakes of red and processed meat and that the strongest evidence of a specific adverse effect is the increased risk of bowel cancer.

[4] BBC. *Vegan v flexitarian – which will save the planet?* Available from: https://www.bbc.com/food/articles/vegan_vs_flexitarian

[5] KANTAR UK Insight. *Only 3 % of UK self-define as Vegan.* https://uk.kantar.com/consumer/shoppers/2019/only-3-of-uk-self-define-as-vegan/

[6] Mintel Press Office. *More than half of all meat-free new product launches in the UK carried a vegan claim in 2017.* Available from: https://www.mintel.com/press-centre/food-and-drink/more-than-half-of-all-meat-free-new-product-launches-in-the-uk-carry-a-vegan-claim-1

[6a] AHDB Beef and Lamb. *Meat retail sales decline, while supplies available increase.* Available from: http://beefandlamb.ahdb.org.uk/market-intelligence-news/meat-retail-sales-decline-while-supplies-available-increase/

[6] *Food in the Anthropocene: the EAT-Lancet Commission on healthy diets from sustainable food systems.* (2019). Available from: https://doi.org/10.1016/S0140-6736(18)31788-4

Whilst the benefits of veganism may appear myriad, diets that exclude animal products are often deficient in vitamin D, B12, iron and Omega-3 fatty acids. Livestock contribute to food security through supplying these essential macro and micro nutrients to the human diet, with beef satisfying over 25% RDI of 10 key nutrients /100g[7]. One contradictory piece of research also published by The Lancet suggests that a diet which includes a moderate - high intake of fat (regardless of animal or plant based), fruits and vegetables and avoids high carbohydrate intake, is actually associated with lower risk of death when compared to diets with lower intakes[8].

Impact of Diet on the Environment

Livestock farming utilises forage legumes as a sustainable nitrogen source and produces natural manure supplies which are used as a fertiliser on many farms. Without this supply, farmers and land owners would have to rely on synthetic fertilisers instead, incurring greater costs and raising issues regarding the declining availability of key nutrients essential for plant growth. Furthermore, over application of man-made fertilisers can lead to a loss of trace nutrients and soil microbiology, increasing soil acidification and reducing friability. This has the potential to contribute to the negative effects of climate change that a diet eradicating meat aims to improve.

The vegan diet leaves many resources unused, such as pastureland which is rendered unproductive due to soil type and nutrient content. Well managed pasture systems have the potential to generate ecosystem services through perennial vegetation cover, reduced pesticide and fertiliser inputs and lower costs of production, thus contributing to climate change mitigation and reducing soil degradation.

Ruminant livestock systems are widely criticised for their GHG emissions, particularly their considerable contribution to global methane emissions. Whilst the carbon footprint for pork and poultry is lower than ruminants due to their digestive process, bbeef cattle are the most efficient at converting feed into protein for human consumption. Another option may be to farm monogastric alternatives to cows such as horse, deer or rabbit which could utilise pastureland without producing methane. However, this would require a significant cultural shift for consumers to change their type of meat intake.

Furthermore, the impacts of different farming systems are complex. In general, intensive production systems have lower carbon footprints than extensive systems. Whilst intensive pig and poultry units are very efficient meat production systems these units often rely on imported food sources which increases the carbon footprint and diverts food which may be suitable for direct human consumption. In addition, some people may believe that more intensive production systems have lower animal welfare standards when compared to extensive systems. Farmers producing to the LEAF marque standard are encouraged to consider the sustainability of their food sources alongside upholding high welfare standards regardless of what production system is best suited to their business.

[7] Lee, M. *Sustainability is not just Carbon – other metrics to consider when comparing systems.* University of Bristol and Rothamsted Research Presentation.

[8] *Associations of fats and carbohydrate intake with cardiovascular disease and mortality in 18 countries from five continents (PURE): a prospective cohort study*. (2017). Available from: https://doi.org/10.1016/S0140-6736(17)32252-3.

A Balanced Diet

Due to the nature of farming systems, there is a large variability in environmental impact from different farms, presenting an opportunity to reduce environmental harm without the need to completely remove animal products from the human diet. This could provide an alternative option which benefits farmers, processors, retailers and consumers.

Flexible dietary patterns that consume less meat and dairy without committing to a complete lifestyle change which omits all animal produce are becoming more common. Consumers following a "flexitarian" diet choose to eat less animal-based products, opting for sustainable alternative protein sources and placing plant-based foods at the core of their diet. Dietary patterns emphasising whole grains, fruits, vegetables, nuts and legumes without specifically becoming vegan have also been associated with substantially lower coronary heart disease risk than those who ate more refined grains, sugar or animal-source foods[9].

This follows onto the popular suggestion of eating a 'better quality' meat when choosing to eat meat. Better quality meat is believed to include organic, grass-fed, free-range or unprocessed meat, and is often quoted as providing higher amounts of dietary antioxidants and omega-3 fatty acids. However, it is important to note that such a lifestyle change is not realistic for all consumers. Concerns regarding the price of better-quality meat and the dietary change required to eat more sustainably are not often considered. Whilst plant-based foods can be significantly cheaper than meat and animal products, the price of 'better quality' meat and dairy products remains higher than the average consumer can afford. A proposed solution could be to enable consumers to purchase meat that has been farmed in an environmentally sustainable manner without having to pay unnecessary premiums. Meat that is produced to the LEAF marque standard provides this and improving communication between consumers and producers may allow consumers to make informed decisions on the environmental impact of their food choices.

Impact on Farmers

Conversely, many communities are reliant on livestock farming for income, and the eradication or even reduction of the consumption of animal products would have a significant effect on the economy, which much propaganda concerning the topic fails to address. This raises concerns for many livestock farmers who may be required to change from livestock production to an arable cropping system due to a significant drop in the demand for animal products. This shift in farming is not always realistic, achievable or economical due to issues such as those previously mentioned relating to farm location and soil quality. Farmers unable to convert to arable may not have the option to adapt to ensure a market for their produce, converting conventional livestock systems to organic, free-range or grass-fed. This may incur significant costs many producers may be unable to generate, alongside being unrealistic in farms where there is not enough space to change from an intensive to extensive system.

[9] *Healthful and Unhealthful Plant-Based Diets and the Risk of Coronary Heart Disease in U.S. Adults.* (2017). Available from: https://www.ncbi.nlm.nih.gov/pubmed/28728684

Sustainable Diets

However, this shift in dietary patterns does present the opportunity for a move towards more conscious food choices that come from informed decisions which benefit the environment. This is important in developing an approach where producers monitor impacts, meeting environmental targets relevant and achievable to their situation and then communicating their impacts to consumers. Knowledge exchange within the industry will better educate consumers on the sustainability of their dietary choices and may help to debunk some of the inaccuracies, potentially contributing to bridging the gap between meat eaters and vegans. Improving carcass efficiency may also contribute to reducing waste by educating consumers on how different cuts of meat can be served to help find markets for less popular parts.

Whilst it is still under debate as to what the 'most sustainable' diet is; rethinking the human diet may contribute to affecting change within the food industry. Mitigating the negative effects of climate change through consumer diet can deliver environmental benefits on a scale not achievable by producers alone. Multiplying the positive effects of small consumer changes through improving communication across the industry enables a framework that includes farms, processors, retailers, consumers, researchers and policy makers. This enables a more balanced, educated approach to livestock farming which contributes to increased sustainability in the farming and food sectors, benefiting both human and environmental health.

Discussion points

- What are the environmental benefits of meat production?
- What are the environmental impacts?
- Is the reduction of animal produce more beneficial than just the sustainable production?
- Is this ideal of eating less meat of better quality realistic for the general demographic, not just for the upper middle class?
- What about environmental benefits like for biodiversity or soil, from sustainably managed grazing leys (pasture)?
- Globally, in some of the poorest economies, increasing animal products may be necessary to improve nutrition – does the west have the privilege to decide whether we eat animal products or not and should we use that privilege for positive change?
- Is locally grown produce better than not eating meat?

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