

**SCIENCE FAIR
RESEARCH PAPER:**

THE IMPACT A VEGETARIAN DIET HAS ON CLIMATE CHANGE AND FOSSIL FUEL PRODUCTION

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Pre-Ambble

In this changing earth it's more prevalent now than ever to consider one's impact on the environment. Humans are trying everyday to reduce their carbon footprint through transportation, consumerism and, what will be discussed in this project, diet.

The vegetarian/vegan lifestyle has become popular in the last couple of years for its impact on human health but also the way it can reduce carbon emissions significantly. In this project we will discuss how eating a meat diet vs a plant based diet will affect the planet focusing on carbon and methane emissions.

PURPOSE: TO SEE IF EATING LESS MEAT CAN HELP
REDUCE EMISSIONS AND SLOW THE IMPACTS OF CLIMATE
CHANGE.

QUESTION: HOW CAN EATING MEAT AFFECT GLOBAL CO2
EMISSIONS AND CLIMATE CHANGE

HYPOTHESIS: EATING MEAT WILL INCREASE CO2
EMISSIONS AND HAVE A NEGATIVE IMPACT ON EARTH'S
HEALTH, INCREASING THE PACE OF CLIMATE CHANGE.

INDEPENDENT VARIABLES: THE FOOD/DIET PEOPLE FOLLOW
AND CONSUME

DEPENDANT VARIABLES: THE EFFECT IT HAS ON RISING
GREENHOUSE GAS LEVELS AND CONSEQUENTLY ON CLIMATE
CHANGE.



procedure

Looking at the impacts of a meat diet vs a plant based diet starts right at the source of the food, its farming and upbringing.

Products from the agriculture sector are in such high demand by their consumers, we can see a resulting surplus in both carbon and methane

Understanding how this relates to consumption is important to help answer the question of the impact of a meat based diet vs. a vegetarian or plant based diet in relation to its productions in fossil fuels.





procedure

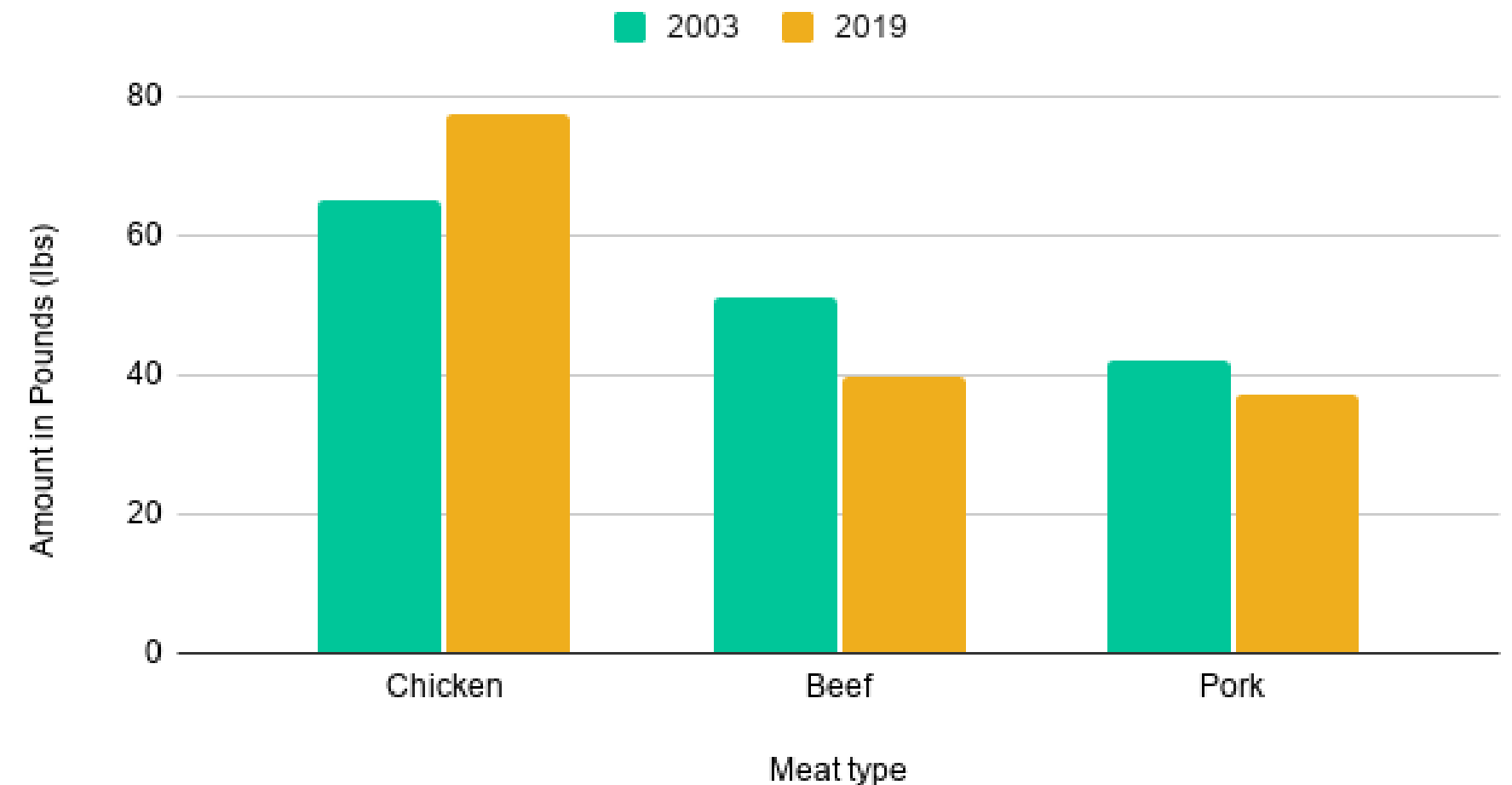
During the procedure of this research it is vital to look at the big picture. Not only how the farming of animals is impactful in the production of harmful gases but also how transporting the product and making it available to consumers can be producing similar effects to the planet.

In the same interest of exploring the meat industry, taking a look at the reasons and percentage of people moving to a plant based diet.

Results Vegetarian Shift

- Methane's biggest producers come from agriculture, in specific beef and dairy farms.
- A change in consumption of beef vs other types of meat are less methane heavy. Going vegetarian is even better
- In 15 years the jump in the population of vegetarians has almost tripled. In 2004, only 4% of Canadians considered themselves vegetarian but in 2018, 9.4 million Canadians considered themselves to be vegetarian.
- With most of these numbers being under the age of 35, scientists predict that the number of vegetarians will continue to grow as time goes on.
- A scientist at Dalhousie stated that the 2 most prevalent reasons people are shifting into a plant-based diet is an increased knowledge of animal welfare and climate change.

2003 vs. 2019 Canadian Meat Consumptions



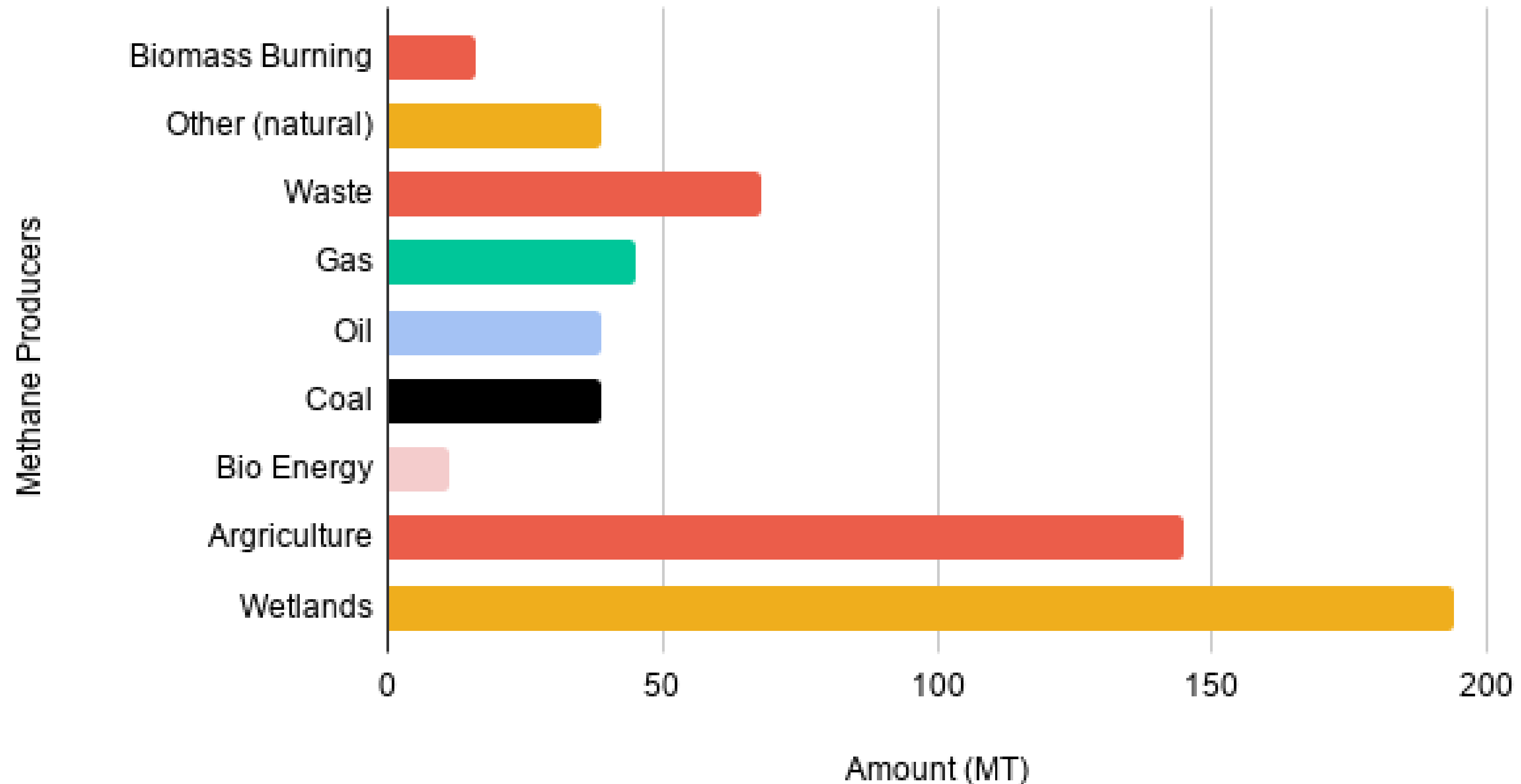


Results Environmental Impact

- –The agriculture industry continues to neglect many different manners such as biodiversity. They use are harmful chemicals and foremost, through the production of CO₂ and Methane.
- The biggest culprit of Methane production in the agriculture sector is beef, which produces 13 times more than the same quantity of plant protein.
- Most of the emissions of beef and pork occur during production while chicken is a even split between production and other.
- Cutting out meat can reduce an individual's emissions by 47%
- Cutting out all animal product can reduce emissions by over 60%

Results Environmental Impacts

Amount (MT) vs. Methane Producers





Results Alternative Solutions

- The climate impact of plant based foods is typically 10 to 50 times smaller than that of animal products.
- sales of plant based foods become more in demand each year. In 2019 sales topped 3.1 billion with Beyond Meat becoming the most popular.
- Beyond meat has the same amount of protein as a regular beef burger(Beyond Meat Burgers). It also produces 90% less greenhouse gas emissions than beef burgers (university of Michigan.)
- As a result of changes in income levels and population, the environmental effects of the meat industry could increase 50-90% in the next 30 years
- Switching to plant based foods such as Beyond Meat Burgers could be a crucial step in the fight against climate change

Discussion

- The results of the research have shown that a plant based diet is much more efficient in conserving green houses gases and preserving the environment than one containing meat.
- The planet is the most important natural resource we possess and conserving it is the highest responsibility we are entrusted with as global citizens.
- It is evident that one of the best ways we can do this is restricting or completely eliminating meat in order to make real change through supply and demand. If done safely, eliminating meat can make a real change in the planet's health



Discussion

- The results of the research should call to action citizens in good physical and mental health in a position to convert to a plant based diet.
- This research and conclusion is not be taken to heart by those unable to convert to the diet. This includes
 - People with health restrictions, either physical or mental, that are heavily influenced by their diet.
 - people of first nations communities who farm and consume their animal products differently than the agriculture industry and people with cultural tradition involving meat consumption
 - The statistics explored in the research are based on the agriculture sector and not individual farming or hunting and should not be taken as such.





Conclusion

- The agriculture sector disproportionately affects the environment compared to other food sectors.
- The agriculture sector is the leading contributor to methane and contributes a substantial amount of CO₂ in the atmosphere, beef being the main culprit.
- With only 10 more years to change the narrative of the climate crisis as per the Paris Climate Agreement. The adaptation of a reduced meat, vegan or vegetarian diet by a large quantity of people could be drastic in protecting the planet.

Sources

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THANK YOU FOR LISTENING

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