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Title: "Public Perceptions of Animal Agriculture's Impact on Climate Change" (1450 words)

1. INTRODUCTION:

Climate change is pressing global issue that has been the subject of much scientific research and public discourse in recent years. Animal agriculture is the third major contributor to climate change, which has been shown to have significant environmental impact, from greenhouse gas emission to deforestation and water pollution (Tegna, 2022). The production of meat, dairy and eggs requires large amount of land, water and feed, which places significant strain on natural resources and contribute to climate change. In addition to the environmental impact, animal agriculture also effects animal welfare, human health and the economy. In this study, we seek to understand how public perceives the impact of animal agriculture on climate change by examining reddit discussions on this subject.

Research Question:

1. How has the public's sentiment towards animal agriculture and climate change evolved over time based on the distribution of Reddit posts and sentiment scores?
2. How does public perceive the impact of animal agriculture on climate change, and what are the key themes and sentiments expressed in their reddit discussions?

2. LITERATURE SURVEY:

Several studies have investigated public perceptions of climate change due to animal agriculture. For example, Busch (2016) explored public perceptions of farm sizes and sustainability in animal farming. They found that consumers often linked large-scale farming with negative environmental impact, but smaller-scale farming was viewed as more sustainable. Similarly, Clough's (2018) study found that consumers had limited knowledge and were not aware of the environmental impacts of animal farming, and tended to prioritize other factors such as taste and price in their food choices. Another study by Cummins (2019) explored perceptions of animal agriculture and meat products. They found that environmental and animal welfare concerns are growing factors in consumer attitudes towards animal agriculture, and that transparency and trust in the industry are crucial for maintaining consumer support.

3. METHODS:

3.1 Data Collection:

This study utilized Reddit posts and comments to examine discussions related to climate change and animal agriculture. Reddit was chosen as the platform of interest due to its popularity and capacity for users to engage in discussions on a broad range of topics. The keywords "climate change" and "animal agriculture" were selected for this study, and it is important to note that they were not case sensitive. The Python Reddit API Wrapper (PRAW) library was employed to collect data by extracting comments with the relevant keywords from various subreddits. This study analyzed a total of 2950 comments from Reddit users that mentioned specific keywords related to animal agriculture and climate change. The comments were collected from all posts containing these keywords between January 1, 2018 and December 31, 2022. This timeframe was selected to capture the public's attitudes and perceptions towards animal agriculture and climate change over several years.

3.2 Data Pre-processing:

The raw Reddit data was cleaned using natural language processing techniques. Non-alphanumeric characters were removed and all text was converted to lowercase. The NLTK library was utilized to remove stopwords and punctuation, while stemming and lemmatization were applied to reduce words to their base form. Duplicate comments were also removed to ensure a representative dataset. Furthermore, TextBlob was used to perform Part-of-Speech tagging to identify and extract relevant keywords. Finally, the Empath library was used to perform sentiment analysis and classify comments into positive, neutral, and negative categories and calculate the sentiment scores. These pre-processing steps were important to ensure the accuracy and quality of our subsequent analyses.

3.2 Network Analysis:

In this study, NetworkX and Gephi were utilized for performing network analysis on the dataset. Network Analysis was used as it allows for a more nuanced understanding of the relationships and connections between different topics and themes. The most frequently occurring keywords were extracted using TextBlob, and a network was created using the top 150 keywords that were highly connected. In this network, nodes are the keywords and edges are connected based on the co-occurrence of keywords in the

Reddit comments. Centrality measures and community detection were performed on this network to gain insights into the themes discussed in each community.

4. RESULTS:

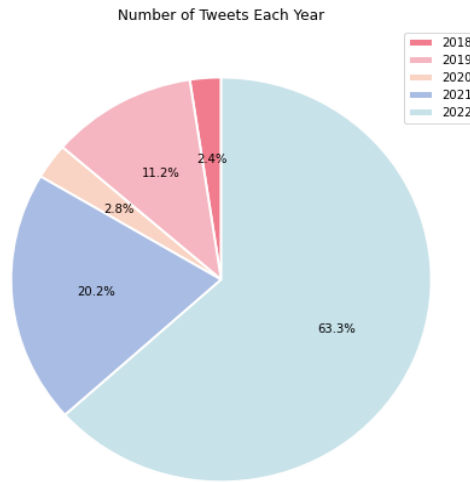


Figure 1: Distribution of Tweets by Year

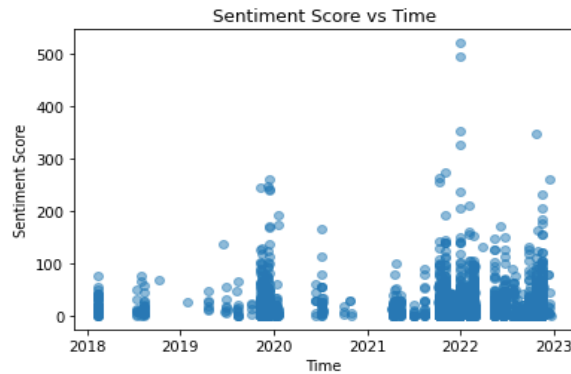


Figure 2: Sentiment Score vs Time Scatter Plot

A significant increase was observed in the percentage of Reddit comments related to animal agriculture and climate change from 2018 to 2022. Specifically, the percentage of comments increased from 2.4% in 2018 to 63.3% in 2022 (refer to Figure 1). Furthermore, sentiment analysis indicated an overall positive sentiment towards animal agriculture and climate change throughout the entire timeframe (refer to Figure 2). The sentiment scores were consistently above zero, with a score of 100 in 2018 and a score of 500 in 2022. These findings suggest that there is a growing interest and positive attitudes towards animal agriculture and climate change among the Reddit community over the years.

	Node	Degree
1	animals	170
2	agriculture	170
3	meat	170
4	people	170
5	change	170
6	emissions	169
7	industry	168
8	products	167
9	climate	166
10	environment	165

Table 1: Top 10 nodes in the network based on degree centrality

Netowrk Analysis:

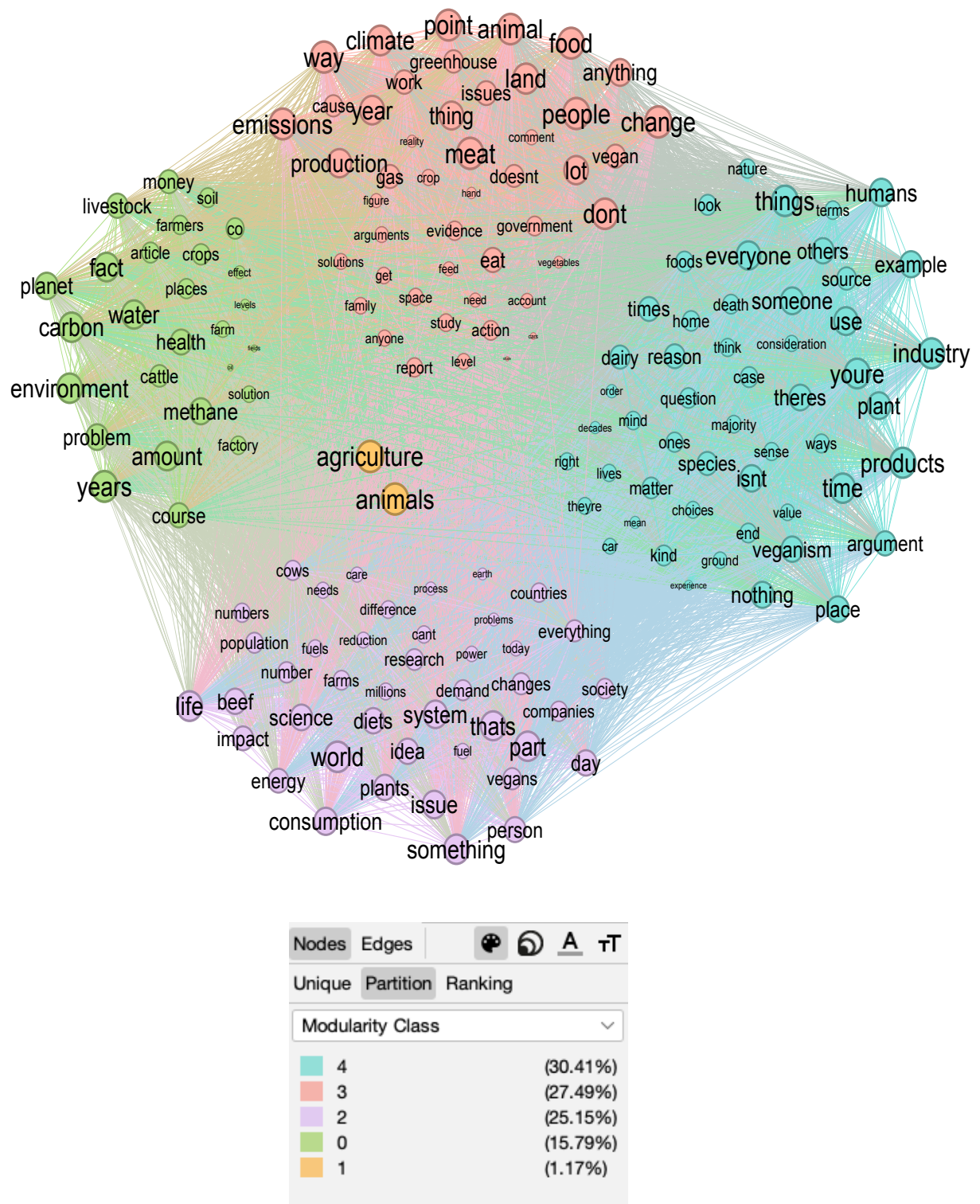


Figure 3: Keyword Network of Discussions on Animal Agriculture and Climate Change

A network of keywords was created using Networkx library and analyzed using Gephi. Five communities were identified based on modularity score of 0.97. Node size varied based on their degrees, indicating highly connected nodes in each community.

Community 0	Community 1	Community 2	Community 3	Community 4
Cattle, livestock	Animals, Agriculture	Meat, dairy, beef	Planet, earth	Society, people, person
Methane, greenhouse gas emissions		Vegetables, crops	Consumption, demand	Change, reduction, impact
Reduction, emissions		Consumption, demand	Greenhouse gas emissions, carbon, oil	Industry, companies
Animal welfare		Production, farms, farmers	Climate change, global warming	Government, policy, action
Meat		Health, diets, nutrition	Agriculture, crops	Argument, evidence, comment
Feed, crops, water		Veganism, vegans	Energy, fuels	Cars, transportation
Health (of livestock and humans)		Animal welfare	Population, society, world	Nature, species, ground
Farms, farmers		Science, research	Veganism, vegans, diets	Majority, minority, order
dairy		evidence	Reduction, emissions, impact	Choice, decision-making, reason

Table 2: Top keywords in each community in the network .

Looking at the network analysis results in Figure 3 and Table 2, the communities were analyzed to identify and understand the various themes discussed related to climate change and animal agriculture.

Community 0: Livestock Farming and Environmental Impact

- Discusses the impact of livestock farming on the environment, including greenhouse gas emissions, soil degradation, and water resources.
- Considers solutions to environmental problems associated with livestock farming.

Community 1: Animal Agriculture

- Community 1 is characterized by two central keywords: "animals" and "agriculture." These two concepts serve as the backbone of the network, as they are connected to and influence all of the other communities.

Community 2: Health Impacts of Meat Consumption

- Considers the impact of diet and nutrition on human health, including debates over the health benefits and risks of a meat-based diet versus a vegan or plant-based diet.
- Emphasizes the role of scientific research and evidence in shaping public opinion and policy decisions related to meat consumption.

Community 3: Consumer Behaviour and Sustainable Agriculture

- Examines the impact of human consumption on the environment, with a focus on veganism and plant-based diets as potential solutions.
- Considers the role of energy sources, such as fuels and electricity, in sustainable agriculture.

Community 4: Government Policies and Public Opinion

- Discusses societal issues and decision-making, including industry, transportation, and government policy.
- Considers personal values and reasoning, as well as the impact of choices and decision-making on nature and species.
- Emphasizes the need for evidence-based decision-making processes.

The communities were found to be focused on different aspects such as animal welfare, health, environmental impact, and sustainability. This provided valuable insights into the perspectives and priorities of the public regarding animal agriculture and its impact on climate change.

5. CONCLUSION:

The study provides insights into how the public perceives the impact of animal agriculture on climate change based on Reddit discussions. The Reddit discussions analyzed revealed a growing interest in and positive attitudes towards animal agriculture and climate change among the Reddit community over the years. The key themes identified in the discussions suggest that the public is concerned about the role of animals in the industry, the impact of meat and dairy consumption on the environment and animal welfare, the need to reduce greenhouse gas emissions, the environmental impact of animal agriculture, and the societal impact of the industry. These findings can inform policies and practices that aim to address the environmental impact of animal agriculture and promote more sustainable practices in the industry. Future research could examine public perceptions of animal agriculture and climate change across different platforms and languages to better understand global attitudes towards this issue.

6. LIMITATIONS:

One of the main limitations of the study is that it only analyses a small sample of Reddit discussions, and therefore, the findings may not be representative of the broader public's views on the topic. In addition, the study only considers discussions in English, which may limit the diversity of perspectives represented in the sample. Furthermore, the study only examines discussions on one social media platform, and other platforms or sources may provide different insights. Finally, as the analysis is based on user-generated content, there is a possibility of bias or misinformation in the data.

7. REFERENCES:

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