Perceptions of Dairy Farms on the Environment: A Content Analysis of Comments on TikTok

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Abstract

This study examined the public perceptions of dairy farms on the environment by viewing comments to a TikTok video, which presented a claim that the dairy industry has had a decrease in its environmental impact. A content analysis was conducted with initial and secondary evaluations, finding five broad categories, which included *positive* and *negative* perceptions of the dairy industry, as well as a further six themes, including *informative*, *clarification*, *blaming humans*, *veganism*, *critical*, and *education*. The most common theme was *informative*, encompassing 38% of the relevant comments. The findings indicated proficient use of scientific research, critical considerations of the video, and reflected the biases and influences found in social media and popular culture.

Introduction

Questions of best practices for the stewardship of the earth are in increasing number as people, researchers and non-researchers alike, strive to reduce the effects of human inhabitation on the planet. One of the areas that has attracted the most attention is the impact of consumerism on the environment, specifically in the scope of this study, the effect of the dairy industry. There has been research conducted on the various environmental aspects of dairy farming, such as greenhouse gas emissions, land use, water waste, and methane production (Capper et al., 2009; Dairy Farms of Canada, 2022; Naranjo et al., 2019). Regardless of the actual impacts, which will be further discussed, another interesting aspect of the subject is the perception of the impact of dairy farms in the public sphere. What exactly are the public perceptions of dairy farming on the environment, and how best can research be done to answer this question?

Literature Review

Longitudinal Research on Dairy Farms and Their Environmental Impact

The longitudinal research surrounding the effect of the dairy industry on the environment has revealed that although there is no doubt that the industry has historically had an environmental impact, there have been measurable leaps forward in the efficiency and a corresponding reduction of the ecological footprint that dairy farms currently have (Dairy Farmers of Canada, 2022). Naranjo et al. (2019) found that between 1964 and 2014, despite an increase in total emissions because of the increased demand for milk, there were reductions in the production of methane, water use, and land requirements, and in the future, further reductions are expected. In similar research, a longitudinal study conducted between 1944 and 2007 by Capper et al. (2009) concluded that "…the environmental impact of the modern US dairy production system is considerably less than that of the historical system with substantial reductions in resource use, waste output, and [greenhouse gas] emissions" (p. 2166). The respective work of these researchers indicates that the modern processes of dairy production have been developed

with efficiency in mind, and as a result, overall environmental impact has lessened. These claims are corroborated by the statements of dairy corporations, such as the Dairy Farmers of Canada (2022), about their commitment to the sustainability of the environment, highlighting their water conservation efforts, reduction in greenhouse gases, responsible use of pesticides, and green energy technology.

Social Media and Research

An important consideration when using social media as a repository of social artifacts is the ethical question of informed consent, since social media sites have become a mainstream location for sourcing data without researchers explicitly seeking it. Research has found that although social media websites and mobile applications are considered a public forum, most users expect that they will be asked for their permission and consent before their posts are used in research, and that their identities will be kept anonymous (Williams et al., 2017). Researchers in this area also describe the blurring of the public and private spheres on social media, and Williams et al. (2017) argue that this blurring is not an indication that informed consent does not need to be sought out, and instead states that "researchers must take into to account the unique nature of this online public environment" (p.1159). They identify the potential for harm when information is taken out of the context that it was intended to be in, and the threat to ethics that this problem poses. To conduct this study as ethically as possible, this research will strive to ensure the protection of individuals and their opinions, only using direct quotes when necessary to provide proof of findings, and endeavouring to keep the artifacts analyzed within their original context without taking any liberties when developing the resulting categories and themes.

Methodology of a Content Analysis

Boyle & Schmierbach (2020) describe a basic blueprint for conducting a content analysis, which they argue follows the same steps as any systematic research. They advise that the first step, after the critical clarification of the research objective and question, is to find the population and then draw the necessary sample, which in a content analysis can involve texts, pictures, audio, and many other kinds of social artifacts. Next, is to engage with the content and observe the variables and themes of interest, if there are any at the outset of the research and decide whether the chosen approach can draw out the elements that are required to answer the research question and contribute to the data for quantitative or qualitative analysis. Other key aspects of a content analysis involve the importance of developing the categories while reviewing the data sample, where one codes the findings of interest into qualitative themes that can be examined and discussed. Krippendorff (2013) describes the importance of the categories or themes being both mutually exclusive and exhaustive, while also using non-complicated everyday language that is easily accessible and replicable in further research. The themes that may be derived from the data, sometimes through their presence or absence, or frequency, can be obtained from small units such as individual words, or larger units such as whole sentences, although Krippendorff (2013) notes the difficulty in determining single themes from larger units, since multiple objectives can be completed with the use of a single sentence.

Context

Since there is a lack of content analyses that have been done for this specific topic, this research will aim to fill that gap using content from TikTok that informs the discourse surrounding the public opinion of dairy farms on the environment. For the purposes of this study, care will be taken to apply the findings of the literature review, which includes, firstly, the scientific findings of researchers who have studied the effects of dairy farms on the environment. Secondly, since this is a content analysis of social media artifacts, any data collected will be carefully controlled, and there will be attempts to minimize the use of direct quotes, considering the lack of informed consent for those whose comments are being analyzed for the purpose of this research. Finally, the methodology that is shaping this study will be informed with the use of systematic research for finding and sampling the data, where the data will undergo an initial evaluation and a secondary evaluation to draw out the major themes and filter out incomplete or unrelated data. This study aims to identity major themes through a textual analysis of social artifacts, specifically, comments on a TikTok video that pertains to the environmental impacts of dairy farming. These frameworks and methodology will be applied to the following study and will answer the

question of what the public perception of dairy farms' impact on the environment is when presented with a video that reinforces claims about the dairy industry's increased efficiency and progress towards more environmentally friendly processes.

Methods

Sample

The sample selected was taken from a video belonging to a TikTok account of a public figure who often discusses the dairy farm industry, its practices, and environmental impacts, while frequently responding to content disparaging the industry. This video was selected because this account and individual are topical to the research question, and although this content creator has multiple platforms that are used to create these videos, TikTok was used because of its public and accessible medium that does not require an account to view. The specific video used, which can be found here, facilitates a discussion of the environmental impacts of dairy farms, and was chosen for its specific content, which reflects research found in longitudinal studies, and its number of comments and likes, 342 and 6,290 respectively.

Sample selection

The video was selected because it addresses the environmental impact of dairy farms on the environment, providing data that reflects the changes in the environmental impact the dairy industry has had. The comments that were selected were chosen because they were the most liked comments, and then the most recent, in that order.

Inclusion and Exclusion Criteria

The first 50 comments in response to the video were included in the analysis, including any responses made to those comments, which amounted to a total of 167 comments, creating a collection of comments including both responses about the video's content and responses to other commenters. All 167 of those comments were included in the initial coding process. Comments that were coded as *incomplete* or *unrelated* were not included in the secondary analysis, which was reduced to 86 comments.

Unit of Analysis

For this research, the units of analysis were the words, sentences, and phrases within each of the 167 comments that were selected, which were written in response to the TikTok video created by iowadairyfarmer.

Setting and Materials

This research was conducted primarily at the MacEwan University John L. Haar Library, and the home of the principal researcher. The collection of the data was done via use of the internet and the social media application TikTok in both its mobile and desktop form, and a TikTok account was not necessary to collect the data.

Coding Procedures

Each comment was evaluated individually to determine whether it was a *positive* response to the content of the video, meaning that the commenter agreed that dairy farms have a minimal or at least lessened impact on the environment, or if they were *negative*, meaning that they disagreed with the content of the video. Additionally, comments that were asking questions about the topic were categorized separately if they gave no indication of being positive or negative regarding the claims, while questions that had a positive or negative manifest or latent tone were categorized appropriately. Comments that were cut off and had sections missing from the beginning, end, or both, due to TikTok's management of comments, were coded as *incomplete* and were not used for the secondary analysis, as their true meaning could not be properly ascertained. Finally, comments that were unrelated to the topic of the environmental impact of dairy farms were coded as *unrelated* and were not used for the secondary analysis. Once the comments were initially coded into the broad categories, they were re-evaluated to determine themes within these broad categories to draw out the most relevant content.

Results

The initial coding process revealed five broad categories within which the comments were sorted, indicating how the commenters felt regarding the content of the video, which was supportive of the dairy industry and claimed that the environmental impact of

the dairy industry was far more efficient and less harmful than that of dairy farms in the past. As can be seen in Figure 1, 53 of the comments were *positive* in nature, meaning that they supported the claims of the video, and 26 were *negative*, and were critical of the claims in the video. A further 7 *asked questions*, which were related to the topic of the impact of dairy farms on the environment but gave no indication of being positive or negative in nature. Fifty comments were coded as *incomplete*, since the TikTok algorithm cut them short and/or made them unusable for an analysis of their content, and finally, 31 were *unrelated* statements that did not pertain to the discussion of the impact of the dairy industry on the environment.

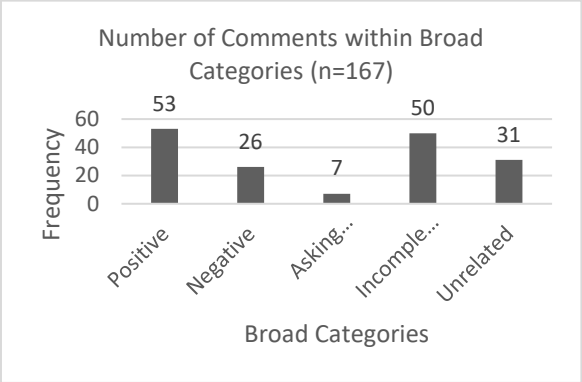

Figure 1. Number of Comments within Broad Categories

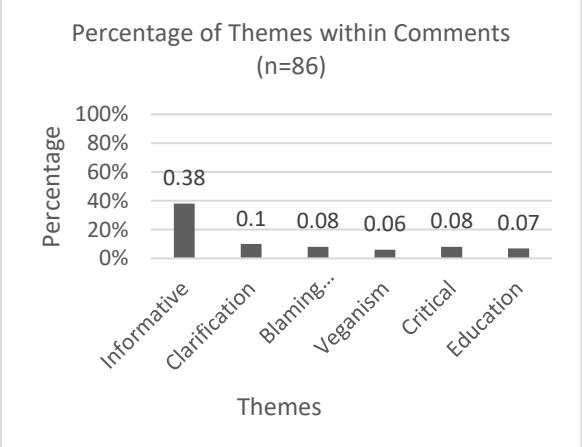

Figure 2. Percentage of Themes within Comments

The secondary analysis of the relevant data revealed 6 major themes amongst the remaining 86 comments, which are displayed in Figure 2: *informative*, *clarification*, *blaming humans*, *veganism*, *critical*, and *education.*

The *informative* theme represented the comments that offered further scientific sources, figures, and critiques of both the video and other commenters, and that were both *positive* and *negative* in nature, as seen in Figure 3.

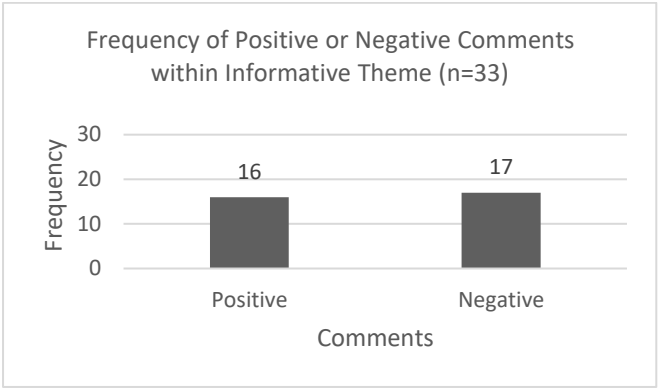

Figure 3. Frequency of Positive or Negative Comments within Informative Theme

Clarification represented the comments that either asked for further clarification on the topic or offered clarification both to the video itself and to other commenters and were mostly *positive* in nature and did not offer the amount of technical or scientific information of the *informative* theme. The theme of *blaming humans* represented the comments that discussed the impact of humanity on the environment and the argument that humans were far worse for the planet than the dairy industry. *Veganism* represented the comments that were supportive of the dairy industry and instead focused on their perception of vegan diets' impact on the environment and were largely disapproving in nature. *Critical* comments referred to those that critiqued the video's content and claims directly, identifying issues they had with the overarching impact of the dairy industry. Finally, the *education* theme contained comments that referred to a lack of education in people who did not support the claims of the video, and an underlying desire to thank the content creator for educating those people. Examples of each of these themes can be seen in Table 1.

Table 1: Examples of themes

Themes	Comment Examples
Informative	"It lists food production as 26% of global greenhouse gas emissions, when everything is taken into consideration (like supply chain and land use)…" [shortened for brevity]
Clarification	"historically were farm animals bad for the environment? Asking I generally dont know"
Blaming Humans	"It's almost as if humans are the bigger problem. The biggest contributor to climate change is fast fashion."
Veganism	"There's also no technically, economically, or ethically sound alternative to farming either. Their vegan diets are 100x worse for the environment"
Critical	"…the environmental side of cattle has gotten much better, but the problem is the methane they produce" [shortened for brevity]
Education	"I know these facts but I'm happy to see them posted for the [ill] informed lol" [misspelled word edited for clarity]

Discussion

The purpose of this study pertained to the collection of data to determine the public perception of the dairy farm industry on the environment. Using the selected TikTok video, which presented a positive opinion of the dairy industry, comments were examined and coded for either their *positive* agreement or *negative* disagreement, and then for broader themes that existed within the relevant data. Of these comments, 38% were *informative*, meaning that they aimed to provide more scientific information, including links to scientific journals and related figures, or to clarify information that other commenters had made. Many of these comments resulted from commenters discussing with one another, either providing sources and data to reinforce their disagreement of others, or to add to the claims of the video in defense of the content and the content creator, and it should be noted that those within this theme were split almost evenly between whether they agreed with the claims of the video or disagreed, as can be seen in Figure 3. A fair number of these comments provided links to scientific journals and went into detail discussing the data provided in the video and comparing it to other data found by other researchers, pointing out the corroboration or inconsistencies that were located. A large number of commenters displayed access to scientific research, and the associated use of the findings, as indicated by the longitudinal research presented in the TikTok video, as well as the research presented in this study (Capper et al., 2009; Dairy Farms of Canada, 2022; Naranjo et al., 2019).

The *clarification* comments, which amounted to 10%, requested further information and often didn't state explicitly whether they agreed with the content of the video or disagreed. A small number of them requested information that was not included in the content of the video, but that might have had an impact on the commenter's perception of the industry, such as the "cost to raise a cow to adulthood", while others stated explicitly that they "generally [didn't] know" about the topic and needed further clarification, which was often provided by other commentors, especially those who fell into the *informative* theme.

Blaming humans was another common theme, with 8% of the comments making statements regarding the impact of humans on the environment, and how humans are primarily to blame for the changes and threats to the climate equilibrium. They often made broad, sweeping declarations that condemned different consumer and private industries, including the fashion industry, and mass clearing of rainforests, as well as claims that the government was responsible for many of the toxins that polluted the air. These comments urged readers to turn their attention to what they perceived as more dangerous threats to the environment, drawing attention away from the dairy industry as a producer of basic needs, and towards what they considered unnecessary acts of human pollution and environmental destruction.

The next theme, *veganism* with 6%, arose as commenters claimed that vegan diets, as opposed to the

dairy industry, were a larger source of environmental damage, often talking about the amount of water used in the production of plant-based products. These comments were largely *positive* in nature and instigated the most responses to their claims, as other commenters came to the defense of the vegan industry and made *negative* comments about the dairy industry in response.

The *critical* comments, which amounted to 8%, were those that examined the videos claims and insisted that, although there was a decrease in the measured environmental impact of dairy farms in longitudinal studies, it was not enough for anyone to defend the industry and claim that any amount of environmental damage is acceptable. There were comments within this theme that claimed the original video was "illogical", and other comments that stated a "now vs then comparison doesn't defeat [vegans claims that the dairy industry impacts the environment] at all". Many comments within the critical theme discussed the impacts of the methane produced by cows, and that although there had been a decrease in the amount of water and land used, the increased number of cows within the industry, and the fractional decrease of methane production found in some longitudinal studies was not a justified reason to claim that there was nothing to be critical about. These comments were not comments that were *negative* or part of the defensive comments responding to other commenters but were those that examined the claims of the video directly and then provided reasoning for why they were critical of the data by pointing to what they saw as illogical statements.

Finally, the *education* theme at 7%, commented on a perception the lack of education in the public and were all *positive* in nature. They claimed that there was a lack of knowledge on the part of those who commented in the *negative* and often thanked the content creator for making these videos to educate those who were, to them, in need of being educated. A large number of these comments made adverse statements about the mental capabilities of those who were not on "their side" and seemed to invalidate the *negative* comments simply by claiming that those who were in disagreement with the content of the video were not educated enough on the subject matter.

Conclusion

This research endeavoured to answer the question of: what are the public perceptions of dairy farms and their impact on the environment? The categories and themes that were produced from the content analyses of the data indicate that those who comment on TikTok videos of this nature are highly capable of examining and linking scientific research, and most responders agreed that dairy farms had a lessened impact on the environment but were not critical of the impact that they did have. The use of scientific research and data indicates that a large number of TikTok users who engaged with this content are capable of finding and disseminating research, and use this research to engage in respectable discussions with other users. Many commenters on this video gave indications that were supportive because they were already fans of the content creator and were likely biased to respond in a *positive* way, also possibly feeling a need to defend the content creator against those who responded in a *negative* way. The content of the video also agreed with the trends found in research, which argue that there has been a large increase in the efficiency of dairy farms and a decrease in their environmental impact, and a large number of commenters also agreed with these findings, citing sources that came to the same conclusion. Arguably, the public perception of dairy farms and their impact on the environment, specifically in this content analysis, are concurrent with scientific findings, but are still critical of the impact that exists, while some are influenced by biases that limit the ability to apply critical thinking and, in some cases, blindly follow the opinions of the content creator while also negating valid critiques made by others.

Limitations and Recommendations

The limitations of this study include TikTok's own algorithm, where data was excluded from the secondary analysis due to the loss of parts of the comments, rendering them unusable in a content analysis. Because of the lack of their inclusion, the main findings may be rendered incomplete and incapable of providing a truly representative discussion of the primary perceptions held by those who were among the first 50 comments to the video. Additionally, longer comments that were made in response the video were broken into many smaller, separate comments, which created the unnecessarily arduous task of piecing them back

together and attempting to decipher if they were, in fact, complete statements, of which many were not and had to be excluded. Others were left to ambiguity, leading to potential issues with the analysis of the comments and the perceptions held within them. The length of the units of analysis were also a limitation, as the examination of the comments led to problems with drawing out the necessary themes, relying on the presence or absence of certain ideas or perceptions. Because comments of this length can achieve multiple goals, it meant that there were themes that inevitably overlapped, creating a question of mutual exclusivity. Finally, a limitation with this research lies in the question of generalizability, as the average TikTok user may fall within a particular age, socioeconomic, digitally literate, and/or other social or structural confound that reduces the generalizability of these findings to the public.

Some recommendations for other researchers studying in this area, and with this method of analysis, would be to ensure that each comment is entirely complete, which in some cases, can be impossible due to the way comments are displayed on TikTok, and to use social media platforms that provide a more visual indication of whether a comment has been broken into many comments or are missing important content that might influence the outcome of the analysis. Additionally, some thought should be given to the interactions and influences that impact people's perceptions when communicating on social media, such as the effects of polarizing opinions and the ongoing existence of fake news and misinformation, as well as the prominent effect of 'being a fan' of certain content creators, and how all these forces effect the discourse that impact the comments from which researchers gather data.

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