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HEDONISM VERSUS HEALTH: A COMPARATIVE AND DYNAMIC ANALYSIS OF DISCOURSES ON MEAT, VEGETARIAN, AND VEGAN FOOD BASED ON TWITTER DATA

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Abstract

This study intends to determine the evolution of the attitudes to "vegetarian", "vegan", and "meat" between 2012 and 2022. For this purpose, cloud plots and qualitative and regression analysis employing 162,000 tweets between 2012 and 2022 were used. The comparison showed patterns such as "chicken" vanishing from meat-related tweets but remaining in vegan tweets. Also, the results showed that the discourse around meat was shaped by hedonism, first emphasizing enjoyment and then sympathy, followed by the strong matter-of-factly will for its enjoyment. The discourses around vegan and vegetarian food were much more shaped by promoting healthy diets and, particularly in the early phase of the period examined in the analysis, by exchanging recipes. Unlike previous studies that focused on short-term trends or limited data sets, our work offers a decade-long perspective, highlighting the dynamic nature of food-related attitudes toward dietary choices.

Key words**:** *food, attitudes, Twitter data, hedonism*

INTRODUCTION

One of the most debated issues in the current food discourse is the future of meat and other animal products. Although adverse health effects [18, 30] and environmental impacts [21, 45] effects make it advisable to reduce consumption levels in the Western world considerably, ethicists are increasingly questioning the ethical feasibility of killing animals for human food in general [43, 32, 48]. However, most explorations on consumer attitudes in this area are based on questionnaires [36, 41, 42], which may not ask consumers about aspects that are more important to them. Over the last few years, the collection of material from social media has emerged as an alternative method for the collection of empirical content from citizens and consumers who want to tell their real stories and experiences [5, 19, 20].

For a long time, Twitter, now known as X, has been among the most influential social networks helping people share their latest opinions and spread their messages among others [22]. Twitter is not only a rapid tool to exchange information, but it is also a valuable source of data for a variety of research purposes [23, 46, 51]. For example, Twitter and other social media data have been used to study public health and disease epidemics [7, 53, 8], monitor trends in public health practices [27, 38, 11], assess consumer preferences and brand perceptions [34, 3, 24], track social movements and activism [35, 29, 13], and conduct environmental studies and disaster responses [14]. Twitter (X) data has also been used to study attitudes towards food [49, 40, 44], and even for the tracking of food security and poverty [31, 15]. Drescher et al. [12] used the #veganuary to demonstrate how combining multiple social media analysis can provide rich insights into the public discourse on food topics.

The aim of this study is to use the most straightforward technique of Twitter analysis to carry out a comparative and dynamic analysis related to *vegetarian*, *vegan*, and *meat*

in the second decade of the 21st century. We constructed and studied a largeX(Twitter) dataset that includes almost a million tweets since 2012 and processed them using machine learning techniques.

This study, therefore, contributes to the debate on the evolution of the attitudes towards *vegetarian*, *vegan*, and *meat* dietaries among the English tweeting population.

MATERIALS AND METHODS

Table 1 describes the conventional method used for data processing. The main shortcoming of our dataset was that we could only extract the tweets registered at the end of each day. The total number of tweets that we extracted was 945,204. The yearly number of tweets during the considered time frame ranged from 47,020 to 53,944 for the years 2012, 2014, 2016, 2018, 2020, and 2022. This step aimed to ensure a representative sample of tweets related to the study's focus.

Table 1.The tweet data processing method used in this study.

Stage	The aim	R-package	Author
1	Dataset extraction		
2	Random 9,000 tweets for each key word	"random"	"stats", "base"
3	"Corpus" of words	"quanteda"	Benoit*et al*. [2]
4	Unified word forms and no meaningless words		
5	Association between the words and key words		
6	Frequencies calculation	"tm"	Feinerer*et al*. [16]
7	Word cloud plots	"wordcloud"	Fellows [17]

Note. We did not identify and exclude tweets from bots.

We randomly extracted a sub-sample of 9,000 tweets each year at Stage 2, creating a "corpus" of words, which is defined as "a collection of written or spoken material stored on a computer and used to find out how language is used" [4]. After giving unified forms for varying words and excluding syncategorematic words, we used this object ("corpus") to find out an association between the words and keywords *vegetarian*, *vegan*, and *meat*, employing frequency investigation and visualizations with wordcloud plots. A word cloud is "an electronic image that shows words used in a particular piece of electronic text or series of texts. The words are different sizes according to how often they are used in the text" [4].

We started with a dynamic analysis. From our database, we found out that only two terms occurred in all years for the three search terms: *dog* and *healthy*. Linear regression models were then fitted to where the dependent variable in each model was the annual tweet count of those keywords, while the independent variable was the year, treated as a continuous linear predictor. A systematic time-series analysis was conducted to detect systematic developments over time in the public discourse related to dietary habits and health consciousness.

The comparative analysis followed a qualitative pattern. The six "samples" per search term from the different years allowed for a well-founded comparison of the terms associated with the different keywords. Elements of objective hermeneutics [37] were then used to identify the meanings of the frequent terms.

RESULTS AND DISCUSSIONS

Dynamic Analysis

Figure 1 displays the numbers with which the two search terms *dog* and *healthy* identified in the tweets. Although the sample size was too small to identify significant trends, we perceived that, in general, the intensity of the discourse increased in both categories between 2012 and 2022.

Moreover, there was a clear distribution of the two terms, which we elaborated on in the comparative section.

When debating dog feed, posts focused primarily on meat, and questions of vegetarian and vegan nutrition covered only a fraction of it.

For healthiness, the situation was opposite: the occurrence of the term *vegan* usually outnumbered the figures for *vegetarian*, and both appeared approximately five times more often in health-related discourses than the term *meat*.

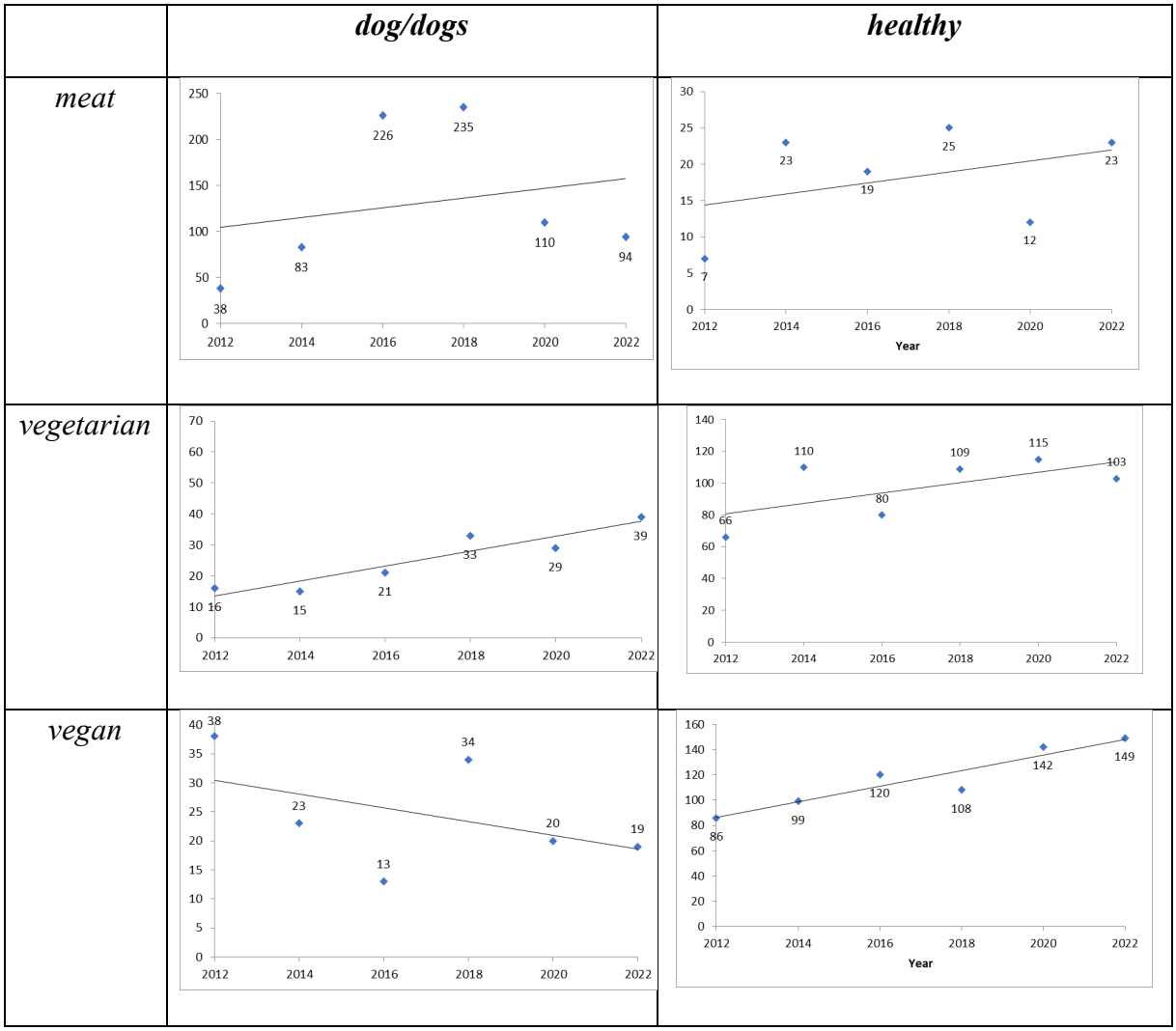


Fig. 1. Trends for tweet word "dog/dogs" and "healthy"
Source: Own design based on the results.

Figure 2 presents wordcloud plots for the six years and the three search terms from our study. The bigger the size of the word in the image, the more often it is used compared to other words in the plot. We have presented these plots in table format, identifying the keywords in the corresponding columns and the years in the corresponding rows of the figure.

Whereas it was impossible to identify significant linear trends over the 10 years, we observed certain developments for the different terms over time:

- In many parts of the world, chicken meat is considered a particularly trendy food choice [1, 6, 50]. This was somewhat confirmed by our results. In 2012 and 2014 and once again in 2018, **chicken** was the only specification of meat found at the top search terms. However, it vanished from the list in the last two years of analysis. It seems that chicken meat lost some of its fascination over the 10 years examined in the analysis. However, it remained a continuous mention in the tweets containing *vegan*, where it probably mostly referred to substitutes.

- A similar observation was made regarding **gluten free** in the tweets containing the *vegetarian* word. They appeared in 2014 and 2016, and in these years, vegetarian and gluten-free diets were often linked [9, 10]. In subsequent years, the novelty of this link faded, as did the occurrence of the term.In tweets containing *vegetarian* and *vegan*, ***recipes*** played a very prominent role at the beginning of the period. This changed in the years until

2022 for *vegetarian* but not for *vegan*. Indeed, the necessity of adapting cooking patterns as a vegetarian diet has been a challenge when vegetarian eating patterns increasingly emerged at the beginning of the study period [25]. It is obvious that preparing vegetarian meals is no longer unusual, whereas the transition to vegan-eating practices still suffers from a lack of practice [47].

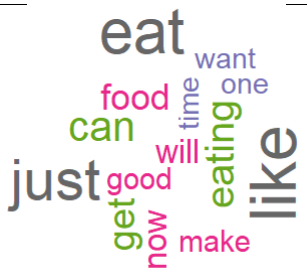
Year	meat	vegetarian	vegan
2012			
2014			
2016			
2018			
2020			
2022			

Fig. 2. Words associated with vegetarian, vegan, and meat in wordclouds.
Source: Own design based on the results.

In contrast to this observation, the usage of **make** and **made** showed up only in 2018 in vegetarian tweets and then increased in all three categories to become a major factor in 2022. Apparently, the messages over the period of observation switched from information about the "how to" to messages focusing on the "whether" and perhaps "when".

-For *meat* and *vegetarian*, there was a surprisingly clear development of the usage of **just**. It did not play a major role in 2012, but it increasingly did so until the year 2022. Lee [28] described the complexity of this term; however, in the context of food, it is very likely that it is used to describe simplicity and liberate the author from further reflection. This may be a mirror of the societal criticism that both meat eaters [26] and, increasingly, vegetarians [33] are facing.

Comparative Analysis

Some of the observations from the dynamic analysis also appeared in the comparative analysis. For example, the fate of **chicken**, which vanished from tweets containing *meat*, appeared in the tweets of *vegan*. Apparently, the vegan chicken meat substitutes attracted more attention from 2020 onwards than the original.

However, the main result of the comparative analysis was that the tweets containing *meat* had a much stronger affective component than the tweets in the other two groups. This started at the linguistic level. It was intriguing that **eat** was the overarching topic in the tweets, while the parallel for the vegetarian and vegan tweets was **food**. This is certainly connected with the grammatical differences between the noun *meat* ("eat meat") and the adjectives *vegetarian* and *vegan* ("vegetarian food"). However, it is also possible that the stronger emotionality of verbs compared to nouns [39] contributes to the visible differences.

This suggestion was provoked by the other, more easily detectable, differences between the *meat* category and the others. Most prominently, this was indicated by the verb **like**, which was consistently more frequent in the *meat*tweets category than in the other two categories. For both *vegan* and *vegetarian* tweets, two years showed a weak incidence of the verb **love**, but the occurrence of the term never came close to the level of **likes** in the *meat* category and which did not only describe affection for the food, but also for animals or the environment.

Two other dimensions of emotionality were identified in the tweets containing *meat*, which never made it into the other two categories we analyzed. In the years until 2014, terms such as **gt**(slang for great), **lol**(laugh out loud)**,** and **festival** described pleasant atmospheres that apparently were linked to meat consumption. Thereafter, this was replaced by **want** and **will**. It seemed that the need to justify meat consumption became more evident, and that this was accomplished by statements describing different preferences. However, both of these dimensions were missing in the *vegetarian* and *vegan* categories. Neither did consumers seem to have a particularly good time, as the terms above mentioned were indicating a pleasant atmosphere or enjoyable experience, nor was *vegetarian* or *vegan* food really urgently **wanted**. The counterpart seemed to be the term **diet**, indicating that food choices are not driven by enjoyment but by some sort of rationale, result that was visible one year in the category *vegetarian* and in all but one year in the category *vegan*.

CONCLUSIONS

Our study has several limitations that should be acknowledged. First, relying on X(Twitter) data limits our ability to generalize the findings to a broader population. As Wojcik and Hughes [52] showed, X users are not representative of the general population in terms of demographics, interests, or even social media usage habits. Second, the analysis of word frequency and word cloud visualizations is limited by the inherent subjectivity of defining and classifying keywords and this can lead to potential biases in the interpretation of the results. Finally, the study focused on a specific time, from 2012 to 2022 (with a span of every two years), and may not fully capture the full extent of the ongoing evolution of vegetarian and vegan trends.

Despite these limitations, our study provides valuable insights into the changing attitudes

towards vegetarian and vegan food. The analysis of the three keywords *meat*, *vegan*, and *vegetarian* through word clouds, word counts, and word frequencies suggest a certain scope of an emerging transformation process. In this process, hedonism is still linked to the meat shelf and has not reached the corner with plant-based substitutes. Vegan and vegetarian lifestyles are considered a diet and, unlike meat, not a tool to have good times.

Nevertheless, recipes for vegetarian dishes have reached the kitchens where they are needed and are still in the process of being exchanged for vegan dishes. Vegetarians and vegans are not just concerned with avoiding meat but also with promoting health and love. Further, eating meat has lost its innocence, and meat eaters defend their habits by highlighting their wants.

It is unlikely that these dynamics have come to an end; thus, there is ample room for future research to accompany the future of the discourse. Will the vegan wave be a fashion that vanishes as it has come? Or will the habit of killing animals and eating their corpses be considered a bad habit first and banned thereafter? This paper has shown that a thorough analysis of social media content can contribute to identifying new trends and likely developments.

REFERENCES

[1]Al-Mashhadani, D.A., Nahla, A.A.A., Aljabar, A.M., Zaki, V.S., Mohammed, V.S., 2018, Detection of antibiotic residues among poultry meat in Erbal city and impact of thermal processing on remnants, Research Journal of Life Sciences, Bioinformatics, Pharmaceutical and Chemical Sciences, Vol. 3(4), 237-250.

[2]Benoit, K., Watanabe, K., Wang, H., Nulty, P., Obeng, A., Muller, S., Matsuo, A., 2018, Quanteda: An R package for the quantitative analysis of textual data. Journal of Open-Source Software, 3(30), 774, https://doi.org/10.21105/joss.00774

[3]Bruce, K.L., 2018, Using social media to understand consumer perceptions of brands: A systematic review. https://www.cambridge.org/core/journals/cns-spectrums/article/role-of-psychological-distress-in-the-relationship-between-lifestyle-and-compulsivity-an-analysis-of-independent-binational-samples/434855E7B9BBDC9A556CADC11A99232D, Accessed on January 5, 2025.

[4]Cambridge Dictionary, 2023, Word cloud. https://dictionary.cambridge.org/dictionary/english/word-cloud, Accessed on January 5, 2025.

[5]Chen, E., Lerman, K., Ferrara, E., 2020, Tracking social media discourse about the COVID-19 pandemic: development of a public coronavirus Twitter data set, JMIR Public Health Surveill, Vol. 6 No. 2, p.e19273. https://doi.org/10.2196/19273

[6]Chetroiu, R., 2016, The food balance dynamics of the poultry meat, In: Agrarian Economy and Rural Development - Realities and Perspectives for Romania. 7th Edition of the International Symposium, November 2016, Bucharest, The Research Institute for Agricultural Economy and Rural Development (ICEADR), Bucharest, pp. 217-221

[7]Chew, C., Eysenbach, G., 2010, Social media and electronic word-of-mouth (eWOM) in health care: A scoping review, Journal of Medical Internet Research, Vol. 12(3), p.e34, https://pubmed.ncbi.nlm.nih.gov/31376273/, Accessed on January 5, 2025.

[8]Chong, M., Woo, H., 2021, The use of Twitter for monitoring public health and disease outbreaks in Korea: A case study of COVID-19, Journal of Medical Internet Research, Vol. 23 No. 7, p.e26814, https://journals.sagepub.com/doi/10.1177/02692155221133468?icid=int.sj-full-text.similar-articles.2, Accessed on January 5, 2025.

[9]Cialdella-Cam, L., Kulpins, D. and Manore, M.M., 2016,Vegetarian,Gluten-Free, and Energy Restricted Diets in Female Athletes, Sports, Vol. 4(4), p.50. https://doi.org/10.3390/sports4040050

[10]Cruchet, S., Lucero, Y., Cornejo, V., 2016, Truths, myths and needs of special diets: Attention-deficit/hyperactivity disorder, autism, non-celiac gluten sensitivity, and vegetarianism, Annals of Nutrition and Metabolism, Vol. 6(1), 42-50.

[11]De Choudhury, M., Counts, S., Horvitz, E., 2013, Human mobility and social behavior in disaster response: A study of the 2010 Haiti earthquake, https://dl.acm.org/doi/proceedings/10.1145/1054972?tocHeading=heading2, Accessed on January 5, 2025.

[12]Drescher, L. S., Grebitus, C. and Roosen, J., 2023, Exploring food consumption trends on Twitter with social media analytics: The example of #Veganuary, EuroChoices, Vol. 22(2), 45-52, https://doi.org/10.1111/1746-692x.12403

[13]Earl, J., Kimport, K., 2022, Digital media and social movements: Uses and impacts of social media by movements around the world, https://www.jmir.org/, Accessed on January 5, 2025.

[14]Effrosynidis, D., Sylaios, G., Arampatzis, A., 2022, Public perceptions of climate change and environmental issues using social media analytics, https://www.tandfonline.com/doi/full/10.1080/07391102.2020.1852968, Accessed on January 5, 2025.

[15]Eskandari, F., Lake, A. A., Butler, M., 2022, COVID-19 pandemic and food poverty conversations: Social network analysis of Twitter data, Nutrition

Bulletin, Vol. 47(1), 93-105, https://doi.org/10.1111/nbu.12547
[16]Feinerer, I., Hornik, K., Meyer, D., 2008, Text mining infrastructure in R. Journal of Statistical Software, Vol. 2595), 1-54, http://www.jstatsoft.org/v25/i05, Accessed on January 5, 2025.
[17]Fellows, I., 2022, Word Clouds R-Package Version 2.6. https://cran.r-project.org/web/packages/wordcloud/wordcloud.pdf, Accessed on January 5, 2025.
[18]Halagarda, M., Wójciak, K.M., 2022, Health and safety aspects of traditional European meat products. A review, Meat Science, Vol. 184, p.108623, https://doi.org/10.1016/j.meatsci.2021.108623
[19]Han, C., Yang, M., Piterou, A., 2021, Do news media and citizens have the same agenda on COVID-19? An empirical comparison of Twitter posts, Technological Forecasting and Social Change, Vol. 169, p. 120849, https://doi.org/10.1016/j.techfore.2021.120849
[20]He, B., Ziems, C., Soni, S., Ramakrishnan, N., Yang, D., Kumar, S., 2021, Racism is a virus: Anti-Asian hate and counter speech in social media during the COVID-19 crisis, ASONAM '21: Proceedings of the 2021 IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining, pp.90-94, https://doi.org/10.1145/3487351.3488324
[21]Hedenus, F., Wirsenius, S., Johansson, D.J.A., 2014, The importance of reduced meat and dairy consumption for meeting stringent climate change targets, Climatic Change, Vol. 124, pp.79-91, https://doi.org/10.1007/s10584-014-1104-5
[22]Keller, T.R., 2020, To whom do politicians talk and listen? Mapping Swiss politicians' public sphere on Twitter, Computational Communication Research, Vol. 2(2), 175-202.
[23]Khan, R., Urolagin, S., 2018, Airline sentiment visualization, consumer loyalty measurement and prediction using Twitter data, International Journal of Advanced Computer Science and Applications, Vol. 9 No. 6, https://doi.org/10.14569/ijacsa.2018.090652
[24]Kim, J., Lee, J., 2016, The impact of social media on brand perception, https://www.sciencedirect.com/science/article/pii/S0019850196000326, Accessed on January 5, 2025.
[25]Romo, L.K., Domovan-Kicken, E., 2012, "Actually, I don't eat meat": a multiple-goals perspective of communication about vegetarianism, Communication Studies, Vol. 63(4), 405-420.
[26]Kranzbühler, A.-M., Schifferstein, H.N.J., 2023, The effect of meat-shaming on meat eaters' emotions and intentions to adapt behavior, Food Quality and Preference, Vol. 107, https://doi.org/10.1016/j.foodqual.2023.104831
[27]Krieck, M. et al., 2013, Using social media to monitor public health behaviors: A systematic review, Journal of Medical Internet Research, Vol. 15(1), p.e28, https://mental.jmir.org/2023/1/e45068
[28]Lee, D., 1987, The semantics of just, Journal of Pragmatics, Vol. 11(3), 377-398.
[29]Lee, J., Kim, J., 2018, Exploring the role of social media in social movements, https://www.researchgate.net/publication/376484042_Power_optimized_intelligent_Handoff_mechanism_for_5G-Heterogeneous_network, Accessed on January 5, 2025.
[30]Lescinsky, H., Afshin, A., Ashbaugh, C., Bisignano, C., Bauer, M., Ferrara, G., Hay, I.S., He, J., Iannucci, V., Marczack, B.L., McLaughlin, A.S., Mullany, C.E., Parent, C.M., Serfes, L.A., Sorensen, J.D.R., Aranvkin, Y.A., Zheng, P., Murray, J.L.C., 2022, Health effects associated with consumption of unprocessed red meat: A burden of proof study, Nat Med, Vol. 28, pp.2075-2082, https://doi.org/10.1038/s41591-022-01968-z
[31]Lukyamuzi, A., Ngubiri, J., Okori, W., 2018, Tracking food insecurity from tweets using data mining techniques, Proceedings of the 2018 International Conference on Software Engineering in Africa. ICSE '18: 40th International Conference on Software Engineering. ACM, https://doi.org/10.1145/3195528.3195531
[32]Mann, S., 2020, Could we stop killing? Exploring a post-lethal vegan or vegetarian agriculture, World, Vol. 1(2), 124-134, https://doi.org/10.3390/world1020010
[33]Mann, S., 2023, On the deadliness of specialized dairy production—The case of Jersey herds in Switzerland, Journal of Applied Animal Ethics Research, Vol. 5(2), 247-268, https://doi.org/10.1163/25889567-bja10039
[34]Martínez-Pérez, B., De la Torre-Díez, I., López-Coronado, M., 2013,Using Twitter to assess consumer preferences and brand perception: A case study of the fashion industry, https://journals.sagepub.com/doi/abs/10.1177/002224299806200307
[35]Mundk, M., Ross, K., Burnett, C.M., 2018, Disrupting activism: How social media is changing the nature of social movements. https://www.researchgate.net/publication/323284885_Affordances-in-practice_An_ethnographic_critique_of_social_media_logic_and_context_collapse, Accessed on January 5, 2025.
[36]Neff, R.A., Edwards, D., Palmer, A., Ramsing, R., Righter, A., Wolfson, J., 2018, Reducing meat consumption in the USA: a nationally representative survey of attitudes and behaviours, Public Health Nutrition, Vol. 21 No. 10, pp.1835-1844, doi:10.1017/S1368980017004190
[37]Oevermann, U., Allert, T., Konau, E., Krambeck, J., 1979, "Die Methodologie einer objektiven Hermeneutik" und ihreall gemeine forschungs logische Bedeutung in den Sozialwissenschaften, Soeffner, H.G. (Ed.), Interpretative Verfahren in den Sozial und Textwissenschaften, Stuttgart, Metzler.
[38]Paul, M.J., Dredze, M., 2012, Social media as a surveillance tool for detecting influenza epidemics,

PLoS One, Vol. 7 No. 10, p.e48039, https://www.molbiolcell.org/doi/abs/10.1091/mbc.E20-01-0079
[39]Portch, E., Havelka, J., Brown, C., Giner-Sorolla, R., 2015, Using emotional scripts to generate and validate a set of emotion verbs, PeerJ, Vol. 3, p.e903v1. https://doi.org/10.7287/peerj.preprints.903v1
[40]Samoggia, A., Riedel, B., Ruggeri, A., 2020, Social media exploration for understanding food product attributes perception: The case of coffee and health with Twitter data, British Food Journal, Vol. 122 No. 12, pp.3815-3835, https://doi.org/10.1108/bfj-03-2019-0172
[41]Sanchez-Sabate, R., Sabaté, J., 2019, Consumer attitudes towards environmental concerns of meat consumption: A systematic review, International Journal of Environmental Research and Public Health, Vol. 6 No. 7, p.1220, https://doi.org/10.3390/ijerph16071220
[42]Sasaki, K., Genya Watanabe, M.M., Nakajima, I., 2022, Meat consumption and consumer attitudes in Japan: An overview, Meat Science, Vol. 192, p.108879, https://doi.org/10.1016/j.meatsci.2022.108879
[43]Singer, P., 1998, A vegetarian philosophy, Griffiths, S., Wallace, J. (Ed.s), Consuming Passions: Food in the Age of Anxiety, Manchester University Press, Manchester, pp.66-72.
[44]Singh, A , Glińska-Neweś, A., 2022, Modeling the public attitude towards organic foods: A big data and text mining approach, Journal of Big Data, Vol. 9 No.1,https://doi.org/10.1186/s40537-021-00551-6
[45]Stoll-Kleemann, S., Schmidt, U.J., 2017, Reducing meat consumption in developed and transition countries to counter climate change and biodiversity loss: A review of influence factors, Reg Environ Change, Vol. 17, pp.1261-1277, https://doi.org/10.1007/s10113-016-1057-5
[46]Thelwall, M., Haustein, S., Larivière, V., Sugimoto, C.R., 2013, Do altmetrics work? Twitter and ten other social web services, PLoS One, Vol. 8 No. 5, p.e64841,https://doi.org/10.1371/journal.pone.0064841
[47]Twine, R., 2016, Negotiating social relationships in the transition to vegan eating practices", Potts, A. (Ed.), Meat Culture, New York: Brill.
[48]van Put, D., 2016, Eating meat should be the new smoking", van den Berg, F., Rep, T. (Ed.s), Thoughts on Oughts: Inconvenient Essays on Environmental Ethics, Utrecht University, Copernicus Institute of Sustainable Development, Utrecht, pp.87-89, https://dspace.library.uu.nl/handle/1874/343765, Accessed 3 May, 2023.
[49]Vidal, L., Ares, G., Machín, L., Jaeger, S.R., 2015,Using Twitter data for food-related consumer research: A case study on "what people say when tweeting about different eating situations, Food Quality and Preference, Vol. 45, pp.58-69, https://doi.org/10.1016/j.foodqual.2015.05.006
[50]Vukasovic, T., 2009, Consumer perception of poultry meat and the importance of country of origin in a purchase making process, Poultry Science Journal, Vol. 65(1), 65-74.
[51]Williams, S.A., Terras, M., Warwick, C., 2013, What people study when they study Twitter: Classifying Twitter related academic papers, Journal of Documentation, Vol. 69, No. 3, https://core.ac.uk/download/pdf/16256493.pdf
[52]Wojcik, S.A., Hughes, A., 2019, Sizing Up Twitter Users. Pew Research Center, New York.
[53]Yousefinaghani, S. et al., 2019, The use of social media in surveillance of COVID-19 outbreak during the early phase of the pandemic, Journal of Medical Internet Research, Vol. 21 No. 4, p.e16956, https://medinform.jmir.org/2019/3/e11929/.