USING TWITTER TO COMPARE CONSUMERS' SENTIMENTS TOWARDS FOOD CHOICES DURING FIRST AND SECOND WAVES OF COVID-19 PANDEMIC

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COVID-19 pandemic could impose several variations on consumers' sentiments towards food choices perceptions. The European Commission considered consumer's food choices as a crucial factor to reach a more healthy and sustainable EU food system. The aim of this study is to compare through Twitter, these sentiments during the first and second waves of COVID-19. The comparison is performed by a sample of 18,970 tweets collected from all countries and auto coded through MAXQDA software. The keywords used were "olive oil", "health claims", "risk, and innovation food". Moreover, consumers' sentiments were analyzed through SentiStrength software. The number of tweets related to "olive oil", "innovation food" and "health claims" increased during the pandemic. A correspondence analysis reveals that consumers' sentiments are positive towards olive oil, while they are negative towards risk food and health claims. A hierarchical segmentation showed that the virus equalized develop and developing countries due to economic recession and unemployment rate in terms of "risk food". Food companies should focus more on the quality of food and adapt to the brand-new consumer by engaging more on healthier and sustainable food production.

Keywords: Consumers' sentiments, food choices, Twitter, COVID-19, segmentation.

1.Introduction

Covid-19 known as the novel coronavirus generated in December 2019 at the Wuhan City, China (Tan et al., 2020). Several precautions were implemented to curb this virus, as social distancing, total lockdown which resulted of limiting consumer's movement. Consequently, this limitation sat in motion changes in consumer's lifestyle especially regarding their food choices (Borsellino et al., 2020). Furthermore, the European Commission considered consumer's food choices as a crucial factor to reach a more healthy and sustainable EU food system (Chen & Antonelli, 2020). However, for consumers to be able to make healthy food choices they need a tool as the information presented in the food packaging (Egnell et al., 2018). One of the most interesting tools is health claims (Ballco et al., 2020; Lähteenmäki, 2013). Several studies showed that consumers found health claims as a misleading tool (Gil, 2020; Petrovici et al., 2012). Nevertheless, it is crucial to study during this pandemic, how the perception of such food external factor could affect the final perception of consumer food choices. Furthermore, olive oil is considered as an example of healthy food, because consumers are more indulged into the Mediterranean Diet since the pandemic started to boost their immunity (Rodríguez-Pérez et al., 2020). Besides, being healthier, consumers became more interested in the safety measurement taken to avoid catching the virus from the food (Byrd et al., 2021). Although, experts reassure consumers that the virus could not be transmitted by food, consumer's risk perception is always influenced by external hazards that are unfamiliar (Faour-Klingbeil et al., 2021). However, the process of sharing information about a specific risk (e.g., food safety) is a fundamental component for influencing public's risk perception. Sharing information on social media about specific risks could modify how consumers think and behave (Han & Liu, 2018). Amongst all social media, Twitter is the most used and reliable platform to study food-related consumer research and their sentiments (Vidal et al., 2015).

From the beginning of COVID-19 several studies emerged to investigate the consumer's food choices changes caused by this pandemic (Laguna et al., 2020). Nonetheless, no study to our knowledge considered comparing consumer's sentiments and perceptions towards food choices during the two waves of COVID-19. Moreover, Pindado & Barrena (2020) suggested to include multilevel strategies to study the contextual influences that could impact food choices. This study aims to compare through Twitter, consumer's sentiments towards food choices perceptions during the first and second waves of COVID-19.

2.Objectives

Our main objectives fold into three parts: first part is to detect the brand-new consumer perceptions towards food choices generated by this pandemic, by analyzing the variation of consumer's sentiments towards food choices. Second part, to shed the light on the usage of social media as a fundamental method to investigate further consumer's perception and sentiments. Third part, to analyze the impact of the economic recession on consumer's food choices perceptions by segmenting consumers by their location and the topic discussed.

3.Methodology

The data were collected and cleaned up by lexical search feature in MAXQDA software 2020, to keep the convenient tweets for our research aim. The words or words combinations for each topic in the lexical search were chosen by considering the most frequent hashtags, then the tweets retrieved were auto coded by coding feature in MAXQDA 2020. On the other hand, the sentiment analysis was conducted by SentiStrength software based on a lexical approach. The lexicon is derived from Linguistic Inquiry and Word Count dictionary, and the values of sentences range was selected on a trinary scale – positive/neutral/negative – between +5 as very positive and -5 as very negative. The data consisted of a sample of 18970 tweets which embodies: user's location, topic discussed (e.g., olive oil, health claims, risk, and innovation food), consumer's sentiments, dates of the tweets (e.g., first wave, second wave). Moreover, data from World Bank and OECD were used.

4.Results

Chi-squared test showed that there is a significant difference between consumer's sentiment during the first and second waves of COVID-19 ($p < 0.001$). Consumers positive sentiment remained the same (8%), whereas consumers negative sentiments decreased by (10.5%). In addition, there is a significant difference between the topic discussed during the first and second waves of COVID-19 ($p < 0.001$). The number of tweets related to "Risk food" topic decreased by (24.2%). While the number of tweets related to other topic increased: by (3.7%) for sustainability, by (3.6%) for health claims topic and by (3.5%) for olive oil topic. A correspondence analysis was carried out to visualize by a scatter plot the association between consumer's sentiments and topic discussed. The results showed that consumer's negative sentiments are close to "health claims" topic but closer to "risk food" topic, while consumer's positive sentiments are closer to the "olive oil" topic. Through a hierarchical clustering, the number of clusters was visually determined based on the dendrogram which was three. In Cluster 1, consumers belong to developed and developing countries and their opinions are regarding the "risk food" topic. However, these countries are in same clusters due to an unpredictable pandemic as COVID-19 that equalized consumer's worries, since also the developed countries are experiencing a big economic recession and high unemployment rate (OECD, 2020). Moreover, the analysis of the frequent hashtags by MAXQDA software 2020 revealed that the percentage of "COVID-19" hashtag is (32%), "food safety" hashtag (14%) and "health" hashtag (7%). These percentages imply that consumers are concerned during the pandemic crisis about food safety and their health. In Cluster 2, consumer's tweet the most about "innovation food" topic, from this point of view this cluster consist of the most developed countries that their concern about innovation and sustainability issues is high in comparison to other developing countries. In Cluster 3, consumers are more concerned about "olive oil" topic and belongs to countries that are either producers of olive oil or the consumption rate is high. As mentioned above, a (CA) revealed that the cluster1 is more concerned about "risk food" topic (10,163 tweets), cluster 2 about "sustainability" topic (346 tweets) and cluster 3 about "olive oil" topic (237 tweets) (Table 1).

Table 1. Correspondence table showing the association between the three clusters and topic discussed

Topic	Cluster 1	Cluster 2	Cluster 3	Active Margin
Olive oil and COVID19	4,593	90	237	4,920
Health Claims and COVID19	1,334	61	13	1,480
Risk Food and COVID19	10,163	269	120	10,522
Sustainability and COVID19	1,591	346	153	2,090
Active Margin	17,681	766	523	18,970

5. Conclusions

Our study aim was to compare through Twitter, consumer's sentiments towards some food choices perceptions during different waves of COVID-19. Furthermore, to study the factors that could affect these perceptions as health claims and food safety. This study reveals that the pandemic influence consumers' sentiment towards food choices perception. Amongst all the factors that affect consumer's sentiment towards food choices perception, food internal factor (i.e., food safety) has the highest number of tweets and negative sentiment. Additionally, consumer's perceived health claims negatively, in contrast to the positive perception of olive oil. Consumer's segmentation by location and topic discussed revealed that the pandemic led to an economic crisis that arose insecurity amongst all the consumers of developed and developing countries alike. Hence, food companies should focus more on the quality of food and implement precautions that enable them to gain the trust of their consumers during this pandemic. Furthermore, companies might be engaged more in food safety assurance programs and obtain quality certifications that enhance consumer's trust.

Acknowledgment: This project has received funding from the European Union's H2020 research and innovation program under Marie Skłodowska-Curie grant agreement No 801586, and from Ministry Science, Innovation and Universities and European Regional Development Fund (ERDF) RTI2018-093791-B-C21 (MCIU, AEI/FEDER, UE).

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