## Extended Abstract
## Please do not add your name or affiliation

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| **Paper/Poster Title** | What do societal stakeholders in the Middle East, North Africa, and Turkey (MENAT) region think about genetically modified (GM) crops, feed, and food products? A systematic literature review |

**Abstract prepared for presentation at the 98th Annual Conference of The Agricultural Economics Society will be held at The University of Edinburgh, UK, 18th - 20th March 2024.**


| **Abstract** | ***200 words max*** |
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| Despite modern biotechnology and genetic modification techniques can help tackle several global challenges, there is a great deal of global controversy regarding the prudence of their application in food production. Hence, societal acceptance of GM crops and foods is crucial for their proliferation.<br>In response to an evidenced lack of research on attitudes towards GM foods in emerging economies and developing countries, and following a systematic approach, this review compiled current knowledge and available evidence on perceptions and attitudes towards GM crops and foods in the MENAT region to support existing and future research and identify existent knowledge gaps.<br>The findings revealed that people in the MENAT region hold a mixture of positive and negative attitudes towards GM foods and crops, with negative attitudes predominating. They also exhibited poor levels of knowledge about GM foods and their local existence. Overall, plant-based GM products were more acceptable than animal-based ones. The results also demonstrated the importance of risk and benefit perception, GM knowledge and educational background, and cultural and moral beliefs in attitudes formation towards GM foods. In conclusion, social research of GM application in food and agriculture in the MENAT region is still in its early stages and future and more targeted research in this area is highly encouraged. | |



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| **Keywords** | Attitudes; Genetic Modification; GM Food; MENAT; Risk perception; Benefit |
| **JEL Code** | Micro-Based Behavioural Economics – D9<br>see: www.aeaweb.org/jel/guide/jel.php?class=Q) |


| **Introduction** | ***100 – 250 words*** |
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Modern biotechnology and genetic modification techniques can help tackle several global challenges such as water and land scarcity, climate change, and food security - to name some. Moreover, it can help with reducing food production timelines. In spite of that, there is widespread opposition, especially in Europe, to GM foods and crops. Much of this opposition stems from uncertainties about potential unknown ecological or health implications of genetic modification technology, and the possible detrimental effects of GM foods on the environment. However, there is scientific consensus that GM crops are no more hazardous or harmful than their conventional equivalents.

There has always been great global societal controversy regarding whether it is prudent to produce and consume GM foods. Hence, the past two decades have seen extensive research on societal perceptions of GM foods and crops. However, most of this research has been conducted in European, North American, and some Asian countries, with minimal focus on developing economies and Middle Eastern countries.

Given this existing deficiency in the literature, the aim of this systematic review was twofold. First, it aimed to collate existing knowledge and available evidence on perceptions and attitudes towards GM crops and foods in the Middle East, North Africa, and Turkey (MENAT) region to support both existing and future research, and to identify existing knowledge gaps and poorly covered aspects for the purpose of research prioritisation. Second, it aimed to contribute to the growing body of literature in this research area and provide necessary insights for further research.

| **Methodology** | ***100 – 250 words*** |
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Following the development of the research question and the identification of the target population to be investigated, a review protocol was compiled prior to commencing the search process to act as a guideline and a framework that to be followed while developing the review. In the footsteps of most of systematic review studies in social sciences, reporting of the review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement.

The review employed a two-stage search strategy to identify relevant literature. First, a literature search was conducted in three online databases (Web of Science, Scopus, and CAB Abstracts) utilising a compound search string. The second stage involved screening the reference lists of all studies that met the eligibility criteria. Following a multi-stage screening process (title screening, abstract screening, and full-text screening) of articles resulted from data-base search and reference list snowballing against pre-defined inclusion criteria, 38 articles were eligible to be included in the review.

A data extraction form was collaboratively designed by the reviewers in order to extract pertinent data from the included studies. After data extraction, data were analysed following a narrative synthesis with theoretical thematic analysis tools. Data were analysed in a single stream as most of the studies were quantitative in nature with a few mixed-method studies that included some qualitative data. The thematic analysis

was adaptively carried out in accordance with the six-phase guiding framework for thematic analysis that was originally proposed by Braun and Clarke in 2006.

**Results** ***100 – 250 words***

Overall, 38 peer-reviewed journal articles were included in the review. Interestingly, 87% of these 38 studies were conducted in only four countries out of the 24 countries constituting the MENAT region.

Four main themes and eight subthemes emerged from the thematic analysis. Results of the analysis showed that societal stakeholders in the MENAT region are both concerned and uncertain about the presences of GM crops and foods in their lives, while holding a mixture of positive and negative attitudes towards them. Overall, negative perceptions and attitudes were found to be more prominent than positive ones. The results also reported very limited levels of knowledge about GM foods and what are they, as well as a lack of awareness about their availability in local food markets.

According to the review's findings, levels of knowledge about genetic modification and familiarity with GM foods impact perceptions and attitudes towards GM food products. Findings also revealed that risk and benefit perceptions constitute a major driver of attitudes towards GM foods and crops and that the nature of the effect on attitudes was clear and consistent.

Individual characteristics, such as socio-demographic and socio-economic attributes, were found to be associated with perceptions and attitudes towards GM foods. Overall, male, younger, and middle- and upper-income participants held more favourable attitudes than female, elderly, and low-income individuals. Ultimately, findings argued that cultural factors including, inter alia, ethical and moral concerns, and religiosity, play an undeniable role in shaping attitudes and perceptions towards GM foods.

**Discussion and Conclusion** ***100 – 250 words***

The findings of the review suggest that people in the MENAT region generally tend to hold negative attitudes towards GM foods as well as demonstrating poor levels of knowledge about them and their existence in local food markets. These findings are comparable to some western review studies which suggest that western consumers similarly demonstrate low levels of knowledge and acceptance of GM foods, as well as generally unfavourable attitudes towards them.

The review also identified a few research gaps in the existing literature and highlights the need for further research. Besides suggestions for further research, some managerial and policy implications can also be drawn from the findings of the review. First, local governments and decision makers should consider investing in and enabling a favourable environment for extensive research and development to address existent socio-political and socio-economic concerns of GM foods. Additionally, given the fact that individuals demonstrated low levels of GM knowledge, governments are advised to adopt and promote public educational campaigns and marketing strategies, that must be monitored and cautiously implemented, to help enhance public

knowledge on genetic modification and GM foods, communicate potential benefits of GM foods, and create awareness on food safety legislations and protocols. Last, both agricultural and food manufacturing industries should strictly adhere to food safety protocols when applying genetic modification in food production to avoid any potential food safety issues and concerns that could easily result in long-term societal backlash or reluctance to GM foods.