

## Community response to genetically modified food products in Libya

Aymen A. Mohammed<sup>1\*</sup>  , Ahmed A. Ali<sup>1</sup>  , Sabri D. Mohammed<sup>2</sup>   and Younis Alkarghli<sup>1</sup>  

<sup>1</sup> Department of Environment, Biotechnology Research Center, Tripoli, Libya

<sup>2</sup> Department of Environment, Libyan Authority for Scientific Research, Tripoli, Libya

\*Author to whom correspondence should be addressed

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### HOW TO CITE THIS

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**Abstract:** Libya is a nation that is exceptionally subject to sustenance imports. Society should ensure that biotechnology is being used to address the districts they consider imperative. They must verify that focal points are decently flowed and available to all. This study followed the quantitative approach, which allows concluding results based on a wide sample of judgment. This study was based on the analytical type of research; this method used some statistical tools to analyze the study data. The questionnaire comprises four sections. The findings revealed that there is a significant and positive relationship between perceived risk, perceived quality, and the intention of genetically modified products. Further, the beta coefficient for variables that perceived risk, and perceived quality are 0.206, 0.262, and a significant at level 5.0%. Based on the findings, the highest contribution toward intention on genetically modified products is from the perceived quality, followed by the perceived risk variable respectively. While the social norms factor showed a non-significant contribution to the respondents' intention on genetically modified products. This study revealed a significant relationship between the perceived risk factor and the intention on genetically modified products with  $r=0.37$  ( $p \leq 0.01$ ), which indicated that the perceived risk of genetically modified products impacts the respondent intention on genetically modified products, whereas the expected perceived risk increases, respondents should avoid buying genetically modified products.

### Introduction

Libya is a nation that is exceptionally subject to sustenance imports. In 2012, Libya was independent on poultry, eggs, new vegetables, fish and fish items, dairy items, hamburger and lamb. The speedy headway of hereditary alteration has achieved open. There are broad potential preferences like improvements in the nourishment era, enhancing the quality and measure of sustenance and withdrawing poverty and starvation, however, there are similarly stresses over important potential risks to the prosperity and thriving of individuals, masses, and our planet [1]. Society should ensure that biotechnology is being used to address the districts they consider imperative. They must verify that focal points are decently flowed and available to all. They also need to understand that when prosperity has been evaluated potential risks have been explored and apportions have been gone on an appendage until it is in every way that matters nonexistent [2]. Buyer affirmation of genetically modified (GM) nourishments differentiates liberally around the world. In the USA, clients, generally, recognize GM things [3]. In a survey in which the USA and Chinese clients were taken a gander, it

was found that they are both generally relentless about the new development [4]. On the other hand, as demonstrated by the Euro gauge, 61 for every penny of individuals from 32 European countries do not support GMFs [5].

Furthermore, In the UK, only two or three customers would recognize eating GM sustenance, even with a markdown. Swedish customers, particularly, hated GM nourishment, and would even pay a premium to blacklist GM energize for their trained creatures [6]. In Italy, the affirmation level of GM sustenance was seen to be low paying little heed to the likelihood that they were nutritiously enhanced [7]. A survey driven in Germany showed that customers decay to extend GMFs. The eventual outcomes of the Eurobarometer report moreover showed that support for GM nourishment has declined in Germany, as in most other European countries, from 47.0% to 22.0% between the years 1996 and 2010 [5]. Identification of consumer preference for genetically modified (GM) food is a complex process, as the consumer's decision may differ based on the information received. Advancement in molecular genetics methods such as the recombinant DNA techniques in genetic engineering improves ways to make use of living organisms to benefit humans [8]. If the awareness of the existing GM food is low, it is predicted that the development of GM crops for the benefit of society will become more difficult to succeed. To facilitate solving this issue, the purpose of this study was to evaluate the consumers' awareness of GM foods [9, 10].

## Materials and methods

*Study design:* This study followed the quantitative approach, which allows concluding results based on a wide sample of judgment. This study area is Tripoli City which is considered the largest city in Libya. The total population of Tripoli is 940 653 [11]. Selecting the sample for this study was based on Morgan's approach to determining the sample size for research [12]. Hence, the sample size of this study is 382.43. Taking into consideration that the analysis unit of this study is 'individual', the individual unit of this study represents random consumers from Tripoli City. This study was based on the analytical type of research; this method uses several statistical tools to analyze the study data.

The questionnaire comprises four sections, where section A was assigned to the respondent's profile, section B to measure the respondents' perceived risk toward GM food, section C was assigned to measure the impact of social norms on consumer behavior toward GM food, section D for measuring the impact of perceived quality on consumers behavior toward GM food. The questionnaire was distributed among respondents from two renowned hypermarkets of Libya, by using random sampling.

*Statistical analysis:* To achieve the study objectives, SPSS software version 22 was used to conduct the required tests. The descriptive data was used to determine the level of each variable in terms of mean and standard deviation. Analysis of variance test (ANOVA) was employed to compare the score mean of each factor, as well as identify the higher significant mean that impacts the GMF. Cronbach's alpha measures internal consistency based on indicator inter-correlations [13]. The coefficient ranges from 0.0 to 1.0, and the higher Cronbach's alpha coefficient score, the higher the instrument's reliability. Most scholars highlight that 45 scores ranging from 0.6 to 0.7 are considered to be acceptable, scores between 0.7 to 0.9 present good reliability, and scores above 0.9 indicate excellent internal consistency [14]. The level of significance was accepted as \* $P \leq 0.05$ , \*\* $P \leq 0.01$ , and \*\*\* $P \leq 0.001$ .

## Results

**Table 1** shows the reliability test for the four constructs of the study has a range from 0.751 to 0.829, which indicates a good and accepted internal consistency. The highest score is 0.829 for the construct perceived risks, followed by intention to GM food 0.815, perceived quality 0.789, and the lowest coefficient 0.751 for the social norms factor.

**Table 1:** Reliability test

Variables	Number of items	Cronbach's alpha
Perceived risks	5	0.829
Social norms	6	0.751
Perceived quality	5	0.789
Intention on GMP	5	0.815

**Table 2** contains the background of the respondents, which clarifies the respondent's gender, age, and educational level. The finding indicates that most of the respondents are females (64.7%), while the males form 35.3%. In terms of age, the highest age category is 26 years to 30 years (63.9%), followed by 17 years to 25 years (30.2%), 31 years to 35 years (04.9%), above 45 (00.8%), and finally 36 years to 40 years (00.3%). Regarding the educational level, the Bachelor certificate holders have the highest percentage (82.1%), while Master's degree (03.5%), diploma (08.2%), PhD holder (02.2%), and other educational level categories (04.1%).

**Table 2:** Demographic distribution of the respondents

Variables	Frequency	Percentage
<b>Gender</b>		
Male	130	35.3%
Female	238	64.7%
<b>Age</b>		
17-25	111	30.2%
26-30	235	63.9%
31-35	18	04.9%
36-45	01	00.3%
> 45	03	00.8%
<b>Education level</b>		
Diploma	30	08.2%
Bachelor	302	82.1%
Master	13	03.5%
PhD	08	02.2%
Others	15	04.1%

In **Table 3**, The obtained general information related to genetically modified products (GMP) is segregated into three groups. Based on **Table 3** data the respondent's awareness of the existence of GMP has shown that 38.9% of the respondents are aware of the existence of GMP. While 59.0% of the respondents were not sure whether GMP is important and beneficial for society or not. 38.9% of the respondents think that GMP is important and beneficial for society, and 27.7% of the respondents think that GMP is not important and beneficial for society. Regarding the type of GMP respondents think it would be important and beneficial for the society as follows: rice (81.3%), corn (06.0%), potatoes (06.0%), wheat (04.1%), and others (02.7%).

**Table 3:** Respondent's awareness of the existence of genetically modified products

Variables	Frequency	Percentage
<i>Are you aware of the existence of GMP?</i>		
Yes	143	38.9%
No	102	27.7%
Not sure	123	33.4%
<i>Do you think that GMP is important and beneficial?</i>		
Yes	129	35.1%
No	22	06.0%
Not sure	217	59.0%
<i>What type of GMP do you think would be important and beneficial for the society?</i>		
Rice	299	81.3%
Corn	22	06.0%
Potatoes	22	06.0%
Wheat	15	04.1%
Others	10	02.7%

**Table 4** shows that there is a significant and positive relationship between perceived risk, perceived quality and the intention of GMP. Furthermore, the beta coefficient for variables that perceived risk and perceived quality are 0.206, 0.262 respectively and significant at level 05.0%. Based on **Table 4** data, the highest contribution toward intention on GMP is from the perceived quality, followed by the perceived risk variable, respectively. While the social norms factor showed a non-significant contribution to respondents' intention on GMP.

**Table 4:** Regression coefficients of contribution on the respondents' intention on GMP

Intention on GMP		
Perceived risk	0.206***	(5.32)
Social norms	0.050	(1.13)
Perceived quality	0.262***	(5.57)
Observations	368	
Adjusted R square	0.21	

Statistically significant by \*P<0.05, \*\*P<0.01, and \*\*\*P< 0.001

## Discussion

The first objective of this study is achieved by finding a significant impact between perceived risk and intention on GMF. Perceived risk is one of the examined factors that have been suggested by several previous studies [15-18]. Assigning this factor to be tested by this study was based on the previous studies that supposed a significant impact from the related potential risk of GMP, besides the increasing level of using GMP in the market. This study found a significant relationship between the perceived risk factor and the intention to GMP with  $r=0.37$  ( $P\leq 0.01$ ) which indicates that the perceived risk of GMP impacts the respondent's intention to

GMP, whereas the expected perceived risk increases and the respondents will avoid buying GMP. This study is consent with a previous study [18], that found a significant relationship between related risk of using GMP and consumers' intention toward buying GMP. Meanwhile, this study is in contrast with a previous study [16] which found a non-significant relationship between perceived risk and behavior intention of consumers to buy the GMP. Hence, the first objective of this study is achieved by finding a significant impact between perceived risk and intention on GMP. Identifying the impact of social norms on the consumer's intention toward GMP has paid attention to several previous scholars [20-22]. These studies hypothesize a positive and significant impact of the social norms on the consumers' intention to buy the GMP. The correlation test for this factor is  $r=0.181$  ( $P\leq 0.01$ ). Along with these studies, this study assumes a significant and positive impact from the social norms on the consumers toward buying the GMP. This study emphasized the role of social norms in directing the consumers' intention toward the expected benefits of GMP, whereas in nations that are governed by strict legislation that organizes the GMP, modifying the products must meet the local legislation that is aware of society's health. Hence, the second objective of this study is achieved by identifying the effect of social norms on the intention of GMP. The perceived quality of any product plays a vital role in directing customers' behavior toward buying the product, as the product has a good quality and reasonable price which will motivate customers to buy the product. The same perception is implied in the GMP, where the perceived quality affects consumers' behavior intention on GMP [23]. The result of the correlation test of this study is  $r=0.374$  ( $P\leq 0.01$ ), which is consent with previous studies such as [23], which found a significant and positive relationship between perceived quality and intention on GMP. Whereas, the GMP is modified to improve the quality of products will increase the consumers' intention to buy the GMP, as well as this modification, is related to protecting products from other hazards and infections [24]. This study emphasized the role of social norms in directing the consumers' intention toward the expected benefits of GMF, whereas in nations that are governed by strict legislation that organizes GMP, modifying the products must meet the local legislation that is aware of society's health.

*Conclusion:* This study found a significant relationship between the perceived risk factor and the intention on genetically modified products, which indicates that the perceived risk of genetically modified products impacts the respondent's intention on genetically modified products. Whereas the expected perceived risk increases, respondents will avoid buying genetically modified products.

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**Author contribution:** IMA & MAM conceptualized the research idea and performed data analysis and interpretation. MSA, HMM, MSA & BOA collected data. HMA drafted the manuscript. All authors approved the final version of the manuscript and agreed to be accountable for its contents.

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