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The Influence of Responsible Agricultural Products on Purchase Decisions in Algerian Celiac Disease Patients: The Mediating Role of Green Brand Awareness

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ABSTRACT

The study aimed to determine the impact of responsible agricultural products on the purchase decision, with green brand awareness as an intermediate variable, on a sample of celiac patients in Algeria. In order to achieve the objective of the study, we used the descriptive and experimental methods by which we addressed various theoretical frameworks including that of responsible agricultural products, the purchase decision, and the green brand. To study and evaluate the data we used the SPSS and Amos Programs. A sample of 153 items was analyzed. The study found several findings, the most important of which was a statistically significant relationship between responsible agricultural products and the purchase decision. Awareness of the green brand also mediates the relationship between responsible agricultural products and the purchase decision.

1. Introduction

The Covid-19 pandemic has demonstrated the importance of food safety and health, Consumers became more aware of food safety issues and the importance of healthy eating, leading to increased awareness of green living and environmentally friendly products. The consumption of responsible products has become imperative, especially with the rise in immune diseases. Consumers are changing their consumption patterns towards natural and healthy products.

Green brands have introduced green products and raised awareness of their consumption, providing a positive image of enterprises and products concerned with environmental and health obligations. With environmental awareness growing among many consumers, particularly those with a gluten-free diet, these consumers have become the focus of agricultural product development and responsible product production.

Statement of Research Problem

To what extent do responsible agricultural products influence a consumer's purchasing decision with green brand awareness in celiac patients in Algeria?

Study Questions

1. What are responsible agricultural products?

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2. What are the stages of a consumer's purchasing decision?
3. What is a green brand and green brand awareness?
4. To what extent do responsible agricultural products influence a consumer's purchasing decision with green brand awareness?

Significance of Study

The importance of the study lies in preserving the environment Through awareness of responsible consumption, which has become a basic and global requirement. Therefore, the presence of responsible consumer products that preserve the environment and consumer health has become essential. With increasing awareness towards green consumption, conscious consumers are searching for green brands that produce green products compatible with their environmental preferences.

Study Objectives

- Clarifying the concept of responsible agricultural products and the concept of green brand awareness.
- Clarifying the stages of consumer purchasing decision-making.
- Clarifying the relationship of responsible agricultural products in purchasing decision-making.
- Understanding the impact of responsible agricultural products on purchasing decision-making in the presence of the intermediate variable, green brand awareness.

Study Hypotheses

Hypothesis1: There exists a positive connection between responsible agricultural products and the factors that represent them (components and performance of responsible agricultural products, packaging of responsible agricultural products, quality of responsible agricultural products).

Hypothesis2: There exists a positive connection between responsible agricultural products and the purchase decision.

Hypothesis3: Green brand awareness plays a mediating role between responsible agricultural products and the purchase decision.

2. Literature Review

2.1 The concept of responsible agricultural products

to give an accurate definition of responsible agricultural products, we ought to first explain what is products and agricultural product:

The producer is the one that was formed in the form of a commodity capable of final consumption, or inputs for the manufacture of other products (Sayeh, 2020), Agricultural products are goods that are derived from farming, these products encompass a wide range of items produced through the practice of agriculture, including crops, livestock, and other. agricultural products have characteristics that distinguish them from the rest of the products, they are large in size, the demand for agricultural commodities is inelastic, the distinction between products is not possible, and it is difficult to maintain the quality of production as well as the quantity of production(Wan, 2022). These goods are fundamental to sustaining human life and are a primary source of food, and materials for various industrial processes.

Owing to recurring food safety problems and increased environmental awareness, consumers are becoming more aware of food quality and safety issues that are environmentally friendly (Jiabao et al, 2020) Food safety has become an important issue for all sectors of society, leading consumers to pursue green and healthy food (Hua et al, 2023).

Green agricultural products refer to pollution-free, safe, high-quality, nutritious and healthy agricultural products that follow the sustainable development strategy, are produced according to specific production methods, are recognized by professional institutions at the national level, and are licensed for the use of green food labels. Such as green wheat, green rice, green meat, green eggs, and green fruits (Cheng et al, 2023).

It can be said that an agricultural product is responsible when it takes into account the dimensions of sustainable

development It is concerned with the health of the consumer on all sides, in terms of the environment, his health, and society. It includes green and sustainable agricultural products to achieve a responsible product from all sides, such agricultural products should provide satisfaction to consumers without affecting the environment and society in the long term.

2.2 The concept of green brand

A brand aims to differentiate itself from competitors, seeking to determine how to distinguish this brand from others as a distinctive mark (Jon, Mike, 2002), Green brands are those that consumers associate with specific sustainable businesses and environmental conservation practices. (Mihai, 2020)

2.2.1 Green Brand Image

A green brand image is consumers' mental impression of an organization (Jinliang et al, 2023), the perception that appears in the consumer's mind when a brand is mentioned for a particular product (Made et al., 2019) .which is associated with environmental commitments and concerns (Darlius, Keni, 2021).

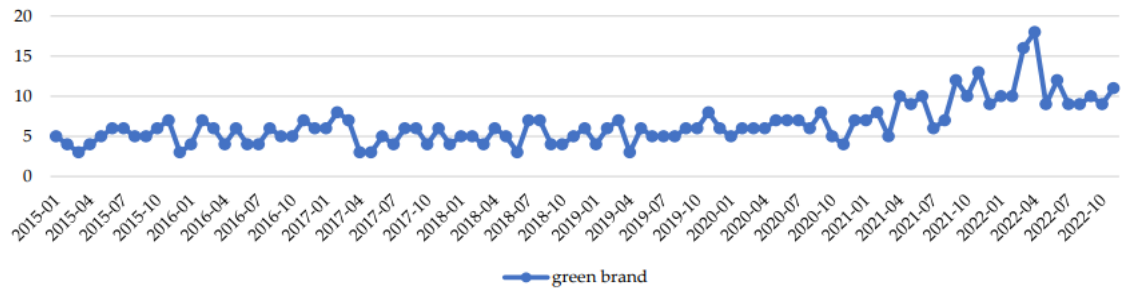
2.2.2 Awareness of the Green Brand

The first step in building a product brand is to create a brand for the product within the mind of consumers, which is considered the most important aspect of brand awareness. Green brand awareness is the consumer's ability to recall the environmental features of the brand and recognize them (Moeliono et al, 2020), the consumer's capacity to perceive and remember that the brand is environmentally friendly (Tariq, 2014). Green brand awareness depends on the ability to identify and remember the traits of brands that are committed to preserving the environment.(Alamsyah, Febriani, 2020)

2.2.3 Trust towards the brand

Trust is an important element in brand-consumer relationships (Islam, Robidas, 2023), Consumer trust in a green brand is due to their awareness of its credibility*, good intentions, and demonstrated ability with regard to environmental sustainability. (Uikey, 2023)

Figure 01: Green2022-Trademark Search between 2015



Source: Yana Us et al, Corporate Social Responsibility and Renewable Energy Development for the Green Brand within SDGs: A Meta-Analytic Review, Energies,2023.

To demonstrate the increase awareness of green brands, we analysed web search from 2015 to 2022 using the Google Trends tool. The results shows that "green branding" increased by 2.2 times in 2022. This indicates the growing interest in brands that care about the environment, which shows that consumer awareness is increasing, with individuals showing more interest in environmental protection and favouring brands that prioritize it.

2.3 Concept of the Purchase Decision Process

* **Awareness of a brand's credibility** refers to the recognition and perception by consumers of a brand's trustworthiness, reliability, and authenticity. understanding of a brand's credibility is crucial for building and maintaining strong customer relationships.

Good intentions for a green brand refer to the genuine and sincere commitment of a brand to environmental sustainability and eco-friendly practices.

Environmental sustainability is the ability to preserve and protect the natural environment over time through appropriate practices and policies

A purchase decision is an integrated process involving the evaluation of two or more alternatives and the selection of one. This process is interpreted as consumers choosing between options to meet their needs.(Sihombing et al, 2023) To make a purchasing decision, the consumer evaluates alternatives and selects the one that best meets their needs.
In order to make a purchase decision, consumers need to evaluate alternatives and make the final decision, which varies due to different incentives and factors surrounding them. This process involves stages and steps that consumers follow to make the final decision about whether to buy a product.

2.3.1 Stages of the purchase decision process

Stages of the Purchase Decision Process Purchasing decision-making includes several stages (Hawass, Youssef Albus, 2018):

Feeling of need or problem: The process begins with the consumer's recognition of a need they want to satisfy, triggered by changes in their actual and desired state.

Search for information: After recognizing the need, the consumer searches for information to identify goods that suit their needs and desires.

Evaluating alternatives and choosing the best alternative: The consumer evaluates the available alternatives using criteria reflecting the desired specifications, depending on the completeness and accuracy of the information collected.

Purchase decision: The evaluation process leads the consumer to form preferences among the alternatives, often resulting in the intention to buy the preferred option.

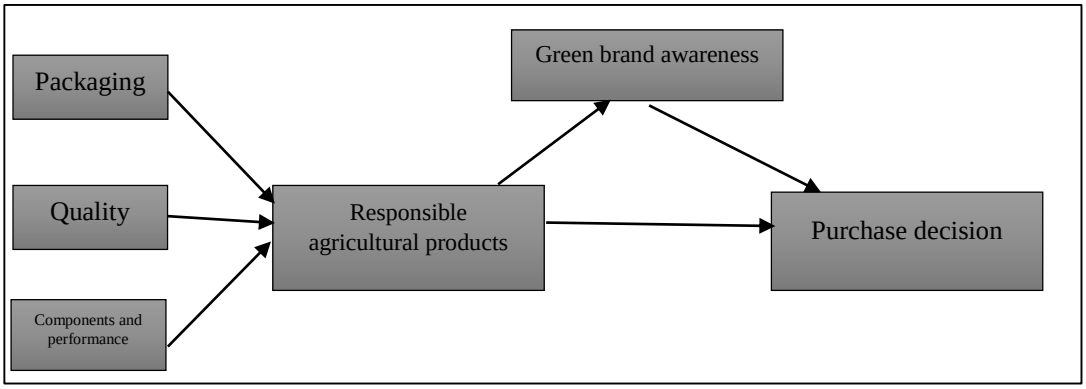
Post-purchase behaviour: The process extends to post-purchase behaviour, where the consumer experiences satisfaction or dissatisfaction with the purchased product.

3. Research Methodology

3.1 Sample and Data Collection

The inquiry utilizes a four-part questionnaire developed by the researchers.The earliest section includes four questions related to customers' demographic information, while the second section contains 17 questions focusing on responsible agricultural products, which is an independent variable. The third part consists of six questions about green brand awareness as a mediating variable. The fourth part consists of ten questions about the purchase decision, which is the dependent variable. The questionnaire uses a five-point Likert scale: one point for "Strongly disagree," two points for "Disagree," three points for "Undecided," four points for "Agree," and five points for "Strongly agree."

Figure 02: The proposed research model



3.2 The study population

The study population consists of Algerian consumers with celiac disease and people who consume natural and gluten-free food products. To assess the adoption of this subject by the study sample, 153 electronic questionnaires were distributed electronically.

3.2.1 DATA analysis

Table 01: Demographic Information of the Participants

		Number of people	**Percent**
Gender	Male	26	17%
	Female	127	83%
Age	Less than 25 year	39	25.5%
	26 to 35 years	73	47.7%
	36 to 45 years	32	20.9%
	46 to 60 years	7	4.6%
	More than 60 years	2	1.3%
Educational Qualification	High School Certificate	6	3.9%
	Diploma	14	9.2%
	Bachelor	100	65.4
	Postgraduat	33	21.6
Monthly Income	Below 15000	68	44.4%
	15000-35000	35	22.9%
	36000-55000	26	17%
	56000-75000	9	5.9%
	Over 75000	15	9.8%

Source: Created By the Researchers.

From the data gathered, it was discovered that 26 (17%) of the respondents are male, while 127 (83%) are female. Thus, it means that females are more interested in healthy and natural eating than males.

In the age characteristics, the distribution is as follows:

- Less than 25 years: 39 people
- 26 to 35 years old: 73 people
- 36 to 45 years old: 32 people
- 46 to 60 years old: 7 people
- More than 60 years old: 2 people

The descriptive statistics also showed that:

- 3.9% of the participants had a high school certificate
- 9.2% had a diploma degree
- 65.4% held a bachelor's degree
- 21.6% had a postgraduate qualification

this indicates that the majority of participants possess a high level of education, enabling them to more effectively comprehend and respond to the questionnaire.

The highest-income category is below 15,000 (44.4%). It is important to consider that higher-income individuals may be more willing to pay for responsible agricultural products

Table 02: Descriptive Analysis of Study Variables

Vriables	MEAN	S.D	
Packaging of RAP	3.93	0.62	Agree
Components and performance of RAP	4.12	0.66	Agree
Quality of RAP	3.91	0.70	Agree
Responsible agricultural product (RAP)	3.29	0.77	Undecided
Green brand awareness	3.93	0.52	Agree
Purchase decision	4.01	0.52	Agree

Souce: Created By the authors.

3.3 Reliability and validity test

Validity and reliability are key criteria that enhance the quality of the questionnaire. (Rozali & etal, 2022)

Table 03: Reliability Analysis for Dependent and Independent Variables

VARIABLE	**TEST ITEMS**	***Cronbach's α***
RAP	17	0.795
GBA	06	0.883
PD	10	0.869
All variables	33	0.919

Source: Created By the Researchers.

we employed SPSS 27 software to evaluate the validity and reliability of the collected data and conduct subsequent analyses. All variables had Cronbach's alpha coefficients above 0.6, demonstrating a strong relationship between the observed indicators and latent variables. The overall Cronbach's alpha for the questionnaire was 0.919, indicating high reliability and internal consistency.

Sample Adequacy: The Bartlett's test is used to test if K samples have equal variances, equal variances across samples is called homogeneity of variances (Herman , Hassan, & Dastane , 2017)

Table 04: KMO Measure and BartlettTest

Bartlett's Test	**Sig**	0.000
	DdI	136
KMO Test		0.861

Source: Based on the results of the AMOS.

The KMO value is 0.861, so it exceeds the threshold of 0.8 which signifye that the research data is so suitable for extracting meaningful information.

3.4 Goodness of Fit Index

In our study, we have used AMOS software to create a measurement model comprising three independent variables and a single dependent variable. According to the criteria in Tables 5 and 7, the results of the measurement model were:

Table 05: Goodness of Fit Indices for Variable Independent

- (CMIN/DF)[1] = 1.638

[1] CMIN/DF: Chi-square fit statistics/degree of freedom
CFI: Comparative fit index
GFI: Goodness of fit index
RMSEA: Root mean square error of approximation
Not: RAP= Responsible agricultural product, GBA= Green brand awareness, PD= Purchase decision

- (CFI) = 0.933
- (GFI) = 0.885
- (RMSEA) = 0.065

The model is accepted because AVE is 0.5. Figure 5 demonstrates the model result.

Table 07: Goodness of Fit Indices for Variable Dependent

- (CMIN/DF) = 1.505
- (CFI) = 0.971
- (GFI) = 0.963
- (RMSEA) = 0.058

The model results show that the RMSEA, CMIN/DF, TLI, and CFI criteria indicate a good fit.

Table 05: GFI for the Independent Variable

GFI	Result	Critical Value	Evaluation
X^2	189.970	Expected to be small`	/
Df	116	DF ≥ 0	Accepted
(CMIN/DF)	1.638	1-3: it indicates an acceptable fit 3-5 it indicates a reasonable fit	Accepted
(CFI)	0.933	≥0.95	Close to 0.95
(GFI)	0.885	≥0.90	Close to 0.90
(TLI)	0.922	≥0.95	Close to 0.95
(RMSEA	0.065	0-0.5 good 0.05 -0.08 reasonable fit	Accepted
RMR	0.051	0-0.5 good 0.05 -0.08 reasonable fit	Accepted

Source: Researcher's analysis based on the results of the statistical program AMOS.

Table 06: Results of AVE and CR for Independent Variable

	CR	AVE
R A P	0.772	0.533

Source: Based on the results of the AMOS..

Table 07: GFI for Variable Dependent

Goodness of Fit Index	Model Results befor modification	Model Results after modification	Evaluation
X^2	74.188	21.073	**Accepted**
Df	27	14	**Accepted**
(CMIN/DF)	2.748	1.505	**Accepted**
(CFI)	0.898	0.971	**Accepted**
(GFI)	0.906	0.963	**Accepted**
(TLI)	0.863	0.957	**Accepted**
(RMSEA)	0.107	0.058	**Accepted**
RMR	0.034	0.024	**Accepted**

Source: Based on the results of the AMOS.

The next step in the analysis involves testing the hypotheses to determine their acceptance. This is done by examining the p-value in the regression weights output. If the p-value is below 0.05, the hypothesis is accepted as statistically significant.

H1: There exists a positive connection between responsible agricultural products and the factors that represent them (components and performance of responsible agricultural products, packaging, and quality).

Table 08: Results of Hypothesis Testing

HP	path			Estimate	S.E	C.R	P	Estimate	H.S
H1-1	**RAP**	⟶	Packaging	1.006	0.251	4.003	***	0.64	Accepted
H1-2	**RAP**	⟶	Perf	0.994	0.248	4.003	***	0.70	Accepted
H1-3	**RAP**	⟶	Quality	1.433	0.348	4.339	***	0.84	Accepted

Source: Based on the results of the AMOS.

According to the analysis results with the path analysis as written above, it can be explained that all variables have a C.R value above 2.000 and a sig value lower than 0.05. We conclude that there is a positive, statistically significant relationship between responsible agricultural products and the factors that represent them (components and performance of responsible agricultural products, packaging, quality) among Algerian celiac disease patients, and that this relationship has varying degrees, as it was estimated at 0.084 between quality and responsible agricultural products, 0.70 between product ingredients and performance and responsible agricultural products, and 0.64 between packaging and responsible agricultural products.

H2: There exists a positive connection between responsible agricultural products and the purchase decision.

Table 09: Results of Testing the Hypotheses of the Survey

HP	PATH			Estimate	S.E	C.R	Estimate	P	H.S
H2	RAP	⟶	PD	1.042	0.217	4.789	0.804	***	Accepted

Source: Based on the results of the AMOS.

Based on the table above, the conclusion is as follows: The attractiveness value of CR is 4.789 and the Sig = 0.000. Because the Sig value is smaller than α (0.05), (Ho) is dismissed; meaning attractiveness (RAP) has a meaningful impact on the purchase decision. Therefore, the relationship between responsible agricultural products and the purchase decision is positive, implying the more elevated the influence of responsible agricultural products, the higher the purchase decision.

Mediation Analysis According to Baron and Kenny (1986), mediation exists under the following conditions:

1. **Stat Sig[*] between Dependent and Independent Variables:** the relationship between responsible agricultural products and the purchase decision must be positive and significant
2. **Stat Sig between Independent and Mediating Variables:** the correlation between responsible agricultural products and green brand awareness must be positive and significant.
3. **Stat Sig between Mediating and Dependent Variables:** There should be a positive and significant relationship between green brand awareness and purchase decisions.

[*] **Statistical Significance**

4. **Direct Effect after Controlling for the Mediating Variable:** If incorporating the mediator into the model completely eliminates the direct relationship , there is full mediation; Or else, mediation is partial or absent.(Hadi et al., 2016)

Figure 03: The Path Coefficient for Testing the Hypothesis

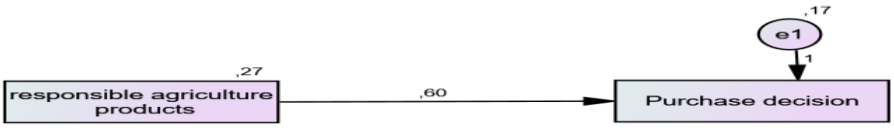
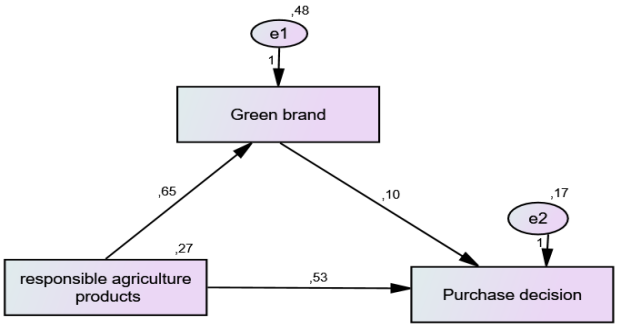


Figure 04: Structural Equation Model for Mediation Analysis



Source: Created By the Researchers

Table 10: Mediating effect

path			Estimate	S.E	C.R	P	Accepted
RAP	⟶	PD	0.532	0.071	7.494	***	YES
RAP	⟶	GBA	0.651	0.107	6.080	***	YES
GBA	⟶	PD	0.100	0.048	2.070	0.038	YES
Direct, indirect and total effect results							
Structural link			DE	DE significance	Indirect effect	Total effect	**Result partial mediation**
RAP	⟶	GBA	0.651	0.532		0.651	
RAP	⟶	PD	0.532		0.065	0.597	

Source: Based on the results of the AMOS.

Based on the results shown in Table 10, responsible agricultural products as an independent variable significantly affect green brand awareness as a mediator in equation one ($P < 0.001$, C.R = 7.494), hence, H3-1 was supported. Responsible agricultural products as an independent variable significantly affect the purchase decision as a dependent variable in equation two ($P < 0.001$, C.R = 6.080), so H3-2 was supported. Both responsible agricultural products as an independent variable and green brand awareness as a mediator significantly impacted the purchase decision as a dependent variable ($P < 0.005$, C.R = 2.070), so H3-3 was supported.

The mediation kind in our study is termed "partial mediation". the direct influence of the independent variable on the dependent variable is meaningful yet even after the mediator variable entered the model, Although the path coefficient for responsible agricultural products decreased from 0.60 (in Figure 03) to 0.53 (in Figure 04). In this case, responsible agricultural products have a significant direct impact on the purchase decision and a significant indirect impact on the purchase decision through the mediating variable, which is green brand awareness.

4. DISCUSSION

Our study evaluated the effect of responsible agricultural products on the purchase decision. Next, the mediating effect of green brand awareness between the relationship of responsible agricultural products and the purchase decision was examined through a sample of celiac disease patients consisting of 153 individuals. We found a positive, statistically significant relationship between responsible agricultural products and the factors that represent them. A path analysis demonstrates that responsible agricultural products have a positive effect on the purchase decision. The study sample is interested in responsible products, possibly because the diet they follow makes them more interested in responsible consumption. As an intermediary variable, green brand awareness improves the purchase decision. Having a green brand seems to enhance consumer awareness and interest in purchasing eco-friendly products, thereby protecting the environment.

4.1 CONCLUSION

The study aimed to identify the impact of responsible agricultural products on the purchase decision through green brand awareness as a mediating variable in celiac disease patients and people on a gluten-free diet. After rigorous data analysis in the SEM approach, it was found that there is a positive, statistically significant relationship between responsible agricultural products and the factors that represent them (components and performance of responsible agricultural products, packaging, quality) among Algerian celiac disease patients. Further that we have a significant relationship between responsible agricultural products and the sample's purchasing decision. The subsequent mediation analysis confirmed that green brand awareness mediates between responsible agricultural products and the purchase decision. Accordingly, the outcomes of our study exhibits the awareness among the group of celiac disease patients about the green brand and the importance of consuming responsible products and interest in healthy and natural eating, which may be due to their consumption of natural products in their dietary pattern.

4.2 RECOMMENDATIONS

- Spread awareness about consuming responsible products through advertisements and promotional campaigns.
- Focus on more educated consumers, identify such segments of consumers, and design and market responsible agricultural products at suitable price levels.
- Companies should concentrate on developing green products that have demand from the general public and align with consumer needs.
- Highlight the environmental and social impacts of consumer choices, encouraging customers towards responsible consumption.

4.3 LIMITATIONS AND FUTURE RESEARCH OPPORTUNITIES

The research has discovered numerous informative and Accurate results; nonetheless, it has specific Constraints that may be explored in subsequent research initiatives.
Firstly, This study includes a sample size of 153 Algerian consumers with celiac disease and people who eat natural food products and gluten-free, which could fall short of representing the full population of Algeria. This adds to the problem of generalization. Consequently, future researchers should consider obtaining a more appropriate sample from a larger number of Algerian consumers to study in order to better understand Algerian consumer awareness of responsible agricultural products and the green brand for more robust results.

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Figure 05: The three-factor, 17 item confirmatory factor analysis (CFA) model of the responsible agriculture products

