

Sustainable Food: What Perception do Young Algerian Consumers Have?*

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Abstract

This paper examines the perception of sustainable food and the development of food systems. It's purpose to assess the perceptions of Algerian consumers on sustainable food and to know how to design and promote sustainable food products. A questionnaire survey of a random sample representative of the population of the wilaya of sidi bel Abbes (Algeria) was conducted in 2016. According to the results of this study, 37% of those surveyed believe that sustainable food should contain traditional foods. 40% think that food supplements should be excluded in order to obtain a sustainable diet. 48% believe that sustainability of food is a global problem. The majority of the population questioned agrees that the use of environmentally friendly agricultural practices is essential and recommends better nutritional education for children at school and at home. Finally, sustainable food is a whole system and useful diet. The educational and cultural dimensions are much evoked in consumers' perceptions of sustainable food.

Keywords: Food security, sustainable food, food system, perception, Algeria

JEL Classification: F18, I25, Q13

Sürdürülebilir Gıda: Cezayirli Genç Tüketicilerin Algısı Nedir?

Özet

Bu makalede, sürdürülebilir gıda algısı ve gıda sistemlerinin gelişimi incelenmektedir. Amaç, Cezayir tüketicilerin sürdürülebilir gıda hakkındaki algılarını değerlendirmek ve sürdürülebilir gıda ürünlerinin nasıl tasarlanıp tanıtılacağını bilmek. sidi bel Abbes (Cezayir) wilaya nüfusunun rastgele bir örnek temsilcisiyle ilgili bir anket 2016 yılında yürütüldü. Bu çalışmanın sonuçlarına göre, ankete katılanların %37'i sürdürülebilir gıdaların geleneksel gıdaları içermesi gerektiğine inanıyor. %40'si, sürdürülebilir bir beslenme elde etmek için gıda takviyelerinin dışarıda bırakılması gerektiğini düşünüyor. %48'si, gıda sürdürülebilirliğinin küresel bir sorun olduğuna inanıyor. Sorgulanan nüfusun büyük kısmı, çevre dostu tarım uygulamalarının kullanılmasının şart olduğunu kabul ediyor ve okulda ve evde çocuklar için daha iyi beslenme eğitimi öneriyor. Son

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olarak, sürdürülebilir yemekler bütün bir sistem ve yararlı bir diyetir. Eğitimsel ve kültürel boyutlar, tüketicilerin sürdürülebilir gıda algısında çok uyarılmaktadır.

Anahtar Kelimeler: *Gıda güvenliği, sürdürülebilir gıda, gıda sistemi, algı, Cezayir*

JEL Sınıflandırması: *F18, I25, Q13*

1. Introduction

Food is a much more complex system than the only quantitative and sanitary satisfaction of nutritional needs: it is also deeply cultural, consumerist, social, economic and local (Esnouf and al., 2011: 11-12). Today, we are witnessing a change in food strategies and policies. They are gradually moving from a productionist ethic to an agroecological ethic (Pastore-Reiss, 2006: 84; Schneider and al., 2015: 396). It is necessary to promote both progress in productivity and the imperative of sustainability through the reasoned modernization of agriculture in the world (Petit, 2011: 34; Feillet, 2014: 47). For an eco-food, the educational dimension is highly integrated, aiming to promote an individual and collective path towards a healthy diet, produced, distributed and consumed with respect for ecosystems and a concern for social equity (Sauvé and al., 2013: 106; Berthet, 2014: 237; Garnotel, 2014: 149).

The industrialization of food has led to an unbalanced supply of nutrition, thus maintaining a number of metabolic diseases. Today, consumers seek to adopt a safe eating behaviour when subjected to so much contradictory information. The time has come to commit to a more sustainable diet through a change in dietary patterns (Rémésy, 2010: 19).

A diagnosis of the global food security situation shows that contemporary food production and consumption patterns are "little sustainable" (Rastoin and al., 2017: 23). Driven by agri-food industries, the current food system is not sustainable. Studies and expertise are multiplying to show the limits in terms of resource use, distance, health, equity, employment etc. Faced with these findings, public or private actors are mobilizing, and we see the emergence of initiatives where "urban governments" appear to be more and more active and powerful (Brand and al., 2017: 28). Today, there is a need to address the different facets of sustainability issues in the agri-food sector and food security: training and trades, consumer protection (quality, accessibility), environmental preservation and social equality (Chikhi, 2018: 276). In Algeria, food policies focus on the quantitative aspect of food security rather than qualitative (food availability, access to food, stability and food wholesomeness). A study conducted by the Algerian Society of Nutrition (SAN), demonstrates "the weaknesses of the Algerian consumer in terms of nutritional balance". The findings of the study recommend changing food policy and systems (Subsidize fruits and vegetables instead of sugar and oil). It is also indicated that the Algerian food model loses its nutritional balance by degrading itself towards a model of excess, with an increase in the quantities consumed and the immoderate consumption of animal products and the need to follow "nutrition education associated with the promotion of physical activity" (Bouchenak, 2017).

These are the signs of a path to sustainable food. So, our study addresses three research questions:

RQ1: What are Algerian consumers' perceptions of sustainable foods?

RQ2: What are their expectations for sustainability?

RQ3: How to design and promote sustainable food products

To test the research questions, a questionnaire will be used to assess the perceptions of Algerian consumers about sustainable food, to deduce their expectations of sustainability and to know their opinions on the design of sustainable food production systems.

2. State of the Art

Food and the environment are at the heart of sustainable development (Combris and al., 2011: 1). The field of research on sustainable food is recent and interdisciplinary in nature (Redlingshöfer, 2006: 84). Many research shows that food is sustainable if the entire process, from production to consumption, health preserves, environment, solidarity and the local economy. However, to ensure access to food and meet their needs, men have designed “food systems” that have evolved significantly since the emergence of agriculture. Sustainable food also known as “sustainable diets ” protects biodiversity and ecosystems, is culturally acceptable, accessible, economically fair and realistic, safe, nutritionally adequate and good for health, optimizes the use of natural and human resources (FAO, 2010: 1; Esnouf and al., 2011: 5).

Based on the FAO definition, sustainable food is based on 4 pillars: environment, socio-cultural, economy and nutrition related to health (cf. Figure 1).

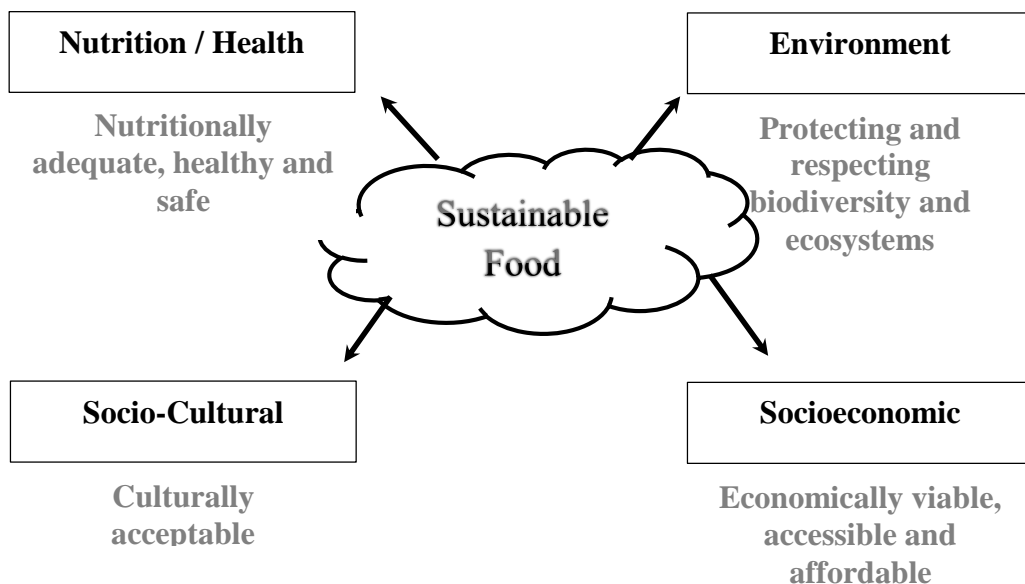


Figure 1: The 4 Pillars of Sustainable Food.

Source: Prepared by the Author According to FAO.

Today, our food is industrialized and globalized. This diet is characterized by a strong transformation of consumed products, significant distances between producer / processor and consumer. Thus, the intensive agriculture set up in the second half of the 20th century has managed to meet the demand for food by increasing the income of producers. This model was then destructive of agricultural jobs and generated strong income inequalities between farmers, jeopardizing natural resources (water, soil, biodiversity) (Yveline, 2013). However, increased consumption of meat and / or meat products is damaging the environment and leading to health problems (Novel, 2010: 11; Chikhi and Bencharif, 2016: 436).

The cultural and social function is also among the ecosystem services. It is often underestimated but is nevertheless essential, as much by the link that links the society to the act of agricultural production or to the rural landscapes, as by the cultural dimension of the agricultural products and their link with the territories (Schneider and al., 2015; Meybeck and al., 2016, op cit). Beyond the environmental aspect, plant-based diets derive their legitimacy from their benefit to human health, which is unanimously recognized by the scientific community in nutrition (Redlingshöfer, 2006: 93).

The main environmental issues (ADEM, 2019)⁴ are:

- Contribute to a sustainable food chain: provision of food to consumers with low environmental impact (organic, local, seasonal, etc.), Eco design throughout the food chain (support to agroecology, development of logistics platform, and reduction of packaging, Etc.);
- To change food practices: responsible purchases in proximity circuits, environmental labelling of products, respect for the seasonality of products, rebalancing of diets (integration of legumes and reduction of proteins of animal origin);
- Fight against food waste at each link in the chain: production, processing, distribution, consumption.

An examination of consumer trends and expectations shows that consumers are demanding more information about the environmental aspects of a product, clarity on the presentation of nutrition information (labelling, logo, etc.) and packaging (Redlingshöfer, 2006, op cit; Ouillet, 2012: 74-102; IPSOS, 2014a). “Sustainable” consumers tend to buy more food products with a quality and / or environmental signature or label. The decisive choice criteria in the buying situation (the price, the origin, the traceability of the product, the respect for the environment by the farmer, the brand, the fact that it comes from fair trade and packaging) (Mathé, 2009: 55; Morgan and al., 2010: 213; IPSOS, 2014b).

Characterizing sustainable diets requires first of all distinguishing between the two dimensions of their definition (cf. Figure 2): on one hand, the nutrition and health dimension, people-oriented, and the on the other hand, the impact on the food

⁴ Environment and Energy Management Agency: Climate change - ecological and energy transition.

system, and its sustainability, in all its dimensions (economic, social, environmental), which is measured at different scales (from the local to the global level).

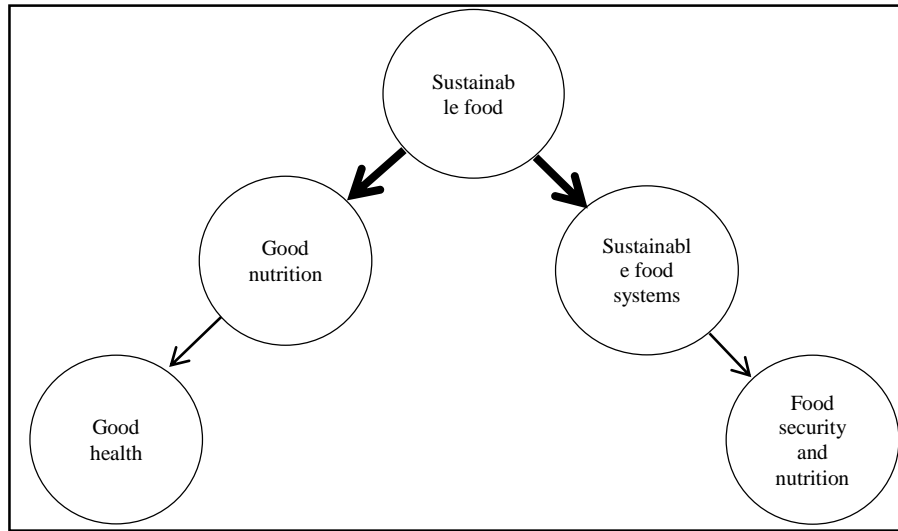


Figure 2: The Two Dimensions of a Sustainable Diet as a Driver of Change at the Individual and Systemic Level.

Source: Meybeck and Gitz, 2016: 309.

The food system itself is shaped by many factors. First, it depends on the sum of all the plans. The widespread existence of unsustainable diets, their predominance and market influence, is in itself, by systemic effect, an obstacle to the emergence of sustainable diets on a larger scale (Price and affordability of food as well as information and education). However, prices, education and consumer information are the parameters influencing food choices. (Meybeck and al., 2016: 311; Chikhi, 2018, op cit).

Consumers are increasingly asking for local foods with a traditional character or image, often perceived as high quality and responding to a need for cultural identity (Chikhi and al., 2014: 51). Thus, the use of short circuits for the sale of agricultural products at the place of production. Products from organic farming, the "organic" remains a fundamental element of a sustainable food to the extent that its mode of production is non-polluting and preserves natural resources. In addition, organic products often have better nutritional quality (more fiber, vitamins and minerals, etc.) and taste.

According to the review of food and nutritional security in Algeria, it was found that the available food ration was still unbalanced, the place occupied by wheat being too important and that of protein and fat still too low. In addition, it has also been found that the insufficient nutritional balance of the available ration leads to the rise of chronic diseases such as diabetes or cardiovascular events (Bedrani and al., 2018: 14). In addition, it has been shown that the quantitative improvement of the food supply available has been, constantly, the result of a resort to imports to

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fill a structural deficit of domestic agricultural supply, especially for the most consumed goods (Durum wheat, soft wheat, milk, sugar, edible oils), a deficit explained by the rainy nature of most of Algerian agriculture and slow progress in yields and productivity. This is the “food dependency” and “food vulnerability” of Algeria. Indeed, since 2014, there has been a regression linked to the strongly constrained macroeconomic and financial framework that needs to be rethought in the agricultural and food policy and the growth model that constitutes its current base (Bessaoud, 2016: 73). In Algeria, there are no detailed studies dealing with consumer perception to the sustainable food.

After this brief state of the art about sustainable food and its characteristics, we can then ask ourselves about “the general idea of individuals in relation to sustainable food in Algeria”. The objective of our study is divided as follows: To evaluate the perceptions of Algerian consumers about sustainable food; Identify their expectations of sustainability; Know how to design and promote sustainable food products. This should lead us to think of food production systems from a sustainable marketing perspective.

3. Methodology (Data Source, Method of Data Collection)

In most research on sustainable food, the methodology used and advocated is the Delphi method (Clément and al., 2006: 297). This method involves anonymous interviewing of experts to explain and build forecasts on technological topics. At the methodological level, we use a questionnaire survey (cf. Table 1) with a sample of 100 mostly young people aged 18 and over with a high level of education living in rural or urban areas representative of the population of the wilaya of Sidi Bel Abbess (Master students at the University of Sidi Bel Abbes - Algeria), to assess their perceptions of sustainable food, identify their sustainability expectations and information on how to design sustainable food products. Data collection was conducted in April / May 2016. The underlying assumption is that young people are unaware of the characteristics of sustainable food and that older people would be closer to the natural and traditional products that characterize sustainable food.

Table 1: Sustainable Food Determinants (Questionnaire Elements)

N°	Characteristics	Modalities X frequencies
01	Age	4
02	Profession	8
03	Sex	2
04	Choice of elements characterizing sustainable food	8
05	Choice of items not related to sustainable food	9
06	Issues of sustainable food and territoriality	3
07	Link between sustainable food and food security	3
08	Important frequency of elements for sustainable diets	11x5
09	How to design a sustainable diet	6
10	Recommendations on sustainable diets and biodiversity	5
11	Usefulness of Code of Conducting to Sustainable Diets	3
12	Definition for sustainable food	/
13	Additional comments	/

Source: Synthesis of the Work: Mathé, 2009; FAO, 2010; Esnouf and al., 2011; FAO, 2014.

Table 1 contains the characteristics and indicators selected from this literature review and a survey of sustainable diets conducted by FAO in November 2010⁵. The type of analysis chosen in our study is multivariate analysis⁶.

4. Empirical Results and Discussion

4.1. Sample of Population Characteristic

Our sample is very representative since 80% of the respondents are between 18 and 30 years old. The other class (from 31 to 60 years old) represents 20% of our sample. The sample is 55% women and 44% men, which leads to an over representation of women compared to the Algerian reality of 49.4% women and 50.6% men (ONS, 2019: 11). 51% of our sample are university students who do not have a job, 20% have a profession in the public or private sector, 15% in education, 5% in agriculture and the rest (4% in health, 2% in culture). Thus, our sample consists mainly of a young population with a university level and unemployed (Cf. Table 2).

Table 2: Demographic and Professional Profile of Respondents (n = 100)

Demographic variables	Details	Percentage (%)
Gender	Women	55
	Man	44
Age	18-30 years old	80
	31-60 years old	20
Education	Diploma in Graduation	100
Profession	Environment	1
	Health	4
	Nutrition	1
	Agriculture	5
	Education	15
	Culture	2
	Public or private service	20
	Unemployed	51

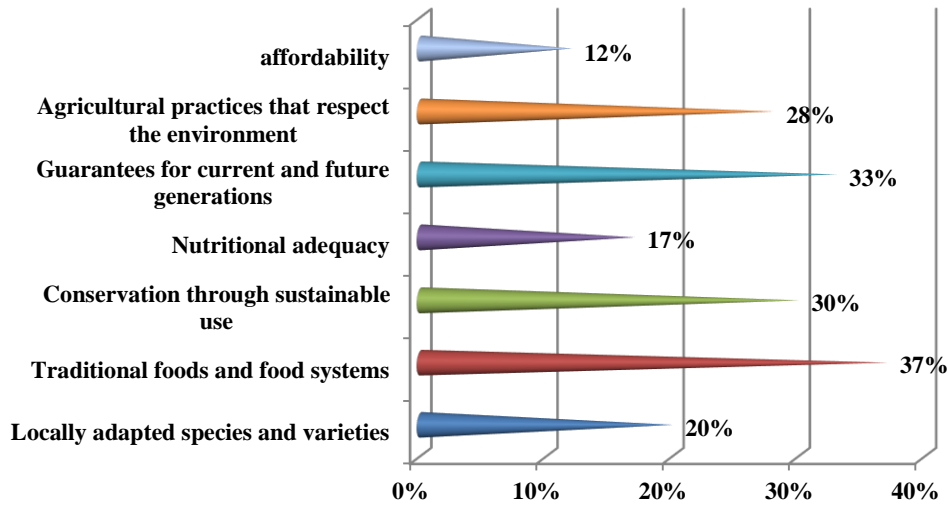
Source: Our Inquiry, 2016.

4.2. The Results of Our Investigation are as Follows

So, 37% of respondents say that sustainable food should include traditional foods and more sustainable food systems (cf. Graph 1). That is, developing a collaborative territorial network that integrates production, processing, distribution, food consumption and waste management, with the goal of increasing the environmental, economic and social health of the community. 33% suggest that safeguards should be introduced for current and future generations While. That is, the excessive use of natural resources; 20% of respondents believe that sustainable food should include locally adapted species and varieties, and 12% think of affordability (economic aspect) for sustainable food.

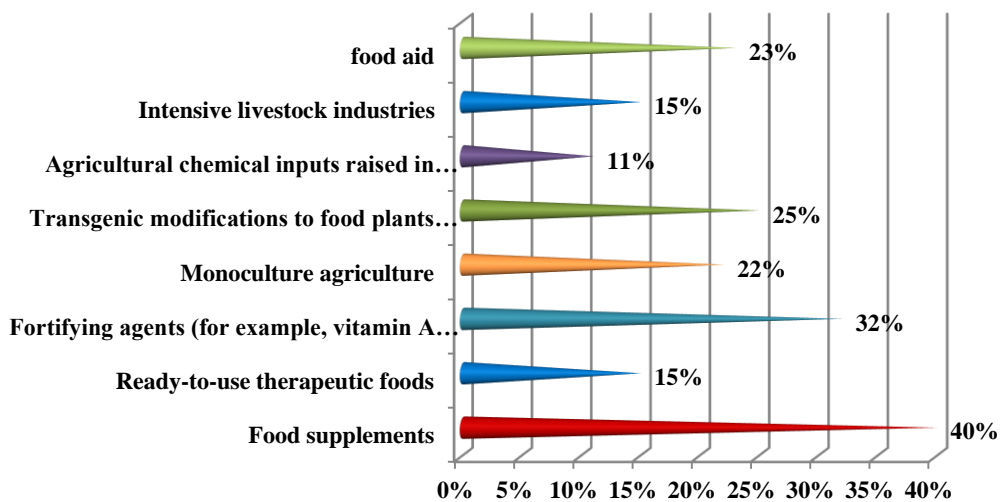
⁵ (cf. <https://www.surveymonkey.com/r/D9DF8NC>).

⁶ Multivariate analysis refers to a set of methods and techniques for studying multivariate tables describing multiple individuals (Niang and al., 2016).



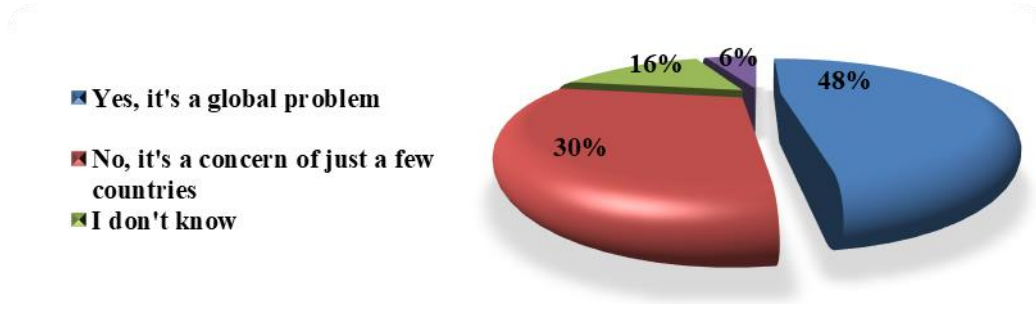
Graph 1: Perception of Respondents on the Components of a Sustainable Diet.
Source: Our survey, 2016.

Thus, 40% of respondents believe that dietary supplements should be excluded to have a sustainable diet, because they contain chemical and pharmacological substances, additives, flavours and technological aids (additive support) whose purpose is to supplement the natural diet (cf. Graph 2). As well, 32% of them think that fortifiers should be discarded, who have the same goals as dietary supplements. 25% of respondents say that transgenic modifications to food plants and animals and genetically modified organisms (GMO) should be excluded and go back to natural farming. While only 11% of them do not think of including agricultural chemical inputs raised in agriculture and its rational use for food to be sustainable.



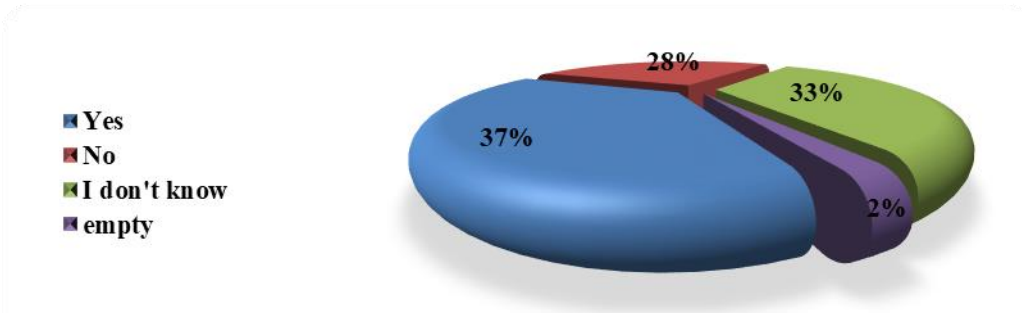
Graph 2: Perception of Respondents on Excluded Elements of a Sustainable Diet.
Source: Our survey, 2016.

However, 48% of respondents say that the sustainability of the food systems is a global problem (cf. Graph 3). Because by 2050, the world's population will be 9 billion, and the demand for food will only grow. On the other hand, 30% of them think it is a concern of only a few countries. While, only 16% totally ignore the answer to this question.



Graph 3: Perception of Respondents on Regions Concerned About Sustainable Diets.

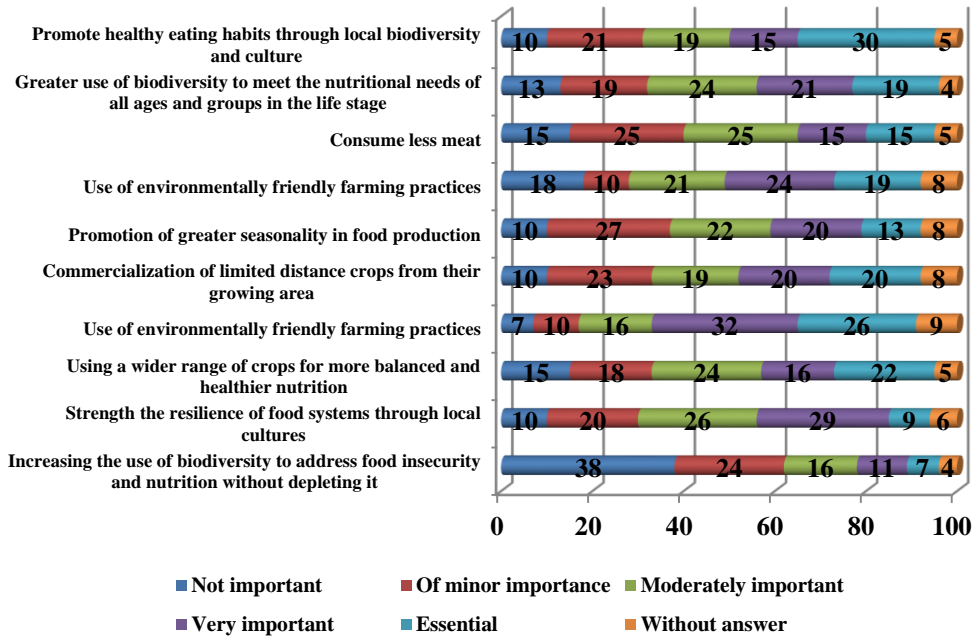
Source: Our survey, 2016.



Graph 4: Perception of Respondents on the Link between Sustainable Food and Food Security.

Source: Our survey, 2016.

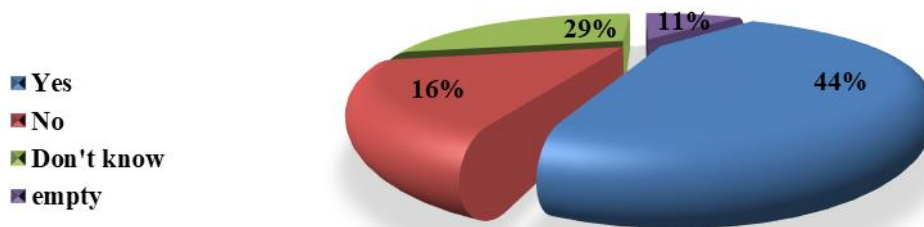
So 37% of respondents believe that sustainable food is strongly linked to food security (cf. Graph 4). While 28% of them think it is not just food security, it concerns in particular biodiversity and other subjects. In other hand, 33% know absolutely nothing.



Graph 5: The Importance of Each Element for Sustainable Diets.

Source: Our Survey, 2016.

Concerning the importance of each element for sustainable diets, (58%) of those surveyed believe that it is essential to use environmentally friendly farming practices (cf. Graph 5). This should preserve the pollution of surface and underground water resources, as well as, the contamination of aquatic environments, the massive and uncontrolled use of pesticides and nitrates, the quality of air and soil and promote organic farming. While, (45%) say it is essential to promote healthy eating habits through local biodiversity and culture and promote biological farming. So (43%) of them consider it necessary to the limited processing of food products and the restricted use of packaging in the transformation process. While, 62% of respondents believe that it is not very important to gradually increase biodiversity to avoid food insecurity but also to address the nutrition problem.

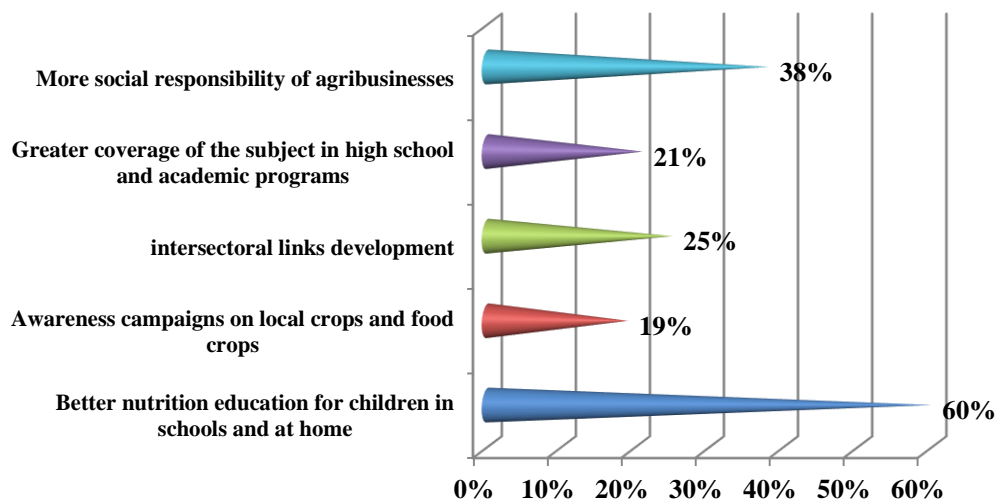


Graph 6: Respondents' Opinions on the Usefulness of a Code of Conduct on Sustainable Diets.

Source: Our Survey, 2016.

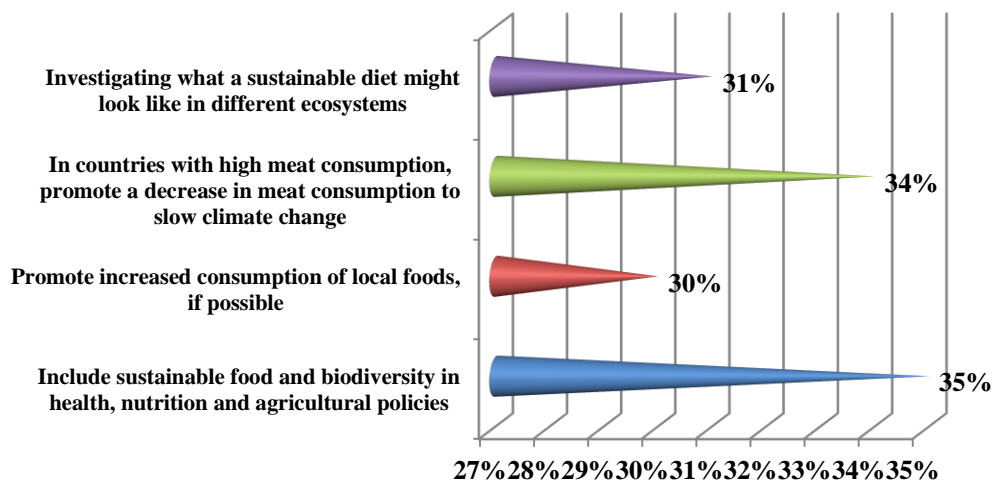
Otherwise, 44% of respondents say that a code of conduct on sustainable diets is very useful and necessary because it allows following the rules of a good behaviour and learning to sustainable diets (cf. Graph 6). While, 16% of them think it is not really useful. On the other hand, 29% of them are not interested with this idea.

On how to design sustainable food products (cf. Graph 7), we note that most respondents (60%) want better nutritional education of children in schools and at home and better nutritional information (38%) of them say it more social responsibility of agri-food companies. In fact, corporate social responsibility (CSR) is today more and more present in the world of large companies and SMEs. This presence expresses the desire of companies to get involved in social action and allows them to promote their brand images.



Graph 7: Respondents' Opinions on How to Design Sustainable Food Products.

Source: Our Survey, 2016.



Graph 8. Surveyor's Recommendations on Sustainable Diets and Biodiversity.

Source: Our Survey, 2016.

5. Conclusion

If sustainable food contributes to the nutritional status and good health of the individual, and contributes to the sustainability of food systems, thus participating to overall food security and good nutrition in the long term (Meybeck and al., 2016). Our study reveals that the Algerian consumers believe that sustainable food is a whole system. It is synonymous with continuous, correct and useful diet and / or dietary restriction (less meat and less sugar and oil) for human welfare. Some of them think that it is a problem that affects much more Africa because it can develop due to the diversity of technologies. In addition, they emphasize the need to inform and educate the general public by dietary experts to move towards a balanced diet.

The educational and cultural dimension is highly evoked in respondents' perceptions of sustainable food. It mainly concerns food consumption and social equity. Sustainable food is considered to be a good breakthrough and should be generalized and disseminated for the maintenance of human life. Our study shows that young people surveyed in Algeria neglect the aspect related to respect for ecosystems and the economic aspect in the perception of sustainable food. The results of the survey seem to confirm our hypothesis. Young people are unaware of the characteristics of sustainable food as older people move closer to natural and traditional products and focus more on sustainable food. These consumers recommend encouraging in-depth studies on sustainable food (improvement of educational methods) to improve general knowledge on this topic and to support biological agriculture and the peasantry as there is a close link between sustainable food and agriculture.

Finally, the opinions of the consumers surveyed demonstrate the importance and the need to apply the 5 principle keys recommended by FAO⁷ for the sustainability of food and agriculture, and the design of a sustainable food system, particularly in Algeria. At the same time, food policies should be improved by promoting standards, criteria and frameworks, and advocating for policy changes that contribute to healthy diets and sustainable food systems, including market regulations and economic incentives, and reconsidering subsidy policy for essential food products, by strengthening strategic partnerships with non-state actors (private institutions, NGO⁸, associations, etc.), and finally, promoting innovation, particularly in the financial sectors targeting rural people; and facilitating the exchange of knowledge and coordination between different sectors.

This study was limited by the sample of consumers included in the analysis and the period examined. Future studies could include a different sample of consumers and include other time periods. This study provides a benchmark for future studies assessing agribusiness and food business practices from a sustainability perspective. With respect to sustainable foods, this study has described some of the

⁷ 1/ Improving the efficiency of resource use. 2 /Conserving, protecting and enhancing natural ecosystems. 3/ Protecting and improving rural livelihoods and social well-being. 4 /Building the resilience of people, communities and ecosystems communities. 5/ Promote good governance of both natural and human systems.

⁸ Non-governmental organizations.

benefits of sustainable food, such as improving the health of populations and increasing food production, as well as related environmental concerns.

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