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ASSESSMENT OF ALGERIAN CONSUMERS' KNOWLEDGE OF THE RISKS ASSOCIATED WITH CANNED FOOD CONSUMPTION

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Abstract:

Canned foods are widely appreciated for their convenience, long shelf life, and affordability, meeting the growing demand for quick and accessible food solutions. However, their consumption poses public health risks, particularly due to the presence of chemicals and microplastics. This study examines the perceptions and knowledge of Algerian consumers regarding the risks associated with canned food consumption. The survey involved 639 participants residing in Algeria. The results reveal that 69.96% of respondents regularly consume canned foods. Additionally, 84.97% of participants check the chemical composition and expiration date before making a purchase, and 84.97% are able to recognize signs of product deterioration. Regarding the presence of potentially harmful substances, 75.43% of respondents are aware that canned foods may contain harmful elements to health. These findings indicate a relatively high level of awareness among Algerian consumers about the risks associated with canned foods. However, further awareness-raising efforts are needed to enhance public understanding of health risks and promote safer consumption practices.

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1. Introduction

Canned foods are widely appreciated for their convenience, long shelf life, and economic accessibility, thus meeting the growing demand for quick and easily available food solutions [1,2]. However, their consumption raises concerns regarding public health, particularly due to the potential presence of chemical substances and microplastics. Among these contaminants are bisphenol A, heavy metals, and other chemicals originating from packaging materials, which can lead to immune disorders, gastrointestinal issues, cancer, infertility, chromosomal alterations, and respiratory problems [3]. Moreover, preservation processes, while prolonging the products' shelf life, can alter the nutritional properties of food and mask signs of degradation, thereby increasing the risks of food poisoning [4,5].

Canned foods have become essential components of the diet, both in urban and rural settings [6]. However, the extent of consumer awareness regarding the potential risks associated with these products remains poorly documented. An informed population is crucial to reduce risky behaviors, encourage healthier food choices, and promote food safety practices [7,8]. Consumer perception, their ability to identify signs of product

deterioration, and their understanding of associated risks play a key role in preventing health issues related to these foods. While global food safety awareness campaigns are on the rise, few initiatives have been implemented to assess or improve Algerian consumers' knowledge about the risks associated with canned foods. A better understanding of their perceptions and practices is needed to fill existing gaps and effectively guide public policies.

This article aims to evaluate the level of knowledge among Algerian consumers about the potential risks related to canned food consumption and to identify key risk behaviors, such as the lack of awareness regarding signs of product deterioration (e.g., bulging, foul odor, etc.) and dangerous substances they may contain (e.g., preservatives, heavy metals, BPA, phthalates).

2. Materials and Methods

2.1. Study area

Our study focused on individuals residing in Algeria, a country spanning 2,381,741 km² with a population of 43.9 million as of 2020. The population is distributed across 58 provinces [9].

The survey was conducted over a three-month period, from January to May 2022.

2.2. Study population

The study focused on individuals of both sexes, of adult age, residing in various provinces across the country. Participants represented a diverse range of educational backgrounds, professions, and family situations.

The study population comprised 639 individuals who responded to our questionnaire.

2.3. Questionnaire description

The questionnaire consists of 12 questions arranged in a specific order, with both single and multiple-choice response options. It is divided into two distinct sections:

The first part includes 5 questions aimed at gathering general information about the participants, such as their gender, age, education level, monthly income, and family status.

The second part consists of 7 questions designed to assess the level of awareness among Algerian consumers regarding the potential risks associated with the consumption of canned foods.

2.4. Data processing:

The collected data were entered and processed using Microsoft Office Excel 2019.

3. Results

3.1. Demographic information

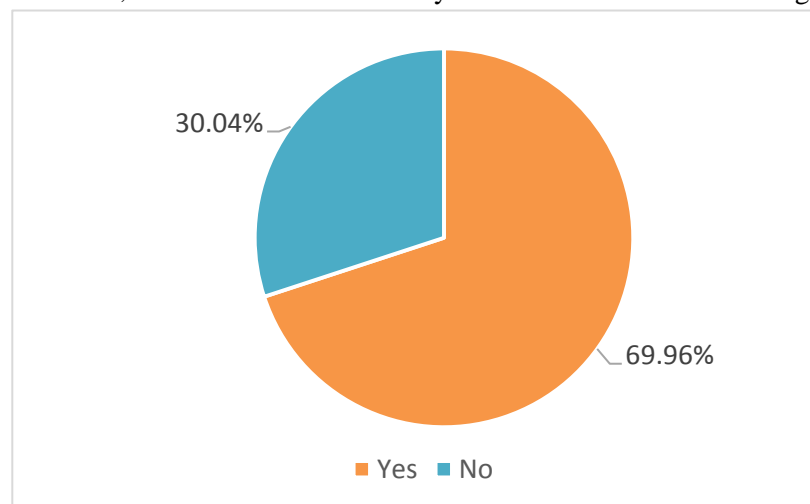
A total of 639 individuals participated in the study by completing the 800 questionnaires distributed, resulting in a response rate of 79.87%. Among the respondents, 59.93% were women, and nearly 80.91% reported being single. All participants reside in Algeria (Table 01).

Table 1. Demographic information.

| Variables | Number of respondents N = 639 | Percentage (%) |
|------------------------------|-------------------------------|----------------|
| Gender | | |
| Male | 256 | 40,06 |
| Female | 383 | 59,93 |
| Age group | | |
| 18-30 | 523 | 81,84 |
| 30-50 | 96 | 15,02 |
| >50 | 20 | 3,12 |
| Education level | | |
| Primary school | 13 | 2,03 |
| Secondary school | 51 | 7,98 |
| University-level | 575 | 89,98 |
| Monthly revenues (DA) | | |
| < 20000 | 400 | 62,60 |
| 20000-80000 | 192 | 30,05 |
| > 80000 | 47 | 7,35 |
| Family status | | |
| Married | 122 | 19,09 |
| Single | 517 | 80,91 |

3.2. Regular consumption of canned food

The majority of respondents, 69.96%, reported regularly consuming canned foods. However, 30.04% indicated that they do not consume them on a regular basis (Figure 1).

**Figure 1.** Regular consumption of canned food.

3.3. Participants' opinions on the nutritional value of fresh and canned foods.

The Figure 2 presents the participants' opinions on the nutritional value of fresh versus canned foods. The majority, 86%, expressed the belief that canned foods are more harmful to health compared to fresh foods. In contrast, only 3% of respondents thought

that canned foods were better for health. A smaller portion, 11%, felt that the nutritional value of both fresh and canned foods was the same.

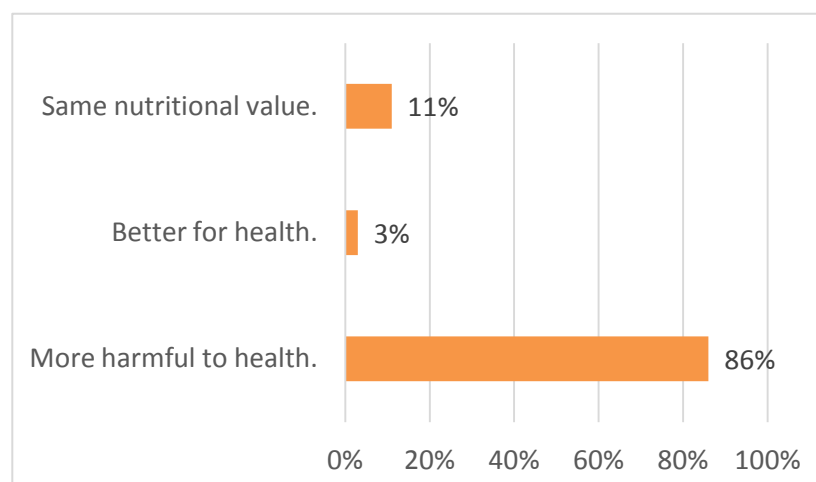


Figure 2. Participants' perceptions of the nutritional value of fresh vs. canned foods.

3.4. Factors influencing the choice of canned food brand

The most significant factor influencing the choice of canned food brand is price, with 30% of respondents prioritizing it. This is followed by habit, with 27% indicating that their purchasing decisions are influenced by familiar practices. The physico-chemical composition of the product is another important consideration, accounting for 21% of responses, while packaging plays a role for 12% of participants. Finally, advertising is the least influential criterion, with only 10% of respondents citing it as a factor in their decision-making (Figure 3).

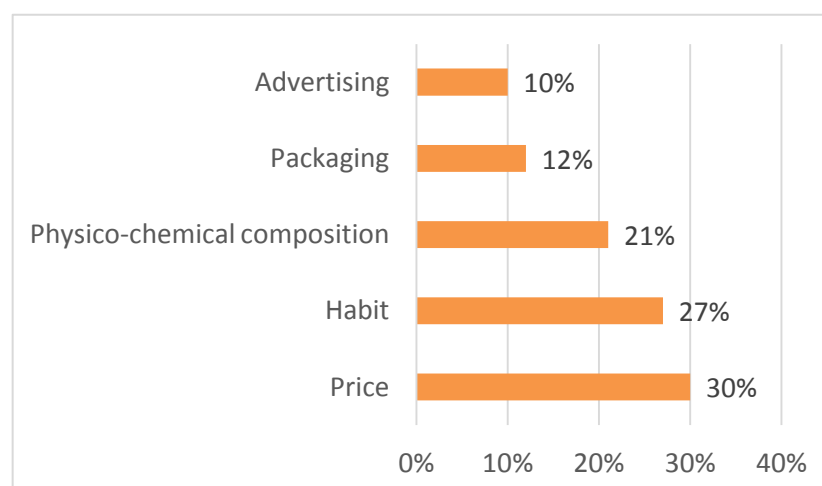


Figure 3. Participants' preferences when selecting canned foods brand.

3.5. Consumer behaviors regarding the verification of the chemical composition and expiration date of canned foods before purchase

The majority of respondents, 84.97%, confirmed that they check both the composition and expiration date prior to buying canned foods. In contrast, a smaller proportion, 15.03%, do not verify these details before making their purchase (Figure 4).

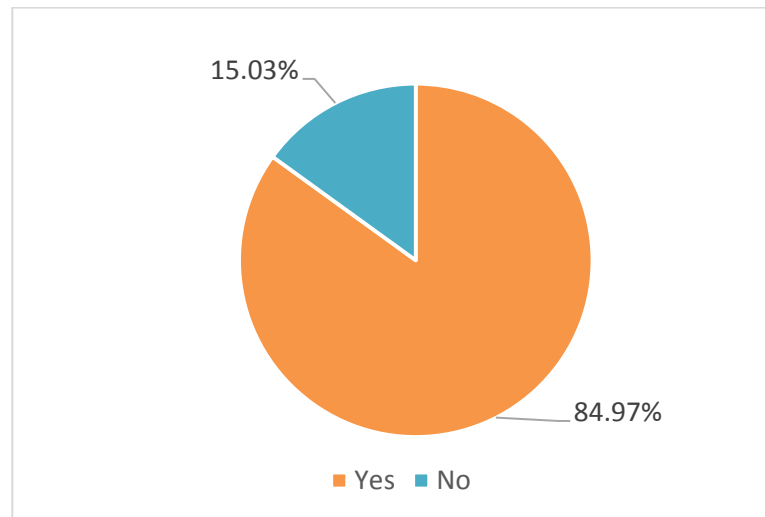


Figure 4. Verification of the chemical composition and expiration date of canned foods before purchase.

3.6. Knowledge of signs of spoilage in canned foods

The figure 5 illustrates the respondents' awareness of the signs of spoilage in canned foods. It shows that the majority of participants (54.77%) are familiar with the indicators of spoilage in these products. In contrast, 45,23% are unaware of these signs, indicating a significant gap in knowledge regarding the proper identification of spoiled canned foods.

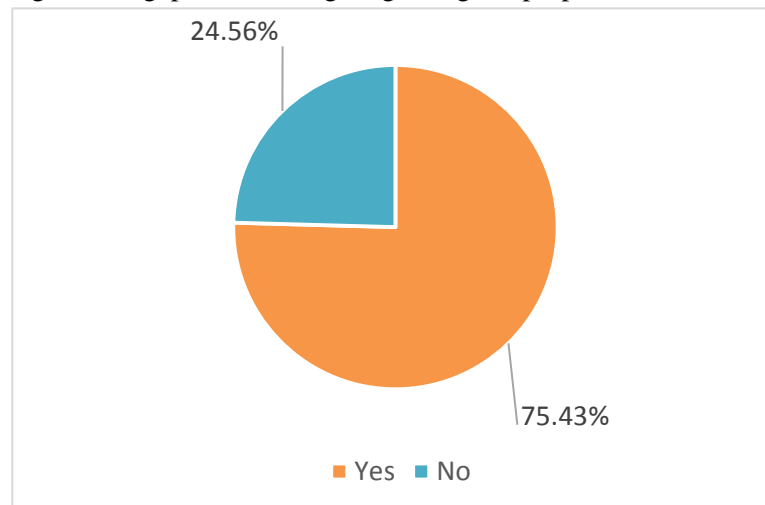


Figure 5. Awareness of signs of spoilage in canned foods.

3.7. Knowledge of canned food spoilage signs

The figure 6 presents the most commonly cited signs of spoilage in canned foods according to the respondents. The most frequently mentioned sign is a change in odor, with 27% of participants identifying it as a key indicator of spoilage. This is followed by a bulging can, which 24% of respondents cited as a warning sign. An abnormal color comes next, reported by 21% of participants, while an unusual appearance was mentioned by 17%. Lastly, a bad taste was the least frequently cited sign, with only 11% of respondents identifying it as a sign of spoilage.

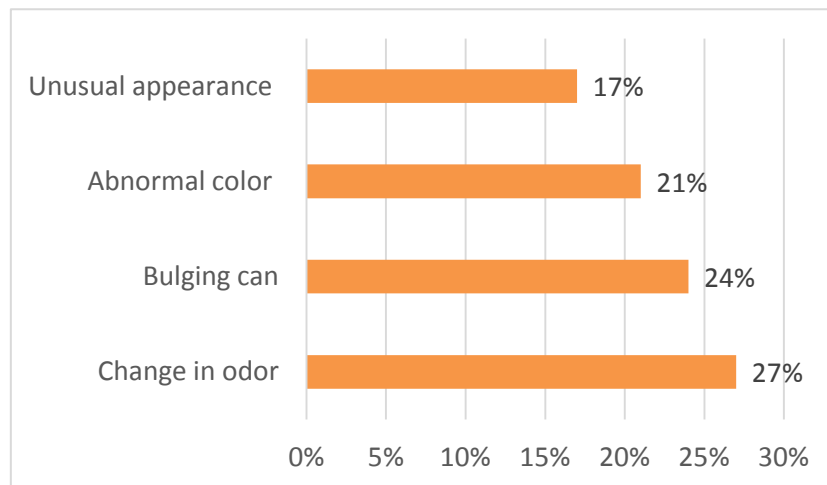


Figure 6. Signs of canned food spoilage according to respondents.

3.8. Potential presence of hazardous substances in canned foods

The figure 7 shows that the majority of respondents (75.43%) are aware that canned foods may contain substances potentially hazardous to health. In contrast, a smaller proportion (24.56%) are not aware of this.

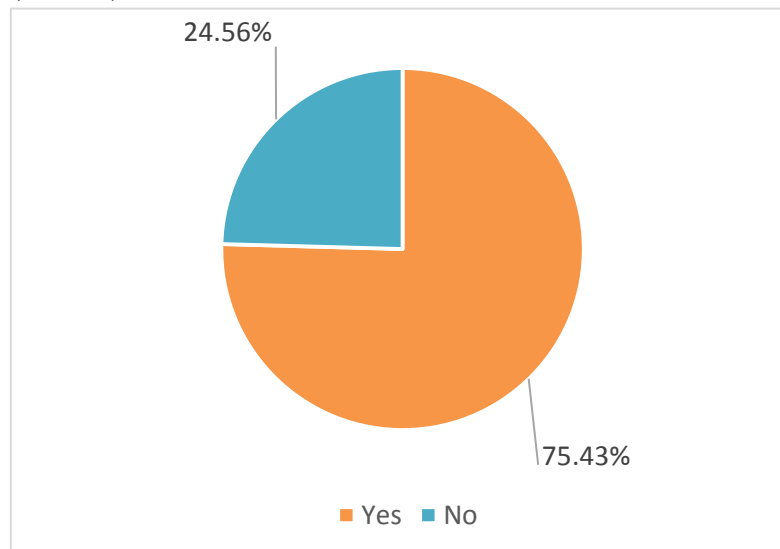


Figure 7. Respondents' knowledge of the potential presence of hazardous substances in canned foods.

4. Discussions

The results of this study reveal several key elements concerning the perception, knowledge and behavior of Algerian consumers with regard to canned foods.

Firstly, it appears that the majority of respondents regularly consume canned food (69.96%). In contrast, contradictory results were obtained in Ethiopia, where the majority of respondents (71.68%) reported that they do not frequently consume or purchase canned foods [5]. In Algeria, this consumption trend is mainly motivated by practical factors such as price and availability, as shown by the priority given to cost (30%) when choosing products. This confirms that canned food is perceived as an

economical solution, particularly in a context where food budgets can be tight. Habit (27%) also plays a significant role in the choice of canned food. This suggests that, for a large proportion of consumers, canned food is an integral part of their diet, probably because of its convenience and availability. However, although these criteria for choice are obvious, other factors, such as physico-chemical composition (21%), reveal that some consumers are aware of the importance of product quality, over and above considerations of price and habit.

Regarding the verification of information on packaging before purchase, approximately 85% of participants report checking the chemical composition and expiration date of canned foods before buying them. This behavior reflects increased vigilance and a growing awareness of the potential risks associated with consuming these products. However, a minority (15%) does not pay attention to this information, which could be attributed to a lack of awareness or some degree of negligence on the part of these consumers, despite rising concerns about food safety. Similar findings were reported in a study conducted in Iraq, where the majority of respondents stated that they prioritize reading expiration dates and ingredient lists on packaging before making a purchase [7].

Furthermore, the majority of participants (84.97%) claimed to know the signs of spoilage in canned foods, which is a positive indicator in terms of awareness and food safety. However, the fact that 15% of respondents were unaware of these signs highlights a lack of awareness that could put their health at risk. The most commonly cited signs of spoilage are a change in smell (27%), bulging packaging (24%) and abnormal color (21%). This knowledge is essential to avoid the risk of food poisoning, which can result from eating spoiled food. A study conducted in Poland revealed that the majority of food products are discarded due to spoilage. The main causes identified are inadequate handling of food after bringing it home, failure to adhere to proper storage conditions, and inappropriate practices regarding uneaten meals [10].

Regarding the presence of hazardous substances in canned foods, 75.43% of respondents are aware that these products may contain substances potentially harmful to health. This awareness is significant, as it indicates that consumers recognize the risks associated with chemicals such as heavy metals, bisphenol A, and other contaminants. However, the relatively high proportion of uninformed individuals (24.56%) highlights the need for further education on this issue. Similar findings were reported in Ethiopia, where 64.15% of respondents were also aware of the health risks associated with canned foods [5]. However, these results differ from those obtained in Korea, where two-thirds of respondents reported a lack of information about the additives used in food packaging [11].

5. Conclusion

This study highlights the growing importance of raising awareness among Algerian consumers of the risks associated with consuming canned food. The results suggest that although the majority of respondents have a good knowledge of the signs of spoilage and the risks associated with the chemical composition of canned foods, further efforts are needed to increase public education. In particular, it is essential to provide clear and accessible information on the specific dangers of the chemical substances present in canned foods and to promote food safety practices.

Consumer behavior is influenced by factors such as price, habit and the physico-chemical composition of products, which highlights the need to broaden public policies and awareness campaigns to include not only food safety but also the impact of food choices

on long-term health. Health authorities should therefore become more involved in information and training initiatives to raise consumer awareness of the risks of canned foods and encourage safer behavior, thereby contributing to better prevention of public health problems.

Patents

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