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Awareness and Expectations of Polish Consumers Regarding Edible Niche Oils as a Food Product

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Abstract: Despite their nutritional value and increasing supply of oils from unconventional plants to the oil industry, edible niche oils do not have high sales. The market for niche oils is geared toward an ever-growing volume of conscious consumers distinguished by their sensitivity to product quality, packaging type, price, sourcing technology, and variety of product use. In the literature, there is a lack of research on consumer preferences and expectations of niche oils. This article continues a series of studies on niche oils aimed at determining the proper technological parameters for production, discussing the economic aspects of niche oil production, and researching consumer behavior concerning these products. It aims to determine Polish consumers' awareness and expectations of edible niche oils, select the oils of most significant interest to consumers, and determine the factors influencing consumers' propensity to try edible niche oils. The survey, in the form of a questionnaire, was conducted using the CAWI method on a representative sample of 1000 Polish consumers. Consumers were divided into four segments: those who regularly consume niche oils, consumers who have experience with niche oils, consumers who are familiar with them but have not tried them, and consumers who do not know niche oils. Data were analyzed collectively and separately for each segment using one-way ANOVA. Grape seed oils and edible castor oil are the most interesting to consumers. Consumers' purchasing decisions are influenced by price, nutrient content, and sustainable production free of GMO products and harmful chemicals. Therefore, manufacturers should increase the availability of certain oils (e.g., peanut oil). Sensory qualities, place of production, and brand recognition are secondary selection criteria. Future research should focus on the organoleptic evaluation of products available on the market. Research results may be used to create production and marketing strategies to make niche oils more attractive to consumers.

Keywords: buying factors; consumer acceptance; consumer preferences; healthy food; niche oils

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1. Introduction

Consumer interest in conscious consumption is growing steadily in developed countries. It is not only related to the desire to lead a healthy lifestyle but also to care for the environment. Conscious consumption is making consumer choices based on knowledge of environmental, political, and social consequences. It allows consumers to influence the environment (i.e., recycling, disposal) and shape goods' production and distribution processes. Conscious consumption is seen as a critical aspect of sustainable development on which the achievement of long-term economic growth depends. It aims to meet current and future generations' environmental and social needs [1,2]. Achieving this is hindered by differences between consumer attitudes and behaviors [3].

As the number of conscious consumers grows, so does the demand for products produced in an environmentally friendly and sustainable manner. Consumers are increasingly paying attention to whether the products they buy were created using only natural

ingredients and their production involved leaving the smallest possible carbon footprint and other factors that negatively affect the environment (i.e., harmful chemicals). There is growing interest in products sourced using zero-waste policies from raw materials that have a variety of uses in many industries. It is particularly evident in the food sector.

Any product that is processed or not suitable for human consumption is considered food [4]. Additionally, in the food sector, it is important to take into account packaging, which accounts for a huge portion of every household's waste. The role of conscious consumption in the food sector is causing the market to increase the supply of sustainably produced products. Everyone needs to have a balanced diet, defined by the FAO as ensuring food security and a healthy diet. [5]. Also, organic food consumption and the green marketing paradigm are elements of a sustainable diet [6].

Recent years have seen an increase in the popularity of studies focusing on the food sector. These studies often represent the comparability of data, variability of production processes, and consumer preferences [7]. The latter, in particular, is an essential issue in understanding the consumer decision-making process. To adequately understand this process, it is necessary to obtain reliable and transparent research results. This is especially true considering consumer declarations, which often differ from their actual behavior [8]. The progressive globalization of economies, noticeable especially in developed countries, is causing consumer preferences to evolve on an unprecedented scale [9].

Consumers' changing food preferences intensify their interest in products that are unusual for the average consumer. In Europe, features and experiences related to a product's impact on human health [10,11], sensory attributes, functionality, and nutritional value [12] are crucial. Product packaging and product origin are of little importance [13]. Niche market products (i.e., locally grown food, organic food) are becoming increasingly popular. Consumer attitudes and preferences toward such products have often not been identified [14]. Such is the case with raw vegetable oils, which are increasingly finding their way into the diet of the average European. Plant-produced edible oils are often characterized by their versatile use in various industries.

The factors discussed were the basis for starting a study of niche oils, which are becoming increasingly popular in the European market. Analysis of the literature made it possible to formulate research questions that require answers based on empirical data:

RQ1: What are consumers' preferences and expectations of niche oils?

RQ2: What should a good niche oil have to become an attractive product for consumers?

RQ3: What prospects are there for developing the niche oil sector, and what trends prevail?

2. Literature Review

The multidirectional use of vegetable oil influences the development of the oil industry, for which the primary raw materials are rapeseed, sunflower, olive trees, soybeans, and Guinea palm (oil palm) [15,16]. These plants are a valuable source of oils, animal feeds, and functional foods [17]. However, in the vegetable oil market, luxury oils are available in addition to those commercially produced oils mentioned above [18]. These oils are made from the seeds or fruit pulp of plants whose primary purpose is not processing in the oil industry, so they are often called niche oils [19,20]. Due to limited access to raw material and its relatively low oil content compared to oilseed crops, niche oils are produced on a small scale (usually in local oil mills). In addition, they have much better health-promoting properties than conventional oils [21,22].

Their physicochemical properties and organoleptic qualities influence the quality of niche oils. They depend on storage conditions and time, but most importantly, on the technology used to obtain them. Their physicochemical properties and organoleptic qualities influence the quality of niche oils. They depend on storage conditions and time, but most importantly, on the technology used to obtain them [23,24]. Vegetable oils are obtained by mechanical pressing or solvent extraction [25]. The technology for getting niche oils should be as simple as possible and meet the sustainability criteria (i.e., reduction of chemical consumption, zero waste, the use of post-production waste, reduction of energy

consumption). There are no regulations regarding niche oil production within the European Union. All regulations apply to the production of mass oils [26,27]. These conditions are met by low-temperature pressing, which is the recommended method for obtaining most niche oils. An essential aspect of improving the quality of niche oils, but deteriorating their shelf life, is that they do not have to undergo the mechanisms of refining processes [28,29].

The niche oils produced in this way are characterized by intense color, clarity, and a fragrance characteristic of the plant from which they were extracted. The essential components of niche oils are monounsaturated (MUFA) and polyunsaturated (PUFA) fatty acids [30]. They should be present in appropriate proportions. In a high-quality product, the MUFA:PUFA ratio should be 1:2–5 [31]. Most niche oils meet this criterion. In addition, they are distinguished by their high content of vitamins, minerals, and other biologically active substances important for human health, i.e., phenols, sterols, tocopherols, and carotenoids [32,33]. Niche oils are perishable products. They should be stored out of sunlight at 10–15 °C, such as in tinted glass packaging, to prolong their shelf life [34]. High-quality oil must be properly sourced, processed, and stored to meet consumers' growing demands.

There is a lack of collaborative research in the literature on niche oils and how consumers perceive them. The primary purpose of niche oils is consumption. Its volume in the European Union is increasing yearly. The niche oil market is oriented toward the ever-growing volume of consumers who are aware and knowledgeable about the health-promoting aspects of food, follow a balanced diet, and are constantly looking for new functional products [35,36]. These consumers generally seek products with high nutritional value and good organoleptic qualities [37]. The lack of legal regulations on the production of niche oils in the European Union means that the parameters of niche oils are selected by producers based on consumer preferences. Organoleptic characteristics, physical and chemical properties, and individual consumer preferences are evaluated. In the niche vegetable oil sector, consumers are distinguished by five characteristics: sensitivity to product quality, sensitivity to packaging type, sensitivity to price, sensitivity to sourcing technology, and sensitivity to the variety of product use [38,39]. Niche oils, compared to most industrial lubricants, meet these criteria. For this reason, in recent years, there has been a significant increase in the sales of these oils [40,41] and an expansion of manufacturers' offerings to include oils from increasingly unusual plants, e.g., nigella, corn, raspberry, tomato, plum, grape, and mustard [42,43].

Consumers' dietary preferences are not motivated only by factors, i.e., wanting to lead a healthy lifestyle, caring for a balanced diet, or being guided by product properties [44,45]. Psychological factors (e.g., personal experiences, perceived benefits) [46,47] and product-related factors (e.g., price, taste, availability) [48,49] play an essential role in consumers' decision to choose a niche oil. When it comes to buying plant-based products, consumers primarily value freshness, appearance and price [50,51]. For producers, on the other hand, the consumer must perceive niche oil as a luxury good since the price of such a product will have to correspond to its uniqueness [52]. The niche oil's final price is disproportionately higher than conventional oils. Distribution channels and their length are also important, as they affect the price and quality of the product delivered to consumers [53]. Oils with a possibly short distribution channel are the most popular. Lengthening the distribution channel deteriorates the product's quality, so oils sourced directly from producers are the most popular [54]. Producers of niche oils are oriented toward increasing the availability and dissemination of information about the effects of niche oils on human health [55]. This increases their investment in marketing campaigns to increase consumer awareness and brand recognition [56].

Consumer food choice behavior is complex and dynamic. In particular, consumers depend on the product's characteristics, the consumer profile, and the context in which the product is presented [57,58]. New food philosophies have emerged in recent years linked to different diets and lifestyle changes. In addition, consumers are constantly enriching their diets with new products [59]. Regardless of the factor that motivates consumers to

choose products to enrich their diets, niche oils can be a good component of a daily diet. The only question that remains is how to study consumer preferences and expectations.

In the literature, quantitative research using a research technique in the form of an anonymous survey questionnaire [60,61] is most often used to study this type of problem. This type of survey increases the chance of obtaining reliable results regarding potential consumer behavior, their reactions to the actions taken, and their opinion regarding the problem being studied [62]. In addition, when combined with information technologies, it increases the reliability and effectiveness of the survey and improves the statistical analysis of the results obtained [63]. Other researchers have also previously used surveys to explain similar problems. Wilkinson et al. thus examined Australian consumers' awareness and acceptance of edible insects [64], Ben Hassen et al. examined changes in eating behavior during the COVID-19 pandemic [65], and Savelli et al. examined consumer attitudes and behavior toward food quality [66]. Accordingly, it was decided to use this research technique to investigate the problems addressed in this publication.

Motivation of the Study

Given the properties discussed, niche oils should be a product attractive to consumers. However, despite their qualities and many marketing campaigns, their sales volume is not high. The available literature lacks an answer explaining the problem at hand. It creates a research gap that needs to be filled with empirical research. Further research is needed to determine what factors motivate consumers to purchase niche oils, how consumers perceive this product, and whether they could be permanently incorporated into the average consumer's daily diet. This publication continues the more influential research on niche oils that began in a previously published literature review. There, the conceptual framework of the entire research cycle was presented, and it was pointed out that the topic of niche oils should be supported by technological research and consumer studies [67]. The aim of this study is to examine Polish consumers' awareness of and preferences for edible niche oils. Consumers participating in the survey were characterized according to their experience with niche oils and segmented. The consumer awareness of niche oils was determining, selecting the oils of most significant interest to consumers, and identifying the factors influencing consumers' willingness to consume edible niche oils. The research conducted and the analysis of the conclusions will allow the definition of factors and product characteristics to improve the sales of niche oils and increase their share in the daily diet of conscious consumers.

3. Materials and Methods

3.1. National Survey

A CAWI (Computer-Assisted Web Interview) survey was conducted to investigate Polish consumers' awareness and expectations of edible niche oils. A key advantage of this method is the space for maneuvering for respondents and interviewers. Respondents have a more extended period of time to get used to participating in the survey and the opportunity to respond through various devices. Interviewers can deliver the online questionnaire to the target anywhere at any time. The questionnaire, consisting mainly of closed-ended questions, was chosen for its effectiveness because the research questions should be well operationalized, allowing for easy and immediate understanding [68,69]. A representative sample of consumers (n = 1000) was recruited at the national level through a market research company (IMAS International, Wroclaw, Poland). The survey included participants from the voivodeships of Lower Silesia (n = 74), Kuyavian-Pomeranian (n = 66), Lublin (n = 59), Lubusz (n = 22), Lodz (n = 67), Lesser Poland (n = 92), Mazovian (n = 142), Opole (n = 29), Subcarpathia (n = 59), Podlaskie (n = 25), Pomerania (n = 59), Silesia (n = 119), Swietokrzyskie (n = 23), Warmia-Masuria (n = 28), Greater Poland (n = 93) and West Pomerania (n = 43). The main criterion for consumer inclusion or exclusion was that respondents should be a group of Polish residents between 18 and 60. A comparable number of men and women were needed to participate in the survey. The participants' percentage from

each voivodeship was selected based on the population density of those areas relative to the country. This measure ensures that the surveyed sample is representative. Each respondent was informed that his or her answers would be used anonymously in a scientific publication. They all gave their consent to this. At the consumer recruitment stage, 57 were rejected because they did not meet the criteria discussed.

The interview performed based on the prepared questionnaire consists of four sections. The first section contained consumer demographics, defined by questions related to gender, age, education, and household income. The second section consisted of questions designed to define niche oils and their purpose. For the survey, consumers (n = 1,000) were divided into four segments according to their experience with niche oils. The first segment consists of consumers who know what niche oils are and have tried one at least once in their lives (n = 501). The second segment comprises consumers who know what niche oils are but have never had the opportunity to try one (n = 295). The third segment comprises consumers who regularly consume niche oils (n = 43). The fourth segment is consumers who have never heard of niche oils and have not been able to try them (n = 161).

In the third section, consumers were asked to indicate their familiarity with the twenty-three most popular niche oils available on the European market (selection of oils based on Czwartkowski et al., 2022 [67]) and their willingness to try them. The degree of consumer interest in niche oils was determined using a seven-point Likert scale, where 1 = 'highly unlikely' and 7 = 'highly likely'. The last section asked consumers about factors influencing their willingness to try edible niche oils. Again, a seven-point Likert scale was used (where 1 = 'highly unlikely' and 7 = 'highly likely'). The survey took 10 min, and data were collected over two weeks. Participation in the survey was voluntary, and consumers received a small financial reward (PLN 10) in exchange for their involvement.

3.2. Data Analysis

Data were analyzed using a combination of descriptive techniques (means and frequencies of indications, percentages) using Microsoft Excel, including consumer segmentation based on factors such as gender, age, education, and monthly household income, and analysis of variance (ANOVA) using PS IMAGO PRO 8.0 (IBM SPSS). A three-step research methodology was followed (Figure 1):

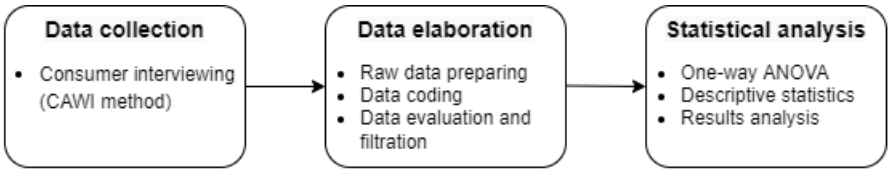


Figure 1. Methodological framework.

4. Results

4.1. Consumer Demographics

A slightly higher percentage of male consumers (50.4%) took the survey. The distribution of consumers by age, education, and income groups were similar, with minor exceptions. Consumers from different age ranges formed groups ranging from 16.4% to 19.4% of respondents, except for the 18–24 age bracket, which stood apart, accounting for 10.6% of all respondents. Within the educational groups, consumers with technical education were the most numerous (40.2%) and the least numerous were in primary education (7.8%), reflecting a cross-section of Polish society. Some respondents (13.4%) refused to state their monthly income. Among consumers who were classified by income, people with the highest level of income (≥15,000 PLN per month) were the least numerous (1.6%), which is not unexpected (Table 1).

Table 1. Consumer demographics and awareness of edible niche oils.

		Have You Previously Consumed Any Niche Oil?		
	Total Sample ***n* = 1000**	**Yes** ***n* = 501**	**No** ***n* = 295**	**Niche Oils Consumers** ***n* = 43**
Sex				
female	49.4	43.3	57.3	30.2
male	50.6	56.7	42.7	69.8
Age (years)				
18–24	10.6	12.6	7.8	18.6
25–31	17.7	25.5	6.1	23.3
32–38	19.4	17.4	22.7	11.6
39–45	18.1	13.2	30.2	4.7
46–52	17.8	12.2	24.1	11.6
53–60	16.4	19.1	9.1	30.2
Education				
primary school	7.8	3.4	16.6	4.7
secondary school	29.8	27.1	41.7	25.6
technical/trade certificate	40.2	43.3	25.4	39.5
undergraduate university	22.2	26.2	16.3	30.2
Monthly household income (PLN)				
≤5000	48.7	49.2	67.7	26.8
5001–10,000	32.0	43.8	28.0	51.2
10,001–15,000	4.3	5.7	2.8	12.2
≥15,000	1.6	1.3	1.5	9.8
How do you understand the concept of 'niche oil'?				
oil with a high nutrients content	45.5	49.1	60.0	55.8
oil with high sensory values	24.6	28.5	30.2	13.9
oil obtained from the seeds of nonindustrial plants	71.0	86.2	72.2	81.4
oil with a short shelf life	31.4	33.5	36.9	20.9
oil with the appropriate ratio of Ω-3 and Ω-6 fatty acids	23.6	24.7	21.4	23.3
oil produced with the use of specialized technologies	28.6	29.3	26.4	30.2
oil produced by the policy of sustainability	46.0	45.7	50.2	48.8
oil produced in small oil plants	70.8	72.6	69.5	83.7
virgin oil	20.1	18.9	23.4	18.6
oil that requires special storage conditions	24.3	26.3	24.1	20.1
GMOs and chemicals harmful free	50.7	52.7	51.2	53.5
How do you think what are niche oils used for?				
Food additives	83.2	94.8	90.1	95.4
Dietary supplement additives	34.5	35.1	46.8	25.6
Direct consumption	65.0	79.0	65.1	51.2
Cosmetics additives	29.9	29.5	42.7	32.6
Food thermal processing	17.9	17.6	24.4	20.9
Natural medicine	40.2	80.2	48.8	61.5

Note: Data are presented as percentages. Some 16.1% of consumers (*n* = 161) had never heard about niche oils., while13.4% of consumers (*n* = 134) elected not to disclose their household income.

4.2. Consumer Awareness and Consumption of Edible Niche Oils

The majority of consumers (54.4%) have tried an edible niche oil at least once in their lives, and 4.3% (*n* = 43) constitute a group of people who regularly consume niche oils (Table 1). The most recognized niche oils on the Polish market are linseed oil (733 indications), hemp oil (669 indications), and nigella oil (588 indications). In contrast, linseed (182 indications), mustard (179 indications), prune seed (178 indications), safflower (174 indications), and rice

bran (168 indications) oils are the least recognized (Figure 2), likely reflecting their lower availability and/or sensory appeal.

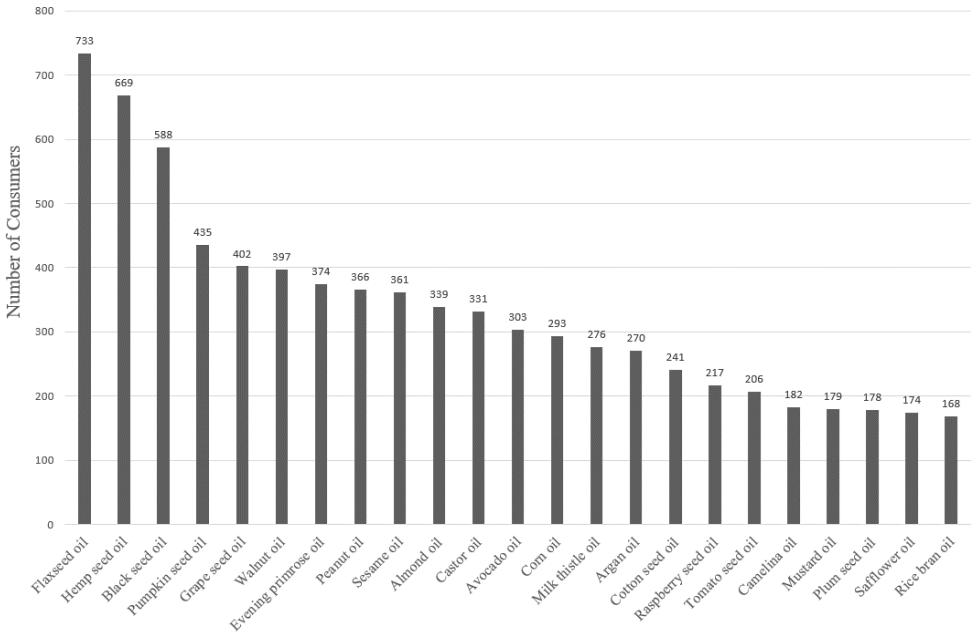


Figure 2. Histogram showing consumer (n = 1000) awareness of popular edible niche oils.

Several interesting trends were observed among respondents when considering the awareness and consumption of edible niche oils. Among those who have tried niche oil at least once in their lives (n = 501), men dominate (56.7%). The male gender also dominates among those who regularly consume niche oils (n = 43), and their percentage is as high as 69.8%. In contrast, women dominate the group that has never tried any niche oil (n = 295), where they account for 57.3% of respondents. This trend likely reflects more extraordinary courage among men to try new products [70,71]. Consumers of niche oils are predominantly young ($\leq$31 years old) and older ($\geq$53 years old).

Polish consumers correctly define the term 'niche oil'. More than 70% of respondents consider oil made in small production facilities, from plants not intended for industrial production, as niche oil. According to respondents, a good niche oil should be characterized by production without contact with GMOs and harmful chemicals (50.7% of respondents), production in line with sustainable development policies (46.0%), and high nutrient content (45.5%). Respondents indicate that niche oils are mainly intended as food additives (83.2% of respondents) and also for direct consumption (65.0%). As many as 82.1% of those questioned felt that niche oils should not be used for the thermal processing of food, which indicates a correct understanding of the purpose of niche oils by Polish consumers.

4.3. Segmentation of Consumers Based on Experience with Edible Niche Oils

The demographics of consumers in each segment are relatively similar (Table 1). It is noticeable that the segments of consumers who have any experience with niche oils (Segment 1 and Segment 3) are characterized by a higher percentage of educated people and those with higher incomes than the segments of consumers who have never tried niche oils. It is likely related to the perception of niche oils as luxury goods [46,47,52]. It is also interesting to note that each segment similarly defines niche oils and their purpose. Based on this, it can be concluded that Polish consumers understand the terms 'niche oil' and instinctively give similar answers.

There is a lack of research in the literature on consumer awareness and expectations of niche oils. However, several works thematically related to niche oils confirm the results. Ostfeld's work indicates that it is essential to consumers that oil production technology

should be environmentally friendly, minimizing environmental impact [72], which confirms the indications of almost 50% of respondents. On the other hand, Choudhary proved that many consumers lack awareness of the health benefits of using raw vegetable oils in their daily diet, even though they use them [73]. This finding is supported by the fact that consumers with no experience with niche oils indicated in the majority (60%) that niche oils are high in nutrients. The impact of the perception of niche oils as luxury goods is confirmed by Pandey in his research, indicating price as a significant factor in the decision to purchase unconventional oils [74]. His research explains why the experience of niche oils is predominant among the more affluent population segment. The dominant role of production technology and nutrient content in the decision to purchase edible oils is confirmed by Ali, defining these two factors as key for informed consumers [75].

4.4. Consumer Willingness to Try Edible Niche Oils

Consumers indicated which selection of 23 popular niche oils available on the European market they would like to try. Significant differences were observed between the reported average scores for different niche oils (Table 2), from 3.32 for prune seed oil to 4.58 for flaxseed oil. In addition to linseed oil, consumers identified castor oil (4.32) and grapeseed oil (4.29) as oils they would try. The choice of castor oil is surprising because crude castor oil contains the poisonous substance ricin and requires refining for purification [76]. Sesame oil (4.10), argan oil (4.08), hemp oil (4.07), nigella oil (4.04), and almond oil (4.01) also scored above average.

Table 2. Consumer willingness to try edible niche oils.

	Total Sample *n* = 1000	**Yes** *n* = 501	**No** *n* = 295	**Niche Oils Consumers** *n* = 43	*p*
	If you had the opportunity, how likely would you be to try a . . .				
almond oil	4.01 c	4.39 cd	5.06 c	4.97 b	0.007
argan oil	4.08 bc	4.74 bc	5.23 bc	4.69 bc	0.016
avocado oil	3.90 c	4.22 d	4.69 d	4.92 b	0.007
black seed oil	4.04 bc	4.57 c	5.17 c	4.99 ab	0.011
camelina oil	3.46 e	3.71 e	4.08 e	4.08 de	0.005
castor oil	4.32 ab	4.96 b	5.48 b	5.19 a	0.012
corn oil	3.89 c	4.03 d	5.46 b	4.77 bc	0.006
cotton seed oil	3.43 e	3.62 e	4.04 e	4.23 d	0.002
evening primrose oil	3.64 d	4.21 d	4.89 c	4.23 d	0.006
flaxseed oil	4.58 a	5.62 a	6.28 a	4.51 c	0.015
grape seed oil	4.29 ab	4.98 b	5.58 b	5.39 a	0.014
hemp seed oil	4.07 bc	4.64 c	5.20 c	4.65 bc	0.007
milk thistle oil	3.89 c	4.67 bc	4.22 e	5.35 a	0.005
mustard oil	3.59 de	3.53 e	3.95 e	4.38 cd	0.002
peanut oil	3.74 d	4.19 d	4.68 d	5.23 a	0.005
plum seed oil	3.31 e	3.58 e	3.92 e	3.88 e	0.002
pumpkin seed oil	3.91 c	4.61 c	5.34 bc	4.81 bc	0.009
raspberry seed oil	3.38 e	3.69 e	4.11 e	3.92 e	0.004
rice bran oil	3.33 e	3.57 e	3.93 e	3.73 e	0.003
safflower oil	3.32 e	3.48 e	3.97 e	3.96 e	0.003
sesame oil	4.10 bc	4.59 c	5.28 bc	5.08 ab	0.008
tomato seed oil	3.33 e	3.53 e	4.09 e	4.04 de	0.003
walnut oil	3.65 d	4.09 d	4.75 cd	4.62 c	0.005

Note: Values are means, where 1 = 'highly unlikely' and 7 = 'highly likely'. Different letters within a column indicate a statistically significant difference ($p = 0.05$, one-way ANOVA).

Average consumer responses for these oils exceeded the neutral level of 4.0. Individual consumer responses ranged from one to seven—covering a seven-point category scale. Close to the mean value results confirm the diversity in consumer attitudes and thus the need for segmentation. For this reason, an analysis of variance on subsets of consumer data

was conducted to compare the inclinations of consumers who have experience with niche oils (segment 1), those who have no experience with niche oils (segment 2), and those who regularly consume them (segment 3). The average responses ranged from 3.48 to 5.62 for segment 1, 3.92 to 6.28 for segment 2, and 3.73 to 5.39 for segment 3, indicating the diverse choices of the various segments analyzed (Table 2).

It was observed that consumers in segment 1 and segment 2 indicated linseed oil (averages of 5.62 and 6.82) and grape seed oil (4.98 and 5.58) as the niche oil they would be most willing to try. The willingness of these consumer segments to try grape seed oil is related to the popularity of grapes in the Polish market [77], and linseed oil to flax's association with the oil industry [78], so these are oils from plants well known to Polish consumers. Consumers in segment 3 would be most likely to try grape seed oil (5.39), milk thistle oil (5.35), and peanut oil (5.23). It is likely due to a desire to try new, less accessible products. In all segments, castor oil was ranked among the top choices, so it can be concluded that it is an attractive product for Polish consumers, which may be due to its unusual and rare occurrence in edible form. The niche oils with the least appeal among consumers are linseed oil (3.46), cottonseed oil (3.43), raspberry seed oil (3.38), tomato seed oil (3.33), safflower oil (3.32), and prune seed oil (3.31). These oils' lower popularity may be related to unfamiliarity with the plants from which they are extracted and/or consumer ignorance about the possibility of obtaining oils from these plants. Further research is needed to verify the lack of consumer interest in these products.

4.5. Factors Influencing Consumer Willingness to Try Edible Niche Oils

The nutritional and environmental benefits of consuming niche oils are well-documented in the scientific literature [79–81]. However, it is unknown whether and to what extent consumer awareness can promote their consumption. It raises the need to examine factors influencing the demand for edible niche oils. Consumer dietary choices may depend on organoleptic preferences, the desire to supplement the diet with nutrients, the product's price, or environmental factors (i.e., conscious consumption, organic production) [82,83]. For this reason, factors influencing consumers' willingness to try edible niche oils were investigated.

Twelve factors could influence consumer behavior in the willingness to purchase niche oils (Table 3). Significant differences were observed in the choice of factors determining purchase. For respondents, price (5.13) and high nutrient content (4.86) were essential factors in purchasing. Respondents ranked the influence of storage conditions (3.46) and brand recognition (3.23) lowest.

Table 3. Factors influencing consumer willingness to try edible niche oils.

	Total Sample ***n*** **= 1000**	**Yes** ***n*** **= 501**	**No** ***n*** **= 295**	**Niche Oils Consumers** ***n*** **= 43**	***p***
To what extent would the following factors influence your willingness to try edible niche oils?					
high nutrient content	4.86 a	5.25 a	5.32 a	4.77 a	0.001
ratio of Ω-3 and Ω-6 fatty acids	3.89 cd	3.85 d	4.05 cd	3.84 cd	0.002
high sensory values	4.49 b	4.78 ab	3.99 cd	3.96 c	0.002
price	5.13 a	5.19 a	4.96 ab	4.50 ab	0.001
storage conditions	3.46 e	3.70 de	3.76 d	3.42 e	0.002
packaging type and convenience of use	3.53 de	3.74 de	3.68 de	3.38 e	0.002
brand recognition	3.23 e	3.29 e	3.18 e	3.57 de	0.002
product availability	4.74 c	4.01 cd	3.78 d	4.65 a	0.001
product promotion	3.59 de	3.67 de	3.55 de	3.26 e	0.002
sustainability production	4.48 b	4.64 b	4.75 bc	4.62 a	0.002
GMOs free	4.56 b	4.86 ab	5.04 a	4.46 ab	0.003
chemicals harmful free	4.76 ab	5.06 a	5.21 a	4.69 a	0.002
local product	3.88 d	3.65 de	3.68 de	3.67 d	0.002

Note: Values are means, where 1 = 'highly unlikely' and 7 = 'highly likely'. Different letters within a column indicate a statistically significant difference ($p = 0.05$, one-way ANOVA).

Consumers were also guided by a seven-point scale when evaluating factors influencing their willingness to try edible niche oils. For all consumer segments, one of the most significant factors influencing consumers' willingness to try niche oils is that they are free of harmful chemicals. It means that consumers expect an oil whose production is devoid of contact with harmful chemicals. Consumers who regularly consume niche oils (n = 43) indicated 'product availability' as a key factor in purchasing niche oil. The Polish market may lack a supply of at least some edible niche oils. Not surprisingly, this segment of consumers indicated less-available oils as more attractive in the previous analysis. The results show that 'storage conditions' and 'packaging type and convenience use' do not influence consumers' purchasing decisions. It suggests that consumers surveyed do not perceive tangible benefits from maintaining proper oil storage conditions, and/or other factors significantly influence their purchasing decisions. Also surprising is the neutral effect of 'high sensory values' on purchase decisions, which may indicate that consumers are more guided by health and environmental values than organoleptic values when choosing niche oils. Although respondents defined niche oil as a product made in small oil mills, the 'local product' factor does not significantly affect their purchase intention (3.88). Comparing this result with those relating to high nutritional content (4.86), sustainable production (4.48), GMO-free products (4.56), and products free of harmful chemicals, (4.76), it can be concluded that for Polish consumers, it is not important whether a product is locally or mass-produced. The physical and chemical properties it possesses, its lack of contact with modified foods, and the minimal environmental impact of its production are what matters.

5. Discussions

The results of this study are confirmed in the research by D'Adamo et al., who indicated that consumers of olive oil (a commercialized niche oil) attach great importance to the natural origin of oil ingredients, organic production, and quality parameters of the final product [84]. Also, in his work, Hoskins confirms that consumers consider bioproducts as goods that improve their health and the environment. Based on consumers' pro-environmental intentions, it can be concluded that such products will be characterized by increased consumer interest. However, it is essential to note the inconsistency in consumers' purchase intentions and actual behavior [85].

For consumers in each segment under discussion, price plays a significant role in their purchasing choices. In the case of niche oils, the cost of the product depends on many factors (i.e., the type of raw material, the place of harvesting, and the technology of processing the raw material). The time of harvesting the raw material is also crucial. As D'Adamo et al. pointed out in their paper, the price of some oils can depend on the year the raw material was harvested. The harvest of some crops is divided into high production years and low production years. For this reason, consumers may perceive the price factor differently depending on the factor discussed [86]. Producers should set prices for niche oils so that in the 'low production year', their price does not rise sharply, and in other years it corresponds to their uniqueness.

Niche oils are most often sold in packaging made of tinted glass. This is not only to extend their shelf life but also to use 100% recyclable packaging. As Notaro et al. point out, consumers are reluctant to buy such products in plastic packaging [87]. The results of this publication indicate that consumers do not care about the type of packaging. However, they were not asked directly which kind of packaging they preferred. The primary purpose of packaging is to protect the product's properties, so it can be concluded that by selling niche oils in the current packaging, manufacturers are making the right decision. Consumers' expectations of nutritional content confirm this fact. Products must be properly packaged to meet consumer expectations of high nutritional content.

In their work, Morone et al. point out that despite the locality of production, the certification of production is also an important factor for consumers. Accredited institutions' confirmation of quality and sustainable manufacturing is expected [88]. Providing niche oils with appropriate certifications can be used to create a marketing strategy for manufacturers.

Although product brand recognition is not a key factor influencing consumers' purchase intentions, supporting a product with such labels can reinforce the feeling of uniqueness of these products for consumers.

Limitations and Future Scope

This study did not provide a personalized survey. To standardize the responses obtained and to be able to analyze them statistically, a generalized survey questionnaire was used. Statistically significant differences were found between the preferences of the different segments of consumers participating in the survey. In particular, differences were evident in their willingness to try oils from plants not associated with the oil industry (i.e., peanut oil, milk thistle oil). It is suggested that continuing the survey and expanding it to include other oils could magnify the observed discrepancies and set new trends for the development of the oil industry. It should be kept in mind that consumer surveys are limited by individual character traits, environmental influences, or health factors (i.e., allergies). For this reason, it would be necessary to conduct individualized research on each product's composition, origin, and production technology. This study was limited to assessing individual factors using a seven-point Likert scale to observe trends in consumer choices and to set potential directions for further research. In addition, it was conducted on Polish consumers, so it only entitles us to make inferences about the behavior of the Polish public. The main research limitations of these studies may be due to the discrepancy between consumers' declarations in surveys and their willingness to consume raw edible oils.

6. Conclusions

The survey results show that demand for edible niche oils may increase significantly in the coming years, as consumers show great interest in products of this type. Consumers are unlikely to incorporate niche oils into their diets through direct consumption, but they may start using them more often as side dishes. The oils that will undoubtedly find buyers among Polish consumers are edible castor oil and grapeseed oil. Essential factors for buying niche oils are high nutritional content, production free of GMOs and harmful chemicals, and price. These requirements are met by low-temperature oil pressing. Thus, it is a technology that producers should use to meet consumer expectations. For Polish consumers, the product's physical, chemical, and technological properties are more critical than the sensory qualities of niche oil. It may be necessary for niche oil producers to increase the supply of less popular oils (peanut oil, milk thistle oil), as regular consumers of niche oils would be eager to purchase them. More than 50% of those surveyed have tried a niche oil at least once, and most have had positive experiences, providing a potential market for such products. Manufacturers should focus on production certification despite inconsistencies in purchasing intentions and actual consumer behavior. Achieving accreditation will encourage consumers to purchase these products. Future studies of niche oils should focus on the organoleptic evaluation of products available on the market. The findings of this publication can be used to create production and marketing strategies to make niche oils more attractive to consumers and encourage regular consumption.

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