


## Article

# The Impact of Ecological Knowledge on Young Consumers' Attitudes and Behaviours towards the Food Market

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**Abstract:** The subject literature around the world puts a strong emphasis on the discrepancy between the positive attitude towards the idea of sustainability and consumer behaviour. These issues are the subject matter of this paper, which aims at both the identification and evaluation of selected aspects of knowledge, attitudes and eco-friendly behaviour of consumers connected with their choice of foods. The authors made an attempt of answering the question, to what extent do the level of knowledge and the declared eco-friendly attitudes have an impact on specific purchasing decisions. In the empirical observations, the conceptual model of the effects of the environment (knowledge, attitude, behaviour) on the customers' ecological awareness was used. The analysis conducted on the basis of this model indicated that stimulating the demand for ecological products is implemented mainly by the processes of raising awareness, which leads to expanding the consumers' knowledge concerning ecological farming and eco-friendly foods. In such a way the consumer awareness is built, especially by educational campaigns and promoting/endorsing the ecological foods targeted at young consumers.

**Keywords:** sustainability; consumer behaviour; consumption; ecological knowledge; attitude; environment; youth



**Citation:** Kuźniar, W.; Surmacz, T.; Wierzbński, B. The Impact of Ecological Knowledge on Young Consumers' Attitudes and Behaviours towards the Food Market. *Sustainability* **2021**, *13*, 1984. <https://doi.org/10.3390/su13041984>

Academic Editor: Iris Vermeir  
Received: 29 December 2020  
Accepted: 9 February 2021  
Published: 12 February 2021

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## 1. Introduction

The connection between attitudes and behaviours is a complex process of interdisciplinary character which makes it difficult to identify. Attitude is a key concept in the research on the consumers' behaviours as it has the final decision on the purchasing decisions.

Research conducted in many countries has put a strong emphasis on the discrepancy between the positive attitudes towards the idea of sustainability and the specific purchasing behaviours. In the literature of the subject, such discrepancies have been called by Boulstridge and Carrigan [1] as the attitude-behaviour gap or the A-B gap. The existence of the discrepancy has been proved by other authors, inter alia by Moser [2] and Hassan et al. [3].

In the light of existing discrepancies, a major challenge to researchers remains trying to explain the reasons for, as well as the ways of reducing the gap between sustainable attitudes and consumer behaviours but also to determine the level of existing discrepancies. In 2010, Cowe and Williams [4] described the level of existing phenomena as the 30:3 syndrome, since 30% of the British consumers surveyed declared the intention of purchasing fair trade goods, whereas the actual market share of such goods did not exceed 3%. Taking into account the fact that lack of conformity between attitudes and behaviours is a dynamic process, it raises a question over the direction of ongoing changes and the factors determining the scope and the scale of the existing gap.

Apart from the attitudes, the process of the consumers' behaviour is conditioned by a number of individual factors and contexts, which can make the attitude-behaviour relationship stronger or weaker. The consumer can have a positive attitude towards a specific behaviour but not express the intention to behave in such a way, especially if he or she is aware of the difficulties or the acts of sacrifice which might be connected with it. The

reason for the discrepancy might also be a low level of ecological awareness which shapes the relationship between the attitudes and the consumers' purchasing behaviours [5].

This paper falls within the ongoing discourse paying attention to the generation of the young consumers known as Millennials, whose ecological knowledge, attitudes and behaviours have been verified empirically. The authors conducted research on a group of young consumers under the age of 28, being representative of this generation. In the literature of the subject, there is no authoritative opinion about the classification of this group, the early division refers to the mid-1970s and 1980s, the latest to 1995/2000. The authors of this article assumed the classification of 1981–1999 suggested by such authors as Bolton et al. [6].

The selection of young consumers as the target group results from the fact that they also constitute the target group for the food manufacturers whose economic potential is related to their purchasing power. What is more, they have promising social potential due to the early process of shaping ecological behaviours as well as ecological knowledge. They are open-minded, usually well-educated and up to date with the current trends. It should be said that Millennials, no matter where they come from or the degree obtained, are convinced about being special which in turn is connected with high expectations concerning food products.

Furthermore, they are characterized by a strong influence on the decisions of other family members. The young consumers pay attention to the positive features of the ecological products and the positive impact of their manufacturing process on the ecosystem. Unfortunately, the declared positive attitudes do not always have an impact on specific purchasing decisions [7].

The aim of this paper is the identification and evaluation of the selected aspects of knowledge, behaviours and attitudes of the young consumers connected with the choice of food products. The authors have made an effort to address the question, to what extent does the level of knowledge and the declared ecological attitudes have an impact on the specific purchasing decisions and the readiness to pay more in return for the guaranteed quality of a product and its health benefits, as well as being it eco-friendly or ensuring the care of future generations.

## 2. Ecological Knowledge and the Consumers' Attitudes and Behaviours

The correlations between knowledge, attitudes and behaviours concerning environmental issues are complex in nature. Many different models have made an attempt to explain the purchasing decisions taken by the consumers. Ajzen and Fishbein [8] formulated the theory of reasoned action (TRA) trying to estimate the discrepancy between attitude and behaviour. The model assumes that the attitude towards an object in question results from one's perception of the features of this object as well as the values attributed to them. In this model, the consumers are questioned over the evaluation of the advantages of the product and then, attributing the features which as a consequence leads to making the overall evaluation of their attitude towards the object. With the aim of recognizing the attitudes and the actual behaviour of the consumer, the authors made it more complex, coming up with the model of rational behaviour. Its assumptions indicate the awareness of the consequences of the consumers' behaviour and show that the consumers opt for such behaviour that leads to the expected results. The current approach based on the Theory of Reasoned Action aims at verifying the correlation between knowledge and attitudes as well as knowledge and environmental behaviours. According to Ajzen, environmental concern shall be the main reason behind such behaviours which in turn are determined by the attitude towards it. The TRA model is used to explain the process of making a decision by the consumer. It can also be applied to tracking the purchasing intention, that is being involved in a specific purchasing behaviour. As such, it can be used as a foundation of the research model used in many disciplines as well as in the context of purchasing, for instance, ecological products [9]. Simultaneously, when assessing the possibility to use the TRA, attention is paid to the limitations of the model, *inter alia* not taking into

consideration the non-volitional factors such as having insufficient financial resources at one's disposal, which can contribute to the fact that, despite the specific purchasing preferences towards the eco-friendly products, the intention will not change into the specific purchasing behaviour. The problematic issue seems to be taken into account in the extension of the TRA model called the theory of planned behaviour (TPB). The TPB enables us to analyse the influence of personality factors together with other conditions like social purchasing intentions [10]. The theory of planned behaviour (TPB) being the extension of the TRA is often used in relation to individual behaviour and preferences. The TPB takes into consideration three factors influencing the intention, namely the attitude, the subjective norm as well as the perceived behavioural control. The TPB has been used by many authors in the research on the purchasing intentions of ecological products in a broad sense [11–16].

Knowledge, attitude and practice can be treated as a series of human behaviours and a set of variables used to research the consumers' behaviours relating to the TBP model. The elements mentioned above are included in the KAP model which is comprised of three components, namely knowledge, attitude and practice [17]. It has been first applied to medical studies, but the popularity of this method can be observed in many social studies as well in order to explain the customers' behaviour. The KAP model is also applied to environmental studies with the aim of evaluating knowledge, attitude and practices related to environmental awareness. For years, various research has focused on establishing the correlation between knowledge, attitudes and shared beliefs and the customers' involvement in acting responsibly. Despite the findings being ambiguous, it is the direction of the research that matters [18].

Many researchers have studied the impact of knowledge as a variable deciding upon the consumers' attitude towards sustainable products [19–24]. Knowledge can be seen as an understanding of any topic, attitude or feeling towards it, along with predetermined opinions and practices as ways in which they demonstrate their knowledge and attitude through their actions. As such, these variables are interrelated and the KAP model can help to understand the interferences existing between them. Ecological awareness can be divided into objective and subjective and is related to the consumers' knowledge of the environment and the factors related to it [25]. The research indicates a correlation between the level of knowledge and environmental activity. The higher the level of knowledge, the bigger the intention to make a decision [26]. Some research indicates the correlation between age and level of education to responsible environmental behaviours [27]. Flamm [28] and Gram-Hanssen [29] point out that the consumers who have a better knowledge of the environment are more inclined to positive activities in terms of environmental issues. The findings of the research conducted by Khan et al. [30] indicate that knowledge, as well as attitude, both have a considerable and positive impact on the eco-friendly behaviours of the consumers. Yet, the research by Paco and Lavrador [31] on energy consumption as well as the knowledge and the environmental attitudes show that there is no correlation between knowledge and behaviour. As indicated, it is hard to make any clear conclusions. Besides trying to find the relationship between knowledge and behaviour of the buyers, it is also worth considering the correlation between knowledge and attitudes and the impact of attitudes on purchasing decisions.

It seems to be obvious that knowledge can have an influence on behaviour. Misra and Panda [32] proved that caring about environmental issues is the highest among consumers in Western countries, who are accountable for the vast majority of it. It has been shown that when comparing a persons' interest in environmental issues with those who are less involved, the factor which makes the biggest difference is knowledge [33]. Interest in ecological knowledge can be explained as customers' engagement and commitment to environmental issues. Hartman and Apaolaza proved that environmental concern leads to preferring buying green brands [34].

Oreg and Katz-Gerro [35] came to a conclusion that despite the access to information on environmental issues, many consumers do not consider the protection of the environ-

ment as seriously as they should. This qualitative study, apart from getting the knowledge, also indicates the importance of cultural factors. Other research showed the impact of opinions on recognizing eco-friendly products when purchasing ones [36]. There is also other research which claims that the care of the environment is based on emotional factors rather than the facts or knowledge [37]. The work of Polonsky et al. [38] suggests that the consumers do not use their knowledge since they can have difficulties in understanding the findings of research of such complex issues as gas emissions.

The influence of environmental awareness on consumption patterns is on the increase, especially in the developing markets [39]. Nin, Zhoumini and Zaoying [40] claim that eco-friendly consumption is difficult to be implemented, *inter alia* due to the lack of knowledge. At the same time, the research findings show that there is no significant correlation between consumers' attitude and behaviour. Other research points out that the households of the respondents who have a bigger knowledge of the impact of owning and using vehicles on the environment own more economical vehicles in terms of fuel consumption but their ecological knowledge is not that significant when it comes to the number of cars owned, the kilometres covered or fuel consumption [28]. Arcury [41] claims that ecological knowledge is correlated with environmental attitudes, but the correlation is of no particular significance. Despite this, some research on the attitude suggests that the number of activities related to the environment and environmental awareness is correlated [42].

According to Luo and Deng, the term environmental concern is often used interchangeably with the term environmental attitude [43]. The attitude is defined as a psychological inclination expressed in the level of understanding or lack of understanding of the entity [44]. The attitude expresses one's preferences concerning specific behaviour. The more positive the attitude, the clearer the intention to express such behaviour [45]. According to Kotchen and Reiling [46], attitude is the basic indicator of a behavioural intention. The findings of the research conducted by Fraj-Andres and Martinez-Salinas [5] indicated that attitudes towards the environment have a major impact on ecological behaviours.

Attitudes are a concept highly valued by researchers of consumers' behaviour because of their considerably constant nature. They can be of use in establishing the probability of the purchasing behaviour related to specific situations. Still, the attitudes are inconsistent, frequently subconscious and difficult to be controlled.

It could be expected that many customers review their consumption patterns and opt for more eco-friendly habits, however, some research shows exactly the opposite [47]. It should be said that the question of consumers' behaviour as a source of environmental concerns is nothing new. For instance, as soon as in 1992 it was stated at the United Nations Conference on Environment and Development that the major cause of the constant deterioration of the global environment is the unsustainable pattern of consumption and production, particularly in industrialized countries [48]. Many of the statements included in the Our Common Future report of 1987 are still relevant or more relevant than ever. It concerns, among others the negative impact on the environment caused by the increase of pollution resulting from using chemicals in production processes. The authors of the report made a reference to the new pattern of behaviour which can contribute to solving global issues [49]. Uncontrolled or excessive consumption, or causing waste is known as unsustainable [50]. It should be noted that according to Gordon, Carrigan and Hastings [51] the opponents perceive the sustainable consumption as a contradiction since to consume means to use something or to destroy it which seems to be the opposite of sustainable development.

Ecological behaviour can be defined as "actions which contribute towards environmental preservation and/or conservation" [52]. It can be also seen as "any action that enhances the quality of the environment" [53] Eco-friendly behaviour is connected with the aim of reducing the negative impact of individual purchasing decisions on the environment and can be considered in the context of green purchase intention [54]. The correlation between environmental concern and purchasing ecological products is indicated [11,25].

Sheltzer et al. proved that environmental concern often leads to buying green brands [55]. Ecological behaviour is often considered a habit. [56]

The consumers' awareness of environmental issues is taken into consideration in their purchasing decisions [57]. However, other research by Aini et al. [58] claims that even if students are mostly aware of the importance of environmental issues, they only moderately put it into practice.

In the research process the following hypotheses are proposed:

**Hypothesis H1:** *Interest in ecological knowledge (IEK) is positively correlated with customer ecological attitude (CEA),*

**Hypothesis H2:** *Ecological shopping habits (ESH) are positively correlated with customer ecological attitude (CEA),*

**Hypothesis H3:** *Ecological shopping habits (ESH) are positively correlated with interest in ecological knowledge (IEK),*

**Hypothesis H4:** *Conscious purchasing planning (CPP) is positively correlated with ecological shopping habits (ESH),*

**Hypothesis H5:** *Conscious purchasing planning (CPP) is positively correlated with interest in ecological knowledge (IEK),*

**Hypothesis H6:** *Knowledge of ecological issues (KEI) is positively correlated with ecological shopping habits (ESH),*

**Hypothesis H7:** *Knowledge of ecological issues (KEI) is positively correlated with interest in ecological knowledge (IEK).*

The H1, H2, H3 and H7 hypotheses result from the analysis of the presented literature and the research concerning the KAP. The ambiguity in terms of the presented results can be the foundation of further research in this area. The H4, H5 and H6 hypotheses are the research gap and the contribution of the authors to the development of the literature of the subject. The planning of shopping can be a sign of ecological awareness so it seems to be reasonable to do research on whether this variable is correlated with behaviour and knowledge. It can indicate eco-friendly behaviours but it can also be the reason behind the consumers' involvement in the environmental issues.

### 3. The Polish Consumer as the Object of the Research in the Context of Environmental Awareness, Attitudes and Behaviours

In Polish literature on the subject, despite the concept of behaviour and ecological attitudes being in use, the scope of the analysis usually embraces also the economic and social aspects. Most papers include the findings of empirical studies whose scope can be basically divided into, those referring to the conditions of the sustainable consumption and those concerning the identification of the consumer's knowledge, sustainable attitudes and behaviours (Table 1).

In the scope of the research concerning the consumers' attitudes and behaviours, Zralek suggested nine criteria of the object scope distinction, among others ethical consumption and the consumers' social responsibility, ethical business, de-consumption, common consumption, voluntary simplicity or consumer boycotts.

As separate categories, she also indicated consumption and the consumers' eco-friendly behaviours (separately for the food market and the so-called general issues) as well as the sustainable consumption and sustainable consumer behaviours [59].

Some of the cited authors conduct their research on a regular basis which seems of great importance since it illustrates the direction of changes taking place in the con-



sumers' attitude towards the questions of sustainable and eco-friendly consumption, it being noticed by, among others, Dąbrowska. The research conducted by her in 2013 on a representative sample of Poles indicated that there is no simple or clear answer when it comes to predicting the Polish consumers' behaviour since as observed even if they became more sensitive towards health issues, environmental protection or social issues, they still pay a lot of attention to consumerism. The research proved that there is a great focus on consumption [60]. The author mentioned above put an emphasis on the fact that many Poles are still fascinated by consumption and are inclined to be an instant buyer, that is to buy goods on the spot, not always the products that they actually need. Such attitudes might be related to the influence of fashion, to show-off consumption and being oriented to the here and now. Bauman claims that in a consumption society the need does not fulfil the need, but it needs the need. A perfect consumer is the one who is bored with the purchase at once and asks for more [61]. On the other hand, the research by Dąbrowska a few years later pointed out that Polish consumers are becoming more and more aware buyers, when purchasing a given product, they check the ingredients, best-before date, price or if it is local. These tendencies, especially being more concerned with environmental and health aspects have been expressed in other research by the same author [62].

The presented findings of the research by Polish authors show the discrepancies between the attitudes declared and the consumers' behaviours. The most important reasons behind the discrepancies between the buyers' attitudes and behaviours in terms of green products as described by Witek [63] include the inconsistency of information, the incomplete knowledge of the green products and their labelling, conflicts of beliefs, the lack of agreement to the higher prices or the insufficient marketing activities.

The question of the lack of knowledge of Polish consumers has been discussed by many other authors in the second decade of the 21st. century, Kieźel [64] included, who also believes that expanding the Poles' knowledge of the new consumption trends, particularly of sustainable, rational, ecological consumption or de-consumption is of great importance. A similar opinion is shared by Patrzalek [65] who claims that ecological awareness is relatively low. Despite the fact that the concept of environmental protection is well-established, it remains more of a declaration than something regulating the actual behaviours of individuals.

What helps to see the future in bright colours is the recent findings of the Polish research institute KANTAR on the representative sample of Polish consumers at the end of 2019, indicating that they are changing consumption as such into sustainable consumption. Approximately 9 out of 10 Poles surveyed declared that environmental protection is of importance to them. As observed, also taking into account food consumption, there is an increase in environmental awareness, especially in eco-labelled foods as well as in the consumption of these kinds of products. According to the data provided by the Polish research institute IMAS, it can be concluded that Poles are quite familiar with the main certificate of eco food, namely the green leaf (17% of the respondents can name it ad hoc whereas 28% know it very well), however, some of them do not put any trust in it as in their opinion, it does not make up for the difference in the price of the certified and non-certified products. The high price of eco-labelled food is still the main obstacle when it comes to purchasing it. On average, one in six respondents (17%) is afraid of being deceived, and to 9% of the respondents, the main obstacle remains the limited availability. The factors indicated contribute to fact that a large group of consumers get their food directly from the farmer, considering it the synonym of the eco-labelled food. Health is still the main reason for purchasing the organic food which proves that the vast majority (87%) at least declares purchasing such food [66].

In the light of the findings of the empirical research presented, it can be confirmed that Zralek [59] was right when claiming that the Polish consumer of the 21st century is a person supporting the idea of sustainable consumption but focused solely on the aspects evolved around the consumer's life and health or his nearest and dearest. Considering all of the above, it is still an important issue to address the question on how to expand the

Polish populations' knowledge of sustainable consumption and to what extent the scope of the knowledge will contribute to them developing attitudes and ecological behaviours that will, in turn, increase the interest in ecological food. Taking into account the place of Poland among the European producers of ecological food (5%) [67], and its great potential to cultivate the natural environment, the question arises, if in the years to come this indicator has a chance to be improved. An important part of this question is played by the young educated consumers since it is their knowledge, ecological attitudes and specific purchasing decisions that will contribute to creating the need for ecological products in the future.

**Table 1.** The issue of sustainable consumption discussed by the Polish authors.

The Scope of the Research in Terms of Object	Selected Papers
Ecological knowledge, attitudes and behaviours of the consumers	M. Grzybowska-Brzezińska [68–70], D. Kiełczewski [71], A. Dąbrowska [60], M. Burgiel, J. Zrałek [72], A. Matel [73], I. Escher, J. Petrykowska [74], L. Witek, K. Szalonka [75], W. Patrzalek [65], J. Zrałek [59], L. Witek [63,76].
Conditions of sustainable consumption	D. Kiełczewski D. [77,78], M. Grzybowska-Brzezińska [79], K. Wasilik [80], A. Dąbrowska, F. Bylok, M. Janoś-Kresło D. Kiełczewski, I. Ozimek [81], T. Zalega [82], B. Jaros [83], W. Łuczka [84], K. Gutkowska, J. Czarnecki [85], G. Zasuwa [86], E.M. Marek [87].

Source: Our own research on the basis of the literature of the subject.

#### 4. Materials and Methods

The aim of this research is to recognize and evaluate the selected aspects of knowledge, attitudes and ecological behaviours of consumers related to their choice of food. In the light of the theoretical aspects, the findings present the survey research which was conducted in April 2020 on a sample of  $n = 265$ , among young respondents under 28 years of age from Poland. The selection of respondents to the survey reflects the percentage share of the urban and rural population in south-eastern Poland.

As far as gender is concerned, it seems reasonable that the majority of the surveyed were women (77.7%) since it is women who are more often responsible for buying food products when it comes to the household [88]. They are also more inclined to purchase ecological products [89].

The key element in determining the choice of ecological products is education. The research indicates that people with higher education are more likely to buy ecological products than those less educated. Education is an important factor determining the choice of organic products [90]. Taking into consideration the fact that the research concerned the young consumers (min. age 18, average 23) who are mostly in the middle of their educational process and within the next 1–3 years will have such an education, the authors did not take into account differences between education levels.

##### 4.1. Questionnaire

The self-administered questionnaire consisted of questions divided into three sections (knowledge, practice, activity) and sociodemographic questions. When analysing, the Likert scale was used in order to measure respondents' attitudes. Despite the fact that the scale does not use natural measurement units, it measures attitudes which are of continuous character. Thus, with symmetrical indicators the points on the scale (ranging from "I completely agree" to "I completely disagree") and the sufficient number of points of the scale (at least 5), the paper makes the use of the 7-point scale (the differences between the points on the scale match similar differences in terms of frequency of the features).

#### 4.2. Data Collection

Before the actual research, a pilot study was conducted (an online pre-test) among a group of 30 young consumers (the experimental group) which made it possible to eliminate the ambiguity connected with the form of the questions in the survey questionnaire and to prepare the actual research of the CAWI technique, that is the computer-assisted web interview. The study covered young consumers up to 28 years of age, representing “Millennials”, where the age range was proposed according to Bolton et al. [6].

#### 4.3. Data Analysis

The description of the respondents surveyed in the south-east of Poland is included in Table 2. The analysis was made by means of IBM SPSS Statistics 26 and the IBM AMOS 26 graphics.

**Table 2.** The characteristics of the respondents surveyed (under 28 years old).

Specification		Rural Areas		Urban Areas		Total Amount	% of <i>n</i> in the Table
		Amount	% of <i>n</i> in the Table	Amount	% of <i>n</i> in the Table		
Female The average net monthly income per capita in the household	below the average of the surveyed area	52	19.62	20	7.55	72	27.17
	within the average of the surveyed area (approx. PLN 1400)	64	24.15	35	13.21	99	37.36
	above the average of the surveyed area	20	7.55	15	5.66	35	13.21
Male The average net monthly income per capita in the household	below the average of the surveyed area	9	3.40	4	1.51	13	4.91
	within the average of surveyed area (approx. PLN 1400)	16	6.04	10	3.77	26	9.81
	above the average of the surveyed area	9	3.40	11	4.15	20	7.55
		170	64.15	95	35.85	265	100%

Source: Our own study.

The research was conducted with the aim of addressing the question, to what extent the interest in ecological knowledge (IEK) related to the access to the reliable information concerning ecological food has an impact on the healthy food habits. The increase in the level of knowledge contributed to being more sensitive to the ecological aspects in terms of developing healthy food habits implemented and taking part in a social campaign devoted to healthy nutrition. The knowledge of ecological issues, (KEI) that is the knowledge of the ecological issues concerning the production of meat on a global scale and the emission of greenhouse gases involved in the production of beef on such scale resulting in climate change, as well as the knowledge concerning the production and the awareness of using production on a small scale to combat global warming.

Purchasing from the locals encourages them to verify the cultivation which is beneficial to the environment and eco-friendly attitudes declared to influence the specific purchasing decisions. The ecological shopping habits (ESH) and conscious purchasing planning (CPP) aim at providing the environment protection and the care of the future of the next generations and the way these factors influence the customer ecological attitude (CEA), both in a narrow and broad sense. The former is the specific knowledge, attitudes and behaviours and the perception of people concerning the role of the environment in human life, its use and protection. The latter concerns the system of norms and beliefs of an individual and the social groups as well as the role of values and opinions of the natural environment [91]. The process of developing ecological awareness includes the specific



levels of being more sensitive to the perception of the natural environment, in the scale of the dichotomy of the destroyed and not destroyed environment, to the general interest of its protection and concluded with obeying the eco-friendly norms of behaviour. The sociological aspect of ecological awareness makes it possible to:

- recognize the values of a particular social group and the importance of ecological norms,
- evaluate the level of knowledge of the threats resulting from the destruction of the natural environment,
- study the correlation between ecological awareness and specific behaviours of people and their plans for the future [92].

The authors focused on the market of food products, particularly ecological food, it being an alternative to the traditional food in common use, fulfilling the main quality criteria of the consumers in terms of the ingredients, the country of origin or the type of packaging used. This scientific paper recognizes the level of knowledge, the attitudes declared as well as the eco-friendly behaviour of the young consumers on the food market which enabled us to distinguish the correlation as well as to indicate the direction of suggested actions aimed at developing eco-friendly, sustainable purchasing decisions and activities of the young consumers.

## 5. Results and Discussion

Starting the research process, the following research assumptions were made:

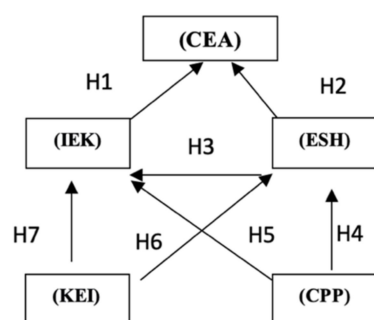
- the questionnaire and selection of research tools in the study were based on literature studies,
- the analysis of the collected research material conducted in the work focuses mainly on qualitative variables measured with the use of the Likert scale (seven-point),
- the theoretical construct proposed in the work was developed on the basis of literature studies, while the empirical construct was based on our own research.

The objectives specified in the work were subjected to a multi-stage process of cognition, the results of which were specified on the basis of such thinking operations as [93]:

- synthesis (comparing separate factors as a comprehensive cognitive approach to the studied phenomenon) and analysis (the analysis of certain wholes into component parts—theses, structures and phenomena—and considering each of them separately)
- deduction (deduction as a research process involving the transition from the general to the detailed) and induction (as a type of reduction reasoning—the process of concluding based on the premises that are individual cases)
- comparing and contrasting value features and data results
- generalization and concluding are the final process of implemented research issues

Modelling of the structural equation models (SEM) structural equations was used to verify the research hypotheses. This methodology was developed among others by Bollen [94], Pearl [95], Kaplan [96] and Kline [97]. In Polish literature Gatnar [98], Os- ińska [99] and Konarski [100] have worked on these issues. The maximum likelihood method (MLM), the generalized least squares method (GLS) and asymptotically insensitive method (AIM) are distinguished among the methods of estimating the SEM models. The AIM was used in the analysis, the sample size was 265 entities. The required number in this method ranges from 200 to 500 objects.

The model consists of two parts (Figure 1). A measurement model represents the exogenous measurements (whose variability is determined by the causes outside the model which are not explained by other variables in the model. They are always independent variables; the arrows in the model always come from them) and the endogenous measurements (whose variability is explained by the impact of other variables in the model). They are always dependent on other hidden variables in the model of structural equations [101–103].



**Figure 1.** Conceptual model of customer ecological attitudes. Source: Our own case study.

### 5.1. Reliability and Validity

The measurement model provides the quantitative measures of the validity and reliability of the constructs. Using Cronbach's alpha, internal consistency among the items was measured. The convergent and discriminant validity were also measured. Convergent validity was measured on the basis of three components: composite reliability (CR), factor loading and variance extracted (AVE). The model represents an adequate validity (convergent and discriminant) and reliability. The details are presented in Tables 3 and 4.

**Table 3.** Regression Weights in the model.

			Estimate	S.E.	C.R.	<i>p</i>
ESH	<—	CPP	0.183	0.077	2.395	0.017
ESH	<—	KEI	0.459	0.131	3.517	***
IEK	<—	ESH	0.612	0.127	4.834	***
IEK	<—	CPP	0.27	0.092	2.922	0.003
IEK	<—	KEC	0.482	0.149	3.244	0.001
KEC_4	<—	KEI	1			
KEC_3	<—	KEI	2.092	0.336	6.221	***
KEC_2	<—	KEI	1.334	0.24	5.552	***
KEC_1	<—	KEI	2.034	0.33	6.167	***
IEK_4	<—	IEK	1			
IEK_3	<—	IEK	0.721	0.089	8.125	***
IEK_2	<—	IEK	0.819	0.086	9.538	***
IEK_1	<—	IEK	0.974	0.093	10.482	***
ESH_4	<—	ESH	1			
ESH_3	<—	ESH	1.188	0.171	6.954	***
ESH_2	<—	ESH	1.453	0.197	7.388	***
ESH_1	<—	ESH	1.26	0.179	7.049	***
CPP_5	<—	CPP	1			
CPP_4	<—	CPP	1.381	0.173	7.997	***
CPP_3	<—	CPP	0.893	0.123	7.239	***
CPP_2	<—	CPP	0.813	0.146	5.566	***
CPP_1	<—	CPP	0.947	0.149	6.347	***
CEA	<—	IEK	0.553	0.097	5.723	***
CEA	<—	ESH	0.253	0.121	2.082	0.037

\*\*\*, show significance at  $p < 0.001$  level. Source: Our own case study.

**Table 4.** Operationalization of hidden variables in the model.

Designation in the SEM Diagram	Content of the Determinant	Assigned Hidden Variable	Factor Analysis FCA
IEK_1	The constant pursuit to expand knowledge concerning green food and developing healthy food habits	Interest in ecological knowledge (IEK) Cronbach's alpha (0.79), AVE (0.6)	0.732
IEK_2	In recent years I have increased the level of knowledge and awareness in terms of developing healthy food habits significantly		0.757
IEK_3	I try to catch up with the ongoing social campaigns devoted to healthy eating and to put them into practice		0.523
IEK_4	I expand my knowledge concerning eating habits on a regular basis by referring to the information presented by the experts		0.728
KEI_1	The production of beef on a global scale leads to climate change to a great extent	Knowledge of ecological Issues (KEI) Cronbach's alpha (0.77), AVE (0.52)	0.696
KEI_2	Purchasing local products eliminates the emission of greenhouse gases related to the food supply		0.695
KEI_3	Diets' rich in fruits and vegetables instead of in meat and products of animal origin make a positive impact on the environment		0.597
KEI_4	Purchasing from the locals makes them verify their cultivation which is beneficial to the environment		0.413
ESH_1	I always check the country of origin of my food	Ecological shopping habits (ESH) Cronbach's alpha (0.74), AVE (0.51)	0.593
ESH_2	Purchasing food products. I always check if it has a certificate of high quality		0.662
ESH_3	I most often purchase food in the shops dedicated to green products		0.738
ESH_4	I prefer food products grown regionally/locally		0.475
CPP_1	When shopping for food I always use my own reusable bags	Conscious Purchasing Planning (CPP) Cronbach's alpha (0.76), AVE (0.53)	0.628
CPP_2	I plan my meals in advance		0.527
CPP_3	I cook using the ingredients at hand		0.659
CPP_4	Before shopping. I look into the cupboards and the fridge		0.769
CPP_5	When shopping I take a shopping list		0.659

Source: Our own case study.

## 5.2. Structural Model

The internal model, also called the structural model, has the following form [93]:

$$\eta = B\eta + \Gamma\xi + \zeta \quad (1)$$

where:

$\eta$   $m \times 1$  is the vector of endogenous hidden variables,

$\xi$   $k \times 1$  is the vector of exogenous hidden variables,

$B$   $m \times m$  is the matrix of regression coefficients for endogenous variables,

$\Gamma$   $m \times k$  is the matrix of coefficients for exogenous variables,

$\zeta$   $m \times 1$  is the vector of random components.

The external model, also called the measurement model, is presented as:

$$\begin{aligned} y &= \Pi_y \eta + \varepsilon, \\ x &= \Pi_x \xi + \delta \end{aligned} \quad (2)$$

where:

$y$   $p \times 1$  is the vector of observable endogenous variables,

$x$   $q \times 1$  is the vector of observable exogenous variables,

$\Pi_y, \Pi_x$  are the factor load matrices,

$\varepsilon$   $p \times 1$ ,  $\delta$   $q \times 1$  are the measurement error vectors.

The hidden variable of the knowledge of ecological issues (KEI) is represented by the observable variables of KEI\_1, KEI\_2, KEI\_3 and KEI\_4 whereas the variable of ecological shopping habits is represented by ESH\_1, ESH\_2, ESH\_3 and ESH\_4. The variable of conscious purchasing planning (CPP) is represented by the following observable variables CPP\_1, CPP\_2, CPP\_3, CPP\_4 and CPP\_5 together with an endogenous variable of the customer ecological attitude (CEA). The model fit with the empirical data is described by the following set of standard diagnostic measures (the values in parentheses show the recommended thresholds for models with an acceptable fit based on Garson) [104]:

Chi-square/df = 2.021 (<3)

$p$ -value for the model < 0.001 (>0.05)

Goodness of fit index (GFI) = 0.902 ( $\geq 0.9$ )

CFI = 0.904 ( $\geq 0.9$ )

Adjusted goodness of fit index (AGFI) = 0.871 ( $\geq 0.8$ )

Root mean square error of approximation (RMSEA) = 0.062 ( $\leq 0.08$ )

The model (Figure 2) can be considered acceptable from the point of view of diagnostic indexes of the degree of matching with empirical data (four indicators in the norm). The chi-square was 260.716, with a number of degrees of freedom  $df = 129$  and a significance level of  $p < 0.001$  (the chi-square measure allows for testing the null hypothesis about the lack of discrepancy between the observed covariance matrix and the matrix implied by the model). In the analysed model, the relative chi-square is 2.021 (less than three for a well-fitted model to empirical data). In contrast, the GFI (goodness of fit index)—an indicator of the goodness of matching the model to empirical data—is 0.902, which suggests that with other indicators at an acceptable level, the quality of the model may be satisfactory. On the other hand, the AGFI (adjusted goodness of fit index)—index is 0.871 (more than the recommended  $\geq 0.8$ ), while CFI: 0.904 (with  $\geq 0.9$  as the recommended value).

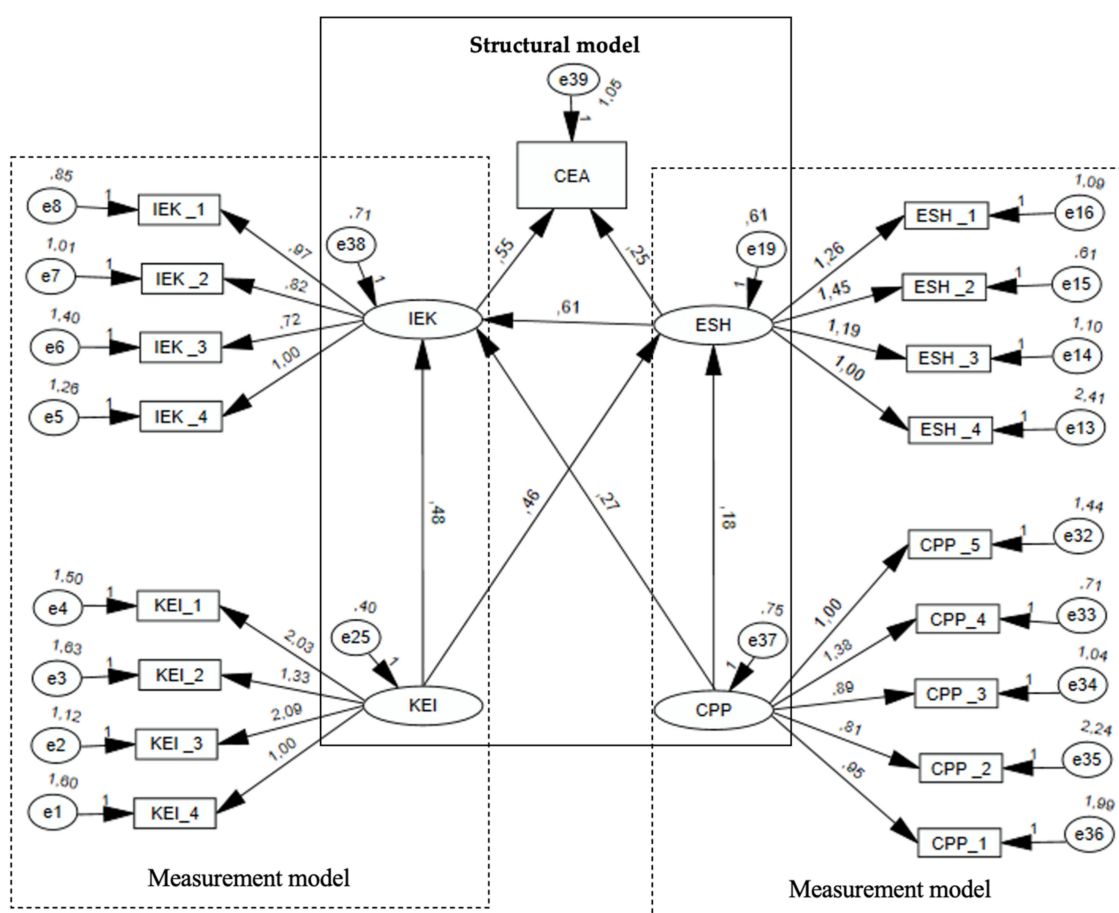


Figure 2. Structural model of customer ecological attitude. Source: Our own case study.

Another measure is RMSEA (root mean square error of approximation), which is the root of the mean square error of approximation, which is a measure of the divergence of the model adjusted for its level of complexity, i.e., the number of parameters [105]. The RMSEA value for the obtained model was 0.062, the recommended range is  $\leq 0.08$ , however, some sources indicate 0.1 as the acceptable limit value. The 90% confidence interval RMSEA has ranges from 0.073 to 0.092 [106]. As a further diagnostic activity, no problems were found with the reliability of the measuring scales (high Cronbach's alpha values).

A detailed description of the regression weights (regression weights) is presented in Table 3:

### 5.3. Measurement Model

In the model the four hidden endogenous variables are defined by means of observable endogenous variables, that is IEK\_1, IEK\_2, IEK\_3 and IEK\_4, to characterize the variable of the interest in ecological interest (IEK). The ability and possibility of obtaining this kind of knowledge from the environment is related to the possibility of developing the consumers' ecological awareness. The matter in question is also related to obtaining information as well as its processing which leads to the developing of eco-friendly behaviours and attitudes [107]. Table 4 provides the characteristics of being the hidden and observable variables operational.

Care for the natural environment expressed by eco-friendly behaviour related to the conscious purchasing planning (CPP) is in accordance with the theory of planned behaviour [108] as well as the knowledge of ecological issues (KEI) and is strongly correlated with ecological shopping (ESH). The research by Larios-Gómez [109] and Fray-Martinez [110] indicates that there is a correlation between eco-friendly attitudes towards the environment and eco-friendly behaviours. In the work by Singh and Verna [111], they



also used four observable variables to define the purchasing decisions of the consumers of the ecological food products.

#### 5.4. Hypothesis Testing

Making the analysis of the structural equation models (SEM), it can be observed that a significant and clear correlation ( $0.61, p < 0.001$ ) of the ecological shopping habits (ESH) has a positive impact on the interest in ecological knowledge (IEK). It seems that this regularity has also been described in the work by Fraj and Martinez [110] claiming that the ecological behaviour of consumers resulting from their conscious activity and the impact on the environment increases their motivation of eco-friendly behaviour on many levels. At times, as suggested by the literature [101], the consumers being environmentally aware follows the pattern of taking into account many factors such as the amount of money held. Analysing the gathered data, it should be emphasized that there is a strong positive correlation (H1) ( $0.553, p < 0.001$ ) between the interest in ecological knowledge (IEK) and the customer ecological attitude (CEA). It has also been shown by research on customer ecological attitudes (CEA), that the phenomenon is directly related to eco-friendly purchasing decisions and other activities aimed at the protection of the environment [112].

The hypothesis (H2) ( $0.253, p = 0.037$ ) that there is a positive correlation between ecological shopping habits (ESH) and the customers' ecological attitude (CEA) has been confirmed, still the stronger correlation (H6) ( $0.456, p < 0.001$ ) occurs between the knowledge of ecological issues (KEI) and ecological shopping habits (ESH). It should be said that the hypothesis (H4) ( $0.183, p = 0.017$ ) concerning conscious purchasing planning (CPP) shows only a considerable correlation with the ecological shopping habits (ESH). When it comes to the hypothesis (H7) ( $0.482, p = 0.001$ ), the knowledge of ecological issues (KEI) is positively correlated with an interest in ecological knowledge (IEK). The hypothesis (H5) ( $0.27, p = 0.003$ ) confirms that conscious purchasing planning (CPP) is positively correlated with the interest in ecological knowledge (IEK).

Stimulating the demand for green products according to the model is fulfilled mainly by the processes of raising awareness and leading to the expansion of the consumers' knowledge concerning ecological farming and ecological food. Establishing consumer ecological awareness can be achieved by educating and promoting green food among young consumers. The findings of the research are similar to the outcomes of other authors. Guven and Sulun take into consideration the dependence between knowledge and awareness of environmental issues and highlight the importance of education [113]. According to Zareie and Navimipour, environmental teaching and learning is necessary and can help to improve people's environmental behaviours [114]. Islam et al. also see the necessity of raising environmental awareness among university students [115]. In a study by Donmez-Turan and Kiliclar, it was estimated that pro-environmental behaviour was practised more often by the students who had environmental training [116].

Summarizing the research results, it should be emphasized that the appropriate level of knowledge of ecological issues (KEI), which was developed in the process of pro-ecological socialization during adolescence, has a direct impact on the subsequent interest in this subject and the continuous expansion of ecological knowledge, becoming an important factor in the functioning of the individual in society. At the same time, it should be noted that the KEI variable also has significant importance in shaping and consolidating the pro-ecological habits of young consumers (ESH), it is probably conditioned by the aspirational processes towards a group with a significant social impact among young buyers of organic food. The research shows that the ecological habits of young consumers (ESH) significantly correlates with the state of ecological knowledge (KEI), i.e., they determine the willingness to acquire knowledge related to pro-ecological issues. It should be emphasized that CPP correlates weakly with both IEK and ESH. It is probably related to the phenomenon of a "mechanical" approach to the process of building ecological attitudes and not understanding the essence of ecological awareness, despite the appropriate reaction related to pro-ecological attitudes. It should be emphasized that the interest in ecological knowledge (IEK) among young

consumers is strongly associated with CEA, i.e., it has an impact on shaping the purchasing attitudes of young consumers. It is consistent with the concept of no waste and affects both the natural environment and the budget of the surveyed individuals.

## 6. Conclusions

Developed countries have one of the most dynamic markets of green products whereas the market of green products in Poland has great potential but is unfortunately used only to some extent. The development of the need for ecological food products is subjected to the ongoing changes of the consumers' attitudes and behaviours which in turn results from the consumers' knowledge and environmental awareness.

Young buyers who are responsible for the state of the natural environment distance from the mindless accumulation of goods, which results in resource exhaustion, waste and pollution. Younger people are more sensitive to problems related to sustainable development [117–119]. Many young consumers are starting to see the negative effects of over-consumption. In this spirit, young consumers strive to limit consumption and adopt forms that are environmentally friendly [120]. On the other hand, Witek and Kuźniar's research shows that young people, especially those aged 18–24, care the least about being perceived as environmentally friendly. This group is also the most sceptical of organic products and their impact on environmental protection [7]. Another study by Witek shows that the older the consumers, the more buyers of organic products among them, the younger, the more non-buyers. According to the author's research, such dependencies also occur in relation to the expressed intentions of purchasing organic products and purchasing organic food at a higher price [63]. Escher and Petrykowska emphasize that thanks to environmental education, the young generation have acquired the necessary knowledge and developed habits conducive to respecting the natural environment and became more open to the adaptation of alternative forms of consumption. According to the authors, the positive views of young consumers towards environmental protection are not always reflected in their actions [121]. Nevertheless, young consumers, due to information and knowledge about sustainability, try to be more environmentally conscious [122]. Therefore, knowledge can be a factor in determining the purchasing behaviour of young people.

According to the authors of this study, the main factor behind the development of ecological food production in the regions having such potential is the consumers' interest in this kind of products resulting from their knowledge, ecological awareness, attitudes and declared behaviours. A key element is to be played by the young educated consumers who in the first place generate the demand for green products.

When consumers are aware of the benefits of purchasing green products, they will be more likely to pay more. It remains a challenge to ecological education and as a consequence, it can lead to the change of the behavioural patterns expressed by the more conscious consumption of a smaller amount of goods, more eco-friendly. The short-term consumption behaviours are indicated as those posing a threat to the natural environment within the education provided by schools. As a result, the younger generation shall be more aware of it. It is hoped that the knowledge of and educating the younger generation will bring a change to the consumers' behaviours. The findings of this research indicate that there is a strong positive correlation between the analysed variables.

If the increase of the level of knowledge has an impact on the attitudes and purchasing decisions, every attempt should be made in order to expand the knowledge of the young generation since it is them who will have the biggest impact on sustainable development. Therefore, the matter in question should be considered from the point of view of the authorities and institutions which can be made responsible for the transfer of knowledge. A crucial role in promoting ecological values is played by the state, which has every possibility to introduce the changes aimed at eco-consumption by means of information and education, economy and finance or regulatory instruments. It is a way to establish the consumers' ecological attitude. Stimulating the demand for green products is the key elements of making the society aware, and leading to an increase in the consumers'

knowledge concerning ecological farming and the consumers' eco-friendly behaviours. It should also be noticed that there is a correlation between the level of interest in ecological issues and ecological awareness. The correlation between ecological awareness and shopping habits also exists but it is not that significant. It could be related to the lack of access to green food or the high price of this kind of product. The increase of ecological awareness resulting from the developing of eco-friendly attitudes and behaviours of the consumers, especially the young generation is the main factor of developing the production of green food in the regions having the potential to do so, which has not been used to a large extent so far. One instance of such a situation can be seen in Poland, where the small size of the farms involving time-consuming methods of farming provide favourable conditions for the production of green food which as a consequence can lead to their social and economic prosperity.

## 7. Limitations and Future Research

One limitation of the research is that the construct has been formed based on data collected from young consumers only. The bigger picture connected with ecological behaviours could have been obtained with research from all age groups. At the same time, the choice of the target group makes it impossible to refer to the results of the research to the whole population. The research was based on respondents' declarations which might have resulted in socially approved answers. Furthermore, accurate measures of the Likert scales can be difficult to obtain because of the acquiescent bias. What is more, the research was mainly based on the qualitative variables. Thus, it could also include the expenditure pattern concerning the food products and the place of ecological food products expenditure among all age groups.

Further studies may examine other variables that might affect the attitudes and behavioural aspects of respondents' purchasing process. Taking into account the great importance of the question of awareness of ecological behaviours, it seems reasonable to include other countries in the research. This in turn would make it possible to consider not only different social and economic factors but also cultural ones. In addition, further studies related to the influence of knowledge on ecological attitudes and behaviours should also include other groups of products and services, for instance, transport. Another important element which could make the picture complete could be the study of the impact of such behaviours on quality of life.

**Author Contributions:** Conceptualization, W.K., T.S. and B.W.; methodology, W.K., T.S. and B.W.; formal analysis, W.K., T.S. and B.W.; editing, W.K., T.S. and B.W. All authors have read and agreed to the published version of the manuscript.

**Funding:** This work has been supported by the funds of the Ministry of Science and Higher Education granted to the University of Rzeszow, Poland.

**Institutional Review Board Statement:** Not applicable.

**Informed Consent Statement:** Not applicable.

**Data Availability Statement:** Not applicable.

**Conflicts of Interest:** The authors declare no conflict of interest. The funders had no role in the design of the study, in the collection, analyses, or interpretation of data, in the writing of the manuscript, or in the decision to publish the results.

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