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CHOICES AND PREFERENCES OF YOUNG WOMEN ON PLANT-BASED BEVERAGES®

Wybory i preferencje młodych kobiet w stosunku do napojów roślinnych®

The aim of the work presented in the article was an analysis the choices and preferences of respondents in relation to plant-based beverages and possible directions of extending their assortment on the market. The research material consisted of survey collected via the Internet from 600 people. The surveyed population was mainly young, educated women. Plant-based beverages most often chosen by respondents were those with the most favorable sensory values and the most available on the market. The respondents' satisfaction with the assortment of plant-based beverages available on the market was varied. The respondents declared a high interest in plant-based beverages enriched with vitamins and minerals, as well as beverages packed in packages of various types and volumes. Consumers are increasingly interested in the nutritional value of the food they buy and want to make conscious dietary decisions.

Key words: plant-based beverages, respondents' preferences, respondents' choices, milk substitutes.

Celem pracy przedstawionej w artykule jest analiza wyborów i preferencji respondentów w stosunku do napojów roślinnych i możliwych kierunków poszerzania ich asortymentu na rynku. Materiał badany stanowiły ankiety zebrane drogą internetową od 600 osób. Badaną populację stanowiły głównie młode, wykształcone kobiety. Najczęściej wybieranymi przez respondentów napojami roślinnymi były napoje o najkorzystniejszych walorach sensorycznych i najbardziej dostępne na rynku. Zadowolenie respondentów z asortymentu napojów roślinnych dostępnego na rynku było zróżnicowane. Osoby badane deklarowały duże zainteresowanie napojami roślinnymi wzbogacanymi w witaminy i składniki mineralne, a także napojami pakowanymi w opakowania różnych rodzajów i o różnej objętości. Konsumenty są coraz bardziej zainteresowani składem kupowanej żywności i chcą podejmować świadome decyzje żywieniowe.

Słowa kluczowe: napoje roślinne, preferencje respondentów, wybory respondentów, substytuty mleka.

INTRODUCTION

The popularity of plant-based beverages, which are usually treated as cow's milk substitutes, is growing year by year. The global market for these products is constantly increasing, and in 2018 it reached a value of USD 16.3 billion, and the European market reached around EUR 300 million. Plant-based beverages are mainly obtained through the extraction of properly processed plant materials, such as cereals, legumes, and nuts. The resulting products differ in both physicochemical and sensory properties depending on the raw material from which they were made, so their acceptance by consumers varies [8, 15].

The popularity of plant-based beverages among consumers is due to several factors. They are consumed primarily by people avoiding cow's milk due to the vegan diet or allergy / intolerance to cow's milk proteins and / or lactose. Increasingly important for many consumers is the ethical and environmental aspect of restricting animal products in the diet, and therefore replacing them with plant products. Producers indicate that the production of one liter of plant-based beverage in a carton

leads to about 70% less water consumption compared to the production of the same volume of cow's milk. Plant-based beverages are also consumed due to their pro-health values, which vary depending on the type of beverage [9, 13].

Plant-based beverages are colloquially called "plant-based milk" by producers and consumers. However, it is a generalized term without a legal description. According to the law, such a term is a large generalization that may mislead the consumer, because in accordance with the Commission Regulation (EU) No 605/2010 of 2 July 2010 laying down animal and public health and veterinary certification conditions for the introduction into the European Union of raw milk and dairy products intended for human consumption, "raw milk" means "milk produced by the secretion of the mammary gland of farmed animals" [14].

Plant-based beverages are mainly obtained by water extraction of the raw material, and the detailed production technology differs depending on the raw material from which the beverage is made. However, each technology for obtaining plant-based beverages includes the following main stages: soaking the raw material, heating, grinding, solid fraction

separation, liquid standardization, homogenization and thermal fixation. At the standardization stage, plant beverages are often enriched with various types of nutrients due to the fact that their composition usually differs significantly from that of cow's milk. Most of the plant-based beverages has a lower content of protein, fat and carbohydrates than cow's milk. The composition closest to cow's milk is soy beverage. Most often it is possible to meet the enrichment of this type of products with calcium, B vitamins, and vitamin D [3, 13]. The nutritional values of cow's milk and selected plant-based beverages available on the Polish market are presented in Table 1.

There are plant-based beverages available on the market made of cereals (e.g. oat, rice, spelled), pseudocereals (e.g. quinoa, buckwheat), legume seeds (e.g. soy, pea, lupine), based on nuts (e.g. almond, cashew), as well as beverages made from other ingredients such as coconut, flax, hemp, sesame or amaranth. In Poland, the most popular beverages are soy, coconut, oat and rice. In stores, we can find not only beverages made of various raw materials, but also beverages offered in various flavors (e.g. vanilla, cocoa), sweetened or unsweetened, organic, or enriched with various nutrients. In order to improve the nutritional properties, producers also use the procedure of combining two or more types of plant-based beverages (e.g. rice-coconut beverage) [5, 15, 17].

The aim of the study was to analyze the choices and preferences of respondents in relation to plant beverages and possible directions of extending their assortment on the market.

MATERIALS AND METHODS

The survey was conducted in 2018 using the proprietary questionnaire. The study was conducted online among Polish respondents who say they consume plant-based beverages, through publications in discussion groups regarding healthy eating and the use of plant-based diets. The research method used in this study was a survey performed using the diagnostic poll method. The questionnaire consisted of questions pertaining to the demographic details of the respondents, 4 closed questions, and 5 semi-open questions. The survey included questions about the frequency of consumption and the most frequently chosen plant-based beverages, as well as factors influencing the consumption and purchase of these products. The respondents were also asked about the forms of consuming plant-based beverages and the assessment of their assortment available on the market. Moreover, the respondents were asked about their attitude to the enrichment of plant-based beverages and indication of factors negatively affecting their quality. Results presented by abundance and frequency analysis. The research material consisted of questionnaires collected from 600 respondents, with an average age of 23.7 years old. The remaining sociodemographic data are presented in Table 2.

Table 1. The nutritional values of cow's milk and selected plant-based beverages available on the Polish market

Tabela 1. Wartości odżywcze mleka krowiego i wybranych napojów roślinnych dostępnych na polskim rynku

Product	Energy (kcal/ 100 ml)	Protein (g /100 ml)	Carbohydrates (g/100 ml)	Fat (g/100 ml)	Fibre (g/100 ml)	Fortification
Cow's milk (Mlekovita)	60	3,0	4,7	3,2	-	-
Soy beverage (Alpro)	39	3,0	2,5	1,8	0,5	vit. D, B2, B12; calcium
Soy beverage (Vitarella)	24	0,3	3,0	1,1	0,4	vit. D, B2, B12, E; calcium
Almond beverage (Alpro)	24	0,5	3,0	1,1	0,2	vit. D, B2, B12, E; calcium
Almond beverage (Sante)	12	0,3	0,3	1,0	0,1	-
Coconut beverage (Alpro)	20	0,1	1,9	0,9	0,1	vit. D, B12; calcium
Coconut beverage (The bridge)	23	0,2	1,9	1,6	-	-
Rice beverage (Alpro)	60	0,1	12,2	1,3	-	vit. D, B2, B12; calcium
Rice beverage (Pilos)	59	0,2	12,2	0,9	-	-
Oat beverage (Alpro)	43	1,4	7,0	1,3	1,4	vit. D, B2, B12; calcium
Oat beverage (enerBIO)	40	0,6	6	1,4	0,5	-

Source: The author's own study

Źródło: Opracowanie własne

Table 2. Sociodemographic profile of the studied population

Tabela 2. Profil socjodemograficzny badanej populacji

Sociodemographic criteria		Quantity	%
gender	female	568	94,7
	male	32	5,3
place of residence	city/village up to 50,000 residents	161	26,8
	city 50-200 thousand residents	106	17,7
	city over 200,000 residents	333	55,5
education	primary	81	13,5
	secondary	262	43,7
	higher	257	42,8

Source: The author's own study based on the results of the survey conducted

Źródło: Opracowanie własne na podstawie przeprowadzonych badań

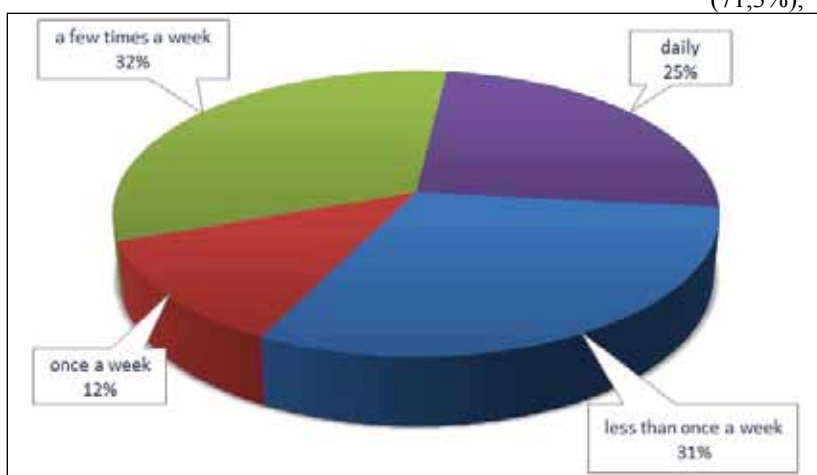


Fig. 1. The frequency of consumption of plant-based beverages by respondents.

Rys. 1. Częstotliwość spożywania napojów roślinnych przez respondentów.

Source: The author's own study based on the results of the survey conducted

Źródło: Opracowanie własne na podstawie przeprowadzonych badań

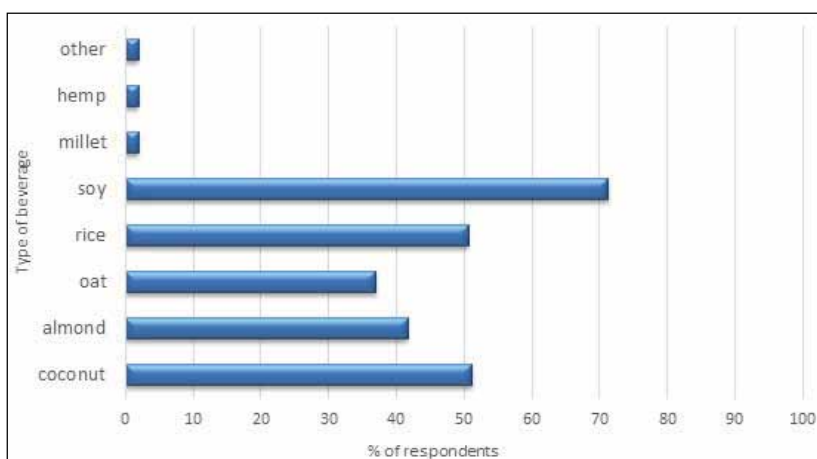


Fig. 2. Plant-based beverages most frequently chosen by respondents.

Rys. 2. Najczęściej wybierane przez respondentów napoje roślinne.

Source: The author's own study based on the results of the survey conducted

Źródło: Opracowanie własne na podstawie przeprowadzonych badań

RESULTS AND DISCUSSION

The surveyed population was mainly young, educated women. Among the 600 people who took part in the survey, 95% were women. This share of women in the study may be due to the fact that the research was conducted mainly on discussion groups on healthy eating and the use of plant-based diets, whose members are mainly women. The people who most often answered the questionnaire were people aged 23 and those with secondary or higher education (Tab. 2). According to Brecic et al. [4], the most frequent buyers of functional foods (which include plant-based beverages enriched with vitamins and minerals) are mainly women and well-educated people who attach the greatest importance to health and comfort in food choices.

The respondents mainly declared the consumption of plant-based beverages less than once a week (30,7%), few times a week (32,3%) or daily (24,8%) (Fig. 1). The most frequently chosen plant-based beverages by the respondents were soy (71,3%), rice (50,7%), coconut (51,2%), almond (41,7%) and oat beverages (37%) (Fig. 2). The study by Hoffmann and Kostyra [5] showed that almond, coconut, soy and walnut beverages are the most desirable, due to their favorable organoleptic characteristics. In a study by Walczak et al. [17] it was found that coconut, soy, rice, almond and oat beverages are the most common in Polish supermarkets. It can therefore be concluded that the beverages most frequently indicated by the respondents are characterized by the most favorable sensory values and the greatest availability on the market. The least frequently respondents indicated consumption of millet and hemp beverages, which, unlike the most frequently chosen beverages, are characterized by much less favorable sensory values and less availability. An answer other than that given was given by 2% of the respondents, including nut, sesame, and buckwheat beverages.

The respondents indicated their diet (80,3%), ethical reasons (41,8%), the taste (45,8%) and the nutritional value (33,7%) as the main reasons for consuming plant-based beverages (Tab. 3). According to Janssen et al. [6] the number of consumers following a vegan diet has increased significantly in many industrialized countries and it is highly likely that this number will continue to increase. Consumers are largely switching to a vegan diet for ethical and health reasons. Moreover, the majority of the respondents were women, and according to Modlińska et al. [10], women prefer plant-based diets more often than men.

The main factors influencing the purchases of plant-based beverages by the respondents were: composition (81%), taste (78,7%) and price (77,7%) (Tab. 3). Similar results were obtained in the study by Niewczas [11], where consumer preferences and criteria for food selection were defined. The respondents indicated that when

choosing food, they most often pay attention to the price and composition of the product. In the study by Barska [2], the similarities and differences in the decision-making process when buying food were found on a sample of young consumers aged 18-29, living in the border regions of Poland, the Czech Republic and Slovakia (most of the respondents were also women there). The study showed that the four main criteria for selecting food products were product freshness, price, quality and taste, similar to the present study. Only 0.3% of the respondents gave an answer other than the one given, and the availability of the product and ethical considerations were mentioned among them.

Table 3. Factors influencing the consumption and purchase of plant-based beverages by respondents

Tabela 3. Czynniki wpływające na spożywanie i zakup napojów roślinnych przez respondentów

Respondents' answers	Quantity	%
Reasons for consuming plant-based beverages		
food allergy / intolerance	103	17,2
diet (vegan, vegetarian, gluten-free etc.)	482	80,3
trends	19	3,2
habits	54	9,0
taste	275	45,8
nutritional value	202	33,7
ethical reasons	251	41,8
other	3	0,5
Factors driving the purchase of plant-based beverages		
price	466	77,7
eco product certificate	122	20,3
gluten-free food certificate	13	2,2
label	36	6,0
brand	48	8,0
shelf life	47	7,8
advertisement	9	1,5
composiotion	486	81,0
taste	472	78,7
product volume	114	19,0
enrichment with vitamins and minerals	266	44,3
confidence in the manufacturer	80	13,3
other	2	0,3

Source: The author's own study based on the results of the survey conducted

Źródło: Opracowanie własne na podstawie przeprowadzonych badań

The number of respondents satisfied with the assortment of plant-based beverages available on the market is similar to the number of dissatisfied people – it was about 40% in both cases (Tab. 4). The respondents showed the greatest interest in plant-based beverages enriched with vitamins and minerals (61,7%) (Tab. 4). The addition of individual nutrients in plant-based beverages is often stated on the label through the nutrition claims. According to Ozimek and Przeździecka-Czyżewska [12], nutritional claims may influence the

perception of particular features of a product by consumers, as well as the overall assessment of its quality. Enriching plant-based beverages is extremely important as they are mainly treated as substitutes for cow's milk. Their nutritional value often differs significantly from that of cow's milk, especially in terms of protein, calcium, vitamin D and B vitamins [9]. Consuming plant-based beverages not fortified with calcium and other ingredients that were previously supplied with milk can lead to nutritional deficiencies. However, the enrichment of plant-based beverages is currently not the norm among producers, which should definitely change.

Table 4. Respondents' attitude to the offered assortment of plant-based beverages and possible directions of its expansion

Tabela 4. Stosunek respondentów do oferowanego asortymentu napojów roślinnych i możliwych kierunków jego poszerzenia

Respondents' answers	Quantity	%
„Are you satisfied with the assortment of plant-based beverages available on the market?”		
yes	285	47,5
no	248	41,3
I have no opinion	67	11,2
„What types of plant-based beverages would be most desirable for you?”		
in various volumes	312	52,0
flavored (fruit, cocoa, vanilla)	25	35,8
enriched (with vitamins, minerals, omega-3 acids, etc.)	370	61,7
with an eco certificate	161	26,8
with gluten-free food certificate	18	3,0
with various types of packaging (carton, plastic, glass, etc.)	268	44,7
„Enriching the market with what flavors of plant beverages would be most desirable by you?”		
chocolate	137	22,8
fruity	157	26,2
vanilla	129	21,5
I'm interested only in natural flavors	176	29,3
other	1	0,2
„What, in your opinion, negatively affects the quality of plant-based beverages?”		
addition of sugar	417	69,5
addition of fat	109	18,2
the presence of food additives	406	67,7
off-flavour	86	14,3
other	0	0,0

Source: The author's own study based on the results of the survey conducted

Źródło: Opracowanie własne na podstawie przeprowadzonych badań

The respondents were also interested in plant-based beverages packed in various types of packaging (e.g. glass, carton, plastic) (44,7%) and beverages of various volumes (52%) (Tab. 4). According to Jerzyk [7], in the set of visual elements of the packaging design, its shape and size are decisive for the emergence and recognition of the consumer's needs in the purchasing environment. Today, most plant-based beverages are available on the market in carton packs of 1 liter, so there is a need to expand the range of packaging types with different volumes and materials. Promoting the availability of plant-based beverages in packages with a volume of less than 1 liter would make it possible to spread them also as refreshing drinks that can be taken with and consumed once.

When asked about the desired flavors of plant-based beverages, the respondents to a similar extent indicated three variants: chocolate (22,8%), vanilla (21,5%) and fruity (26,2%) (Tab. 4). An answer other than the proposed one was given by 0.2% of the respondents, and among them flavored plant-based beverages were mentioned, in which sugar was replaced with sweeteners, such as xylitol, erythritol. Offering plant-based beverages in various flavors may improve their acceptance. Some of these products in their natural form are negatively received by consumers, mainly due to the presence of off-flavor [16].

The conducted study showed that the main factors negatively influencing the perception of the quality of plant-based beverages are addition of sugar (69,5%) and the presence of food additives (67,7%) (Tab. 4). According to Asiola [1], some food ingredients, such as food additives, are perceived by consumers as unhealthy and unknown. This phenomenon, often referred to as the „clean label” trend, has prompted the food industry to report whether a specific ingredient or additive is not present or whether the food has been produced using a more „natural” production method. Consumers are increasingly interested in the composition of the food they buy and want to make informed nutritional decisions that allow them to stay healthy longer.

SUMMARY AND CONCLUSIONS

The conducted study analyzed the choices and preferences of respondents in relation to plant-based beverages offered on the market. The surveyed population was mainly young, educated women. The growing popularity of plant-based beverages is related to the increase in the number of consumers following a vegan diet, which is likely to continue to grow. The conducted analysis showed that the beverages most frequently chosen by the respondents (soy 71,3%, rice 50,7%, coconut 51,2%, almond 41,7%, oat 37%) are beverages characterized by the most favorable sensory values and the highest availability on the market.

The respondents' satisfaction with the assortment of plant-based beverages available on the market varied. The respondents declared a great interest in plant-based beverages enriched with vitamins and minerals (61,7% of studied population). The fortification treatment of these products is extremely important, mainly due to the fact that they are treated as substitutes for cow's milk, but it is still not a standard procedure. The composition of plant-based beverages often differs significantly from that of cow's milk,

and producers should implement a fortification procedure for more plant-based beverages to prevent nutritional deficiencies in consumers.

Plant-based beverages are available on the market most often in the form of carton packages with a volume of 1 liter. The respondents in this study indicated the interest in products packed in various types of packaging (e.g. glass, carton, plastic) (44,7% of studied population) and beverages offered in various volumes (52% of studied population). Promoting the availability of plant-based beverages in packages with a volume of less than 1 liter would also make it possible to spread them also as refreshing drinks that can be taken with and consumed once. The increase in the number of products offered in various flavors (e.g. vanilla, chocolate) may also contribute to increasing interest in the assortment of plant-based beverages. Some types of plant-based beverages are negatively perceived by consumers due to the presence of off-flavor, the perception of which can be reduced by adding flavor substances.

The popular „clean label” trend affects the consumers of plant-based beverages who have reported a negative perception of the quality of beverages for the production of which sugar and food additives have been used. Consumers are increasingly interested in the composition of food they buy and want to make conscious dietary decisions that allow them to stay healthy longer. The dynamic development of the milk substitutes market prompts producers to expand their product range. It is necessary to familiarize with the expectations of consumers, which allows to create products that meet their requirements.

PODSUMOWANIE I WNIOSKI

Przeprowadzone badanie pozwoliło dokonać analizy wyborów i preferencji respondentów w stosunku do napojów roślinnych oferowanych na rynku. Badaną populację stanowiły głównie młode, wykształcone kobiety. Wzrost popularności napojów roślinnych powiązany jest ze wzrostem liczby konsumentów stosujących dietę wegańską, która to liczba prawdopodobnie nadal będzie wzrastać. Przeprowadzona analiza wykazała, że najczęściej wybierane przez respondentów napoje (sojowe 71,3%, ryżowe 50,7%, kokosowe 51,2%, migdałowe 41,7%, owsiane 37%) charakteryzują się najbardziej korzystnymi walorami sensorycznymi oraz największą dostępnością na rynku.

Zadowolenie respondentów z asortymentu napojów roślinnych dostępnego na rynku było zróżnicowane. Osoby badane deklarowały duże zainteresowanie napojami roślinnymi wzbogacanymi w witaminy i składniki mineralne (61,7% badanej populacji). Zabieg fortyfikacji tych produktów jest niezwykle istotny, głównie, ze względu na fakt, że są one traktowane jako substytuty mleka krowiego, jednak nie jest to procedura standardowa. Skład napojów roślinnych często odbiega znacząco od składu mleka krowiego, w związku z czym producenci powinni wdrażać procedurę fortyfikacji w przypadku większej liczby napojów roślinnych, aby zapobiegać niedoborom pokarmowym u konsumentów.

Napoje roślinne są dostępne na rynku najczęściej w postaci kartonowych opakowaniach o objętości 1 litra. Respondenci przeprowadzonych badań wskazali na zainteresowanie

produktami pakowanymi w opakowania różnych rodzajów (np. szklane, kartonowe, plastikowe) (44,7% badanej populacji) oraz napojami w różnej pojemności (52% populacji). Propagowanie dostępności napojów roślinnych w opakowaniach o mniejszej objętości niż 1 litr pozwoliłoby na rozpowszechnienie ich również jako napojów orzeźwiających, możliwych do zabrania ze sobą i jednorazowego spożycia. Do zwiększenia zainteresowania asortymentem napojów roślinnych może również przyczynić się zwiększenie liczby produktów oferowanych w różnych wariantach smakowych (np. waniliowy, czekoladowy). Niektóre rodzaje napojów roślinnych spotykają się z negatywnym odbiorem konsumentów, ze względu na obecność posmaków roślinnych. Ich odczuwanie może zostać zredukowane poprzez dodatek

wsadów smakowych.

Popularny trend „czystej etykiety” wpływa korzystnie na konsumentów napojów roślinnych. Deklarowali oni negatywne postrzeganie jakości napojów, do produkcji których wykorzystano cukier i dodatki do żywności. Konsumenty są coraz bardziej zainteresowani składem kupowanej żywności i chcą podejmować świadome decyzje żywieniowe, pozwalające im na dłuższe utrzymanie zdrowia. Dynamiczny rozwój rynku substytutów mleka skłania producentów do poszerzania ich asortymentu. Niezbędne jest dalsze poznawanie oczekiwań konsumentów, co pozwoli na tworzenie produktów spełniających ich wymagania.

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