

Original Article

Sugary and Carbonated Beverage Consumption in an Example of Generation Z - Small Sample: Health Risks for Young People

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Abstract: This article aims to study consumer choices for sweet and carbonated beverages among Generation Z consumers and, using quantitative methods, identify key types of consumer behavior, establish similarities or differences that indicate specific preferences for consuming sweet or carbonated beverages, and formulate recommendations for preventing excess weight and obesity based on consumer type. The article examines the problems of analyzing consumer choice of sweet and carbonated drinks using the method of analytic hierarchy of T. Saaty and multidimensional scaling methods. The following popular beverages were selected as a set of sweet and carbonated drinks: Cola, Pepsi, Fanta, packaged in plastic or glass bottles; sweet Ice Tea varieties prepared from green and black tea with various flavor additives and packaged in plastic bottles; sweet drinks based on black coffee, packaged in closed plastic cups; apple juice and orange juice with added sugar or sweeteners, packaged in plastic or glass bottles; carbonated mineral water, packaged in plastic or glass bottles. Four groups were identified, characterizing the consumer preferences for sweet and carbonated beverages among Generation Z. The first and fourth groups were characterized by lower levels of consumption of beverages such as Cola, Pepsi, and Fanta, and a high preference for carbonated mineral water. This means that this group exhibits lower health risks associated with consuming sugary and carbonated beverages. The first group comprised 20% of observations, while the fourth group comprised 10%. The second group, the largest (60% of observations), exhibited the highest level of health risk due to their high consumption of Cola, Pepsi, and Fanta. In the third group (10% of observations), the health risk from consuming sugary and carbonated beverages was moderate. Thus, various taste and behavioral preferences in the choice of sweet and carbonated drinks were identified, which are of sufficient importance for determining the target group and developing programs to promote healthy eating, prevent obesity and the development of diabetes mellitus associated with metabolic disorders and endocrine system functioning.

Keywords: Sugary and Carbonate Beverages, Consumer Choice, Analytical Hierarchy Process, Multidimensional Scaling, Overweight and Obesity, Health Risk.

I. INTRODUCTION

Consumer choice is a key area of analysis in microeconomics and marketing. Consumer choices of food and beverages influence health, particularly in the medium and long term, by shaping dietary patterns and eating habits, as well as calorie, vitamin, and mineral intake. Consumer choices of food and beverages also depend on income, education, social environment, the availability of retail outlets that supply and sell food and beverages, product variety, price level, and product quality.

Consumer choices of food and beverages are also determined by the influence of external and internal sociocultural environments, national or local traditions, and are shaped by stereotypes and behavioral patterns. Therefore, it is crucial to study the psychological and behavioral factors influencing consumer choices of food and beverages, as both consumer segments and individual choice patterns should be examined.

Particular attention should be paid to studying the younger generation's consumer choices regarding sugary and carbonated beverages (Bodzsar, Zsakai, 2014). One of the negative phenomena in modern society is the growing epidemic of overweight and obesity among the population, including children and young people (Blundell et al, 2017; Saha et al, 2022).

Numerous researchers have examined the prevalence of overweight and obesity among contemporary populations across various countries. In particular, the dynamics (trends over time) of overweight and obesity in Eastern European populations have been the subject of several epidemiological, comparative, and modeling studies.



These can be grouped into several key types of research: (1) regional overviews, (2) longitudinal or trend analyses, (3) modeling studies, and (4) systematic reviews with Eastern European evidence. Thus, Knai et al. (2007) provides a comprehensive overview of overweight and obesity in Eastern Europe, examining both epidemiological trends and economic consequences. According to the study, there has been a noticeable increase in obesity among adults and children in the area, indicating lifestyle changes brought about by the shift from centrally planned to market economies.

Bodzsar & Zsakai (2014) focused on temporal trends (children and adolescents). Using data from two large representative Hungarian growth studies (from 1983–1986 and 2003–2006), the authors assessed trends in overweight and obesity among children over roughly two decades. Olaya et al. (2015) investigated the prevalence and correlates of overweight and obesity among primary school children across seven European countries: Italy, Germany, the Netherlands, Romania, Bulgaria, Lithuania, and Turkey.

A thorough examination of overweight and obesity rates throughout European nations is given in the article "Obesity prevalence from a European perspective: a systematic review" (2008), which also highlights significant regional variance and methodological issues with data comparability. In Eastern European countries, the review indicates generally high and, in some cases, increasing levels of obesity, particularly in populations undergoing socioeconomic transition.

Researchers such as Hongai Li et al. (2024), Li Zhang et al. (2021), Jay Saha et al. (2022), and Ty Beal et al. (2020) have examined the specific features of obesity and overweight in Asian countries (China, India, and Vietnam). As we can see from the studies (Hongai Li et al., 2024; Li Zhang et al., 2021), the prevalence of overweight/obesity among youth has risen dramatically since the 1980s.

The key and contributing factors are:

Lifestyle and diet:

- Increased consumption of high-calorie, processed foods,
- Sugar-sweetened beverages and fast food expansion.

Socioeconomic transformation:

- Rapid urbanization and economic growth,
- Shift from traditional diets to “Westernized” diets.

Behavioral factors:

- Sedentary lifestyle (screen time, academic pressure),
- Reduced physical activity.

Biological and behavioral risks:

- Sleep deprivation,
- Energy imbalance and irregular eating patterns.

Ty Beal et al. (2020) identify the main determinants of child obesity in Vietnam and analyze how they vary geographically. This indicates that obesity is concentrated in particular locations rather than being dispersed uniformly. Therefore, rather than just biological factors, economic development, urbanization, and lifestyle changes are the main causes of childhood obesity in Vietnam.

Such authors, as Wong, Martin et al. (2020), Artime, Esther et al. (2025), Berghöfer, Anne et al. (2008), Blundell, John et al. (2017), and Orsini Francesca et al. (2023), specifically examine regional and country-level epidemiological characteristics of overweight and obesity across Europe and Asia. These studies typically use comparative datasets, stratified prevalence analysis, and cross-country epidemiological frameworks. The systematic review of European countries (Berghöfer, Anne et al., 2008) shows the strong geographic variation across Europe: higher prevalence in Central, Eastern, and Southern Europe and lower prevalence in Western and Northern Europe.

Broader continental trends analyzed by Blundell et al. (2017) revealed marked variability in obesity prevalence across European countries, shaped by socioeconomic development, dietary patterns, sedentary lifestyles, and policy environments, reflecting the complex interplay of structural, behavioral, and cultural determinants.

Numerous studies conducted by biochemists, medical professionals, and experts in nutrition and public health have shown a link between the intake of sugary and carbonated drinks and problems related to obesity and excess weight.

The systematic review and meta-analysis by Deierlein et al. (2024) evaluated the relationship between sugar-sweetened beverage (SSB) consumption and three key outcomes—growth, body composition, and risk of obesity—across the life course, including infants, children, adolescents, adults, and older adults. The paper by Jakobsen, Brader, and Bruun (2023) demonstrates

that specific dietary behaviors—particularly high consumption of sugar-sweetened beverages and fast food—are key modifiable risk factors for overweight and obesity in children and adolescents. At the same time, the heterogeneity of findings across food groups highlights the complexity of diet–obesity relationships and the limitations of focusing on individual food items rather than broader dietary patterns.

It should be noted that among Generation Z, the problem is amplified by digital exposure, lifestyle changes, and early-life dietary patterns, making sugary beverage consumption one of the most critical modifiable risk factors in modern obesity epidemiology.

Young people's consumption of sweet and carbonated beverages is linked to youth culture and the advertising of these beverages in the media and on social media. Sweet and carbonated beverages constitute the main product offerings in bars, cafes, kiosks, cafeterias, supermarkets, and self-service vending machines. Thus, the widespread availability of sweet and carbonated beverages and their active advertising have led to their consumption becoming an integral part of the modern lifestyle.

At the same time, it is necessary to more thoroughly study consumer patterns and the reasons for the formation of consumer choice of certain sweet or carbonated drinks, especially among the younger generation, since the prevention of obesity and the promotion of a healthy lifestyle should become important tasks of public health and the development of appropriate health policies.

II. RESEARCH OBJECTIVES

This article aims to study consumer choices for sweet and carbonated beverages among Generation Z consumers and, using quantitative methods, identify key types of consumer behavior, establish similarities or differences that indicate specific preferences for consuming sweet or carbonated beverages, and formulate recommendations for preventing excess weight and obesity based on consumer type.

III. RESEARCH DATA AND METHODS

This study involved students from a Central European university studying under the Erasmus+ program, bilateral agreements, and an English-taught economics curriculum. Of the 10 students who participated in this study, three were from Ukraine, two from Portugal, two from Greece, one from Slovakia, one from India, and one from Vietnam. Students ranged in age from 17 to 24. There were two females and eight male respondents.

One of the primary methods for analyzing respondents' consumer choices used in this study was the analytic hierarchy process (AHP) developed by T. Saaty (Saaty, 1977). In this study, respondents were asked to rate their preferences for a particular sweet or carbonated drink on a scale (from 1 to 9), making pairwise comparisons, and recording the results in a matrix.

The algorithm was then used to calculate weighting coefficients and construct pie charts showing the degree of importance (weight, percentage, or percentage) in shaping consumer choice and preferences for purchasing sweet and carbonated beverages. These pie charts allowed us to characterize the participants' consumer profile.

Next, the participant survey results were processed by calculating a distance matrix and constructing a tree diagram. Afterward, multidimensional scaling was used to determine consumer groups and their locations in two-dimensional space for the values of the two new attributes calculated based on the values of the original variables (Hout, 2012).

IV. MAIN FINDINGS

To study young people's consumer preferences for sweet and carbonated beverages, we analyzed responses from Gen Z students from various countries who were studying under the Erasmus program and bilateral programs at a university in Slovakia. The following popular beverages were selected as a set of sweet and carbonated drinks: Cola, Pepsi, Fanta, packaged in plastic or glass bottles; sweet Ice Tea varieties prepared from green and black tea with various flavor additives and packaged in plastic bottles; sweet drinks based on black coffee, packaged in closed plastic cups; apple juice and orange juice with added sugar or sweeteners, packaged in plastic or glass bottles; carbonated mineral water, packaged in plastic or glass bottles.

In microeconomics and business economics classes, students were introduced to the analytic hierarchy process developed by T. Saaty and asked to complete preference matrices according to the scale used in this method. Students pairwise compared the importance of consuming the beverages specified in the set and filled in the matrix cells according to their own preferences and the scale used. Then, using the MPriority program (Matrosova et al, 2021), the matrix elements were checked for transitivity. If the transitivity condition was not violated, the weighting coefficients used in Saaty's method were calculated to assess the choice priority of alternatives.

The results of processing student responses and their characteristics are presented in Table 1. As can be seen from the calculation results, the weighting coefficients range from 0 to 1, and their sum for each case is equal to 1. Weighting coefficients

are often used to analyze individual preference profiles for constructing pie charts, where these values are displayed as percentages. Higher weighting coefficient values correspond to higher degrees of preference or the importance of a given choice for the respondent. The following variables were used to calculate priorities: COLA – a variable reflecting the priority of consuming the popular drink Cola; PEPSI – a variable reflecting the priority of consuming the popular drink Pepsi; FANTA – a variable reflecting the priority of consuming the popular drink Fanta; ORJUICE – a variable reflecting the priority of consuming orange juice; APLJUICE is a variable reflecting the priority of apple juice consumption; BLTEA and GRTEA are variables reflecting the priority of consumption of the popular drink Ice Tea, prepared using black and green tea; BLCOFFEE is a variable reflecting the priority of consumption of drinks based on black coffee; CARBMINWAT is a variable reflecting the priority of consumption of carbonated mineral water.

Table 1: Values of Weighting Coefficients Characterizing Priorities Calculated Using The Saaty Method

No of Case	Name	COLA	PEPSI	FANTA	ORJUICE	APJUICE	BLTEA	GRTEA	BLCOFFEE	CARB-MIN-WAT	Country	Age	Gender
1	AY	0,0207	0,0207	0,0207	0,0809	0,0907	0,1549	0,2362	0,037	0,3378	Ukraine	18	M
2	CE	0,386	0,1965	0,1006	0,1192	0,0731	0,0474	0,0269	0,0307	0,0192	Portugal	20	F
3	PS	0,3619	0,2078	0,125	0,0842	0,0219	0,0659	0,0567	0,0444	0,0317	Greece	21	M
4	SN	0,032	0,032	0,032	0,1077	0,1948	0,0612	0,1948	0,0094	0,3357	Slovakia	19	M
5	AO	0,0852	0,1472	0,2045	0,015	0,0107	0,0596	0,0596	0,0489	0,3689	Portugal	21	M
6	EM	0,3475	0,1778	0,1121	0,0807	0,0265	0,0835	0,0701	0,0575	0,0439	Greece	21	M
7	LA	0,328	0,207	0,1476	0,1092	0,0831	0,0495	0,0343	0,0238	0,0171	Ukraine	19	F
8	AM	0,2463	0,2463	0,1856	0,0935	0,0726	0,0573	0,0424	0,0314	0,0241	Vietnam	21	M
9	MO	0,0151	0,0232	0,0452	0,0795	0,0942	0,2941	0,2941	0,1454	0,0087	Ukraine	17	M
10	SB	0,2909	0,2493	0,1575	0,1015	0,0626	0,0714	0,0261	0,0304	0,0099	India	24	M

Source: calculated by authors

As can be seen from the calculation results presented in Table 1, there are several instances of respondents' answers that are quite similar in their consumption priorities for certain sweet and carbonated beverages, while others differ significantly. Therefore, it is advisable to examine the degree of similarity between respondents' answers using multivariate analysis methods.

First, it is advisable to calculate the distance between the instances, using, for example, a standard Euclidean metric.

Table 2 presents the results of calculating the distances between the 10 indicated response cases.

Table 2: Euclidean distances matrix

	C_1	C_2	C_3	C_4	C_5	C_6	C_7	C_8	C_9	C_10
C_1	0,00	0,57	0,55	0,15	0,33	0,51	0,55	0,52	0,38	0,55
C_2	0,57	0,00	0,08	0,55	0,49	0,10	0,08	0,17	0,56	0,13
C_3	0,55	0,08	0,00	0,54	0,45	0,05	0,09	0,15	0,53	0,11
C_4	0,15	0,55	0,54	0,00	0,33	0,51	0,52	0,50	0,45	0,53
C_5	0,33	0,49	0,45	0,33	0,00	0,43	0,45	0,41	0,55	0,44
C_6	0,51	0,10	0,05	0,51	0,43	0,00	0,10	0,16	0,50	0,13
C_7	0,55	0,08	0,09	0,52	0,45	0,10	0,00	0,10	0,53	0,07
C_8	0,52	0,17	0,15	0,50	0,41	0,16	0,10	0,00	0,51	0,06
C_9	0,38	0,56	0,53	0,45	0,55	0,50	0,53	0,51	0,00	0,53
C_10	0,55	0,13	0,11	0,53	0,44	0,13	0,07	0,06	0,53	0,00

Source: calculated by authors in Statistica

For a simple graphical interpretation of the calculation results and assessment of the degree of similarity of the responses, a Tree Diagram was constructed, presented in Figure 1, and an Amalgamation Schedule with Linkages is given in Table 2.

Table 3: Amalgamation Schedule with Linkages and Cases

Linkage	Obj. No.	Obj. No.	Obj. No.	Obj. No.	Obj. No.	Obj. No.	Obj. No.	Obj. No.	Obj. No.	Obj. No.
0,0460103	C_3	C_6								
0,0601574	C_8	C_10								
0,0662231	C_7	C_8	C_10							
0,0774238	C_2	C_7	C_8	C_10						
0,0820032	C_2	C_7	C_8	C_10	C_3	C_6				
0,1523087	C_1	C_4								
0,3256781	C_1	C_4	C_5							
0,3787327	C_1	C_4	C_5	C_9						
0,4069638	C_1	C_4	C_5	C_9	C_2	C_7	C_8	C_10	C_3	C_6

Source: calculated by authors in Statistica

As can be seen from Table 2 and the diagram in Fig. 1, Case 3 and Case 6 turned out to be the closest (Linkage 0.0460103); then come Case 8 Case 10 (Linkage 0.0601574) in terms of similarity; for the group Case 2, Case 7, Case 8, Case 10, Case 10, Case 3, Case 6 the similarity degree is less, since (Linkage) is 0.0820032; for the group Case 1, Case 4, Case 5, Case 9 the degree of similarity is significantly lower, since Linkage increased significantly and amounted to 0.3787327; and finally, Case 1, Case 4, Case 5, Case 9, Case 2, Case 7, Case 8, Case 10, Case 3, Case 6 the Linkage value was 0.4069638.

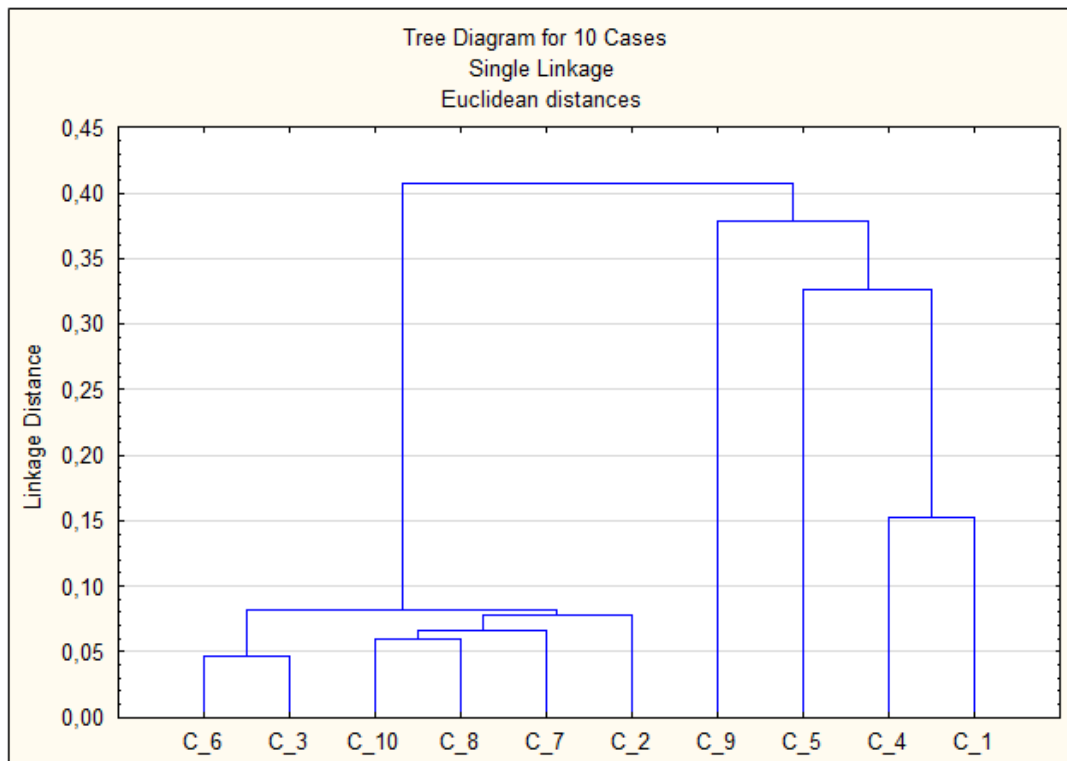


Figure 1. Tree Diagram for Cases

Source: calculated by authors in Statistica

Next, multidimensional scaling methods were used to analyze the similarities or differences between cases. Multidimensional scaling (MDS) is a data analysis method that visualizes complex relationships between objects by placing them as points in two- or three-dimensional space. Similar objects are placed close together, while dissimilar ones are placed farther

apart, allowing for a clear interpretation of the data structure. The primary goal is to transfer high-dimensional data to a lower-dimensional space with minimal loss of information, as measured by the stress function (Hout, 2012).

The results of the final configuration are presented in Table 3. In this table, the spreadsheet with the coordinates of the final configuration is given.

For this configuration, the following stress (Stress=0,0000108) and loss function (Alienation = 0,0000194) values were obtained. These metrics are used for the analysis of the quality of the model used in the multidimensional scaling.

Stress in multidimensional scaling (MDS) is a goodness-of-fit metric measuring the disparity between distances in a high-dimensional dataset and their low-dimensional representation. Lower stress values indicate a better fit, usually minimized through iterative optimization to create accurate visual mappings. It acts as a variance measure of distortion [25].

Alienation in multidimensional scaling (MDS) is a loss function coefficient, often associated with Guttman, that measures the discrepancy between original data dissimilarities and distances in a reduced-dimensional map. It quantifies how poorly a low-dimensional configuration represents the original high-dimensional data, acting as a "badness-of-fit" metric that typically ranges from 0 to 1. A lower alienation value indicates a better fit. A value of 0 indicates a perfect representation of the original data in the lower dimension. While Kruskal's stress has detailed thresholds (e.g., <0.10 excellent, >0.15 poor), Guttman's alienation coefficient is generally considered acceptable if it is below 0.15.

As can be seen from the results for the Stress and Alienation coefficient, the resulting model is quite suitable for interpreting differences or similarities between objects (cases) using multidimensional scaling.

Table 4: The coordinates in two-dimensional space and the results of grouping with the evaluation of health risk

	DIM. 1	DIM. 2	GROUP	HEALTH RISK
C_1	-1,35601	-0,258689	Group 1	Essentially Lower
C_2	0,69677	0,041116	Group 2	Essentially Higher
C_3	0,69671	0,041130	Group 2	Essentially Higher
C_4	-1,35594	-0,258783	Group 1	Essentially Lower
C_5	-0,38940	-0,842801	Group 3	Middle
C_6	0,69664	0,041143	Group 2	Essentially Higher
C_7	0,69672	0,041071	Group 2	Essentially Higher
C_8	0,69663	0,041005	Group 2	Essentially Higher
C_9	-1,07883	1,113792	Group 4	Rather lower
C_10	0,69670	0,041018	Group 2	Essentially Higher

Source: calculated by authors in Statistica and own interpretation of groups and health risks

Then we plotted the final configuration of variables for the cases in a two-dimensional format (Figure 3). For some cases, the coordinates were the same and this means that we can consider such cases as the elements in the group.

As can be seen from the data in Table 3 and Figure 3, 4 groups were obtained: Group 1 included Case 1 and Case 4 (2 observations or 20% of the sample size); Group 2 was the largest and included 6 observations or 60% of the sample size (Case 2, Case 3, Case 6, Case 7, Case 8 and Case 10); Group 3 included one observation or 10% of the sample size (Case 5) and Group 4 also included one observation or 10% of the sample size (Case 9).

Figure 3 shows that Group 2 is located in the first quadrant and is quite far removed from the other groups. Visually, Group 2 is located farthest from Group 1 and quite far from Group 4, while Group 3 is closer to Group 2. Group 1 is closer to Group 4 than to Group 3. Group 1 and Group 3 are in the third quadrant, while Group 4 is located in the second quadrant.

Next, a qualitative interpretation of the resulting groups was carried out based on the analysis of the initial data and graphical presentation of the results using pie charts characterizing the preferences of respondents in choosing sweet and carbonated drinks.

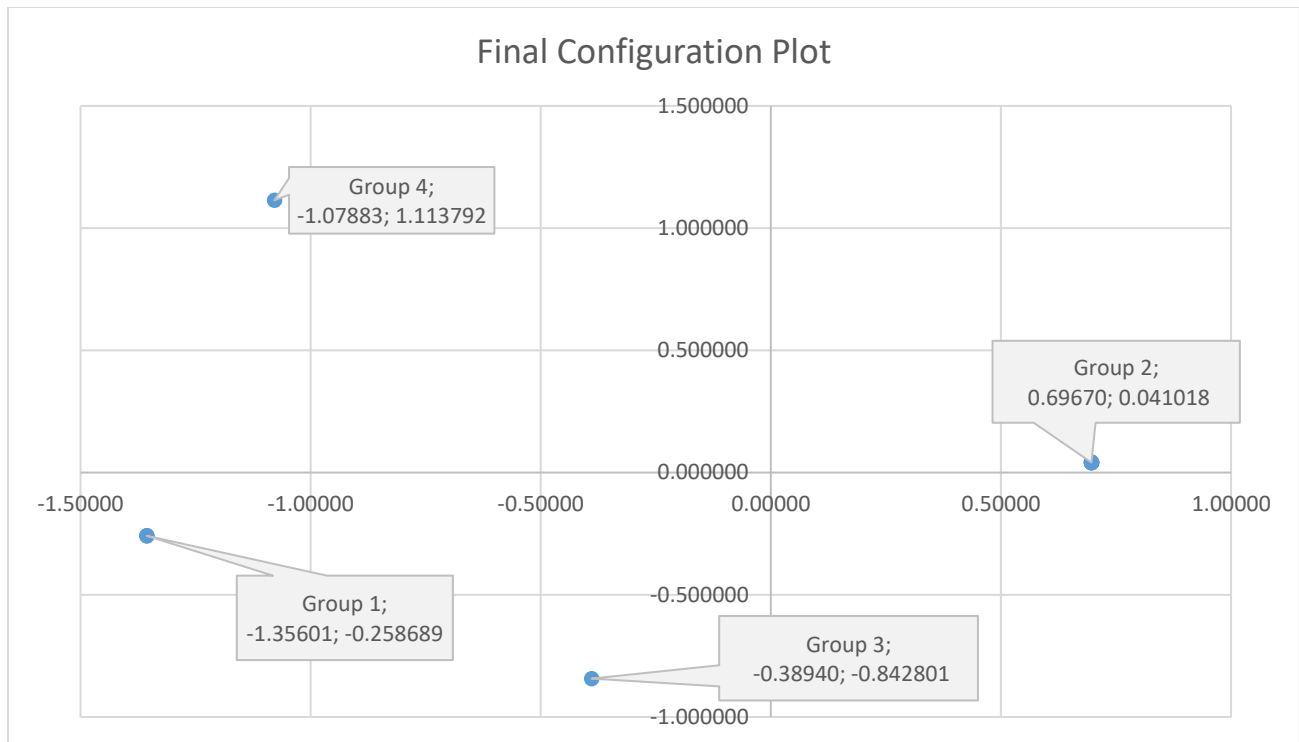


Figure 2. Final Configuration Plot of the Data in Two-Dimensional Space

Source: composed by authors

The interpretation of the groups and their corresponding health risk levels depends on the cases assigned to the groups and is based on consumer preferences for specific sugary and carbonated beverages.

A description of these groups and their interpretation is provided below.

A) Group 1

The first group included Cases 1 and 4, which represent relatively young male students from Ukraine and Slovakia, aged 18 and 19, respectively.

In Case 1 (presented by a student from Ukraine, 18 y.o., male), carbonated mineral water accounted for 34% of all other sweet and carbonated drinks offered. Green tea (24%) and black tea (15%), which are used to prepare iced tea with various flavors, follow closely behind. Next comes green tea (24%) and black tea (15%), which are used to prepare iced tea with various flavors. Apple juice (9%) and orange juice (8%) are also quite significant. The consumption of sweetened black coffee-based drinks accounts for 4%, while consumption of sweetened carbonated drinks accounts for 6%: Fanta (2%), Pepsi (2%), and Cola (2%).

The consumer profile indicating the degree of priority for choosing sweet and carbonated drinks, expressed as a percentage, is shown for the first respondent in Figure 4.

In Case 4 (presented by a 19-year-old male student from Slovakia), carbonated mineral water also accounts for the largest share of the beverages consumed (34%). Apple juice (20%) and green tea, used in making iced tea, are second in importance (19%).

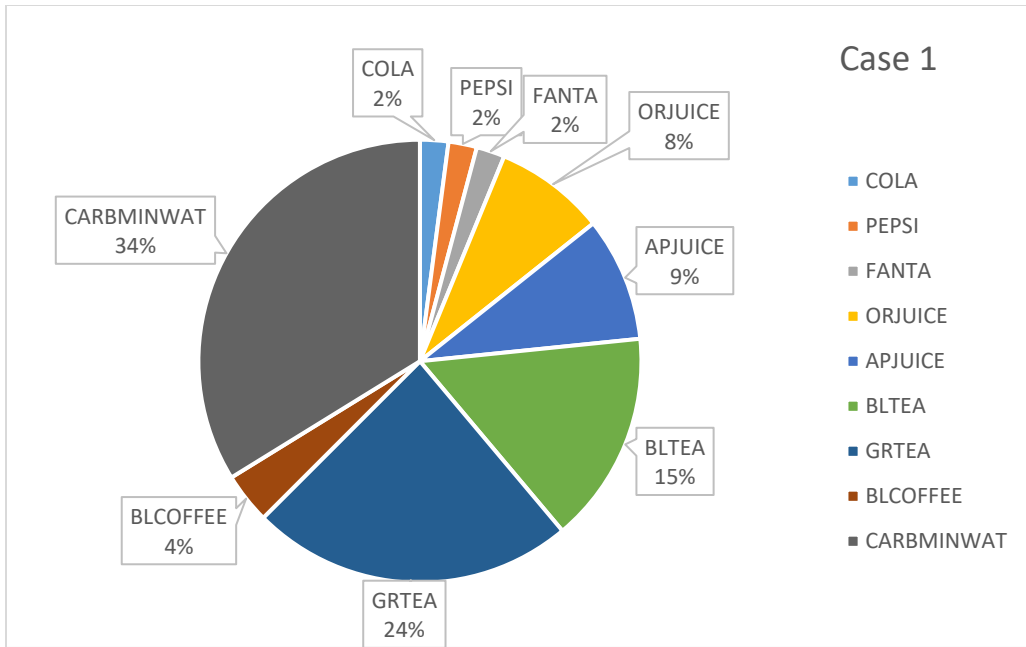


Figure 4. Consumer Profile of the 1st Respondent (Case 1), Indicating the Degree of Priority for Choosing Sweet and Carbonated Drinks (%)

Source: composed by authors

As it is seen from Case 4, Orange juice is fourth in importance (11%), followed by black tea, used as the main ingredient in making iced tea (6%). The share of importance of consumption of sweet carbonated drinks (Cola, Pepsi, Fanta) is 9%, although their contribution is equal, 3%. The importance of the consumption of sweet drinks based on black coffee in this case is only 1%.

The consumer profile indicating the degree of priority for choosing sweet and carbonated drinks, expressed as a percentage, is shown for the fourth respondent in Figure 5.

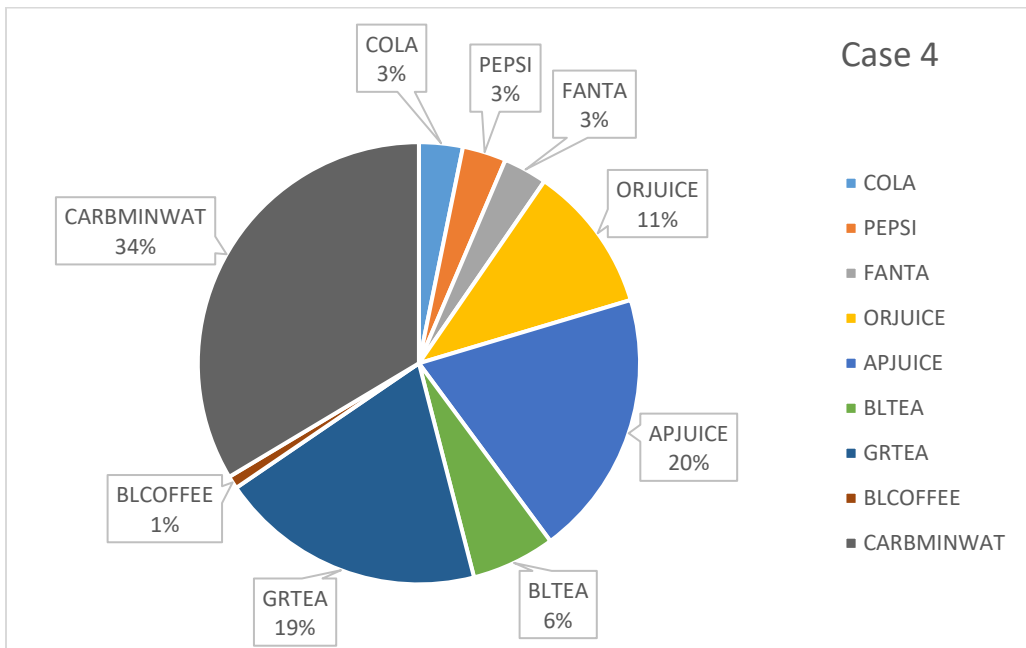


Figure 5. Consumer Profile of the 4th Respondent (Case 4), Indicating the Degree of Priority for Choosing Sweet and Carbonated Drinks (%)

Source: composed by authors

Thus, in this group, the dominant choice is carbonated mineral water (over 30%); there are also relatively high preferences for green and black teas, which are used in Ice Tea, and juice consumption (orange and apple). At the same time, consumption of sweetened black coffee-based drinks, as well as sugary drinks such as cola, Pepsi, and Fanta, is quite low.

The characteristics presented in Table 3 indicate that members of this group in this consumption segment appear to prefer healthier, lower-calorie beverages. Consequently, this group had the lowest level of health risk compared to other groups.

B) Group 2

The second group included six cases: Case 2, Case 3, Case 6, Case 7, Case 8, and Case 10. This group included students from Portugal, Ukraine, Greece, India, and Vietnam. This group of consumers included two females and four males, with ages ranging from 19 to 24.

Let us provide a more detailed description of the consumer profiles of the respondents included in this group.

The second respondent was a 20-year-old girl from Portugal (Case 2). The consumer profile indicating the degree of priority for choosing sweet and carbonated drinks, expressed as a percentage, is shown for the 2nd respondent in Figure 6.

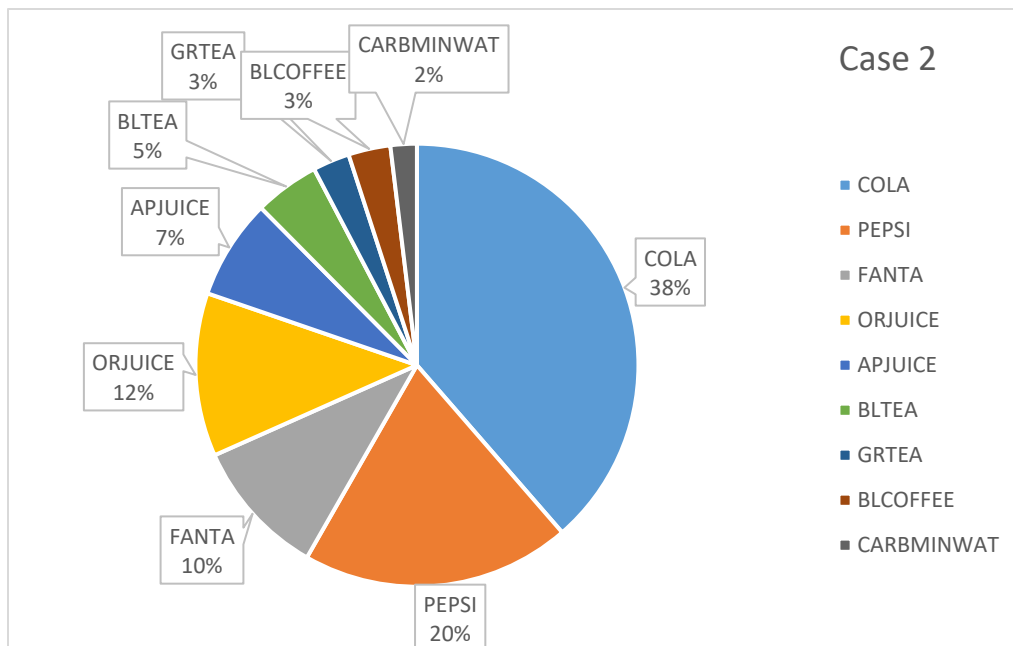


Figure 6. Consumer Profile of the 2nd Respondent (Case 2), Indicating the Degree of Priority for Choosing Sweet and Carbonated Drinks (%)

Source: composed by authors

As can be seen from Figure 2, the importance of Cola consumption for this respondent is 38%. Pepsi consumption is also important for this respondent (20%), which also follows from the values presented in Table 2. Consumption of Fanta and fruit juices (orange and apple) is also quite important for this respondent. The importance of Fanta consumption is 10%, the importance of orange juice consumption is 12%, and the importance of apple juice consumption is 7%. The consumption of other beverages is less important and less preferred. Thus, the preference (importance) for drinking iced tea made with black tea is 5%, while that made with green tea is 3%. The importance of drinking black coffee-based beverages is 3%, and the importance (preference) for drinking carbonated mineral water is only 2%.

The next respondent is a 21-year-old male student from Greece (Case 3). Based on the calculation results presented in Figure 7, it is clear that this respondent's highest preference is for Cola (36%), followed by Pepsi (21%) and Fanta (13%). The consumption of orange juice (8%) and iced tea made with black tea (7%) and green tea (6%) is quite important for this respondent. The importance of other beverages is low. For example, the importance of black coffee-based drinks is 4%, carbonated mineral water is 3%, and apple juice was the least important (2%).

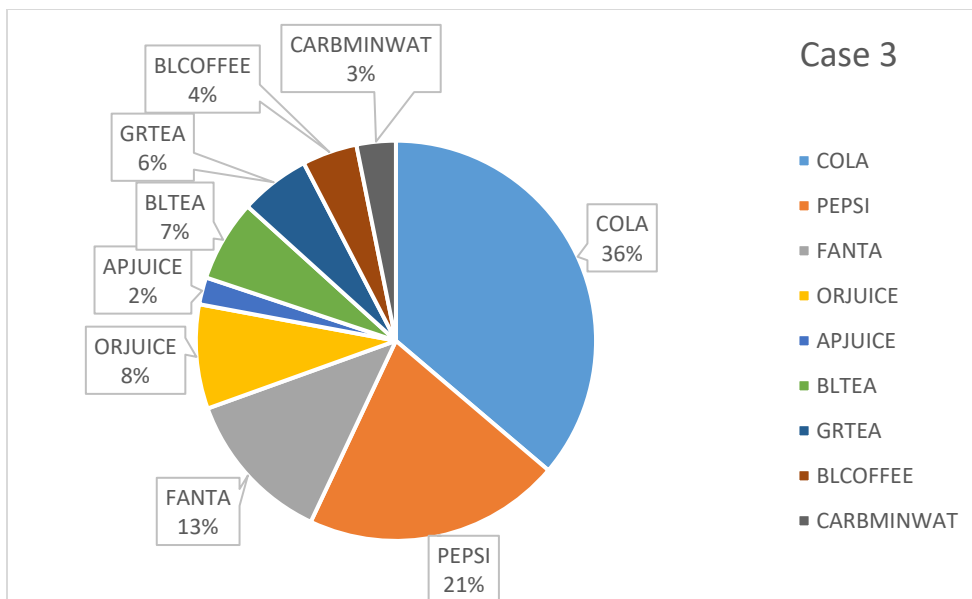


Figure 7. Consumer Profile of the 3rd Respondent (Case 3), Indicating the Degree of Priority for Choosing Sweet and Carbonated Drinks (%)

Source: composed by authors

Respondent number 6 was a 21-year-old male student from Greece. According to his responses, shown in Figure 8, Cola occupied the highest priority (highest level of importance) in the consumption of sweet and carbonated beverages (35%). Pepsi (18%) and Fanta (11%) followed in priority. Orange juice (8%), black tea-based iced tea (8%), and green tea (7%) were also considered quite important by this respondent. The priority level for black coffee-based beverages was 6%, which is higher than in other cases. Carbonated mineral water and apple juice were ranked lower, at 4% and 3%, respectively.

The consumer profile of the next respondent is presented in Figure 9. Respondent number 7 was a 19-year-old female student from Ukraine. As can be seen from the results presented in Figure 9, her highest priority was Cola consumption (35%). The importance of Pepsi and Fanta consumption was also high, accounting for 18% and 11%, respectively. Orange juice consumption (8%), iced tea made from black tea (8%), and Green Tea (7%) were also quite important in terms of priority. Compared to other cases, the priority of drinking sweet drinks based on black coffee was quite high (6%). The priorities of apple juice and carbonated mineral water were 3% and 4%, respectively.

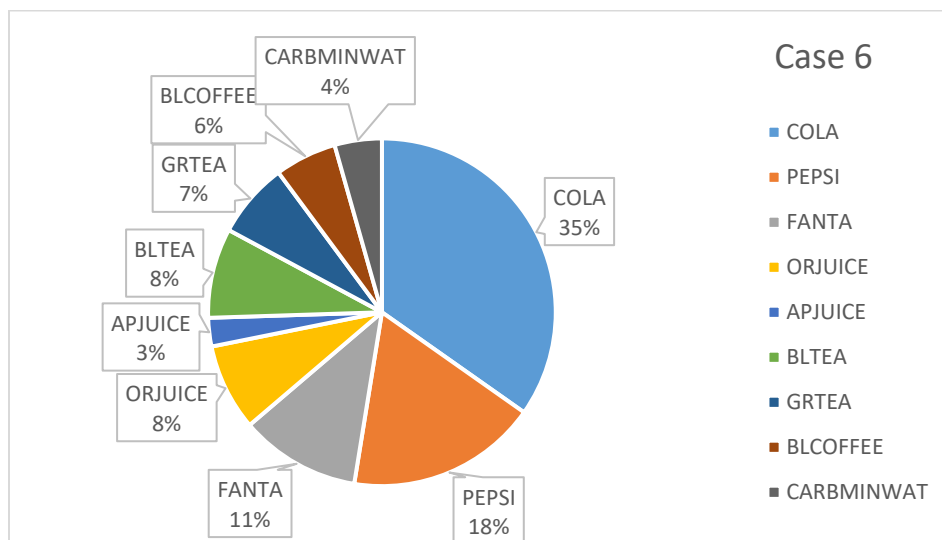


Figure 8. Consumer Profile of the 6th Respondent (Case 6), Indicating the Degree of Priority for Choosing Sweet and Carbonated Drinks (%)

Source: composed by authors

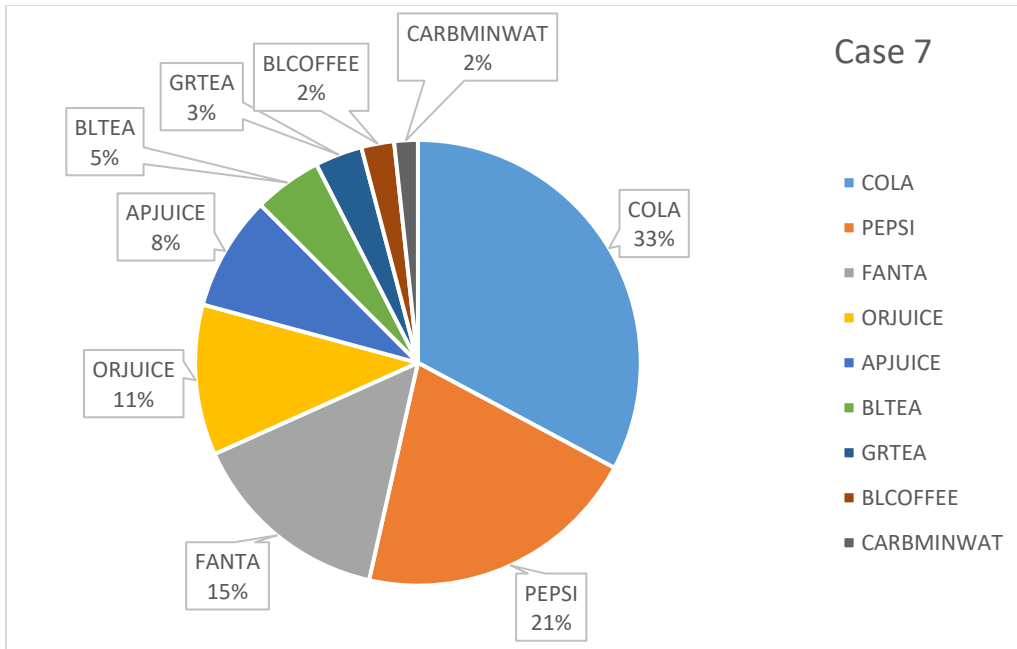


Figure 9. Consumer Profile of the 7th Respondent (Case 7), Indicating the Degree of Priority for Choosing Sweet and Carbonated Drinks (%)

Source: composed by authors

Figure 10 shows the results of respondent number 8. This respondent was a 21-year-old student from Vietnam. As can be seen from his responses, presented in Figure 10, the highest priorities were Coke (25%) and Pepsi (25%). Fanta also ranked fairly high in its consumption of sweet and carbonated drinks (19%). Orange juice (9%) and apple juice (7%) were the next most important. Black and green tea-based iced tea consumption was also quite significant for this respondent, accounting for 6% and 4%, respectively. At the same time, the priority of consuming drinks based on black coffee was low (3%), and the priority of consuming carbonated mineral water was 2%.

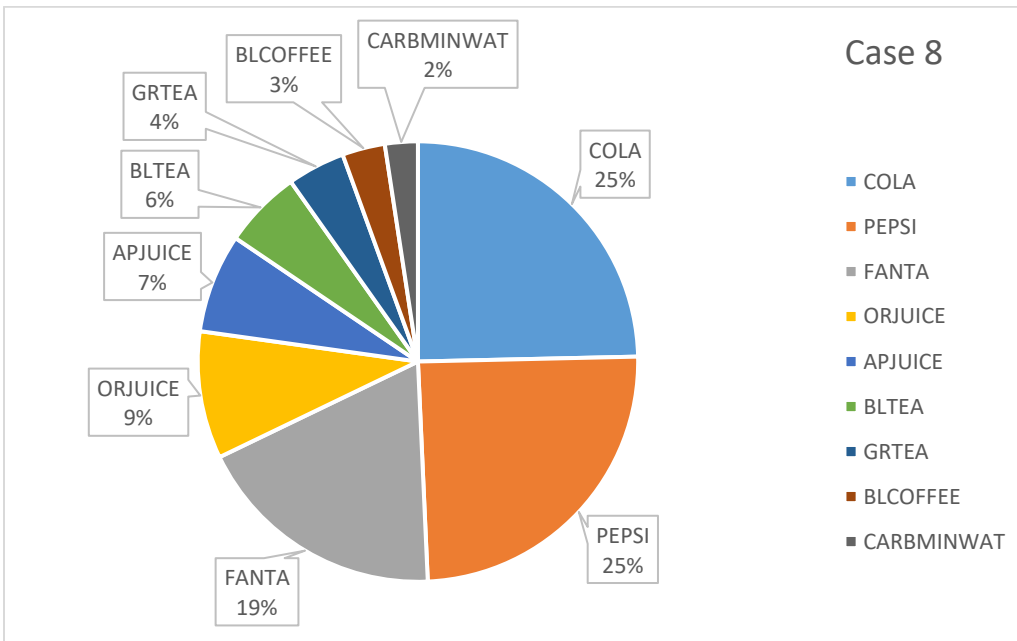


Figure 10. Consumer Profile of the 8th Respondent (Case 8), Indicating the Degree of Priority for Choosing Sweet and Carbonated Drinks (%)

Source: composed by authors

Figure 11 shows the consumer profile of respondent number 10.

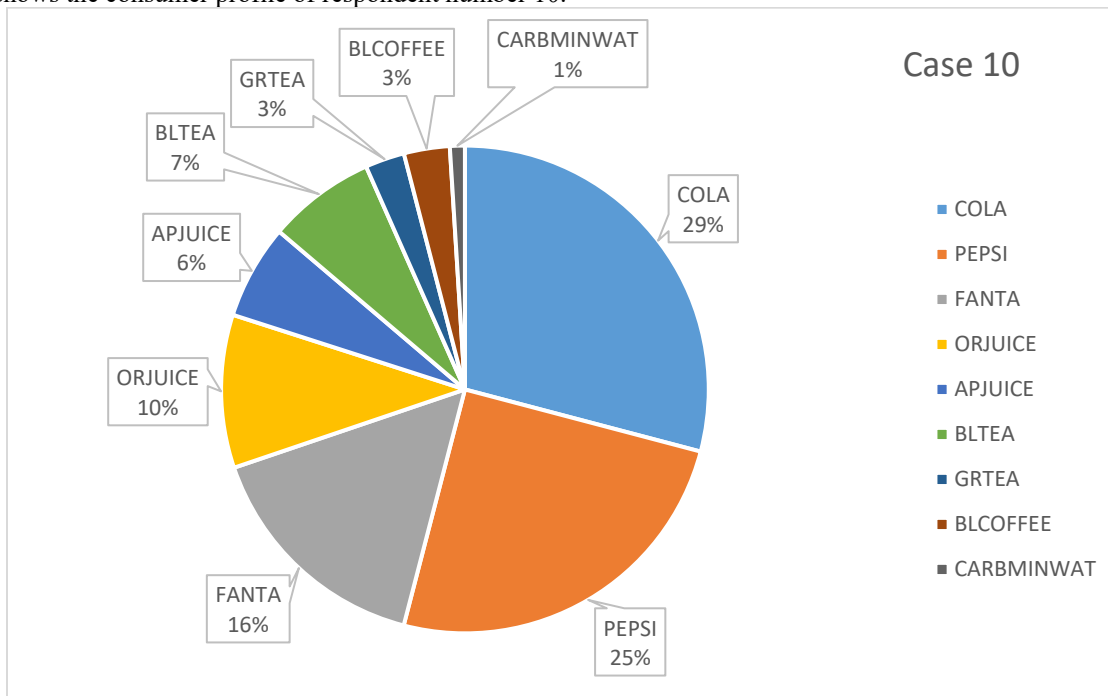


Figure 11. Consumer Profile of the 10th Respondent (Case 10), Indicating the Degree of Priority for Choosing Sweet and Carbonated Drinks (%)

Source: composed by authors

Respondent number 10 was a 24-year-old student from India. According to his preferences for sweet and carbonated drinks, Coke (29%) and Fanta (25%) ranked highest, followed by Fanta (16%). He also rated orange juice (10%) and apple juice (6%) quite highly, and black tea-based iced tea (7%) was also quite important. The consumption priorities for other beverages were low. For example, the importance of green tea-based iced tea was 3%. The same (3%) was the priority for sweet black coffee-based drinks. Carbonated mineral water was the lowest priority, at 1%.

Thus, summing up the cases in group 2, the following conclusion can be drawn. In this group, the largest, the consumption of sugary carbonated drinks such as Cola, Pepsi, and Fanta predominates. This group also has a preference for juices (orange and apple), while the importance of other beverages is much less. This group is characterized by the highest risks associated with health consequences, since the constant consumption of high-calorie drinks such as Cola, Pepsi and Fanta leads to problems with weight gain, the development of gastrointestinal diseases, and the possibility of developing type 2 diabetes.

C) Group 3

The third group contains one case, Case 5, based on the responses of a 21-year-old student from Portugal. The highest priority is carbonated mineral water consumption (37%). Meanwhile, the consumption priorities for Fanta, Pepsi, and Cola are also quite high, accounting for 20%, 15%, and 9%, respectively. Black and green tea-based iced tea consumption priorities account for 6% each. Consumption of sweetened black coffee-based drinks accounts for 5%. Sweetened fruit juices (orange and apple) are low in consumption, at 1% each.

Thus, in Group 3, the consumption of sweetened carbonated drinks (Cola, Pepsi, Fanta) and carbonated mineral water dominates. Also significant in this group is the consumption of sweetened green and black tea drinks, as well as sweetened black coffee drinks. Overall, despite the high priority given to carbonated mineral water, the relatively high consumption of beverages such as Cola, Fanta, and Pepsi must also be taken into account. Therefore, the health risk level was assessed by experts as moderate.

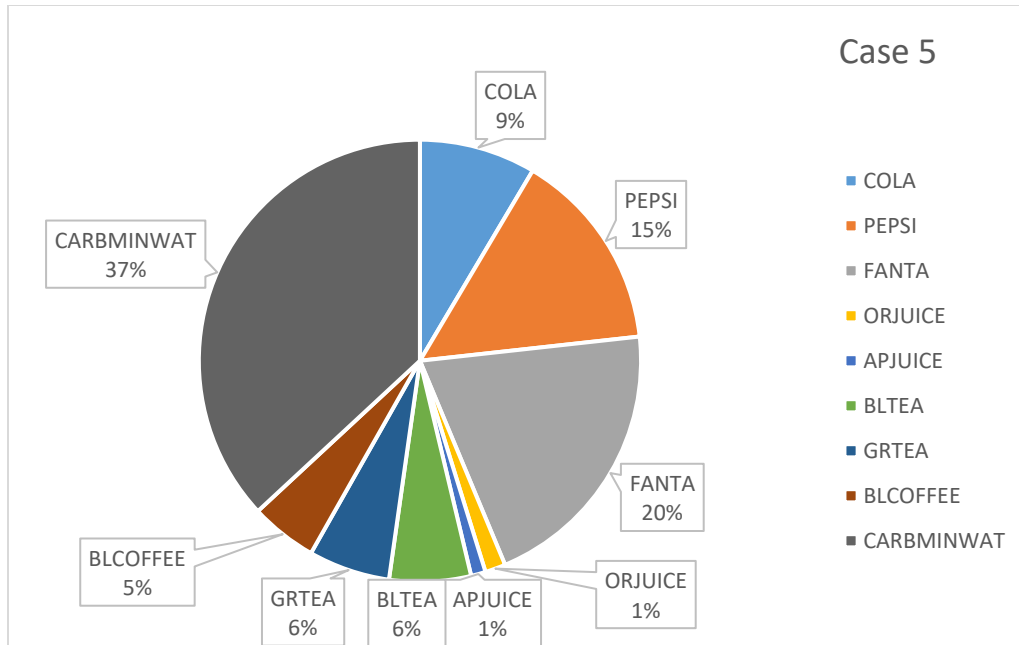


Figure 12. Consumer Profile of the 5th Respondent (Case 5), Indicating the Degree of Priority for Choosing Sweet and Carbonated Drinks (%)

Source: composed by authors

D) Group 4

The fourth group also includes one case, Case 9, based on responses from a 17-year-old student from Ukraine. Iced tea, made with black and green tea, ranks highest in consumption, accounting for 29% each. Black coffee-based drinks are next in priority (15%). Apple juice (9%) and orange juice (8%) also rank quite high. In contrast, the degree of importance of consumption of sweet carbonated drinks was distributed as follows: 5% - consumption of Fanta, 2% - consumption of Cola and 2% - consumption of Pepsi.

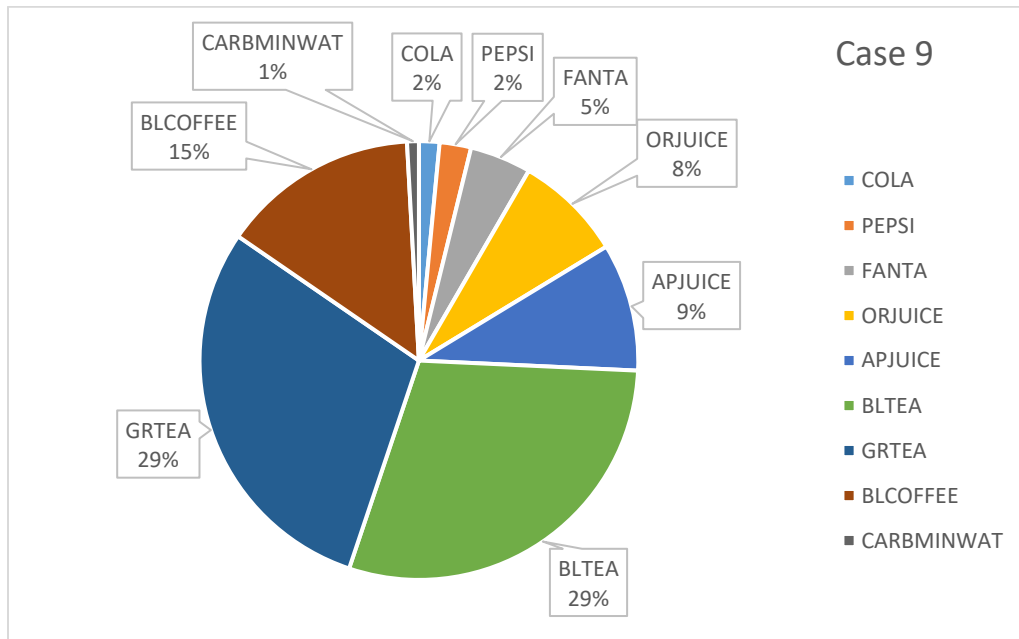


Figure 13. Consumer Profile of the 9th Respondent (Case 9), Indicating the Degree of Priority for Choosing Sweet and Carbonated Drinks (%)

Source: composed by authors

Thus, this group is dominated by consumption of sweetened beverages, such as black and green tea (for iced tea), and also by consumption of black coffee, orange juice, and apple juice. Overall, the health risk is relatively low, but the risk in this group is somewhat higher than in Group 1.

V. DISCUSSION AND CONCLUSIONS

This study used the Analytical Hierarchy Process (AHP) method developed by T. Saaty to analyze consumer profiles of sweet and carbonated beverages. Respondents were asked to complete a matrix, where they were asked to evaluate the items based on pairwise comparisons of alternatives according to a preference scale. The matrices containing the respondents' responses were then processed using MPriority software, generating weighting coefficients characterizing the importance (priority) of consuming a particular beverage.

Multivariate analysis methods, particularly multidimensional scaling, were then used to analyze the differences and similarities in respondents' responses. Four groups were identified, characterizing the consumer preferences for sweet and carbonated beverages among Generation Z. The first and fourth groups were characterized by lower levels of consumption of beverages such as Cola, Pepsi, and Fanta, and a high preference for carbonated mineral water. This means that this group exhibits lower health risks associated with consuming sugary and carbonated beverages. The first group comprised 20% of observations, while the fourth group comprised 10%. The second group, the largest (60% of observations), exhibited the highest level of health risk due to their high consumption of Cola, Pepsi, and Fanta. In the third group (10% of observations), the health risk from consuming sugary and carbonated beverages was moderate.

Thus, various tastes and behavioral preferences in the choice of sweet and carbonated drinks were identified, which are of sufficient importance for determining the target group and developing programs to promote healthy eating, prevent obesity and the development of diabetes mellitus associated with metabolic disorders and endocrine system functioning. This study, aimed at identifying the characteristics of young people's consumer choices for sugary and carbonated beverages, was conducted using a small sample as a pilot phase of a project to assess the risks of unhealthy eating and prevent associated diseases. Future plans call for a similar study to be conducted on larger groups of respondents representatives of Generation Z with partners from various countries, including students from various universities and colleges.

There are also plans to develop an additional questionnaire with questions clarifying the reasons and motives for choosing certain sweet and carbonated drinks, as well as the socio-demographic and cultural characteristics of the respondents (gender, age, country and region of residence, level of education, income level, individual eating habits and type of diet, family food traditions, sports or other types of physical activity, BMI level, presence of gastrointestinal diseases, endocrine system disorders, etc.).

All this will allow for a more detailed analysis of consumer choice and segmentation of consumer groups, taking into account country and cultural characteristics, education level, income level, attitudes towards their own health, and understanding of the importance of a healthy lifestyle and healthy eating (Koh et al, 2018; Jakobsen, 2023; Nguyen et al, 2023; Carrillo Larco, 2025).

At the same time, even a small sample shows that the consumption of beverages such as Cola, Pepsi, and Fanta is associated with stereotypes of youth behavior in environments such as clubs, discos, cinemas, cafes and restaurants, tourist centers, etc. Cola, Pepsi, and Fanta, or their analogs, are common attributes of youth parties and celebrations, entertainment events, and recreation.

Active mass advertising, popularization in films, books, comics, and other media, also contribute to the establishment of these drinks as essential attributes. Cola, Pepsi, and Fanta are not only well-known iconic drinks in fast food restaurants but are also sold everywhere, from supermarkets and small grocery stores to kiosks and cafeterias in universities and colleges. Vending machines are located on streets, in schools and universities, and in various public places, where anyone can buy Cola, Pepsi, and Fanta at any time and in any quantity.

To reduce the mass consumption of sugary and carbonated beverages, a number of countries have introduced taxes and increased prices on certain high-calorie and sugary carbonated beverages. However, there is not always evidence that taxes on sugary and carbonated beverages reduce sales and consumption. Therefore, improving literacy among young people and promoting healthy lifestyles and healthy eating are important areas to address.

Particular attention should be paid to information campaigns for young people, including various events explaining the risks of weight gain and possible obesity associated with the persistently high consumption of high-calorie sugary and carbonated drinks such as Cola, Pepsi, Fanta, and their analogs (Berghöfer et al, 2008; Abbasalazad Farhangi et al, 2022; Artime et al, 2025).

It is also necessary to expand the range of healthy beverages, making them more accessible and popular in youth recreational and entertainment venues.

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