

AWARENESS OF USAGE THE ARTIFICIAL SWEETENERS IN FOOD BY DIFFERENT POPULATION IN NORTH MACEDONIA

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Abstract

The artificial sweeteners (AS) are popular low-calorie substances used as sugar substitutes, providing strong sweetening effects without adding sugar and energy to the diet. The most popular AS are aspartame, saccharin, and acesulfame K.

The aim of this study is to investigate the awareness and knowledge on the usage and health effects of the artificial sweeteners in food products in North Macedonia. Therefore, an online survey was conducted, distributed through Forms media platform on different age population, completed by 392 participants aged 12 years and above, where 69 % were at the age of 30 - 64 old. According to the obtained results, 6 % of respondents do not know what AS are, while 23 % are partially familiar with them. Moreover, 19 % of the respondents do not know how to recognize the additives on the product declarations at all. On the question if the respondents could list which artificial sweeteners they know, 43 % did not know how to answer, and 28 % gave a partially correct or incorrect answer. Also, 35 % of respondents answered that they use artificial sweeteners in order to reduce the calorie intake. Regarding the risk of consuming large amounts of AS in the diet, 15 % of respondents are not aware, and 36 % are partially aware.

The results suggest that it is necessary to develop effective strategies for greater education, information and awareness of consumers, about the usage of AS in their diet, as well as about the advantages and risks of their intake.

Keywords: artificial sweeteners, awareness, usage, food products.

Introduction

Artificial sweeteners are synthetic substances with a sweet taste, that according to their function are used as food additives. They are widely used all over the world, in different food industries for the production of: soft drinks, confectionery, fruit processing, candies, chewing gums, etc., as well as in the pharmaceutical industry. They are usually added to products in small quantities, due to their intensive sweet taste, which ranges from 30 to 3000 times sweeter than sucrose. Most of them have low or no caloric value, that conditions a reduced energy value of the products themselves. Soft drinks with added artificial sweeteners are low-calorie drinks, and are labeled “Diet” or “Light” or “with sweetener” (Nollet, 2000; Babanovska-Milenkovska, 2007).

The popularity of artificial sweeteners (AS) has rapidly increased among people who have a problem with excess weight, but also among people who use a low-calorie diet. The use of low-calorie intense sweeteners (artificial sweeteners - AS), also known as non-nutritive sweeteners (NNS), in food and beverages has therefore gained more attention as of their low amounts of calories, as well as their low glycemic response. Also, it is due to the new trend for “healthy lifestyle”, which is the use of low-calorie foods and soft drinks, combined with physical activity (Babanovska-Milenkovska, 2007; Janvier et al., 2015).

For all the types of additives, their health correctness, method of application, Acceptable Daily Intake (ADI) and all issues related to additives, the responsibility is of: worldwide, JECFA

(Joint Expert Committee for Food Additives, of FAO/WHO - Food and Agriculture Organization/World Health Organization) of the United Nations; at the European level - EFSA (European Food Safety Authority), which are generally the same for all EU countries (Velkoska-Markovska, 2022).

The presence of artificial sweeteners in food products must be indicated on the declaration of the product itself (Directive 2000/13/EC), with the name of the sweetener or with the E number, approved for the use as a food additive in the European Union. In the European Union there is a Regulation on food additives (Regulation (EC) No 1129/2011), which regulates their use.

In R. of North Macedonia, legal regulations and norms have been adopted that determine the maximum permitted amounts of artificial sweeteners in various food products, which are given in the Rulebook on additives used in food production (Official Gazette of R. North Macedonia No. 31/2012). In the Rulebook on information related to food (Official Gazette of R. North Macedonia No. 150/2015) are prescribed the mandatory labeling and warnings for used sweeteners. It is also prescribed that products containing aspartame should be indicated: "contains phenylalanine" or "should not be consumed by persons with phenylketonuria".

The most commonly used sweeteners are: aspartame, acesulfame-K, saccharin, but cyclamate, alitame, dulcin, sucralose, thaumatin, etc., are also used. They can be found in the products in a strictly prescribed quantity, according to the National Regulations. All these sweeteners have different chemical composition, structure and characteristics (Nollet, 2000). The most common artificial sweeteners used in food products, which are found on Macedonian market, are: aspartame (E951), Na-saccharin (E954) and acesulfame K (E950). It is common to use several sweeteners in combination to provide a better taste to food and drinks (Babanovska-Milenkovska et al., 2022).

Although the use of artificial sweeteners in food has a certain function and benefit, such as reducing calorie intake, several studies show the existence of adverse reactions, such as allergies, behavioral changes and carcinogenicity, as well as, an increased risk of excessive weight gain, type 2 diabetes; occurrence of cancer; increased pressure and cardiovascular diseases. Furthermore, ingesting aspartame in a patient with the condition of phenylketonuria can lead to dangerously high levels of phenylalanine in the brain, which can be fatal (SCF/CS/ADD/EDUL/194 final, 2000; SCF/CS/ADD/EDUL/222 Final, 2002; Babanovska-Milenkovska, 2007).

Many previous research suggests that consumers are worried and would like to be better informed about the potential health implications of food additive use and consumption (Bearth et al., 2014). Perceptions and trends in Non-nutritive sweeteners (NNS), consumption vary between countries; therefore, understanding the factors affecting these trends and perceptions can help to develop effective communication strategies for educating the public. A US survey showed that 64 % of the population is concerned about the safety of NNS. These concerns could be due to miscommunication of information, or a lack of knowledge in the benefits and risks surrounding the use of NNS. This suggests that consumer education might help to promote appropriate messages and avoid misleading information (Farhat et al., 2021).

Findings from previous studies indicate that public concerns and fear of food additives are progressively growing. Data also suggest that consumer education on the functions, advantages, and safety issues of food additives, as well as label declarations and control programs, are necessary in order to prevent misunderstandings regarding food additives (Shim et al., 2011).

Materials and methods

The aim of this paper is to investigate the awareness and knowledge of different population groups in R. North Macedonia about the use of artificial sweeteners in food products. In the research was conducted an online questionnaire survey distributed through the media platform Forms, to a different age population. The questionnaire was prepared by the authors, professors from the Faculty of Agricultural Sciences and Food – Skopje, and the electronic distribution was aimed at colleagues, students and their friends. The survey was conducted from February 16 to June 7, 2022, and then the results were processed in order to draw appropriate conclusions. It was determined that the survey was completed by 392 respondents, aged over 12 years. The average time to complete the questionnaire survey was 13.38 min and it was composed of 35 questions, divided into four parts: Part A: Sociodemographic characteristics, 5 questions; Part B: Knowledge of healthy habits, 11 questions; Part C: Knowledge of additives, 5 questions; Part D: Knowledge and use of artificial sweeteners, 14 questions.

Results and discussion

A total of 392 participants completed the survey with the 35 questions, divided in four parts.

Part A: Sociodemographic characteristics

According to the questionnaire survey, the part for sociodemographic characteristics contains 5 questions, which are presented in Table 1. The results from the table 1 shows that the most of participant 269 (68.62 %) are in the range age 30 - 64; 90 (22.98 %) are in the range age 19 - 29; 28 (7.14 %) are in the range age 12 - 18; 5 (1.30 %) are over 64 years old and no one are below 12 years old. Females from the participants were 325 (82.90 %) and male were 67 (17.10 %), from which 366 (93.37 %) live in cities and other 26 (6.63 %) live in rural area. From all respondents, the PhD degree presented 26 (6.60 %), MSc degree 50 (12.80 %), Specialization 2 (0.50 %), BSc degree 203 (51.80 %), Students 35 (8.90 %), Secondary education 74 (18.90 %) and 1 (0.25 %) both for answer primary education and “it does not matter”. In terms of the profession of the participants, 78 (19.90 %) were graduated engineers, doctors, pharmacists; 73 (18.62 %) graduated economists, lawyers; 36 (9.18 %) academic professors; 30 (7.65 %) teachers; 24 (6.12 %) technicians and laboratory workers (secondary education); 22 (5.61 %) economists/lawyers (secondary education); 41 (10.46 %) college students; 7 (1.79 %) primary/high school students; 12 (3.06 %) unemployed and other 69 (17.60 %).

Table 1. Sociodemographic characteristics of the survey population

1. How old are you? (age, years)	Below 12	12 - 18	19 - 29	30 - 64	Over 64
No. of respondents (N = 392)	0	28	90	269	5
(%) of the Population	0.00	7.14	22.98	68.58	68.59
2. Gender	Male		Female		
No. of respondents (N = 392)	67		325		
(%) of the Population	17.10		82.90		
3. What kind of area do you live in?	City		Rural		
No. of respondents (N = 392)	366		26		
(%) of the Population	93.37		6.63		

4. The highest degree of completed education or current education.	No. of respondents (N = 392)	(%) of the Population
PhD.	26	6.60
MSc.	50	12.80
Specialization	2	0.50
BSc.	203	51.80
Students	35	8.90
Secondary education	74	18.90
Primary education	1	0.25
It does not matter	1	0.25

5. Profession	No. of respondents (N = 392)	(%) of the Population
Graduated engineers, doctors, pharmacists	78	19.90
Graduated economists/lawyers	73	18.62
Academic professors	36	9.18
Teachers	30	7.65
Technicians and laboratory workers (secondary)	24	6.12
Economists/Lawyers (secondary)	22	5.61
Students	41	10.46
Primary/High school students	7	1.79
Unemployed	12	3.06
Other	69	17.60

Part B: Knowledge of healthy habits

The part for knowledge of healthy habits, contains 11 questions, that are presented in Table 2.

Table 2. Knowledge of healthy habits

6. Write your body mass (kg)	Under 60 kg	From 60 to 70 kg	From 71 to 80 kg	Over 80 kg
No. of respondents (N = 392)	80	151	78	83
(%) of the Population	20.41	38.52	19.90	21.17

7. Write your body height (cm)	Under 160 cm	From 160 to 170 cm	From 171 to 180 cm	Over 180 cm
No. of respondents (N = 392)	28	222	111	31
(%) of the Population	7.14	56.63	28.32	7.91

8. Do you think your body weight is:	Within normal limits	Below normal weight	Excessive weight
No. of respondents (N = 392)	244	10	138
(%) of the Population	62.24	2.55	35.21

9. Do you do sports?	Actively	Not at all	Recreationally
No. of respondents (N = 392)	34	169	189
(%) of the Population	8.67	43.11	48.22

10. What kind of sport do you play?	No. of respondents (N = 392)	(%) of the Population
Walking	51	32.08
Running	16	10.06
Cycling	13	8.18
Fitness/Gym	20	12.58
Football/Basketball	10	6.29
Volleyball/Handball	6	3.77
Martial arts	14	8.80
Yoga/Pilates	14	8.80
Other	15	9.44

11. Do you sleep at night?	Yes	No	Sometimes
No. of respondents (N = 392)	354	15	23
(%) of the Population	90.30	3.83	5.87
12. If not, is it because of:	Working duties	Personal choice	
No. of respondents (N = 15)	11	4	
(%) of the Population	73.33	26.67	
13. Do you pay attention on the quality of your diet?	Yes	No	Sometimes
No. of respondents (N = 392)	224	24	144
(%) of the Population	57.14	6.12	36.74
14. Do you pay attention on the caloric value of your diet?	Yes	No	Sometimes
No. of respondents (N = 392)	94	152	146
(%) of the Population	23.98	38.78	37.24
15. Are you informed about the positive effects of the products you consume?	Yes	Partially	No
No. of respondents (N = 392)	218	136	38
(%) of the Population	55.61	34.70	9.69
16. Are you informed about the negative effects of the products you consume?	Yes	Partially	No
No. of respondents (N = 392)	230	125	37
(%) of the Population	58.67	31.89	9.44

According to the questionnaire survey, in terms of body mass of participants, 80 (20.41 %) had under 60 kg; 151 (38.52 %) had body mass in range 60 to 70 kg; 78 (19.90 %) in range 71 to 80 kg; 83 (21.17 %) had over 80 kg body mass. For the body height, responds of participants were: 28 (7.14 %) under 160 cm; 222 (56.63 %) had body height in range 160 to 170 cm; 111 (28.32 %) in range 171 to 180 cm and 31 (7.91 %) had body height over 180 cm. On the question, what the participants think about their body weight, 224 (62.24 %) think that it is within normal limits; 10 (2.55 %) think that it is below normal weight and 138 (35.21 %) think that it is excessive weight. Respondents to the question of whether they do sports, 34 (8.67 %) do actively; 189 (48.22 %) do recreationally and 169 (43.11 %) do not practice sports at all. The kinds of sports that participants practice were: walking 51 (32.08 %); running 16 (10.06 %); cycling 13 (8.18 %); fitness/gym 20 (12.58 %); football/basketball 10 (6.29 %); volleyball/handball 6 (3.77 %); martial arts 14 (8.80 %); yoga/pilates 14 (8.80 %) and other sports 15 (9.44 %). Also, participants were asked do they sleep at night, where they answered: 354 (90.30 %) do sleep; 15 (3.83 %) do not sleep and 23 (5.87 %) do sleep sometimes. Other question was additional on the previous one “If not, is it because of”: working duties and personal choice, where participants which had gave previous answer “Yes”, 32.58 % do not sleep due the working duties, 67.42 % do not sleep due their personal choice; Participants which had gave previous answer “No”, 73.33 % do not sleep due the working duties, 26.67 % do not sleep due their personal choice; and participants which had gave previous answer “Sometimes”, 50.00 % do not sleep due the working duties and other 50 % do not sleep due the personal choice. Other question was do participants pay attention on the quality of their diet, where 224 (57.14 %) answered that they do, 24 (6.12 %) do not pay attention and rest 144 (36.74 %) sometimes pay attention. Additionally, they were asked, do they pay attention on the caloric value of their diet, whereby 94 (23.98 %) answered that they do, 152 (38.78 %) answered that they do not pay attention and 146 (37.24 %) only sometimes pay attention. The participants were asked about the information of the positive effects of the products that they consumed, whereby 218 (55.61 %) answered “Yes”, 136 (34.70 %) “Partially” and 38 (9.69 %) “No”. Also, there was a question about information of the negative effects of the products that they

consumed, whereby 230 (58.67 %) answered “Yes”; 125 (31.89 %) answered “Partially” and 37 (9.44 %) answered “No”.

Part C: Knowledge of additives

In this part were 5 questions and the obtained results are presented in Table 3.

Table 3. Knowledge of additives

17. Do you know what food additives are?	Yes	Partially	No
No. of respondents (N = 392)	295	82	15
(%) of the Population	75.26	20.92	3.82
18. Do you think you are sufficiently informed about the meaning of food additives?	Yes	Partially	No
No. of respondents (N = 392)	141	162	89
(%) of the Population	35.97	41.33	22.70
19. Do you know how to recognize additives on food product declarations?	Yes	Partially	No
No. of respondents (N = 392)	175	142	75
(%) of the Population	44.65	36.22	19.13
20. When buying food products, do you read the composition of the declaration?	Yes	No	Sometimes
No. of respondents (N = 392)	173	41	178
(%) of the Population	44.13	10.46	45.41
21. Do you know the meaning of the E mark on the declaration of food products?	Yes	Partially	No
No. of respondents (N = 392)	187	93	112
(%) of the Population	47.70	23.73	28.57

According to the questionnaire survey in the part 3, the results from the table 3 shows that: 295 (75.26 %) of the participants know what are food additives; 82 (20.92 %) know partially and 15 (3.82 %) do not know what are food additives. On the question do they have sufficient information about the meaning of food additives, 141 (35.97 %) answered positively, 89 (22.70 %) answered negatively and 162 (41.33 %) answered that they are partially informed. The respondents were also asked about their recognition additives on food product declaration, where 175 (44.65 %) answered “Yes”, 142 (36.22 %) answered “Partially” and 75 (19.13 %) answered “No”. In terms of this, next question was do they read the composition from declaration, when they buy products, where 173 (44.13 %) answered “Yes”, 41 (10.46 %) answered “No” and 178 (45.41 %) answered “Sometimes”. Additionally, the knowledge of the participants for meaning of the E mark on the declaration of food products were 187 (47.70 %) do know, 93 (23.73 %) partially know and 112 (28.57 %) do not know.

Part D: Knowledge and use of artificial sweeteners

In the 4th part of the questionnaire about the knowledge and use of artificial sweeteners, there were 14 questions and the results are presented in Table 4.

Table 4. Knowledge and use of artificial sweeteners

22. Do you know what artificial sweeteners are?	Yes	Partially	No	
No. of respondents (N = 392)	279	90	23	
(%) of the Population	71.17	22.96	5.87	
23. If yes, can you specify which artificial sweeteners you are familiar with?	Do not know	Correct answer	Partially correct	Wrong answer
No. of respondents (N = 392)	171	85	83	53

(%) of the Population	43.62	21.68	21.17	13.53
24. Do you have knowledge about their nutrition safety, i.e. do you think they are:		Safe	Partially safe	Unsafe
No. of respondents (N = 392)		28	227	137
(%) of the Population		7.14	57.91	34.95
25. How often do you use food products that contain artificial sweeteners?	Very rare	Several times a week	Never	Daily
No. of respondents (N = 392)	207	116	29	40
(%) of the Population	52.81	29.59	7.40	10.20
26. Declare how much food products containing artificial sweeteners you use during the day/week?		No. of respondents (N = 392)		(%) of the Population
There is no answer/ they do not know				60.20
They don't use		236		4.85
Very few/very rare		19		16.07
Large amounts/very often		63		3.32
Often (several times a week)		13		7.14
Up to 300 g (300 mL) / week		28		3.06
500 g (500 mL) / week		12		0.26
Other		1		5.10
		20		
27. Do you use food products / soft drinks labeled “Light” and/or “Diet”?	Very rare	Several times a week	Never	Daily
No. of respondents (N = 392)	196	32	157	7
(%) of the Population	49.55	8.16	40.50	1.79
28. Declare how much drinks “Light” and/or “Diet” you use during the day/week!		No. of respondents (N = 392)		(%) of the Population
No answer/ Do not know				58.42
Do not use		229		17.09
Very little/very rarely (up to 250 mL week)		67		16.84
Up to 500 mL/week		66		2.81
A lot (more than 1L per day)		11		2.55
Other		10		2.29
		9		
29. Which food products containing artificial sweeteners do you most often use in your diet (multiple answers are possible)?		No. of respondents (N = 843)		(%) of the Population
Soft drinks (“Light”/“Diet”)		93		4.98
Instant drinks		42		22.54
Chewing gums		190		8.54
Candies		72		25.98
Chocolate and cocoa products		219		10.32
Dairy products (fruit yogurt) (“Light”/“Diet”)		87		2.73
Dietary preparations		23		6.88
Marmalade or jam		58		7.00
Other		59		
30. Do you use other sweeteners, apart from ordinary sugar (sucrose) in your diet?		Yes	No	Sometimes
No. of respondents (N = 392)		88	199	105
(%) of the Population		22.44	50.77	26.79
31. Declare which other sweeteners, apart from ordinary sugar, do you use in your diet?		No. of respondents (N = 392)		(%) of the Population
No answer				48.47

I do not know	190	0.77	
I do not use	3	5.10	
One sweetener	20	32.14	
More sweeteners	126	13.52	
	53		
32. Declare for which type of food you use sweeteners other than regular sugar in your diet?	No. of respondents (N = 392)	(%) of the Population	
Desserts/cakes	33	8.42	
Cocoa	5	1.28	
Coffee	12	3.06	
Tea	15	3.83	
Fruit/smoothies	6	1.53	
Drinks/shake	6	1.53	
Rice pudding	6	0.26	
Cereals	1	0.51	
Chocolate	2	0.26	
Wrong answer	1	3.32	
No answer	13	76.02	
	298		
33. Do you use artificial sweeteners in tablet form (in coffee, tea, etc.)?	Yes	No	Sometimes
No. of respondents (N = 392)	29	325	38
(%) of the Population	7.40	82.91	9.69
34. If you use artificial sweeteners, for what reasons do you use them?	No. of respondents (N = 392)	(%) of the Population	
Diabetes	9	2.30	4.85
Increased body mass	19	16.58	23.47
Reducing calories	65	52.80	
Other	92		
No answer	207		
35. Are you informed about the risk of consuming large amounts of artificial sweeteners in the diet?	Yes	Partially	No
No. of respondents (N = 392)	191	143	58
(%) of the Population	48.72	36.48	14.80

From the presented data in the table 4, on the question for the knowledge what are artificial sweeteners, 279 (71.17 %) responds positive, 23 (5.87 %) responds negative and 90 (22.96 %) responds that they partly know. Then, if yes, they were asked to specify which artificial sweeteners are they familiar with, where 171 (43.62 %) they did not know which one, 85 (21.68 %) gave correct answers, 83 (21.17 %) answered partially correct (both correct and incorrect answer about a substance that is an artificial sweetener) and 53 (13.53 %) gave wrong answer. The results for knowledge of the participants about safety of the artificial sweeteners, shows that 28 (7.14 %) think they are safe; 227 (57.91 %) think that they are partially safe and 137 (34.95 %) think that the artificial sweeteners are not safe. The participants were asked how often do they use food products that contain artificial sweeteners, where 207 (52.81 %) use them very rare; 116 (29.59 %) use them several times a week; 40 (10.20 %) use them daily and 29 (7.40 %) never use them.

The respondents were asked to declare how much food products containing artificial sweeteners do they use during the day or week, where 236 (60.20 %) do not have answer or they do not know how much; 19 (4.85 %) do not use at all; 63 (16.07 %) use them very rare or very few; 13 (3.32 %) use large amounts or very often; 28 (7.14 %) use often (several times a week); 12 (3.06 %) use quantity up to 300 g (300 mL) per week; 1 (0.26 %) use 500 g (500 mL) per week

and 20 (5.10 %) use other quantities. About the use of food products / soft drinks labeled “Light” and/or “Diet”, the responders answered that 196 (49.55 %) use them very rare; 32 (8.16 %) use them several times a week; 7 (1.79 %) use them daily and 157 (40.50 %) never use them. Then, they were asked to declare how much drinks “Light” and/or “Diet” do use during the day or week, where 229 (58.42 %) do not had an answer; 67 (17.09 %) do not use at all; 66 (16.84 %) use very little or very rarely (up to 250 mL per week); 11 (2.81 %) use up to 500 mL per week; 10 (2.55 %) use a lot (more than 1L per day) and 9 (2.29 %) use other quantity of these drinks. Next question was with possibility for multiple answers, about which food products containing artificial sweeteners do they most often use in their diet, where 93 participants answered for soft drinks (“Light”/“Diet”); 42 for instant drinks; 190 for chewing gums; 72 for candies; 219 for chocolate and cocoa products; 87 for dairy products (fruit yogurt) (“Light”/“Diet”); 23 dietary preparations; 58 for marmalade or jam and 59 answered other food products. Next question was about do the participants use other sweeteners, apart from sucrose in their diet, where 88 (22.44 %) answered positive; 199 (50.77 %) answered negative and 105 (26.79 %) answered that sometimes they use. Additionally, they were asked to declare which other sweeteners, apart from sucrose, do they use in their diet, where 190 (48.47 %) had no answer; 3 (0.77 %) answered that they do not know; 20 (5.10 %) answered that they not use; 126 (32.14 %) use one other sweetener and 53 (13.52 %) use more sweeteners. Also, in this question, some of the responders declared that they use agave syrup 2.38 %, brown sugar 5.56 %, madzun 1.59 %, honey 48.41 %, saccharine (“Natren”) 7.14 %, stevia 27.78 %, fructose or glucose 4.76 % and other sugars 2.38 %. The participants were also asked to declare for which type of food do they use sweeteners other than regular sugar in their diet, where 33 (8.42 %) for desserts or cakes; 5 (1.28 %) for cocoa; 12 (3.06 %) for coffee; 15 (3.83 %) for tea; 6 (1.53 %) fruit/smoothies and same percentage for drinks/shake; 1 (0.26 %) for sutlijash and same percentage for chocolate; 2 (0.51 %) for cereals; 13 (3.32 %) gave wrong, not appropriate answer and 298 (76.02 %) do not gave an answer. On the question do they use artificial sweeteners in tablet form (in coffee, tea, etc.), 29 (7.40 %) answered “Yes”; 325 (82.91 %) answered “No” and sometimes use 38 (9.69 %). Respondents were asked if they used artificial sweeteners, which is one of the following stated reasons: diabetes 9 (2.30 %); increased body mass 19 (4.85 %); calorie reduction 65 (16.58 %); other reasons 92 (23.47 %) and do not gave an answer 207 (52.80 %). At the end of this survey, on the question are the responders informed about the risk of consuming large amounts of artificial sweeteners in the diet, 191 (48.72 %) answered “Yes”, 58 (14.80 %) answered “No” and 143 (36.48 %) are partially informed.

Conclusions

This research provides an overview of consumer knowledge and use of artificial sweeteners by various population groups in the Republic of North Macedonia. The obtained results show that consumers are partially informed about the meaning of food additives. Very few consume them in large quantities, and most consumers avoid them or use them rarely and in small quantities. According to the research analysis, 71.17 % of the survey participants think they know what artificial sweeteners are, but the results show that: 43.62 % do not know what artificial sweeteners are, 21.17 % give a partially correct answer, 13.53 % give wrong answer and 21.68 % give correct answer.

These results can serve as a starting point for further research to assess the risk of consuming high amounts of food products sweetened with artificial sweeteners.

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