



STRUČNI RAD / PROFESSIONAL PAPER

# Consumption of sheep and goat milk ice cream - a survey of young consumers

Milna Tudor Kalit <sup>1\*</sup>, Andrijana Glavaš<sup>2</sup>, Barbara Horvatinović<sup>2</sup>, Marina Tomić Maksan<sup>3</sup>

1 University of Zagreb Faculty of Agriculture, Department of Dairy Science, Svetošimunska cesta 25, Zagreb, Croatia

2 University of Zagreb Faculty of Agriculture, Graduate programme Production and Processing of Milk, Svetošimunska cesta 25, Zagreb, Croatia

3 University of Zagreb Faculty of Agriculture, Department of Marketing in Agriculture, Svetošimunska cesta 25, Zagreb, Croatia

\*Corresponding author: mtudor@agr.hr

## Abstract

*The aim of this paper is to investigate consumer behaviour in relation to the consumption of ice cream, sheep and goat milk and finally ice cream made from sheep and goat milk, as well as consumer attitudes towards ice cream made from sheep and goat milk. The survey was conducted on a sample of 366 younger respondents. The questionnaire consisted of 22 questions. Only 19 respondents have tried ice cream made from sheep/goat milk. The respondents who did not like ice cream made from sheep/goat milk listed the inappropriate taste, smell and consistency as reasons. Those who had not yet tried sheep/goat milk ice cream showed moderate willingness to consume such ice cream in the future. The respondents expressed a neutral attitude towards ice cream made from sheep/goat milk. The intrinsic characteristics of ice cream are more important than the extrinsic characteristics. The most important intrinsic characteristics of ice cream for the respondents were taste and quality, and the most important extrinsic characteristics were price-quality ratio and the price of ice cream. The results of this study provide valuable insights that can be used to increase the consumption of sheep/goat milk and sheep/goat milk-based ice cream.*

*Key words: ice cream, goat milk, sheep milk, young consumers, behaviour and attitudes*

## Introduction

Ice cream belongs to a group of frozen desserts that is characterised by wide consumer acceptance due to a great variety of flavours and ingredients. As consumer awareness of the impact of diet on health increases, so does the popularity of ice cream with added nutritional benefits, which, in addition to the basic ingredients, also contains ingredients that have some beneficial effects on consumer health. The frozen dessert category is therefore experiencing a shift towards functional products called “better-for-you” (BFY) products. Although sales of conventional ice cream have hardly changed in recent years, the consumption of ice cream in the BFY category has grown rapidly (Sipple et al., 2022). Motives for the development of functional ice cream are consumers’ increasing health concerns and interest in new foods that fit a healthy lifestyle (Genovese et al., 2022). Therefore, ice cream marketers and retailers recognise health and wellness products as a key trend for their future product development (International Dairy Foods Association, 2019). Improving the nutritional value of ice cream without compromising its physicochemical, structural and sensory properties is the subject of several studies. There are several ways to nutritionally enrich ice cream. Some of them include the addition of probiotic strains and/or prebiotics (Di Criscio et al., 2010; Balthazar et al., 2017; Balthazar et al., 2018; Akalin et al., 2018; Kowalczyk et al., 2021), certain types of protein, such as whey or soy proteins (Prindiville et al., 2000; Danesh et al., 2017; Liu et al., 2018; Akbari et al., 2016), olive oil (Sacchi et al., 2019; Tagliamonte et al., 2023), and fibres or polysaccharides (Pintor Jardines et al., 2020; Hanafi et al., 2021; Abdeldaiem et al., 2023; Liu et al., 2023). Furthermore, some studies researched reducing the amount of fat or sugar (Ismail et al., 2013; McGhee et al., 2014; Akbari et al., 2019), or the use of sheep and/or goat milk in ice cream production (McGhee et al., 2014; Güzeler et al., 2017; Nadelman et al., 2017; Balthazar et al., 2017; Balthazar et al., 2018, de Oliveira et al., 2021).

The sensory characteristics of ice cream should not be compromised by reducing or eliminating common ice cream ingredients or adding unusual ingredients to the standard recipe, as sensory quality is one of the most frequent reasons for purchasing ice cream. Consumer acceptance of ice cream is largely dependent on its texture and taste (Genovese et al., 2022). The most important purchase decisions of Turkish consumers regarding ice cream are attributes related to sensory quality, but also to the prestige of the retailer, trust in the producer, satisfaction with the producer’s brand, hedonic quality (relationship between product quality and price), the country of origin and consumption of the ice cream (Topcu, 2015). The aroma and taste of frozen BFY desserts are still a more important factor for purchase than perceived healthiness, as these products are still seen as indulgence foods, which is why the food industry faces constant challenges (Genovese et al., 2022; Sipple et al., 2022). Da Silva et al. (2014) assessed consumer purchase intention and health perceptions of seven ice cream concepts (traditional, light, sugar-free, fat-free, fibre-enriched, bioactive protein-enriched and omega-3 fatty acid-enriched). Although the consumption of traditional ice cream is associated with a high-calorie intake, consumers have the highest purchase intention for traditional ice cream as well as for enriched ice cream, as they associate them with certain health benefits. The reduced-calorie ice cream concepts (light, fat-free, sugar-free) are associated with a loss of sensory quality and therefore receive the lowest purchase intention. One of the reasons for this is that the aroma and taste are seen as a consequence of the presence of milk fat (Urala and Lähtenmäki, 2003).

Due to their beneficial health and nutritional properties, sheep and goat milk are excellent raw materials for the production of functional ice cream, the consumption of which could have a positive impact on human health (McGhee et al., 2014; Balthazar et al., 2017). Producing such a product with probiotics or prebiotics further increases its nutritional value (da Silva et al., 2015; Balthazar et al., 2017; Balthazar et al., 2018; de Oliveira et al., 2021). Sheep and goat milk ice cream could be an attractive alternative to cow milk ice cream due to its high nutritional value for consumers such as children, adolescents, the elderly and people with certain diseases. Such ice cream is creamier and softer in texture and has good melting properties (Ribeiro, 2010). However, one problem with producing ice cream is that it cannot be produced all year round, as goats are seasonally polyestrous

animals. The high fat content of sheep milk and the characteristic taste of sheep and goat milk pose further problems. The high fat content of sheep milk leads to a higher price of ice cream compared to ice cream made from cow milk. Sheep and goat milk ice cream has a flavour characteristic of sheep and goat milk that is more intense than that of cow milk, which can deter consumers (Vargas-Bello-Perez et al., 2022). This problem can be solved by adding certain flavours during ice cream production to reduce the intense taste and accustom consumers to a product with a different taste than cow milk ice cream (Wendorff and Kalit, 2017). Flavours such as vanilla, chocolate and premium white chocolate are most commonly used in the production of sheep and goat milk ice cream. Moreover, sheep and goat milk can be mixed with cow milk in varying proportions due to their limited production, but also to reduce the intensity of the taste of goat or sheep milk (Ribiero, 2010).

Although consumer interest in sheep and goat milk products has increased in recent years due to their high nutritional value, there is a lack of research on consumer behaviour and attitudes of ice cream made from sheep and goat milk. Therefore, the aim of this paper is to investigate consumer behaviour toward the consumption of ice cream, sheep and goat milk, and finally ice cream made from sheep and goat milk. It also aimed to determine consumer attitudes towards ice cream made from sheep and goat milk.

## Materials and methods

The survey was conducted on a sample of 366 younger respondents (up to the age of 45) during the November 2020. The questionnaire consisted of 22 questions, including 5 sociodemographic questions and 17 questions about respondents' behaviour regarding ice cream consumption, importance of intrinsic and extrinsic characteristics of ice cream, respondents' behaviour regarding sheep and goat milk and ice cream consumption, and their

Table 1. Sample description

Sociodemographic characteristics		N	%
Gender	Female	219	59.8
	Male	147	40.2
Age	18-25	218	59.6
	26-35	92	25.1
	36-45	56	15.3
County of residence	City of Zagreb	81	22.1
	Šibenik-Knin	58	15.8
	Split-Dalmatia	44	12.0
	Zagreb county	35	9.6
	Požega-Slavonia	30	8.2
	Zadar	23	6.3
	Dubrovnik-Neretva	20	5.5
	Brod-Posavina	9	2.5
	Varaždin	7	1.9
	Istria	6	1.6
	Primorje-Gorski Kotar	6	1.6
	Bjelovar-Bilogora	6	1.6
	Sisak-Moslavina	4	1.1
	Osijek-Baranja	3	0.8
	Koprivnica-Križevci	3	0.8
	Karlovac	2	0.5
	Međimurje	2	0.5
Vukovarsko-Srijem	2	0.5	
Virovitica-Podravina	1	0.3	
Krapina-Zagorje	1	0.3	
Lika-Senj	1	0.3	
I live outside Croatia	22	6.0	
Education	Elementary school	1	0.3
	High school	146	39.9
	University degree	219	59.8
Individual monthly income	Up to 5.500 HRK	210	57.3
	5.501 – 7.000 HRK	68	18.6
	7.001 – 9.500 HRK	38	10.4
	More than 9.500 HRK	50	13.7



attitudes about ice cream made from sheep and goat milk. Most questions were closed-ended type, while one question was open-ended (the type of ice cream they consume most often).

Attitudes toward ice cream made from sheep and goat milk were measured using 5 statements developed for the purposes of this study. Respondents indicated their level of agreement with each statement on a five-point Likert scale. The number one indicates complete disagreement with the statement, while the number five indicates complete agreement with each statement.

The questionnaire was created using the Google Forms. Univariate data analysis (frequencies and data distribution) was performed in Excel, and the obtained data were presented in the form of charts and tables. The link to the questionnaire was sent to the respondents by e-mail, through the Messenger application and the WhatsApp mobile application, and through Facebook.

## Results and discussion

### Sample description

Of the total 366 respondents, 59.8% were females and 40.2% were males. Most respondents were in the 18-25 age group (59.6%), followed by the 26-35 age group (25.1%), and the fewest respondents were in the 36-45 age group (15.3%). The survey is focused on the younger population, as previous studies have shown that the younger population is more inclined to consume new products on the market from the functional food category (Zychowicz-Jezewska, 2009; Markovina et al., 2011; Tomić Maksan, 2014, Vukasović, 2017). In terms of education level, most respondents have a university degree (59.8%). The largest share of respondents has a monthly income of up to HRK 5.500 (now 733.3 EUR) (57.3%) - Table 1.

### The behaviour of the respondents when consuming ice cream

Of the 366 respondents, the majority (96.7%) answered affirmatively to the question "Do you consume ice cream?" while 3.3% of respondents answered that they do not consume ice cream. For those respondents who answered that they do not consume ice cream (n=12), the survey was closed with this question. When asked "When do you consume ice cream?" most respondents (39.5%) answered that they consume ice cream regardless of the season, while 23.7% of respondents answered that they only consume it in the summer. 18.7% of respondents consume ice cream in summer and spring and 18.1% in summer, spring and fall. Most often, respondents consume ice cream several times a month (31.4%) and several times a week (28.5%). The fewest respondents (5.1%) answered that they eat ice cream every day (Figure 1).

Respondents had to indicate which type of ice cream they prefer to eat. Most respondents prefer to consume ice cream with chocolate (n=195) and vanilla (n=182) flavours (Table 2). Sippl et al. (2022) also reported that the favourite flavour of frozen desserts is chocolate. In addition to the abovementioned flavours, the respondents also like to consume ice cream with the flavours of coconut (n=4), punch (n=4), cookies (n=4), caramel (n=3), cherry (n=3), cheesecake (n=1), blueberry (n=1), dark chocolate (n=1), almond (n=1), and raspberry (n=1). There was the possibility of multiple answers to the above question.

When asked if they prefer individual packaging or family packaging (ice cream in a box), 42.7% of the respondents indicated individual packaging and 21.3% indicated family packaging, while 36.0% of the respondents answered that they choose ice cream regardless of packaging.

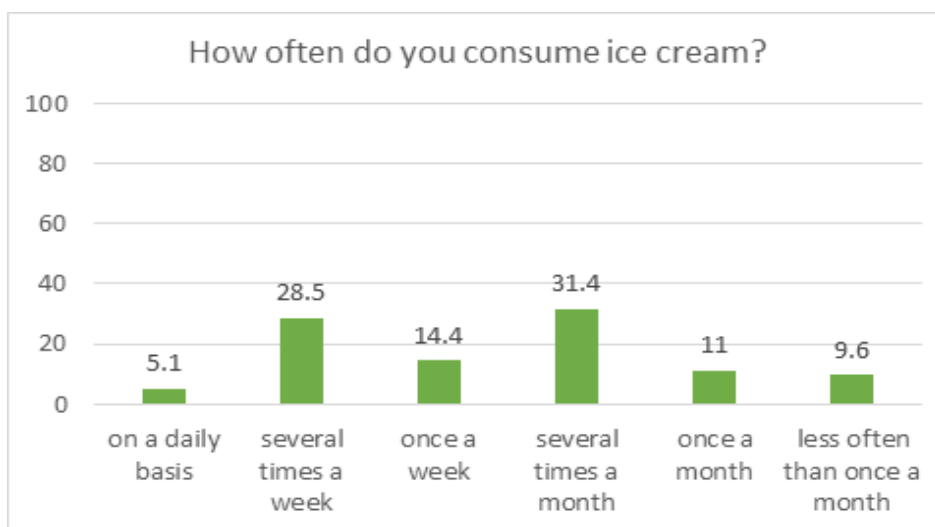


Figure 1. Frequency of ice cream consumption

Table 2. The most commonly consumed flavours of ice cream

The most commonly consumed ice cream flavour by respondents	N	%
Chocolate	195	55.1
Vanilla	182	51.4
Hazelnut	130	36.7
Forest fruit	124	35.0
Strawberry	81	22.9
Pistachio	74	20.9
Lemon	11	3.1
Yogurt	6	1.7

Table 3. Importance of the intrinsic and extrinsic characteristics of ice cream

Ice cream characteristics		Mean	Standard deviation
Intrinsic characteristics of ice cream	Taste	4.31	0.96
	Quality	4.06	0.97
	Aroma	4.04	1.02
	Consistency of quality with each purchase	3.83	1.06
	Texture	3.68	1.12
	Odour	3.64	1.08
	Solubility	3.54	1.09
Extrinsic characteristics of ice cream	Price-quality ratio	3.79	1.07
	Price	3.24	1.11
	Presence of milk in the list of ingredients	2.92	1.16
	Packaging	2.89	1.13
	Amount of sugar	2.88	1.20
	Brand name	2.79	1.17
	Country of origin	2.79	1.26
	Colour	2.75	1.16
	Nutritional value	2.72	1.18
	Amount of fat	2.69	1.15
	Nutrition declaration	2.66	1.13

Table 4. The most common reasons against the consumption of sheep and goat milk

Reason	N	%
I don't like the taste and the smell	86	29.3
Unavailability in the stores	74	25.2
I don't like their taste	44	15.0
I don't like the smell	42	14.3
The price is too high	14	4.8
I don't drink milk at all	13	4.4
I've never had the opportunity to try them	9	3.1
I've no habit	6	2.0
Other (unavailability of sheep and goat milk, allergies)	6	2.0

### Importance of the intrinsic and extrinsic characteristics of ice cream

As shown in the research results presented in Table 3, the intrinsic (inner) characteristics of ice cream are more important to the participants than the extrinsic (outer) characteristics. The most important intrinsic characteristics of ice cream for respondents are taste (mean 4.31) and quality (mean 4.06), while the most important extrinsic characteristics are price-quality ratio (mean 3.79) and price of ice cream (mean 3.24). This is in line with the findings of Markovina et al. (2011) and Tomić Maksan et al. (2014) in studies on functional foods. Young people believe that the most important characteristics of functional foods are taste and price-quality ratio. The amount of fat, the nutritional declaration and the nutritional value of ice cream are not important for the respondents.

### The behaviour of respondents in the consumption of sheep and goat milk

The majority of respondents (n=294, 83.1%) indicated that they do not consume sheep and goat milk. 7.9% of respondents indicated that they consume only goat milk, 2% consume only sheep milk, while the remaining 7% of respondents consume both types of milk. Table 4 lists the most common reasons for not consuming sheep and goat milk, based on a sample of 294 respondents who do not consume such milk. The most common reasons for not consuming sheep and cow milk are the inappropriate taste and smell, and unavailability in stores. Vargas-Bello-Pérez et al. (2022) reported, as a result of a cross-continental study on consumer attitudes towards sheep and goat milk dairy products, that in European and Asian countries non-consumption was attributed to the fact that consumers do not like them, in addition to their concern about sustainability and climate change issues. For all respondents, the main reasons for non-consumption are limited market availability, strong flavour and odour, and lack of knowledge about sheep and goat dairy products.



Table 5. Respondents' attitudes towards ice cream made from sheep and goat milk

Item	Mean	Standard deviation
Ice cream made from sheep/goat milk is more suitable for children and the elderly than ice cream made from cow milk.	3.4	0.9
The nutritional value of sheep/goat milk ice cream is higher than that of cow milk ice cream.	3.3	0.9
Sheep/goat milk ice cream is more digestible than cow milk ice cream.	3.3	0.9
The intense taste of sheep/goat milk discourages me from even trying ice cream made from these types of milk.	3.1	1.1

When asked if they know that ice cream can be made from sheep/goat milk, respondents are divided. 51% of respondents answered that they know, and 49% that they do not know. Of the 354 respondents who consume ice cream, only 18 had the opportunity to try ice cream made from sheep/goat milk. Two of them indicated that they did not like the taste of such ice cream at all, two of them disliked it, and one liked it a lot. Three respondents indicated that they neither liked nor disliked the taste of such ice cream, and nine of them that they liked it. One respondent did not answer the question about the taste of such ice cream. Respondents who did not like ice cream made from sheep/goat milk gave the inappropriate taste, smell, and texture as reasons. Respondents who had not yet had the opportunity to try ice cream made from sheep/goat milk expressed a medium willingness to consume such ice cream (mean 3.5, standard deviation 1.1).

### ***Respondents' attitudes towards ice cream made from sheep and goat milk***

The respondents showed a neutral attitude towards ice cream made from sheep/goat milk. However, they show a higher level of agreement with the statement "Ice cream made from sheep/goat milk is better for children and the elderly than ice cream made from cow milk" (mean 3.4), followed by the statements "The nutritional value of sheep/goat milk ice cream is higher than that of cow milk ice cream" and "Sheep/goat milk ice cream is more digestible than cow milk ice cream" (mean 3.3.) (Table 5). Vargas-Bello-Pérez et al. (2022) found that more than 50% of respondents considered dairy products from sheep and goat milk to be healthy, with no differences between consumers and non-consumers. Perceptions of the health benefits of small ruminant's dairy products are based on the nutritional benefits and the assessment of small ruminant's dairy products as natural, less processed, traditional or easy to

digest. Sippl et al. (2022) found that the type of sweetener and the base ingredient (dairy vs. plant) are the most important attributes for BFY consumers when choosing a BFY ice cream. According to this study, when developing new products for the BFY category, manufacturers should focus mainly on dairy-based products with natural ingredients, especially sweeteners. According to the International Dairy Foods Association (2022), trends driving the global ice cream market include natural, gourmet and nostalgic products, clean labels, convenience, and an appreciation of healthy products that help improve health and well-being (Teixeira et al., 2023).

### **Conclusions**

The results of this study provide valuable insights that can be used to develop ice cream that meets different consumer needs and could increase the consumption of sheep/goat milk and sheep/goat milk-based ice cream. The intrinsic characteristics of ice cream were more important than the extrinsic characteristics. The most important intrinsic characteristics of ice cream for respondents were taste and quality. In contrast, the most important extrinsic characteristics were the price-quality ratio and the price of ice cream. There are some limitations of the present study that should be taken into account. The sample included mainly younger respondents with higher education, which is related to the contact technique. The online questionnaire allowed us to reach a large number of participants, but the results cannot be extrapolated to the general population. Therefore, future studies that include a diverse socio-demographic sample are needed. In addition, further studies should investigate the factors that influence consumers' intention to eat alternative ice cream such as sheep/goat milk ice cream (e.g. health consciousness, food involvement, food neophobia).

### **References**

- Abdeldaiem A.M., Ali A.H., Mousa A.H., Elkot W.F., Simal-Gandara J. (2023) Ice cream supplemented with roasted and grilled corn powders: Physical properties, rheology, antioxidant activity, color, sensory evaluation, and production cost. *International Journal of Gastronomy and Food Science*, 32 100692.
- Akalin A. S., Kesenkas H., Dinkci N., Unal G., Ozer E., Kınık O. (2018) Enrichment of probiotic ice cream with different dietary fibers: Structural characteristics and culture viability. *Journal of Dairy Science*, 101 37–46.
- Akbari M., Eskandari M.H., Davoudi Z. (2019) Application and functions of fat replacers in low-fat ice cream: A review. *Trends in Food Science & Technology*, 86 34–40.
- Akbari M., Eskandari M. H., Niakosari M., Bedeltavana A. (2016) The effect of inulin on the physicochemical properties and sensory attributes of low-fat. *International Dairy Journal*, 57 52–55.
- Balthazar C. F., Silva H. L. A., Cavalcanti R. N., Esmerino E. A., Cappato L. P., Abud Y. K. D., Moraes J., Andrade M. M., Freitas M. Q., Sant'Anna C., Raices R. S. L., Silva M. C., Cruz A. G. (2017) Prebiotics addition in sheep milk ice cream: A rheological, microstructural and sensory study. *Journal of Functional Foods*, 35 564–573.
- Balthazar C.F., Silva H.L.A., Esmerino Erick.A., Rocha R.S., Moraes J., Carmo M.A.V., Azevedo L., Camps I., K.D Abud Y., Sant'Anna C., Franco R.M., Freitas M.Q., Silva M.C., Raices R.S.L., Escher G.B., Granato D., Senaka Ranadheera C., Nazarro F., Cruz A.G. (2018). The addition of inulin



and *Lactobacillus casei* 01 in sheep milk ice cream, *Food Chemistry*, 246 464-472.

Da Silva V.M., Rodrigues Minim V.P., Ferreira M.A.M., de Paula Souza P.H., da Silva Moraes L.E., Minim L.A. (2014) Study of the perception of consumers in relation to different ice cream Concepts. *Food Quality and Preference*, 36 161-168.

Da Silva, P.D.L., Bezerra, M.d.F., dos Santos, K.M.O., Correia, R.T.P. (2015) Potentially probiotic ice cream from goat's milk: Characterization and cell viability during processing, storage and simulated gastrointestinal conditions. *LWT - Food Science and Technology*, 62 (1) 452-457.

Danesh E., Goudarzi M., Jooyandeh H. (2017) Short communication: Effect of whey protein addition and transglutaminase treatment on the physical and sensory properties of reduced-fat ice cream. *Journal of Dairy Science*, 100 5206-5211.

de Oliveira, A.P.D., de Oliveira Almeida, T.J., Santos, T.M.B., Dias, F.S. (2021) Symbiotic goat milk ice cream with umbu fortified with autochthonous goat cheese lactic acid bacteria. *LWT - Food Science and Technology*, 62 141 110888.

Di Criscio T., Fratianni A., Mignogna R., Cinquanta L., Coppola R., Sorrentino E., Panfili G. (2010) Production of functional probiotic, prebiotic, and symbiotic ice creams. *Journal of Dairy Science*, 93 4555-4564.

Genovese G., Balivo A., Salvati A., Sacchi R. (2022) Functional ice cream health benefits and sensory implications. *Food Research International*, 161 111858.

Güzeler N., Dođdu L., Kalender M., Özbek Ç., Y. (2017) Some Physicochemical and Sensory Properties of Ice Cream Samples Produced by Different Milk Types with Different Amounts. 2nd International Energy & Engineering Conference, 12-13 October, 820-825.

Hanafi F.N.A., Kamaruding N.A., Shaharuddin S. (2021) Influence of coconut residue dietary fiber on physicochemical, probiotic (*Lactobacillus plantarum* ATCC 8014) survivability and sensory attributes of probiotic ice cream. *LWT - Food Science and Technology*, 154 112725.

International Dairy Foods Association (2019) What's hot in ice cream. New product trends. <https://www.idfa.org/what's-hot-in-ice-cream>. Accessed August 31, 2023.

Kowalczyk M., Znamirska A., Buniowska M. (2021) Probiotic sheep milk ice cream with inulin and apple fiber. *Foods*, 10 (3) 678.

Liu R., Wang L., Liu Y., Wu T., Zhang M. (2018) Fabricating soy protein hydrolysate/xanthan gum as fat replacer in ice cream by combined enzymatic and heat-shearing treatment. *Food Hydrocolloids*, 81 39-47.

Liu X., Sala G., Scholten E. (2023) Role of polysaccharide structure in the rheological, physical and sensory properties of low-fat ice cream. *Current Research in Food Science*, 7 100531.

Markovina J., Čačić J., Gajdoš Kljusurić J., Kovačić D. (2011) Young consumers' perception of functional foods in Croatia. *British Food Journal*, 113 (1) 7-16.

McGhee C. E., Jones J. O., Park Y. W. (2014) Evaluation of textural and sensory characteristics of three types of low-fat goat milk ice cream. *Small Ruminant Research*, 123 (2-3) 293-300.

Nadelman P., Frazão J. V., Vieira T. I., Balthazar C. F., Andrade M. M., Alexandria A. K., Cruz A. G., Fonseca-Gonçalves A., Maia L. C. (2017) The performance of probiotic fermented sheep milk and ice cream sheep milk in inhibiting enamel mineral loss. *Food Research International*, 97 184-190.

Pintor Jardines A., Arjona-Román J.L., Severiano-Pérez P., Totosaus-Sánchez A., Fiszman S., Escalona-Buendía H.B. (2020) Agave fructans as fat and sugar replacers in ice cream: Sensory, thermal and texture properties. *Food Hydrocolloids*, 108 106032.

Prindiville E. A., Marshall R. T., Heymann H. (2000) Effect of milk fat, cocoa butter, and whey protein fat replacers on the sensory properties of lowfat and nonfat chocolate ice cream. *Journal of Dairy Science*, 83 2216-2223.

Ribiero A. C., Ribiero S. D. A. (2010) Specialty products made from goat milk. *Small Ruminant Research*, 89 231.

Sacchi R., Caporaso N., Squadrilli G.A., Paduano A., Ambrosino M.L., Cavella S., Genovese A. (2019) Sensory profile, biophenolic and volatile compounds of an artisanal ice cream ('gelato') functionalised using extra virgin olive oil. *International Journal of Gastronomy and Food Science*, 18 100173.

Sipple L. R., Racette C. M., Schiano A. N., Drake M. A. (2022) Consumer perception of ice cream and frozen desserts in the "better-for-you" category. *Journal of Dairy Science*, 105 154-169.

Tagliamonte S., De Luca L., Donato A., Paduano A., Balivo A., Genovese A., Romano R., Vitaglione P., Sacchi R. (2023) A 'Mediterranean ice-cream': Sensory and nutritional aspects of replacing milk cream with extra virgin olive oil. *Journal of Functional Foods*, 102 105470.

Teixeira N.S., de Alcantara M., Martins I.B.A., Chávez D.W.H., Rosenthal A., Chaves A.C.S.D., Deliza R. (2023) Attitudes and conceptions of Brazilian consumers toward ice cream and protein addition. *Food Quality and Preference*, 108 104881.

Tomić M., Cerjak M., Rupčić I. (2014) Functional foods and the young. *Journal of Food Products Marketing*, 20 (5) 441-451.

Topcu Y. (2015) Turkish consumer decisions affecting ice cream consumption. *Italian Journal of Food Science*, 27 1-11.

Urala N., Lähteenmäki L. (2003) Reasons behind consumers' functional food choices. *Nutrition & Food Science*, 33 (4) 148-158.

Vargas-Bello-Pérez E., Tajonar K., Foggi G., Mele M., Simitzis P., Mavrommatis A., Tsiplakou E., Habib M.R., Gonzalez-Ronquillo M., Toro-Mujica P. (2022) Consumer attitudes toward dairy products from sheep and goats: A cross-continental perspective. *Journal of Dairy Science*, 105 8718-8733.

Vukasović T. (2017) Functional foods in line with young consumers: challenges in the marketplace in Slovenia. In: Bagchi D., Nair S. (ed): *Developing New Functional Food and Nutraceutical Products*, 391-405. Academic Press, USA.

Wendorff W. L., Kalit S. (2017) Processing of sheep milk. In: Park, Y.W., Haenlein, G.W.F., Wendorff, W.L. (ed): *Handbook of milk of non-bovine mammals*, 222 - 249. Wiley Blackwell, Oxford, UK.

Zychowicz-Jezewska M. (2009). Impact of beliefs and attitudes on young consumers' willingness to use functional food. *Polish Journal of Food and Nutrition Sciences*, 59 (2) 183-187.