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INTERNATIONAL CHEESES IN THE FOCUS OF CONSUMERS - CONNOISSEURSHIP, SELECTION AND PREFERENCES

Stefan Šmugović^A, Natalija Knežević^A, Velibor Ivanović^A Received: August 13, 2021 | Accepted: December 21, 2021

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ABSTRACT: International cheeses present an important factor in gastronomy of many catering establishments. The expansion of the market influenced the expansion of the great variety of cheeses among consumers. Branding, origin protection of some types of cheese, its packing and exploitation on the market enabled the expansion of cheeses all over the world. This expansion is important because it facilitates the selection and safety for buyers, while increasing market demands as well as expanding to new market branches for the manufacturers.

The subject of this study is international cheeses that are available to domestic market, as well as the preferencies of the consumers. Our task is to depict the basic connoisseurship of international cheeses in the focus of the consumers , as well as the factors that influence their shopping preferences. Our aim is to establish the levels of that connoisseurship and if it influences consumers' preferences in buying some types of cheeses.

Keywords: dairy products, cheese, manufacturing of cheeses. consumer preferences, cheese consumption

INTRODUCTION

There are more than a thousand different types of cheeses in the world, which makes it one of the most diverse food products (Fox et al., 2017). Cheese is a food product that is made by the coagulation of proteins of milk and cream (Havranek et al., 2014). In other words, microbiological fermentation of milk happens because of certain lactic acid bacteria (Hayaloglu, 2016).

Nowadays, there is a wide range of diffrent cheeses that meet different sensory, nutritional and microbiological demands of the consumers. Cheeses contain high concetration of essential nutrients in regard to their energy value, which makes them a very suitable grocery in a balanced diet (O'Brien, O' Connor, 2017.) Cheese, in worldwide gastronomy, is one of the most valued products, and it is used in the preparation of different meals. It has a very important role, not only in gastronomy but also in food industry (Guinee, Kilcawley, 2004; Guinee, 2011). Cheeses are being produced all over the world of many different tastes, textures and shapes. It is valued mainly because of its durability – sustainability, high content of fat, proteins, calcium and phosphorus. Thanks to all of these, cheese presents an indispensable food product all over the world (Havranek et al, 2014.)

^A Department of Geography, Tourism and Hotel Management, Faculty of Sciences, University of Novi Sad, Novi Sad, Serbia; corresponding author: <u>stefan.smugovic.car@gmail.com</u>

The global market of dairy products is in expansion since 2005, mostly because of the increasing demands of the developing economies. Cheese market has been one of the most dynamic segments of food production in the last 20 years. There is a steady increase in consumption, production and international trade. It is estimated that one third of the world milk is being used for the production of cheeses (Farkye, 2004). This is more than the annual crops of coffee beans, tea leaves, cacao beans and tobbaco altogehter (PM Food & Dairy Consulting, 2014.) Around 17 million tons of cheese is being produced in one year, of which the largest part encompases Cheddar, Mozzarella, Gouda, Emmentaler and Grana Padano (Park et al. , 2013.).

Going from pastures to plates, cheese is being identified with a specific geographical area. Hereof, the taste of cheese is being connected to that specific area. Food, like cheeses, conveys cultural and natural food of the place they are made in. These factors are the factors the consumers want to experience when they consummate cheese (Berno, Fusté – Forné, 2019). The popularity of cheese among consumers impacts its healthy and positive image (Fox et al. , 2000).

Cheeses present the identity of the region they originate from. Cheese producers transfer manners of production and consumption through their traditional recepies. This is associated with practices of food tourism, especially that in connection to gastronomy, which in this case refers to cheese. Hereof, people can buy cheese at different sales places and one of the most appreciated places for tasting authentic products are the market places (Bessiere, Tibere, 2013).

The subject of this study is international cheeses and consumers' awareness of the types and origins of cheeses that are available on the domestic market. In addition, this study examines the preferences of the consumers and the factors that affect the selection of famous cheeses worldwide. The task is to represent general knowledge of consumers about international cheeses from different gastronomical areas, to test which international cheeses are their choices when buying and the reasons for buying it, in order to make a selection of the market based on the demographic characteristics. The aim is to show authentic types of cheese from different places of the world and represent their consumption to the domestic population based on the general consumerist knowledge about cheese classics that originate from France, Italy, Greece, Switzerland and England.

LITERATURE REVIEW

Even though the cheese has being produced for centuries now, modern production of cheese relies on a great number of technologies and sciences of production (McSweeney, 2004). Cheese presents one of the most complex dairy products because of its chemical, biochemical and microbiological production processes (Popović – Vranješ, 2015). Cheese is a rich source of essential nutrients, primarily of proteins, peptides, amino acids, fatty acids, vitamins and minerals (Walther et al. , 2008). According to the Regulation on quality of dairy products and starter cultures ('Sl. Glasnik RS no. 69/2010 (Official Gazette of Serbia)), cheeses are fresh products or products of different degrees of maturation which are produced by:

- the separation of whey after coagulation of milk (cow's, sheep's, goat's, buffalo's milk and / or their combination), sour cream, whey or the combination of these ingredients and
- using technological solutions that include milk coagulation, that is products and semi-products made of milk, where the final product has the same physical, chemical and sensory characteristics as the product made naturally.

Cheese is made by adding the rennet enzyme, such as chymosin, into the milk, as well as by acidification of milk, through bacteria, that convert lactic sugars into lactic acid by fermentation. Distributed, checked and pasteurized at appropriate temperatures and in perfect conditions, milk is being transferred to appropriate containers and bested to the required acidity level. When this level is achieved, the mix of lactic bacteria or

containers and heated to the required acidity level. When this level is achieved, the mix of lactic bacteria or starter cultures is being added. They transform lactose into lactic acid and contribute to the flavor, aroma and

texture of the cheese. This leads to concentration of milk protein, casein. After these processes, the solid substance is pressed into desired form (Kindstedt, 2001).

Different characteristics of natural habitat of animals affect the final features of the product. Climactic features and various vegetation influence different flavors of some cheeses. Minerals and other components of plants that animals eat, affect the rate of fermentation, texture and flavors of cheese. Different habits of milking cattle affect other characteristic of cheese (Harbutt, 2009.). The flavor of milk changes with the age of animals that produce milk. These characteristics are mostly noticeable in sheep's milk, because older sheep produce more aromatic milk than younger sheep (Portic, Milovic, 2010.).

In addition to cow's milk, goat's and sheep's milk, cheese is also made from the milk of other animals. One of the most famous world cheeses, Mozzarella, was originally produced from buffalo's milk. Yak's milk is used in the production of artisan cheese in China and Tibet (Park, Haenlein, 2006; Wiener, 2011), while deer's milk is being used in Russia and arctic area (Park, Haenlein, 2006).

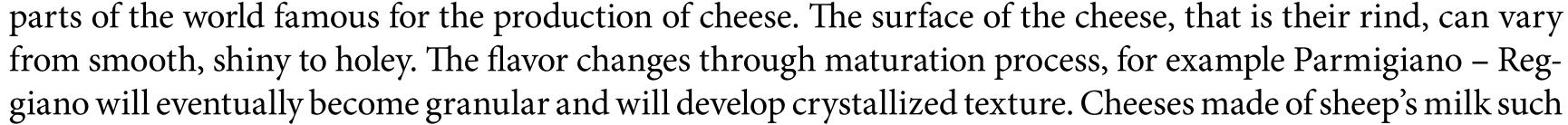
Classification of cheeses is a complex task, because one can find a great number of different classifications. Davis (Davis, 1965) was the first author who suggested classification of cheese into soft, semi soft, semi hard and hard cheese. This classification is being used still by most authors. According to Harbutt (Harbutt, 2009) cheeses can be classified into seven basic categories:

- fresh cheeses
- fresh white cheeses
- aged cheeses
- hard cheeses
- semi hard cheeses
- blue cheeses
- flavored cheeses

Fresh cheeses are those that can be consummated immediately after production. Sweet, refreshing, lactic or sour are some of the terms used to describe the flavor of fresh cheese. They are maturated enough, just with a hint of potential flavor of milk (Harbutt, 2009). Some of the most famous types of fresh cheeses are Mozzarella, Halloumi, Ricotta, Feta, Mascarpone and other (Portić, Milović, 2010). Fresh white cheeses contain high amount of whey, obtaining an almost liquid texture of the cheese. During the production, little lumps of coagulated milk are used, whose weight is being used to squeeze the excess whey. The surface of the cheese is being wrapped with white, velvety penicillin candidum mold. Fresh white cheese produced in industrial machines has thick velvety rind that resembles the package itself rather than the content of the product. On the other side, there are artisan white cheeses whose rind is thin, white with splashes of reddish brown ferments of yellow mold. The most popular types of fresh white cheeses are Camembert, Brie and Sharpham (Harbutt, 2009).

Aged cheese is the cheese left to rest and maturate in perfect conditions and controlled humidity levels. The process of maturation is usually conducted in cold basements. This protein – rich area is an ideal place for the development of microflora that enables the process of maturation. The greatest aged cheeses are from France, usually shaped as a bell or a cone. Creamy aromatic cheeses are usually made of goat's milk and are coated with different natural materials such as ashes, herbs, walnut leaves that enable the growth of molds. Cheeses made of cow's or sheep's milk are milder and have creamier, softer texture with fewer molds (McCalman, Gibbons, 2009). These cheeses are not appropriate for cooking or sauce making because of their unique texture and consistency. However, any charcuterie board is almost impossible without these types of cheese whose rustic appeal gives completely new look to the products served on the board. Some of the most famous types of aged cheeses are Ventadour, Valencay, Clochette (Harbutt, 2009).

Hard cheeses made of goat's, cow's and sheep's milk usually in round model shapes can be found in the



as Pecorino and Manchego have crumbly texture and unique caramel flavor, while goat cheeses have nuttier flavor (Harbutt, Danny, 2001). They carry different features depending on the area they come from. For example, British cheeses have cylinder shape, which is different from the great rounded cheeses that usually originate from Switzerland or the Netherlands. Wood reed patterns used for maturation of cheeses are usual for Spanish cheeses, while the greatest producers of cheese, Italy and France, have wide range of different shapes and sizes of cheeses (Werlin, 2009). The size of cheese is diverse and goes from 250grams such as Camembert to big pieces of 60 to 80 kilograms such as Emmentaler (Fox et al, 2015). The flavor is the feature that distinguishes this category from other cheese categories. For example, the flavor of the most popular British cheese, Cheddar, is exactly the feature that makes this cheese different on the market. This is the one of the most important characteristics for the consumers (Young et al, 2004; Yates, Drake, 2007). Apart from being used in preparation of many different dishes, salads, dressings and sauces, these cheeses, when compared to other cheese categories, are most likely to be eaten raw. Elasticity of hard cheeses such as Gryuere and Emmentaler, is affected by warmth. The most prominent types of hard cheeses are: Manchego, Emmentaler, Cheddar, Parmigiano – Reggiano, Grana Padano and many other (Harbutt, 2009).

In relation to other categories, the group of semi-hard cheeses has many different shapes and flavors and they mutually differ in color and texture. First group contains cheeses with dry rind, wide range of flavors from mild to nutty. The rind on their surface can be thick, but also barely noticeable. Second group are cheeses whose rind is washed. Their rheological characteristics are different from those of the first group. They are considerably softer and they have sharp smoked flavor. The texture becomes softer and more liquid through the maturation process (Werlin, 2009).

Representative types of semi hard cheeses are Edam cheese, Taleggio, Langres and other. Edam cheese is the semi hard pale yellow cheese that originated from the Netherlands. Even though Edam cheese was traditionally shaped as a large reel, nowadays it can be found in a shape of a cube, but also in a shape of a loaf. This is the trade cheese whose production is based on industrial manufacture. It is named after the city of Edam (Agricultural Research Service, 1978). Unlike white mold that grows on the surface of cheese, blue mold, that comes from the penicillium, grows in the interior of cheese. There is a wide range, all from buttery and elastic, to soft and salty cheeses such as Gorgonzola. Sweet taste of sheep's milk presents a good combination with blue mold for example Roquefort cheese. European cheeses are usually wrapped in a foil that assures the growth of a great number of molds on a soft and flexible rind. British cheeses have a hard rind that visually gives the impression of being sprayed with blue or gray spots (Werlin, 2009). Throughout history, blue cheese has matured in huts, basements and caves, which helped with the development of blue mold. Blue mold had found its way through cracks on the surface and entered into fresh curd. Maturation of cheese with blue mold like Stilton, Roquefort, Gorgonzola, Cabrales and other, requires the presence of *Penicillium Roquefort* mold that gives blue – green color, specific and recognizable flavor of this cheese (Garcia – Estrada, Martin 2016). Aromatic cheeses date from the 16th century when people learned to make hard cheeses and preserve it in the vicinity of a wood stove. These are pale cheeses that found their place on the cheese market all over the world. The Dutch used spices from the East, mostly India, to enrich their traditional cheeses, such as Gouda. Modern aromatic cheeses are usually hard or semi hard cheeses combined with spices, aromatic parts of herbs and fruit (Harbutt, 2009). Famous representatives of smoked cheeses are: Taramundi, Nagelkaas, Idiazabal (Harbutt, 2009). Consumption of cheese throughout the world is constantly increasing because of versatility and availability of different types of cheeses and increased cravings for dishes containing cheese. This increased production and consumption of cheese is directly proportional to food safety aspects of this product (Planzer et al, 2009). Key factors when deciding to buy Parmesan are the result of a research conducted on the example of consumers' perception. In that manner, the main trait of sensory characteristics of cheese belongs to flavor

and aroma. Geographical origin and price of cheese, as outward quality factors, are the most important factors that affect the consumption of cheese (Silvestri et al., 2019).

METHODOLOGY

The research was conducted in the area of Novi Sad (the capital of A. P. Vojvodina, north of Serbia) in which consumers of different age and gender structures participated. It was carried out according to a pre-compiled and non-standardized questionnaire consisting of four parts. The first part has an aim at finding out about socio-demographic characteristics of the respondents, the second one is about the consumption of cheese and its frequency. Finally, the last part is about the level of consumers' knowledge of international types of cheese. Respondents were given the task to choose one answer from the given options. Also, in the part of the survey that refers to the factors which have a role in deciding cheese consumption, the answers were determined according to the Likert scale from one to five, where one indicates insignificant influence, and five very important influences on the consumer's decision to buy cheese. For the needs of the paper, 270 questionnaires were distributed, but 245 were collected, of which 226 were processed and completed. The obtained data are systematized and processed using descriptive statistics and graphically and tabularly presented in the paper.

RESULTS OF THE RESEARCH AND DISCUSSION

Sample analysis

Based on the obtained data, shown in Table 1, it was stated that the majority of female respondents participated in the research – 51,8% and that the majority of respondents is between 21 and 30 years old – 23,5%. Regarding the level of education of the respondents, the largest share has acquired higher education (BSc diploma) - 39,8% and the largest number of respondents has a monthly income that exceeds more than 70,001 dinars – 28,8%.

Variable	ltem	N	(%)
Gender	Male	109	48,2
Gender	Female	117	51,8
	< 20 years old	38	16,8
	Between 21 and 30 years old	53	23,5
Age	Between 31 and 40 years old	45	19,9
	Between 41 and 50 years old	48	21,2
	> 51 years old	42	18,6
Education level	Primary school	9	4
	High school	77	34,1
	Bachelor's degree	90	39,8
	MSc degree/PhD	50	22,1
Monthly income	<40000	63	27,9
	Between 40001 and 50000	22	9,7
	Between 50001 and 60000	35	15,5
(in RSD)	Between 60001 and 70 000	41	18,1
	>70001	65	28,8

 Table 1. Socio-demographic structure of the participants (N=226)



Cheese consumption analysis

Analyzing the frequency and manner of cheese purchase, the data are shown in Table 2, it can be told that the majority of respondents, more than half, consume some type of cheese at least once a week - 51,8%. Furthermore, it was found that the average monthly consumption of cheese is between 100 and 300 grams - 22,1% of consumers said.

When it comes to the manner of consumption, the majority of respondents answered that they consume cheese as a side dish for breakfast - 42%. And 69% of respondents buy cheese in supermarkets and/or shops which are a bigger share in comparison to markets, dairies, or other places.

Variable	Item	N	(%)
	Every day	46	20,4
Frequency of cheese consumption	Once a week	117	51,8
	2-3 times a month	40	17,7
consumption	Once a month	8	3,5
	Rarely	15	6,6
	<100	19	8,4
	100-300	50	22,1
Cheese consumption per month (in grams)	300-600	76	33,6
	600-1000	49	21,7
	>1000	32	14,2
	For breakfast, as a side dish	95	42
	As a part of salty meals	84	37,2
The manner of consuming cheese	As a part of sweet meals	13	5,8
	Independently	18	8
	Other	16	7,1
	Supermarkets/Shops	156	69
The most common place to	Market	33	14,6
buy cheese	Dairy	28	12,4
	Other	9	4

Table 2. Data of cheese consumption (N=226)

Source: Authors' research results, 2021

Analysis of factors influencing the purchase decision

In the research part that refers to the factors that are crucial in the process of deciding to buy some cheese, the respondents had the task to determine the degree of influence of each of these factors on a scale of one to five. According to the results presented in Table 3, it is found that the significant factors are product quality (M=4,51), then the ratio of price and product quality (M=4,35), and indicated the product's expiration date (M=4,11). The influence of other factors such as the content of additives and harmful substances in the product (M=3,97), the appearance of the product (M=3,95), and the recommendation from close people (M=3,92) should not be neglected, while the smallest impact on the purchase has product advertising (M=3,22).

Variable Μ Ν Min. Max. SD Product quality 226 4,51 ,855 5 1 Product origin 226 3,82 5 1,256 1 Attractive packaging 226 5 3,28 1,250 1 Indicated the expiration date 226 5 4,11 1,125 1 The product does not consist of additives and harmful 226 3,97 5 1,147 1 substances 226 5 1,098 1 3,86 Price Recommendation (by close friends, family, doctors, . .) 226 5 3,92 1,084 1 Product is promoted 5 226 1 3,22 1,377 Affirmed manufacturer 226 5 3,46 1,310 Pleasantly decorated ambiance where the product is sold 226 5 3,69 1,330 1 The product looks good/attractive 226 5 3,95 1,074 1 Eco-friendly product 5 226 1 3,80 1,227 The best ratio of price and product quality 5 226 4,35 ,955 1

Table 3. Descriptive analysis of factors that influence decision making of the purchase of cheese

Source: Authors' research results, 2021

Analysis of customer's knowledge of the origin of cheese

In the part of the research that refers to the respondents' knowledge about the origin of international kinds of cheese, they referred to cheese origin from Italy, France, Greece, Switzerland, and England (Table 4). When they were asked from which country cheddar cheese originates, 56,64% of respondents answered that it is England. Then, the respondents chose Italy as the country of origin of mozzarella cheese - 78,76%, gorgonzola - 61,06%, and parmesan - 76,11%. The next two kinds of cheese referred to a French origin, so 58,85% of respondents answered that roquefort cheese is of French origin, and 63,27% of respondents marked France as the country of origin of camembert cheese. Furthermore, when they were asked where the emmentaler cheese comes from, the largest share of the examinations is that it is France, while 28,76% of the respondents answered correctly, that it is of Swiss origin. On the other hand, grier cheese was recognized by the majority of respondents as a cheese of Swiss origin - 40,71%. Finally, the largest share of respondents - 88,49% stated that feta cheese originates from Greece, while a smaller share of respondents recognized that manure cheese is also of Greek origin (30,09%).

		Country of origin									
	lta	Italy		France		Greece		Switzerland		United Kingdom	
Cheese	N	%	Ν	%	N	%	N	%	N	%	
Cheddar	36	15,93	36	15,93	7	3,10	19	8,41	128	56,64	
Mozzarella	178	78,76	32	14,16	10	22,6	5	2,21	0	0	
Gorgonzola	138	61,06	55	24,34	19	8,41	12	5,31	2	0,88	
Parmesan	172	76,11	26	11,50	21	9,29	4	1,77	3	1,33	
Roquefort	20	8,85	133	58,85	23	10,18	25	11,06	25	11,06	
Camembert	14	6,19	143	63,27	26	11,50	19	8,41	24	10,62	
Emmentaler	20	8,85	102	45,13	27	11,95	65	28,76	12	5,31	
Grier	16	7,08	67	29,65	37	16,37	92	40,71	14	6,19	
Feta	7	3,10	14	6,19	200	88,49	2	0,88	3	1,33	
Manure	25	11,06	49	21,68	68	30,09	75	33,18	9	3,98	

Table 4. Customer's knowledge of the cheese origin (N=226)

Source: Authors' research results, 2021

In the next research part, the degree of information of the respondents about the type of milk that makes up the basic raw ingredient composition of cheese was investigated (Table 5).

Cow's milk is the basis for obtaining cheddar cheese, which was confirmed by 65,93% of respondents, gorgonzola 44,25% of respondents, then parmesan 49,11% of respondents, camembert 41,59%, emmentaler 50,44%, and grier 39,38% of respondents. Goat's milk is used in the production of manure cheese, which was answered by 31,86% of respondents. While 24,78% of respondents knew that sheep's milk was used as a basis for the production of feta cheese. Finally, 41,15% of respondents confirmed that buffalo milk is used for the production of Mozzarella cheese.

	The kind of milk which cheese is made of								
	Cow's milk		Goat	's milk	Shee	p's milk	Buffalo milk		
Cheese	Ν	%	N	%	N	%	N	%	
Cheddar	149	65,93	25	11,06	47	20,80	5	2,21	
Mozzarella	62	27,43	43	19,03	28	12,39	93	41,15	
Gorgonzola	100	44,25	56	24,78	62	27,43	8	3,54	
Parmesan	111	49,11	62	27,43	45	19,91	8	3,54	
Roquefort	71	31,41	72	31,86	70	30,97	13	5,75	
Camembert	94	41,59	61	26,99	62	27,43	9	3,98	
Emmentaler	114	50,44	62	27,43	41	18,14	9	3,98	
Grier	89	39,38	69	30,53	57	25,22	11	4,87	
Feta	80	35,40	85	37,61	56	24,78	5	2,21	

Table 5: The customer's knowledge of the type of milk from which certain cheese is made (N=226)

Manure 82 36,28 72 31,86	50 22,12	22	9,73
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Source: Authors' research results, 2021

The purpose of the next research part is to find out about the level of knowledge of cheese from the aspect of the content of noble molds in them (Figure 1). Among the questions offered are two kinds of cheese that have noble molds in their composition. Thus, 55,75% of respondents stated that gorgonzola is a cheese with noble molds, while 38,08% of respondents believe that roquefort cheese is with noble molds.

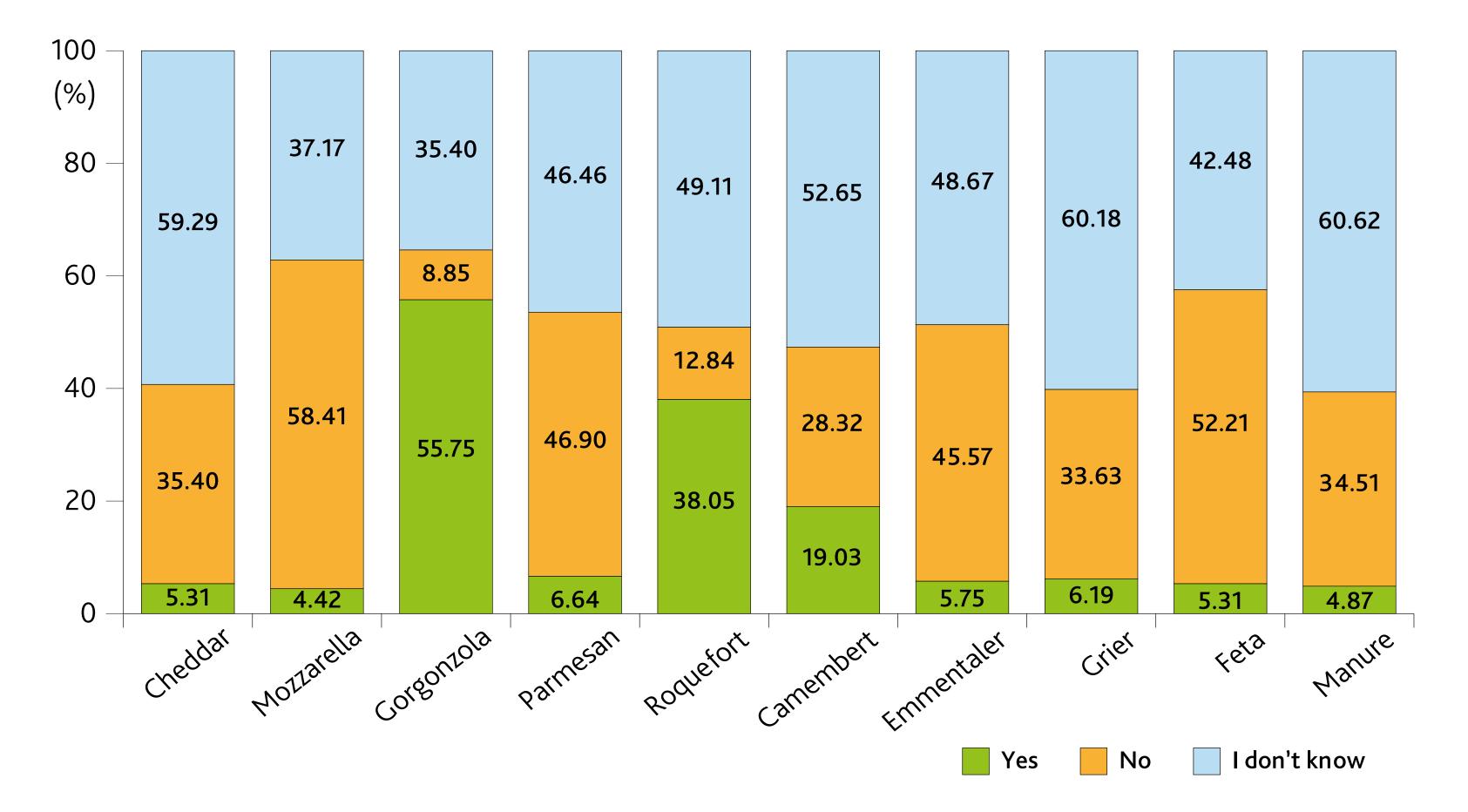


Figure 1. The customer's knowledge of existing noble molds in cheese *Source: Authors' research results, 2021*

Figure 2 shows the analysis of the structure of cheese according to its hardness, where the respondents could choose and declare cheese among the offered answers as soft, semi-soft, semi-hard, and hard cheese.

The results show that only 12,83% of respondents believe that camembert cheese is a soft cheese, and 19,91% of respondents believe that feta cheese belongs to the group of soft cheese. Regarding semi-soft cheese, 41,15% of respondents believe that mozzarella is a semi-soft cheese, and 30,09% of respondents believe that manure is a semi-soft cheese in its structure. The next level of hardness refers to semi-hard cheese, which includes cheddar, which was considered by 38,05% of respondents, and gorgonzola, which is considered by 44,25% of respondents. Finally, the last level refers to hard cheese, 48,23% of respondents said it was parme-san cheese, 23,45% of respondents said it was roquefort and emmentaler cheese, while 26,55% of respondents said that grier is hard cheese.

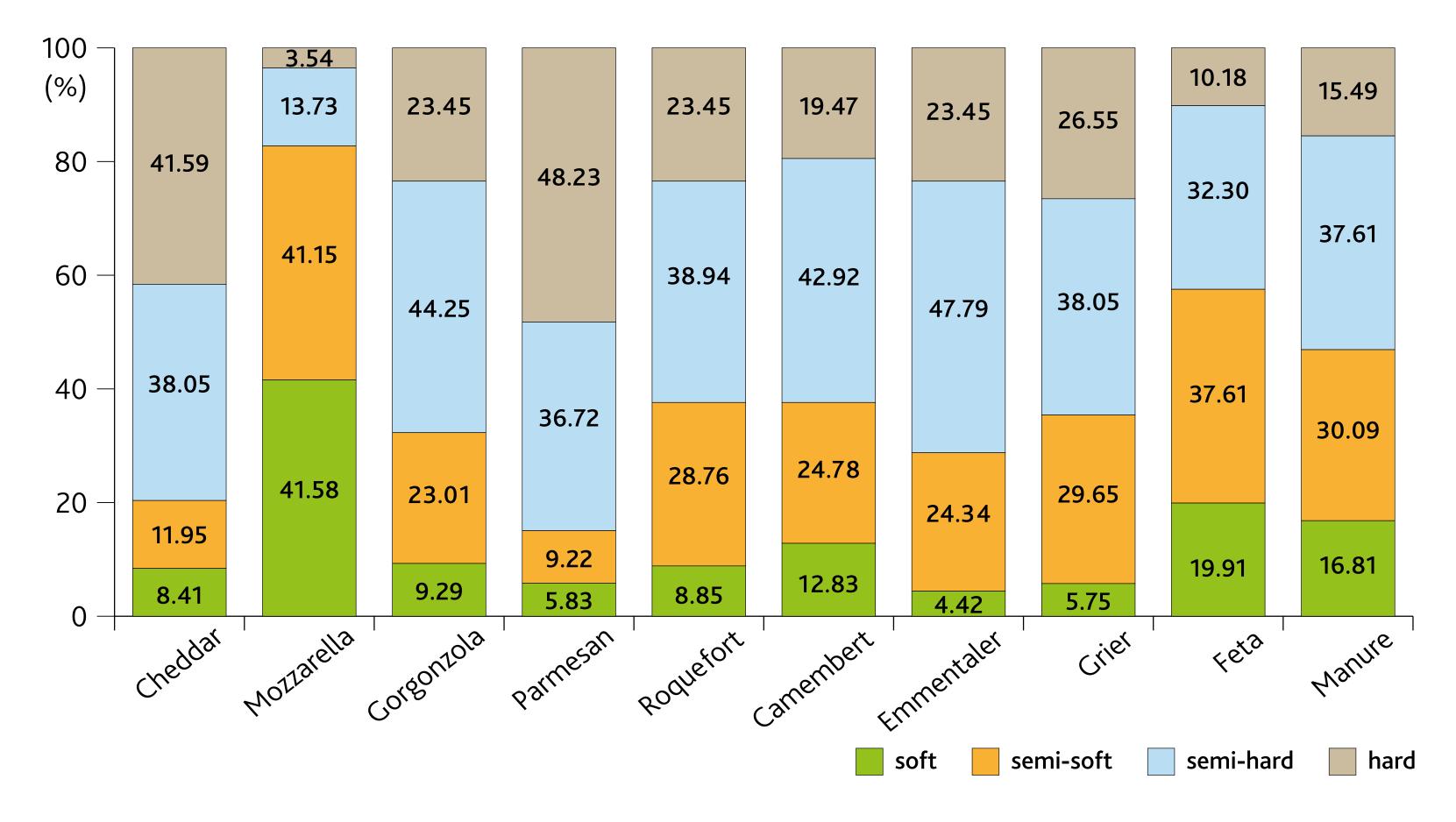


Figure 2. Customer's knowledge of cheese structure Source: Authors' research results, 2021

Analyzing the results of the research related to the maturity of the cheese, it is found out whether the respondents can distinguish between fresh and mature cheese (Figure 3). In the following text, only the percentages of respondents who gave the correct answer for each group of cheese will be shown. Mature cheese was evaluated by the respondents as follows: cheddar – 82,63% of respondents, gorgonzola – 76,55% of respondents, parmesan - 79% of respondents, roquefort – 64,16% of respondents, camembert - 66. 82% of respondents, emmentaler – 71,24% of respondents and grier – 67,26% of respondents. Regarding fresh cheese, 75,66% of respondents stated that mozzarella is a fresh cheese, 60,62% of respondents also claim it is feta cheese, while 38,05% of respondents believe that manure cheese is a fresh cheese due to its maturity.

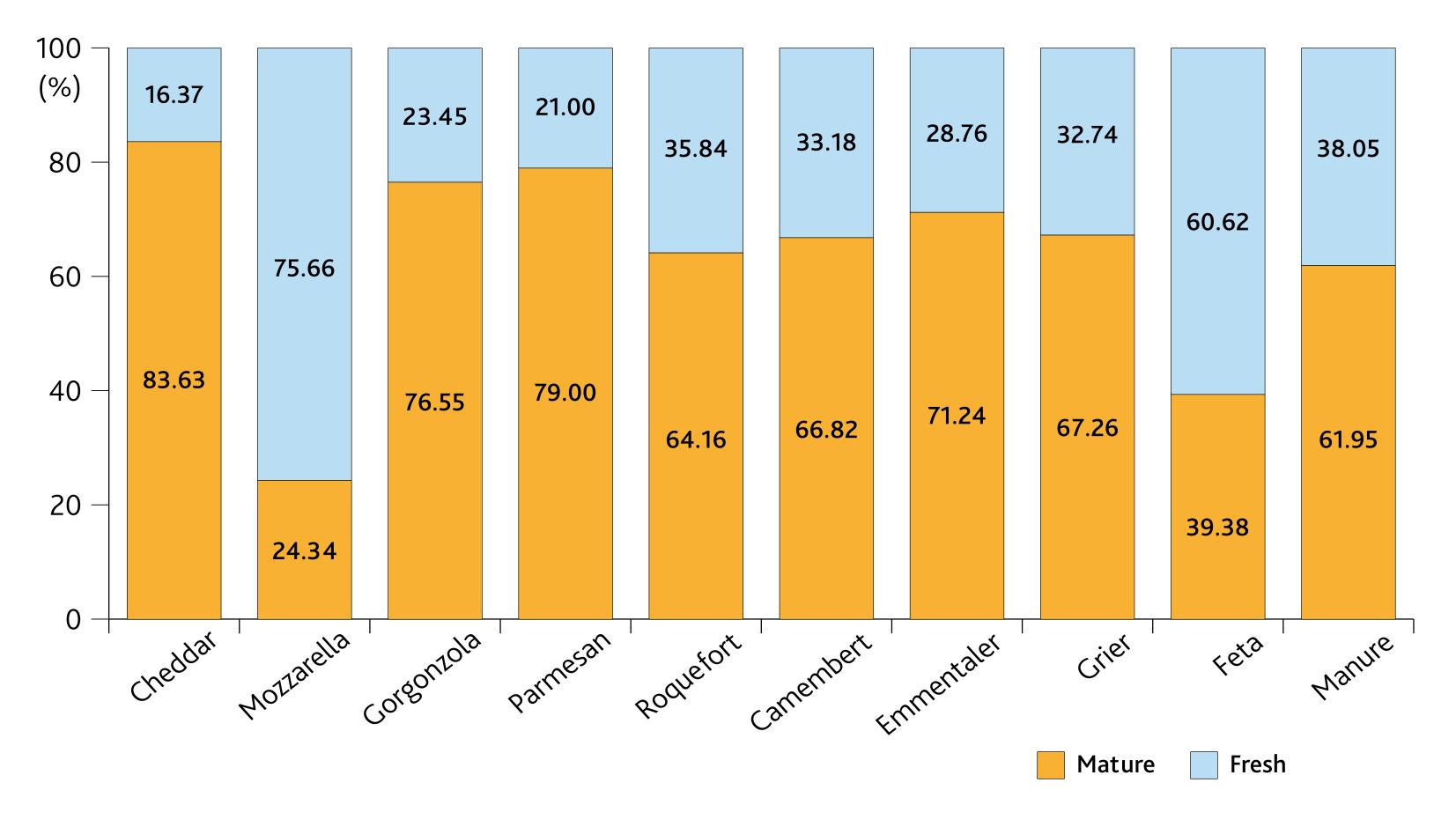


Figure 3. Customer's knowledge of cheese maturity Source: Authors' research results, 2021

CONCLUSION

Based on the survey research, which examined the knowledge, consumption, and preferences of consumers, it is possible to identify different habits and attitudes regarding the frequency and manners of consumption, but also the level of familiarity with different types of cheese.

Accordingly, it was concluded that cheese is a food that is included in the daily diet of consumers from Novi Sad, especially at breakfast, regarding the fact that most respondents consume cheese at least once a week (300-600 grams). Most consumers purchase cheese in supermarkets and stores, which can be considered a good source of a wide range of cheese, but a limitation in terms of knowledge of less well-known cheese and small cheese producers.

When it comes to knowledge of the type of milk, as the basic raw ingredient for making a certain cheese, the respondents showed representative knowledge, because most of them are familiar with cheese that is produced from cow's and buffalo's milk. However, negative results occur with cheese made from sheep's and goat's milk (Feta and Manure), where most respondents stated that it was cow's milk. The majority of respondents are not sure whether certain cheese contains noble mold or not. While the high results of knowledge of the hardness and maturity of the cheese may be a consequence of the assessment of the physical characteristics of the product.

In addition to a good knowledge of cheese, research has shown that respondents are focused on quality and value for money, which is crucial for creating an offer. On the other hand, it is found that the examined consumers know the structure and maturity of the cheese apart from its origin, especially that cheese that is often talked about and which is more present in public, such as Feta cheese, Gorgonzola, Camembert, and mozzarella.

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REFERENCES

Agricultural Research Service. (1978). Cheese Varieties and Description, Dairy Products Laboratory. Bessière, J., Tibère, L. (2013). Traditional food and tourism: French tourist experience and food heritage in rural spaces, Journal of Science of Food and Agriculture, 93(14), 3420-3425.

- Berno, T., Fusté-Forné, F. (2019). Imaginaries of cheese: revisiting narratives oflocal produce in the contemporary world, Annals of Leisure Research, ahead-of-print.
- Davis, J. G., (1965). Cheese, *Bibliography*. Churchill Livingstone, London.
- Farkye, N., (2004). Cheese technology, Dairy Products Technology Center, California Polytechnic State University, San Luis Obispo, USA, 57(2-3), 91–98.
- Fox, F. P., Guinee, P. T., Cogan, M. T., McSweeney L. H. P., (2000). Fundamentals of cheese science. AN AS-PEN PUBLICATION, Aspen Publishers, Inc. Gaithersburg, Maryland 2000, 504-513.
- Fox, P. F., Uniacke-Lowe, T.; McSweeney, P. L. H.; O'Mahony, J. A. (2015). Dairy Chemistry and Biochemistry. Chemistry and Biochemistry of Cheese, 12, 499–546.
- Fox, P. F; Guinee, T. P.; Cogan, T. M.; McSweeney, P., (2017). Fundamentals of Cheese Science. Cheese Fla*vour*, 13, 443–474.
- García-Estrada, C., Martín, J. F. (2016). Biosynthetic gene clusters for relevant secondary metabolites produced by Penicillium roqueforti in blue cheeses. *Applied Microbiology and Biotechnology*, 100, 8303–8313.
- Guinee, T. P. (2011). Cheese as a food ingredient. In: Encyclopedia of Dairy Sciences, 2nd edn (eds J. F. Fuquay, P. F. Fox & P. L. H. McSweeney), 1, 822–832. Academic Press, London
- Guinee, T. P., Kilcawley, K. N. (2004). Cheese as an ingredient. In: Cheese: Chemistry, Physics and Microbiology, 3rd edn (eds P. F. Fox, P. L. H. McSweeney, T. M. Cogan & T. P. Guinee), 1, 393–428. Elsevier Applied Science, Amsterdam
- Harbutt, J., (2009). World of cheese. Dorling Kindersley, London.
- Harbutt, J., Denny, R. (2001). Cheese: A Feast of International Dishes. Anness Publishing, Ltd.
- Havranek, J., Kalit, S., Antunac, N., Samaržija, D. (2014). Sirastvo, Hrvatska mljekarska udruga, Zagreb.
- Hayaloglu, AA., (2016). Cheese: Microbiology of Cheese. Food Sciences. Elsevier, 1–11.
- Kindstedt, P. (2001). Cheese and culture, A history od cheese and its place in western culture. Chelsea green.
- McCalman, M., Gibbons, D. (2009). Mastering cheese: Lessons for Connoisseurshipfrom a Maitre Fromager. Clarkson Potter, New York.
- McSweeney, P. L. H. (2004). Cheese: Chemistry, Physics and Microbiology. Major Cheese Groups Volume 2, *Diversity of cheese varieties: An overview*, 1–23.
- O'Brien, N., O'Connor, T. (2017). Nutritional Aspects of Cheese. Cheese (Fourthedition). Academic Press, University College Cork, Cork, Ireland. 603-611.
- Park, Y. W., Haenlein, G. F. W. (2013). Milk and Dairy Products in Human Nutrition (Production, Composition and Health). *Cheese Science and Technology*, 357–389.
- Park, Y. W., Haenlein, G. F. W. (2006). Handbook of Milk of Non-bovine Mammals. Blackwell Publishing Professional, Ames, IA
- PM Food and Dairy Consulting. (2014). The World Cheesemarket Report 2000-2020

Popović-Vranješ, A., (2015). Specijalno sirarstvo. Univerzitet u Novom Sadu. Poljoprivredni fakultet, Departman za stočarstvo, Novi Sad, 403.

- Wiener, G. (2011). *Yak. In: Encyclopedia of Dairy Sciences*, 2nd edn (eds F. Fuquay, P. F. Fox & P. L. H. McSweeney), 1, 343–350. Academic Press, London.
- Walther, B., Schmid, A., Sieber, R., Wehrmuller, K. (2008). *Cheese in nutrition and health. Dairy Science Differential Content in Whey of Different Origin.* Whey Types, Composition and Health Implications. Nova Publisher, Hauppauge, NY, USA.
- Werlin, L. (2009). Laura Werlins Cheese Essentials: An Insider's Guide to Buying and Serving cheese (with 50 Recipes). Harry N. Abrams.
- Yates, M. D., Drake, M. A. (2007). Texture properties of Gouda cheese. J Sen Stud, 22, 493-506.
- Young, N. D., Drake, M. A., Lopetcharat, K., McDaniels, M. R., (2004). Preference mapping of Cheddar cheese with varying maturity levels. *J Dairy Sci*, 87(11), 9.
- Portić, M., Milović, D. (2010). Gastronomske karakteristike poznatih sireva Evrope. Zbornik radova Departmana za geografiju, turizam i hotelijerstvo 39/2010. Departman za Geografiju, turizam i hotelijerstvo. Prirodno matematički fakultet, Novi Sad.
- Planzer Jr., S. B., da Cruz, A. G., Sant'ana, A. S., Silva, R., Moura, M. R. L., de Carvalho, L. M. J. (2009). Food Safety Knowledge of Cheese Consumers. *Journal of Food Science*, 74(1), M28–M30.
- Silvestri, C., Aquilani, B., Piccarozzi, M., Ruggieri, A. (2019). Consumer Quality Perception in Traditional Food: Parmigiano Reggiano Cheese. *Journal of International Food & Agribusiness Marketing*, 1–27.

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ORCIDStefan Šmugović https://orcid.org/0000-0002-8489-101XNatalija Knežević https://orcid.org/0000-0001-9772-1725