



A CASE STUDY ON DETERMINING CONSUMER PREFERENCES FOR ROSE PRODUCTS CONSUMPTION

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ABSTRACT

Rosa damascena Mill., commonly known as the Isparta rose, is a product of economic value in the perfume, cosmetics, pharmaceutical, and food industries due to its distinctive fragrance. Rose products are not consumed directly but are offered for consumption in the form of processed value-added products such as rose oil and various derivatives. The consumption of rose products, which serve as a significant source of income for the economy of Isparta province, and the factors influencing this consumption are of great importance for the development of the sector. This study aims to identify the consumption patterns and preferences of consumers regarding rose products in Isparta, the production hub of roses and rose-based products. The data for this research were obtained through a survey conducted with 272 consumers residing in Isparta. According to the findings, the most commonly consumed rose products are Turkish delight with rose, rose water, jam, soap, cream, and cologne, whereas products such as syrup, vinegar, rose oil, room fresheners, and fresh roses are less preferred. Among daily consumed items, soap and rose water stand out, while products like rose oil are used less frequently. Key factors influencing consumers' preferences for rose products include quality, brand recognition, and natural ingredients, whereas the impact of promotions and sales campaigns was found to be limited. However, high prices of rose products and inadequate product knowledge of sales personnels were identified as significant issues in the sector.

Keywords: *Rose products, Consumer preferences, Isparta, Geographical indication products*

1. INTRODUCTION

The rose, known as a significant member of the *Rosaceae* family, has been utilized throughout history in the production of medicine and cosmetics, while also being frequently represented in poetry, religion, art, and sculpture due to its aesthetic value [18]. *Rosa damascena* Mill., commonly referred to as the "Isparta Rose" or "Pink Oil Rose," stands out among other fragrant rose species cultivated worldwide due to its distinctive, sharp, and intense fragrance, making it the most economically valuable rose species for the perfume, cosmetics, pharmaceutical, and food industries [7]. In Türkiye, rose production is carried out in two forms: cut roses (pieces) and oil roses (tons) [21]. Oil roses are predominantly used in the production of rose-based products.

It has been noted that Türkiye and Bulgaria are the leading countries in global rose production [13]. In Türkiye, 19.879 tons of oil-bearing roses were produced in 2022 on an area of 41.675 decares. Rose production in Türkiye is primarily concentrated in the provinces of Isparta, Afyonkarahisar, Denizli, and Burdur, with Isparta accounting for 85.17% of the total production [21]. However, rose products are not consumed directly; instead, they are processed into value-added products such as rose oil and its derivatives. Approximately 60-65% of the world's rose oil production originates from Isparta and its surrounding areas, while domestic consumption in Türkiye remains at around 2-5% [13]. Isparta province, serves as the central hub for rose flower production and marketing. The region's historical

expertise in rose oil production, combined with its favorable climate for rose cultivation compared to other provinces, enhances its significance in the industry. In Isparta province, rose flower production is carried out on small-scale rose orchards, making it an essential income source for small family farms [8]. Rose flower production in the province is primarily intended for rose oil extraction [9]. The rose oil obtained from rose flowers is used to produce industrial, high-value-added rose products [7].

The indirect consumption of rose products is widespread in the cosmetics and food industries, including rose oil, rose water, cologne, perfume, deodorant, soap, cream, air fresheners, jam, Turkish delight, syrup, vinegar, tea, coffee, and similar products. However, Güneş [6] stated that the cosmetics and perfumery sector in Türkiye is underdeveloped and that a significant portion of rose oil is exported. Research and development (R&D) efforts focusing on the domestic utilization of rose oil and the exploration of new uses for rose products are crucial for enhancing Türkiye's competitiveness in the sector. While studies in the literature address the production process, costs, and marketing of rose products [1, 14], Şirikçi and Gül [3] provided significant insights into rose product consumption. However, no recent studies have been found that specifically examine consumer preferences for rose and rose products. This highlights the need for new research supported by up-to-date data, particularly on a regional basis. Hence, this study was conducted to address this gap. Identifying the demand for rose products, which are among the key income sources for Isparta's economy, and the factors influencing this demand, is considered highly important for the sector's development. Feldmann and Hamm [4] noted that consumer interest in local products has increased over the past 15 years. Similarly, Henseleit et al. [10] found that consumers perceive local foods as offering better quality and higher food safety. The Isparta Rose (Pink Oil Rose) and its products, recognized as local products, were granted Geographical Indication Certificates on 06.05.2006, and Isparta Rose Oil on 07.03.2019 [19, 20]. Having a geographical indication is a significant factor influencing consumers' preferences, as it serves as a quality indicator for the product [11]. This suggests that geographical indications guide consumers regarding the quality of such products [16].

Studies on roses and rose products generally focus on topics such as the development of oil-bearing rose production and trade [12, 14], production costs in rose product enterprises [1], attitudes, opinions, and preferences regarding cut roses [5, 17, 18], and the consumption of rose products [3]. However, no recent studies have been identified that specifically address consumer preferences for rose products in Türkiye or Isparta. This study aims to establish a general framework for rose product consumption in Isparta, reveal consumer perceptions and preferences for rose products, and thereby enhance their unique value and significance. By examining the consumption patterns and the factors influencing consumer preferences in Isparta, a production center for both roses and rose products, the study seeks to contribute to the identification of policies that can enhance the sector's competitiveness and provide suitable recommendations for its development.

2. MATERIALS AND METHODS

The study population consists of 272 consumers residing in Isparta, surveyed through face-to-face interviews. The survey included both open-ended and closed-ended questions. The sampling method employed was "Simple Random Probability Sampling Based on Population Proportions" [2, 15].

$$\frac{Np(1-p)}{(N-1)\sigma_{px}^2 + p(1-p)} \quad (1)$$

σ_{px}^2 : Variance of the proportion

n: Sample size

N: Population size

p: Proportion (set as $p = 0.5$ to achieve the maximum sample size)

The population of Isparta city center was recorded as 268.595 in 2022 [22]. Accordingly, the sample size was calculated as 272 individuals, based on a 90% confidence level and a 5% margin of error.

Descriptive statistics were utilized in the study to analyse the socio-economic characteristics and preferences of consumers who use rose products in Isparta province. The analysed data were interpreted and discussed by creating cross-tables.

3. RESULT AND DISCUSSION

Table 1 presents the socio-demographic characteristics of the consumers. The average age of the respondents was 37.83 years, with an average education duration of 11.74 years. The average household size was 3.67 individuals, including an average of 1.89 women and 1.87 employed individuals per household. The average monthly household income was calculated as 60.132,73 TL, with average expenditures on food, cosmetics, and rose products amounting to 17.907,27 TL, 2.716,18 TL, and 1.396,18 TL annually, respectively. Findings on household income and expenditure data reveal that food expenditures constitute a significant share of overall expenditures (29.78%), while expenditures on rose products are relatively low. Şirikçi and Gül [3] reported an average consumer age of 36.47 years, with most respondents having postgraduate education levels.

Regarding gender distribution, 68% of the respondents were women, and 32% were men. The proportion of those with social security was 90.55%. The vast majority of consumers (94.55%) made their purchases from physical stores, while only 5.45% opted for online shopping (Table 1). This underscores the importance of physical stores for businesses selling rose products.

Table 1. Socio-demographic characteristics of consumers

	Average	Std. Deviation
Age	37.83	10.987
Education level (years)	11.74	4.470
Household size (individuals)	3.67	1.263
Number of women in the household (individuals)	1.89	0.960
Number of employed individuals in the household (individuals)	1.87	0.634
Average monthly household income (TL/month)	60.132,73	25.929,26
Average monthly household food expenditure (TL/month)	17.907,27	13.070,47
Average monthly household cosmetic expenditure (TL/month)	2.716,18	4.315,71
Average annual household rose products expenditure (TL/year)	1.396,18	1.010,99
	N	%
Gender		
Female	187	68.00
Male	88	32.00
Marital status		
Single	100	36.36
Married	175	63.64
Social security status		
Yes	249	90.55
No	26	9.45
Places of rose product purchases		
Physical store	260	94.55
Online	15	5.45

The consumption amounts and purchasing preferences of various rose products among the surveyed consumers were examined (Table 2). Turkish rose delight is the most consumed product, with an

average of 0.64 kg/month, and 56.36% of consumers consume it. 91.61% of Turkish rose delight purchases are made from places selling rose products. Rose water is consumed by 44.73% of consumers, with an average of 0.54 liters per month, and 94.31% of these purchases are made from rose product-selling locations. Jam is consumed by 27.27% of consumers, with an average of 0.89 kg per month, and it is predominantly purchased from places selling rose products (92%). Among other products, cream (26.55%), cologne (25.45%), shampoo (24.36%), and perfume/deodorant (20.36%) have significant consumption rates. These products are mostly purchased from rose product-selling locations as well. The products with the lowest consumption rates are roses (4.72%), rose oil (4.72%), vinegar (1.82%), and syrup (1.45%). These findings show that consumers predominantly prefer places selling rose products, and their consumption of rose products varies depending on the product type. Food products such as Turkish rose delight and rose water reach a wider consumer base, while the consumption rates of cosmetic products like shampoo, cream, and perfume are lower.

Table 2. Rose product consumption quantity and purchasing preferences

	Average Consumption Amount (kg or liter/month)	Percentage of Consumers (%)	Places of Purchase ¹				Places Selling Rose Products (%)
			Supermarket (%)	Grocery Store (%)	Local/Neighborhood Market (%)	Internet (%)	
Turkish Rose Delight (kg)	0.64	56.36	3.22	0.65	0	4.52	91.61
Rose Water (liter)	0.54	44.73	0.81	0	0.81	4.07	94.31
Jam (kg)	0.89	27.27	5.34	1.33	0	1.33	92.00
Soap (kg)	0.40	27.27	8.00	0	0	8.00	84.00
Cream (kg)	0.27	26.55	0	0	0	1.37	98.63
Cologne (liter)	0.53	25.45	2.85	1.43	1.43	5.71	88.58
Shampoo (liter)	0.62	24.36	4.48	0	0	7.46	88.05
Perfume/Deodorant (liter)	0.22	20.36	3.57	0	0	5.36	91.07
Tea (kg)	0.30	17.09	4.26	0	0	0	95.74
Coffee (kg)	0.29	17.09	4.26	0	0	0	95.74
Room fragrance (liter)	0.48	6.18	5.88	0	0	5.88	88.24
Rose (pieces)	1.23	4.72	0	0	0	7.69	92.31
Rose oil (liter)	0.19	4.72	0	0	0	7.69	92.31
Vinegar (liter)	0.43	1.82	20.00	0	0	0	80.00
Syrup (liter)	0.85	1.45	0	0	0	0	100.00

¹Only the percentage of those who consume has been calculated.

In Table 3, the purposes of rose products consumption preferences among consumers are examined. Rose is consumed entirely in relation to social needs (100%), while rose oil is consumed solely for health purposes, accounting for 100% under the safety need category. The safety need refers to the basic needs of individuals to ensure their physical, work, moral, family, and health safety, as well as special and sacred days. Rose water is preferred 85.37% for safety needs and 10.57% for physiological needs. Cologne (85.37%) and perfume/deodorant (80.36%) are also generally preferred for safety needs, particularly for special and sacred days. Cosmetic products like cream (97.26%) and soap (98.67%) are preferred to meet safety needs. Turkish rose delight and tea are consumed 73.55% and 95.74%, respectively, primarily for safety needs, with a certain proportion also for social needs. Syrup, vinegar, tea, and coffee, on the other hand, are consumed entirely in line with physiological needs. These findings indicate that the primary reason for the consumption of most rose products is the safety need. However, a significant portion of rose and rose product consumption is made to fulfill social needs. Additionally, food products (such as Turkish rose delight, jam, tea, and coffee) are mostly preferred to meet physiological needs.

Table 3. Rose products consumption preference purposes

	Consumption Preference Purposes (%) ¹		
	Physiological Needs (Breathing, eating, drinking, sleeping, healthy metabolism, etc.)	Safety Needs (Body, work, morality, family, health, special and sacred days, etc.)	Social Needs (Love, friendship, etc.)
Rose	0	0	100.00
Rose oil	0	100.00	0
Rose water	10.57	85.37	4.06
Cologne	2.86	85.71	11.43
Perfume/Deodorant	3.57	80.36	16.07
Cream	2.74	97.26	0
Soap	1.33	98.67	0
Room fragrance	5.88	82.35	11.77
Shampoo	2.99	94.02	2.99
Jam	96.00	0	4.00
Delight	73.55	0.65	25.80
Syrup	100.00	0	0
Vinegar	100.00	0	0
Tea	95.74	0	4.26
Coffee	95.74	0	4.26

¹Only the percentage of those who consume has been calculated.

Table 4 shows the consumption frequency of rose products. It was determined that 84.62% of respondents purchase roses once a year. As for rose oil, 15.38% of consumers use it daily, while 53.85% use it once a month. Regarding rose water, 36.59% of consumers use it daily, and 43.90% use it several times a week. For rose cologne, 47.14% of consumers use it several times a week, 20% use it daily, and 11.43% use it once a week. Among consumers of rose perfume/deodorant, 37.50% use it daily, and 53.33% of those using rose cream use it daily as well. It was found that 80% of consumers use rose soap daily. As for rose syrup, 50% of consumers use it once a month, while 40% use rose vinegar several times a week, and 20% use it daily. Rose tea and rose coffee are consumed daily by a large majority of consumers (78.72% and 76.60%, respectively). The frequency of rose product consumption varies widely. Products like rose soap and rose water are consumed more frequently, while products like roses and rose oil are consumed less frequently (once a year or once a month). In another study, it was found that 27.81% of consumers consume rose products once a month, 22.52% once a week, and 19.21% daily, with the most consumed products being Turkish rose delight and rose cream [3].

Products like rose tea and coffee have become part of consumers' daily habits, while the frequency of consumption of other rose products varies depending on the purpose and type of the product. This diversity indicates that marketing strategies for rose products should be customized based on consumer behaviour and product characteristics.

Table 4. Rose products consumption frequency (%)

	Every Day	Several Times a Week	Once a week	Once a Month	Once a Year	Only on Special Days (e.g., Religious Holidays, Festivals)
Rose	0	0	0	15.38	84.62	0
Rose oil	15.38	0	30.77	53.85	0	0
Rose water	36.59	43.90	9.76	8.13	0.81	0.81
Cologne	20.00	47.14	11.43	18.57	2.86	0
Perfume/Deodorant	37.50	37.50	8.93	8.93	7.14	0
Cream	53.33	40.00	6.67	0	0	0
Soap	80.00	17.34	1.33	1.33	0	0
Room fragrance	23.53	29.41	41.18	5.88	0	0
Shampoo	11.94	79.10	4.48	0	4.48	0
Jam	36.00	48.00	9.33	2.67	4.00	0
Delight	9.03	29.68	23.87	27.10	9.68	0.64
Syrup	0	25.00	25.00	50.00	0	0
Vinegar	20.00	40.00	20.00	20.00	0	0
Tea	78.72	17.02	0	2.13	2.13	0
Coffee	76.60	17.02	0	4.25	2.13	0

¹Only the percentage of those who consume has been calculated.

Table 5 shows the packaging preferences for rose products of consumers. For rose products, 50% of consumers prefer plastic packaging, while all consumers prefer glass packaging for rose oil. For rose water, 59.68% of consumers prefer plastic packaging, and 40.32% prefer glass packaging. For rose cream, 97.06% of consumers prefer plastic packaging. In the case of rose room spray, 47.06% of consumers prefer plastic packaging, 47.06% prefer glass packaging, and 5.88% prefer metal packaging. All consumers prefer plastic packaging for rose shampoo. 97.26% of consumers prefer glass packaging for rose jam, and 81.05% prefer cardboard packaging for Turkish rose delight. For rose syrup and rose vinegar, all consumers prefer glass packaging. Consumers' packaging preferences vary based on the type of product, usage purpose, and aesthetic factors. This diversity shows that packaging design plays an important role in marketing strategies, and different packaging options for each product can influence consumer preferences.

Table 5. Rose products packaging preference

	Glass	Plastic	Paper	Cardboard	Metal
Rose	25.00	50.00	0	25.00	0
Rose oil	100.00	0	0	0	0
Rose water	40.32	59.68	0	0	0
Cologne	42.86	57.14	0	0	0
Perfume/Deodorant	29.63	68.52	0	0	1.85
Cream	2.94	97.06	0	0	0
Soap	0	94.66	2.67	2.67	0
Room fragrance	47.06	47.06	0	0	5.88
Shampoo	0	100.00	0	0	0
Jam	97.26	2.74	0	0	0
Delight	0	16.99	1.96	81.05	0
Syrup	100.00	0	0	0	0
Vinegar	100.00	0	0	0	0
Tea	0	0	100.00	0	0
Coffee	0	0	100.00	0	0

The factors influencing consumers' preferences for rose products and the average scores for each factor are shown in Table 6. Product quality stands out as the most important factor with an average score of 4.68. Following quality, the factors of brand (4.20), product recognition (4.19), and price (4.17) are ranked. These factors are key elements influencing consumers' product choices. Promotional factors such as price discounts (3.99) and product + product (3.76) bundles are also considered quite important by consumers. Aesthetic factors, such as product design (3.56), appear to have a lower level of importance. Marketing strategies such as coupons (3.44), combined sales promotions (3.29), giveaways (3.13), and contests/lotteries (2.99) are identified as less influential factors. A study identified the effective factors for rose product preferences as quality, expiration date, absence of additives, and price-quality ratio [3].

These findings suggest that primary factors like quality and brand are more important than additional elements like price discounts and product design in the purchasing decision for rose products. Consumers prioritize quality while also placing significant importance on brand trust and product recognition. While packaging design and aesthetic appeal play a role in the attractiveness of products, they are of lower priority for consumers.

Table 6. Factors influencing rose products preferences

	Average	Std. Deviation
Quality	4.68	0.591
Brand	4.20	0.970
Product recognition	4.19	0.902
Price	4.17	0.952
Price discounts	3.99	1.211
Product + product	3.76	1.304
Product design	3.56	1.205
Gift packages	3.55	1.388
Taste panel	3.55	1.346
Extras (25-30% more)	3.46	1.346
Coupons (20% discount when purchasing the same brand)	3.44	1.364
Combined sales promotion (multiple promotions)	3.29	1.408
Giveaways	3.13	1.398
Contests/lotteries	2.99	1.472

(1. Not important at all, 2. Not important, 3. Moderately important, 4. Important, 5. Very important)

Table 7 shows the reasons why consumers prefer rose products. Naturalness is seen as the most important reason for preference. The statement "I find rose products more natural" received the highest rating with an average score of 3.99, reflecting consumers' inclination towards natural products. Easy accessibility (3.93) and product variety (3.82) are also strong factors in determining consumer preferences. While consumers think rose products are tasty (3.45), they acknowledge that their shelf life is short (3.41). Factors such as inspection (3.25) and label information (3.20) were rated lower. The statements "I prefer rose products because their price is more affordable" (2.94) and "I find the advertisements and promotions for rose products sufficient" (2.88) received lower scores. In the study by Şirikçi and Gül [3], it was noted that advertisements, promotions, fairs, and festivals related to rose products were insufficient. This issue is still observed today. Consumers' concerns about the reliability of inspection and label information indicate that improvements need to be made in these areas.

Table 7. Reasons why consumers prefer rose products

	Average	Std. Deviation
I find rose products more natural.	3.99	0.908
I can find rose products everywhere.	3.93	1.030
I find the product variety in rose products sufficient.	3.82	1.075
I believe that rose products cause less environmental harm during production.	3.63	0.921
I believe that rose products preserve traditional flavours.	3.61	0.919
I think the packaging of rose products is healthy and hygienic.	3.59	0.834
I believe that rose products are produced under hygienic conditions.	3.58	0.902
I think that rose products do not contain harmful additives.	3.53	1.015
I believe that proper storage standards are followed from the producer to the finished product.	3.47	0.860
I find rose products delicious.	3.45	1.140
I believe that rose products have a short shelf life due to their natural nature.	3.41	0.967
I think the companies producing rose products are adequately monitored by regulatory authorities.	3.25	1.059
I have no doubts about the accuracy of the label information on rose products.	3.20	1.014
I prefer rose products because they are more affordable.	2.94	1.241
I find the advertisements and promotions for rose products sufficient.	2.88	1.196
There are more promotions/product campaigns for rose products.	2.70	1.091

(1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree)

The problems encountered by consumers in the consumption of rose products are shown in Table 8. High product prices, with an average score of 3.37, emerge as the most significant issue. This is followed by inadequate promotions (3.28). Insufficient information provided by sales staff regarding the products is considered a medium-level issue by consumers, with a score of 3.05. On the other hand, product quality issues (2.84) are perceived as a less severe problem, while harmful substance content (2.52) and not being able to access the desired product immediately (2.44) are among the least prioritized issues. These findings indicate that consumers are primarily affected by price, promotion, and information gaps when consuming rose products. While quality, content safety, and accessibility are seen as less important, improvements in these areas could enhance consumer satisfaction. Especially, price sensitivity can be addressed by increasing promotions and campaigns. Additionally, addressing the lack of promotion can help the products reach a broader audience.

Table 8. Problems faced by consumers in consuming rose products

	Average	Std. Deviaton
High product prices	3.37	1.217
Inadequate promotions	3.28	1.133
Insufficient information provided by sales staff regarding products	3.05	1.083
Quality issues in products	2.84	1.092
Presence of harmful substances	2.52	1.092
Inability to immediately access the desired product	2.44	1.235

(1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree)

4. CONCLUSION

In this study, the consumption habits of rose products and the factors influencing these habits of consumers living in Isparta province were examined comprehensively. The findings of the study reveal various trends and preferences that hold strategic importance for the rose products market.

According to the research results, the majority of consumers prefer to make their purchases from physical stores. This highlights the importance for businesses selling rose products to improve the customer experience in-store. Among the most consumed rose products are Turkish rose delight, rose

water, jam, soap, cream, and cologne, while products like syrup, vinegar, rose oil, room fragrance, and fresh rose are less preferred. It was found that consumers generally prefer to buy rose products from specialized retailers in this field.

The frequency of rose product consumption varies greatly depending on the product type and the purpose of use. For example, products like rose soap and rose water are consumed daily, while products like rose and rose oil are used more sporadically. Products like rose tea and rose coffee have become part of daily routines, while the consumption of other products is more oriented towards special needs or occasions. This diversity indicates that marketing strategies should be designed to align with consumer needs and product characteristics. Packaging preferences also vary depending on the product type and purpose of use.

In consumer preferences for rose products, factors such as quality, brand recognition, and natural ingredients are decisive, while promotions, free samples, and campaigns are less influential. Consumers prefer rose products because they find them natural, the product variety is sufficient, and they are easily accessible. However, factors such as high prices and insufficient promotion and advertising activities negatively impact consumption. High product prices and the lack of product knowledge among sales staff are significant problems in the rose products sector. To address these issues, it is recommended to diversify and increase advertising and promotional activities, and to equip sales personnel with sufficient product knowledge.

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