

The Evaluation of Consumer Behavior Influence on the Buying Process of Dairy Products in Minas Gerais State, Brazil

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Abstract Data on the consumption and buying behavior of milk and dairy products, collected in Viçosa, State of Minas Gerais, Brazil was used to predict the consumption profile of such products in an effort to better understand the dairy market. This study set out to identify the preferences of consumers of dairy products as well as the most appropriate marketing strategies for increasing the competitiveness of small and medium-sized dairy industries. Three hundred people responded to a structured questionnaire applied in interview form. Most of the consumers (73%, specifically) would pay for a better quality, functional product, of which 58.48% attributed their answers to health concerns. "Low fat" and "cholesterol-free" were pointed out by 50% of the interviewed consumers as essential features of healthy products. Overall, most of these potential consumers buy milk (95%), yogurt (86.3%), and mozzarella (82.6%). On the other hand, moldy fine cheese was the least purchased dairy product (93%). Recommendations of doctors and nutritionists played a fundamental role in the buying intention of 70% of the consumers. Furthermore, tasting the product at the store and suggestions from friends were reported by 54.7% and 47.7% of the potential consumers, respectively, to stimulate the purchase and consumption of new dairy products. Correspondence analysis was performed to verify the relationship between the favorite purchase locations and the studied dairy products. In addition, a Pearson correlation analysis ($p < 0.05$) was applied to the reasons for buying intention and to the gender of the panelists, highlighting low to moderate correlations ($r = -0.53$) for men and women.

Keywords: dairy products, consumer, buying behavior, consumer behavior, healthy products

Cite This Article: Vinícius Rodrigues Arruda Pinto, Laura Fernandes Melo, Douglas Fernando Balbino, Juliana Farias de Novaes, Maria Claudia Negrete, and Thiago Duarte de Sousa, "The Evaluation of Consumer Behavior Influence on the Buying Process of Dairy Products in Minas Gerais State, Brazil." *Journal of Food and Nutrition Research*, vol. 4, no. 1 (2016): 51-59. doi: 10.12691/jfnr-4-1-9.

1. Introduction

The dairy agribusiness system plays a fundamental role on both economic and social scenarios, mainly for its capability of generating employment and income. Brazil ranks fourth among the milk producers in the world. In recent years, milk production in Brazil has been growing at average rates of 4.5% per year, reaching 34.3 billion liters in 2013 [1]. The per capita consumption of milk and dairy products in Brazil has increased from 123.9 liters in 2000 to 178 liters in 2014 [1]. Still, this volume does not reach the recommendation of the Ministry of Health: 600 milliliters/person/day or 219 liters/person/year [2].

In addition to the efforts that have been made to address this drawback, the food industry currently faces changes on consumer behavior. In this context, [3] highlighted the increasing demand for high-quality dairy products, providing dairy industries with a gradual trend of adapting

their products to the market needs. In the context of food choice a technologist, who is mainly in charge of product development and product innovation, places his focus on intrinsic sensory properties of the food. Social and business scientists, however, preferably scrutinize how the evaluation of a consumer is influenced, and how preferences are elevated by extrinsic cues such as brand, price, or packaging [4].

During the development and improvement of food products, companies should strive to understand consumers' wants and needs, as well as their perception of their food products, in order to assure the products' success [5]. While some consumers are more keen on the promotion of a healthy lifestyle and healthy food choices [6,7], changing the eating patterns of the general population is a very complex problem [7].

Consumers can only be expected to consider substituting conventional with functional foods if the latter are perceived as comparatively healthier. However, this benefit cannot be perceived directly by consumers, unlike

other characteristics such as sensory ones [8]. Labels provide important information to households that allow them to make informed and healthier food choices [9]. If a functional food manufacturer wants to emphasize the use of a novel ingredient, the ingredient could be declared using its scientific name but incorporating a health claim on the label, in order to achieve an association in consumers' mind between the ingredient and its health effect [10].

Thus, this study was set out to identify the factors that influence the buying behavior of consumers whose demands are not fulfilled by the traditional dairy products. The preferences of consumers of dairy products in the region of Viçosa, Minas Gerais, Brazil were also studied in an effort to optimize the marketing strategies for increasing the competitiveness of small and medium-sized dairy industries.

2. Materials and Methods

2.1. Research Description

The methodology relied upon an interview-based descriptive research in accordance with Resolution n. 466 (12/12/2012) from the National Health Council due to the involvement of human beings [11]. The sampling population was established with a 95% confidence interval and approximately 6% of error, which required the minimum number of respondents (275) considering an infinite population [12].

We applied 300 questionnaires to regular consumers of dairy products in the city of Viçosa, from Winter/2014 to Spring/2014. The descriptive study assessed their attitudes and preferences, which play a crucial role on their buying behavior. The market research took place at different spots, in varying days and times, as well as to 18-year-old consumers or older.

2.2. Questionnaires

Objective questions were predominantly used for data collection, though questionnaires also contained dichotomous questions focused on both preference and behavior of consumers. Questionnaires were previously tested with a smaller audience in order to correct possible mistakes that could impair the quality of the research. The interviewers were trained prior to applying the questionnaire so that to conduct the interview in a standardized, impartial way, i.e., without expressing their feelings and emotions.

Questionnaires were split into three parts to evaluate the consumer behavior when buying dairy products. Initially, socio-demographic information as well the buying frequency of milk and dairy products were asked. Then, information regarding consumer preference was collected in structured scales of importance and non-sensory characteristics (e.g., brand, price, and contextual factors) were investigated. Finally, the most attractive means of achieving the target audience were pointed out.

2.3. Data Analysis

Data were tabulated in Microsoft Excel® Version 2013. Mean and frequency analyses were used to evaluate the parameters that affect the buying intention of dairy product consumers.

Correspondence analysis was performed using the PROC CORRESP procedure in The Statistical Analysis System SAS®, version 9.4, licensed by the Universidade Federal de Viçosa. This analysis considered two dimensions to explain the relationship between dairy products and favorite purchase places.

In addition to the graphs generated to examine the reason why respondents consume dairy products, Pearson correlation analysis ($p < 0.05$) was conducted in SAS® software using PROC CORR command. This analysis allowed us to identify correlations between the studied variables and gender. Additionally, a table was generated using the PROC MEANS command to provide a complementary explanation of frequency data and correlation analysis. Mean values and standard deviations were obtained for all involved characteristics.

3. Results and Discussion

3.1. Sample Characterization

The characterization of the sampled population was based on 300 respondents from Viçosa, Minas Gerais, Brazil, 50.7% (152) of which were females and 49.3% (148) were males (Figure 1). Respondents were 39.7 years old in average. As for education, most of the respondents (25.0%) had incomplete higher education, while only 3.7% of the interviewees had incomplete primary education. Regarding family income, most of the respondents (36.8%) stated that they earned between 1 and 3 minimum wages, which was equivalent to US\$183.00 at the time they were interviewed.

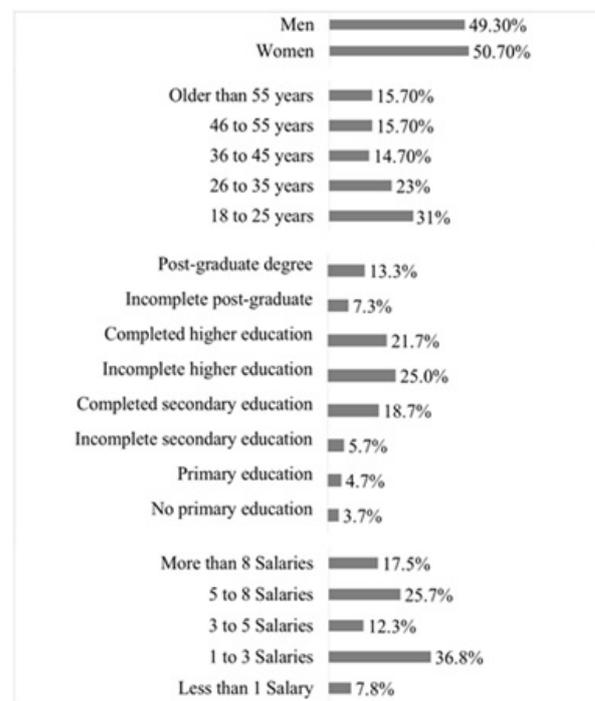


Figure 1. Socio-demographic characteristics of the interviewees (Source: Authors' Computation)

3.2. Consumer Behavior

Consumers were asked about the purchase profile of dairy products. Most of the respondents were used to buy

milk (95%), yogurt (86%), cream cheese (82%), and mozzarella (82%) (Figure 2).

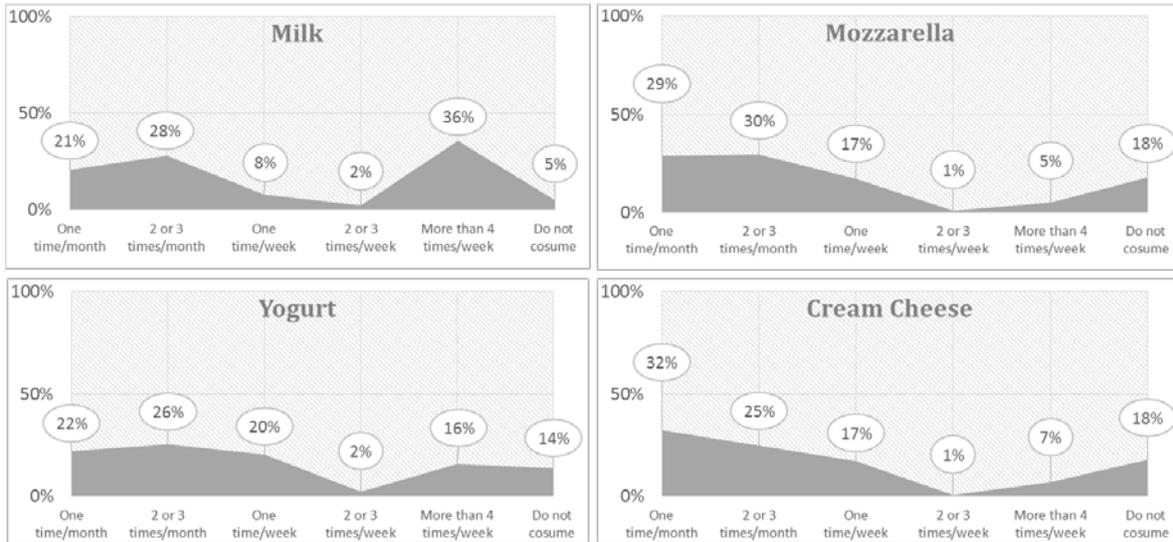


Figure 2. Most purchased dairy products (Source: Authors' Computation)

The least purchased dairy products were moldy fine cheese (not consumed by 93% of the respondents), mold-

free fine cheese (86%), ricotta (66%) and fermented milk (63%) (Figure 3).

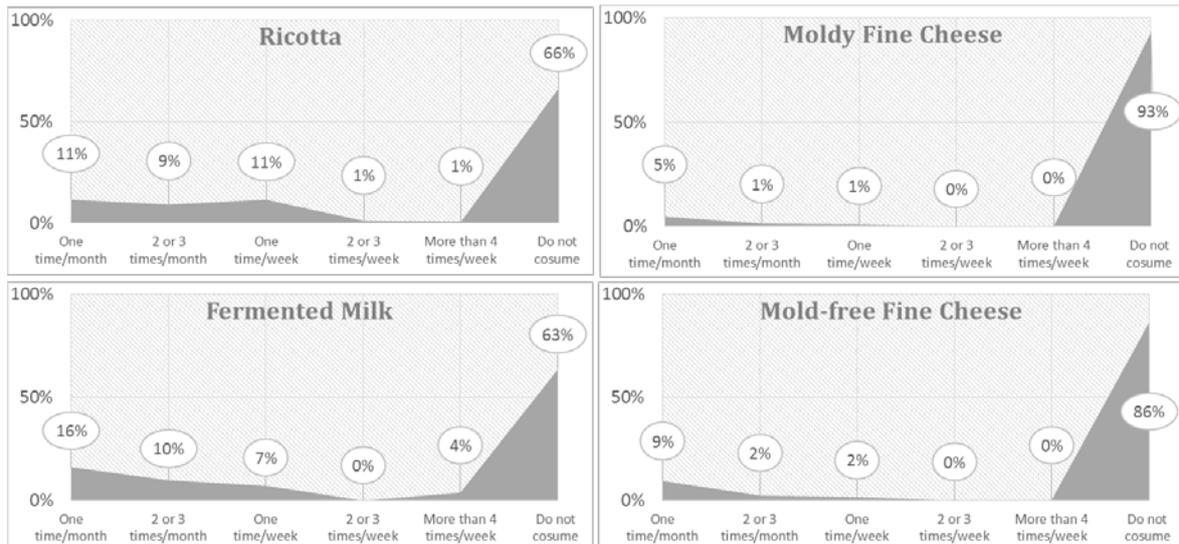


Figure 3. Least purchased dairy products (Source: Authors' Computation)

A possible explanation for the low consumption of moldy fine cheese (7%) is the negative connotation associated with the term “moldy” along with the exotic appearance that can lead to misinterpretations from those who are not familiar with the product [13]. The appearance and soft texture of ricotta, may influence consumer choice and acceptability, even though this product is regarded as healthy [14].

Reference [15] pointed out that the fine cheese market in Brazil, which is defined by the purchasing power of the consumers [16], is expected to grow, though its main features must be known. Then, consumer education and marketing strategies denote feasible alternatives to make dairy products (fine cheese, specifically) familiar to the consumers. It is worth mentioning that fine cheese is consumed by 18% of the respondents.

Fermented milk has some particularities in Brazilian market and is the target of many marketing strategies. This dairy product is often associated to specific and leading brand in the country since the 90s.

Such brand remains consolidated in the market even with prices 50-60% higher than its competitors. According to [17], the Brazilian market for probiotic and prebiotic drinks grew 157% in the last five years drinks and had a turnover approaching R\$3.7 billion in the last year.

Within this segment, Yakult holds a market share of 40% [18]. Although this statistic does not explain the low consumption of fermented milk, it shows the prominent role that a single brand plays in this sector. Currently, Brazilians consume about 178 liters of milk per year. Ten years ago, the per capita consumption was only 99 liters per year. Even though the milk consumption has raised throughout the past decade, and despite milk consumption is Brazil being higher than in other Latin American countries, the per capita consumption of milk is lower than that recommended of the Ministry of Health: 219 liters of milk per person per year [2].

In the present study, 5% of the respondents stated they did not consume milk, which might be explained by two health problems: lactose intolerance and allergy to cow milk protein.

Another possible explanation is the ongoing change in consumer behavior as a result of food fads created by the media and health professionals, which limit the need of milk to children.

Concerning the purchase frequency, 20.7% of the respondents claimed they bought milk once a month whereas 28.1% of them bought milk twice or thrice a month. This might be because consumers rather buy larger amounts at once to avoid the need to repurchase several times during the month. In this case, consumers prefer UHT (Ultra High Temperature) milk, which are not only convenient but also last longer (around 4 months) even if stored at room temperature. Conversely, pasteurized milk typically has a 5-day shelf life and must be cold-stored at around 7°C [19].

3.3. Important Factors in the Purchase of Dairy Products

After asking consumers about the most important factors in the purchase of dairy products, the collected information was converted into total score sums for each characteristic, as follows: the scores given for each characteristic were added, generating a total average named average sum of orders (M). Because the structure scale ranged from 1 to 7, smaller numbers being assigned to more important characteristics (1-most important, 7-least important), the lowest average sums of orders indicated higher importance.

The results showed that the consumer ranked "quality" (M = 2.2) as the most important factor, followed by "shelf life" (M = 3.0), "price" (M = 3.5), "brand" (M = 4.1), and "origin" (M = 4.5). "Packaging" was the least important factor (M = 5.4), preceded by "serving size" (M = 5.3).

The collected data are supported by the Brazilian study "Food Trends 2020" that identified the latest requirements and trends of food consumers worldwide, including quality and reliability. While consumers demand high-quality products, they are aware of market changes and become more demanding about what to consume. The expiry date is an example of the increasing attention currently given upon food consumption. This is a result of several studies highlighting the excessive use of pesticides and additives in food products, as well as the association of such compounds with cancer, poisoning, and skin diseases [20].

Regarding price, around 73% of the respondents affirmed they would pay more for a functional product, 58.48% of which attributed this to the healthier aspect. Therefore, it is clear that "price" is no longer the main factor driving purchase; this factor must be associated with quality and functionality. On the other hand, many consumers do not trust in the jargon "more expensive as a result of superior quality"; for these respondents, due to the broad product diversity available in the market, good products can be found at affordable, fair prices.

Convenience was identified as an important factor for consumers who have hectic routines and little time to go shopping at markets. According to [21], what is currently taking place is the outsourcing of cooking, which is more prevalent among individuals that live alone or in smaller households and who need the convenience of processed foods.

According to [22], Viçosa's population has been steadily increasing. This growth is strongly affected by the

Universidade Federal de Viçosa, which constantly hosts new students. Therefore, we expected to find a deep call for convenience in this study. Contrastingly, "convenience" was found not to fall within the main reasons driving the purchase of dairy products. Based on a 6-point importance scale (1 – most important; 6 – least important), only 3% of the respondents considered convenience as the most important reason to consume dairy products. Conversely, 29% pointed out "healthy" as the most important characteristic of dairy products, followed by "nutritious" (23%) and "tasty" (20%) (Fig. 4).

Currently, people are not only more demanding, but also clearly seeking for satisfaction when consuming food items. This is evidenced by the number of consumers who pointed out taste as one of the most important factor influencing the purchase of dairy products. It means that the product must be both "healthy" and "tasty"; the latter received was classified as importance 1 by 20%, being after "nutritious" (23 %) and "healthy" (29 %) only.

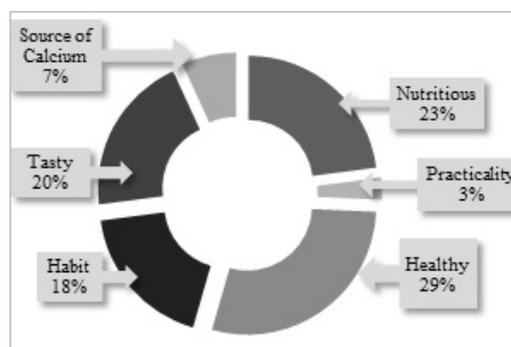


Figure 4. The most important characteristics of dairy products (%) (Source: Author's Computation)

In this context, it is not enough just to be tasty. Products must also be healthy and nutritious. Besides "health", the "assurance of higher product quality" was raised by 31% of the respondents when asked about the possibility of paying more for functional dairy products. This shows that aspects such as quality and reliability are crucial. More knowledgeable consumers tend to demand safer, higher-quality products, valuing the source and product certification. Therefore, traceability, certification of origin, quality management systems, safety certificates and informative labeling are becoming increasingly valued by well-informed consumers. It is then important that companies demonstrate the quality attributes of their products [23].

Also regarding quality, using a scale ranging from 1 (most important) to 5 (least important), the respondents pointed what they considered important to ensure the quality of dairy products. Despite being identified as a trend, traceability received score 5 by 44% of the respondents and, hence, was considered the least important factor. Traceability can only raise the consumers' confidence once they are aware of this system and know the way it is applied in food industry [24]. Traceability may be unknown to interviewees. Nevertheless, the traceability of milk—and of food in general—may become an important marketing tool [25].

According to [26] the "quality seal" also embraces sustainability and ethics which are global trends related to consumption. In this respect, an attractive packaging could be an advantageous tool of industry to gain more consumers,

not only by ratifying propagated values, but also by attracting the consumer attention at the purchase decision time.

Reference [27] studied the effect of advertising in healthy food packaging and verified that the female consumers' decision is influenced only by the packaging, while male consumers also regard the credibility of the information in the labels. It should also be emphasized the role of companies in this scenario in adopting responsible practices along the community, thereby changing their behavior. In this way, it is possible to develop sustainable activities and value improving practices for a better performance in market, through innovative solutions that foment trusted image dissemination as well as sustainable consumption [28].

When questioned if they would buy a product from an unknown brand rather than a famous brand, 76% of the consumers responded "Yes". Among these, 15.7% affirmed that they could pay up to 2 times more in relation to the famous product. This result shows that other aspects of the product could display stronger appeal than the brand itself.

In recent years, the interest of big companies in buying little ones has risen sharply, for realizing that unknown brands has gained visibility with certain success. Because of such trends, big companies have been interested in acquiring, investing or incubating small startups [29].

3.4. Functional Importance

The respondents were also questioned about the features that should be presented by products in order of importance. The features prioritized in the consumer trial were: low fat content (64%), cholesterol-free (63%), fat-free (58%), low sugar content (56%) and low salt content (56%) (Fig. 5). This can be mainly related to health concerns, since 80% of the respondents over the age of 46 prioritized these factors.

Reduced or low fat food products development is often challenging because functional and sensorial attributes of the foods can be affected after removing fat from numerous food items [30,31]. In order to increase the acceptability of low fat cheese, several strategies have been proposed. Among them most useful strategy is the use of fat replacers [31,32].

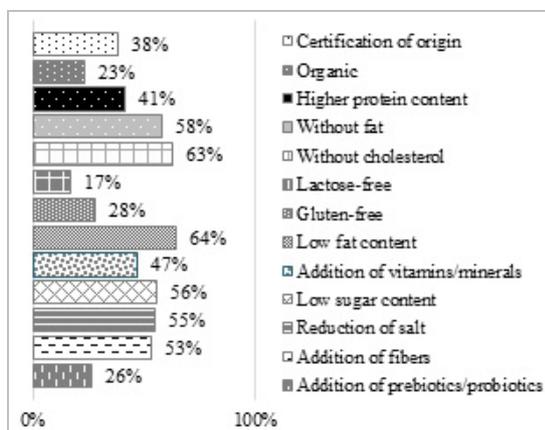


Figure 5. Factor influencing the valuation of dairy products by consumers (%) (Source: Author's Computation)

Lower frequencies were observed for the aspects "gluten-free" (28%), "addition prebiotics/probiotics" (26%), "organic food" (23%) and "lactose-free" (17%).

Such terms may not be as common to the consumers as "fat", "sugar" and "cholesterol". Furthermore, consumers may be more prone to purchasing and consuming functional foods included with functional ingredients that are familiar to them [10]. This result contradicts the ongoing fad of gluten- and lactose-free products.

Therefore, grocery retailers could encourage consumers to perceive the benefits of purchasing organically grown foods by addressing what nutritional contents the food contains, how its nutritional contents help consumers stay healthy, and how it contributes to environment protection and animal welfare [33].

3.5. Marketing

Satisfied consumers lean towards being loyal to the brand, often divulging the brand in a positive way and attracting new consumers. This usually decreases the probability of the competitors of penetrating into the market. In this context, it can be mentioned the power of the "indication of friends" as a product diffusion manner. The most important ways by which consumers become aware of unknown dairy products were also examined in this work. The "indication of friends" was highlighted in 47.7% of the responses. This finding could be associated with the sense of reliability, since consumers believe in products recommended by people from their social circle (Figure 6).

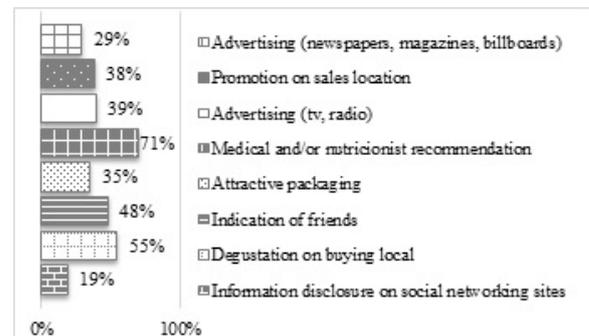


Figure 6. Product diffusion means preferred by the respondents (%) (Source: Author's Computation)

In addition to the "indication of friends", 70.7% of respondents valued the "medical and/or nutritionist recommendation". This is due to the reliability aspect abovementioned showing that specialists give safety when recommending a product. This denote a challenge for the industry, which needs to ally with health professionals who strongly influence consumer behavior. The marketing of unhealthy foods in grocery stores and supermarkets can influence consumer behavior. Most of the customers are receptive to services or programs that are designed to help them make healthy food choices. This is an encouraging result for public health professionals and market policies [34].

The "tasting at buying local" appeared at second place (54.7%). In addition to its sensory importance, the "tasting at buying local" is a free and visually effective way, since consumers are attracted by the curiosity of experiencing a new product. Furthermore, the company predisposed to this form of communication, make the consumers feel themselves motivated and valued.

The TV and radio advertising had an answering percentage of 39% which was greater than that of the

advertising of newspapers and magazines (29%). This may be possibly associated with the fact that visual/audio images are interactive means highly efficient in catching the consumer attention, while newspapers, magazines and billboards are inanimate and often used for reading of a more specific topic. In relation to foods, there is a little more attention of the regulatory agencies, since they are strongly responsible for the public health. But consumers can also misjudge a good product with basis on a bad experience with the advertisement, or for thinking that the advertisement is fraudulent and/or abusive. Food advertising often has a subtle effect and long-term potential on the eating habits of the society [35]. Recent investigations in the field of behavioral economics, social psychology and neuroscience suggest that consumers are irrational with their food choices because many decisions are taken by instinctive, automated processes without conscious awareness [36].

The “information disclosure on social networking websites” appeared at last position with 18.7% of the responses. The vast majority of the respondents did not take this into account probably because they did not belong to any social network or because of the thought that this kind of virtual advertising provokes a certain visual pollution. However, it is noteworthy that many of the respondents in this survey may not have had access to social networks.

According to [37], Facebook and YouTube are the leading active social networking services in the market. Facebook has been registering exponential membership

growth in recent years. This social network offers attractive means for interaction, communication and business [38]. Through the profiles on social networks, it is possible to generate a photo, video or digital media information of any kind and share them with other network users [39].

There have been a growing number of organizations that use social networks to disseminate their products and/or services, brand and promotions. Facebook, for instance, allows the creation of corporate webpages where companies can publicize and share news, events and other marketing activities. Thus, the “information disclosure on social networking sites” is gradually increasing although the low percentage of answers registered in this work. At internet, the advertisements on clothes, services, jewelries and technologies are still predominant, which may explain the little importance of this product diffusion way to alert consumers about dairy products.

3.6. Statistical Analysis

3.6.1. Correspondence Analysis

The correspondence analysis was used to evaluate the correlation between dairy products and preferred buying places (Figure 7). This type of analysis can be regarded as a special case of principal component analysis (PCA), although to be directed to categorical data organized in contingency tables rather than continuous data [40]. Therefore, two dimensions were considered to explain the variability of the data.

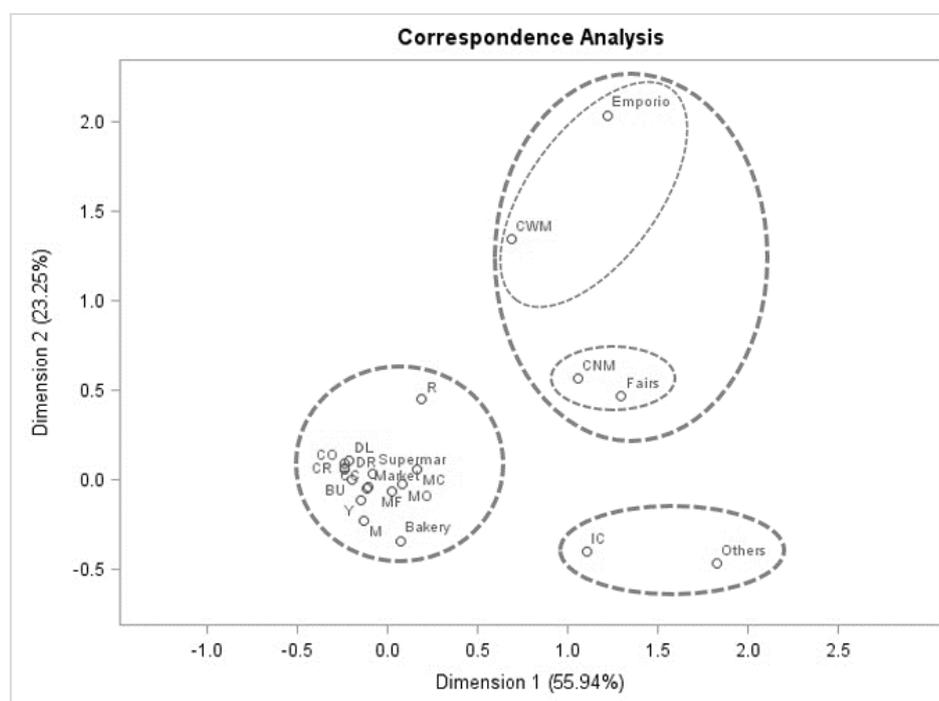


Figure 7. Correspondence analysis of dairy products and preferred buying places. Each point of purchase is shown in blue while dairy products are shown as red points. First group (supermarket, market and bakery): M-milk, Y-yogurt, MF-fermented milk, R-ricotta, MO-mozzarella, B-butter, CC-cream cheese, MC- ‘frescal minas’ cheese, D-dry milk, DL-dulce milk, CO-condensed milk, CR-milk; Second group (‘emporio’ and fairs): CWM-mold fine cheese, CNM-mold-free fine cheese; Third group (others): IC-ice cream (Source: Author’s Computation)

The dimension 1 explained 55.94% of the variation of the data while the dimension 2 explained 23.25%. The sum of the two dimensions was 79.19% which is sufficient to explain most of the data variability. The spatial separation of the 15 dairy products suggests the formation of three groups: a first group of supermarket,

bakery and market, a second group of emporium and fairs, and a third unspecific group characterized by the “others” option. In Figure 7, the products correlated with the dimensions analyzed and showed a relationship with their corresponding buying places. The groups “buying places” were well distributed throughout the plot, reflecting their

differences in terms of type and attractiveness of the environment, displaying of products, proximity to consumers and other peculiarities inherent to the business.

Two subgroups were observed within the group “emporium and fairs”, which were the places preferred by the consumers of fine cheeses with and without mold (20%). Among the evaluated products, the fine cheeses had the highest frequency of answers to these places, considering a group composed only of the subgroups of these two places. Despite the consumers of fine cheeses mentioned the supermarket as their favorite buying place (63% fine cheeses with mold and 58.2% fine cheeses without mold), when compared with the other products, the fine cheeses had lower percentage values, diverging from the place “supermarket”. The fairs were cited by most of the consumers of fine cheeses in Viçosa because these sites are well visited mainly due to the attractive prices, and not because the availability of fine cheeses. From the collected data, it is possible to observe that among the main milk products, the fine cheeses are preferably bought at emporiums, since these stores have the distinction of offering handmade products and gourmet.

The group formed by “supermarket, bakery and market” is preferred for the purchase of most dairy products, including the most cited with larger purchase frequency by the majority of respondents (milk, yogurt, cottage cheese and cheese "mozzarella"). The products Dulce de leche, condensed milk, and milk cream appeared closer to 'supermarket' and 'market' probably because these sites are normally chosen to buy industrial products. It is worth mentioning that these places are easily accessed, have broad variety of products, present better price flexibility when compared with bakeries, in addition to allowing a higher movement of people, thereby satisfying most of the consumer demands. The data collected showed that milk was the product with the highest purchase frequency at bakeries (20.4%), followed by mozzarella (13.4%), which suggests that this place is equally important to provide dairy products to consumer.

In addition, past research has shown that consumption decisions are influenced by those who are physically present. People are sensitive to the behavior of others in a retail context [41,42], even if such a person is only physically present but does not engage the consumer in any way [43]. It is more common to happen on buying places with there is greater movement of people.

The third group formed by the “others” option represented the places preferred by the consumers of “ice cream”, a product that is not considered as a milk derivate but often mentioned as such by consumers. A percentage of 20.4% of the respondents of ice cream marked the option “others” for ice cream, that is, without specifying of buying place. Possibly the fact that the term ice cream does not relate to a specific buying location suggests that the respondents do not have a defined place to buy this product and that they could be influenced by other factors such as product quality and price.

3.6.2. Pearson’s correlation

Table 1 summarizes the Pearson correlation coefficient (r) ranked in categories of correlation of magnitude, and the frequency values obtained for each correlation level. The correlation intensities for males and females were also inserted into the Table 1.

Table 1. Intensity of Pearson’s Correlation Regarding the Respondent Gender

Correlation intensity*	Male	Female
Slight correlation (0 to 0.19)	4	6
Low correlation (0.20 to 0.36)	5	6
Moderate correlation (0.36 to 0.69)	5	2
High correlation (0.70 to 0.89)	0	0
Very strong correlation (0.90 to 1.00)	0	0

*Adaptated Weber and Lamb 1970 [44].

In Table 2 it is observed the correlation between the variables and their respective probability values of random occurrence, being a diagonal used as a tool to separate the values by gender. The upper part at right represents the correlation values of the variables obtained from the scores of the female respondents, whereas the lower part at left shows the correlation values for the male respondents. In case of the male respondents, the interest in the variable “nutritional” showed a very low and not significant positive correlation with the variable “healthy” (r = 0.15, p = 0.06). Thus, there is no linear relationship between these variables meaning that they are statistically independent. For the females respondents there was a similar but opposite trend; it was evidenced a very low correlation and not significant negative correlation between the variables “nutritional” and “healthy” (r = -0.001, p = 0.8984). A possible explanation for this behavior is that the sources of nutrients taken into account by both genders are not necessarily healthy for them.

Table 2. Pearson’s Correlation – Men and Women

Man \ Women	Nutritional	Convenience	Healthy	Habit	Tasty	Source of Calcium
Nutritional	1.00	-.25 .0018	-.01 .8984	-.31 .0001	-.026 .0013	.11 .1682
Convenience	-.38 .0001	1.00	-.32 .0001	.06 .4819	.003 .9699	-.36 .0001
Healthy	.15 .0599	-.29 .0002	1.00	-.39 .0001	-.33 .0001	-.36 .0001
Habit	-.53 .0001	.13 .1132	-.31 .0001	1.00	-.11 .1849	-.52 .0001
Tasty	-.25 .0016	.08 .2844	-.50 .0001	.02 .7761	1.00	-.14 .0777
Source of Calcium	.21 .0075	-.38 .0001	.14 .0859	-.44 .0001	-.38 .0001	1.00

First Line: Pearson’s correlation. Second Line: p-values. Significant: p < 0.05.

Conversely, when the variable “nutritional” was correlated with the variable “habit”, negative and statistically significant relationships were found regarding both genders. With respect to the male gender, the

correlation was moderate (r = -0.53, p < 0.0001) and greater than that observed for the female gender (r = -0.32, p < 0.0001). This suggests that the consumption of dairy products could be decided by habits rather than their

nutritional facts. It was also observed a low and not significant correlation between the variables “calcium source” and “nutritional” for the female gender ($r = 0.11$, $p = 0.1682$). Reference [45] suggests that the fear of gaining weight can explain the low consumption of dairy products by women, and consequently, the low calcium intake along with other factors, such as low bone mass, calcium depletion during pregnancy, and bone loss over years. Therefore, the fear of obesity is a behavior that may result in a habit of low consumption of dairy products which are important for the intake of essential nutrients.

When the variables “healthy” and “tasty” were confronted, both with greater percentages of importance for both genders, there was a moderately negative correlation for the male ($r = -0.50$, $p < 0.0001$) and a low and negative correlation for the female ($r = -0.33$, $p < 0.0001$) genders. There is a probability that the respondents did not analyze carefully the importance scale of these variables, thus resulting in a random distribution of scores for both. Hence, the negative and significant correlations suggest that both variables were considered to be important by the respondents, but some of them gave more importance to the variable “healthy” while the other gave more importance to the variable “tasty”. On the other hand, when the variable “healthy” was compared with the variable “calcium source”, there was a positive and significant correlation for the female respondents ($r = 0.19$, $p = 0.0205$). This finding seems to be contradictory to the “nutritional”- “calcium source” correlation, that is, there

are a percentage of women more concerned about the intake of calcium from dairy products as an essential factor for their health. Altogether, the variable “convenience” showed a low or none correlation with the other variables for both genders.

Table 3 reports the average score values obtained from the importance scale given by the respondents. For both genders, the variable “convenience” received the highest scores, 4.78 (male) and 4.47 (female) from a total of 6 which corresponds to the least importance in the scale.

The dispersion about the mean score values ranged between 1.0 and 2.0 for both genders which could explain part of the “low to moderate Pearson’s correlations”. Among the possible factors involved in this dispersion are the variations inherent to the respondents, environment, schedule of the surveys, insufficient time, and socio-demographic features such as income, gender, age, and education.

In general, Table 3 evidences the formerly discussed results: the variable “healthy” was considered to be the most important aspect of dairy products, receiving the greatest scores of importance from both genders (2.41; 2.74). Next, the variables “nutritional” and “tasty” were the most important aspects. The male respondents gave less importance to the factors “convenience” (4.78) and “habit” (4.10); On the other hand, the female respondents considered “convenience” and “calcium source” the least important reasons to consume dairy products.

Table 3. Estimate of Mean, Standard Deviation and Sum by Gender

Variable	Men				Women			
	N	M	SD	S	N	M	SD	S
Nutritional	152	2,70	1,46	411,0	148	2,81	1,41	416,0
Convenience		4,78	1,36	728,0		4,47	1,53	662,0
Healthy		2,41	1,32	367,0		2,74	1,45	406,0
Habit		4,10	1,81	623,0		3,68	1,88	546,0
Tasty		3,35	1,52	510,0		3,04	1,65	450,0
Calcium’s Source		3,82	1,60	582,0		4,52	1,42	669,0

4. Conclusion

This work identified that consumers of dairy products are becoming more aware and demanding. As a result, they are willing to spend more money for buying healthier, more nutritious, and tastier products. As for the influence of product brand in buying intention, factors such as innovation and marketing were found to have a great importance on the purchase. Also, consumers are more open to choose a relatively unknown brand instead of a widely known one. In this context, the use of advertisements to highlight product quality, especially regarding fat, sugar, and cholesterol reductions can be a valuable tool for the dairy businesses to reach a broader audience, even if consumers need to pay more for products of superior quality.

In this study, organic foods were not valued as a functional food. Retailers and manufacturers can help consumers develop more positive perceptions of organic foods by improving accessibility of useful and objective information on nutritional content and the process of food production.

The nutritional education of the population stands out as a valuable tool for disseminating terms that are still

unknown to consumers. This can be more easily applied to local purchases, in which the audience varies a lot when it comes to income, education level, and age. *In situ* tests allow consumers to taste and buy at the same place, making them decided about the sensory quality of the products. This could be a strategy to increase the awareness and the importance of fine cheeses, ricotta, fermented milk, prebiotics, and probiotics.

Investments in technological innovation and credibility among consumers may be a differential to increase the competitiveness of small dairy companies that wish to expand their market shares. Additionally, the valuation of local products may lead to a higher tax revenue in Viçosa and neighboring towns.

Acknowledgement

The authors are thankful to FAPEMIG-Brazil for the financial support as well as to local retailers that have allowed data collection.

Competing Interests

The authors have no competing interests.

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