Profiling Italian cat and dog owners' perception of pet food quality and their purchasing habits

Marica Vinassa (marica.vinassa@unito.it)
Universita degli Studi di Torino

Diana Vergnano
Universita degli Studi di Torino

Emanuela Valle
Università degli Studi di Torino

Marzia Giribaldi
Consiglio per la Ricerca e la Sperimentazione in Agricoltura Centro di ricerca Zootecnia e Acquacoltura

Joana Nery
Università degli Studi di Torino

Liviana Prola
Università degli Studi di Torino

Domenico Bergero
Universita degli Studi di Torino Dipartimento di Scienze Mediche

Achille Schiavone
Università degli Studi di Torino

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Abstract

Background. There has recently been a growth in sensitivity toward pet animals, and this has also involved an increase in attention toward their nutrition, which is seen as a way of guaranteeing the welfare of their pets. However, it is difficult for pet owners to understand the quality of products, due to a lack of clear information on the label. The aim of the study has been to identify the pet food characteristics that can be considered as quality indicators for dog and cat owners through a survey which was distributed by the promoters in pet stores and sector fairs throughout the Italian territory.

Results. A total of 935 surveys were collected. Descriptive statistic showed a higher percentage of female owners (61.8%) among the interviewees. The participants were divided almost equally between owners of dogs (39.4%), cats (30.8%) and both dogs and cats (29.8%). A quarter of the owners (25.5%) asked veterinary for advice on which pet food to buy, and about a third (30.4%) trusted the advice posted on web sites' of the major brands', giving both of them a greater responsibility to provide information. "Contains natural ingredients" was the characteristic with the highest score (4.3 out of 5). Older owners (>65y) paid more attention to cost, and less to the appearance of pet food, animal satisfaction and fecal quality. Younger owners (<35y) paid more attention to the quality of the faeces, the percentage of protein, the presence of recyclable packaging and less attention to the appearance of the food, the smell and animal satisfaction. Appearance, smell, a higher cost and some label indications (protein content, presence of fresh meat, grain-free) were important for the wet pet food buyers. Furthermore, some differences emerged between the owners of different animal species.

Conclusions. Italian pet food buyers considered the presence of particular ingredients as the most important indicator of quality of pet food, while the least important was the price. The information from this survey could be used to help pet food companies to identify the factors that influence the quality of the products as perceived by dog and cat owners.

Background

Around 39% of the families in Italy own at least a cat or a dog [1] and, in recent years, the dog and cat food market has showed a positive trend [1]. Furthermore, the sensitivity of pet owners toward pet care has been growing [1], and nutrition is seen as a way of guaranteeing welfare. Pet owners, who have different and specific expectations that pet food should fulfill, inevitably determined their pets diets Nowadays, pet owners are more aware of the quality and the ingredients used in their pets' feeds. Furthermore, their choices can be influenced by different social and cultural factors, the same that rule the differences observed between individuals pertaining to their eating habits. Wholesomeness, safety of the feed ingredients and perception of the nutritional value are the major features that influence choices, together with ideas about industrial pet food and their sources of information about pet nutrition[2]. In fact, pet food buyers have access to numerous sources of information about pet nutrition (veterinarians, internet, trainers, pet shop employees, pet nutrition books, pet nutrition company websites, other pet owners…), even though this information may not always accurate [3]. Some feed features are perceived as positive and linked to health benefits, such as "organic" or "grain free", while other ingredients (i.e. grain) are now often seen as negative because they have been associated with potentially harmful effects [4]. Pet food producers take into account this information, and promote their products with such claims as "free range/organic/natural" [5, 6]. Complete commercial foods are cited as a contributing factor to longer, healthier life spans in pets [7] and their use is widespread in developed countries, as it is in Italy[1], even though there is an increasing interest in alternative feeding strategies [8–11].

This growing attention to certain features of pet food has affected consumer behavior and marketing [6, 12] and has led to a shift from focus on convenience and price to more attention being paid to quality [6, 13]. Dog and cat owners have a tendency to spend more on premium feeds rather than other unnecessary products [14] and they feel better when they have spent more money on feeding their pets.

Understanding the attitudes of pet owners regarding the nutrition of their pet animals, in more detail may help to improve communication between the suppliers and owners regarding nutrition. Furthermore understanding them is an integral part of the eating habits of pet owners [2]. In fact, the social and cultural factors that influence pet owners' eating habits also influence their selection of pet food and the feeding practices of their pets in the same way [15].

The aim of the study has been to profile which features are considered by owners as quality indicators when buying commercial pet food.

Results

A total of 972 questionnaires were distributed during the observation period, 935 of which were actually used, after elimination of incomplete questionnaires.

The socio-demographic characteristics of surveyed pet owners' population are reported in Table 1. The surveyed population of pet food buyers was mainly composed of females. Most buyers were between 35 and 50 years old. The majority of the questionnaires were completed by workers with a medium-high education. The majority of the population was resident in Center of Italy (Tuscany, Umbria, Marche, Lazio) and North of Italy (Piedmont, the Aosta Valley, Liguria, Lombardy, Trentino Alto Adige, Veneto, Friuli-Venezia Giulia, Emilia-Romagna), while the sample coverage for the South (Abruzzo, Molise, Campania, Puglia, Basilicata, Calabria) and the Islands (Sicily, Sardinia) was lower. The participants were divided almost equally between those owning a dog, a cat, or both.

Table 1. Socio-demographic characteristics of the surveyed pet owner population

Characteristics	% and n° of valid responses
Gender	(n=935)
Women	61.8
Men	38.2
Age	(n=929)
18–34 years	31.5
35–50 years	38.6
51–64 years	22.1
> 64 years	7.8
Geographical area of residence	(n=932)
Nord West of Italy	29.0
Nord East of Italy	20.5
Center of Italy	34.4
South Italy and the Islands	16.1
Educational level	(n=893)
Primary / secondary school	14.4
High school / professional qualification	58.1
Degree / Specialization	27.4
Occupation	(n=931)
Student	15.7
Housewife	8.8
Retired	8.6
Worker	61.5
Unemployed	3.1
Other	2.3
Animal owned (dogs and/or cats)	(n=932)
Dogs	39.4
Cats	30.8
Dogs and cats	29.8

Some questions were used to profile the shopping habits of the participants (Table 2). The majority (65.3%) of the sampled population bought both dry and wet pet food, while about 10% only purchased wet food. The preferred marketing channel of the population was a pet store (63.3%). About one-fourth (25.5%) of the interviewees asked for advice from their veterinary before purchasing pet food, and almost one-third (30.4 %) relied on the information provided by major brands on their websites.

Table 2. Shopping habits of the surveyed pet owners.

Pet food bought (n=914)	%	**Marketing channel for the pet food (n=915)**	%	**Source of nutritional advice for the pet food (n=931)**	%
Dry food	24.7	Supermarket	15.8	Friends and relatives	13.0
Wet food	10.0	Pet store	63.3	Online-blog	9.8
Dry & wet pet food	65.3	Online	6.6	Online-website	30.4
		More than one	14.3	Veterinarian	25.5
				Other	6.7
				More than one	14.7

Table 3 reports the quality characteristics assessed on a 1-5 Likert scale, the respective %, and the resulting average score. The claim “Contains natural ingredients” received the highest score from the interviewees, while the price resulted to be of little importance for the interviewees.

Table 3: Average relevance score of the surveyed quality characteristics of the chosen pet food.

Characteristics	Score (% for each category)					Average score
-	1	2	3	4	5	(n=935)
Presence of natural ingredients	0.4	3.7	15.3	29.7	50.9	4.3
Clear location of the pet food production facilities	0.9	3.8	16.8	31.0	47.5	4.2
Clarity of the label	1.0	4.8	19.0	27.3	47.9	4.2
High appreciated by the dog / cat	0.3	2.7	18.5	32.5	46.0	4.2
Normal stool appearance	0.7	2.8	18.8	33.4	44.3	4.2
Presence of fresh meat	1.5	6.0	21.5	27.1	43.9	4.1
Cruelty free	3.3	6.9	23.1	22.6	44.1	4.0
Guaranteeing shiny coat	1.0	5.0	22.7	35.5	35.8	4.0
Meat as the main ingredient	2.2	7.3	23.2	26.7	40.6	4.0
Good food smell	3.3	11.6	26.5	33.6	25.1	3.7
High protein content	1.3	8.5	28.7	37.9	23.5	3.7
Food appearance	4.3	10.8	29.0	31.5	24.4	3.6
Grain free	6.0	19.4	32.2	24.6	17.8	3.3
Recyclable packaging	13.9	18.3	24.5	22.0	21.3	3.2
Known brand	12.0	20.3	28.8	25.3	13.5	3.1
Higher price than others	24.1	27.6	26.9	13.7	7.7	2.5

Correlation analysis

The correlation analysis showed that only a few correlations were relevant (<50%) (Table 4). The location of the pet food production facilities was linked with information on the label (clarity R=0.660; use of natural ingredients R=0.584; cruelty-free products R=0.564). Attention to the appearance of the coat and attention to the stools were linked to each other (R=0.579) as well as to attention to pet preferences (R=0.591 and R=0.529 respectively). Attention to the brand was correlated with attention to the price (R=0.616). A correlation between attention to smell and food appearance was also observed (R=0.761).

Table 4: Correlation coefficients between quality characteristics scored by the surveyed population.

	Preference	Coat	Stool	Food smell	Food appearance	Production site	Cruelty free	Clear label	Natural ingredients	Meat first	Fresh meat	Total protein %	Grain free	Known brand	High price
Recyclable	0.302	0.297	0.324	0.256	0.228	0.359	0.428	0.414	0.373	0.209	0.209	0.233	0.430	0.305	0.416
High price	0.103 ns	0.218	0.101 ns	0.372	0.411	0.159	0.205	0.183	0.190	0.260	0.122 ns	0.228	0.447	**0.616**	
Known brand	0.168	0.177	0.085 ns	0.328	0.367	0.111 ns	0.139 ns	0.126	0.148	0.227	0.194	0.300	0.365		
Grain free	0.256	0.372	0.311	0.379	0.382	0.372	0.414	0.371	0.396	0.373	0.304	0.396			
High protein %	0.211	0.205	0.249	0.181	0.247	0.331	0.175	0.326	0.345	0.402	**0.511**				
Fresh meat	0.237	0.184	0.302	0.197	0.233	0.398	0.263	0.390	0.480	**0.649**					
Meat first	0.205	0.250	0.301	0.271	0.285	0.378	0.310	0.435	**0.521**						
Natural ingredients	0.310	0.284	0.384	0.216	0.219	0.584	0.508	**0.670**							
Clear label	0.341	0.344	0.462	0.241	0.262	**0.660**	**0.643**								
Cruelty free	0.361	0.396	0.459	0.339	0.352	0.564									
Production site	0.331	0.377	0.494	0.305	0.338										
Food appearance	0.373	0.459	0.338	**0.761**											
Food smell	0.426	**0.524**	0.403												
Stool	**0.529**	**0.579**													
Coat	**0.591**														

ns: correlation not significant. Bold values are considered relevantly correlated (>0.5).

Multivariate correspondence analysis

Multivariate correspondence analyses were performed in order to underline any relevant associations between specific population segments and important factors in the decision-making process of pet food purchasing. The surveyed population was segmented according to age, educational level, occupation, geographical provenance, the type of food purchased and the animal owned (dog or cat).

The results of the segmentation for the age classes are shown in Figure 1. Older interviewees (>65 y) gave more importance to high prices, while a low relevance was found with respect to the other population segments for the presence of recyclable packaging and the presence of the “cruelty-free” claim. Little importance was also observed for some label information, such as clarity of the information, the location of the pet food production facilities and the presence of natural ingredients. Moreover stool quality was not considered so important by elderly. On the other hand, younger owners (<35 y) paid slightly more attention to the appearance of the stools, a high percentage of proteins, and to the presence of recyclable packaging. Pet food appearance and smell were less relevant as was pet acceptance. The

cruelty free claim and the grain free claim on average received higher scores for the population aged 35 to 50, who also rated sa higher price slightly more important.

[Figure 1]

The results of the education level segmentation are given in Figure 2. Pet owners with a higher educational level (degree/specialization) paid less attention to the smell and appearance of the pet food, high price and renowned brand, but they declared they paid more attention to the appearance of the stools and coat. Label clarity, the location of production, the presence of natural ingredients, and grain-free and cruelty-free claims all received positive scores for this population segment. Unlike graduate owners, the population with a primary-school educational level considered such label information as production site, percentage of proteins, and label clarity less relevant, the presence of a cruelty free claim was not a decisional factor for this population segment. A healthy stool and coat appearance was relevant for the interviewees with high school or professional qualifications, together with the presence of recyclable packaging.

[Figure 2]

Housewives paid more attention to the cruelty free claim and low cereal content. Label clarity, food smell and appearance, pet preferences, coat quality and stool appearance were all less important for students. Given that our findings were based on an unbalanced number of housewives and students with respect to workers, the results from such analyses should be treated with considerable caution.

The results from the segmentation of the macroscopic regions of the Italian peninsula are reported in Figure 3. It should be noted that the scores assigned in the South/insular regions were always higher than those for the rest of Italy, while lower scores were found in the North-West. The mean assigned score was about 50% higher in the South for the importance of the high price in the choice of pet food than in the North-West.

[Figure 3]

The appearance, smell, higher cost and some label indications (high protein, meat as the main ingredient, grain free) were more relevant for wet pet food buyers. Cat owners gave more importance to the appearance and smell of pet food, but less to recyclable packaging, while dog owners focused more on the presence of meat as the main ingredient and on a healthy stool appearance.

Discussion

Even though the survey was only administered in pet stores and fairs, thereby neglecting some pet food sectors (i.e. e-commerce), and limited to specific population segments (i.e. elder people), it has been possible to highlight the characteristic that were considered as quality indicators by pet owners when they chose their pet food.

In this study, the pet owners were divided into dog owners, cat owners and both dog and cat owners (36.9%; 33.4%; 29.7% respectively) with only a slight prevalence of dog owners. This tendency confirmed by the result of a national report [1], which reported a higher percentage of dog owners (27.1%) than cat owners (18.3%) in Italian families.

A higher percentage of female owners involved in pet nutrition than to male owners was reported, thereby confirming the trend found in another study [16]. Our data reported a higher incidence of pet store (64.8%) as the preferred shopping

channel, but, because of this result, our data can only be considered partial, because our survey was only conducted in pet stores and fairs. In the Assalco-Zoomark report [1], it was instead reported that the most of the acquired pet food was bought in supermarkets (63.6% considering hypermarkets, supermarket and discount stores) while only about a quarter was bought in pet stores (26.3%).

When assessing quality of pet food, Italian buyers considered the presence of natural ingredients as the most important aspect (average score 4.3/5). This may reflect the current trend that is also observed for human nutrition where there is an increasing demand for a more natural diet [17]. Pet food is becoming more “humanized”, and it follows human food trends. The type of feeding used for pets might reflect the relationship between humans and animals and it could be considered as a symbolic inclusion of the pet in the owner’s family and to reflect the pet owner’s culture or ideology; furthermore, the owners, by using such pet food felt they were taking care of the health of their pets [15]. In a recent study, considering relationship between children and household pets, the family pet was considered as the child’s playmate by 70.7% of the interviewed families [18].

At the same time the location of the pet food productionfacilities of (4.2/5) was an important factor, as was the information written on the label and its clarity (4.2/5). The correlation analysis also revealed a link between these two aspects.

Another current trend in pet food industries is the development of grain free products. In fact, the interviewees showed some concern about the quality and nutritional value of cereals, their actual utility for pets and the fact they could be a possible origin of allergies [19]. However, according to this preliminary survey, this characteristic does not seem to be a major priority for the Italian interviewees. The average score of this features was one of the lowest (3.3/5) together with the presence of recyclable packaging (3.2/5) and the known brand (3.1/5). A higher price than other similar products (2.5/5) was the least important parameter, according to Italian buyers, considered to evaluate pet food quality. The reason for this could be linked to a decreasing confidence in large famous companies by some of interviewees.

Considering these results, the role of veterinarians in influencing the choice of pet owners about pet food has emerged. In fact, around a quarter of the interviewees (25.5%) asked their veterinarians for advice about their choice of pet food. Veterinarians should not only be able to correctly evaluate pet food quality, they should also have a great deal of knowledge about animal nutrition. This topic should be part of their formation so that they can pass on this knowledge to pet owners. At the same time the pet food industry also play an important role in providing useful information to their buyers. In fact, a third of the interviewees (30.4%) mentioned they trusted the details provided on brand websites. Pet food companies should rely on experts to edit the information on their websites. These results confirmed the findings of a previous study [20] in which veterinarians were the most frequent source of information about pet nutrition.

In another study conducted in the United States and in Australia[2], the attitudes of owners toward pet food were investigated and it was shown that a large part of the owners (15.8% of dog owners and 16.9% of cat owners) used the Internet and other media as their primary sources of information. The important role of the veterinarian about the necessity of being prepared about nutritional topics, in order to communicate with and address the issues of owners about the feeding management of their pets, was also highlighted.

“Cruelty free” is another aspect that should be taken into consideration, even though there are still some concerns about its definition. It is a term that is generally used above all for cosmetic ingredients and products that are not tested on animals. The tendency of consumers to search for feeds that are not tested on laboratory animals, which are referred to “cruelty-free” feeds, is spreading in Italy.. This aspect seemed to be perceived as being very important by the Italian interviewees (4.0/5). This could also be important from a marketing point of view, as it is an aspect the media and public opinion focus on. However, this aspect is not yet regulated by any specific legislation. Updating legislation with reference to this topic could be a possible perspective for Italian and European legislation bodies.

Other concerns pertain to the clarity of the label, which resulted to be one of the most important factors for the interviewees (4.2/5). It is not easy to evaluate the quality of a pet food product only from the label and to the best of our knowledge, no studies have been conducted to evaluate the clarity of the labels from a consumer's point of view; further research is needed in this direction. However, it is a important that the label should not mislead the use, as is clearly stated in Reg. (EC) No. 767/2009 on the placing of feed on the market and their use, as pointed out by FEDIAF (European Pet Food Industry Federation), which developed the Code of Good Labeling Practices [21]. Altough Reg. (EC) No. 767/2009 is focused on placing feeds on the market and their use within the European Community and includes general requirements for labeling, but it does not explore specific aspects, especially for what concerns claims.

A distinction between two large categories of pet owners emerged from the correlation analysis. Interviewees that placed great importance on pet preference also seemed to pay attention to the appearance of the coat and stools, and in general paid more attention to the wellbeing of their pets. On the other hand, the interviewees interested in known brands also seemed to pay attention also to the price and exterior characteristics of the feeds (such as the appearance and the smell), more than to their pets.

This study has also revealed a difference on the perceived quality, depending on the age of the interviewees. For example, elderly interviewees di not tend to consider the presence of recyclable packaging, which was instead important for the younger ones, although this could just be an indication of a major awareness of environmental impacts. Furthermore, the most important aspect for the elderly interviewees was the price, and they paid much less attention to the label information; on the other hand, the younger interviewees were more interested in the information written on the label. An influence of the age of the interviewees was also found for the evaluation of the perceived quality of human food [22]. Older interviewees, with reference to both pet food and food for humans, apparently gave less importance to nutritional aspects than to marketing aspects. Mascarello *et al.* [22], for example, found that older people, were more interested in buying certified products and local products. The educational level also seems to have an effect on the perception of pet food quality, and it was also reported, in a study on human food habits, that differences in the educational level of mothers were linked to differences in the eating habits of their children (i.e. consumption of soft drinks, sweets, fruit and vegetables) [23].

When the species of owned animal was taken into consideration, it seemed that cat owners were more interested in how the pet food appeared externally. This could be linked to the fact that cats are notoriously fussy, and cat owners know that a certain kind of feed can be eaten, or not, by their pet on the basis of its smell and appearance (i.e. texture). Dog owners, instead, focused more on the composition of the feed and in particular on the quantity of protein, perhaps because of the new trend of considering dog like wolves. A healthy stool appearance was also important for them. In fact, dogs, especially large dogs, tend to have stool consistency problems [24]. However, further information on the size of the dog would be necessary to understand whether there is a correlation with attention to stool consistency.

Conclusion

The interviewed Italian pet food buyers considered the presence of specific ingredients as the most important quality indicator, while they considered a high price as the least important aspect. Furthermore, our results highlight that the interviewees asked for advice on pet food to veterinary and websites of major brands in an equal proportion (about 30%). The information obtained from this Italian survey may help pet food companies to profile communication strategies tailored to specific consumer segments. The obtained data may be helpful to identify factors that influence the perceived quality of the purchased products for both dog and cat owners.

Methods

The survey (see Additional file 1) was designed to investigate the relevant habits and attitudes of dog and cat owners when choosing and purchasing pet foods.

No approval by an institutional review board was required, because enrollment was on a voluntary basis, and the participants consented to an anonymous information collection. In addition, the questionnaires were blinded before the statistical analysis, which was performed independently by a specialist on a synthetic database.

Respondents

The survey was designed and administered by trained staff over a period of 9 months, from March to November 2018.

People were contacted directly by the promoter in different pet stores and during sector fairs in Italy, and the respondents, who agreed to participate filled out the hard copy questionnaire. The sample consisted of 935 statistical units on the dog and/or cat owners' population in charge of purchasing pet food. A pilot version of the questionnaire was presented to 100 people before the survey in order to understand whether it was easy to understand.

Structure of the questionnaire

The questions selected for the survey were based on the existing literature, and in particular on Mascarello et al. [22]. Each question was developed with the assistance of experts (a veterinarian, a nutritionist and a marketing research specialist) to gather information from owners about the target topics.

Ten questions, divided into two sections, were included in the survey in Italian. The first section, containing 9 multiple-choice questions, was designed to profile the population sample. The demographic variables included in the profiling were gender, age, geographical area (see Additional file 2), education and occupation. Other variables were included to profile the interviewees in terms of pet food purchasing attitudes (type of animal owned, preferred marketing channel, type of purchased pet food, sources of pet nutrition information).

In the second part, the pet owners were asked to express their opinion using a score from 1 to 5 (1 = not important at all, 2 = not very important, 3 = quite important, 4 = very important, 5 = fundamental) on the relevance of sixteen specific quality-associated characteristics in the decision-making process of choosing pet food. The surveyed characteristics included pet preferences, coat and stool appearance, food smell and presentation, label information, controlled origin, ingredients, brand, price, recyclable packaging and cruelty-free claim.

Statistical analyses

The choice of the statistical analyses that were performed was made on the basis of the surveys designed by [22, 25]. The data generated in this way were submitted to exploratory, correlation, and correspondence analyses. The exploratory analysis provided a description of the sample interviewed through a frequency analysis, the use of synthetic indicators (median, mean, coefficient of variation), and the cross tabulation of specific variables so as to identify the main differences in the consumer groups. Bonferroni's corrected Spearman Rho Correlation analyses were carried out in order to highlight highly or poorly connected features. A strong correlation was detected when $>\pm 0.5$ and a weak correlation when $<\pm 0.2$. Finally, profiling of the respondents, according to the clusters of interest (age, education, occupation, geographical origin, type of pet food, dog and/or cat ownership) was achieved using a multivariate Correspondence Analysis approach between the scores and specific population segments. To this aim, the data were first converted to Dummy variables, then grouped into specific Burt tables (one table for each target profiling feature), which were subsequently used for a multivariate correspondence analysis. When a specific preference class was poorly represented (less than 10 cases), the cases were assigned to the adjacent preference class. The relative weight of each class of

preference was standardized by considering its percentage occurrence in each specific population segment. All the analyses were performed using PAST version 2.3 [26].

Abbreviations

FEDIAF: European Pet Food Industry Federation

Declarations

Ethics approval and consent to participate

No ethics approval process within national or EU legal systems was needed for the present procedure, as enrolment in the survey was on a voluntary basis, and the participants consented verbally to participate in the anonymous information collection as per the Regulation of the European parliament and of the council of 27 April 2016 (UE 2016/679). Data were collected directly from owners who were contacted directly by front desk personnel in the pet-shops. These personnel explained the aim of the questionnaire and collected the participants' consent. The interviewees agreed to participate in the study voluntarily by self-enrolling. They were informed that their answers would be published in a study. No animals were involved in the study.

Consent for publication

The participants consented to anonymous information collection as per Italian Data Protection Code - Legislative Decree no. 196/2003. The interviewees agreed to participate in the study voluntarily by self-enrolling. They were informed that their answers would be published in a study.

Availability of data and materials

The datasets analysed during this study are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

MV: data collection, support data analysis and preparation of manuscript. DV: data collection, support data analysis and preparation of manuscript EV: coordination and preparation of manuscript MG: data management and data analysis

JN: data management, planning of the study. LP: data management, planning of the study. DB: data management, planning of the study. AS: coordination role. All authors read and approved the final manuscript.

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Additional Files

Additional file 1:

Format: .pdf (Adobe Acrobat)

Title of data: Questionnaire: how is pet food quality assessed?

Description: In this file the questionnaire used during the survey is reported, translated in English language.

Additional file 2:

Format: .pdf (Adobe Acrobat)

Title of data: Map of Italy

Description: Map of Italy and segmentation in North, Center, South and Islands.

Figures

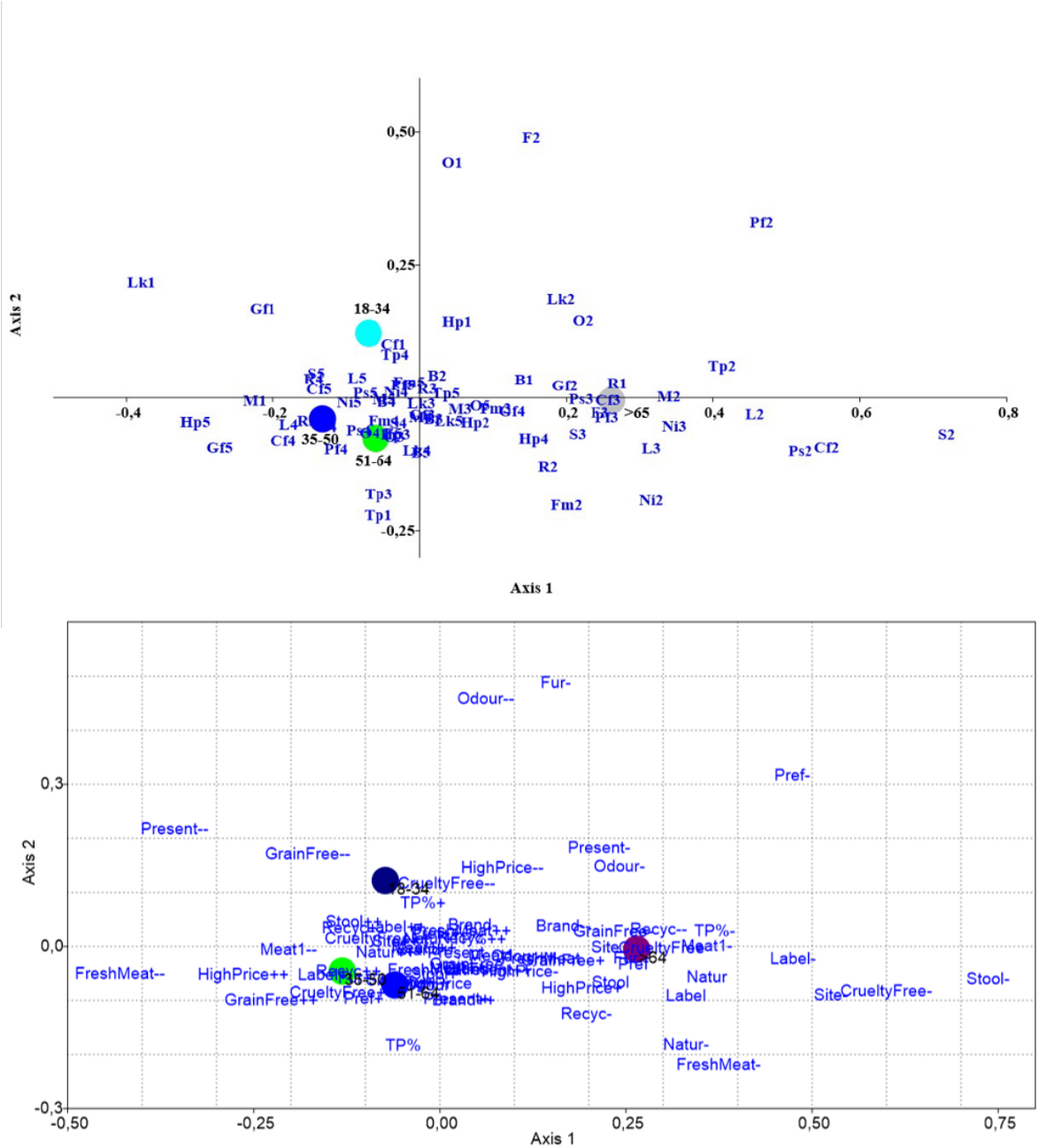

Figure 1

Results of the segmentation for age classes. Pf1-Pf5: be very appreciated by dog / cat; F1-F5: guarantee shiny coat; S1-S5: normal stool appearance; O1-O5: food smell; Lk1-Lk5: food apperance; Ps1-Ps5: manufacturing facilities location; Cf1-Cf5 Cruelty free; L1-L5: Label clarity; Ni1-Ni5: presence of natural ingredient; M1-M5: meat as first ingredient; Fm1-Fm5: fresh meat presence; Tp1-Tp5: high protein content; Gf1-Gf5: grain free; B1-B5: known brand; Hp1-Hp5: higher price than others; R1-R5: recyclable packaging. Age classes: 18-34 y; 35-50 y; 51-64 y; >64 y.

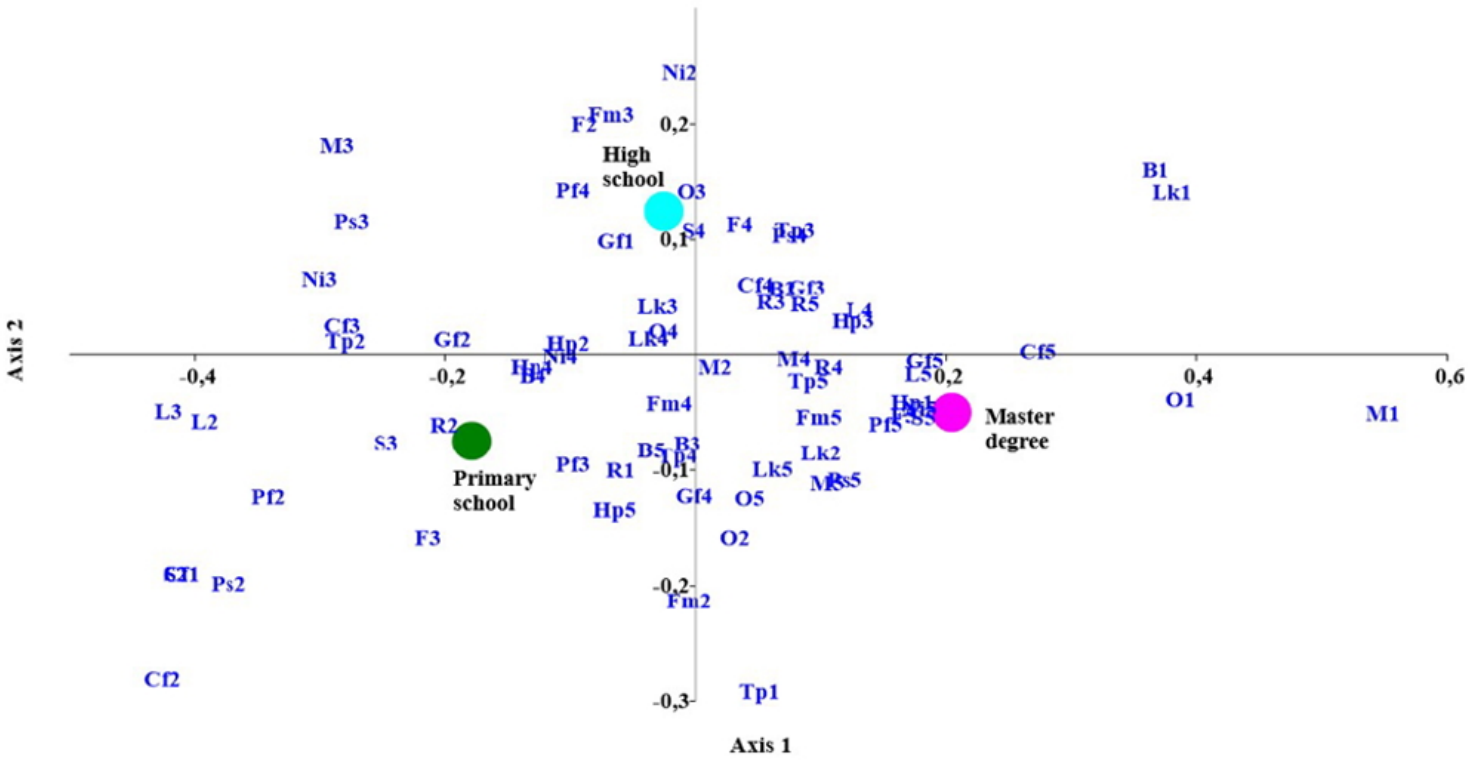

Figure 2

Results of the segmentation for educational level. Pf1-Pf5: be very appreciated by dog / cat; F1-F5: guarantee shiny coat; S1-S5: normal stool appearance; O1-O5: food smell; Lk1-Lk5: food apperance; Ps1-Ps5: manufacturing facilities location; Cf1-Cf5 Cruelty free; L1-L5: Label clarity; Ni1-Ni5: presence of natural ingredient; M1-M5: meat as first ingredient; Fm1-Fm5: fresh meat presence; Tp1-Tp5: high protein content; Gf1-Gf5: grain free; B1-B5: known brand; Hp1-Hp5: higher price than others; R1-R5: recyclable packaging. Master degree: degree/specialization; High school: High school / professional qualification; Primary school: Primary / secondary school

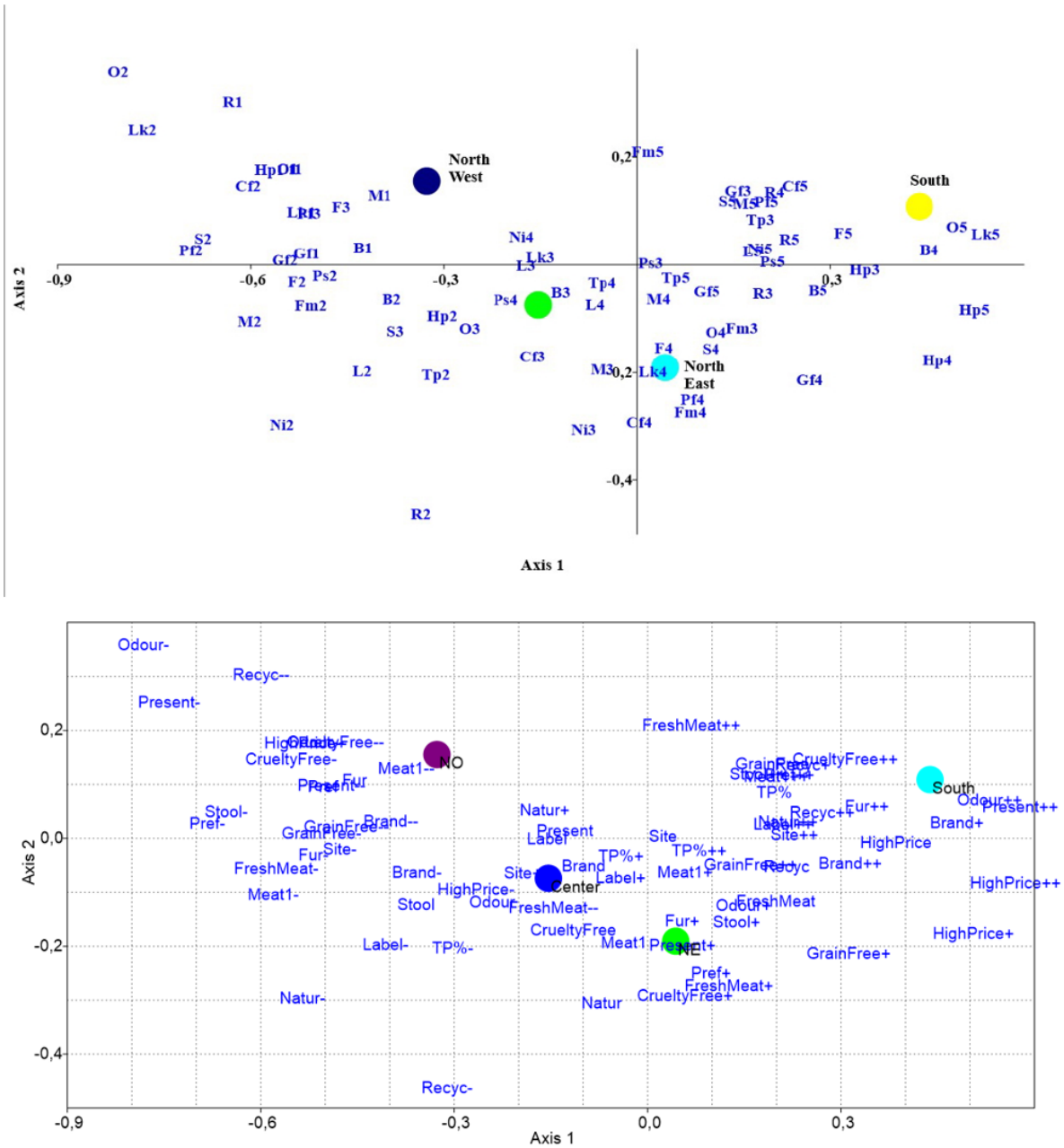

Figure 3

Results from the segmentation according to macroscopic regions of the Italian peninsula. Pf1-Pf5: be very appreciated by dog / cat; F1-F5: guarantee shiny coat; S1-S5: normal stool appearance; O1-O5: food smell; Lk1-Lk5: food apperance; Ps1-Ps5: manufacturing facilities location; Cf1-Cf5 Cruelty free; L1-L5: Label clarity; Ni1-Ni5: presence of natural ingredient; M1-M5: meat as first ingredient; Fm1-Fm5: fresh meat presence; Tp1-Tp5: high protein content; Gf1-Gf5: grain free; B1-B5: known brand; Hp1-Hp5: higher price than others; R1-R5: recyclable packaging. North West: North-West of Italy (the Aosta Valley, Piedmont, Liguria, Lombardy); North East: North-East of Italy (Trentino Alto Adige, Veneto, Friuli-Venezia Giulia, Emilia-Romagna); Center: Center of Italy (Tuscany, Umbria, Marche, Lazio); South: South of Italy (Abruzzo, Molise, Campania, Puglia, Basilicata, Calabria) and islands (Sicily, Sardinia).

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- Additionalfile2.pdf
- Additionalfile1.pdf