The prevalence of local fresh fruit and vegetables in supermarkets and hypermarkets in Zaragoza and the consumer purchase behavior

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Resumen

Existe una tendencia global desde hace pocos años en comercializar y promover el consumo de productos locales ya que aportan beneficios sociales, medioambientales y económicos. Además, en el caso de los productos perecederos que se venden en fresco también presentan beneficios para la salud porque al consumirse más cerca de la zona de producción son más frescos lo que incrementa los niveles de algunos nutrientes que se van perdiendo en el almacenamiento y transporte. En concreto se han analizado las frutas y hortalizas frescas porque se ha colaborado con la cadena de supermercados SIMPLY que estaba interesada en estos productos. Nuestro estudio se ha centrado Aragón y más concretamente en Zaragoza.

Los objetivos de este proyecto son estudiar la presencia de frutas y verduras locales en los supermercados e hipermercados de Aragón, investigar la percepción de los consumidores hacia los alimentos locales y sus hábitos de consumo y compra de frutas y verduras locales y averiguar los lugares de compra de frutas y verduras locales preferidos por los consumidores. Para alcanzar estos objetivos se ha utilizado un método cualitativo y cuantitativo. El cualitativo consiste en una observación directa de las frutas y verduras frescas vendidas en diferentes supermercados e hipermercados en Zaragoza y el cuantitativo, en una encuesta en línea dirigida a compradores de alimentos de Zaragoza, principalmente.

Para el estudio de la presencia de frutas y hortalizas en los supermercados e hipermercados se seleccionaron en el caso de las frutas, la manzana y la pera, y en el de las verduras, la col, la acelga, la borraja, la patata, la cebolla y el tomate al ser todos ellos producidos en Aragón y vendidos a lo largo de todo el año.

Los principales resultados indican que la presencia de frutas y hortalizas locales depende de la cadena de distribución y dos de las cadenas analizadas no vendían frutas y hortalizas de Aragón. Sin embargo, independientemente del lugar de compra, las frutas y verduras producidas en Aragón son más baratas que las procedentes de otros orígenes geográficos. La manzana, borraja y acelga son los productos con mayor porcentaje de referencias de esta región.

Respecto a los resultados de la encuesta mencionar que los consumidores asocian los alimentos locales en mayor medida con alimentos frescos, producidos cerca de su localidad y que han recorrido menos distancia entre el productor y el consumidor. Por otra parte, asocian un alimento local en menor medida con seguridad y vendido directamente por el productor. Además, consideran que los mayores beneficios de comprar alimentos locales son el mantenimiento de las zonas rurales, el aumento de la renta de los agricultores y el ofrecer productos más frescos.

La mayoría de los consumidores afirman comprar siempre o a menudo frutas y verduras frescas locales (61%) y una minoría que las compran a veces (33%). Además, de los encuestados que decían comprar frutas y verduras locales a veces, nunca o casi nunca, un 73% indicaron que es probable o muy probable que las compren en el futuro. Estos resultados indican que existe un importante potencial de mercado para estos productos. Además, aquellos consumidores que compran frutas y verduras locales con mayor frecuencia son los que asocian en mayor medida los alimentos locales con su origen y los que creen que ofrece beneficios para la sociedad y el medioambiente y para su propia salud. Las principales razones para no comprar frutas y verduras

frescas locales son no encontrarlas en sus tiendas habituales de compra y no tener tiempo para ir a comprarlas a los lugares donde las venden. Por lo tanto, la conveniencia en la compra es un freno al consumo de estos productos.

Finalmente, los lugares de compra de frutas y verduras frescas locales preferidos por los consumidores son las verdulerías y fruterías tradicionales seguidos por los mercadillos de productores. En último lugar se sitúa la compra directamente en la finca del agricultor. Además, consideran que la mejor manera de comunicar en las tiendas el mensaje de producto local es "del huerto a su casa" seguidor por "el sabor de nuestra región. Por último, mencionar que la mayoría de consumidores creen que los precios de las frutas y verduras frescas locales deberían ser los mismos que los precios de las no locales.

Résumé

Il existe une tendance mondiale depuis quelques années dans la commercialisation et la promotion de la consommation de produits locaux car ils apportent des avantages sociaux, environnementaux et économiques. En outre, dans le cas des produits périssables vendus frais, ils présentent également des avantages pour la santé et surtout lorsqu‟ils sont consommés plus près de la zone de production, car ils sont plus frais, ce qui augmente les niveaux de certains nutriments perdus lors du stockage et du transport. En particulier, les fruits et légumes frais ont été analysés car on a collaboré avec la chaîne de supermarchés SIMPLY qui s'intéressait à ces produits. Notre étude est concernée par la communauté d‟Aragón et plus spécifiquement Saragosse.

Les objectifs de ce projet sont d'étudier la disponibilité de fruits et légumes locaux dans les supermarchés et les hypermarchés d'Aragon, étudier la perception des consommateurs vis-à-vis les aliments locaux et leurs habitudes de consommation et d'achat des fruits et légumes locaux et révéler leur locaux préférés pour l‟achat de ces aliments.

Pour atteindre ces objectifs, une méthode qualitative et quantitative a été utilisée. La qualitative consiste en une observation directe des fruits et légumes frais vendus dans les différents supermarchés et hypermarchés de Saragosse et la quantitative consiste en une enquête en ligne destinée aux acheteurs de produits alimentaires à Saragosse, principalement.

L'étude de la disponibilité des fruits et légumes dans les supermarchés et les hypermarchés est concernée par les fruits, pommes et poires, ainsi que par les légumes, le chou, la bette à carde, la bourrache, la pomme de terre, L'oignon et la tomate , qui sont tous produits en Aragon et vendus tout au long de l'année.

Les principaux résultats indiquent que la présence de fruits et légumes locaux dépend de la chaîne de distribution et que deux des chaînes analysées ne vendaient pas les fruits et les légumes d'Aragon. Cependant, quel que soit le lieu d'achat, les fruits et légumes produits en Aragon sont moins chers que ceux d'autres origines géographiques. La pomme, la bourrache et la bette à carde sont les produits ayant le plus haut pourcentage de références dans cette région.

En ce qui concerne les résultats de l'enquête, mentionnons que les consommateurs associent d‟avantage les aliments locaux aux aliments frais, produits près de leur localité et qui ont parcouru moins de distance entre le producteur et le consommateur.

D'un autre côté, ils associent dans une moindre mesure la nourriture locale à la sécurité et à la vente directe par le producteur. En outre, ils considèrent que les principaux avantages de l'achat d'aliments locaux sont le maintien des zones rurales, l'augmentation des revenus des agriculteurs et l'offre de produits plus frais.

La majorité des consommateurs affirment qu‟ils achètent toujours ou souvent des fruits et légumes locaux frais (61%) et une minorité affirme qu‟elle les achète parfois (33%).

De plus, parmi les enquêtées certains ont déclaré qu‟ils achètent des fruits et des légumes locaux à certains moments, jamais ou presque jamais, 73% ont indiqué qu'ils étaient susceptibles ou très susceptibles de les acheter au future.

Ces résultats indiquent qu'il existe un potentiel de marché important pour ces produits. De plus, les consommateurs qui achètent plus fréquemment des fruits et des légumes locaux sont ceux qui associent les aliments locaux à leur origine et ceux qui croient que cela présente des avantages pour la société et l'environnement et pour leur propre santé.

Les principales raisons de ne pas acheter de fruits et légumes frais locaux sont de leur indisponibilité dans leurs magasins habituels et l‟insuffisance du temps des consommateurs pour aller les acheter aux endroits où ils se vendent. Par conséquent, la commodité de l'achat est un frein à la consommation de ces produits.

Enfin, le lieux d'achat de fruits et légumes frais locaux préférés par les consommateurs sont les magasins traditionnels de fruits et légumes suivis par les marchés des fermiers. Le lieu d‟achat classé le dernier est la ferme de l‟agriculteur. En outre, ils considèrent que la meilleure façon de communiquer dans les magasins le message du produit local est "du jardin à votre maison" suivis par "le goût de notre région ".

Finalement, mentionnons que la plupart des consommateurs estiment que les prix des fruits et légumes frais locaux devraient être les mêmes que ceux des fruits et légumes non locaux.

Summary

There has been a global trend for a few years in marketing and promoting the consumption of local products as they provide social, environmental and economic benefits. In addition, in the case of perishable products that are sold fresh, they also have health benefits because when consumed closer to the production area they are fresher, which increases the levels of some nutrients that are lost in storage and transportation. In particular, fresh fruits and vegetables have been analysed because it has collaborated with the supermarket chain SIMPLY that was interested in these products. Our study has focused Aragón and more specifically in Zaragoza.

The objectives of this project are to study the presence of local fruits and vegetables in the supermarkets and hypermarkets of Aragon, to investigate the perception of consumers towards local foods and their consumption habits and purchase of local fruits and vegetables and to find out where to buy of local fruits and vegetables preferred by consumers. To achieve these objectives, a qualitative and quantitative method has been used. The qualitative consists of a direct observation of the fresh fruits and vegetables sold in different supermarkets and hypermarkets in Zaragoza and the quantitative one, in an online survey directed at food buyers in Zaragoza, mainly.

For the study of the presence of fruits and vegetables in supermarkets and hypermarkets were selected in the case of fruits, apple and pear, and in the case of vegetables, cabbage, chard, borage, potato, onion and tomato are all produced in Aragon and sold throughout the year.

The main results indicate that the presence of local fruits and vegetables depends on the distribution chain and two of the analysed chains did not sell fruit and vegetables from Aragón. However, regardless of the place of purchase, fruits and vegetables produced in Aragon are cheaper than those from other geographical origins. The apple, borage and chard are the products with the highest percentage of references in this region.

Regarding the results of the survey, mention that consumers associate local foods to a greater extent with fresh foods, produced near their locality and that have travelled less distance between the producer and the consumer. On the other hand, they associate a local food to a lesser extent with security and sold directly by the producer. In addition, they consider that the greatest benefits of buying local food are the maintenance of rural areas, the increase in farmers' income and the offer of fresher products.

The majority of consumers claim to always or often buy fresh local fruits and vegetables (61%) and a minority that sometimes buy them (33%). In addition, of the respondents who said they bought local fruits and vegetables at times, never or almost never, 73% indicated that they are likely or very likely to buy them in the future. These results indicate that there is an important market potential for these products. In addition, those consumers who buy local fruits and vegetables more frequently are those who associate local foods with their origin and those who believe that it offers benefits for society and the environment and for their own health. The main reasons for not buying local fresh fruits and vegetables are not finding them in their usual stores and not having time to go buy them to the places where they sell them. Therefore, the convenience in the purchase is a brake on the consumption of these products.

Finally, the places of purchase of local fresh fruits and vegetables preferred by consumers are the traditional greengrocers and fruit shops followed by the farmers' markets. Lastly, the purchase is placed directly on the farmer's farm. In addition, they consider that the best way to communicate in the stores the message of local product is "from the garden to your home" follower for "the taste of our region. Finally, mention that most consumers believe that the prices of local fresh fruits and vegetables should be the same as the prices of non-local ones.

1. Introduction

Sustainable food consumption has attracted widespread attention over the last decades by scholars, policymakers, and consumers. By reducing the number of actors and distances along the food chain, these alternative food systems foster the reconnection between farmers and consumers and contribute to different social, economic and environmentally sustainable goals (Giampetri et al., 2016).

Envisaging both the reduced geographical distance (i.e., transportation distance between production and consumption known as food miles) and a small number of intermediaries between the producer and the consumer, Short Food Supply Chains (SFSC) contribute to preserve both economic activities in areas with climatic and geographical constraints (e.g., by maintaining food production and processing) and the culture and identity of those places.

Local food systems are defined as systems of producing, processing and trading, primarily of sustainable and organic forms of food production, where the physical and economic activity is largely contained and controlled within the locality or region where it was produced, which delivers health, economic, environmental and social benefits to the communities in those and it‟s also considered as emerging as a viable alternative to the production and marketing models used in the industrialized global food system. (King et al., 2010)

In this definition, the local is not attributed with a specific spatial scale, but the key point is that the control of economic activity is retained locally and that a range of benefits is delivered. Local food systems are also often associated with co-operative, fair and ethical behavior. In addition to reducing food miles, stimulating local economies and providing farmers with alternative markets, these locally based systems can also be a model for agriculture at the rural-urban interface.

On the policy side, several EU Member States have developed legal frameworks and incentives to support such types of food chains. France, for example, defined precisely the notion of a short chain (*‘circuit court’*) in the framework of 2009 Action Plan to develop them and Italy has also established legislative decrees for the regulation of Farmers Markets. At EU level, this kind of initiative benefits from Rural Development funding, and the European Commission proposed, within the „CAP towards 2020‟ proposals 1, that short supply chains may be subjectto thematic sub-programs within Rural Development programs. The recent „Agricultural Product Quality Schemes Regulation‟ (Regulation (EU) No 1151/92) adopted by the European Parliament and the Council includes a request to the European Commission to elaborate a report on a possible new „local farming and direct sales labeling scheme to assist producers in marketing their produce locally‟ (Article 55), focusing on the „ability of the farmer to add value to his produce‟ and, among others „the possibilities of reducing carbon emissions and waste through short production and distribution chains‟, and, if necessary, „accompanied by appropriate legislative proposals‟.

Recent years have seen a proliferation of initiatives to develop local food systems (LFS) and short food supply chains of many different types such as on-farm direct sales, farmer‟s markets and shops, delivery schemes and more formal partnerships between producers and consumers, not only in the European Union, but throughout the world. Such initiatives have become of increasing interest to researchers and policymakers as the global food chain expands

and extends across international boundaries, often distancing those for whom the food is destined for the stages of its creation, and in so doing „disconnecting" producers from consumers.

In recent years, as global food chains have expanded, a large array of terms has been used in academic, policy, technical or civic debates to illustrate innovative re-organizations of food supply chains aiming at re-connecting producers and consumers and re-localizing agricultural and food production. These include short supply chains, alternative food networks, local farming systems and direct sales. Short supply chain businesses are a local sale system, where Intermediates between producer and consumer are reduced. There exist two types of short supply chains, short circuits, and direct trades. Short supply chain distributions systems in Europe have always existed. They started to increase again since the 1990's because of a rise in demand for better sanitary conditions, traceability, closer relationships with the producers and for creating employment opportunities. (Kneafsey et al., 2013)

The prices of food are the main criteria that influence consumer purchase. Therefore, their willingness to buy local products might be translated into higher prices. Farm production costs per units are higher than the industrialized production. The reduction or elimination of intermediaries enables farmers to sell their products directly to the public and thus maximizing the return. However, things are changing nowadays as farmers are competing with the large retailers by adapting their prices according to the supermarket and hypermarket offers. Additionally, local production enables a cheaper final product price as the distribution takes place closer to the production area.

Consequently, buying locally and directly from the producer enables affordable products with a higher quality. This is beneficial for the agricultural sector as it helps to maintain and create employment opportunities in rural areas (Selfal et al., 2004).

Recent data suggest that the growth of local food sales through direct-marketing channels (roadside stands, farmer"s markets, on-farm stores, etc.) has reached a plateau while overall sales of local food, including sales intermediated through distributors, restaurants, and retailers are growing rapidly (Richards et al., 2017). One reason for the growth of local foods in intermediated grocery channels may be that consumers tend to purchase multiple food items on each purchase occasion because shopping involves substantial fixed costs. High fixed costs lead consumers to substitute away from making auxiliary stops for local produce at direct marketing channels when local food becomes available at multi-category grocery retailers. Therefore, farmers" markets and other outlets that sell only a limited selection of foods are less likely to accommodate consumers" demand for foods in a number of different categories relative to traditional supermarkets and hypermarkets. In addition, locally-sourced foods are now available at numerous supermarket and hypermarkets chains.

Taking these trends into account, our main objectives are: i) to study the prevalence of local fresh fruit and vegetables in supermarkets and hypermarkets in Zaragoza; ii) to investigate consumer"s perceptions towards local foods and purchase decision of local fresh fruit and vegetables; and iii) where consumers prefer to buy local fresh food and vegetables (direct from consumer, traditional greengroceries, supermarkets, etc.).

To do that, two types of research methodologies were employed in this study: qualitative and quantitative. The qualitative research methodology was applied through direct observation of the fresh fruit and vegetables available in different supermarkets in Zaragoza (Spain). The quantitative research methodology was an online survey targeted to shoppers of food products who live in Zaragoza older than 18 years old.

2. Fresh fruit and vegetable market

2.1. Fresh fruits and vegetables in Europe

2.1.1. Production

Almost 1 million holdings cultivated fresh vegetables according to the most recent (2013) farm structure survey which was 12.4 % of all European farms with an arable area. Nearly half (49.4 %) of those holdings were in just three countries: Romania (22.1 %), Poland (15.4 %) and Spain (11.9 %). By contrast, 15 countries accounted for shares of less than 1 % each (Figure 1).

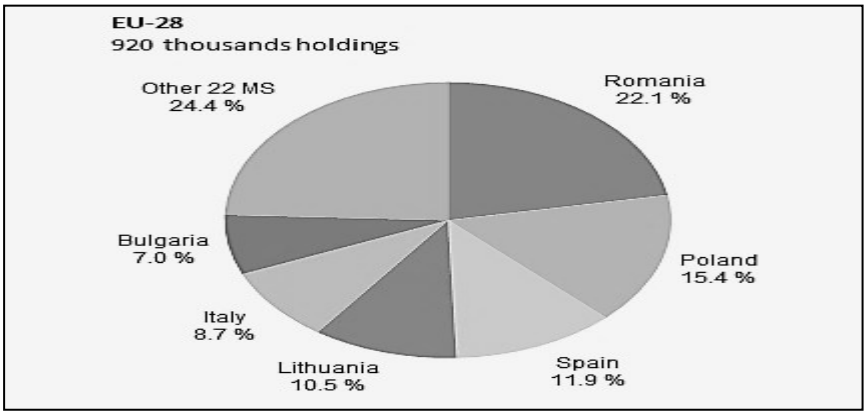

Figure 1. Holdings cultivated fresh vegetables in EU 28 in 2013 (%).
Source: Database of Eurostat

In 2015, almost 2.2 million hectares of land in the EU was used to produce vegetables for fresh consumption and for processing. This amounts to 1.9 % of all EU arable land (Figure 2).

Almost half (47.2 %) of the vegetable area was located in just three Member States. These were Italy (19.5 %), Spain (16.6 %) and Poland (11.1 %). This first group was followed by a second group made up of France (10.9 %) and Romania (7.1 %).

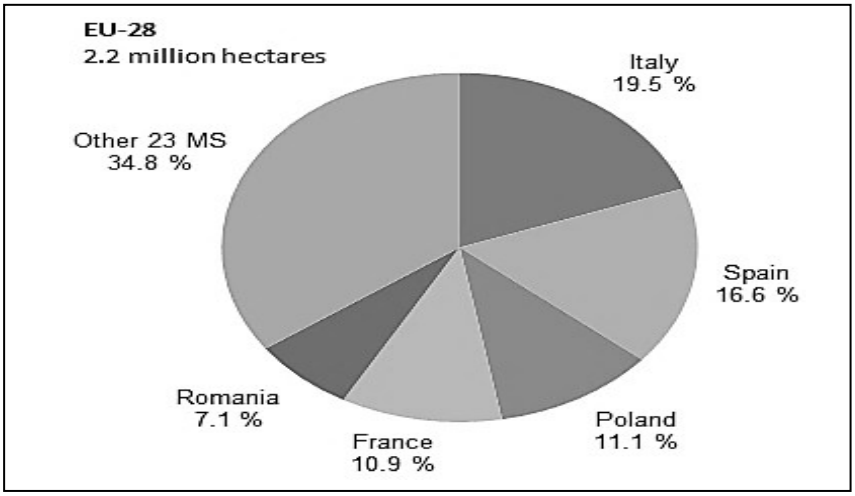

Figure 2. Fresh vegetables in EU-28, % distribution of production, by class of area size, 2015.
Source: Database of Eurostat

Among individual vegetable crops, tomatoes occupied the largest area, accounting for 11.7 % of the total vegetable area (Table1). The areas used to grow tomatoes were predominately in Italy (41.9 %) and Spain (22.8 %), followed at a distance by Romania (9.5 %), Portugal (7.3 %) and Greece (6.7 %).

Table 1. EU-28 tomato and apple, areas and harvests, 2015

	Tomato Area	Share of EU-28 area %	Harvested production	Share of EU-28 harvest %	Apple area	Share of EU-28 area %	Harvested production	Share of EU-28 harvest %
EU-28	255.6	100.0	17 657.6	100.0	532.9	100.0	12 686.0	100.0
Belgium	0.5	0.2	253.1	1.4	6.9	1.3	284.2	2.2
Bulgaria	3.3	1.3	121.7	0.7	4.8	0.9	58.4	0.5
Czech Republic	0.2	0.1	5.6	0.0	8.3	1.6	155.4	1.2
Denmark	0.0	0.0	10.6	0.1	1.4	0.3	35.7	0.3
Germany	0.3	0.1	80.9	0.5	31.4	5.9	973.5	7.7
Estonia	0.0	0.0	0.9	0.0	0.6	0.1	1.6	0.0
Ireland	0.0	0.0	4.4	0.0	0.6	0.1	18.8	0.1
Greece	17.2	6.7	1 086.4	6.2	12.1	2.3	281.8	2.2
Spain	58.2	22.8	4 838.7	27.4	30.7	5.8	593.6	4.7
France	5.7	2.2	787.9	4.5	49.6	9.3	1 967.1	15.5
Croatia	0.4	0.2	36.3	0.2	5.3	1.0	96.2	0.8
Italy	107.2	41.9	6 410.3	36.3	51.6	9.7	2 441.6	19.2
Cyprus	0.2	0.1	14.7	0.1	0.6	0.1	5.1	0.0
Latvia	0.0	0.0	6.1	0.0	2.4	0.5	7.8	0.1
Lithuania	0.5	0.2	7.7	0.0	10.7	2.0	65.0	0.5
Luxembourg	0.0	0.0	0.1	0.0	0.2	0.0	2.4	0.0
Hungary	2.1	0.8	200.0	1.1	30.0	5.6	500.0	3.9
Malta	0.0	0.0	12.0	0.1	0.0	0.0	0.0	0.0
Netherlands	1.8	0.7	890.0	5.0	7.6	1.4	335.9	2.6
Austria	0.2	0.1	55.7	0.3	6.6	1.2	287.6	2.3
Poland	13.8	5.4	789.6	4.5	180.4	33.9	3 168.8	25.0
Portugal	18.7	7.3	1 407.0	8.0	14.0	2.6	325.0	2.6
Romania	24.3	9.5	464.5	2.6	54.3	10.2	459.6	3.6
Slovenia	0.2	0.1	5.7	0.0	2.5	0.5	83.9	0.7
Slovakia	0.6	0.2	19.5	0.1	2.4	0.4	46.3	0.4
Finland	0.1	0.0	36.5	0.2	0.6	0.1	6.0	0.0
Sweden	0.0	0.0	14.8	0.1	1.3	0.2	25.4	0.2
United Kingdom	0.2	0.1	97.2	0.6	16.0	3.0	459.6	3.6
Iceland	0.0		0.1		:		:	:
Norway	:		:		:		:	:
Switzerland	0.2		45.7		3.9		141.7	:
Montenegro	0.0		2.7		0.1		2.8	:
FYROM	5.6		173.4		:		136.9	:
Albania	6.2		256.5		4.0		91.8	:
Serbia	:		:		:		:	:
Turkey	187.0		12 615.0		171.0		2 570.0	:
Bosnia and Herzegovina	3.5		41.2		:		91.5	:

Source: Database of Eurostat, 2015

Organic vegetable farming was practiced on 2.5 % of EU holdings cultivating fresh vegetables and on 5.3 % of the area dedicated to these crops. 12.6 % of all certified organic farms grew organic fresh vegetables. However, the area devoted to organic fresh vegetables made up just 1.3 % of all certified organically managed hectares.

Over half (53.6 %) of the total area dedicated to organic fresh vegetable cultivation was located in just three Member States: Poland (19.8 %), France (17.3 %) and Italy (16.5 %). These three were followed by Germany (13.0 %) and Spain (10.0 %) (Table2).

Table 2. Area and holdings producing fresh vegetables and fruit, 2013

	Area under organic fresh vegetables (ha)	Share of EU-28 area under organic fresh vegetables (%)	Holdings producing organic fresh vegetables (number)	Share of EU-28 holdings producing organic fresh vegetables (%)	Area under organic fruit and berry (ha)	Share of EU-28 area under organic fruit and berry (%)	Holdings producing organic fruit and berry (number)	Share of EU-28 holdings producing organic fruit and berry (%)
EU-28	85 240	100.0	23 210	100.0	257 340	100.0	44 670	100.0
Belgium	510	0.6	190	0.8	360	0.1	70	0.2
Bulgaria	890	1.0	240	1.0	10 490	4.1	1 490	3.3
Czech Republic	160	0.2	50	0.2	4 890	1.9	390	0.9
Denmark	1 800	2.1	250	1.1	370	0.1	160	0.4
Germany	11 120	13.0	1 940	8.4	8 550	3.3	1 350	3.0
Estonia	140	0.2	380	1.6	1 670	0.6	620	1.4
Ireland	:	:	:	:	0	0.0	0	0.0
Greece	820	1.0	560	2.4	1 010	0.4	680	1.5
Spain	8 540	10.0	1 800	7.8	93 630	36.4	7 940	17.8
France	14 770	17.3	4 590	19.8	18 110	7.0	3 470	7.8
Croatia	180	0.2	170	0.7	3 490	1.4	760	1.7
Italy	14 030	16.5	4 520	19.5	41 820	16.3	11 530	25.8
Cyprus	20	0.0	20	0.1	60	0.0	110	0.2
Latvia	280	0.3	940	4.0	740	0.3	790	1.8
Lithuania	170	0.2	300	1.3	6 170	2.4	750	1.7
Luxembourg	40	0.0	20	0.1	40	0.0	20	0.0
Hungary	1 630	1.9	80	0.3	4 110	1.6	410	0.9
Malta	:	:	:	:	:	:	:	:
Netherlands	5 710	6.7	400	1.7	490	0.2	130	0.3
Austria	2 610	3.1	760	3.3	2 530	1.0	1 240	2.8
Poland	16 870	19.8	4 540	19.6	48 360	18.8	9 110	20.4
Portugal	440	0.5	240	1.0	4 970	1.9	730	1.6
Romania	110	0.1	70	0.3	1 420	0.6	660	1.5
Slovenia	240	0.3	330	1.4	1 320	0.5	1 740	3.9
Slovakia	280	0.3	10	0.0	1 260	0.5	40	0.1
Finland	320	0.4	250	1.1	500	0.2	220	0.5
Sweden	1 310	1.5	300	1.3	380	0.1	120	0.3
United Kingdom	2 250	2.6	260	1.1	600	0.2	140	0.3
Norway	210	:	170	:	220	:	170	:

Source: Database of Eurostat, 2013

More than 1.5 million holdings in the EU managed fruit orchards. According to the 2013 farm structure survey, 1.55 million holdings managed fruit orchards. This figure represents 14.6 % of all European farms with „utilized agricultural area". Nearly half (47.9 %) of those holdings were in just three countries: Romania (18.7 %), Spain (16.5 %) and Poland (12.7 %). By contrast, 15 countries accounted for less than 1 % each (Figure 3).

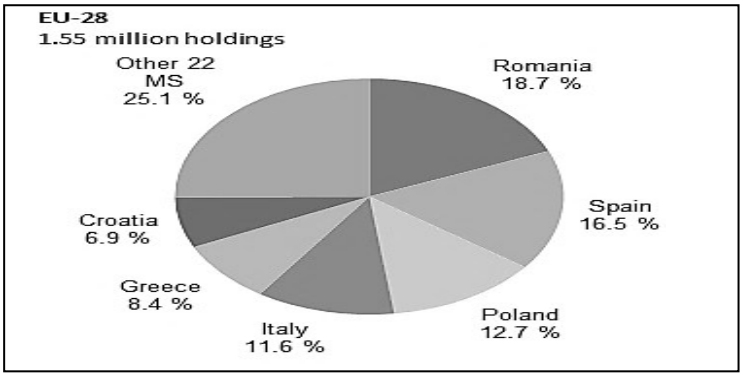

Figure 3. EU-28 fresh fruit, holdings cultivated fresh vegetables, 2013.
Source: Database of Eurostat.

In 2015 two thirds (66.6 %) of the area devoted to fruit was located in just three Member States. Spain (37.7 %) was first in the ranking, followed by Italy (16.8 %) and Poland (10.1 %). These three were followed by Portugal (6.7 %) and Greece (6.1 %) (Figure 4).

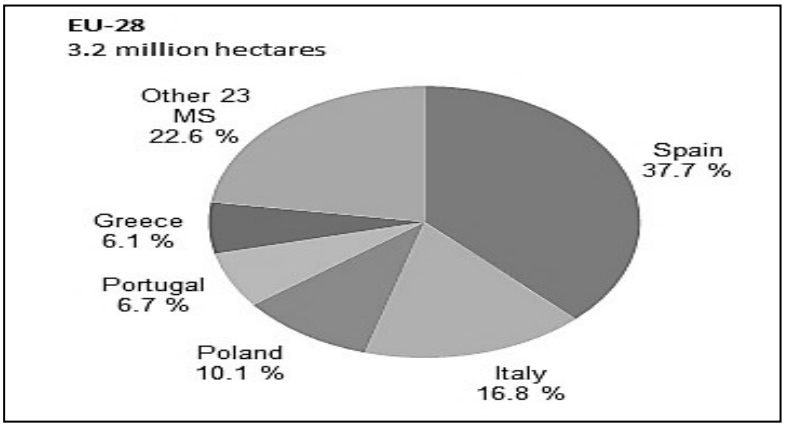

Figure 4. EU-28 fresh fruits, production cultivated fresh vegetables, 2015.
Source: Database of Eurostat

Apples were the second most common single species with a share of 16.5 % and were grown in all Member States. One third (33.9 %) of all EU apple orchards were situated in Poland, where apples covered more than half (53 %) of the total fruit area. Poland was followed at a distance by Romania (10.2 %), Italy (9.7 %) and France (9.3 %) (Table1).

Spain accounted for over one third (36.4 %) of the total European area covered by organic orchards, followed by Poland (18.8 %) and Italy (16.3 %); all the other Member States have much lower shares (Table 2).

2.1.2. Consumption

In the EU-28 two-thirds of the population consumed at least one portion of fruit and vegetables daily. The most recent data from the European Health Interview Survey (EHIS) show that daily consumption of fruit and vegetables in 2014 was widespread across all Member States, albeit with different patterns. In the EU-28, on average a third (34.4 %) of the population aged 15 or over did not consume any fruit or vegetables in a day; half (51.4 %) the population ate daily from 1 to 4 portions of fruit and vegetables, while the residual 14.1 % consumed more than 5 portions a day.

The smallest share of no daily consumption (16.1 %) was recorded in Belgium, along with the highest share (71.2 %) of from 1 to 4 portions consumed in a day. The opposite was found in Romania, where almost two thirds (65.1 %) of the population did not consume any fruit or vegetables daily. In the United Kingdom, one third (33.1 %) of the population consumed more than 5 daily portions, in Denmark, it was 25.9 % and in the Netherlands 25 %. On the opposite side, in Romania and Bulgaria, 3.5 % and 4.4 % of the population respectively, ate more than 5 portions of fruit and vegetables in a day (Table 3)

Table 3. EU-28 Daily consumption of fruit and vegetables, 2014

	Not daily	Daily	
		From 1 to 4 portions	5 portions or more
EU-28	34.4	51.4	14.1
Belgium	16.1	71.2	12.7
Bulgaria	58.6	37.0	4.4
Czech Republic	46.3	44.6	9.1
Denmark	37.6	36.5	25.9
Germany	45.2	44.9	9.9
Estonia	34.9	47.8	17.3
Greece	30.1	62.1	7.8
Spain	25.0	62.6	12.4
France	34.7	50.4	14.9
Croatia	27.5	65.5	7.0
Italy	23.0	65.2	11.9
Cyprus	32.6	51.3	16.1
Latvia	48.5	40.2	11.4
Lithuania	41.5	44.5	14.1
Luxembourg	36.2	48.7	15.1
Hungary	33.1	56.8	10.1
Malta	35.6	47.6	16.8
Netherlands	45.9	29.0	25.0
Austria	31.8	61.1	7.2
Poland	33.2	56.8	10.1
Portugal	20.7	61.1	18.2
Romania	65.1	31.4	3.5
Slovenia	27.0	65.5	7.5
Slovakia	46.6	42.6	10.8
Finland	42.3	44.8	12.9
Sweden	36.5	54.5	9.0
United Kingdom	21.3	45.6	33.1
Norway	30.9	62.6	6.5
Turkey	33.7	63.2	3.0

Source: Database of Eurostat, 2014

2.1.3. Trade

Among the Member States, the Netherlands and Spain were the main exporters followed by Italy and France. Fresh fruit and vegetables were traded mainly on the European market: Spain was the leading trader. Figure 5 shows that Spain exported more than 10 million tons of fresh fruit and vegetables in 2017 followed by Netherlands. It has also significant difference with other countries like Poland, Greece and Portugal in terms of fresh fruit and vegetables exported quantities as these countries were the least important in that filed.

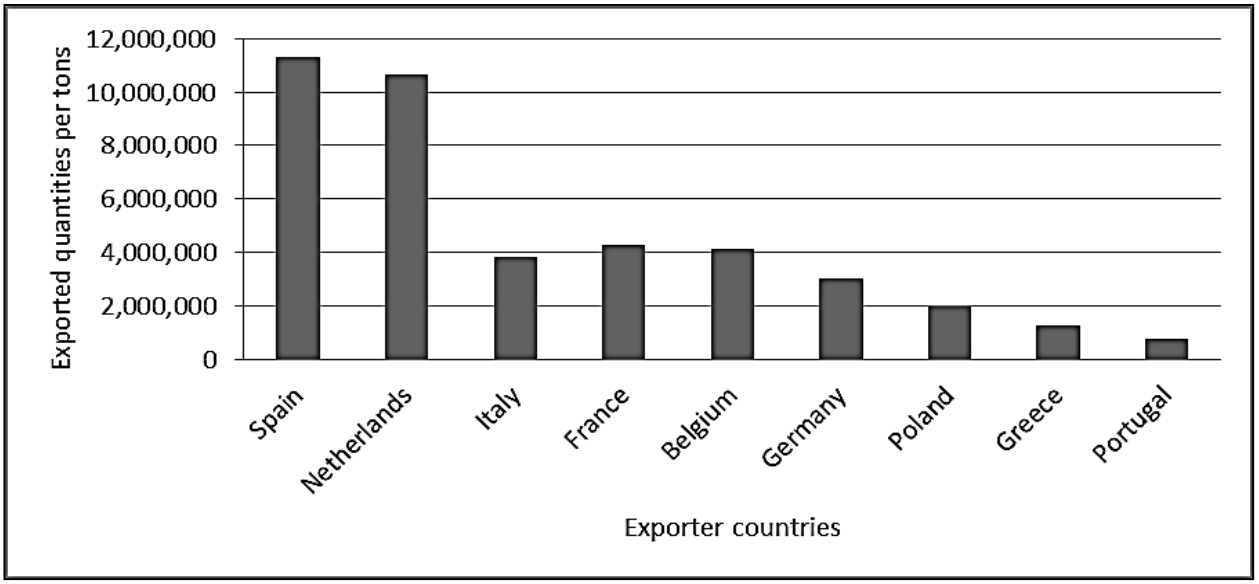

Figure 5. Exported quantities of fruit and vegetables in EU28, 2017
Sources: ITC calculations based on UN COMTRADE and ITC statistics

In 2017, the EU imported quantities from fresh fruit and vegetables were concentrated more in Germany with approximately 9 million tons, followed by Netherlands with more than 7 million tons in the same year, where UK and France were kind of at the same level with about 6 million tons of imported fresh fruit and vegetables in 2017. The least imported amount of fresh fruit and vegetables was in Denmark, Lithuania and Sweden with less than 1 million tons in the same year (Figure 6).

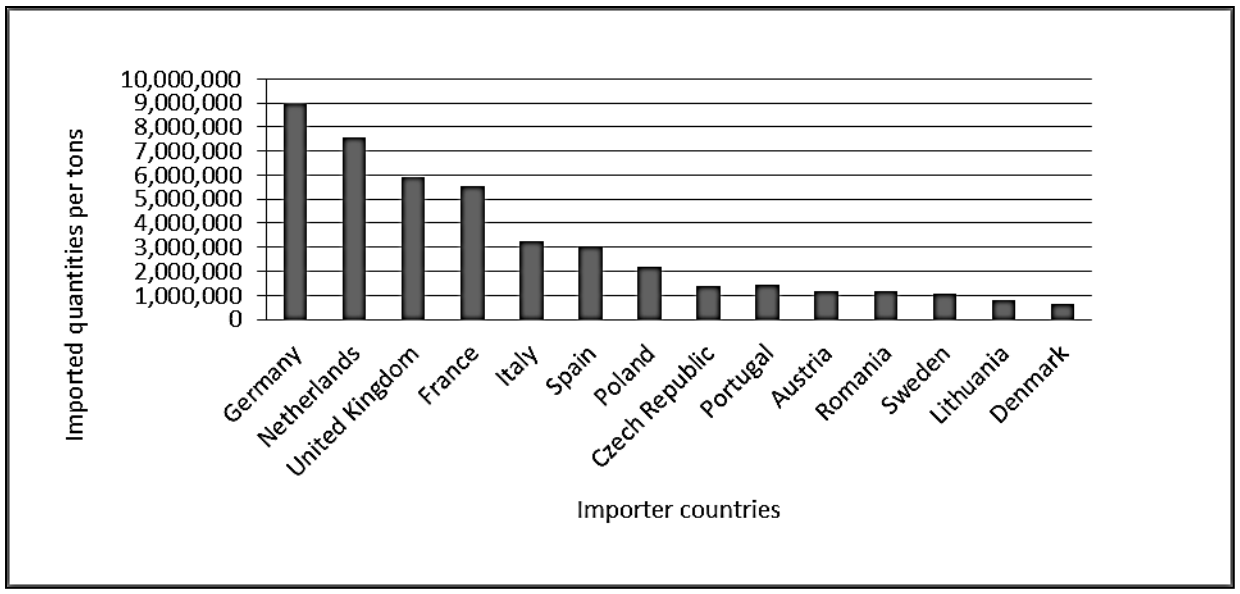

Figure 6. Imported quantities of fruit and vegetables in EU28, 2017.
Sources: ITC calculations based on UN COMTRADE and ITC statistics

2.2. Fresh fruit and vegetables in Spain

2.2.1. Production

Fresh fruit and vegetables is the most important sector in the Spanish agriculture, accounting for 65% of crop output. With regard total agricultural production, which includes crops plus livestock production, fruit and vegetables account for 39 per cent of the total.
The value of the production of the fruit and vegetables (not including flowers and plants, wine grapes or olives) stands at 10,000 million euros (average 2008 - 2013) contributing 41% of the Vegetable Production and 24% of the Production of the Agrarian sector, which places it as the most important sector in the agrarian sector as a whole.

Spain produces 22 million tons of fresh fruit and vegetables, approximately 60% of which are exported. In addition, an estimated 8.5 million tons is used for transformation.

Spain allocates just over 800,000 hectares to fruit and vegetable production, a mere 5 per cent of the cultivated area in Spain, 151,000 hectares of which are used for growing vegetables, 56,000 hectares for potatoes, 312,000 for citrus fruit and 280,000 for non-citrus fruits, according to data published by the Ministry of Agriculture, fisheries, Food and the Environment, processed by FEPEX. (Fepex, 2018)

Figure 7 shows that most produced fruits in Spain are citrus (orange, tangerine and lemon) followed by peach, apple and nectarine.

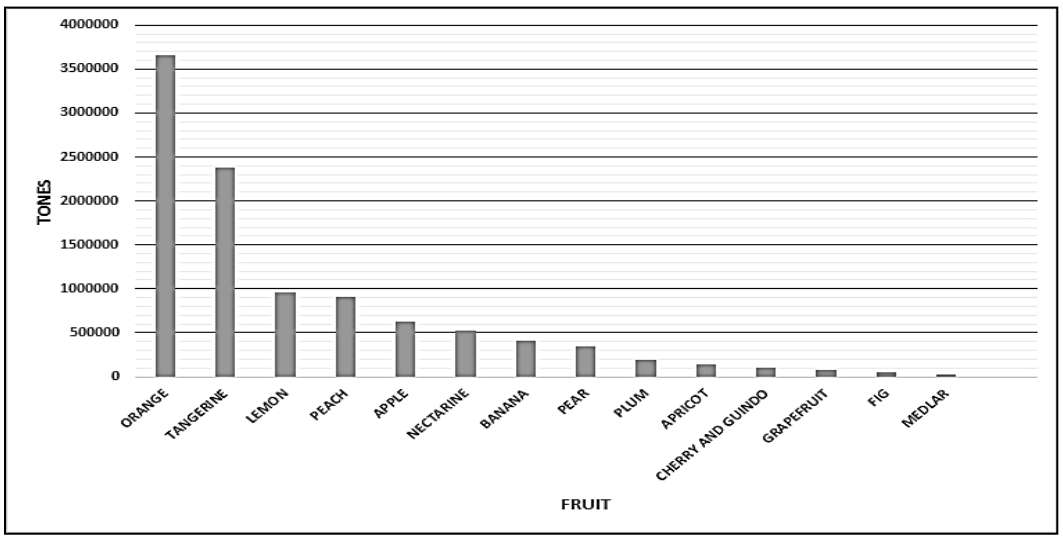

Figure 7. Production of the fresh fruit in Spain in 2016
Source: Database of MAPAMA

Figure 8 shows the most produced vegetable in Spain according to the statistics published by the Ministry of agriculture, fisheries, food and environment of the year of 2016 is tomato followed by potato and onion.

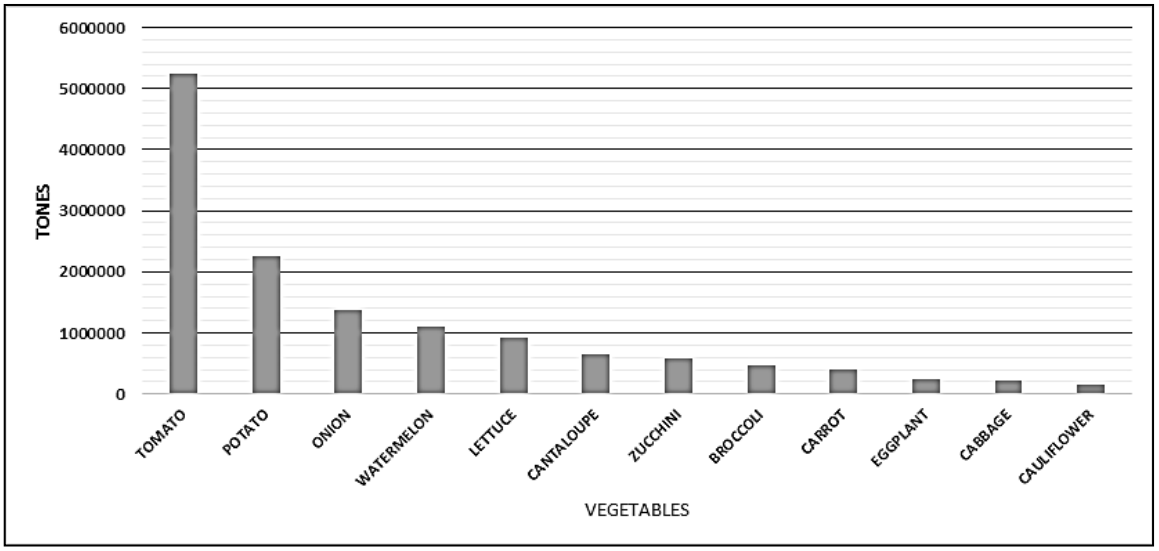

Figure 8. Production of fresh vegetables in Spain in 2016
Source: Database of MAPAMA

2.2.2. Consumption

Figure 9 shows the per capita consumption of fresh fruit in Spain in 2016, broken down by type. In total, 99.54 kilograms of fresh fruit were consumed per capita throughout this period. Oranges had the highest per capita consumption with 19.59 kilograms, closely followed by bananas, which amounted to 12.15 kilograms.

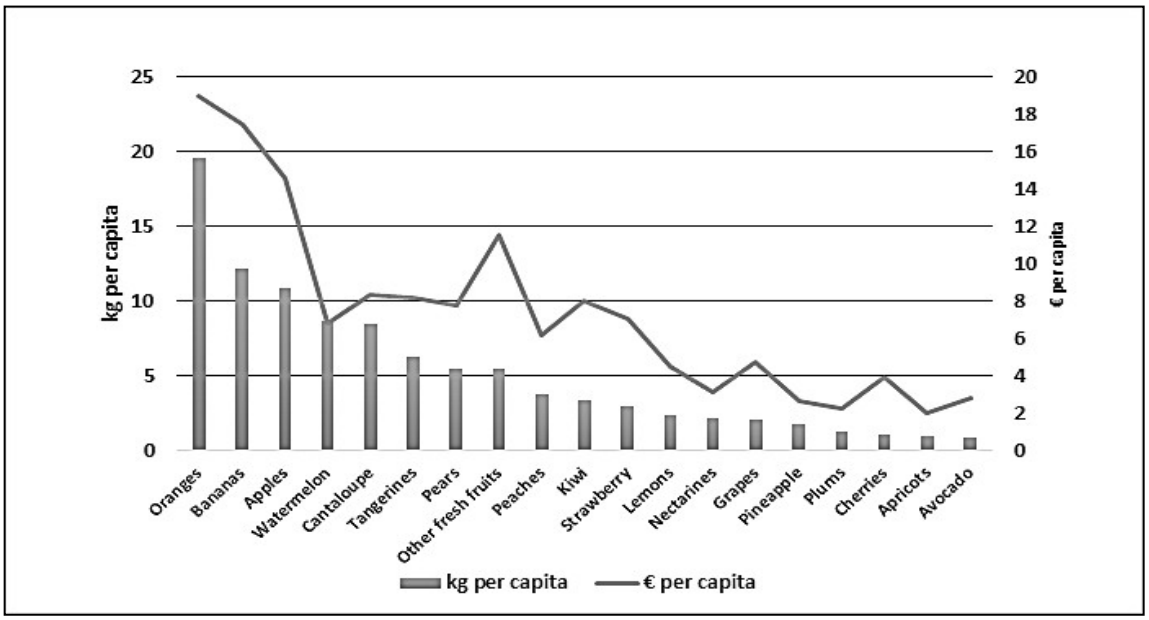

Figure 9. Per capita consumption of fresh fruit by product in Spain in 2016
Source: Database of MAPAMA

Figure 10 shows that fresh potatoes had the highest per capita consumption at 23 kilograms, closely followed by tomatoes, which amounted to 14.5 kilograms.

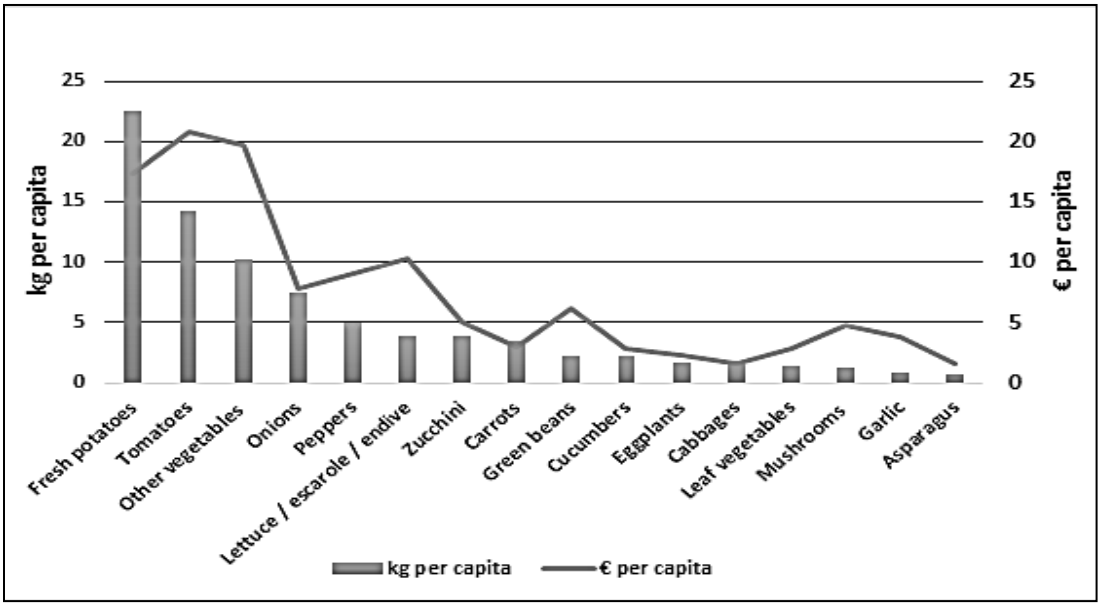

Figure 10. Per capita consumption of fresh vegetables by product in Spain in 2016
Source: Database of MAPAMA

2.2.3. Trade

Spain is the most important exporter of fresh fruit and vegetables globally. This has been the case for a long time. In recent years, Spain‟s share in the total world trade of fresh fruit and vegetables has always been around 10 per cent.
Spanish export, which grew until 2014, has remained stable at that level in 2015 and 2016.

Figure 11 shows that the largest Spanish export products are tomatoes (more than 900,000 tones) followed by lettuce (more than 700,000 tones) than pepper and cucumber.

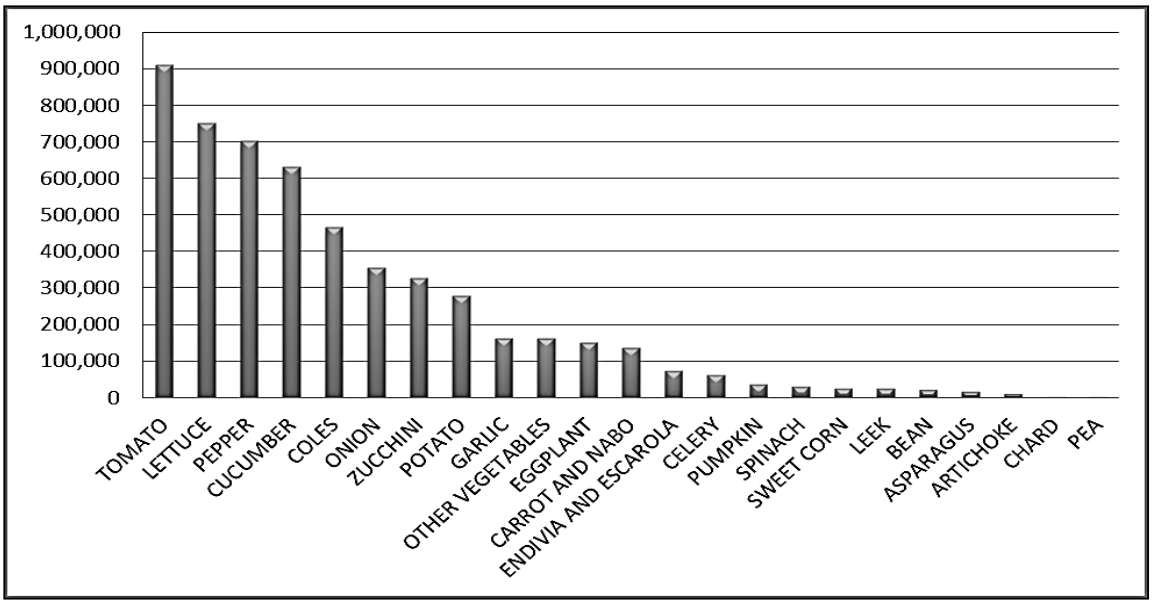

Figure 11. Spanish exports of fresh vegetables by product in 2016 (tones)
Source: Database of MAPAMA

Figure 12 shows that citrus are the fruit which Spain managed to sell abroad more. In fact, oranges are Spain"s most important export fruit (more than 1500,000 tones), followed by tangerines (more than 1400,000 tones)

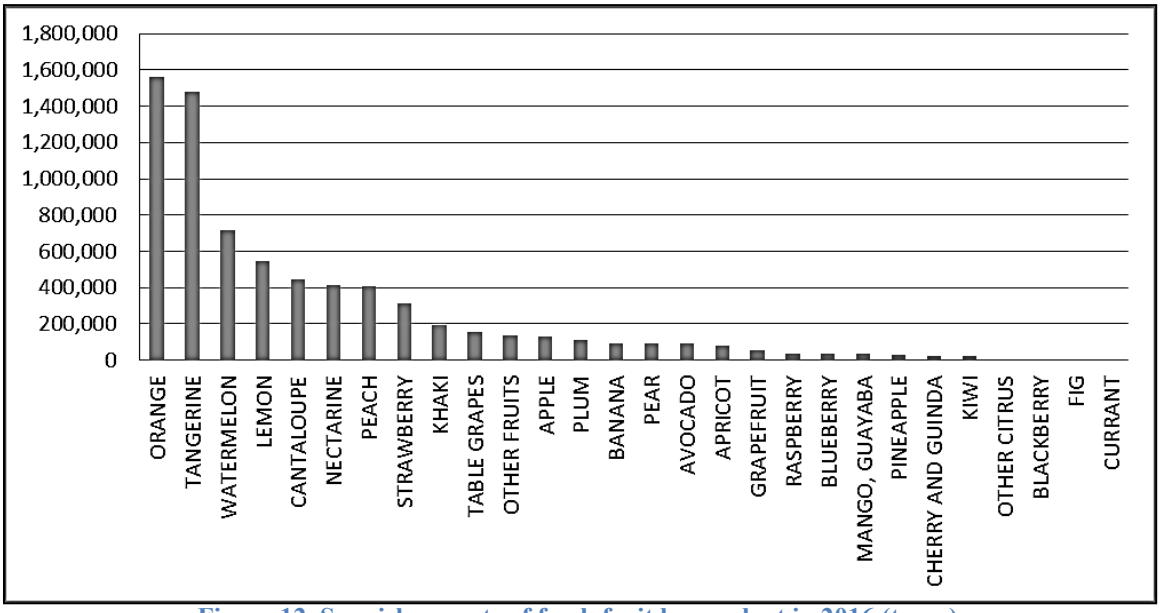

Figure 12. Spanish exports of fresh fruit by product in 2016 (tones)
Source: Database of MAPAMA

Spanish imports of fresh fruit and vegetables totaled 1.7 million tons and reported revenues of 1,389 million Euro. (CentralAmericaData, 2016)

Figure 13show that banana is the most imported fruit with a volume that has amounted to almost 250 thousand, followed by apple than orange.

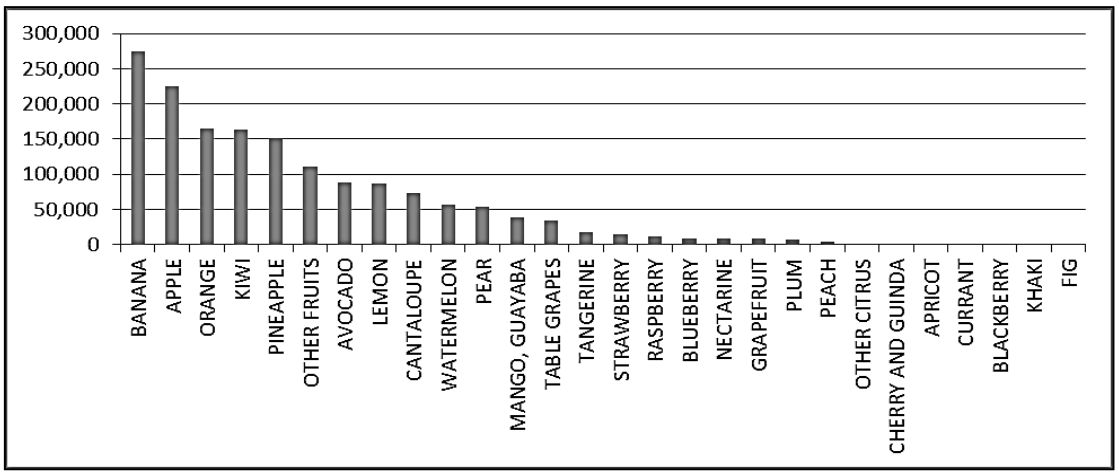

Figure 13. Spanish imports of fresh fruit by product in 2016 (tones)
Source: Database of MAPAMA

Figure 14 shows that the most imported vegetables are potato with a volume of 700 thousand followed by tomato, bean and onion.

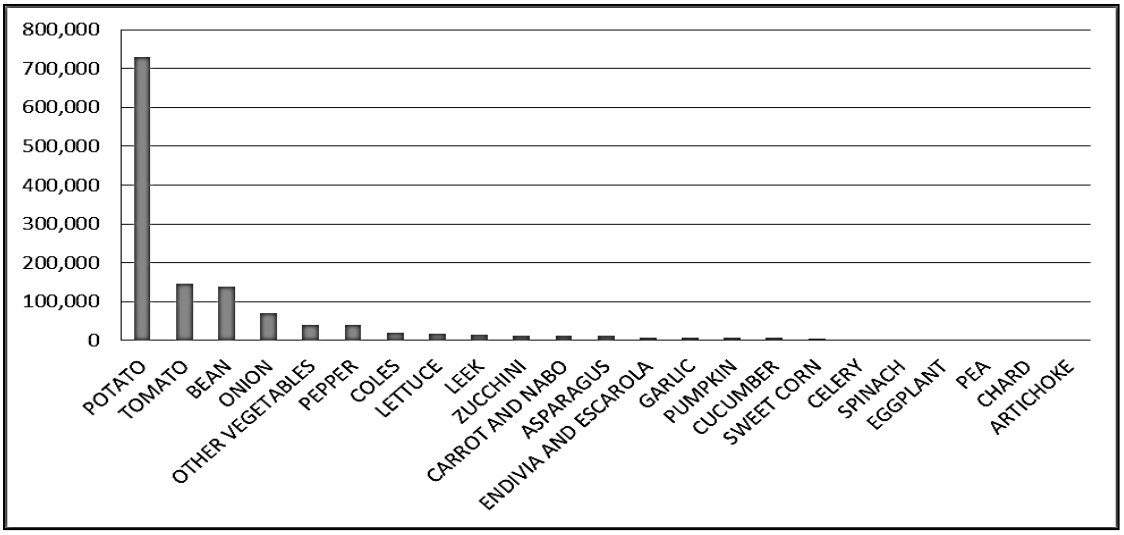

Figure 14. Spanish imports of fresh vegetables by product in 2016 (tones)
Source: Database of MAPAMA

2.3. Fresh fruits and vegetables in Aragon

2.3.1. Production

Table 4 shows that the most important fruits in terms of production in Aragón are peaches (38.89%), nectarines (22.67%) and apples (13.45%).

The production of peach represents the 29.69% of the total Spanish production but the cherries and guides represents a 38.52% and nectarines a 30.13%. In total, the production of fruit in Aragón represents the 6.03% of the total fruits produced in Spain (MAPAMA, 2016). One example of a peach produced in Aragón is the famous "Melocotón de Calanda", it's a peach produced in Calanda (Teruel).

Table 4. Production of fresh fruits in Aragón in 2016

Fruit	Production in tones	Percentage of the production of this product on total fruit production
Peach	268092	38.89%
Nectarine	156301	22,68%
Apple	92719	13.45%
Pear	62051	9.00%
Cherry and guindo	38717	5.62%
Apricot	11284	1.64%
Plum	9337	1.35%
Fig	431	0.06%
Other fruits	50379	7.31%
Total	**689311**	100%

Source: Database of MAPAMA

Figure 15 shows that the most important vegetables in terms of production in Aragón are onion (37.35%), tomato (17.50%), green peas (14.31%) and cabbage (12.28%) (MAPAMA, 2016). The production of borage in Aragón represents the 47.42% of the total production of Spain followed by green peas (38.65%) and cabbage (16.92%). The production of vegetables in Aragón represents the 2.05% of the total vegetables produced in Spain (MAPAMA, 2016).

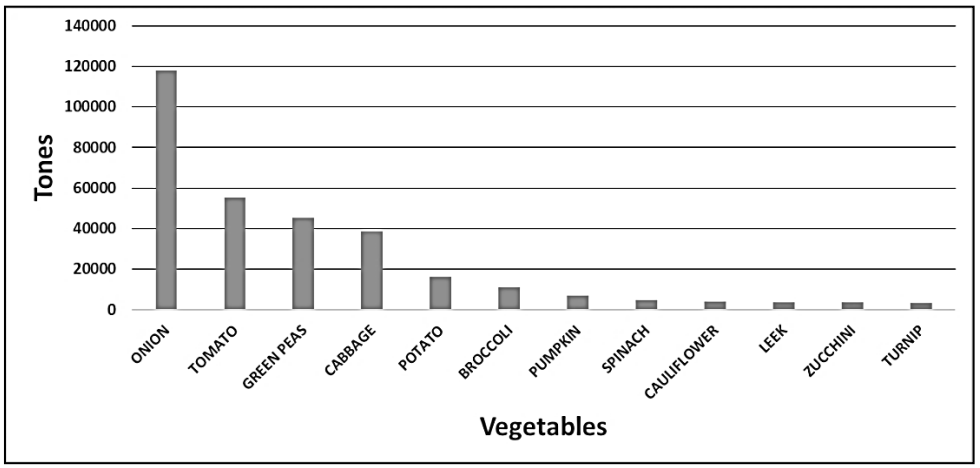

Figure 15. Production of the fresh vegetables in Aragón in 2016
Source: Database of MAPAMA

2.3.2. Consumption

Figure 16 shows that oranges, apples and bananas are the most consumed fresh fruits representing more than 50% of the total fruit per capita consumption. Aragón does not produce citric, then it need to import oranges, tangerines, etc. In the case of apple and pear, Aragón produced these fruits and the consumption is high.

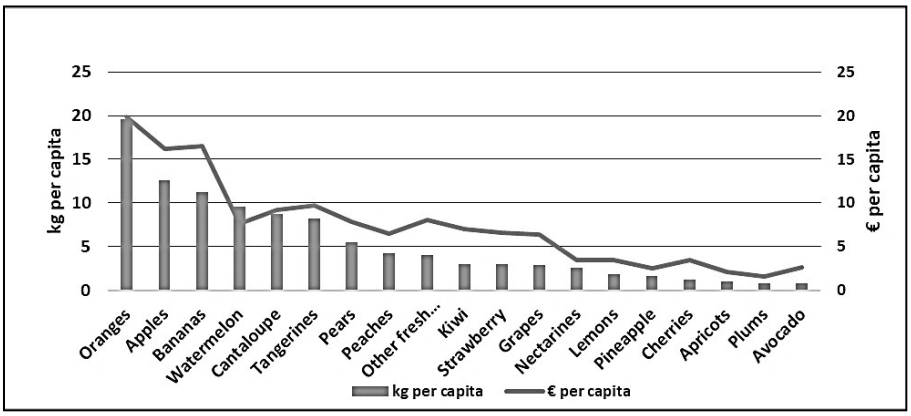

Figure 16. Fresh fruits per capita consumption in Aragón in 2016
Source: Database of MAPAMA

Figure 17 shows that potatoes, tomatoes, onions and lettuce/escarole/endive are the most consumed and they represent more than the 50% of the total vegetables per capita consumption in Aragón.

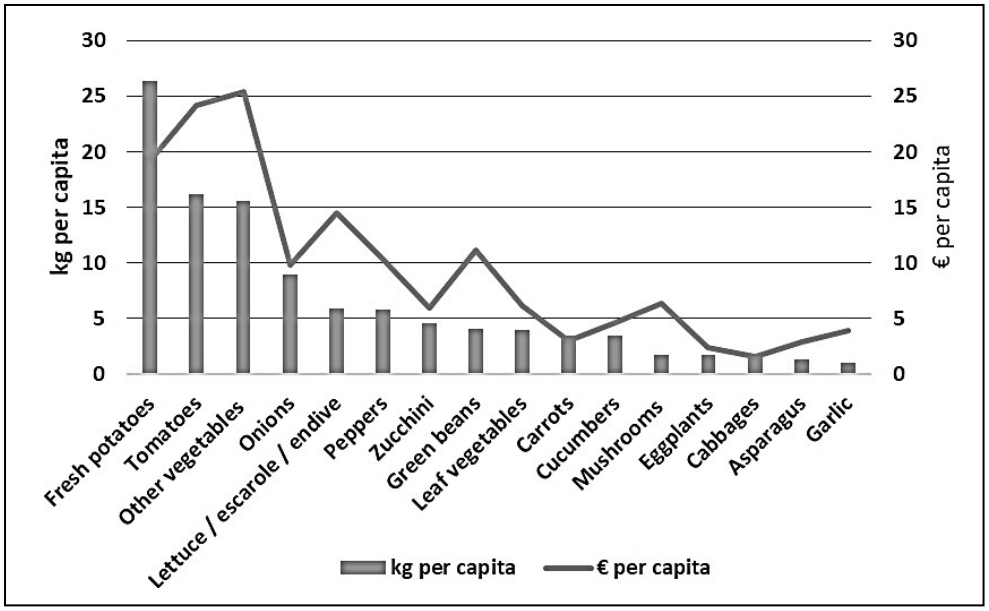

Figure 17. Fresh vegetables per capita consumption in Aragón in 2016
Source: Database of MAPAMA

3. Food products distribution channels

3.1. Fresh fruit and vegetables purchase by type of outlet

Figure 18 shows the fresh fruit purchase by type of outlets in 2016 and the variation from 2015. It is observed that fresh fruits are mainly purchase in traditional stores (35.4%) and supermarkets (30.9%). In addition, the percentage bought in supermarket is increasing.

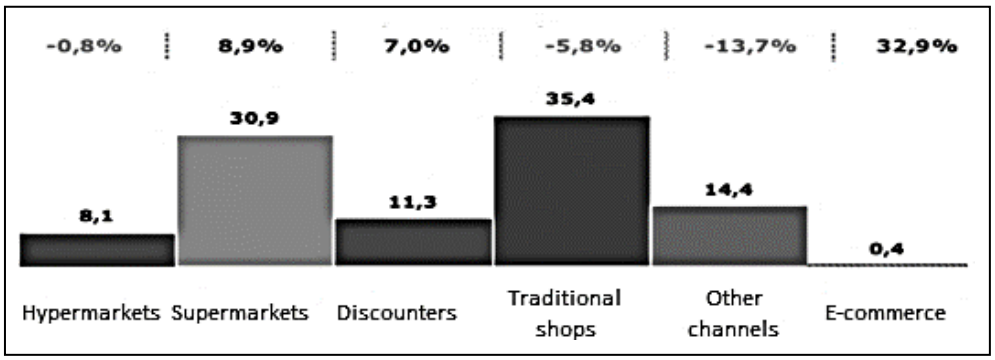

Figure 18. Fresh fruit purchases by type of outlet in Spain (%) in 2016.
Source: MAPAMA

In the same way, Figure 19shows the figure for fresh vegetables and potatoes. We can observe the same trend. Fresh vegetables are mainly purchased in traditional shops (31.8%) and supermarkets (29.1%) and these percentages are decreasing (-5.1%) and increasing (7.5%) respectively.

Figure 19. Fresh vegetables purchase by type of outlet in Spain (%) in 2016
Source: MAPAMA

Therefore, we focus our work on local fresh and vegetables sold in supermarkets because they presented one or the highest purchase share with and increasing trend.

Before, it‟s showed the percentage of the distribution channel quota, now it will show the average price of these products in the different channels.

First, it showed the average prices of fresh vegetables and potatoes, the Figure 20 shows that the price increased in all channels but in e-commerce decreased because every year the logistic it‟s more good, also the time of delivery is less.

Figure 20. Average price (€/Kg) of fresh vegetables in different channels in 2016 and variation between 2015 and 2016

Source: MAPAMA

In the case of fresh fruit, Figure 21, it"s the same, increased in all channels less in e-commerce. Here the highest average price is in traditional shops (1.46€/Kg) following of self- service supermarket (1.44€/Kg), but in fresh vegetables and fresh potatoes is in self-service supermarkets (1.57€/Kg) following of hypermarkets (1.55€/Kg).

Figure 21. Average price (€/Kg) of fresh fruits in different channels in 2016 and variation between 2015 and 2016

Source: MAPAMA

3.2. The retailer's distribution in Aragon

3.2.1. Food retailer sector

Figure 22 presents the market share of the most important retailers in Spain. It is observed that five companies represent more than 50% of the distribution channel. Mercadona has the highest quota in Spain (24.5%), almost a quarter of the total, following by Carrefour (8.6%) and Dia (7.5%). Mercadona, Dia and Eroski are mainly supermarkets while Carrefour and Auchan Group are hypermarkets. LIDL is a hard discounter.

Mercadona, it"s a national company with national providers specially from the "Comunidad Valenciana" because this company was created there. Mercadona strategy is low prices and few references of products.

Dia company follow a similar strategy of Mercadona and was created in Spain and work with national providers. They sell a big quantity of references of private labels to be competitive in low prices like Mercadona. Dia doesn‟t work with national providers of fruit and vegetables of Aragón but work with other autonomous communities. Dia and Simply are located in each part of the city, but in each part can be 3 or 4 supermarkets of this groups.

The case of Eroski it‟s similar, but this channel has less supermarkets in the parts of the city only 1 or 2. Both Dia and Mercadona are supermarkets that we can consider like basics because they are to go to shop basic products not special.

Carrefour, it‟s a french company with mainly hypermarkets that sells a lot of references. Their help to promote local products like fruit and vegetables between others (Carrefour, 2017). They don‟t have big prices but have a lot of references and a big quantity of different products. Their locals are situated on the outskirts of the city center; in Zaragoza has 2 supermarkets each one in a different commercial center. It‟s similar like Alcampo. Like Dia and Mercadona, also, Carrefour has centers in Zaragoza, Huesca and Teruel.

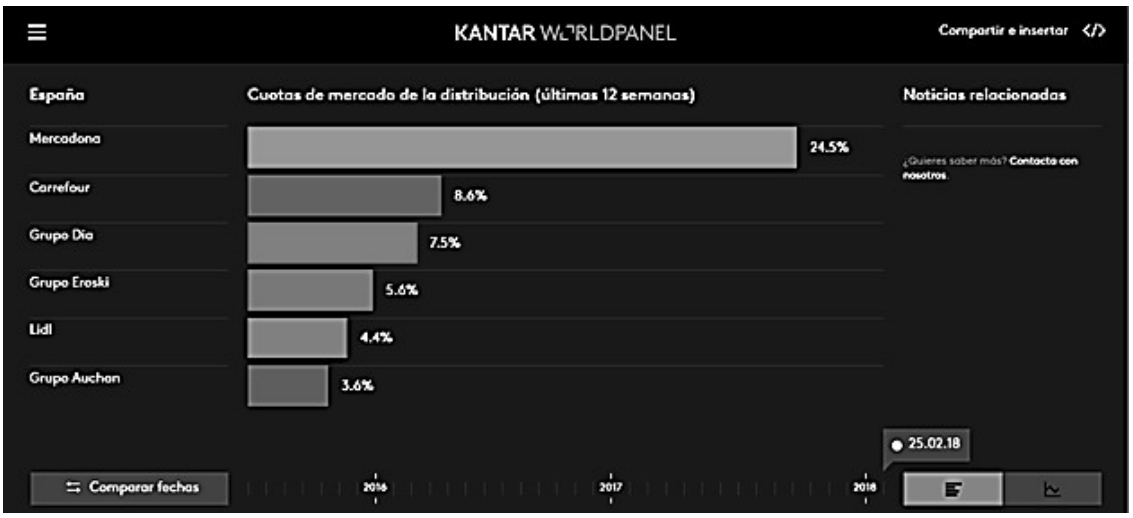

Figure 22. Distribution channel quota in Spain a date of 25th of February of 2018, the main groups.
Source: Kantar Worldpanel

Figure 23 shows the importance of retailers in Aragón in terms of commercial surface. The first company per commercial surface is Dia (22.7%) followed by Auchan group with Simply included (20.5%) and in the third position its Mercadona (15.7%). The total of surface is 373,878 m2 distributed in 704 shops. In comparison to 2016 the surface has decreased in a 0.8%, by provinces in Zaragoza decreased in 0.9%, in Huesca a 0.6% and Teruel 0.3% (Alimarket, 2018).

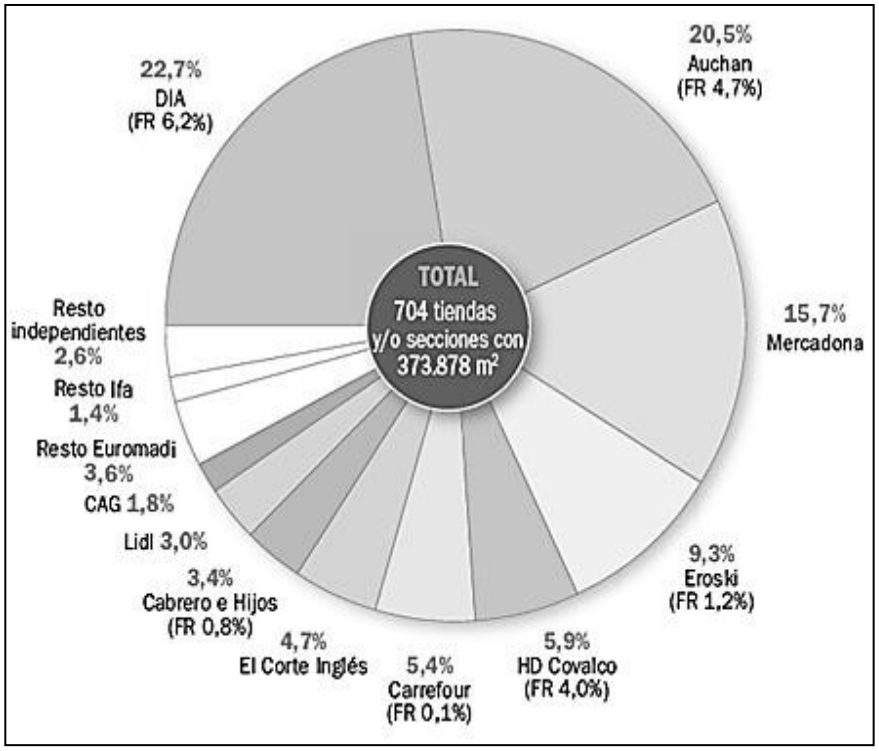

Figure 23. Retailers importance in Aragón.
Source: ALIMARKET 2018

Figure 24 shows the evolution of the importance of the different retailers brands. The largest increased correspond to Carrefour (1.3%) followed by Mercadona (0.6%). Only Eroski and Simply decreased their surface.

		2016	2017
MERCADONA		15,1%	15,7%
DIA	(1)	10,4%	9,8%
EROSKI	(2)	8,9%	8,8%
la plaza		7,9%	8,0%
SIMPLY	(1)	6,7%	6,5%
Carrefour		3,7%	5,0%
Alcampo		4,2%	4,2%
HIPERSIMPLY	(1)	4,1%	4,1%
caliment		3,4%	3,6%
DIA	(1)	3,0%	3,4%

(1) Includes franchises, (2) Includes the "Eroski Center" line and franchises.

Figure 24. Evolution of quotas on commercial area of the main brands in Aragon (%) between 2016 and 2017.
Source: ALIMARKET

4. Methodology and analysis tools

In this chapter, we explain the methodology employed during this research, describe the instrument used to collect consumers' information, the sample selection, and justify the statistical methods used in the data analysis.

Two types of research methodologies were employed in this study: qualitative and quantitative. The qualitative research methodology was applied through direct observation of the fresh fruit and vegetables attributes available in different supermarkets in Zaragoza (Spain). The quantitative research methodology was conducted through a survey targeted to shoppers of food products who live in Zaragoza older than 18 years old.

4.1. Qualitative Research Methodology

A qualitative research methodology was employed to assess the prevalence of local fresh fruit and vegetable market in Zaragoza and their characteristics (brand, type, price, origin, etc.). In the present research, we used observation as the qualitative research method. (Cohen, 2016) define this type of method as "a systematic data collection approach." The observation of fresh fruits and vegetable products and the attributes was conducted by visiting eight supermarkets in Zaragoza: *Simply*, *Eroski*, *Mercadona*, *Carrefour*, *Alcampo*, *Hipercor*, *Lidl*, and *Dia*. Those supermarkets were chosen because they represent the highest market share. The objective of the visit was to observe and gather the following information about the different fruits and vegetable available in each of the supermarkets:

- Price: mainly price per kilo.
- Origin: this refers to the geographic origin of production. We were interested in the local origin (Aragon)
- The variety: for instance, for apple (Golden delicious, Royal gala, etc.)
- Type of packaging: bulk, tray, bag or others (in the case of some vegetables)

The information gathered in order to know about the main types of fresh fruits and vegetables that are produced locally in Aragon which are commercialized in supermarkets, at different varieties, prices, and packaging types.

4.2. Quantitative Research Methodology

Surveys are typically conducted to obtain primary data that can be used to assess trends and conditions, to advance the understanding on a particular topic, to test theories, to develop business strategies and much more. Surveys can be conducted by questionnaires (self-administered in face to face online) or by interviews (by phone or in person) (Bill, 2011).

Commonly surveys rely on the responses of a sample population to gauge the feelings of a larger population. Two common examples are surveys to assess public opinion (mostly used by the media and elected officials or government) and surveys to assess consumer preferences and interests mostly used by businesses and marketing firms (Bill, 2011). The later survey corresponds to the one used in the present work. The stages of the survey are (Blair et al., 2015):

- Survey design;
- Questionnaire design and pre-test;
- Sample selection;

- Data collection and coding;
- Analysis and interpretation of results;
- Report of results.

Each of these steps is important and requires accuracy and consistency but in reality, surveys are not error free. The procedures used in conducting a survey have direct effects on the outcomes. In order to avoid mistakes, a careful survey design is compulsory. The research questions and the objectives must be clearly and precisely defined. Furthermore, for the available resources (sampling, frame, budget, time), is necessary to choose the appropriate survey method to reduce errors and to maximize the description accuracy of what is being measured.

Other important decisions are sampling and questionnaire design. These elements should be consistent with all the objectives and expected results of the consumer survey.

4.2.1. Survey design

An online survey was chosen as the instrument to collect data. Online surveys involve programming and emailing a set of questions to consumers. This method can include many of the same questions and formats as written (self-administered) surveys and telephone surveys. Online surveys can be globally distributed via a hyperlinked URL embedded in an email and can be sent with one mouse click – making it very fast and easy. No volunteers are needed to distribute or administer the survey. Online surveys are active and available 24 hours a day, for a limited period of time. The online platform selected to conduct the survey is Qualtrics – the world‟s leading Research & Insights platform and software (Qualtrics). The clear interface and organized structure of this platform helped to introduce more easily the questionnaire, to manage the survey and to follow the evolution. The consumer survey was launched on March 26th, 2018 and closed on April 25th, 2018.

An online survey method was used to conduct the surveys for the following reasons:

- Questionnaires can be easily distributed;
- No distribution costs (neither paper nor printers are required);
- No need to wait for respondents to return the completed questionnaire;
- The order of questions can be preprogramed;
- The ease with which the questionnaire can be modified without adding additional expenses;
- The responses are automatically entered in a database and can be easily analysed or exported;
- It allows a simple tracking of response rate;
- It can be programmed to enforce the mandatory response to questions (respondents cannot pass to another question if they do not answer a previous one).

However, the online survey is not lack of limitations list following:

- Respondents must have ready access to the internet and be “computer literate,” i.e., they must be able to use a browser, a mouse and/or keyboard;
- Due to the fact that the use of computers requires some acquired skills, the expected respondents will be younger adults with a higher level of studies;
- The computer system can go down or be unreliable;

- Dependency for the Internet connection;
- An unbalanced sample of respondents by education level and age.

4.2.2. Questionnaire design

Once a survey method (online, web-based survey) has been selected, the next step is to determine the specific questions to be asked to collect appropriate information according to the objectives. It is very important to minimize response error when creating the questionnaire. Good information requested to the respondent, encourage respondents to cooperate, and elicit accurate information. The questionnaire should also be reliable and consistent. Generally, the questionnaire design process is composed of sequential steps:

- Listing research questions;
- Listing the survey‟s topics and the respective questions;
- Searching for questions from other surveys (can give the possibility to compare the results and pre-test the survey and is less expensive, but language issues can occur);
- Assessing the appropriate variables based on the objectives of the survey;
- Drafting survey cover letter (introduction);
- Drafting new questions;
- Proposing the questions order and organization into blocks;
- Revising all questions (identifying weaknesses, reading out loud);
- Pre-testing (try draft on colleagues);
- Beginning of revisions;
- Repeating the test on colleagues (pilot testing);
- Launching.

The questions must be carefully worded, double-checked by an unbiased reader, and pre-tested to ensure they are understood in the way we intended them to be. A poorly worded question will greatly increase the risk of response error and limit the usefulness of the collected data. Designing good questions involves selecting those that meet the research objectives, testing them to make sure they can be asked and answered as planned, then formatting them to make it easy for respondents to understand them (and interviewers to ask them) and to answer them.

The questionnaire begins with an introduction to inform about the scope of the research, and the objectives, to ask for collaboration, to thank the potential respondent and to ensure confidentiality and anonymity. This introduction or cover letter was followed by 3 blocks of questions (see the full questionnaire in Spanish in Appendix 1). In total there were 32 questions. The blocks were the following:

First block: CONSUMPTION AND PURCHASE HABITS

Gathers information about the consumption and purchasing‟s habits for fresh fruits and vegetables.

- Who is the responsible for buying food in the respondents home (Q1)
- The main motives of purchasing food products: price, health, taste, place of production and convenience (Q2)

- Which of the following type of fruits and vegetables are usually bought by the respondents whether it‟s; fresh, frozen, canned, etc. (Q3)
- Frequency questions about how often the respondents eat fresh fruits and vegetables and how many pieces per day and how many servings per day. (Q4)(Q5)(Q6)
- The importance attached by respondents to different fruits and vegetables characteristics; colour, size, price, location, origin, etc. (Q7)
- Questions about the place of purchasing and the importance attached to different food store characteristics. (Q8) (Q9) (Q10)
- Whether respondents pay attention to the local origin of the fruits and vegetables. (Q11)
- Which aspects associated the most with local food. (Q12)

Second block: LOCAL FOODS

Before asking the second block about local foods, neutral information on local foods was presented. The following paragraph was provided to participants:

Local foods are those produced and consumed in a nearby geographical area, sold directly by the farmer or through a single intermediary that must communicate to the consumer that it is a local food. In our case, the food produced in Aragon can be considered local.

the questions included were:

- Consumer‟s perceptions about local food. (Q13)
- Whether respondents usually buy local fresh fruits and vegetables if no, for which a list of reasons. (Q14) (Q16)
- Respondent‟s intention to buy local fresh fruits and vegetables in the future. (Q15)
- Where the respondents have bought or believe they would be able to buy local fresh fruits and vegetables: Traditional grocery /fruit shop, Supermarkets/hypermarkets, Directly from the farmer, etc. (Q17)
- Consumer preferences about the place of purchase, price and information in the store about local fresh fruit and vegetables (Q18 till Q20)

Third Block: SOCIO-DEMOGRAPHIC CHARACTERISTICS

Include questions regarding the demographics of respondents; Age, Gender, Household size, Education level, Province of residence, Income level, etc. (Q21 to Q32). For a more comprehensive approach to data collection and taking into account that our research is mainly a quantitative one, most of the questions were closed, forced-choice questions and qualifiers. For a more organized collection of primary data, we used the different levels of measurement in our questions, such as:

1. Nominal measurement (unordered categories): For the questions about gender (Male/Female) and Yes/No questions. For instance:
    - Q30. Do you belong to any nature conservation association? Yes/No

2. Ordinal measurement (ordered categories):

    - Frequency questions:

Q4. How often do you eat fresh fruits and vegetables at home?
Q5. How many pieces of fruit do you eat per day?
Q6. How many servings of vegetables and/or salads do you eat per day?

- Ratings:

Q7. When buying fresh fruits and vegetables, how important are the following characteristics: Colour, Size of the piece, Production place (national, regional, etc.), Price, Perfect appearance (no visual defects), that are ecological, that have a Denomination of Origin, that are produced near my location and that have been produced in my region.

4.2.3. Pilot test

The pre-test instrument was developed to obtain the same information as expected in the consumer survey, to test the questionnaire, to verify that all the questions are clear, and to reduce possible errors. These surveys were conducted in person and in a self-administered format in order to assess respondent's understanding, and readiness to answer. The chosen sample for the pilot survey was composed of university workers and residents of Zaragoza city centre. After implementation and analysis of the pilot study, small modifications were made to the questionnaire. These changes included the format and wording of some questions. Also, there was significant repetition in the consumption part, therefore it was modified to obtain an online survey easier to understand and that would yield more accurate answers. The pilot test was conducted from 16/3/2018 till 20/3/2018.

4.2.4. Sample

A sample is a subset of a larger population, that is, the set of elements from which we draw conclusions. We use sampling in order to generalize and make inferences about the population of interest.

Target population: is composed of „food shoppers" older than 18 years living in the city of Zaragoza (Spain). Zaragoza is a landlocked city in North-Eastern Spain. It is bisected by the Ebro River, with the Pyrenees Mountains at its north. Aragon, with Zaragoza as its capital, is the inland autonomous community with the most kilometres of river, making agriculture and the production of vegetables and fruits one of its most important economic forces.

In order to minimize sampling bias and to have an accurate representation of the target population the guidelines of representative sampling have been followed (Kruskal, 1979), which include:

- Coverage bias

Coverage bias can occur when population members do not appear in the sample frame, creating deviations between the observed values and the population parameters.

Online surveys suffer from a well-known source of coverage bias because they are not able to reach a significant proportion of the elderly population (i.e. Above 65 years of age) who are, for

the most part, non-frequent Internet users and have a low utilization rate of electronic devices (i.e. computers, smartphones etc.).

- Non-response bias: response rate

Non-response bias occurs if the answers of respondents differ from the potential answers of those who did not answer. As previously mentioned, in this study an online questionnaire was conducted, resulting in some non-response bias related to the older population of over 65 years of age. This can be explained by taking into consideration that respondents of this age group do not frequently use the Internet.

- Minimize sampling error

The question of "How big should the sample be?" was answered by accepting a maximum of 7% sampling error, which requires a sampling size of 200 respondents. Our study is based on a total sample size of 212 respondents stratified by age and gender.

Table 5 summarizes the technical details of the survey. For a confidence level of 95% (k = 2), „p' and „q' equal to 0.5 in the infinite population, our sampling error was 6.5%. Taking into account that the population of Zaragoza can be considered infinite, this error was calculated according to the following formula:

$$N = 4 * p * q / \varepsilon 2$$

Where: N is the total sample size; p = 0.5 for a maximum sample size; q = 1 – p; ε is the sampling error.

Table 5. Technical details of the survey.

Characteristics	Details
Population:	Food shoppers who live in Zaragoza older than 18 years old.
Area:	Zaragoza, Spain.
Sample size:	212 surveys
Sample error:	+/- 7%
Confidence level:	95% (k=2)
Method of collecting data:	Online questionnaire (Qualtrics platform)
Date of fieldwork:	March-April 2018

Source: Own

4.2.5. Statistical methods of analysis

The statistical analysis helps to examine, summarizing, calculating, and interpreting quantitative data obtained from questionnaire responses, with the intention to fulfil the research objectives. Table 6 summarizes the statistical analyses performed in this study and their respective objectives.

To perform the different statistical analysis in our research, the version 23 of the statistical software Statistical Package for the Social Sciences (SPSS) was used. SPSS is commonly used for survey analysis. Qualtrics, the software platform used to conduct the present survey, provided the results of the survey as a „sav" file with raw data, variables and value labels ready to be used in SPSS.

Table 6. Statistical analysis and objectives.

Statistical analysis	Objectives
1. Univariate analysis	- To summarize the socio-demographic and economic characteristics.
2. Multivariate analysis • Regression (Ordinary Least Squares) • Factor analysis • Cluster analysis • Ordered PROBIT analysis	- To perform studies across multiple dimensions while taking into account the effects of all variables on the responses of interest. - To identify factors determining the intentions to purchase. -To establish groups of objects based on measurements that represent the objects.

Source: Own

Table 7 summarizes the statistical analysis in relation to the research objectives. This table shows the different variables according to the specific study objectives and the methods used.

Table 7. The statistical analysis in relation to the research objectives.

Objectives	Variables	Analysis methods
1. Socio-demographic characteristics	A) Age, gender, income, level of education, household size, Province of residence.	A) Frequency and mean
2. Consumption behavior	A) The frequency of consumption of fruits and vegetables.	A) Frequency
3. Purchase behavior and importance of different attributes	A) Importance when shopping to price, place of origin, packaging, brands etc. B) Outlet types (Grocery, Supermarkets, Directly from the farmer)	A) Factor analysis B) Frequency
4. Intention to purchase local fresh fruits and vegetables	A) Intention to purchase local fruit and vegetables.	A) Frequency / Factor analysis A) PROBIT analysis A) Segmentation of consumers and characterization

Source: Own

- Univariate analysis

Univariate analysis is the simplest form of quantitative analysis, which provides a short abstract of the study results. Univariate analysis was utilized in the first descriptive stage of this research, prior to conducting more advanced inferential bivariate or multivariate analysis. The univariate analysis can differ according to the nature of the data (nominal or metric). In this way, if variables are nominal, the frequency and the percentage were calculated and then presented in charts or tables. As for the metric variables, the mean and the standard deviation were calculated (Grande et al, 2009).

- Multivariate analysis

Multivariate analysis is the second statistical type of analysis used. It refers to all statistical techniques that simultaneously analyse multiple measurements on individuals or objects under investigation. Thus, any simultaneous analysis of more than two variables can be considered multivariate analysis (Hair et al, 2010).

This type of analysis is used to perform studies across multiple dimensions while taking into account the effects of all variables on the responses of interest.

In multivariate analysis, techniques are classified according to two criteria: data properties, whether data is non-metric or metric and the relationship between variables, and variable properties, whether the relationship is dependent or interdependent. According to these criteria, different types of multivariate analysis exist.

For the purpose of the research objectives we have utilized three types of multivariate analysis:

- Regression analysis of hedonic prices (using ordinary least square).
- Factor analysis
- Cluster analysis
- Ordered PROBIT model.

Regression analysis of hedonic prices

This analysis started it‟s used to developed applications related to the field of advertising (Azqueta, 1994). Hedonic pricing is a model, which identifies price factors, according to the premise that price is determined both by internal characteristics of the good being sold and external factors affecting it (Investopedia, 2018).

The model has been used in a large number of studies, for example, Angulo et al., (2000) or Sanjuán et al., (2004). Considering Freeman (1992) the hedonic price equation was specified; where the price (P) of a good (Y) depends on the set of characteristics of the good (Q1, Q2,...,Qk), all the characteristics are considered from the first to K. Therefore, we will have K characteristics that determine the price, in such a way that the equation is as follows for each product Y:

$$PYi = PY\ (Qi1, Qi2,\ldots,Qik)$$

Where (Qi1, Qi2,…,Qik) are the product characteristics. In this study, two specifications of this equation were used the linear and the semi logarithmic function both of them were estimated using ordinary least square and results show that the semi-log is the best specification for our empirical application.

Factorial analysis

Factor analysis is a statistical approach that can be used to analyse interrelationships among variables and to explain their common underlying dimensions. The objective is to find a way of condensing the information contained in a number of original variables into a smaller set of variants (factors) with a minimal loss of information. By providing an empirical estimate of the structure of

the variables considered, factor analysis becomes an objective basis for creating summated scales (Hair et al, 2010).

Below is a summary of the steps required in a factor analysis: (Hair et al, 2010)

- Confirmation that data is metric;
- Calculation and examination of the correlation matrix between all variables. Factorial analysis is meaningless if there is not a high correlation between variables. This is measured through Bartlett's test of sphericity, KMO index or by analyzing the coefficient of multiple correlations;
- Extraction of the factors that represent the data by the extraction of the major pair components. In this method, the various factors are obtained in a sequential order, from highest to lowest according to the percentage of variance they explain in the original data; normally these factors with eigenvalues greater than 1 are selected.
- Rotation of the factors in order to facilitate interpretation. Normally factors are interpreted according to the correlations between them and the original variables. Sometimes the interpretation is difficult because some variables are not sufficiently correlated with factors. In this case, a Varimax rotated factor analysis was carried out to identify a smaller set of factors and determine what they represent and generate high correlations between factors and variables;
- Calculation of each individual factor scores that can be used in subsequent analysis. Considering that each factor is a linear combination of the original variables and that each individual gave different ratings to these variables, it is possible to obtain the scores given to each individual factor.

Cluster analysis

Cluster analysis is a multivariate method which aims to classify a sample of subjects (or objects) on the basis of a set of measured variables into a number of different groups such that similar subjects are placed in the same group. It‟s done by applying Heretical cluster analysis first in order to identify rang number of cluster solutions. Secondly a K-means cluster analysis was conducted with three clusters in order to define the membership in each cluster.

Ordered probit model

An ordered probit model is used to estimate relationships between an ordinal dependent variable and a set of independent variables. An ordinal variable is a variable that is categorical and ordered, for instance, “Never”, “Rarely”, “Sometimes”, “Often”, “Always” which might indicate a person‟s current status or habit. Because our endogenous variable (local buyer (Question 14) was defined and categorical a dummy variable with three levels (1= hardly ever, 2= sometimes and 3= usually), we specified an ordered probit model to investigate the factors explaining the frequencies of purchase of local fresh fruit and vegetables.

The ordered probit model is based on a latent model and specified as follows:

$$FP^{*}=\beta X_i+u_i$$

Where FP* is the frequencies of purchase, β is the vector of parameters to estimate, X_i is a vector of all exogenous variables (Locally produced, Intrinsic and extrinsic attributes, Healthy and tasty, Social and environmental welfare, Supermarket and Hypermarket), and u_i is the error term normally distributed N(0, σ_u^2). FP* is the frequency of buying stated by the individual which is observed and measured by three levels (hardly ever, sometimes and usually). The model has been estimated with SPSS.

5. Results

After careful examination of the collected data, we derived results for each of the components studied during the supermarket observation and through the consumer survey. The qualitative information was divided by importance in order to reach the objectives of the present research. The quantitative information was analysed based on the blocks of the questionnaire. As explained in the methodology, several statistical methods were employed in the analysis of the quantitative data. In the following section we present the results of the collected data (both the qualitative and quantitative).

5.1. Supermarkets' observation results

The qualitative method of the present research was conducted through direct observation in supermarkets. We collected data about different fruit and vegetable brands and their intrinsic and extrinsic attributes (i.e. origin, price, packaging, variety, etc.).

In total, eight supermarkets were visited. Simply, Eroski, Mercadona, Carrefour, Alcampo, Hipercor, LIDL and Dia. The access to the data in seven of them was permitted in the first visit but in the case of Hipercor the access to the data was not allowed and a personal contact with communication manager was needed to get permission to gather the information. Then, by the end of March we had observations from eight supermarkets.

The first results of this section show general information about all the brands sold in every supermarket observed. Then in order to have the updated version of this data we made the second visit to the same supermarkets that we have visited including Hipercor.

The results include, but are not limited to the total number of fruit and vegetable brands, price, variety, type of packaging and origin of production. The following products were selected previously to be included in our study; the cabbage, the borage, the potato, the chard, the tomato, the onion, the pear and the apple because they are more or less available all the year and they are produced in Aragon. In this chapter, the descriptive results will be discussed from the visits made to the supermarkets and the results of the hedonic price analysis will be shown.

Figure 25 shows that the most prevalent products in supermarkets are apples (27.5%) followed by tomatoes (25.00%) and potatoes (15.6%).

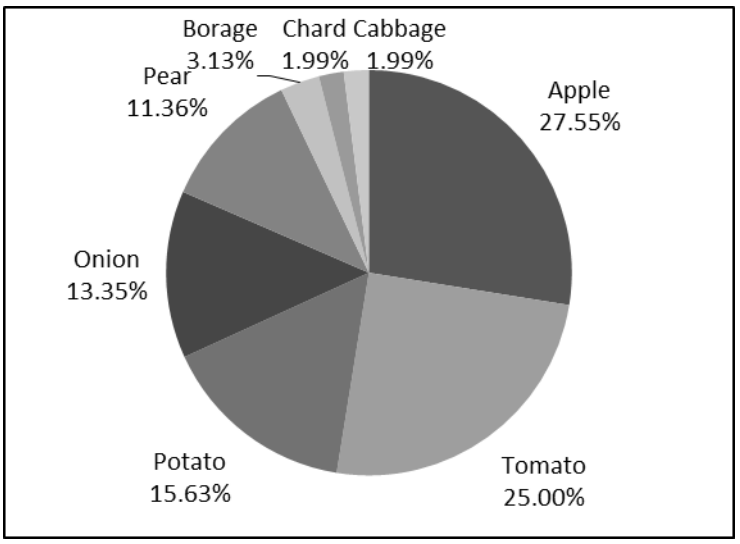

Figure 25. Percentage of the total observations by product
Source: Own

Table 8 shows the average price range of the products in all supermarkets. The highest variability corresponds to tomato because the price fluctuates from 0.75€/Kg to 9.98€/kg. Thishighest price for tomato is 9.98€/kg in Hipercor. To point out that cabbage‟sprices is for piece no per kilo.

Table 8. Price range of all products in all supermarkets

Products	Price range
Cabbage	0.99-2.75€/piece
Chard	0.79-3.63€/kg
Borage	0.99-4.99€/kg
Pear	0.89-5.99€/kg
Onion	0.59-5.58€/kg
Potato	0.49-3.30€/kg
Tomato	0.75-9.98€/kg
Apple	1.29-5.99€/kg

Source: Own

Table 9 provides information on fruits and vegetables sell in Alcampo. It can be observed that 100% of tomato sold in Alcampo was produced in Spain but not in Aragon. Borage has the highest average price in Alcampo because one of the references it‟s sold in a plastic tray cut and cleaned. In the case of packaging, apples are mainly sold in bulk and pear, 50% are sold in plastic tray and the other 50% in bulk. Vegetables are sold in different formats and only some onions and potato are sold in mesh bag.

Table 9. Information gathered in Alcampo

	Percentage of the origin of the products over the total number of references of each product			Average price	Most common packaging
	Aragon	Spain	From outside of Spain		
Onion	0%	62%	38%	1.66€/kg	Mesh bag
Chard	50%	50%	0%	1.45€/kg	Bundle and plastic bag
Cabbage	0%	100%	0%	1.89€/piece	Plastic bag
Borage	100%	0%	0%	2.94€/kg	Plastic tray
Apple	19%	36%	45%	2.03€/kg	Bulk
Pear	20%	60%	20%	2.00€/kg	Bulk and plastic tray
Potato	0%	27%	73%	1.16€/kg	Bulk and plastic bag
Tomato	0%	100%	0%	2.65€/kg	Bulk

Source: Own

For apples and pears, Figure 26 and Figure 27 shows the distribution of these products by variety. According to Figure 26, the most common variety for apples is Golden delicious (18%) followed by Granny Smith (13%), Fuji (13%) and Red delicious (12%). These represent more than 50% of all varieties sold in Alcampo. Now, this supermarket has also introduced varieties that are not so familiar for consumers like Braeburn.

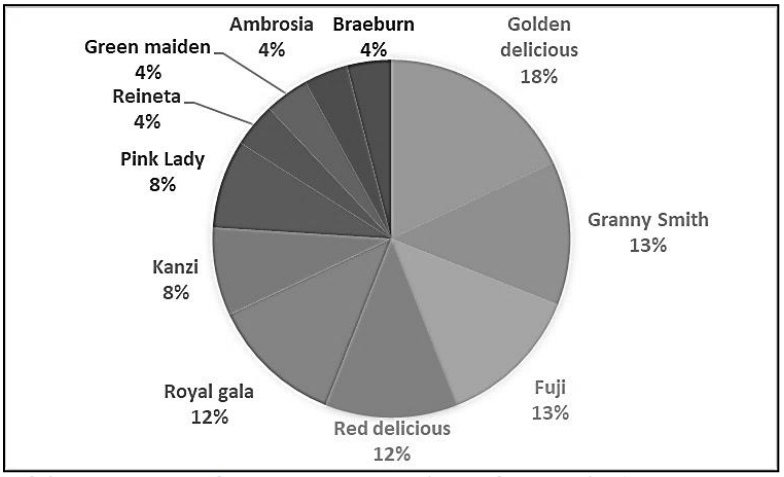

Figure 26. Percentage of the total observations of apples in Alcampo by variety

Source: Own

Figure 27 shows the variety of pear Blanquilla is the most commonly in Alcampo (40%) followed by Conference, Ercolina and Rocha wich represent a 20% respectively.

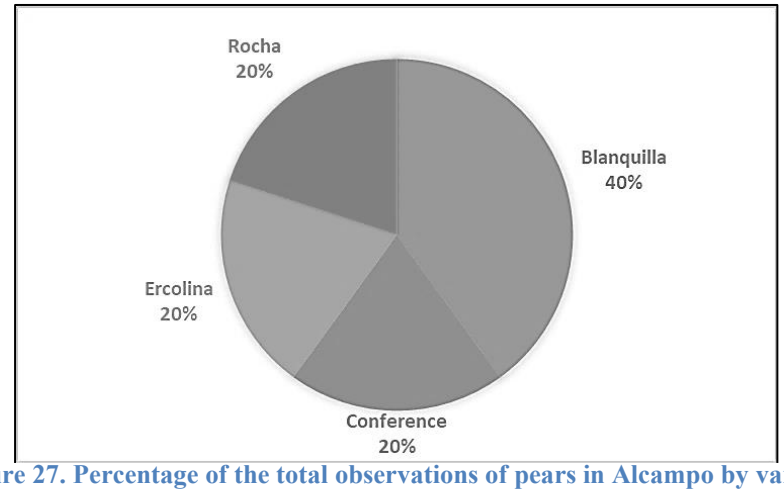

Figure 27. Percentage of the total observations of pears in Alcampo by variety
Source: Own

Table 10 shows the information for Carrefour, the number of references in Carrefour is lower than in Alcampo. The average price of onions, apples and potatoes are highest than the prices in Alcampo but the other products are cheaper. In packaging, it‟s similar than the other case but in potato exist more references of mesh bag than plastic bag or bulk.

Table 10. Information gathered in Carrefour

	Percentage of the origin of the products over the total number of references of each product			**Average price**	**Most common packaging**
	Aragon	Spain	From outside of Spain		
Onion	0%	43%	57%	2.16€/kg	Mesh bag
Chard	100%	0%	0%	0.95€/kg	Plastic bag
Cabbage	0%	100%	0%	1.37€/piece	Bulk
Borage	100%	0%	0%	2.76€/Kg	Plastic tray and plastic bag
Apple	24%	41%	35%	2.39€/Kg	Bulk
Pear	25%	50%	25%	1.72€/kg	Bulk and plastic tray
Potato	7%	27%	66%	1.43€/kg	Mesh bag
Tomato	0%	81%	19%	2.47€/kg	Bulk

Source: Own

Figure 28 shows that the most common variety for apple in this supermarket is Golden delicious (35%) followed by Royal gala, Red delicious and Reineta accounting for 12%, respectively.

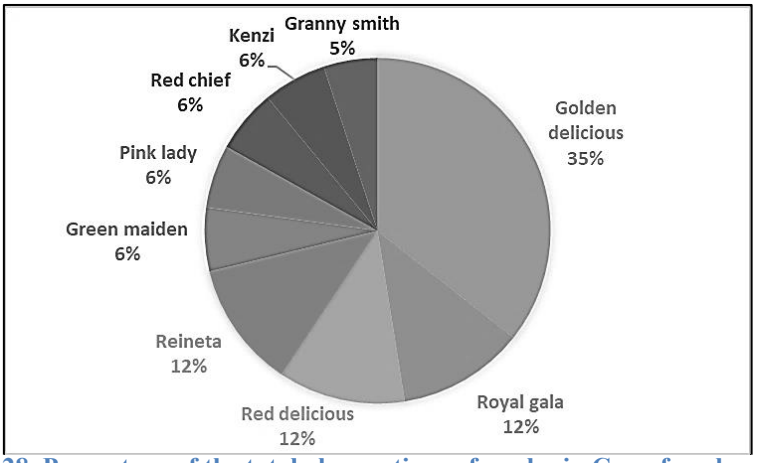

Figure 28. Percentage of the total observations of apples in Carrefour by variety
Source: Own

In the case of pears, Figure 29 shows that Conference and Blanquilla represents more than 70% of the total references.

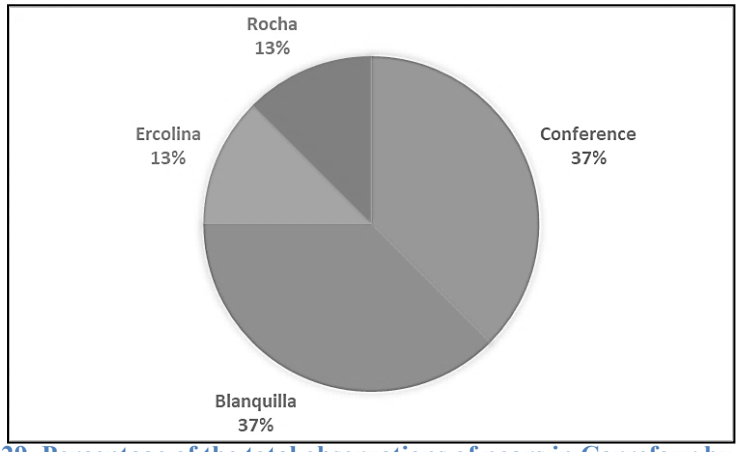

Figure 29. Percentage of the total observations of pears in Carrefour by variety
Source: Own

Table 11 shows the fruit and vegetables sell in Dia. This supermarket has fewer references for all products because they sell basic products, with cheaper prices than the hypermarkets commented before. According to Table 11, only borage has a price per kilo of more than 2€ and the most common packaging in general is bulk.

Table 11. Information gathered in Dia

	Percentage of the origin of the products over the total number of references of each product			**Average price**	**Most common packaging**
	Aragon	Spain	From outside of Spain		
Onion	0%	25%	75%	1.53€/kg	Bulk
Chard	-	-	-	-	-
Cabbage	-	-	-	-	-
Borage	100%	0%	0%	2.03€/kg	Plastic bag
Apple	0%	80%	20%	1.69€/kg	Bulk
Pear	0%	100%	0%	1.54€/kg	Bulk
Potato	0%	50%	50%	0.86€/kg	Mesh bag
Tomato	0%	60%	40%	0.75€/kg	Bulk

Source: Own

In the case of the varieties of apples and pears, the two references of pears, one is Conference and the other Blanquilla, of the 5 references of apples; one is Golden delicious, other Royal gala, other Fuji, other Red delicious and other one of Granny smith.

Table 12 presents fruits and vegetables sell in Hipercor. Hipercor has less references than Alcampo and Carrefour. In addition, of these products and the averages prices are higher except for potato, the potatoes in Carrefour are more expensive and cabbages, in Alcampo are more expensive. Tomato, apple and potato are the most prevalent products in this hypermarket. In Hipercor, the use of plastic packaging is more common.

Table 12. Information of the data recollected in Hipercor

	Percentage of the origin of the products over the total number of references of each product			**Average price**	**Most common packaging**
	Aragon	Spain	From outside of Spain		
Onion	0%	22%	78%	2.72€/kg	Mesh bag
Chard	0%	100%	0%	3.63€/Kg	Plastic bag
Cabbage	0%	100%	0%	1.65€/piece	Bulk
Borage	100%	0%	0%	3.19€/kg	Plastic tray and plastic bag
Apple	14%	22%	64%	3.17€/kg	Plastic tray and bulk
Pear	0%	67%	33%	3.43€/kg	Plastic tray and bulk
Potato	0%	20%	80%	1.17€/kg	Plastic bag
Tomato	0%	100%	0%	3.41€/kg	Bulk

Source: Own

Figure 30 shows that the most important varieties are Golden delicious and Fuji with 22% respectively followed by and Green maiden and Reineta with a 14%, these represents more than 70% of the total references.

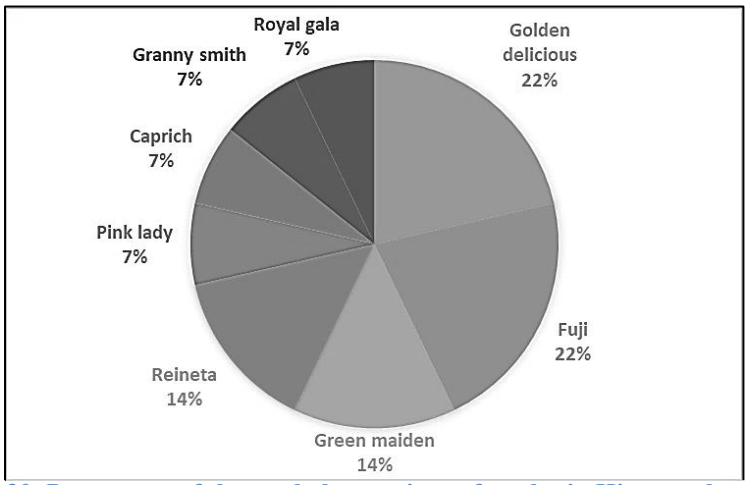

Figure 30. Percentage of the total observations of apples in Hipercor by variety

Source: Own

Figure 31 shows that Conference represents the 50% of the total reference for pears followed by Ercolina (33%) and Blanquilla (17%).

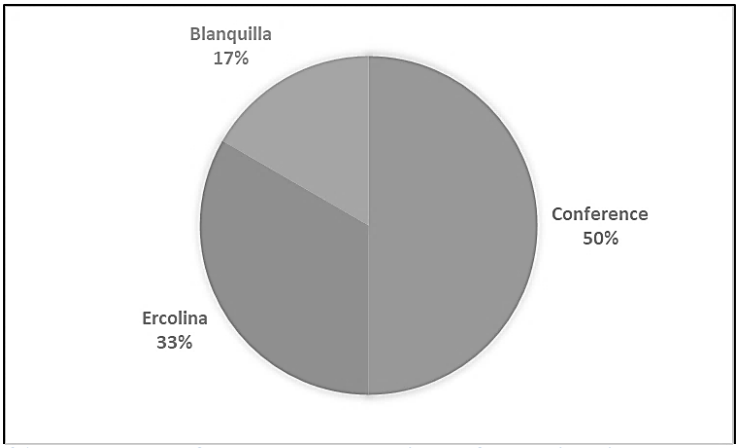

Figure 31. Percentage of the total observations of pears in Hipercor by variety
Source: Own

Table 13 shows that in general prices are higher in this supermarket. Only of potato exist more references of outside of Spain than of Spain. The most common packaging is plastic and bulk.

Table 13. Information gathered in Eroski

	Percentage of the origin of the products over the total number of references of each product			**Average price**	**Most common packaging**
	Aragon	Spain	From outside of Spain		
Onion	50%	50%	0%	2.37€/kg	Mesh bag
Chard	100%	0%	0%	1.28€/kg	Plastic bag
Cabbage	100%	0%	0%	2.75€/piece	Bulk
Borage	100%	0%	0%	1.45€/kg	Plastic bag
Apple	67%	8%	25%	1.95€/kg	Bulk
Pear	0%	100%	0%	1.72€/kg	Plastic tray and bulk
Potato	0%	25%	75%	1.51€/kg	Plastic bag
Tomato	0%	87%	13%	3.29€/kg	Bulk

Source: Own

Like the others supermarkets the biggest number of references of apples that are sold in Eroski are Golden delicious (25%) followed by Royal gala (17%), Fuji (17%) (Figure 32).

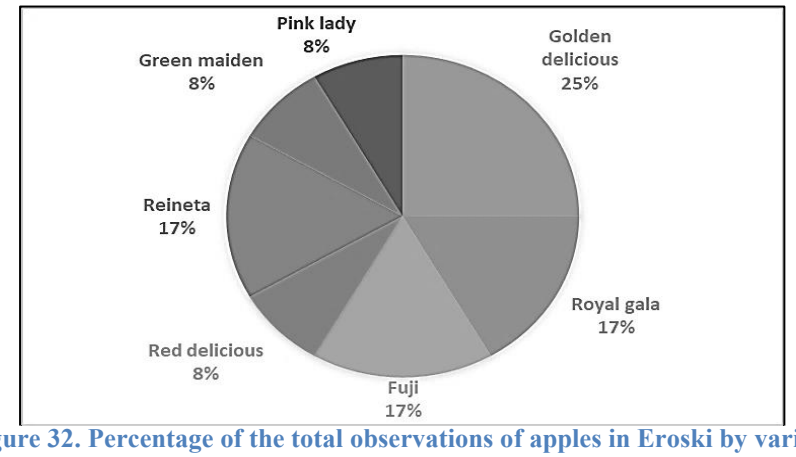

Figure 32. Percentage of the total observations of apples in Eroski by variety
Source: Own

In the case of pears, Eroski doesn‟t sell Ercolina but has Conference, Blanquilla and Rocha like the others supermarkets and also has more references than Leclerc (Figure 33). The variety Leclerc is only sold in this supermarket.

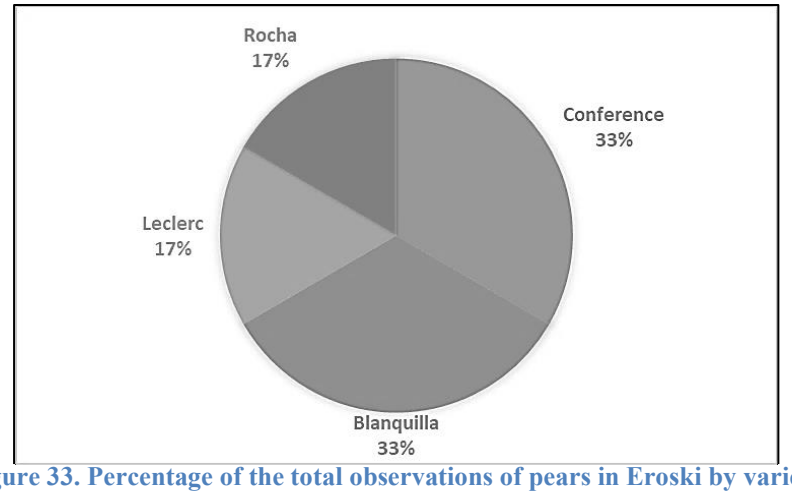

Figure 33. Percentage of the total observations of pears in Eroski by variety
Source: Own

Table 14 shows fruit and vegetables sell in LIDL. This supermarket doesn‟t sell chard, cabbage and borage. In addition, it does not sell any products produced in Aragon. Products are mainly sold packaged with few references in bulk.

Table 14. Information gathered in LIDL

	Percentage of the origin of the products over the total number of references of each product			**Average price**	**Most common packaging**
	Aragon	Spain	From outside of Spain		
Onion	0%	100%	0%	0.99€/kg	Mesh bag
Chard	-	-	-	-	-
Cabbage	-	-	-	-	-
Borage	-	-	-	-	-
Apple	0%	100%	0%	1.83€/kg	Plastic bag
Pear	0%	50%	50%	2.23€/kg	Plastic bag
Potato	0%	25%	75%	0.93€/kg	Bulk
Tomato	0%	89%	11%	3.09€/kg	Plastic tray and bulk

Source: Own

LIDL does not sell Golden delicious and Royal gala (Figure 34) and the most importance variety is Red delicious (40%) followed by Pink lady, Fuji and Granny smith.

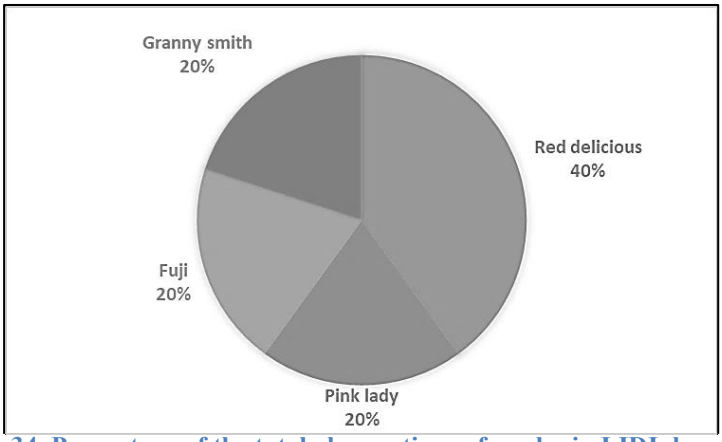

Figure 34. Percentage of the total observations of apples in LIDL by variety
Source: Own

LIDL only sells three varieties of pears, Conference (50%), Rocha (25%) and Ercolina, (25%). (Figure 35)

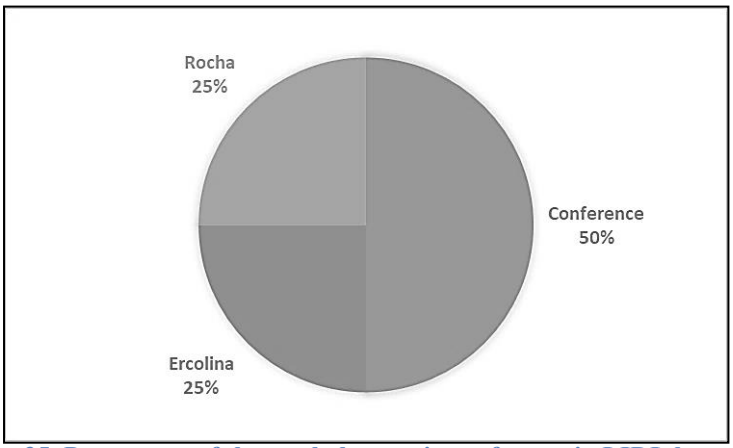

Figure 35. Percentage of the total observations of pears in LIDL by variety
Source: Own

The main retailer in Spain is Mercadona. This supermarket does not sell products from Aragon because it mainly uses providers of the Comunidad Valenciana where the company comes from. Prices in general are cheaper because this is the strategy of Mercadona. The number of references is low and therefore Mercadona does not sell chard, cabbage and borage. (Table 15)

Table 15. Information gathered in Mercadona

	Percentage of the origin of the products over the total number of references of each product			**Average price**	**Most common packaging**
	Aragon	Spain	From outside of Spain		
Onion	0%	50%	50%	0.99€/Kg	Bulk
Chard	-	-	-	-	-
Cabbage	-	-	-	-	-
Borage	-	-	-	-	-
Apple	0%	80%	20%	1.67€/kg	Plastic bag
Pear	0%	100%	0%	1.42€/kg	Bulk
Potato	0%	100%	0%	0.91€/kg	Mesh bag
Tomato	0%	100%	0%	2.12€/kg	Bulk

Source: Own

Like Dia, Mercadona has only one reference by variety of pears and apples. In the case of pears, has Conference, Rocha and Blanquilla and in apples has Golden delicious, Royal gala, Fuji, Reineta and Braeburn.

Table 16 shows the fruit and vegetables sell in Simply also shows that this supermarket has a big relation with Aragon. Like Alcampo, potatoes are from France. In the case of pears, all are from outside of Aragon but 40% of apples are produced in Aragon. The prices of the products are very competitive. Also, this supermarket uses a lot plastic package.

Table 16. Information gathered in Simply

	Percentage of the origin of the products over the total number of references of each product			**Average price**	**Most common packaging**
	Aragon	Spain	From outside of Spain		
Onion	17%	17%	66%	1.45€/kg	Mesh bag
Chard	100%	0%	0%	0.84€/kg	Plastic bag and bulk
Cabbage	100%	0%	0%	0.99€/piece	Bulk
Borage	100%	0%	0%	0.99€/kg	Plastic bag
Apple	46%	23%	31%	2.16€/kg	Bulk
Pear	0%	83%	17%	1.43€/kg	Plastic tray and bulk
Potato	0%	22%	78%	0.98€/kg	Plastic bag
Tomato	0%	100%	0%	1.63€/kg	Bulk

Source: Own

By varieties of apple, Figure 36 shows that similar to the other supermarkets, the variety with more references is Golden delicious (31%) followed by Royal gala (23%) and Fuji (15%).

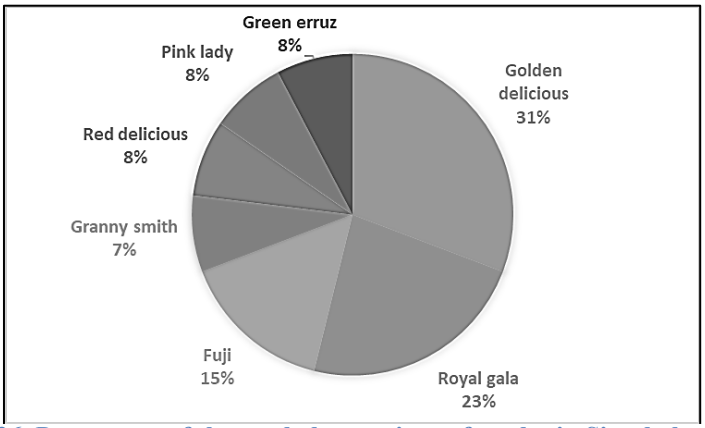

Figure 36. Percentage of the total observations of apples in Simply by variety

Source: Own

Figure 37 shows that in pears the most important variety is Conference (50%) followed by Blanquilla (17%), Rocha (17%) and Guar (16%). The variety Guar was not in the others supermarkets and hypermarkets.

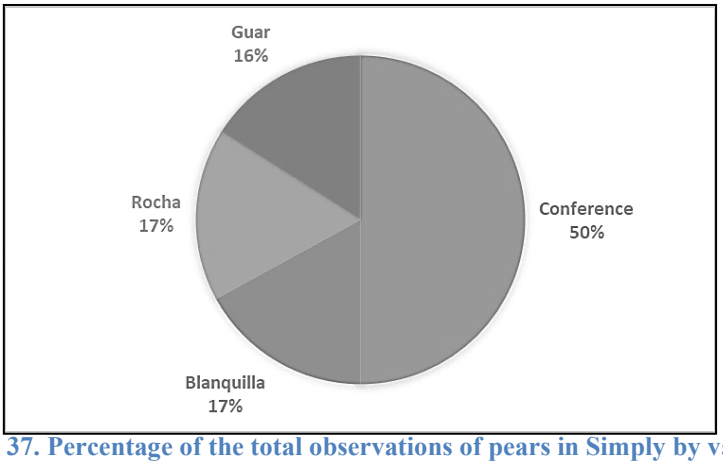

Figure 37. Percentage of the total observations of pears in Simply by variety
Source: Own

5.1.1. Hedonic price analysis

As mentioned in the methodology part, hedonic price function is specified with the observed characteristics (packaging and origin of production). In particular, a semilogaritmic equation was considered and the ordinary least square (OLS) was used for estimation purposes.

Table 17 shows the results of the three estimated models; the first is a model considering all fruits and vegetables, the second only fruits and the third only vegetables. If we observe the F- test we see that in all the models the variables are jointly significant. Regarding the adjusted R squared, the three models have a value higher than 0.4, the highest value being that of the model only considering fruits.

Now, the coefficients of the independent variables will be explained by model, in order to make it easier to understand them.

The cabbage has not been taken into account in the hedonic price analysis because cabbage prices in supermarkets and hypermarkets are per piece, therefore only information € / piece is available.

- Model 1- Fruits and vegetables

The coefficients of Eroski and Hipercor are statistically different from zero. To understand the coefficients, we start from the base option that is Alcampo, if the coefficients are positive it means that the price of fruits and vegetables in these supermarkets are higher than in Alcampo, if the coefficient is negative, it indicates that this supermarket is cheaper for fruits and vegetables. Then, fruit and vegetables prices are higher in Eroski and Hipercor than in Alcampo. Moreover, because the coefficient for the other supermarkets are not statistically different from zero, prices for fruit and vegetables are similar in the rest of supermarkets.

In the case of the product, in this model tomato it"s the reference. Then, only the coefficients of pear and potato are significant and negative indicating that prices for pear and potatoes are lower than the prices of tomatoes. On the other hand, prices for the rest of products are similar to tomatoes.

In terms of packaging, bulk is the reference. It is observed that the plastic bag and the tray and plastic box have significant coefficients. Then, the plastic bag has a lower price than the bulk format, while the tray and plastic box have a higher price than the bulk.

Finally, for the origin, Spanish origin is the reference. Both estimated coefficients are significant indicating that products from Aragon are cheaper than those produced in other parts of Spain while those from outside Spain are more expensive. It makes sense, because in some cases transport costs are very high.

- Model 2 - Fruits

In this model, only observations for apples and pears are used in the estimations. The model of fruits has a better R squared than the model of fruits and vegetables and the last model of only vegetables.

The price in supermarkets and hypermarkets considering Alcampo as the reference shows that the coefficient of Hipercor is significant indicating that fruits in this supermarket are more expensive than Alcampo.

By products, pear is cheaper than apple.

In packaging, bulk is the reference. The results of the analysis show that the price of apples and pears that are sold in a plastic bag are cheaper, this is because in the bags the quantity is 2 or more kilos and the price per kilo is lower.

The last attribute, origin, Spain is the reference. The results indicate that the price of apples and pears sold in the supermarkets and hypermarkets is lower for those produced in Aragón than the same product produced in Spain or from outside of Spain. Also, the products from outside of Spain are more expensive than the produced in Spain. The coefficient for outside of Spain is statistically different from others at 8% significance level.

- Model 3 – Vegetables

The last model estimated is with only vegetables information. The adjusted R squared is better than the model 1 but worse than model 2. The F-test indicated that all the variables are jointly significant.

In supermarkets and hypermarkets, the only estimated coefficient statistically significant is the related to Eroski. The positive value indicates that the price of vegetables in Eroski is higher than in the rest of the supermarkets.

By products, the tomato is the reference. Results indicate than tomato is more expensive than potato.

In terms of packaging, bulk is the reference. It is observed that only the tray and plastic box has significant coefficients. Then, the tray and plastic box have a higher price than the bulk.

By origin, Spain is the reference. The results indicate that the price of vegetables sold in the supermarkets and hypermarkets is lower for those produced in Aragón than the same product produced in Spain or from outside of Spain like the results of the model with only fruits. Also, the products from outside of Spain are more expensive than the produced in Spain. The coefficient for outside of Spain is statistically different from others at 9% significance level.

Table 17. Estimated coefficients for the hedonic price equation

Variable	Definition	Estimated coefficients (p-value)		
		Fruits and vegetables	Fruits	Vegetables
Constant		0.714 (0.000)	0.684 (0.000)	0.632 (0.000)
Independent variables				
Supermarket/hypermarket	(Base=Alcampo)			
	Carrefour	0.077 (0.251)	0.076 (0.309)	0.090 (0.365)
	Dia	-0.129 (0,279)	-0.149 (0.206)	-0.208 (0.294)
	Hipercor	0.291 (0.000)	0.428 (0.000)	0.244 (0.015)
	Eroski	0.170 (0.037)	0.041 (0.612)	0.302 (0.020)
	Lidl	0.064 (0.503)	0.104 (0.345)	0.016 (0.907)
	Mercadona	-0.122 (0.299)	-0.169 (0.126)	-0.011 (0.956)
	Simply	-0.097 (0.212)	0.022 (0.777)	-0.189 (0.117)
Product	(Base=Tomato)			
	Apple	-0.074 (0.286)	(Base=Apple)	____
	Pear	-0.280 (0.000)	-0.180 (0.001)	____
	Potato	-0.649 (0.000)	____	-0.564 (0.000)
	Onion	-0.188 (0.063)	____	-0.114 (0.371)
	Chard	-0.251 (0.142)	____	-0.084 (0.728)
	Borage	0.035 (0.815)	____	0.103 (0.663)
Packaging	(Base=Bulk)			
	Plastic bag	-0.159 (0.038)	-0.172 (0.037)	-0.187 (0.131)
	Plastic tray and box	0.257 (0.000)	0.065 (0.221)	0.499 (0.000)
	Other formats	-0.106 (0.207)	____	-0.090 (0.387)
Origin	(Base=Spain)			
	Aragón	-0.171 (0.042)	-0.163 (0.023)	-0.248 (0.200)
	From outside of Spain	0.130 (0.023)	0.101 (0.079)	0.159 (0.082)
R squared adjusted		0.41	0.44	0.42
F-test		13.509 (0.000)	9.613 (0.000)	9.829 (0.000)
Number of observations		328	135	193

Source: Own

5.2. Consumer survey results

In this part the results obtained from the quantitative research (consumer survey) are presented.

5.2.1. Socio-demographics characteristics of the sample

Table 18 summarizes the main socio-demographic characteristics of the sample and provides the information to understand the level that the sample reflects or represents the reference population.

Table 18. Socio-demographic characteristics of the sample.

Gender	Sample	Population
Man	31.55%	59
Woman	68.45%	128
Studies		
Primary	1.60%	3
Secondary	21.39%	14
High studies	77.01%	144
Age		
<34	6,84%	13
35-49	40,00%	75
50-64	48,95%	91
>65	4,21%	8
Net income in home		
< 900 € / month	2.14%	4
901 - 1.500 € / month	15.51%	29
1501 – 2500 € / month	29.41%	55
2501- 3500 € / month	23.53%	44
> 3500 € / month	29.41%	55
Province		
Huesca	7.49%	14
Teruel	0.53%	1
Zaragoza	91.98%	172

Gender composition of the sample is in line with our target population because although the population in Aragón is composed approximately by 50% males and 50% females. Our sample consists of a higher proportion of female with a percentage of 68.45%.

Approximately 49% of total respondents are between 50 and 64 years of age, while 40% of the respondents are older than 35 years of age till 49 years old. Average age is 46, which equals the average age of the reference population (45 years).

As expected, the level of education differs between the sample and the reference population because coverage bias imposed from the online survey. Online surveys pose difficulties in reaching the elderly population of over 65 years old and people with lower education level. Additional self-administered questionnaires, with random selection on online platform like Facebook and LinkedIn were utilized, in order to minimize this bias. But unlikely, the final sample was mainly composed of respondents with higher education (77%).

Regarding the income level, the sample is composed by respondents, with an average income between 1,500 to 2,500 euros/month, resembling well the Spanish population, which is characterized by a medium income level.

5.2.2. Consumption and purchase habits

Our target population was composed by, food shoppers older than 18 years old. Figure 38 shows the purchase frequency of food products in the households of the respondent (Question 1). Figure 38 shows that more than 50% of our respondents are the ones who purchase food in their homes and more than 30% purchase food product often.

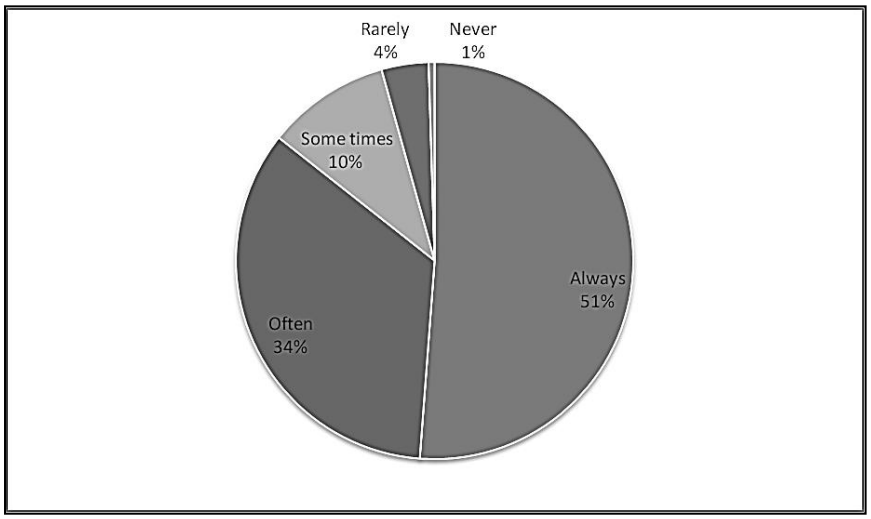

Figure 38. Frequency of purchase of food product
Source: Own

In Question 2, respondents should rank the importance that they attached to different food purchase motives. We can observe that the most important motives are health and taste with average scores of 2.21 and 2.71 respectively. In contrast, the least important ones are the convenience and the place of production with an average score of 3.5 and 3.6 respectively.

Table 19 shows the percentage of the respondents that ranked the different purchase motives as first, second, third, fourth and fifth, together with the mean of the ranks.

Table 19. Probabilities of ranking and rank means (%, mean, Standard deviation)

	1	2	3	4	5	Mean	Standard deviation
Price	14.9	23.9	25.4	24.9	10.9	**2.93**	1.235
Health	45.3	18.9	13.9	13.4	8.5	**2.21**	1.362
Production place	7.5	19.4	16.9	22.9	33.3	**3.55**	1.326
Taste	16.9	27.9	30.8	16.4	8	**2.71**	1.166
Convenience	15.4	10	12.9	22.4	39.3	**3.6**	1.470

Source: Own

Figure 39 shows the type of fruit and vegetables purchased (Question 3, Appendix 1). It is observed that the fresh form is the most consumed with more than 60% of respondents followed by frozen vegetables with a percentage of 17%. And the least form consumed is packed fruits that are ready to eat with a percentage of 3%

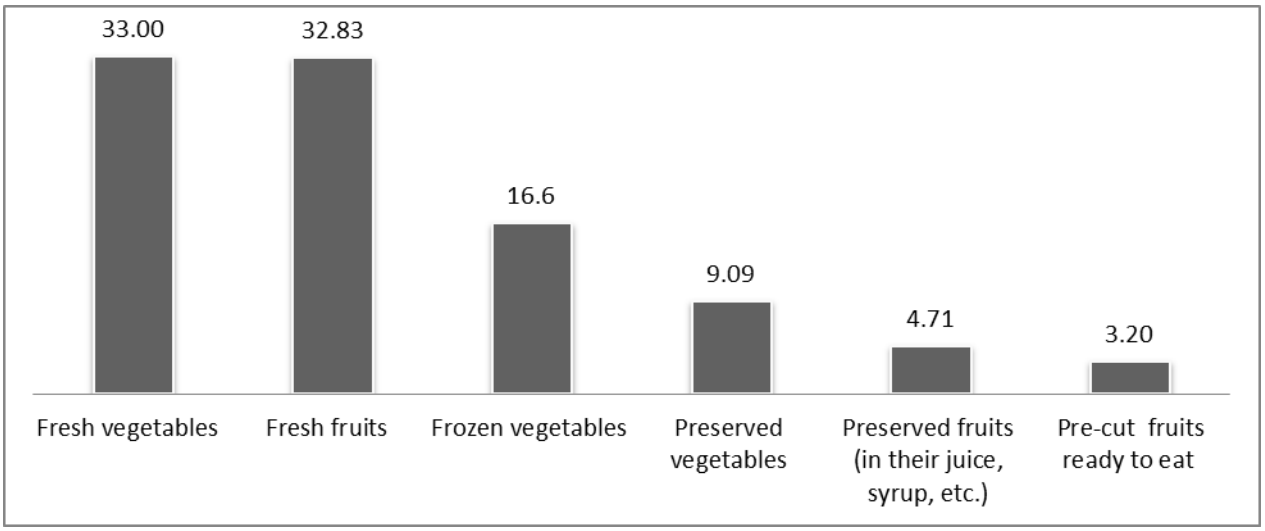

Figure 39. Type of fruits and vegetables purchased at home (%)
Source: Own

As previously mentioned, our sample was composed by, fruit and vegetables consumers. Figure 40 and 41 show the frequency of consumption of fresh fruit and vegetables in the households (Question 4). It is observed that more than 70% of the respondents consume fruits on a daily basis, while only 41% consume fresh vegetable daily.

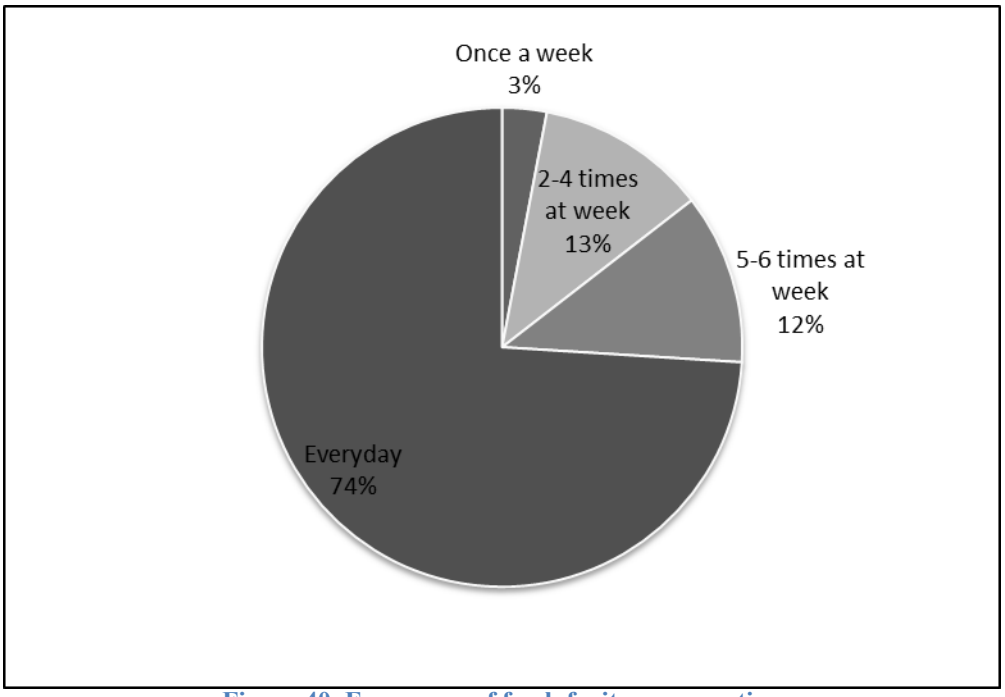

Figure 40. Frequency of fresh fruits consumption
Source: Own

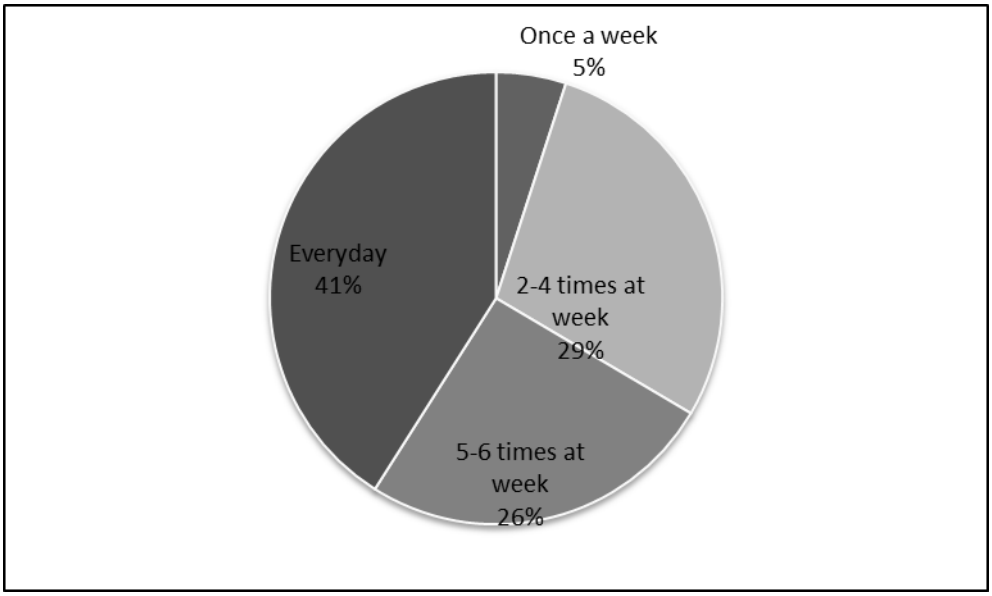

Figure 41. Frequency of fresh vegetable consumption
Source: Own

In order to identify the most important attributes that influence the fresh fruit and vegetables purchase decision, respondents should provide the importance they attached to different fruit and vegetables characteristics in question 7. Figure 42 presents the average scores consumers give to different fresh fruit and vegetables characteristics consisting of a5-item scale (1=not important, 5=very important). We can observe that the most important features are the production place , the color and the price with average scores of 3.58 , 3.57 and 3.55 respectively. In contrast, the least important characteristics are the certification (Organic and denomination of origin) with average score of 2.59 and 2.67 respectively.

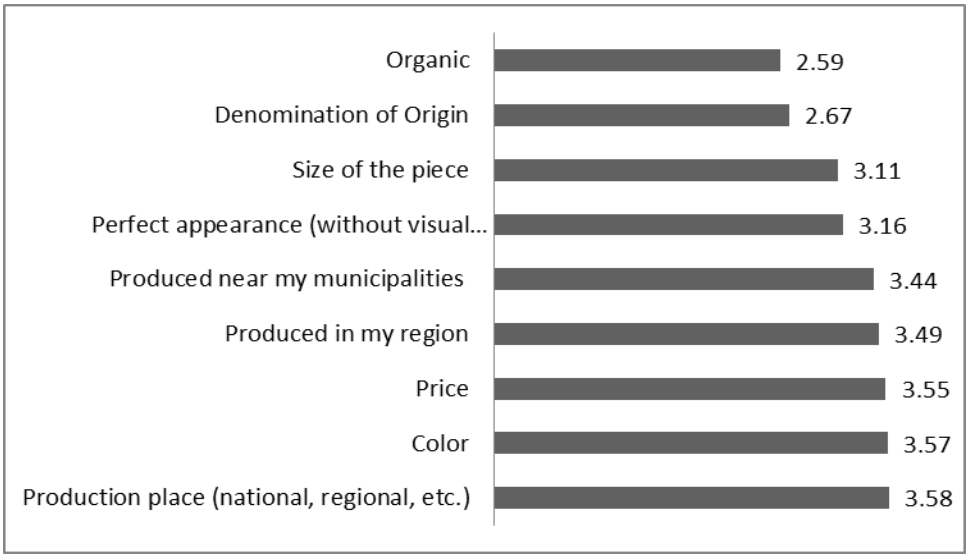

Figure 42. Average scores of the importance of fresh fruit and vegetables attributes on purchase decision.
Source: Own

Now, we conduct a factorial analysis to extract the most important information. In particular, a Varimax rotated factor analysis was carried out to identify a smaller set of factors and determine what they represent (Question 7, Table 22).

First of all, we obtained a correlation matrix that represents the variance of all the variables and covariance between pairs of all the variables. Then, we had to confirm that our data are correlated using the KMO index and Bartlett‟s test (Table 20). The results showed that the Kaiser- Meyer-Olkin Measure of Sampling Adequacy equals 0 .742, which evaluated as Middling using a rule of thumb suggested by Kaiser (Table 21).

Table 20. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO Index)

KMO Index	Description
0.9	Marvelous
0.8	Meritorious
0.7	Middling
0.6	Mediocre
0.5	Miserable
<0.5	Unacceptable

Besides, the p-value resulted from Bartlett‟s test for sphericity is (0.000), which is less than the significance level (0.050). Therefore, we rejected H0 hypothesis (H0: none of the variables are correlated) meaning that our variables are correlated and the use of a factorial analysis is justified.

Table 21. KMO and Bartlett's Test results

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.742
Bartlett's Test of Sphericity	Approx. Chi-Square	635.894
	Df	36
	Sig.	.000

Last column in table 22 presents communalities which indicates the proportion of the variance of a specific characteristic explained by all the derived factors. As the communalites were greater than 0.5 we accepted them all. Hence goodness of fit is acceptable. In summary, three communalities are „Strong“ (>0.7), three are „Respectable“ (0.6) and three are „Moderate“ (0.5) (Table 22).

Table 22 shows the correlation between the original variables (attributes) and the factors obtained. Three factors summarized the characteristics which account for 66% of the variance. Those factors were selected because they represent eigenvalue greater than 1.

Table 22. Factorial analysis for the most important stores characteristics when shopping fresh fruit and vegetables.

Component (Rotated component Matrix)				
	1 Locally produced	2 Appearance	3 Price and Certification	h^2
Produced near my municipalities	**.895**	-.197	.106	.850
Produced in my region	**.892**	-.169	.100	.834
Production place (national, regional, etc.)	**.821**	-.105	.122	.700
Color	-.099	**.777**	-.031	.615
Size of the piece	-.028	**.740**	-.160	.574
Perfect appearance (without visual defects)	-.209	**.733**	-.005	.582
Price	.077	.140	**-.737**	.569
Organic	.341	-.126	**.678**	.592
Denomination of Origin	.521	.187	**.588**	.652
Eigenvalue%	3.362	1.553	1.052	
Variance%	37.357	17.256	11.690	
Cumulative variance%	37.357	54.613	66.303	

Factor 1 is strongly associated with „Produced near my municipalities“ (0.895), „Produced in my region“ (0.892), „Production place (national, regional, etc.)“ (0.821). This factor explained 37% of the variance and can be named as „locally produced“.

Factor 2 is most strongly associated with „Color“ (0.777), „Size of the piece“ (0.740) and „Perfect appearance (without visual defects)“ (0.733) and it is named as „appearance“.

Factor 3 is negatively associated with „Price“ (0.777), positively associated „Organic“ (0.678) and „Denomination of Origin“ (0.588) and it is named as „Price and Certification“

Regarding the point of purchase of fresh fruit and vegetables, Figure 43 shows that most consumers normally purchase fresh fruit and vegetables in “Greengrocers” and Supermarkets (Question 8). In fact, 29% of the respondents said that they purchase fresh fruits and vegetables in “Greengrocers” with other 29% indicate that they purchase in Supermarkets. This is possibly related to the supermarkets convenience in terms of location and time. On the other hand, only 4% purchase fresh fruit and vegetables directly from producer or cooperatives. Regarding the

respondents who indicated another choice (2.1%), they mentioned that they have their own orchard where they produce their fresh fruits and vegetables.

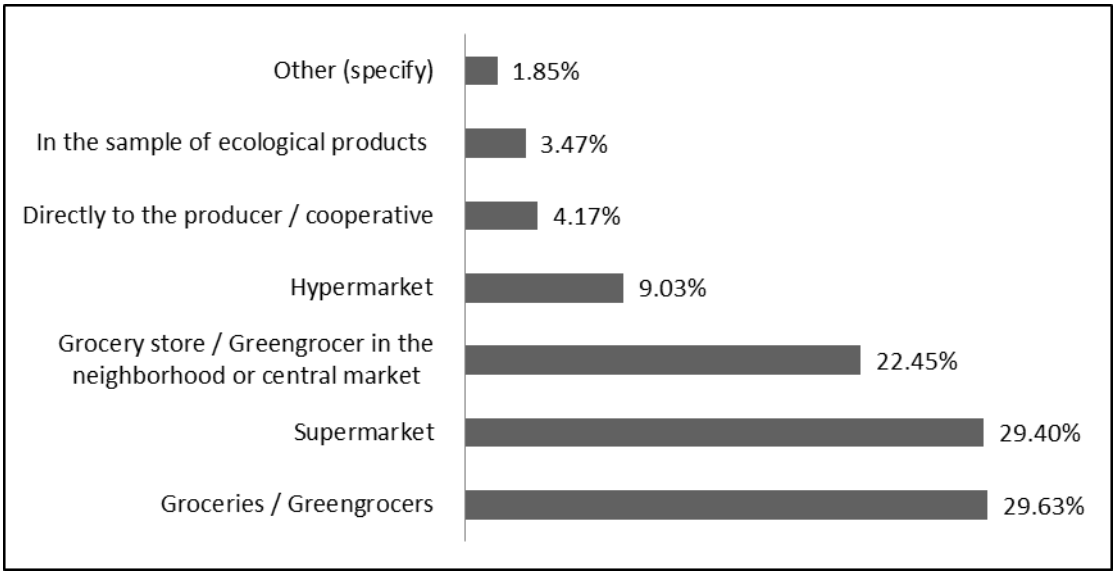

Figure 43. Place of purchase of fresh fruits and vegetables
Source: Own

In Question 9 respondents indicated the name of the supermarket they purchase fruits and vegetables. The question is a multiple choice so consumers could select more than one option, because actually they purchase from different supermarkets at different times. As can be seen in Figure 44 most respondents purchase fresh fruit and vegetables in Mercadona (26%), followed by Simply with (13%) This is possibly related to the convenience offer from Mercadona in terms of location and prices.

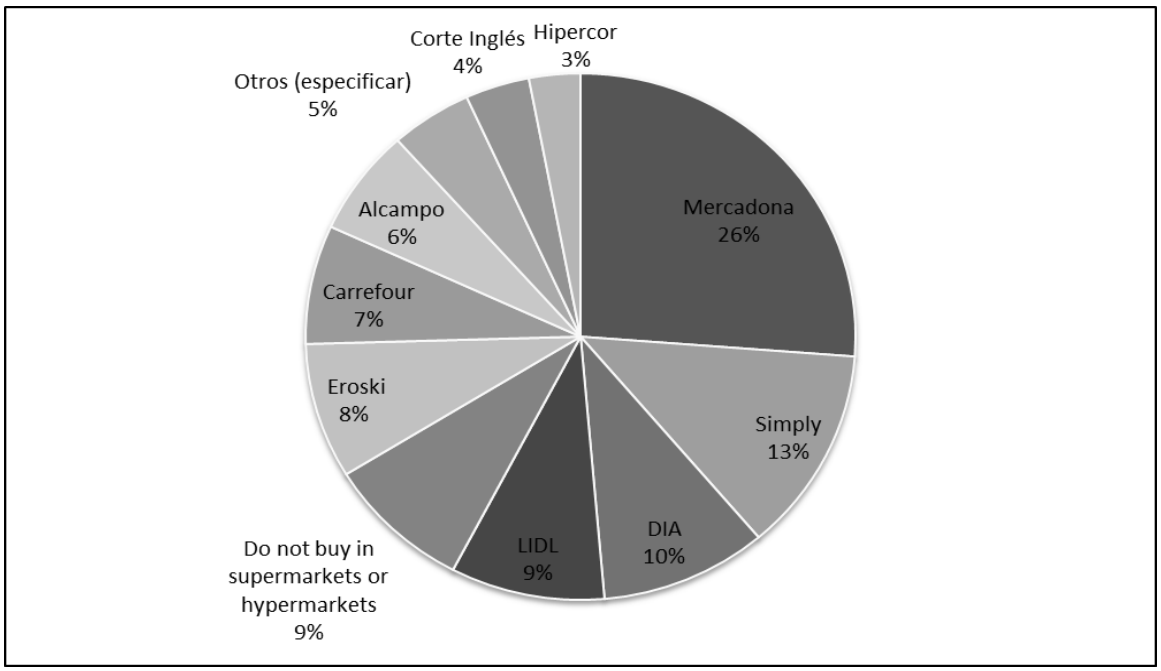

Figure 44. Supermarket and hypermarket used to buy fresh fruits and vegetables
Source: Own

Question 10 asked respondents to give the importance they attached to different stores characteristics when shopping fresh fruit and vegetables. Figure 45 presents scores averages. It can be observed that the most important characteristics are good value for money and the proximity of the establishment with average scores of 4.17 and 4.04 respectively. In contrast, the least important characteristics is the seller‟s advice with average score of 2.78.

Figure 45. Average scores of the importance of different stores characteristics
Source: Own

Then in order to extract the most important characteristic of the purchase places of fresh fruit and vegetables that influence the consumer purchase decision, we conducted a factorial analysis for (Question10) In particular, a Varimax rotated factor analysis was carried out to identify a smaller set of factors and determine what they represent.

First of all, we obtained a correlation matrix that represents the variance of all the variables and covariance between pairs of all the variables. Then, we had to confirm that our data are correlated using the KMO index and Bartlett‟s test (Table 23). The results showed that the Kaiser- Meyer-Olkin Measure of Sampling Adequacy equals 0.587, which evaluated as Mediocre using a rule of thumb suggested by Kaiser. After that we conduct a Cronbach's Alpha analysis to have an over view about the reliability of the scale.

Table 23. KMO and Bartlett's Test results

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.587
Bartlett's Test of Sphericity	Approx. Chi-Square	135.860
	df	21
	Sig.	.000

Last Colum in Table 24 shows that the proportion of the variance of a specific characteristic explained by all the derived factors. Considering that communalities below 0.5 are not acceptable, we could have decided to exclude the “he can do all the food shopping there” (0.490). But we didn‟t make elimination because the value is 0.49 close to 0.5. Nonetheless, the majority are greater than

0.5. Hence goodness of fit is acceptable. In summary, one communalities are „Strong" (>0.7), four are „Respectable" (0.6) and one is „Moderate" (0.5).

Besides, the significance statistic resulted from Bartlett"s test for sphericity is (0.000), which is less than the significance level (0.050). Therefore, we rejected H0 hypothesis (H0: none of the variables are correlated) meaning that our variables are correlated and the use of a factorial analysis is justified.

Table 24 shows the correlation between the original variables and the factors. Three factors were selected because their Eigen values were greater than 1. These three factors explained 62% of the variance.

Table 24. Factorial analysis for the most important attributes that influence fresh fruit and vegetables purchase decision

Component (Rotated component Matrix)				
	1 Shopping convenience	2 Price and variety	3 Information	h2
Possibility to do the whole shopping there	**.478**	.362	-.361	.490
The opening hours of the establishment	**.825**	-.012	.061	.684
The proximity of the establishment	**.719**	.106	.010	.529
Good value for money	-.065	**.869**	-.039	.760
The variety of fresh fruits and vegetables	.250	**.753**	.181	.662
Presence fruits and vegetables from Aragon	.252	.169	**.716**	.605
The seller's advice	-.176	-.034	**.777**	.635
Eigen value%	1.964	1.307	1.095	
Variance%	28.052	18.665	15.649	
Cumulative variance%	28.052	46.717	62.366	

Factor 1 is positively associated with „Possibility to do the whole shopping there" (.478), „The opening hours of the establishment" (.825), „The proximity of the establishment" (.719). This factor can be named as „shopping convenience".

Factor 2 is positively associated with „Good value for money“ (.869) and „Have a variety of fresh fruits and vegetables“ (.753) so it is named as „Price and variety“.

Factor 3 is associated with „Offer fruits and vegetables from Aragon“ (.716) and associated also with „The seller's advice“ (.777) so it is named as „Information“.

In question 11 we asked the respondents if they pay attention to the origin of the production of food they purchase, the majority of respondents indicated that always or often pay attention to the place of production. (Figure 46)

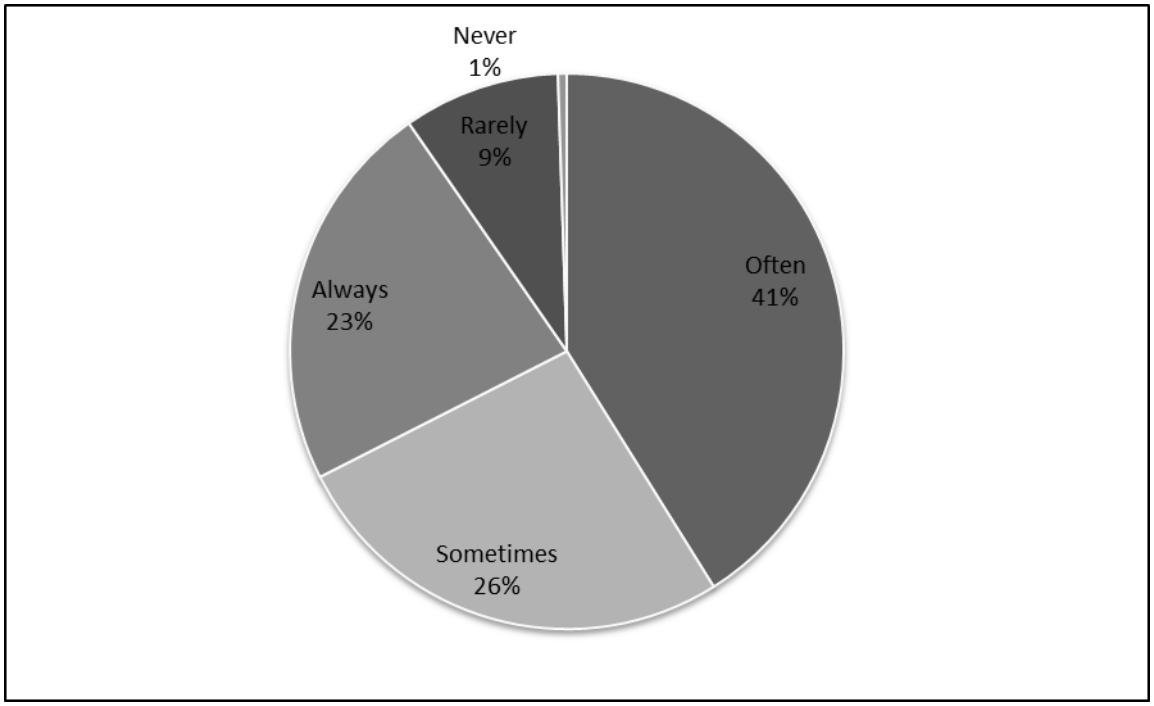

Figure 46. Awareness of the place of production of fruits and vegetables (%)
Source: own

5.2.3. Local foods

To measure consumer‟s perception on local foods participants were asked to associate them with a list of aspects (Question 12). Figure 47 presents the average scores indicating that the aspect they associated local food products the most were the freshness and the local production with average scores 4.09 and 3.98 respectively. In contrast, the least important aspects are the safety and the products directly sold by producers with average scores 3.12 and 3.19 respectively.

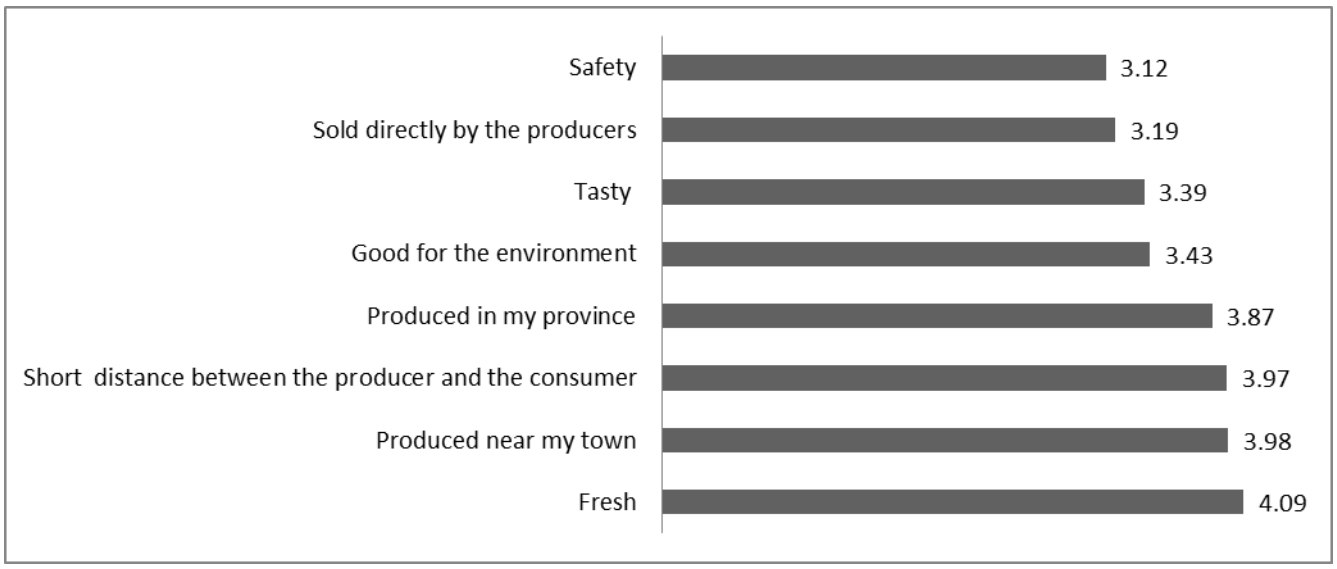

Figure 47. Average scores of the aspects associated with local foods
Source: own

In order to summarize the perception of the respondents towards the aspects associated with local foods, we conducted a factorial analysis (Question 12).

In particular, a Varimax rotated factor analysis was carried out to identify a smaller set of factors and determine what they represent.

First of all, we obtained a correlation matrix that represents the variance of all the variables and covariance between pairs of all the variables. So we had to confirm that our data are correlated using KMO and Bartlett‟s test (Table 25). Results showed that; Kaiser-Meyer-Olkin Measure of Sampling Adequacy = 0.753 which categorized as “Middling” using a rule of thumb suggested by Kaiser.

Table 25. KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.753
Bartlett's Test of Sphericity	Approx. Chi-Square	514.779
	Df	28
	Sig.	.000

In addition, the significance statistic resulted from Bartlett‟s test for spheritciy is (0.000) which is less than the significance level (0.050).So we rejected H0 hypothesis (H0: none of the variables are correlated) meaning that our variables are correlated.

Communalities for some of the items from the factor analysis were less than 0.5:‟ they are „Sold directly by the producers‟ (0.337). The rest of communalities were greater than 0.5 or slightly lower. In particular, three communalities are 'Strong'(>0.7), one is „Respectable‟ (0.6) and two are „Moderate‟ (Table 26)

Table 26. Communalities

	Initial	Extraction
Produced near my town	1.000	.668
Tasty	1.000	.732
Short distance between the producer and the consumer	1.000	.751
Good for the environment	1.000	.570
Safety	1.000	.716
Fresh	1.000	.582
Produced in my province	1.000	.492
Sold directly by the producers	1.000	.337

In order to get more accurate results for the analysis, the variables ,with communality less than (0.5) was eliminated .Therefore ,KMO and Bartlett‟s test were calculate and variables were still correlated (Table 27).

Table 27. KMO and Bartlett's Test results

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.740
Bartlett's Test of Sphericity	Approx. Chi-Square	461.435
	df	21
	Sig.	.000

In addition, the Cronbach's Alpha test (0.78) was calculated to measure the scale reliability. Results indicated that the scale reliability can be considered „acceptable‟ (more than 0.7)

Table 28 shows the correlation between original variables and factor. Two factors were selected because their Eigen values are greater than 1. These two factors explained 65% of variance

Table 28. Factorial analysis for the perception towards the local foods.

Component (Rotated component Matrix)			
	1 Locally origin	2 Extrinsic and intrinsic attributes	h^2
Short distance between the producer and the consumer	**.873**	.030	.762
Produced near my town	**.825**	.044	.683
Good for the environment	**.681**	.323	.568
Produced in my province	**.677**	.182	.492
Tasty	-.037-	**.848**	.721
Safety	.172	**.848**	.749
Fresh	.326	**.711**	.612
Eigenvalue %	3.074	1.513	
Variance %	43.915	21.615	
Cumulative variance %	43.915	65.530	

Factor 1 is strongly associated with „Short distance between the producer and the consumer" (.873), „Produced near my town" (.825), „Good for the environment" (0.681), and „Produced in my province" (0.677). This factor can be named as „Locally origin".

Factor 2 is most strongly associated with „Tasty" (.848), „Safety" (.848) and „Fresh „(.711) and it is named as „Extrinsic and intrinsic attributes".

To identify segments of homogenous consumers according to their perception about local foods, a cluster analysis was conducted using as segmentation variables the two factors from factorial analysis of question 12 (Table 28). This segmentation was done in two steps. First, a hierarchical cluster analysis was applied select the number of cluster solutions by scanning the increase in distance (coefficient). In this our case, possible solutions are between 2-8 clusters (Appendix 2, Table 1). Secondly a K-means cluster analysis was conducted with three clusters in order to define the membership in each cluster (Table 29). It is observed that cluster 1 consists of 24% of the respondents, cluster 2 of 30% and cluster 3 is the largest with almost half of the sample.

This information support the idea that three cluster is an acceptable solution. If some cluster would have been small (<10%) it might be judged to be not feasible in the context of segmentation (marketing segmentation, targeting and positioning theory).

The next step is to test whether statistical differences among clusters exist for the two segmentation variables. The ANOVA test shows that there are significant differences between final cluster centers on each of the target variables (factors) under the null hypothesis that the average scores are equal. Assuming a significance level of 5% (.050) the significance statistic (Sig) indicates that the null hypothesis is rejected for each target variable. (Appendix 2, Table 2).

Table 29. Number of Cases in each Cluster

Cluster	Number of consumers in each cluster	Percentage
1	47	24%
2	59	30%
3	91	46%
Valid	197	100%
Missing	16	

Each segment is characterized taking into account the values of the segmentation variables for each cluster (Table 30) and the socio-demographic characteristics (age, gender, education and income level). However, the statistical tests show that only differences among clusters exist for the education level (Appendix 2, Table 3).

Table 30. Final Cluster Centers to identify the membership in each group

	Cluster		
	1	2	3
Local origin	.03239	-1.05195	.66531
Intrinsic and extrinsic attributes	-1.34234	.39588	.43663

Cluster 1 is characterized for having positive attitudes towards local origin and negative attitudes towards the intrinsic and extrinsic attributes of local foods. In addition, consumers in this cluster place the least emphasis on intrinsic and extrinsic attributes than any other cluster. Consumers in this group are almost all high educated with more than 90%. On contrary, only 9% of consumers are low educated.

Cluster 2 contains consumers who have negative attitudes towards local origin and positive attitude towards the intrinsic and extrinsic attributes. It places least emphasis on locally produced than any other cluster. The percentage of high-educated consumers is the lowest among clusters and approximately 30% have low education

Finally, cluster 3 consists of consumers with positive attitudes towards both local origins, intrinsic and extrinsic attributes. In addition, it places the most emphasis on both factors more than any other cluster. This group is characterized by 74% of high educated consumers and just 25.8% are low educated.

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Question 13 asked respondents to rate their level of agreement or disagreement with different benefits that local food consumption can provided. Figure 48 presents average scores of the importance of the benefits that associated with local food. It can be observed that the main important benefit for the respondents is that local food help the maintained of rural areas followed by increase the farmer‟s income in many areas.

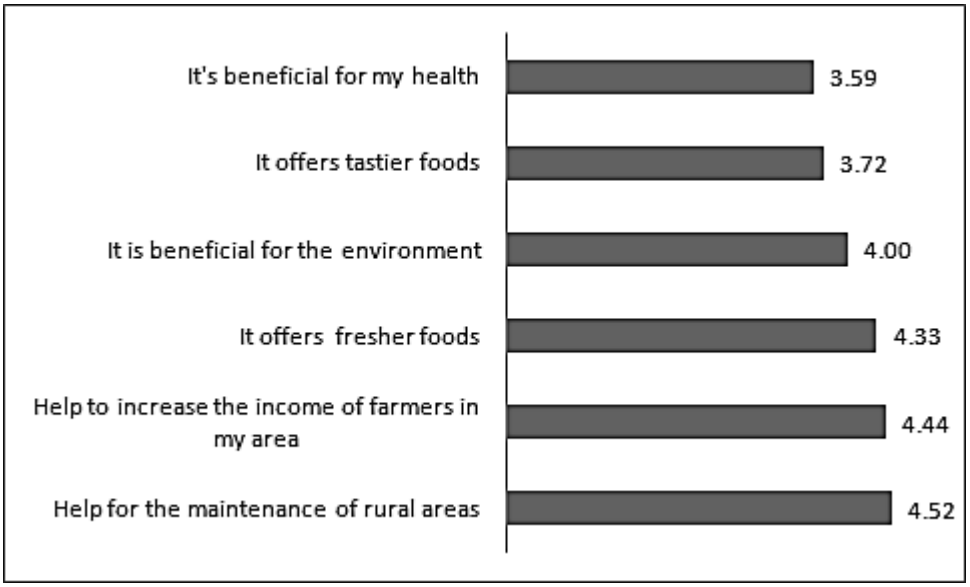

Figure 48. Average scores of the benefits associated with local foods
Source: own

In order to summarize the consumer perceptions a factorial analysis was conducted for (Question 13) In particular, a Varimax rotated factor analysis was carried out to identify a smaller set of factors and determine what they represent.

First of all, we obtained a correlation matrix that represents the variance of all the variables and covariance between pairs of all the variables. So we had to confirm that our data are correlated using KMO and Bartlett‟s test (Table 31). Results showed that; Kaiser-Meyer-Olkin Measure of Sampling Adequacy = 0.759 which categorized as “Middling” using a rule of thumb suggested by Kaiser.

Table 31. KMO and Bartlett's Test results

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.759
Bartlett's Test of Sphericity	Approx. Chi-Square	408.544
	Df	15
	Sig.	.000

In addition, the significance statistic resulted from Bartlett‟s test for sphericity is (0.000) which is less than the significance level (0.050). So we rejected H0 hypothesis (H0: none of the variables are correlated) meaning that our variables are correlated.

All the communalities were greater than 0.5. In particular, four communalities are 'Strong'(>0.7), one is „Respectable" (0.6) and one is „Moderate" (Table 32)

Table 32. Communalities

	Initial	Extraction
Help to increase the income of farmers in my area	1.000	.743
It's beneficial for my health	1.000	.803
Help for the maintenance of rural areas	1.000	.736
It offers tastier foods	1.000	.817
It is beneficial for the environment	1.000	.521
It offers fresher foods	1.000	.616

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In order to get more accurate results for the analysis, variables, so try to eliminate the two variables that has commonalties values less than 0.5 and there is no dominating value to one factor more than the other in the Rotated Component Matrix. Therefore, KMO and Bartlett"s test were repeated assuring that the variables are still correlated (Table 33). This led to a new KMO index of 0.568.

Table 33. KMO and Bartlett's Test results

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.568
Bartlett's Test of Sphericity	Approx. Chi-Square	236.034
	Df	6
	Sig.	.000

Conducted also the Cronbach's Alpha test to measure the scale reliability, results have shown that its value = 0.704 which is considered „acceptable" (more than 0.7)

Finally, after performing the rotated component matrix (Table 34), we observed that the benefits can be grouped in two factors which explain 82 % of the total variance (more than 60%).

Table 34. Factorial analysis for the perception of the respondents towards the benefits brought by local food.

Component (Rotated component Matrix)			
	1 Health and taste	2 Social and environmental benefits	h^2
It's beneficial for my health	**.904**	.195	.856
It offers me tastier foods	**.928**	.085	.868
Help increase the income of farmers in my area	.131	**.881**	.793
Help to maintain the rural environment	.132	**.878**	.788
Eigenvalue %	2.142	1.162	
Variance %	53.558	29.052	
Cumulative variance %	53.558	82.611	

Factor 1 is strongly associated with „It's beneficial for my health" (.904), „It offers me tastier foods" (.928). This factor can be named as „Health and taste"

Factor 2 is most strongly associated with „Help increase the income of farmers in my area" (.881), „Help to maintain the rural environment" (.878). This factor is named as „Extrinsic and intrinsic attributes".

Question 14 asked about whether respondents are actually purchase local fresh fruit and vegetables, Figure 49 shows that, 61% of the respondents usually buy (always and often) local fresh fruit and vegetables and 33% of them are sometimes consumers. And only 7% are non-consumers of local fresh fruit and vegetables.

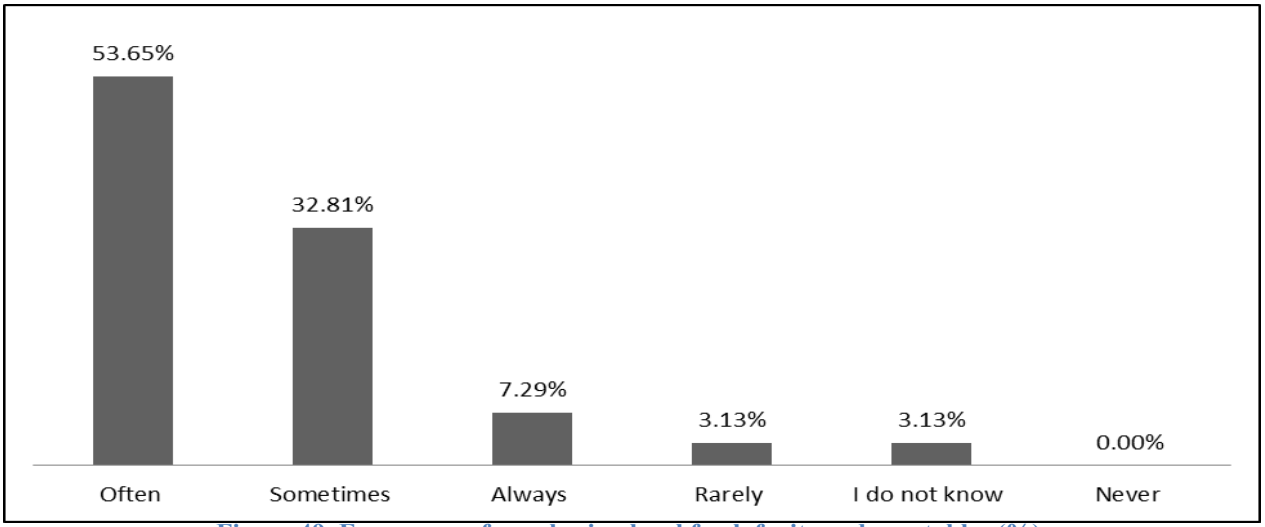

Figure 49. Frequency of purchasing local fresh fruits and vegetables (%)
Source: Own

For those consumers who stated that they buy local fresh fruit and vegetables sometimes, rarly or never, we asked them about their intention to purchase in the future (Question 15), Figure 50 shows that the majority of respondents (73%) stated that it‟s likely or very likely that they will buy it.

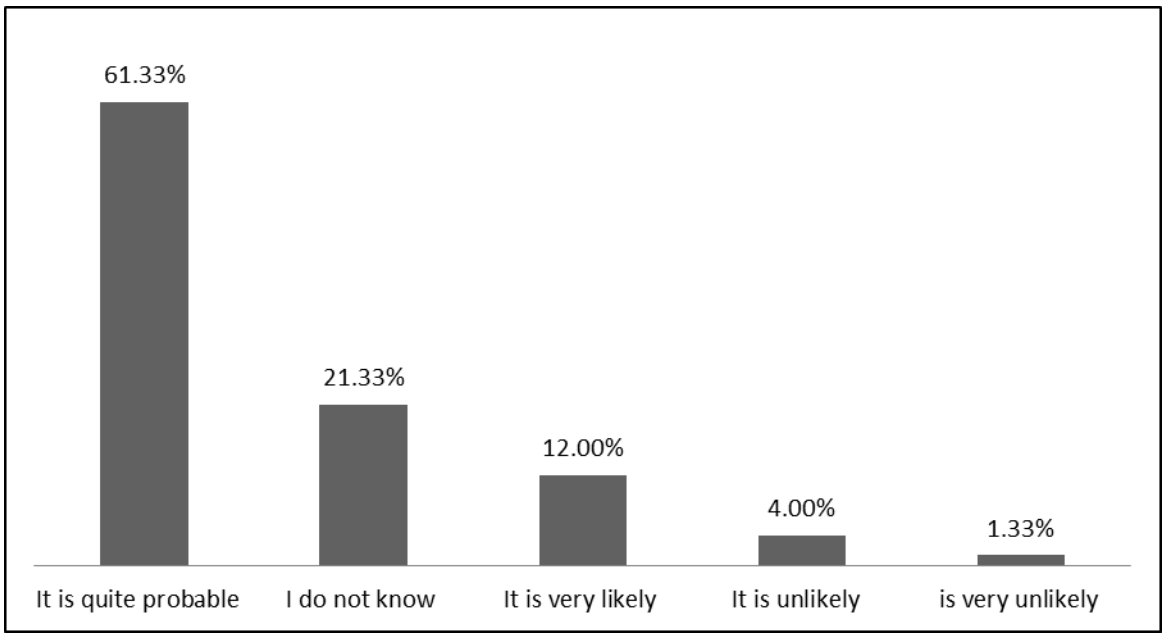

Figure 50. Intention to purchase local fresh fruits and vegetables (%)
Source: Own

After identifying the group of people that would not purchase fresh fruit and vegetables in the future, this group of respondents were asked to indicate their level of agreement with different motives for not purchasing (Question 16)

Figure 51 indicates that the most important reasons for not purchasing local fresh fruit and vegetables are „they are not sold in the stores where i usually purchase‟ and „I don‟t have time to go where do they sell‟, followed from „its quality is similar to those produced in other places. The least important reason is „I don‟t care where the fruits are produced and vegetables that i buy‟ because only 14% of the respondents agree with this statement and almost 30% disagree.

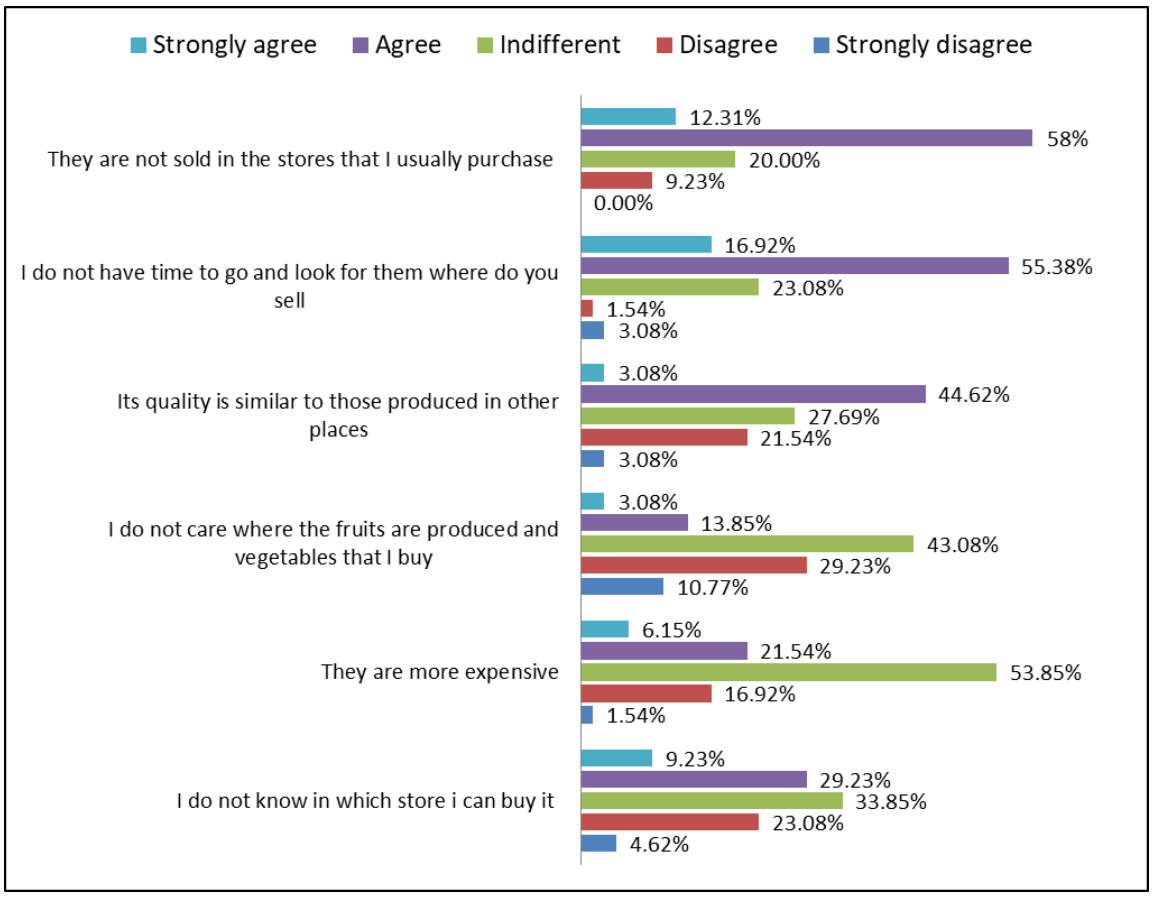

Figure 51. Reasons for not purchasing local fresh fruit and vegetables (%)
Source: Own

Regarding the point of purchase of fruit and vegetables in Zaragoza, (Question 17) Figure 52 shows that most consumers normally buy or intent to buy local fresh fruit and vegetables in Traditional groceries (31.83%). Only 18.8% mentioned that buy or intent to buy directly from farmers. On the other hand, only8.6% buy or intent to buy local fresh fruit and vegetables at street vendors.

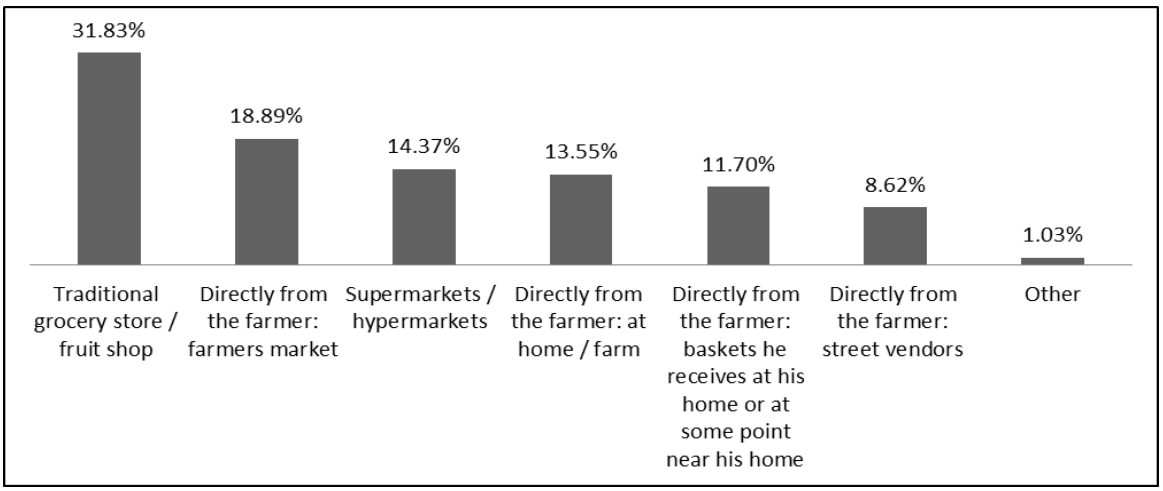

Figure 52. Places where consumers buy or intent to buy local fresh fruits and vegetables (%)
Source: Own

In Question 18 we asked the respondents to rank the following purchase places, according to their preferences to purchase local fresh fruits and vegetables, where 1 indicates the most preferred and 5 the least preferred. The results indicate that the most preferred place of purchase to buy local fresh fruits and vegetables is „traditional stores of fruits and vegetables" and „directly from at the farmer"s/ farmer"s market „with average scores of 2.18 and 2.65 respectively. On the other hand, the least preferred place of purchase is „in the farmer"s house/ the farm" with average score of 3.54 (Figure 53).

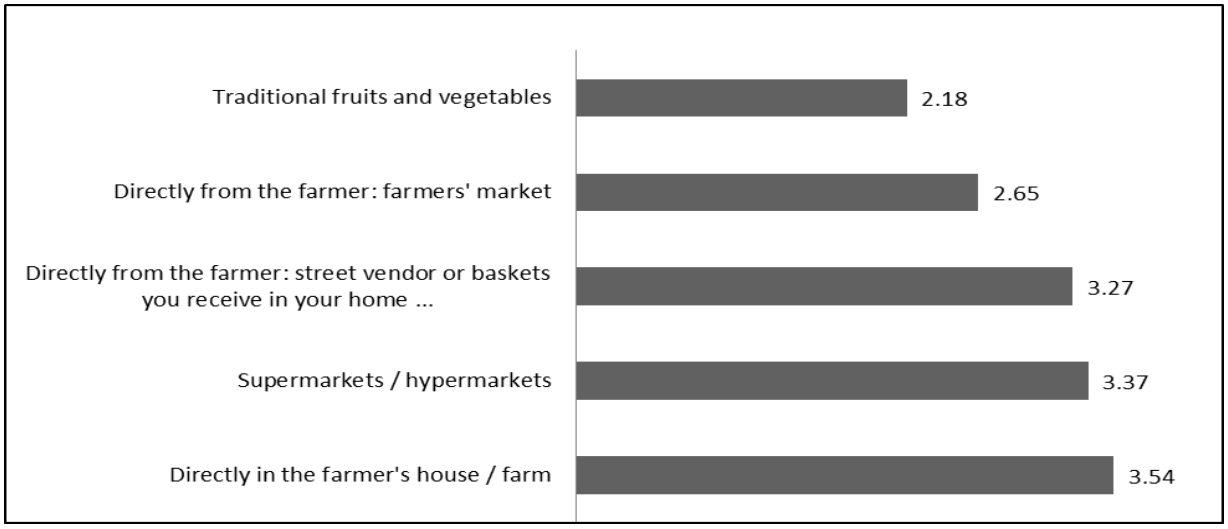

Figure 53. Classification of places where consumers prefer buying local fresh fruit and vegetables
Source: Own

In addition, Question 19 asked respondents whether they think that local fresh fruit and vegetables should be more expensive or cheaper than non-local. More than half of respondents stated they should have approximately the same prices (60%). On the other hand, (35%) believe that local fresh fruit and vegetables should be cheaper. Only, (5%) of respondents believe that local fresh fruit and vegetables could be more expensive (Figure 54).

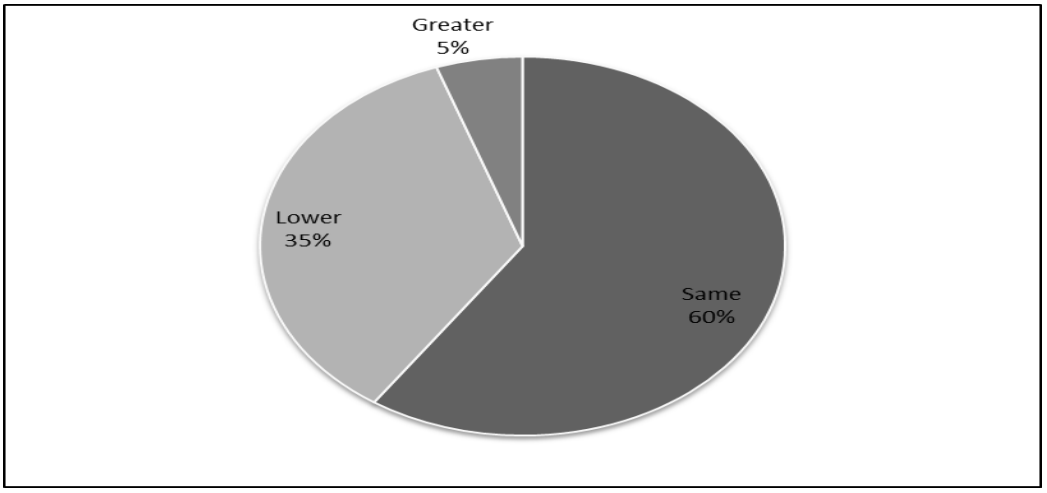

Figure 54. The perception of consumers for the price of local fresh fruit and vegetables in comparison with those that are not local
Source: Own

Finally, Figure 55 shows that the most appropriate information message to inform about the local origin of the local fresh fruits and vegetables in stores. It‟s observed, „From the farm to your home‟ followed by „The taste of our region‟ and „in your nearest store, the taste of our garden‟.

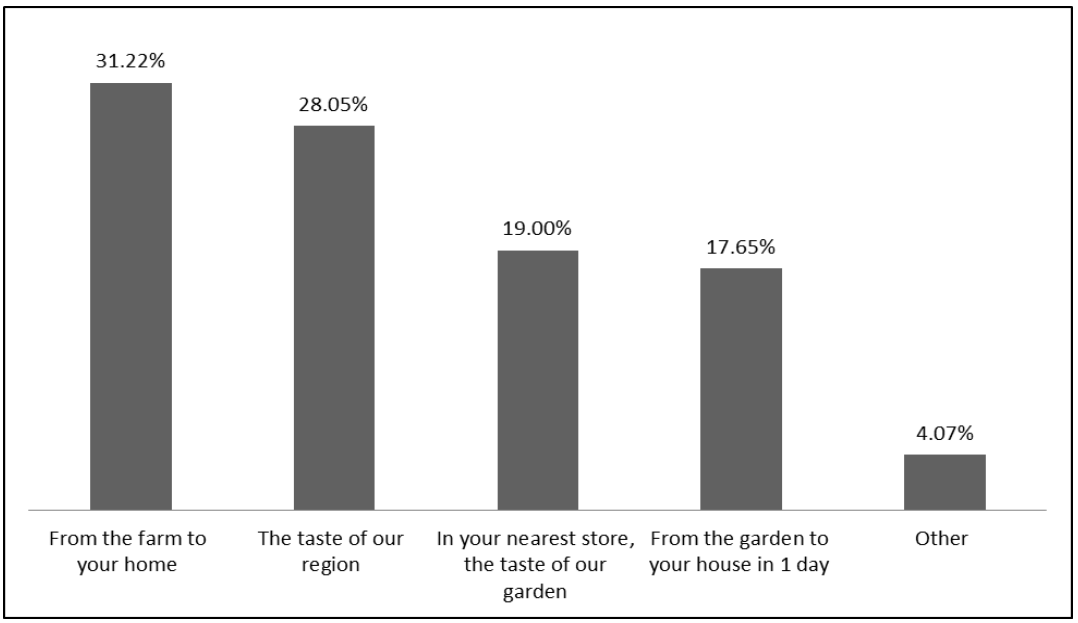

Figure 55. The most appropriate phrase for signaling local fresh fruits and vegetables in stores.
Source: Own

5.2.4. Ordered probit model

Table 35 shows the exogenous variables that have been finally statistically significant explaining the frequency of purchasing local fresh fruit and vegetables (Q14 of the survey). Two of these variables are dummies for the place of purchase: supermarkets and hypermarkets. The continuous variables are the factors obtained in Table 28 and Table 34.

Table 35. Exogenous and Endogenous variables: Ordered probit model

Endogenous variable (Dependent variable)	Exogenous variables (Independent variable)
• **Frequency of buy local fresh fruit and vegetables: (Q14)** 1= hardly ever (Answers never, hardly ever, I don‟t know) 2=sometimes (Answer sometimes) 3=usually (Answers always and usually)	• **Perceptions of local foods:** - Origin: Continuous variable - Intrinsic and extrinsic attributes: Continuous variable • **Benefits of consuming local foods:** - Healthy and tasty: Continuous variable - Social and environmental benefits: Continuous variable • **Place of purchase of local food products:** - Supermarket: Dummy: 1=Yes;0=otherwise - Hypermarket: Dummy: 1=Yes;0=otherwise

Source: Own

Table 36 shows the results of this estimated model, individually, most are significant at 1% error, less intrinsic and extrinsic attributes that is significant at 5%, hypermarkets that is significant at 10% error, and social and environmental wellbeing that is not significant at 10%. We observe that those who buy fruit and vegetables in hypermarkets are more likely to usually buy local fresh fruit and vegetables. On the other hand, for supermarkets, the coefficient is negative indicating that consumers who buy fresh fruit and vegetables in supermarkets are less likely to usually buy local fresh fruit and vegetables.

Table 36. Ordered probit model estimated results

		Estimate	P-value
Threshold	[localbuyer = 1.00]	-2.355	.000
	[localbuyer = 2.00]	-.712	.000
Location	Origin	.383	.000
	Intrinsic and extrinsic attributes	.250	.039
	Healthy and tasty	.287	.019
	Social and environmental welfare	.165	.108
	Supermarket	-.673	.002
	Hypermarket	.411	.097
Number of observations	187		
Pseudo R square of McFadden	0.182		

Source: Own

6. Conclusions

Supermarket observation

After gathering, recording and analysing information of 350 observations for 8 fruit and vegetables products sell in eight supermarkets in Zaragoza, we derived conclusions on the prevalence of fresh fruit and vegetables produced in Aragon. Also, the prices system and the type of packaging were analysed.

Concerning availability of fresh fruit and vegetable products in the supermarkets and hypermarkets, we identified main products such as Apple, Pear, Potato, Tomato, Onion, Borage, Cabbage and Chard.

Also, results indicate that apart from Chard and Borage that the percentage of vegetables produced in Aragon available in supermarkets and hypermarkets varies a lot, the prevalence of vegetables from Aragon in Eroski and Simply is high while Mercadona, LIDL and Hipercor does not sell vegetables from the region.

The same applies for fruits, Mercadona, LIDL and DIA does not sell fresh fruits from Aragon, Hipercor, Eroski and Simply only sell apples from the region and Alcampo and Carrefour offer apples and pears from Aragon.

Regarding to the price system, the prices of fresh fruit and vegetables are fairly similar regardless of the place of origin (i.e. Aragon or Spain). Even if the fresh fruit and vegetables products produced in Aragon are normally cheaper, they are not available in all supermarkets considered. But the Aragon products are more prevalent in hypermarkets.

About the hedonic price analysis, the products which have the origin of Aragon are slightly cheaper than other products from Spain or outside Spain. For packaging, it can observe that the products in plastic bags are less expensive than the products using other types of packaging. About the vegetables products it‟s noticed that borage is the most expensive followed by tomato. For fruits, apple is a little bit more expensive than Pear. Considering all the distribution channels that have been visited, Hipercor is the most expensive and Dia is the cheaper.

Conclusion on consumer survey

In order to better understand the following conclusions, it is important to keep in mind that the average food shopper studied in our survey are mostly females (68.45%) with an average age of 52 years old with higher education (77.1%) and more than 95% of the respondents have a net income in home of more than 1501 euros/month and more than 90% of our sample is from Zaragoza.

Consumption habits and place of purchase of local fresh fruit and vegetables

Fresh fruit and vegetables consumption is important and the majority of consumers eat fruit and vegetables daily. Additionally, the majority of our respondents are habitual shoppers of local fresh fruit and vegetables. The most common places of purchase fresh fruits and vegetables are groceries and supermarkets, in particular, Mercadona, Simply and Dia. The most preferred place of purchase for local fresh fruit and vegetables were traditional stores and directly from the farmer. With a specific characteristic like convenience, availability of information and price.

Important product attributes

Considered all the attributes that affect the food purchase decision, the results indicated that health and taste are the most relevant aspects and the convenience was the least important attribute that affect purchase decisions. More particular, the main factors that influence purchase decision are locally produced, the appearance of the products, price and credence attributes (i.e. Ecological and Denomination of origin). According to the place of origin as a technical attribute related with local fresh fruit and vegetables the majority of our respondents are normally looking for the place of origin in when purchasing food.

Consumer perceptions about local food and intention to purchase

Regarding to the consumer perceptions towards local food, the most appropriate phrase for signaling local fresh fruits and vegetables is „From the garden to your home". It"s noticed that the major factors that consumers associated with local food are locally produced (i.e. they are produced near their towns) and intrinsic and extrinsic attributes (i.e. they are fresh, they are safe).

For the consumer perceptions about the local food benefits the main aspects in the consumer"s minds are that local food increase social and environmental welfare and healthy and tasty benefits.

When analysing the intention to purchase fresh fruit and vegetables, it is concluded that the consumers who are more likely to purchase local fresh fruit and vegetables in the future were almost the majority. Also as it were expected, respondents who already purchased local fresh fruit and vegetables in the past were more likely to buy it again displaying a certain level of customer loyalty. Another group of people identified as more likely to purchase fresh fruit and vegetables, we assumed that this group of people is less interested in the common local varieties and is willing to try and find a more convenient fresh fruit and vegetables product.

The majority of consumers who did not purchase local fresh fruit and vegetables products reported that they could not find them in the stores where they usually purchase.

According to the consumer perceptions about the differences between local fresh fruit and vegetables and non-local in terms of the prices, the majority of our respondents admit that there are approximately no differences.

The majority of consumers (60%) stated that local fresh fruit and vegetables should have the same price as the non-local with a minority (35%) thinking that they should be cheaper.

Segmentation of consumers

We identified 3 different segments of consumer two of them give positive attitude towards local food products.

Understanding the particular needs of these groups is important for building the right marketing mix. Apart from the socio-demographic characteristic in particular (Education level), these segments have been compared in terms of their perceptions about local foods such as: local origin, intrinsic and extrinsic attributes.

7. Recommendations

Following the conclusions mentioned above, we can state that consumers in Zaragoza are interested in buying local fresh fruit and vegetables because the actual frequency of consumption is relevant and they are willing to purchase local fresh fruit and vegetables in the future. However, the prevalence of vegetables (except for borage and chard) in supermarkets and hypermarkets is very small and of fruits is still low. It was observed that the prevalence is higher in hypermarkets than in supermarkets.

Our recommendations are mostly related to areas of the marketing mix where the retailers could focus its operations. Below we present the most important aspects categorized by the 4 P‟s of the marketing mix:

Place

Taking into consideration that the most important reason why consumers do not purchase local fresh fruit and vegetables was its unavailability in the shops that they used to purchase from, we recommend that the retailers could take advantage of the consumers‟ interest and willing to buy local fresh fruit and vegetables. Then, they should increase the proportion of local products in their supply along the year.

For the producers, we recommend that they should consider alternative distribution channels where people think they could buy local food from and try to make them as convenience as possible (i.e. traditional shops, small mini-markets, ecological shops etc.), which would support the full market potential of their local products. However, they should try to sell their local products also in supermarkets and hypermarkets informing them that consumers are increasingly interested in local produce based on our results.

Promotion

As already mentioned, the origin of the product is one of the most important factors consumers take into account when purchasing fresh fruit and vegetables. Thus, our recommendation for the producers and/or the retailers is to continually communicate and advertise the fact that local fresh fruit and vegetables have great social, environmental and economic benefits, in order to increase consumers‟ awareness about local fresh fruit and vegetables characteristics, which will result in an increase of sales as well as consumer‟s loyalty. Moreover, retailers should provide visible and clear information on local products in the shelves in order to increase consumers‟ attention to these products. Consumers spend few seconds looking at the shelves and it is important to catch their attention. They could use promotional posters informing about the local fresh fruit and vegetables using some of the messages found the most important for consumers “From the farm to your home” or “the taste of our region”.

Normally, a good promotion of local products can be done by private companies, public institutions or cooperatives. This promotion is expensive; then, public institutions and/or government could implement generic promotional campaigns of local products (in general) explaining the implications and benefits of consuming local products for the whole society.

Price

As observed in all supermarkets, the prices of fresh fruit and vegetables produced in Aragon are cheaper than fresh fruit and vegetables from any other origin. Moreover, we found that the majority of consumers believe that prices should be the same. Then, once promotional campaigns are implemented and their success is verified, prices could be increase to be closer to the prices for the non-local products.

Product

According to our study results, we know that the intrinsic and extrinsic attributes is one of the most important factor consumers consider prior to their purchase decision. We recommend offering local fresh fruit and vegetables with high standards of intrinsic quality.

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Appendix 1

ENCUESTA SOBRE CONSUMO DE FRUTAS Y HORTALIZAS FRESCAS

Buenos días/tardes, somos un grupo de estudiantes de master de Marketing agroalimentario del Instituto Agronómico Mediterráneo de Zaragoza y estamos realizando un trabajo ***sobre consumo de frutas y hortalizas frescas.*** *Sus opiniones nos serán de gran utilidad, por lo que le pedimos su colaboración. La mayoría de las preguntas son de opinión, por lo que no hay respuestas correctas ni incorrectas a las preguntas que haremos a continuación. Sus contestaciones están sujetas a secreto estadístico. Muchas gracias por su colaboración.*

Bloque 1: HÁBITOS DE CONSUMO Y COMPRA

1. ¿Es Usted el que realiza la compra de alimentos en su hogar? (Marque con una X)

☐ Nunca (Fin de Encuesta) ☐ Rara vez ☐ Algunas veces ☐ A menudo ☐ Siempre

2. Ordene los siguientes motivos, según la importancia que tienen para usted a la hora de comprar alimentos. Donde 1 indica que es el más importante y 5 que es el menos importante.

	Comodidad	Precio	Salud	Lugar producción	Sabor
Ordenación					

3. ¿Cuáles de las siguientes frutas y verduras se suelen comprar en su hogar? Se pueden marcar varias opciones

Verduras en fresco (verduras frescas)	
Verduras congeladas	
Verduras en conserva	
Frutas en fresco (frutas frescas)	
Frutas envasadas partidas listas para comer	
Frutas en conserva (en su jugo, almíbar, etc.)	
Otros (especificar)	

4. ¿Con qué frecuencia se comen en su hogar frutas y verduras frescas? (Marque con una X)

	Nunca o menos de una vez a la semana	Una vez a la semana	2-4 veces a la semana	5-6 veces a la semana	Todos los días
Frutas					
Verduras y Hortalizas					

5. ¿Cuántas piezas de fruta come al día? _____

6. ¿Cuántas raciones de verduras y/o ensaladas come al día? _____

7. Cuando compra frutas y hortalizas frescas ¿Qué importancia le da a las siguientes características? (Marque con una X)

	Ninguna	Poca	Media	Bastante	Mucha
Color					
Tamaño de la pieza					
Lugar de producción (nacional, regional, etc.)					
Precio					
Apariencia perfecta (sin defectos visuales)					
Que sean ecológicas					
Que tengan Denominación de Origen					
Que sean producidos cerca de mi localidad					
Que hayan sido producidos en mi región					

8. ¿Dónde suele comprar las frutas y hortalizas frescas?Se pueden marcar varias opciones (puede marcar varias X)

Verdulería/Frutería en el mercado de barrio o central	
Supermercado	
Hipermercado	
Verdulería/Frutería	
Directamente al productor/cooperativa	
En la muestra de productos ecológicos	
Otros (especificar)	

9. ¿En cuál/es de los siguientes supermercados y/o hipermercados compra las frutas y hortalizas frescas? Se pueden marcar varias opciones

No compro en supermercados ni hipermercados	
Eroski	
DIA	
Simply	
Mercadona	
Carrefour	
LIDL	
Alcampo	
Hipercor	
Corte Inglés	
Otros (especificar)	

10. Cuando va a comprar frutas y hortalizas frescas, indique la importancia que tienen para usted los siguientes aspectos de los establecimientos de compra (Marque con una X)

	Ninguna	Poca	Media	Bastante	Mucha
La cercanía del establecimiento					
El asesoramiento del vendedor					
Que pueda hacer allí toda la compra de alimentos					
Tenga una gran variedad de frutas y verduras frescas					
Buena relación calidad-precio					
Ofrezca frutas y verduras de Aragón					
Los horarios de apertura del establecimiento					

11. Cuando va a comprar frutas y verduras frescas, ¿se fija donde han sido producidas? (Marque con una X)

☐ Nunca ☐ Rara vez ☐ Algunas veces ☐ A menudo ☐ Siempre

12. Podría indicarme en qué medida asocia un alimento local con los siguientes aspectos (siendo 1 = ninguna, …, 5 = alta asociación) (Marque con una X)

Los alimentos locales	Ninguna Asociación	Poca Asociación	Asociación Media	Bastante Asociación	Alta Asociación
Son producidos cerca de mi localidad					
Son sabrosos					
Son los que recorren poca distancia entre el productor y el consumidor					
Son mejores para el medioambiente					
Son seguros					
Son frescos					
Son los producidos en mi provincia					
Son los que venden directamente los productores					

Bloque 2: ALIMENTOS LOCALES

Los alimentos locales son aquellos producidos y consumidos en un área geográfica próxima, vendidos directamente por el agricultor o a través de un único intermediario que debe comunicar al consumidor que se trata de un alimento local. En nuestro caso, los alimentos producidos en Aragón pueden ser considerados locales.

13. Podría indicar su grado de acuerdo o desacuerdo con las siguientes afirmaciones? (Marque con una X)

Comprar alimentos locales	Muy en desacuerdo	En desacuerdo	Indiferente	De acuerdo	Muy de acuerdo
Ayuda a aumentar la renta de los agricultores de mi zona					
Es beneficioso para mi salud					
Ayuda al mantenimiento del medio rural					
Me ofrece alimentos más sabrosos					
Es beneficioso para el medioambiente					
Me ofrece alimentos más frescos					

14. ¿Suele comprar frutas y verduras frescas locales? (Marque con una X)

Nunca	Rara vez	Algunas veces	A menudo **(Ir a pregunta 17)**	Siempre **(Ir a pregunta 17)**	No lo sé

15. ¿Cree que compraría frutas y verduras frescas locales en una compra futura? (Marque con una X)

Es muy poco probable **(ir a pregunta 16)**	Es poco probable	No lo sé	Es bastante probable	Es muy probable **(ir a pregunta 17)**

16. Podría indicarme el grado de acuerdo o desacuerdo con los siguientes motivos por los que usted NO compra o es poco o muy poco probable que compre frutas y verduras frescas locales

	Muy en desacuerdo	En desacuerdo	Indiferente	De acuerdo	Muy de acuerdo
No se venden en mis establecimientos habituales de compra					
Me da lo mismo donde se produzcan las frutas y verduras que compro					
Su calidad es similar a las producidas en otros lugares					
No sé en qué establecimiento se pueden comprar					
Son más caras					
No tengo tiempo para ir a buscarlas donde las venden					

17. ¿Dónde ha comprado o cree que compraría frutas y verduras frescas locales? (Marque con una X)

Verdulería/Frutería tradicionales	
Supermercados/hipermercados	
Directamente del agricultor: mercadillo de productores	
Directamente del agricultor: venta ambulante	
Directamente del agricultor: en su casa/finca	
Directamente del agricultor: cestas que recibe en su domicilio o en algún punto cercano a su casa	
Otros (especificar)	

18. Imagínese que quiere comprar frutas y verduras frescas locales, ordene, las siguientes formas de compra, según sus preferencias, donde 1 indica la más preferida y 5 la menos preferida

	Ordenar según preferencia 1 = más preferida … 5 = menos preferida
Directamente del agricultor: mercadillo de productores	
Supermercados/hipermercados	
Fruterías y verdulerías tradicionales	
Directamente del agricultor: venta ambulante o cestas que recibe en su domicilio o en algún punto cercano a su casa	
Directamente en la casa/finca del agricultor	

19. Usted cree que las frutas y verduras frescas locales deberían tener un precio mayor, menor o igual que las NO locales. (Marque con una X)

Mayor	Menor	Igual

20 ¿Cuál/es de las siguientes frases considera más apropiada/s para señalizar las frutas y hortalizas frescas locales en las tiendas? (Puede marcar varias opciones, como máximo 3)

El sabor de nuestra región	
En su tienda más cercana, el sabor de nuestra huerta	
Del huerto a su casa	
De la huerta a su casa en 1 día	
Otros (especificar):	

Bloque 4: CARACTERISTICA SOCIO-DEMOGRAFICAS

21.- ¿Podría decirnos cuántas raciones de frutas y verduras se recomienda comer al día?

☐ Raciones ☐ No sabe/ No contesta

22. ¿Podría indicar su año de nacimiento? _____

23. ¿Usted es? (Marque con una X)

☐ Hombre ☐ Mujer

24. ¿Podría decirnos el número de miembros de su hogar? _____

25. ¿Podría decirnos su nivel de formación/estudios? (Marque con una X)

☐ Primarios (EGB, Primaria) ☐ Secundarios (BUP, Bachiller, FP Medio) ☐ Superiores (FP Superior, Universitarios)

26. ¿Es usted vegetariano o vegano? (Marque con una X)

☐ No ☐ Sí

27. ¿Podría indicar en qué provincia reside? (Marque con una X).

☐ Huesca ☐ Teruel ☐ Zaragoza

28. ¿Cuánto tiempo lleva viviendo en Aragón?_____años

29. ¿Pertenece Ud. a alguna asociación de conservación de la naturaleza?

☐ No ☐ Sí

30. ¿Es usted voluntario en alguna actividad de su comunidad (colegio, ayuntamiento, parroquia, etc.)? (Marque con una X).

☐ No ☐ Sí

31. ¿Ha donado en los últimos meses dinero para alguna causa social y/o ambiental? (Marque con una X).

☐ No ☐ Sí

32. En esta escala de 1 a 5, ¿podría indicar en qué intervalo se sitúa la renta mensual neta de su hogar? Incluyendo los ingresos de todos sus miembros. (Marque con X)

1.- < 900 € / mes		4.- 2.501- 3.500 € / mes	
2.- 901 - 1.500 € / mes		5.- > 3.500 € / mes	
3.- 1.501 – 2.500 € / mes			

Appendix 2

Table 1. Agglomeration Schedule to define the number of clusters

Stage	Cluster Combined		Coefficients	Stage Cluster First Appears		Next Stage
	Cluster 1	Cluster 2		Cluster 1	Cluster 2	
1	2	10	1.542	178	37	10
2	24	45	2.314	106	184	9
3	3	12	**2.370**	181	186	**8**
4	3	53	3.494	189	169	7
5	4	144	3.508	185	175	6
6	2	168	3.745	187	174	5
7	1	24	3.922	183	188	4
8	3	4	**4.410**	190	191	**3**
9	1	3	**5.649**	193	194	**2**
10	1	2	10.001	195	192	1

Table 2. ANOVA

	Cluster		Error			
	Mean Square	df	Mean Square	df	F	Sig.
local origin	52.809	2	.466	194	113.353	.000
intrinsic and extrinsic attributes	55.642	2	.437	194	127.418	.000

Table 3. clusters profiling

		Education level		
		Low education	High education	Total
cluster identity	cluster 1	4 9.1%	40 90.9%	44 100.0%
	cluster 2	16 29.6%	38 70.4%	54 100.0%
	cluster 3	23 25.8%	66 74.2%	89 100.0%
Total		43 23.0%	144 77.0%	187 100.0%