



Master's Thesis  
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# **Comparison Study of the Reducing, Reusing and Recycling knowledge and habits of conventional and organic food consumers**

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Master Thesis  
“Comparison Study of  
the Reducing, Reusing  
and Recycling  
knowledge and habits of  
conventional and  
organic food consumers”

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## ***Abstract***

The purpose of the present Master Thesis is to study, analyse and compare the attitude and knowledge of conventional or non-organic food consumers and organic food consumers in the packaging food disposal. Sweden and Spain are the countries chosen to develop this project.

The research therefore will try to answer the following questions:

- **How much do conventional and organic food consumers know about the packaging food disposal?**
- **How do they behave when disposing it?**

A comparison between both types of consumers and countries will be done.

The objective is also to try **to find the causes that make some consumers not recycle or not recycle more and try to find a solution to increase their recycling habits.**

By using literature, articles and information on the Internet, the Theory chapter has been developed. In the theory chapter, a number of sections describe information related to Packaging, Sustainability, Organic Farming in Sweden and Spain, Waste background and finally the Waste Management System used by each of the countries. This information has helped me in the analysis of the results obtained and in the development of the conclusion.

To answer the research questions, qualitative and quantitative data has been gathered by different methods. Interviews done in three different class supermarkets have been used to get quantitative information. The focus groups have been used to gather the qualitative information, which have helped me in the understanding of the knowledge and attitude of both consumers. The gathered information has also helped me with the development of the possible alternative solution.

Each of the countries are analysed in the same way. Firstly, an introduction of the conventional and organic market is done. Then conventional consumers are analysed by answering the three research questions. After having analysed conventional consumers, the organic consumer research questions are analysed. A comparison between both consumers is then developed. A comparison between Sweden and Spain is finally done.

The conclusions of this Thesis are different in each of the countries. In Sweden, although conventional consumers have a small higher knowledge and small better habits than organic consumers, there is not a significance difference of what conventional consumers know and do compare to what organic consumers know and do. In Spain, organic consumer do it worse in the Recycling activities due to the untruthful of the little information spread by governments, while they do it better in the Reducing and Reusing rates due to the more awareness with environmental problems. Finally, when comparing Sweden with Spain, Sweden has a higher knowledge and attitude than Spain. Therefore, it would be interesting to improve the Spanish knowledge and attitude by copying the good systems of the Swedish model and implementing them in Spain.

## ***Preface***

The present Master Thesis is written as the final task of my Industrial Engineering degree. It has been written in the Division of Packaging Logistics within the Department of Sciences of Lunds Tekniska Högskola (LTH), Lund University.

First of all, I would like to thank my supervisor Helena Lindh, without whom this Thesis would have not been possible. I would also like to thank Gwenola Bertoluci and Annika Olsson for the help and feedback with which they have provided me. All of them have made me work in a very comfortable and nice environment at IKDC. I am also grateful to all participants that participated in the focus groups done.

I would also like to give a special and deep thanks to my family and boyfriend for the support and recommendations they have sent me, not just while doing my Thesis, but also during all my Engineering studies. I really appreciated it.

Finally, a special mention to all my Erasmus friends and partners for the support they have given me and the good moments that we have spent in Lund.

Tack så mycket,

Lund 17-06-2010

Marina Vargas Julián

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APPENDIX 1: Questions and results obtained from supermarket surveys.

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## 1. Introduction

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*In this first chapter, the reader will be introduced to the background, the problem formulation, the purpose and the delimitations of the thesis.*

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### 1.1 Background

In 1987 the Brundtland Commission first defined Sustainable Development as “the development that meets the needs of the present without compromising the ability of future generations to meet their own needs”.<sup>1</sup>The term sustainable development refers to all environmental, social and economical activities as a whole.

In what food consumption concerns, organic agriculture is the food way to work for sustainable development. It sets that production and food systems must be based on local and renewable resources, ecosystems must be preserved and it must promote human health.<sup>2</sup>IFOAM sets that health, ecology, care and equity are the issues that organic agriculture must promote.<sup>3</sup>

In the EU organic framework, Sweden and Spain are two interesting countries to consider. Sweden is characterized by high organic food consumption but a small production, while in Spain the organic consumption stays in a small niche, but the organic agricultural production is one of the highest among the EU members.<sup>4</sup>

Food normally comes with its own packaging. Packaging is a very important feature in all industries and business as it is the link between producers and consumers. The main function of the package is identifying the product and transporting it in the safest and most cost- effective way through all the distribution system.<sup>5</sup>

There has been a tremendous evolution in the packaging industry throughout the centuries. Packaging trends shifted from the farming societies, where all products were manufactured locally and sold in local markets, to the industrialized societies, when the market became global and the need for a distribution system to supply every client appeared. This made packaging necessary. The last big step was in the late 1950s and early 1960s when self-services stores appeared and industries had to adapt to the demand, and produce ready to pick packages.<sup>6</sup>

Nowadays, packaging plays a very important role in our sustainable society. Packaging contributes to the environmental, economical and social dimension of sustainable development. Being the link between producer and consumer, it helps to prevent waste and improves the economical flow of countries.

On the other hand, in the current world in where we live today, where consumption is growing and the living standards are constantly changing, packaging is becoming essential and each time more packaging and packaging waste is being generated. In most of the developed countries the increasing generation of packaging waste is link to the economical growth of the country.

An inappropriate management of packaging and packaging waste lead to tremendous impacts in the environment, society and economy, as it can produce the

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<sup>1</sup> Redclift, M. ‘Sustainable Development (1987-2005): an oxymoron comes of age’, 2005.

<sup>2</sup> U.Geber, ‘Organic Agriculture-production and consumption. Framework for research 2007-2009’, in Centre for Sustainable Agriculture, viewed on 1 June 2010, <<http://www.cul.slu.se/english/index.asp>>

<sup>3</sup> [http://www.ifoam.org/growing\\_organic/definitions/doa/index.html](http://www.ifoam.org/growing_organic/definitions/doa/index.html), visited on 1 June 2010

<sup>4</sup> [http://www.organic-europe.net/country\\_reports/default.asp](http://www.organic-europe.net/country_reports/default.asp), visited on 1 June 2010

<sup>5</sup> Corner, E. & Paine, F.A., *Market Motivators: The special worlds of Packaging and Marketing*, 2002, p7

<sup>6</sup> Johansson, K.et al.1996.p 9-10

pollution of water, land and air, contribute to climate change as well as to affect the ecosystems and human health.<sup>7</sup>

The environmental problem that a bad waste of packaging and packaging waste can produce, has led countries to develop legislation concerning packaging waste management. In the European Union framework, legislation has been developed with the Directive 94/62/EC on Packaging and Packaging Waste, that set the recovery and recycling targets to be comply by all the EU members. Its aim is to try to reduce the total amount of packaging waste produced as well as the total amount going to landfill. It is set in a hierarchical level: Reduce, Reuse, Recycle, other recovery and landfill.<sup>8</sup>

Public administration, economic sectors and society are becoming more sensibly.

Each country implements its own waste management systems to improve the efficiency of the management of packaging waste and waste in general.

Sweden and Spain has its own systems, with which they involve producers, municipalities, consumers and households in order to have a better systems. The involvement of all actors is essential for the waste management system to work. And it is consumers and households' one of the most important actor for its well functioning. If consumer do not cooperate by the reducing, reusing and separation activities, the waste management system will not be effective.<sup>9</sup>

## **1.2 Problem Formulation**

The problem treated in the present Thesis is the increasing amount of packaging food waste. This increased has a negative impact on the natural environment, society and economy.

The increase of wealth and population leads to a higher consumption. People's lifestyle is constantly changing, and a higher consumption is also hidden in it. One good example is the increasing habit of eating in fast food restaurants. These are just some of the reasons why food packaging waste is increasing.

A good way of decreasing the packaging food waste is practising in a proper way the 3Rs: Recycling, Reusing and Reducing. In that sense, consumers play a very important role, since they are the ones in charge of the disposal of the packaging.

The great impacts of climate change are making consumers to be more concerned about environmental issues. That is why the number of organic food consumers is increasing, since they want to have a greener way of life. However, conventional food consumers are still higher.

This thesis will compare the habits and knowledge of the disposal of food packaging of both types of consumers. It will study if the greener way of buying the food products that the organic food consumers have, corresponds to the way of disposing it; analyzing also the conventional consumer perspective.

## **1.3 Purpose**

The purpose of the present Master Thesis is to study, analyse and compare the attitude and knowledge of conventional or non-organic food consumers and organic

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<sup>7</sup> Ministerio de Medio Ambiente Rural y Marino, Plan Nacional Integrado de Residuos, 2008, p3

<sup>8</sup> <http://ec.europa.eu/environment/waste/packaging/legis.htm>, visited on 1 June 2010

<sup>9</sup> Ebbesson, J. 'Producer Responsibility in Sweden', Avosetta Meeting, Brussels, 2004



food consumers in the packaging food disposal. Sweden and Spain are the countries chosen to develop this project.

The research therefore will try to answer the following questions:

- **How much do conventional and organic food consumers know about the packaging food disposal?**
- **How do they behave when disposing it?**

A comparison between both types of consumers and countries will be done.

The objective is also to try **to find the causes that make some consumers not recycle or not recycle more and try to find a solution to increase their recycling habits.**

### ***1.4 Delimitations***

The scope of the Thesis will be just focus on food packaging and primary packaging. The focus will also be on Sweden and on Spain within the European Union framework. Lund and Madrid are the two cities where the supermarkets surveys and focus groups have taken place. However, the description of all the section within the theory chapter that refers to the countries’ systems and data, do refer to the whole countries and not just to Lund and Madrid.

The consumer is the only actor of the waste management system analysed.

Finally, the problem, causes and alternative solution will just be developed for the country which the worst results obtained and the alternative solution will be just focus on improving the recycling rate, leaving a part the reducing and reusing rate.

## 2. Methodology

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*In this chapter the reader will be introduced to the research techniques and the research tools used in the thesis.*

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### 2.1 Research Techniques

The data or material used in a research is known as sources. The sources of information can be classified in to two types: primary and secondary sources

- Primary sources: These sources are the ones created at the same time of an event or people described. There is not a link between the creator of the document and the document itself. Some examples are: letters, diaries, interviews or magazines.
- Secondary sources: These sources are created after the primary sources. It refers to the information that has been analysed, interpreted or commented. Some examples are: history book, biographies or public stories.<sup>10</sup>

The information can be gathered with two different techniques approaches that are complementary: quantitative and qualitative techniques.

- Quantitative Technique – It gathers and measures people in different categories based on variables, such as gender, profession, age...The quantitative techniques are divided in to: personal interview, telephone interview, post survey, informative panel and mystery shopping.
- Qualitative Technique – It analyses the meaning of the reality, the quality of the information. Focus groups are a qualitative technique which obtain and then analyse a discussion between a reduced number of participants who have with something in common. The qualitative techniques can be divided in to: in depth interview, focus group and semi structured interview.<sup>11</sup>

### 2.2 Research Tools

The present Master Thesis research is based on literature studies, interviews and focus groups. The qualitative information has been gathered by the literature studies and the focus groups, while the interviews constitute the quantitative part of the research.

#### 2.2.1 Literature Studies

The theory chapter and in depth knowledge of the matter have been done thanks to the search done mainly in Internet. Some books have also been used to write about some issues. The Lund University data base has also been used to read information in research interesting project.

#### 2.2.2 Interviews

Interviews have been done in order to get quantitative information. The interviews have led to the obtaining of interesting data regarding the knowledge and

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<sup>10</sup> <http://www.collectionscanada.gc.ca/education/008-3010-e.html>, visited on 16-06-2010

<sup>11</sup> <http://www.marketing-xxi.com/principales-tecnicas-de-recogida-de-informacion-27.htm>, visited on 3-06-2010

attitude of consumer, which have helped to make some statistical analysis and to try to find relation between several variables.

Interviews have been conducted in three different class supermarkets in the cities of Lund and Madrid. The reason for choosing three different class supermarkets is to be able to interview a variety of consumers with different incomes. ICA, Konsum and Willys have been the three supermarkets chosen to do the interviews in the city of Lund, while Hipercor, Carrefour and Mercadona the ones in Spain.

The duration of each interview has been between 5 and 8 minutes, in which consumers were able to answer the questions in a relaxing atmosphere.

Finally, the number of interviews gathered during a four days interviewing is 150 in Lund and 120 in Madrid.

The Swedish and Spanish questionnaires and the results obtained are attached in Appendix 1.

### **2.2.3 Focus Group**

The focus groups have been conducted to get qualitative information. The focus group has been developed, in order to get a deeper knowledge of what the attitudes and knowledge of both organic and conventional food consumers are. The analysis of the results obtained together with the relation with the theory has been done to understand why the data obtained in the interviews is the way it is, and also to comprehend the problems and causes of not having an ideal recycling rate and to try to develop the suggested solution.

There have been two focus groups in Lund and in Madrid: one for conventional consumers and the other one for organic consumers. Conventional participants have in common the fact that they recycle and they also do the family shopping. There have been 6 and 3 participants in the Swedish conventional and organic focus groups, and 6 participants in both focus groups conducted in Madrid.

Conventional consumer focus group lasts 1 hour while the organic groups 1 hour and 15 minutes, due to the special biodegradable plastic packaging section to be answered by the organic consumers

The four focus groups have been recorded, with the approval of all focus group members, in order to get a better analysis of the group.

The questions asked in the Swedish and Spanish Focus Groups and the results obtained are attached in Appendix 2.

## 3. Theory

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*In this chapter the reader will be introduced to the theory chapter, were the following subchapters will be described: Packaging, Sustainability, Organic Farming, Waste and the Waste management systems of both Sweden and Spain.*

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### 3.1 Packaging

#### 3.1.1 Packaging System

Packaging can be defined as a system with three hierarchical levels: primary, secondary and tertiary packaging. The performance of a packaging system is influenced not just by the performance of each of the levels but also by the interactions of all three.<sup>12</sup>

- **Primary Packaging:** It is the packaging that is directly in contact with the product and the one that the consumer gets. The main functions of the primary packaging are to protect and preserve the product's quality and to make the product available for the consumer. The packaging appealing and the ease of identification are also two important characteristics of this packaging. Ex. A bottle of milk.
- **Secondary Packaging:** It contains several primary packaging. Its main function is to facilitate the handling of products. It can sometimes be designed to be placed directly on the shelves. Ex. A cardboard tray where the bottles of milk are placed.
- **Tertiary Packaging:** It contains a number of secondary packaging. It is the packaging used for transportation. It has to facilitate transportation and handling and prevent damage to the product. Ex. Wooden Pallet.<sup>13</sup>

This paper focus its attention on the primary packaging, as it is the one in contact with the consumer.

#### 3.1.2 Packaging Functions

Packaging is a very important feature in all industries and businesses and it is the link between producers and consumers. In the food industry, the packaging plays a very important role, as the product needs to be delivered to consumers in perfect conditions. The product passes by several stages during its trip through all the supply chain, and it is there where it can lose some of its food properties.

In order to maintain the product's properties and add value to the product, the packaging has to fulfill logistics, market and environmental functions. Regarding food packaging, the identification of the product and the transportation in the safest and most cost-effective way through all the distribution system, are the two main functions of the packaging. The consumer has to be able to identify the product, in order to know what it is being bought. The package also protects and preserves the product from external and internal damages. Finally, the packaging must be designed in a way that it makes the use of the packaging and the product easy for the consumer.<sup>14</sup>

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<sup>12</sup> Hellström, D. Saghir, M. 'Packaging and logistics interactions in retail supply chains', 2007

<sup>13</sup> Johansson et al, *Packaging Logistics*, STFI/PackForsk, 1997

<sup>14</sup> Corner, E. & Paine, F.A., 2002

### 3.1.3 Packaging Materials

In this subchapter, the properties, types and applications of each of the packaging materials will be described.

#### Glass

The manufacturing process of glass is a very high energy consuming process. Glass packaging is made from silica, soda ash and limestone. These raw materials are melted in ovens at 1500°C. Once they are melted, the mix of raw materials is placed in cans and then blown up until the packaging gets its final shape.<sup>15</sup>

The strong and durable properties of glass packaging make products remain in very good conditions throughout its whole life cycle. However, its heavy nature means more energy consumption used for transportation and reprocessing. For that, it is recommended to use the minimum amount of glass without putting into risk the product's safety.<sup>16</sup> It is also an inert material that does not react with the products that it is in contact with.<sup>17</sup>

The most used glass packaging type is called commercial or soda lime glass. This commercial glass is normally uncoloured. However, by adding chemicals the colourless glass can be converted into green, blue or brown/amber glass. Different tonality can be found within each of the colour glasses too. Heat-resistance borosilicate (Pyrex) can also be found as a packaging.

Jars, bottles and containers are its main applications, and it is commonly used for food packaging due to its inert properties.<sup>18</sup>

#### Metal

Metal packaging is made of steel or aluminium and has a very high market value. The fabrication process and the mining of the raw materials use great amounts of energy as well as they produce pollution.

Metal packaging is strong and durable, although it is a light material. It also has a very high strength-to-weight ratio. The different treatments done to the metal's surface make the metal packaging ideal for protection and preservation, although the quantity of metal used is small. For that, food packaged with metal packaging has a long life. For instance, steel packages are normally covered with a very thin layer of tin that is why they are usually called tins.

The limited design formats, the impossibility of resealing the packaging once opened and the great amount of energy and resources used are some of the disadvantages of the metal packaging.<sup>19</sup>

#### Plastic

Plastic packaging is one of the most recent packaging materials, which appeared in the second half of the 20<sup>th</sup> Century. Plastic is made from non-renewable oil resources, most of them derived from petrol.

Many packaging designs can be done with plastic packaging. Some of the advantages of using plastic packaging are that it is a tough, durable and light packaging.

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<sup>15</sup> <http://www.uned.es/biblioteca/rsu/pagina1.htm>, 2010-05-12

<sup>16</sup> WRAP material Report

<sup>17</sup> Johansson et al., 1997

<sup>18</sup> WRAP material Report

<sup>19</sup> WRAP material Report

On the other hand, it is difficult to collect and store enough quantities to recycle economically, due to the low material value and bulk.<sup>20</sup>

There is a wide range of different plastics packaging with different properties and applications. Regarding the flexibility, there are flexible and rigid plastic packaging materials. Flexible plastic packaging is used for plastic bags or plastic films among others applications. And rigid plastic is used for buckets, boxes, bottles, jars or cans.<sup>21</sup>

### **Paper and Board**

Paper is made from cellulose fibre, which can be produced by pulped wood, recovered paper (the one that has been printed and used) or a mix of other materials like cotton, straw, grasses or sugar cane.<sup>22</sup>

One of the main advantages of paper is that is very easy to shape; therefore lots of different packaging designs can be done.<sup>23</sup>

Paper can be bleached with a mix of oxygen, hydrogen, peroxide and ozone.

There are two types of board: carton board and corrugated board.

Carton board consists of four or five layers of pulp and an outer coating that provides a smooth surface, where it is common to put clays, varnishes and sometimes plastic laminates. The smoothness of the surface makes it ideal for printing.<sup>24</sup>

Corrugated board consists of separated plane and corrugated paper layers glued together. Strength and unity properties are provided by the plane layers, while protection against impact and pressure are provided by the corrugated one.

Corrugated Board is light, not very expensive and is commonly used for stacking, as it is quite a strong material. There are different types: strong triple welled, single and double welled. Each of them offers different applications. Strong triple welled are used as part of pallet systems and single and double are used for regular boxes.<sup>25</sup>

### **Composite**

Composite materials for beverage carton are made of layers of paper carton, aluminium and plastic.<sup>26</sup>The manufacturing process is as follows: the company’s design is printed on the paper carton. Then the paper carton is laminated with aluminium foil and a film of Polyethylene. Finally, the material is taken to the manufacturing plants to start the packaging process.<sup>27</sup>

This packaging material has very good barrier properties such as moisture and protection properties. Its non heavy nature makes it a good environmental option for transportation. Its manufacturing process also requires less energy consumption and smaller amounts of raw materials.

When talking about recycling, the multi-layer nature makes it difficult to recycle it. Finally, as the amount of raw materials used is little, there are not recycling materials in its composition.

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<sup>20</sup> WRAP material Report

<sup>21</sup> Johansson et al., 1997

<sup>22</sup> WRAP material Report

<sup>23</sup> Johansson et al., 1997

<sup>24</sup> WRAP material Report

<sup>25</sup> Johansson et al., 1997

<sup>26</sup> Johansson et al., 1997

<sup>27</sup> <http://www.uned.es/biblioteca/rsu/pagina3.htm>, visited on 8-05-2010

This type of packaging is mostly found as beverage carton such as milk, yogurt or juice cartons.<sup>28</sup>

### **Biodegradable and Compostable**

Biodegradable and compostable packages are the ones made from agricultural waste production or crops grown for packaging production. The existing microorganisms living in compost decompose, in specific conditions, the biodegradable material into simpler elements such as carbon dioxide, water, inorganic components and biomass.

It is important to know that a biodegradable packaging is not necessarily compostable, but a compostable material is biodegradable.

If biodegradable packaging ends up in landfills, the decomposition of it will emit methane due to the anaerobic biodegradation.

Some biodegradable packaging materials are:

- Polylactic Acid (PLA)
- Polyhydroxyalkanoate (PHA)
- Bagasse (from sugar cane)
- Poly-hydroxybutyrate-co-hydroxyvalerate (PHBV)
- Thermoplastic Starch Materials (TSM)
- Polyglycolide Acid (PGA)
- Polycaprolactone (PCL).

It is very common to confuse them with conventional plastics, since their appearance is similar.<sup>29</sup>

### **3.1.4 Logos on Packaging**

There are several logos that can be printed on the packaging in order to inform consumers about the possibility of recycling certain types of materials:

- Mobius Loop – It consists of three twisted arrows dispose as a triangle. It means that the packaging is recyclable, and it is most commonly uses for paper packaging. If the triangle carries a percentage, it means that the packaging is made of a certain percentage of recycled material.



- Glass Packaging – This symbol reminds consumers to recycle glass packaging.



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<sup>28</sup> WRAP material Report

<sup>29</sup> WRAP material Report

- Plastic Packaging – There is a code of the different recyclable plastic, written with numbers and initials which refer to the types of plastic.<sup>30</sup>



### 3.1.5 Legislation on Packaging

#### Food Contact Material Legislation

Food contact materials are all materials and articles that can be in contact with foodstuffs such as packaging materials, cutlery, bottles, domestic appliances, dishes or even inks for printing labels.<sup>31</sup>

When food gets to the consumer, it has to arrive in good conditions and with its original quality. Food contact material must be safe and must not transfer (migration) their components to food in unacceptable quantities.

To protect the health of the consumer and avoid the contamination of foodstuff, two migration limits have been set for plastic material:

- The Overall Migration Limit (OML), which applies to all substances that can migrate from food contact material to food and is set of 60mg (of substances)/Kg (of Foodstuff).
- The Specific Migration Limit (SML), which applies to individual authorised substances. This Migration Limit is based of the toxicological evaluation of the substance. The Acceptable Daily Intake (ADI) and The Tolerable Daily Intake (TDI) are the references to establish SML.
- The EU has also developed legislation regarding materials that are in contact with food staff. The legislation for food contact material has two main objectives: The protection of the health of the consumer and the removal of technical barriers to trade.
- The EU framework encompasses the three following directives:
- The Framework Regulation (EC) No 1935/2004 sets up general requirements for all food contact materials.
- Legislation on specific materials covering groups of materials and articles listed in the Framework Regulation.
- Directives on Individual Substances or groups of substances used in the manufacture of materials and articles intended for food contact.<sup>32</sup>

#### The Packaging and Packaging Waste Directive

The first measures on packaging and packaging waste were taken in the 1980's. However, the vagueness of Directive 85/339/EEC on packaging and packaging waste led some member states to develop their own legislation with reductions of the environmental impacts of packaging purposes.

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<sup>30</sup> <http://www.wasteonline.org.uk/resources/InformationSheets/Packaging.htm>, visited on 03-06-2010

<sup>31</sup> [http://www.cbi.eu/marketinfo/cbi/docs/eu\\_legislation\\_food\\_contact\\_materials](http://www.cbi.eu/marketinfo/cbi/docs/eu_legislation_food_contact_materials), visited on 26-3-2010

<sup>32</sup> [http://ec.europa.eu/food/food/chemicalsafety/foodcontact/eu\\_legisl\\_en.htm](http://ec.europa.eu/food/food/chemicalsafety/foodcontact/eu_legisl_en.htm), visited on 26-03-2010



Internal market problems in these countries led to the development of an EU legislation on packaging. Finally and after a long discussion between the European Parliament and The Council of Ministers, Directive 94/62/EC (The Packaging and Packaging Waste Directive) was adopted in 1994.<sup>33</sup>

“This Directive covers all packaging placed on the market in the Community and all packaging waste, whether it is used or released at industrial, commercial, office, shop, service, household or any other level, regardless of the material used.”<sup>34</sup>

Directive 94/62/EC has two main objectives. On one hand, it is a harmonised measure, as it establishes common rules for all EU Member States in order to ensure the well functioning of internal market and to have a freer and easier trade among EU states. And on the other hand, it tries to reduce the environmental impact of packaging.

It sets the minimum requirements for packaging and the recycling and recovery packaging targets that all Member States must comply with. To do so, all States must developed national programmes to prevent the packaging waste, could develop packaging reuse systems and must develop systems for the collection and/or return of used packaging for the comply of the set targets.<sup>35</sup>

Targets should have been complied by 31<sup>st</sup> December 2008, except for Greece, Ireland and Portugal, were targets would not be bound until 2011, due to its geographical conditions.

The Directive also binds countries to create databases in order to have a solid waste management data and also to make information campaigns for consumers and producers.

To set new targets for packaging and packaging waste, Directive 94/62/EC has been amended to Directive 2004/12/EC, which clarifies the definition of packaging, increases the recovery and recycling rates and also specifies some material specific targets, all of it to be achieved by 2011; and Directive 2005/20/EC, which sets later targets for the new EU members (the Czech Republic, Estonia, Cyprus, Latvia, Lithuania, Hungary, Malta, Poland, Slovenia, Slovakia) by 31<sup>st</sup> December 2012.<sup>36</sup>

“The recycling and recovery targets are:

- No later than 30 June 2001 between 50 % as a minimum and 65 % as a maximum by weight of packaging waste will be recovered or incinerated at waste incineration plants with energy recovery;
- No later than 31 December 2008 60 % as a minimum by weight of packaging waste will be recovered or incinerated at waste incineration plants with energy recovery;
- No later than 30 June 2001 between 25 % as a minimum and 45 % as a maximum by weight of the totality of packaging materials contained in packaging waste will be recycled with a minimum of 15 % by weight for each packaging material;

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<sup>33</sup> [http://ec.europa.eu/environment/waste/packaging\\_index.htm](http://ec.europa.eu/environment/waste/packaging_index.htm), visited on 25-03-2010

<sup>34</sup> [http://europa.eu/legislation\\_summaries/environment/waste\\_management/121207\\_en.htm#AMENDING ACT](http://europa.eu/legislation_summaries/environment/waste_management/121207_en.htm#AMENDING_ACT), visited on 25-03-2010

<sup>35</sup> EUROPEAN COMMISSION, ‘Packaging and the EU Directive on Waste: Questions and Answers’, January 2009

<sup>36</sup> [http://europa.eu/legislation\\_summaries/environment/waste\\_management/121207\\_en.htm#AMENDING ACT](http://europa.eu/legislation_summaries/environment/waste_management/121207_en.htm#AMENDING_ACT), visited on 25-03-2010

- No later than 31 December 2008 between 55 % as a minimum and 80 % as a maximum by weight of packaging waste will be recycled;
- No later than 31 December 2008 the following minimum recycling targets for materials contained in packaging waste will be attained:
  - 60 % by weight for glass;
  - 60 % by weight for paper and board;
  - 50 % by weight for metals;
  - 22,5 % by weight for plastics, counting exclusively material that is recycled back into plastics;
  - 15 % by weight for wood."<sup>37</sup>

### Swedish Legislation

The Swedish waste management and disposal actions are regulated by the notion of the producer's responsibility, which implies that the producer is responsible for the collection and management of waste.

Swedish Law defined this system by government ordinances. One of these ordinances is *Ordinance (1997:185) on producer's responsibility for packaging*.

"The purpose of this ordinance is so that:

- Packaging shall be produced in such a way that its volume and weight is limited to the level required in order to maintain a good level of safety and hygiene,
- Producers shall arrange systems for the collection of all packaging waste that arises.
- Packaging waste shall be taken care of in an environmentally acceptable way, and,
- Meet the recycling objectives for collected packaging waste, provided in appendix 1 of this ordinance. Ordinance (2005:221)."<sup>38</sup>

This ordinance applies for all packaging materials, except for Aluminium containers and PET bottles, which are regulated by other ordinance.

### Spanish Legislation

*11/97, 24 Abril, Ley de Envases y Residuos de Envases y Embalajes*

The 11/97, 24<sup>th</sup> April, Law Packaging and Packaging Waste, was developed taking in consideration Directive 94/62/EC. It has twin purposes: On one hand, to prevent and reduce the environmental impact of packaging, and on the other hand, to manage packaging waste throughout its life cycle.

To achieve these twin purposes measures have to be taken into account in two senses:

- To prevent the packaging waste production
- For recycling and other types of incineration of packaging waste.

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<sup>37</sup>[http://europa.eu/legislation\\_summaries/environment/waste\\_management/121207\\_en.htm#AMENDING](http://europa.eu/legislation_summaries/environment/waste_management/121207_en.htm#AMENDING) ACT, visited on 25-03-2010

<sup>38</sup> REPA, 'Ordinance (1997:185) on Producers' Responsibility for Packaging', <http://www.repa.se/informationinenglish.4.3aac893711761f082898000759.html>

This law also sets a number of recycling and incineration targets to be achieved in a 5 years period of time.

In 2004, The Directive 2004/26/EC modified the target that needed to be achieved by 31<sup>st</sup> December 2008.<sup>39</sup>

## **3.2. Sustainability**

### **3.2.1 Sustainable Development**

The economic growth achieved during the 20<sup>th</sup> Century not just increased the life and health standards of people; it also introduced the world to the environmental problems that are being faced today and increased the gap between developed and developing countries.<sup>40</sup>

During the 1980s and 1990s, society started to be aware of these problems and the term sustainable development became the buzzword used by different kinds of people, from environmentalist to politicians.<sup>41</sup> It was in 1987 when the Brundtland Commission first defined Sustainable Development as “*development that meets the needs of the present without compromising the ability of future generations to meet their own needs*”.<sup>42</sup>

Sustainable Development is supported by three pillars: Environmental, Social and Economic pillars. These three pillars, which were already introduced in the 1987 by the Brundtland Commission definition, are important individually and as a whole, and must be interdependent and inseparable in order to achieve a sustainable human progress.<sup>43</sup>

### **3.2.2 The Packaging Life Cycle**

Life Cycle is defined by the ISO 14040 series as “*consecutive and interlinked stages of a product system, from raw material acquisition or generation from natural resources to final disposal*”.<sup>44</sup>

The packaging life cycle is a circular cycle that goes from the extraction of the raw materials to the disposal of the packaging, as shown in Figure 1. The packaging has to meet particular requirements at each of the stages of the supply chain. The packaging’s role changes throughout its life cycle, as packaging changes from tertiary or transport packaging, then to secondary packaging and finally to primary packaging, having each of these levels its own and particular functions.<sup>45</sup>

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<sup>39</sup> [www.afam-morteros.com/funciones/bajarfile.asp?id\\_registro](http://www.afam-morteros.com/funciones/bajarfile.asp?id_registro), visited on 4-05-2010

<sup>40</sup> Tyler Miller, T. “*Living in the Environment: Principles, Connections and Solutions*”, Wadsworth Publishing Company, 2001, p7

<sup>41</sup> Harris, J.M. ‘Basic Principles of Sustainable Development’. Global Development & Environment Institute, June 2000

<sup>42</sup> World Commission on Environment and Development, “*Our Common Future*”, Oxford University Press, Oxford, 1987, p. 43.

<sup>43</sup> Harris, J.M. June 2000

<sup>44</sup> EUROOPEN, ‘Packaging in the Sustainability Agenda: A Guide for Corporate Decision Makers’, ECR Europe, Brussels, 2009

<sup>45</sup> WRAP, ‘A summary of the packaging life cycle’, [www.wrap.org.uk/](http://www.wrap.org.uk/)

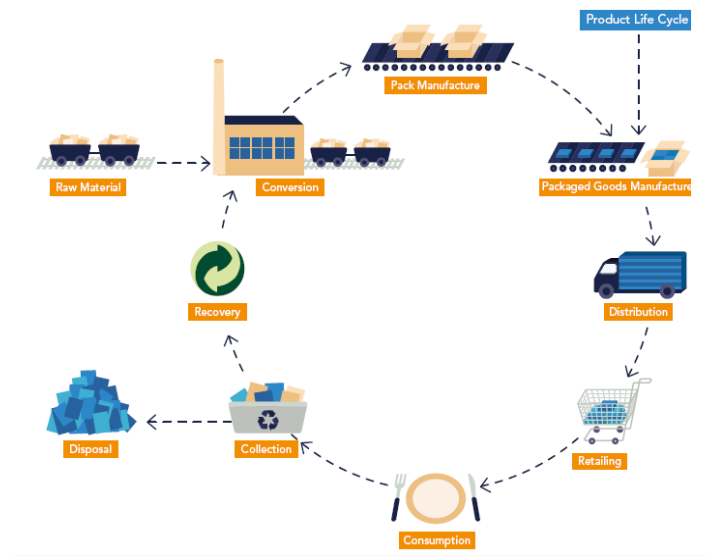


Figure 1: Packaging Life Cycle <sup>46</sup>

The product and the packaging must be designed and specified together from conception, in order to achieve efficiency, effectiveness and convenience in each of their life cycle stages.

The product-packaging’s life cycle begins with the obtaining of the packaging raw materials, which are then converted to a packaging. The warehouse packages the products in its primary, secondary and tertiary packaging, in order to transport it. Once the products are packaged, they are transported to the retail stores, where consumers buy their packaged products. Finally, once the consumer consumes the product, the packaging does not fulfil its functions anymore and can follow two different paths: the disposal or the recovery of the packaging. It is then when the package life cycle ends and starts again.

Sustainability along the packaging value chain needs to be taken into account.

### 3.2.3 Packaging and Sustainability

Sustainable development has been defined as the development that meets the needs of the present without compromising the ability of future generations to meet their own needs.<sup>47</sup> In that sense, packaging helps to live in a sustainable society. By protecting the product, preventing waste, improving business efficiency and providing with the product’s benefits to consumers, packaging addresses the environmental, economical and social dimension of sustainable development.<sup>48</sup>

Packaging is the link between producers and consumers. The packaging ends up in consumers hands thanks to distribution. For that, distribution needs to be sustainable by:

- Optimising the use of resources: water, energy and material
- Minimising food and packaging waste

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<sup>46</sup> EUROPEN, ‘Packaging in the Sustainability Agenda: A Guide for Corporate Decision Makers’, ECR Europe, Brussels, 2009

<sup>47</sup> World Commission on Environment and Development, 1987, p. 43.

<sup>48</sup> EUROPEN, 2009

- Maximising the efficiency of recovery methods, including recycling<sup>49</sup>

To achieve these goals packaging should be designed taking into account the whole life cycle of the packaging, the characteristics of the product, the supply chain and the customer’s needs.

The product usually uses much more resources and has a higher value than the packaging that is used to protect it. For that, the losses produced for the underperforming of the package represent a higher impact for the environment than the gains made through reducing excessively the package. That is why the packaged should be designed as a whole system and not just by taking into considerations isolated issues such as recycling.

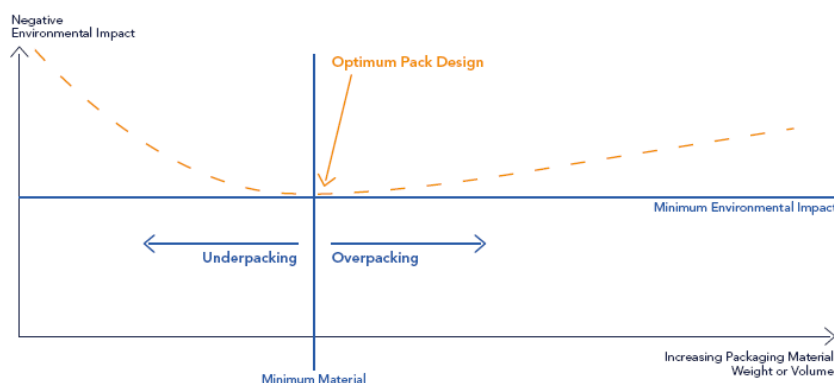


Figure 2: Environmental impact vs. Amount of packaging<sup>50</sup>

Under packaging can led to high environmental impacts as food waste, while over packaging can represent an overprotection of products using too many resources. In conclusion, there has to be equilibrium between the amount of packaging used and the environmental impact.<sup>51</sup>

### 3.2.4 Life Cycle Assessment (LCA)

Society is becoming more aware and concern of the environmental problems, as the existing terrible impacts of climate change are becoming more and more devastating. Industries and businesses are also aware of these problems and are trying to reduce the environmental impacts of their products and activities by developing more environmental products. Measures are taking into account in their environmental management departments in order to improve the environmental performance. Some of these tools include the Life Cycle Assessment (LCA), which considers the entire life cycle of a product.<sup>52</sup>

The ISO 14040 (ISO 2006) states that “*LCA addresses the environmental aspects and potential environmental impacts (e.g. use of resources and the environmental consequences of releases) throughout a products life cycle from raw*

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<sup>49</sup> <http://www.incpn.org/>, visited on 10-05-2010

<sup>50</sup> EUROPEN, ‘Packaging in the Sustainability Agenda: A Guide for Corporate Decision Makers’, ECR Europe, Brussels, 2009

<sup>51</sup> EUROPEN, ‘Packaging in the Sustainability Agenda: A Guide for Corporate Decision Makers’, 2009

<sup>52</sup> U.S Environmental Protection Agency, ‘Life Cycle Assessment: Principles and Practice’, Scientific Application International Corporation, Reston, 2006

*material acquisition through production, use, end-of-life treatment, recycling and final disposal (i.e. cradle-to-grave)”*<sup>53</sup>ISO 14040 series set the standards of the LCA and the way of doing it right. Some of the potential environmental impacts evaluated are the greenhouses gasses emissions, acidification, eutrophication, resource depletion, primary energy, waste and toxicity.<sup>54</sup>

LCA consists of four different phases: goal definition and scope, inventory analysis, impact assessment and interpretation.

- Goal Definition and Scope: Set and identification of the context, the boundaries and the environmental effects of the product, process or activity.
- Inventory Analysis: Quantification, in each of the stages of the life cycle, of the consumption of natural resources and the release emissions.
- Impact Assessment: Evaluation of the human and environmental effects of the consumption of natural resources and the release of emissions.
- Interpretation: Analysis of the results.<sup>55</sup>

Companies and governments use LCA software and it is used to predict if a product, material, process or service is appropriate for its use. The used of this software are very time consuming in order to do an effective analysis. That is why external consultants make this job in some cases.<sup>56</sup>

### **3.3 Organic Farming**

#### **3.2.1 Definition**

The International Federation of Organic Agriculture Movements (IFOAM), a democratic organization of the organic agricultural movement, whose mission is “leading, uniting and assisting the organic movement in its full diversity”,<sup>57</sup> describes Organic Agriculture as follows:

***“Organic agriculture is a production system that sustains the health of soils, ecosystems and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects. Organic agriculture combines tradition, innovation and science to benefit the shared environment and promote fair relationships and a good quality of life for all involved”***<sup>58</sup>

Organic farming uses certain practices to minimize the human impact on nature and to supply the consumer with the fresher and tastier products without disturbing the natural life-cycles. The rotation of corps, prohibition of genetically modified organisms,

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<sup>53</sup> WRAP, ‘Life Cycle Assessment of example packaging systems for milk’, January 2010, [www.wrap.org.uk/](http://www.wrap.org.uk/)

<sup>54</sup> EUROPEN, ‘Packaging in the Sustainability Agenda: A Guide for Corporate Decision Makers’, 2009

<sup>55</sup> U.S Environmental Protection Agency, ‘Life Cycle Assessment: Principles and Practice’, Scientific Application International Corporation, Reston, 2006

<sup>56</sup> EUROPEN, ‘Packaging in the Sustainability Agenda: A Guide for Corporate Decision Makers’, ECR Europe, Brussels, 2009

<sup>57</sup> [www.ifoam.org/](http://www.ifoam.org/), visited on 02-02-2010

<sup>58</sup> [www.ifoam.org/](http://www.ifoam.org/), visited on 02-02-2010

the used of biological pest control or the not use of chemical products, such as pesticides, are among some organic agriculture practices. But it is important to consider that organic agriculture does not refer just to the way food is processes, it also refers to the whole supply chain, the food processing, distribution, retailing and consumers.<sup>59</sup>

It appeared during the 1930s and 1940s due to a huge reaction to pesticides. Much research was done during these years in order to find new solutions, being Sir Albert Howard considered the father of organic farming.

Since then, global movements against pollution and the environment’s damage and the concern for food’s quality and the bad impacts of conventional agriculture, using pesticides, to the environment, has led to a growth of the organic agriculture in the developed world.

The development of organic farming in the European Union (EU) started to get bigger 20 years ago. It increased by approximately 25% a year between 1993 and 1998, and by around 30% since 1998. Nowadays, organic agriculture is considered to be the most dynamic agricultural sector in EU, although it just represents 3% of its agricultural land.<sup>60</sup>

### **3.2.2 Swedish Organic Framework**

#### **Organic Farming in Sweden**

The organic Swedish movement started at the beginnings of the 1980s. Before the 1980s organic farming in Sweden consisted of some isolated farming businesses. It was at the beginnings of 1980s when the first co-operation group (SAO: The Co-operation group for Alternative Agriculture) was created due to the need for establishing common concepts in the organic world.

The first organic association appeared in 1985 with the name of ARF (National Association of Alternative Formers). In 1994 it changed its name into the Ecological Farmers Association. The need of policies for farmers and marketing tools motivated the creation of this association. ARF had two tasks: To create a certificate organic food body and to encourage the development and marketing of organic products. In 1985, ARF fulfil its task of creating a certificate body and created KRAV.

The growth and development of the Swedish organic farming started to get bigger in 1989 due to political supports. The ARF even set a special target to have a bigger involvement of the society in the development of the organic market. The target was that 10% of the arable land had to be organic.

A plan to achieve this goal was adopted by the Board of Agriculture, The Ecological Farmers Association and KRAV in 1995. The adoption of this plan coincided with the European Union Swedish entry. The EU membership made Sweden part of the European organic farming supports and since then the organic market in Sweden has experienced continuous increases.<sup>61</sup>

Sweden accounts currently with 2,8 million hectares of farmland, which is just 7% of the total arable land.

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<sup>59</sup> [www.organic-farming.europa.eu/](http://www.organic-farming.europa.eu/)

<sup>60</sup> European Comission,, Organic Food information campaign

<sup>61</sup> Ekologiska Lantbrukarna, ‘General Information on the Agricultural Situation in Sweden’, <http://www.ekolantbruk.se/english/>

In 1993, agricultural production meant 0,3% of GDP, and the agricultural and food exports were smaller than the imports. The food and agricultural exports just mean 3% of the total exports.

To what organic agriculture concerns, the growth and development of it has been steady since its beginnings. However, this increased has been higher since Sweden entered the EU. Figure show the hectares used for organic farming since 1985.

Year	Area,ha
1985	1,500
1990	33,390
1995	86,824
1996	162,312
1997	205,185
1998	257,000
1999	315,000
2000	320,000
2001	325,000
2002	360,000
2003	420,000
2004	457,000
2005	510,000

Figure 3: Development of Organic Farming between 1985 and 2005<sup>62</sup>

There were some years of smaller increases and stagnation. However, the great concern about environmental issues and health and food quality reopened the increasing path. A survey demonstrates that 60% of the population interviewed would sacrifice the price for an organic product.<sup>63</sup>

In 2006 the Swedish organic market accounted as follows: 2-3% of organic food consumption and 6-7% of agricultural land certified by KRAV.

The new objectives for organic production and consumption to be achieved by the end of 2010 are that 20% of agricultural land must be certified and that 25% of the food consumed in the public sector must be organically produced. This objective requires tripling the number of farms that were certified organic in 2006.<sup>64</sup>

Finally, imports in the organic Swedish market play an important role as they constitute between the 15 and 20% of the total organic market. On the other hand, although there are some grain and other products exports, the exported quantity is not significance for the market.<sup>65</sup>

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<sup>62</sup> [http://www.ifoam.org/growing\\_organic/2\\_policy/case\\_studies/sweden\\_ag\\_conditions.php](http://www.ifoam.org/growing_organic/2_policy/case_studies/sweden_ag_conditions.php)

<sup>63</sup> [http://www.ifoam.org/growing\\_organic/2\\_policy/case\\_studies/sweden\\_ag\\_conditions.php](http://www.ifoam.org/growing_organic/2_policy/case_studies/sweden_ag_conditions.php), visited on 15-05-2010

<sup>64</sup> U.Geber, 'Organic Agriculture-production and consumption. Framework for research 2007-2009', in Centre for Sustainable Agriculture, viewed on 15 June 2010, <<http://www.cul.slu.se/english/index.asp>>

<sup>65</sup> [http://www.ifoam.org/growing\\_organic/2\\_policy/case\\_studies/sweden\\_ag\\_conditions.php](http://www.ifoam.org/growing_organic/2_policy/case_studies/sweden_ag_conditions.php), visited on 15-05-2010



### **Standard, Certification and State Regulation**

KRAV and Svenska Demeterförbundet are the two private sector bodies recognised by government authorities as inspection and certification bodies.<sup>66</sup>

KRAV is an association of 27 members. It represents the interests of all the actors in the supply chain: farmers, processors, trade, consumers and environmental and animal welfare interests.<sup>67</sup>

KRAV activities consist of the development of standards, inspection, certification and information about the organic farming and KRAV. The certificated actors support the cost of KRAV’s activities, as there is not a government supporting financial cost.

Member of IFOAM (International Federation of Organic Agriculture Movement), it develops its standards in line with the IFOAM ones and also works for influencing EU legislation.

As an EU member, there has to be compatibility between the Swedish and the European legislation, and it is the Swedish Board of Agriculture and The National Food Administration the ones in charge of this compatibility.<sup>68</sup>

The KRAV logo is well-known among Swedish consumers and dominates the Swedish market. It is recognised by 98% of the consumers.<sup>69</sup> In contrast, the EU logo is not well- recognised and has been criticized.<sup>70</sup>



Svenska Demeterförbundet follows international standards for bio-dynamic production.

### **Retail Stores**

The disappearing fear cooperatives had due to the expansion of conventional agriculture, made them develop marketing structures for selling its products in a better way.

Nowadays, organic agriculture works mainly with a system of food processing, distribution and retailing. Organic products are sold in the same shops and supermarkets than conventional food, which represents an accessibility advantage. Sweden is also one of the countries where the price gap between conventional and organic food is smaller. The organic demand is increasing.

Nowadays, organic food is sold in all major retailers like Gröna Konsum, ICA or Hemköp.

This industrialised- like system represent some disadvantages for small-scale local producers. Therefore, local producers have found a new market model to work with consisting in farmer markets or food-selling-boxes. A part from stimulating the competition between formal supermarkets and farmers, it also answers new consumer’s demands of less transportation, local production and identity.<sup>71</sup>

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<sup>66</sup> [http://www.ifoam.org/growing\\_organic/2\\_policy/case\\_studies/sweden\\_ag\\_conditions.php](http://www.ifoam.org/growing_organic/2_policy/case_studies/sweden_ag_conditions.php), visited on 15-05-2010

<sup>67</sup> <http://www.krav.se/System/Spraklankar/In-English/KRAV-/>, visited on 15-05-2010

<sup>68</sup> Ekologiska Lantbrukarna, ‘General Information on the Agricultural Situation in Sweden’, <http://www.ekolantbruk.se/english/>

<sup>69</sup> <http://www.krav.se/System/Spraklankar/In-English/KRAV-/>, visited on 15-05-2010

<sup>70</sup> Ekologiska Lantbrukarna, ‘General Information on the Agricultural Situation in Sweden’, <http://www.ekolantbruk.se/english/>

<sup>71</sup> [http://www.ifoam.org/growing\\_organic/2\\_policy/case\\_studies/sweden\\_regs\\_policy.php](http://www.ifoam.org/growing_organic/2_policy/case_studies/sweden_regs_policy.php)

### 3.2.3 Spanish Organic Framework

#### Organic Farming in Spain

Organic agriculture has been practiced in Spain since the beginnings of the 1980s. Since then, it has gone through an exponential increased, even bigger since the Spanish entrance to the EU. Nowadays, the increased has slow down. Next figure show the evolution of the organic areas and number of farmers since 1991.

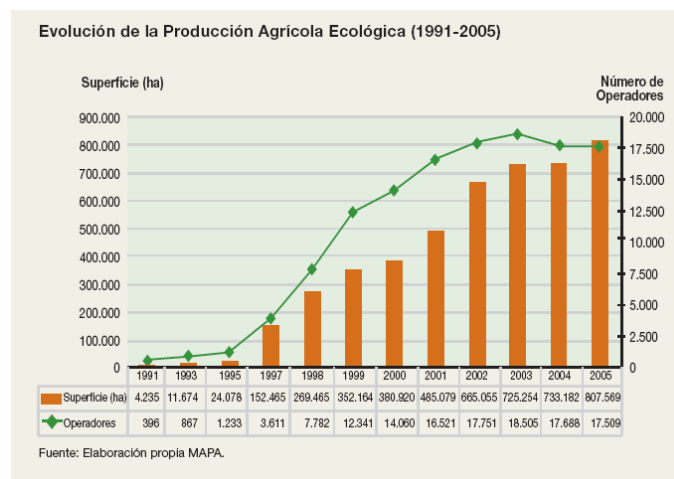


Figure 4: Organic agriculture evolution between 1991 and 2005<sup>72</sup>

The good climate and land conditions make Spain a country with a high diversity within the ecological sector, both in the variety of organic products and placements, since there are organic agricultural activities in every Spanish Region.

There is organic production and industry. The first one is highly consolidated and the second one is in expansion.

All Regions produce organic products. However, they do not produce at the same level. Regarding production, Andalucía is the region that accounts with more production area and number of farmers. It represents the 45% of the total organic area. In regards with organic industry, the Mediterranean coast is where most of the industries are placed, being Cataluña the region that accounts with a higher number of industries.

The commercialisation of organic products meant 300 million Euros in 2005. The majority of this profit is due to exports and very little internal consumption.

Spanish consumers spend less than 1% of its expenses in organic products. While the average European expenses on organic food is 24,5 €/year, the Spanish consumer expenses are estimated to be 5,6 €/year.

On what exports concerns, 70% of the organic production is exported mainly to Europe. Germany, France, Great Britain, The Netherlands, Italy, USA and Japan are among the countries where Spain exports the most. Fresh products are the main exported products, while the elaborated products like wine or olive oil mean a smaller fraction. Spain also imports transformed products. 50% of the transformed products are imported from EU members.<sup>73</sup>

<sup>72</sup> [http://www.organic-europe.net/country\\_reports/spain/default.asp](http://www.organic-europe.net/country_reports/spain/default.asp), visited on 16-05-2010

<sup>73</sup> [http://www.organic-europe.net/country\\_reports/spain/default.asp](http://www.organic-europe.net/country_reports/spain/default.asp), visited on 16-05-2010

In conclusion, Spain has a great organic production volume and potential, since the internal market could be defined as emergent.<sup>74</sup>

### **Standard, Certification and State Regulation**

In 1989, after a private-based regulation, the CRAE (Regulation Committee on Organic Agriculture) was established as the authority in charge of the organic agricultural issues.

Later on, a decentralised movement started to appear and since 1993 the organic agricultural issues are a competence of each of the Spanish Regions. The Regions regulate under the Royal Decree (RD) 1852/1993, based on the EU Regulation (CEE) 2092/91.

Every Region has established Council and Committees that are responsible for the organization, supervision and inspection of the certification systems, for the promotion of the organic farming products and for the advice given to regional governments in policy issues.

There are just three Regions where a private system operates: Andalucía, Castilla la Mancha and a mixed system in Aragón.

Labels have to be printed on the organic food packaging in order to identify them as organic products. The logo has to have printed the name of the monitoring authority and the legend “Organic Farming”. The new EU logo could also be placed on the packaging.<sup>75</sup>



Figure 5: Organic agriculture Spanish and EU logo<sup>76</sup>

### **Retail Stores**

Organic food consumption in Spain is very low compared with other countries. One of the reasons why the consumption rate is so low is the bad accessibility of these products. Organic food in Spain can be bought in the following places:

- Special organic shops – There are not a lot of these shops around the country.
- Supermarkets – Big supermarkets have small organic food sections where it is possible to find organic products. These sections are frequently gourmets section where products have a very high price.
- Cooperatives – A cooperative is a group of people from the same neighbourhood or municipality who gather around a business building. Producers deliver directly the products to the business building and it is the members of the group

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<sup>74</sup> [http://www.organic-europe.net/country\\_reports/spain/default.asp](http://www.organic-europe.net/country_reports/spain/default.asp), visited on 16-05-2010

<sup>75</sup> [http://www.organic-europe.net/country\\_reports/spain/default.asp](http://www.organic-europe.net/country_reports/spain/default.asp), visited on 16-05-2010

<sup>76</sup> <http://www.mapa.es/es/alimentacion/pags/ecologica/introduccion.htm>, visited on 16-05-2010

the ones in charge of buying and managing the orders, maintaining the business building and revising the accounts. In that way, there are not distribution and retail costs and there is a direct contact with producers. Cooperatives normally have a wide range of products such as fruit, vegetables, oil, meat, soap or cosmetics.

The price of organic products is higher than the conventional products in the special shops and supermarkets. On the other hand, the price in cooperatives is not higher. However, an effort of helping in a group has to be done to make a consumption of these products.<sup>77</sup>

### **3.4 Waste**

#### **3.4.1 Definition of waste**

The definition of waste is very subjective, as what can be waste to one person is useful to another. However, there must be an official definition so as to comply with its own country and European Union Law.<sup>78</sup>

The EU has developed a number of directives that set a number of policies that try to protect the environment while disposing. One of these directives is the Waste Framework Directive (European Directive 2006/12/EC on waste).<sup>79</sup>

The Waste Framework Directive defines waste as

*“Any substance or object that the holder discards, intends to discard or is required to discard.”*<sup>80</sup>

Apart from defining waste, this Directive set a number of objectives to be fulfilled regarding the disposal and recovery of waste. It also emphasized the importance of recycling, reducing and reusing. Its aim it’s the prevention of harming the environment and human health.<sup>81</sup>

#### **3.4.2 Types of Waste**

The solid waste can be classified depending on the sources in to:

- Municipal Solid Waste
- Industrial Solid Waste
- Agricultural Waste and Residues
- Hazardous Waste

An in depth analysis of MSW is done as it the one concerning the Thesis.

Municipal Solid Waste (MSW) is the one generated by households, offices, hotels, shops, schools and other institutions, which is disposed by a local authority. It mainly consists of Household Waste and Commercial Waste.

Food waste, paper, plastic, metal, rag and glass are among the most common components of MSW. However, some other types of waste are included in the MSW,

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<sup>77</sup> [www.vidasana.com](http://www.vidasana.com), visited on 16-05-2010

<sup>78</sup> Williams, P.T. *Waste Treatments and Disposal*, Wiley, 1998

<sup>79</sup> [http://aggregain.wrap.org.uk/waste\\_management\\_regulations/background/european.html](http://aggregain.wrap.org.uk/waste_management_regulations/background/european.html), 18-03-2010

<sup>80</sup> <http://ec.europa.eu/environment/waste/legislation/a.htm>, visited on 18-03.2010

<sup>81</sup> <http://ec.europa.eu/environment/waste/legislation/a.htm>, visited on 18-03.2010

such as construction debris, unwanted medicines or chemicals and small amounts of hazardous wastes like light bulbs or batteries.<sup>82</sup>

The amount or rate and composition of the MSW vary from country to country and also from city to city, as waste generation and economic development are related.

In the EU framework, the amount of MSW produced by the EU27 did not experienced significant changes from 2007 to 2008, when the MSW generated per person and per year decreased from 525 Kg per person in 2007 to 525 kg per person.

Figure 6 shows the amount of waste generated per person and per year of the different EU27 countries. Municipal Waste Generation varies across the Members States, being Denmark the country that generated the biggest amount (802Kg) and Czech Republic the one that generated the least amount (306Kg).

Sweden and Spain generates a similar amount of Municipal Waste, between 500 and 600Kg per person.<sup>83</sup>

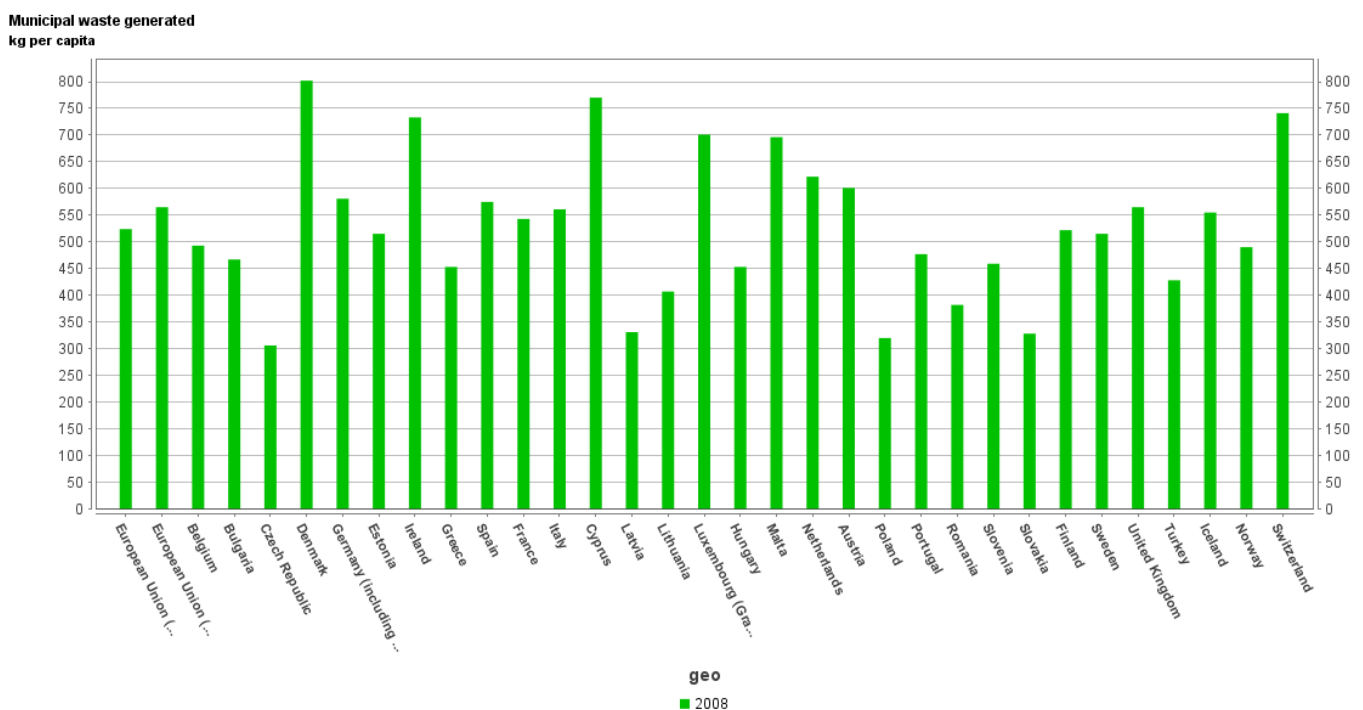


Figure 6: Municipal Solid Waste<sup>84</sup>

### 3.4.3 Recovery Methods

Recovery methods are the treatments done to waste. The recovery methods are: landfill, incineration, recycling and composting.

#### Landfill

Landfill consists of dumping the waste in a natural hollow of the earth. Every day the rubbish is dumped, compacted and covered with soil. An anaerobic decomposition decomposes the organic waste into biogas, which is a mix of gases, out of which the Methane is important to mention.

<sup>82</sup> Williams, P.T. *Waste Treatments and Disposal*, Wiley, 1998

<sup>83</sup> [epp.eurostat.ec.europa.eu/cache/ITY.../8...AP/.../8-19032010-AP-EN.PDF](http://epp.eurostat.ec.europa.eu/cache/ITY.../8...AP/.../8-19032010-AP-EN.PDF), visited on 18-03-2010

<sup>84</sup> Eurostat

Land filling is the last and least wanted recovery method as it represents a number of problems:

- Landfills are extensive land occupations that are normally far away from the municipalities. The transportation means a high cost and high Carbon Dioxide emissions.
- Landfills are usually place in natural ecosystems.
- The energy consumption due to the big earth movements is high.
- The emission of methane, which is a dangerous greenhouse gas.
- Noise, odour and pollution of the local area.

Finally, there are some existing environmental friendly activities such as the use of the biogas to produce energy. This practice is both a source of income and decreased of the methane emissions.<sup>85</sup>

### **Incineration**

Incineration of waste consists of the total combustion of waste in an excessive air atmosphere at high temperatures of around 850°C according to the European Legislation.<sup>86</sup> The products of combustion are Carbon Dioxide, water vapour and small amounts of other gases. It also leaves a small ash residue which needs to be land filled. Some of the emitted gases need to be cleaned through different types of processes, due to its harmful nature.<sup>87</sup> There are two types of incinerations: without energy recovery or with energy recovery.

Incineration with energy recovery is a way of generating energy without fossil fuel consumption as coal. It also decreases the amount of MSW that goes to landfill. However, it does not replace it. It just reduces an 80-85% of the waste mass and a 95-96% of the waste volume.

Incineration methods have also had lots of criticism due to the supposed amount of pollution that the process generates.<sup>88</sup>

This recovery method is well extended<sup>89</sup> in countries such as Sweden or Denmark<sup>89</sup>

### **Recycling**

Recycling is defined by the Waste Framework Directive as “*any recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes. It includes the reprocessing of organic material but does not include energy recovery and the reprocessing into materials that are to be used as fuels or for backfilling operations*”<sup>90</sup>

Recycling generates many environmental, social and financial benefits. By recycling, the consumption and used of raw material decreases. The less used of virgin

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<sup>85</sup> <http://www.uned.es/biblioteca/rsu/pagina4.htm>, visited on 18-05-2010

<sup>86</sup> <http://www.uned.es/biblioteca/rsu/pagina4.htm>, visited on 18-05-2010

<sup>87</sup> Bickerstalle, J. et al. ‘Finding out...About Managing Waste’, Ed.coms, 2005

<sup>88</sup> Knox, A. ‘An overview of Incineration and EFC Technology as Applied to the Management of Municipal Solid Waste’, February 2005

<sup>89</sup> <http://www.uned.es/biblioteca/rsu/pagina4.htm>, visited on 18-05-2010

<sup>90</sup> <http://ec.europa.eu/environment/waste/legislation/a.htm>, visited on 18-05-2010

materials means energy savings in the production process. And, therefore, the green houses gasses emissions into the air, water and on to land are reduced.<sup>91</sup>

The recycling packaging materials include: glass, metal, plastic, paper and board. In some case not all the fractions are possible to recycle due to the pollution of the packaging:

- Glass – Once glass has been collected it is sorted out by colours. Then, it is placed into the conveyor belts where the glass packaging is crushed. The crushed glass turn into a thick powder called calcine. The calcine is again melted in the oven and transformed into new bottles, jars or boxes. This process saves lots of energy and raw materials.<sup>92</sup> Glass Packaging is easily recycled and reused. It can be recycled many times, as it does not lose its properties after the recycling process. Glass packaging usually contains part of recycled materials known as cullet. This amount of recycled materials varies from one type of packaging to another. The maximum amount of cullet that each type of glass can have is 60% for white glass, 65% for amber glass and 95% for green glass.<sup>93</sup>
- Metal – Steel (ferrous material) and Aluminium (non-ferrous material) packages need to be separated before starting the recycling process. Aluminium packages are separated by introducing Foucault currents. Steel is perfectly recyclable having the same properties after recycling it. Recyclable steel is used for making new packages or for scrap in smelting. Aluminium also keeps its properties after recycled. Aluminium is shredded into small pieces which are then melted to produce molten Aluminium. Metal recycling also represents a very high energy and raw materials saves. Metal Packaging is easy to recycle and can be recycle many times without losing its properties, which decreases the environmental impact of its production. Metal packaging often contains a significant amount of recycled materials.<sup>94</sup>
- Plastic – Before plastic packages are recycled, a separation between the different types of plastics needs to be done. A code with a number printed on the package determines the type of packaging. The sorting process is done manually. After the separation, the packages are shredded into fragments and are passed into a purification process where the packages are cleaned of impurities such as code bars. Then the material is melted and normally extruded in to pellets. Finally, the pellets are used to manufacture other products. The plastic recycling industry is not as developed as the glass, metal or paper one. It is a costly process due to the manually selection of the types of plastic.<sup>95</sup> The recycling process is good as it decreases the amount of waste ending up in landfills and also the Carbon Dioxide emissions. However, the plastic recycling industry is very limited; since just two types of plastics can be recycle: polyethylene terephthalate (PET) and high density polyethylene (HDPE). There is not any local authority collecting mixing plastics.<sup>96</sup>

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<sup>91</sup> Williams, P.T. *Waste Treatments and Disposal*, Wiley, 1998

<sup>92</sup> <http://www.uned.es/biblioteca/rsu/pagina4.htm>, visited on 18-05-2010

<sup>93</sup> WRAP, Material Report

<sup>94</sup> WRAP, Material Report

<sup>95</sup> <http://www.uned.es/biblioteca/rsu/pagina4.htm>, visited on 18-05-2010

<sup>96</sup> WRAP, Material Report

- Paper and Board – The first step is to get rid of the ink printed on the packaging. To do that, the packaging is immersed in a tensionactive solution. Then the fibres are dried. Finally, a roller crushes and flats the fibres and the recycled paper is ready.<sup>97</sup> Paper and board are easily recyclable. However, they cannot be recycled indefinitely. Each time it is recycled, the fibres get shorter and weaker. It is necessary from time to time to introduce virgin paper in the process in order to maintain the strength and quality of the fibre.<sup>98</sup>

### Compost

Composting is the biologic transformation of the organic waste into compost. Compost is used as a fertilizer. It can be done at home or at the industry. It is an aerobic decomposition that is done in presence of oxygen with correspondent humidity, temperature and PH.

### 3.4.4 The Waste Hierarchy

The term of Waste Hierarchy has been introduced by the European Union legislation on waste (Waste Framework Directive). The Waste Hierarchy ranks the different ways in which waste can be disposed of in a hierarchical order. The aim is to obtain the maximum benefits of products while generating the minimum amount of waste. All EU Member States should take measures to encourage the hierarchy.

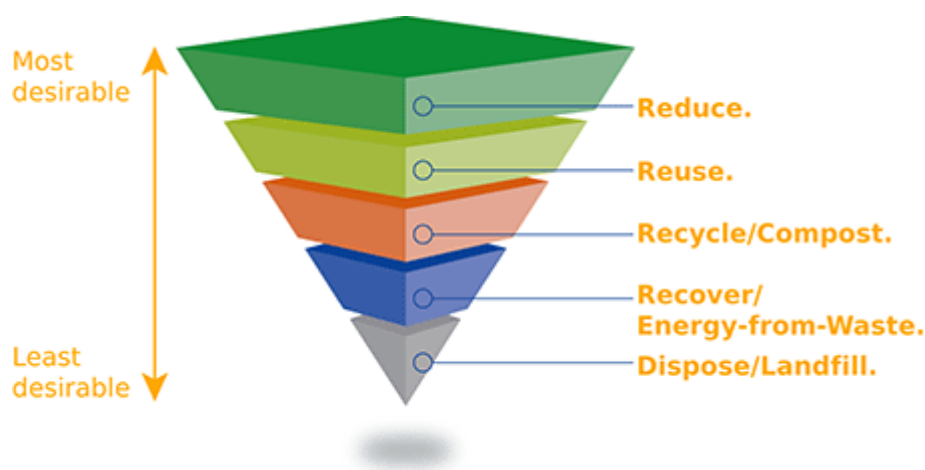


Figure 7: The Waste Hierarchy<sup>99</sup>

It ranks at follows:

- Reduce/Prevent –The first level of the hierarchy is Reduce. The best way of managing the waste is preventing it and not producing it. Consumer’s role is to try to purchase products and services that represent the least environmental impact.
- Reuse – The second level is reuse the waste produce. Try to find second application to the waste that has been produced.

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<sup>97</sup> <http://www.uned.es/biblioteca/rsu/pagina4.htm>, visited on 18-05-2010

<sup>98</sup> WRAP, Material Report

<sup>99</sup> Google images



- Recycle – The third level is recycling.
- Other recovery methods like energy recovery.
- The last level is disposal.

It is not normally used strictly as many factors influence on it.<sup>100</sup>

### 3.4.5 Legislation on Waste

Air pollution, greenhouse gasses emissions, noise, odour or pollution of water are just some of the problems related to a not controlled waste. Legislation has been developed, in order to minimise the environmental impact of waste.

The European Union has its specific legislation. Figure 8 shows the three main elements that the EU legislation comprises:

- **Framework Legislation:** Consist of the Waste Framework Directive and the Waste Shipment Regulation. These two regulations establish the framework for the management of wastes.
- **Waste Treatment Operations:** Divided into Incineration, Landfill and Recycling standards. It sets the different standards and regulation for the operation of these facilities.
- **Waste Stream:** There is specific regulation for some products, such as packaging, batteries, vehicles...

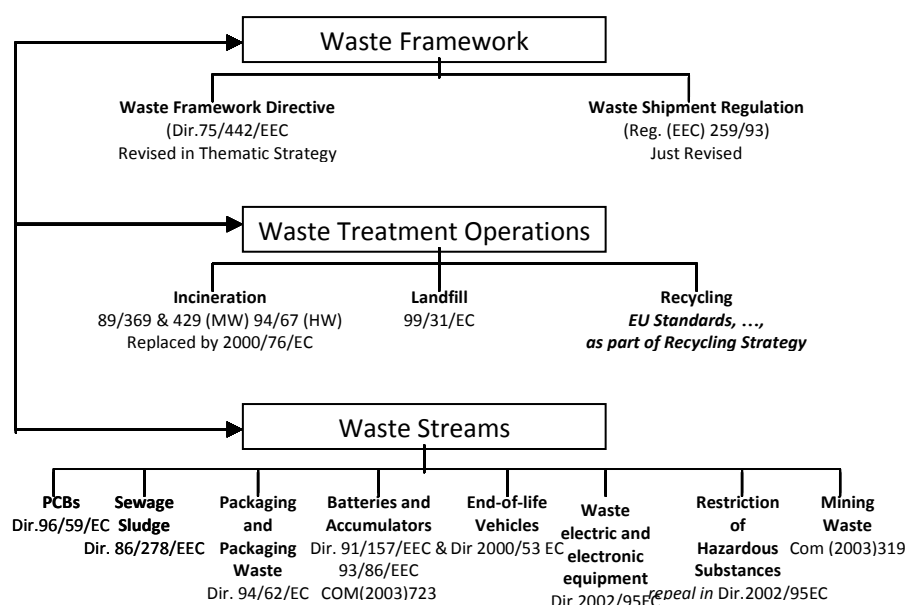


Fig 8. Elements of EU Waste Legislation<sup>101</sup>

The Packaging and Packaging Waste Directive have been described in a previous chapter. The following section makes an in-depth description of The Waste Framework Directive.<sup>102</sup>

<sup>100</sup> <http://ec.europa.eu/environment/waste/legislation/a.htm>, visited on 26-05-2010

<sup>101</sup> Directive, own figure

<sup>102</sup> <http://ec.europa.eu/environment/waste/legislation/a.htm>, visited on 26-03-2010

### **The Waste Framework Directive**

The Waste Framework Directive was first established in 1975. The policy set the basic concept and definition of waste management, as well as waste management principles. It has been revised periodically, leading to new directives that introduce changes, new concepts and improvements.<sup>103</sup>

The revision of Directive 2006/12/EC led to the introduction of the present Directive 2008/98/EC, which was agreed in June 2008 and adopted by the European Parliament and Council on 19 November 2008 and need to be implemented by all Member States before 12 December 2010.

The main objective is “to protect the environment and human health by preventing or reducing the adverse impacts of the generation and management of waste and by reducing overall impacts of resource use and improving the efficiency of such use.”<sup>104</sup>

The key features The Waste Framework Directive 2008/98/EC are:

- Introduction of a new objective and a precise scope.
- Simplification – It incorporates Hazardous Waste and Waste Oils, which were part of the Hazardous Waste Directive before.
- Clarification of concepts such as some definitions like recovery, disposal, recycling or waste (end-of-waste, by-products).
- Introduction of the Waste Hierarchy: Prevention, re-use, recycling, recovery and disposal.
- The first EU recycling targets.
- Requirements for separate collection of recyclable materials.
- A life Cycle approach, where it is taken into account all the phases in the life cycle of the product and not just the waste phase.
- Establishment of a new dimension of prevention where both the Commission and the Member States need to collaborate. Member States have to develop programmes that reflect the set of prevention objectives, description of measures and set of targets for waste prevention. The Commission has to develop prevention indicators. Finally, informative commissions have to be created in order to inform Member States about practices and guidelines for waste management.<sup>105</sup>

### **3.5 Waste Management**

In this chapter the reader will be introduced to the waste management scenarios of both countries, Sweden and Spain.

Waste management is the group of activities done since waste is generated until its final treatment or elimination. Once a product has been consumed and its packaging does not fulfil its missions anymore, packaging becomes waste and needs to be treated. Once consumers have sorted all their trash out there are three different phases until the material ends its life:

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<sup>103</sup> <http://ec.europa.eu/environment/waste/legislation/a.htm>, visited on 26-03-2010

<sup>104</sup> <http://ec.europa.eu/environment/waste/legislation/a.htm>, visited on 26-03-2010

<sup>105</sup> <http://ec.europa.eu/environment/waste/legislation/a.htm>, visited on 26-03-2010

- Disposal and Collection
- Transportation - This phase consists on the transportation of the waste collected to transference stations, classification plants, recycling plants, incineration plants or landfills.
- Treatment – The different waste treatments that can be done to waste are: landfill, incineration, recycling or biological processes.  
In the recycling plants, matter of our study, each of the separated fractions will be transformed in to its raw material. Finally, the raw material will be then used either to produce the same product or to produce new products, ex. pieces of automobiles.

The Swedish and Spanish waste management framework will be introduced in the following subchapters.<sup>106</sup>

### 3.5.1 The Swedish Waste Management System

#### The Waste Management System in Sweden

The Swedish legal system introduced the term of “the producer responsibility” in 1994. This term means that “*all companies that manufacture import or sell packaging or packaged goods are legally responsible for the packaging which enters the Swedish market place*”.<sup>107</sup>

This term also means a number of obligations. The producer’s obligation is to ensure an environmental friendly design, presentation and marketing of the packaging. The producer also has to provide the adequate facilities for households to do the sorting activities. Ensuring the adequate treatment of the waste (recovery, recycling and energy recovery) is another obligation to fulfil. Be in charge of the collection and transportation of waste. And finally, provide information about the ways of sorting the fractions and the collection systems to households.<sup>108</sup>

To be able to achieve these obligations as cost effectively as possible, the Swedish Trade and Industry has formed material companies for each type of packaging material.

All the material companies except from the Glass Company and packaging under the deposit system have formed a joint subsidiary called REPA (Reparegisteret). Glass packaging material company is Svensk GlasÅtervinning.

Private companies affiliated to the REPA system are offered a recycling system by the material companies through REPA. Companies pay a packaging fee, which depends on the quantity and the type of packaging materials and on return REPA worries about the collection and recycling activities as well as it fulfils the producer responsibility obligations. REPA is also in charge of the marketing activities, customer relations and of the registering of the packaging fees. Companies that are affiliated with the REPA system put the Green Dot logo on their packaging.<sup>109</sup>



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<sup>106</sup> <http://www.uned.es/biblioteca/rsu/pagina3.htm>, visited on 26-03-2010

<sup>107</sup> Ebbesson, J. ‘Producer Responsibility in Sweden’, 2004

<sup>108</sup> REPA, ‘Ordinance (1997:185) on Producers’ Responsibility for Packaging’, <http://www.repa.se/informationinenglish.4.3aac893711761f082898000759.html>

<sup>109</sup> <http://www.repa.se/informationinenglish.4.3aac893711761f082898000759.html>, visited on 1-05-2010

### **Sorting, collection and transportation**

Households have to separate the different packaging materials into different bins. Before separating them, the packaging must be emptied and cleaned. If a packaging is made of different materials, all the materials must be separated and if it is not possible to separate them, the packaging should be thrown away in the most abundant packaging material container.

The packaging separating options that exist in the recycling stations are:

- Plastic packaging – Plastic packaging are to be put loose in the container and not in a bag. Sweden distinguishes between two types of plastic: hard and soft plastic. Depending on the municipality, there can be two containers (one for each type of plastic) or one container where both plastics are mixed. Examples of hard plastic are bottles, plastic jars and small buckets; and of soft plastic are plastic bags, refill packets, plastic tubes, crisps packets, plastic wrapping or film. Plastic that is not packaging should be thrown away in the regular rubbish bin. Finally, plastic bottles with a refund system should be brought back to the shops.
- Paper packaging – Paper packaging should be flattening out and folded and also smaller packaging should be put into bigger ones. Some examples of paper packaging are paper bags, milk or juice cartons or wrapping paper. Envelopes should be thrown away in the regular container and newspaper and magazines in the newspaper and magazine container.
- Metal packaging – Sharp lids of tin should be folded and the lid on food tubes should be left. Some examples of metal packaging are tin cans, spray cans or aluminium foil. Finally, beverage cans with a refund system should be brought back to the shop.
- Glass packaging – Tops, lids and corks should be removed of the glass packaging and be thrown away in its correspondent container. Sweden distinguishes between coloured and non coloured glass. 33 and 50 cl bottles with a deposit system must be brought back to the shops.
- Magazines and Newspapers – Plastic bags, stickers or other type of materials should be removed before throwing them away.<sup>110</sup>

There are different sites where consumers can throw their separated fraction away:

- Municipal Recycling Centres – Consists of large manned facilities where sorted waste, garden waste, dangerous waste, electronic waste, etc can be dispose of. There are around 650 recycling centres all over Sweden. The number of bulky waste (very voluminous waste like furniture or toys) and visitors have increased during the lasts years.

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<sup>110</sup> Svensk GlasÅtervinning, Sorting Guide



- Recycling Stations – Small unmanned stations where the sorted packaging and paper and newspapers can be thrown away. There are around 5800 recycling stations all over Sweden. They belong to the producer’s responsibility system.



- Curb side Collection Material – Consist on special garbage rooms situated next to apartment blocks and detached houses where the sorted packaging and paper and newspaper can be thrown away. It is also of a producer’s responsibility. The waste is collected once a week.<sup>111</sup>



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<sup>111</sup> Avfall, ‘Swedish Waste Management’, June 2009

Local authorities choose how to organise the waste management, either manage by private companies or by the municipality. External actors like private companies manage the collection of household waste in 75% of the municipalities, while municipalities manage the rest of the territory.

Traditional back loading vehicles are still the most common used. However, multi-compartmented vehicles and side-loading vehicles are gaining more market.

New technologies are appearing to replace the manual handling collection, reduce the need of waste transportation and improve the effectiveness of the current systems. Vacuum collection (stationery and mobile) and underground solutions are two of these new technologies.<sup>112</sup>

### **3.5.2 The Spanish Waste Management System**

#### **The Waste Management System in Spain**

In Spain municipalities are the ones in charge of the collection, transport and elimination of waste by law.

The 11/97 Law of Packaging and Packaging Waste (“Ley de Envases y Residuos de Envases y Embalajes”) establishes that product must be commercialised by two different systems: The Return, Devolution and Deposit Systems (RDDS) and Integrated System of the packaging waste and used packaging waste.

In The Deposit and Return Systems, product packaging traders, packaging workers or the people responsible for putting a product out in the market, must charge an individually quantity to its clients and also return the empty packaging waste or used packages, giving back the same amount of money that they charge to its clients. The possessor of the final packaging waste or used packaging is the one that must be take the packaging waste or used packaging to a recycler or incinerator for its reuse. Companies choosing this System must do a Waste Prevention Business Plan to each of the Spanish Regions depending on the quantity of waste produced.<sup>113</sup>

The Integrated Systems of the Packaging waste and used packaging waste (SIG) are entities with no profit motive in mind. These Systems are in charge of the periodic collection and classification of packaging and packaging waste, in order to avoid the waste management activities to companies. In return, companies have to pay to the system a certain amount of money, which depends on the number and type of the generated waste packaging that the companies put out in the market. The received money is used to help the Spanish Region and Local Authorities with the extra cost the Selective Collection means.<sup>114</sup>

These Systems guarantee the achievement of targets set by the Packaging Law. To improve the consumers recycling habits, the systems often make informative and educational campaigns.<sup>115</sup>

There are several SIGs in Spain:

- Ecoembes – Deals with all the packaging materials.
- Ecovidrio – Deals just with glass

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<sup>112</sup> Avfall, ‘Swedish Waste Management’, June 2009

<sup>113</sup> [www.afam-morteros.com/funciones/bajarfile.asp?id\\_registro](http://www.afam-morteros.com/funciones/bajarfile.asp?id_registro), visited on 20-05-2010

<sup>114</sup> [www.ecoembes.com/](http://www.ecoembes.com/), visited on 20-05-2010

<sup>115</sup> [www.afam-morteros.com/funciones/bajarfile.asp?id\\_registro](http://www.afam-morteros.com/funciones/bajarfile.asp?id_registro), visited on 20-05-2010

- Sigre – Deal with medicines and packaging of medicines

The packaged products whose companies belongs to these systems must be identifies with logos. Ecoembes and Ecovidrio are identified by the Green Dot Logo and Sigre with its correspondent logo.<sup>116</sup>



### Sorting, collection and transportation

There are two different kinds of sorting methods: The Not Selective Sorting and the Selective Sorting.

The Not Selective Sorting consists on dumping all the fractions of waste away in the same container.

The Selective Sorting consists on separating the different fractions of materials in different containers.<sup>117</sup>

The “Plan Nacional de Residuos Urbanos” establishes for Spain a colour code separation system.<sup>118</sup> It consists of four different colour containers where the different fractions of waste can be thrown away.

**Grey and Orange** Container – This is the general container where food and everything except from paper, cardboard, packaging, glass, textile, batteries and hazardous waste must be thrown away. Some examples are: food left over’s, china, corks, dirty paper and cardboard or conventional light bulbs.



**Yellow** Container – This is the called the Packaging container. Plastic bags, wood boxes and plastic, metal and beverage carton packages must be thrown away in the yellow container. Some examples are: For plastic packaging (Plastic Bottles, packaging of dairy products, white cork trays for fruit or eggs plastic packaging), for Metal packaging (Refreshment cans or tins of food) or for beverage cartons (milk or yoghurt cartons).



**Green** Container – This container is where glass should be thrown away. Some examples are: Glass jars or bottles. The window’s glass, mirrors and glass kitchen stoves must not be thrown away in this container. Instead, these materials should be taken to a recycling station.



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<sup>116</sup> <http://www.uned.es/biblioteca/rsu/pagina3.htm>, visited on 20-05-2010

<sup>117</sup> <http://www.uned.es/biblioteca/rsu/pagina3.htm>, visited on 20-05-2010

<sup>118</sup> Ministerio de Medio Ambiente Rural y Marino, Plan Nacional Integrado de Residuos, 2008

**Blue Container** – This container is where paper and cardboard must be thrown away. Some examples are: Newspaper or paper and cardboard packaging. Dirty packaging must be avoided in this container and must be thrown away in the general container.



**Collection Stations:** A part from all these four containers, there are some recycling stations situated in each district. These recycling stations are called “Punto Limpio”. These are special collection stations used for those wastes that cannot be thrown away in the other containers. The products thrown away are: batteries, oil, fluorescent and low consumption light bulbs, print cartridge, spray cans, X-rays, paintings, thermometers or medicines.<sup>119</sup>

Each municipality is responsible and in charge of the implementation and realisation of the selective collection of the different colour containers. There are three kinds of packaging waste selective collection systems:

1. Selective Collection System in contribution areas – Igloo-like yellow, blue and green containers situated in squares or spacious places that make the collection phase easier. Consumers sort their trash out at their households and then dispose them there. This type of collection is done when necessary but it is normally done once a month. The quality of the different fractions is high, as the igloo shape of the containers makes the sorting job easier for consumers. However, the fraction collected is not very high due to the not proximity to households.



2. Selective Collection by street containers – Just smaller yellow containers than igloo-like containers, situated outside households. These types of containers are placed next to the normal food containers (grey & orange). The collection is done several times a week. The quality of the fractions collected is not as high as in the previous system. The proximity to food containers and the ease of dumping other types of materials are the reasons why the quality of this fraction is not that good.



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<sup>119</sup> Ayuntamiento de Madrid, ‘Guía para resolver dudas sobre la separación de residuos domésticos en Madrid’, [www.munimadrid.es/](http://www.munimadrid.es/)



3. Selective Collection System of sealed containers – Just yellow containers situated as the street containers. Sealed top containers designed with a hole in where to introduce the packaging. The collection is done once or twice a week. The quality of the obtained fraction is better than the obtained with street containers since the impossibility to open the top make consumers throw their packaging in the right place.



In short, glass and paper/board containers can just be found as igloo containers, which are not always placed near households. However, packaging yellow containers can be found in the three different physical containers. Out of them, igloo and sealed containers produce the best quality fraction.<sup>120</sup>

The regular method of collection is by using lorries. However, the pneumatic collection also exists. It was first introduced in the Nordic countries and consists on the collection of waste by underground pneumatic systems. It is a very unusual method as it requires a high investment. However, it is gaining importance.<sup>121</sup>

Lorries transport the waste collected to transference stations, classification plants, recycling plants, incineration plants or landfills.

In the transference plants waste is compacted, temporarily stock and then transported in bigger lorries to the corresponding treatment plant.

If the treatment plant is not far from the municipality, the collection lorries drive the waste directly to the treatment plant.<sup>122</sup>

As some fractions are mix, in Spain is necessary to separate the mix materials in to the different packaging materials before going to the treatment plant. This phase takes place in packaging selection plants. There are around 90 plants situated through the Spanish geography.

Paper and board (Blue container) are classified by qualities and are then taken to the treatment plants.

The packaging container (Yellow container) is taken to a packaging selection plant before going to the treatment. Metals (Aluminium and Steel), plastics (PET, High density Polyethylene and mix plastic) and bricks are separated in the plant.<sup>123</sup> There are different technologies to separate each of the fractions:

- Ferrous Materials: Magnetic fields
- Non-Ferrous: Manually and Foucault currents
- Hard Plastic: Manually
- Soft Plastic: Pneumatic systems

Glass is taken to selective packaging plants and manually the colour and the white glass are separated.<sup>124</sup>

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<sup>120</sup> [www.ecoembes.com](http://www.ecoembes.com), visited on 20-05-2010

<sup>121</sup> <http://www.uned.es/biblioteca/rsu/pagina3.htm>, visited on 20-05-2010

<sup>122</sup> <http://www.uned.es/biblioteca/rsu/pagina3.htm>, visited on 20-05-2010

<sup>123</sup> [www.ecoembes.com](http://www.ecoembes.com), visited on 20-05-2010

<sup>124</sup> <http://www.uned.es/biblioteca/rsu/pagina3.htm>, visited on 20-05-2010

Regular food container are also taken to selective plants as in many cases, wrong fractions have been thrown away in this container.

Finally, once all the fractions have been well separated the next phase is to take them to the corresponding treatment plant.<sup>125</sup>

### 3.5.3 Data

The achievement of The Packaging and Packaging Waste Directive goals of reducing packaging waste has not gone as expected. There has been an increased of packaging waste generated by the EU-27 Member States.

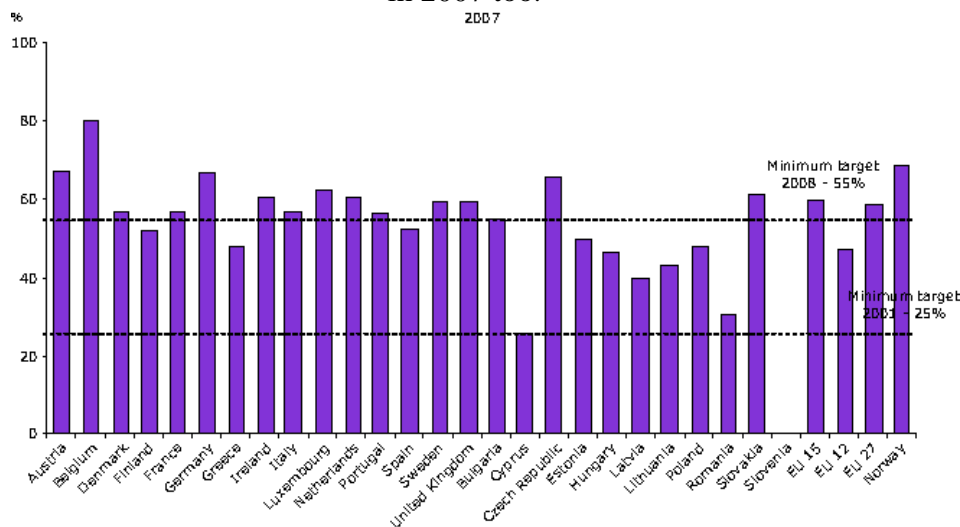
The average packaging consumption of Member States is 164 Kg per capita. The level of packaging consumption varies from one country to another and important differences exist between some of them. There is a considerable difference between EU-15 and the new Member States. The new Members consume in general less packaging. Differences between EU-15 Members are more difficult to explain. Different market shares of reusable packages, different patterns of consumption or production or different information given due to the lack of understanding of the packaging that need to be reported to DG Environment, are some of the possible reasons for these differences between Member States.

Recycling is one key practice in the management of packaging waste.

Recycling Targets are more promising. Although there are some differences between Member States, the 25% packaging recycling target of 2001 was met and even exceeded, as well as the 55% packaging recycling target of 2008. Figure 9 shows that Both EU-15 Member States and EU-12 are doing it very well.

The increased of the packaging recycling rate is due steps taken by politicians and the more awareness of consumers. Improvement of the existing collection and recycling systems or economic measurement are some of the measures taken.<sup>126</sup>

When comparing Sweden and Spain, data demonstrates that in 2007, the rate of packaging recycling in Sweden was higher than in Spain. In 2007, Sweden had already achieved the minimum recycling target of 55% set on 2008.<sup>127</sup> Spain achieved this target in 2007 too.<sup>128</sup>



<sup>125</sup> www.ecoembes.com, visited on 20-05-2010

<sup>126</sup> http://www.eea.europa.eu/, visited 30-05-2010

<sup>127</sup> http://www.eea.europa.eu/, visited 30-05-2010

<sup>128</sup> www.cincodis.com, visited on 30-05-2010

Figure 9: Recycling Rates of EU Members<sup>129</sup>

### Sweden

Data from 2008, which falls under the producer’s responsibility, show that 97% of the waste was recovered and 3% was land filled. Out of the 97%, 35% was recycled, 48,5% was incinerated with energy recovery, 12,6% was biologically treated and 0,9% was treated as hazardous waste.

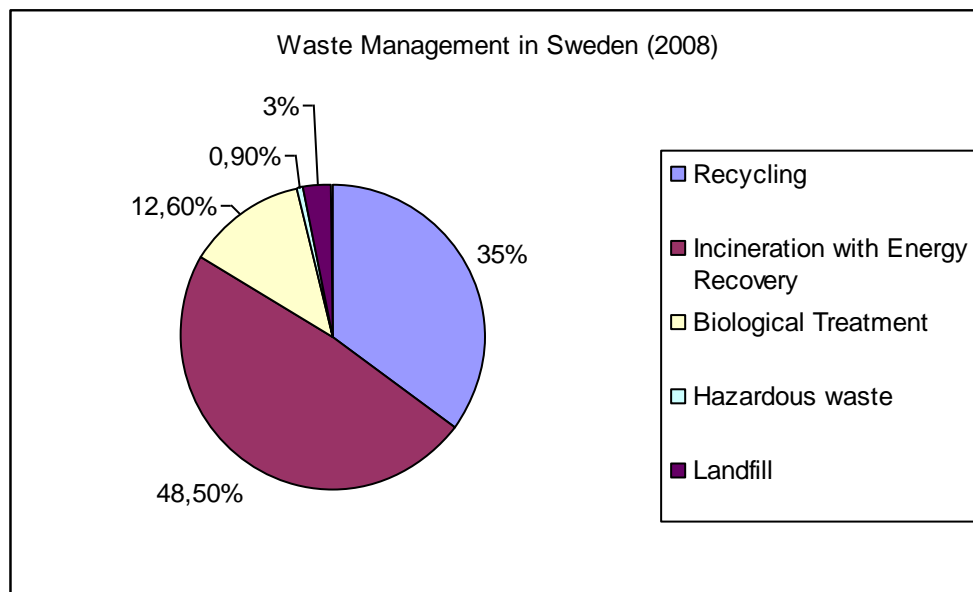


Figure 10: Waste Management in Sweden<sup>130</sup>

Of what material recycling concern, the recycling rates are going in the right direction. The Swedish Parliament has set a recycling goal that says that by 2010 at least 50% of household waste must be recycle (including biological treatment). By the end of 2007, the material recycling rate already reached 47,6%, which demonstrates that the target would be achieved without any problems.

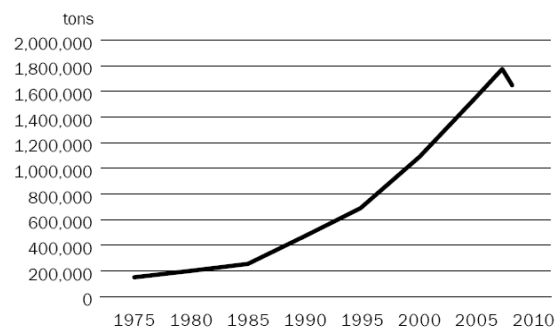


Figure 11: Amount of packaging materials recycled by households<sup>131</sup>

<sup>129</sup> <http://www.eea.europa.eu/>, visited 30-05-2010

<sup>130</sup> Avfall, `Swedish Waste Management`, June 2009

<sup>131</sup> Avfall, `Swedish Waste Management`, June 2009

As seen in figure 11, which represents the material recycling by households, the tons of material recycling have increased since the recycling beginnings. However, there has been a decreased in the past years that could be link to the less consumption due to the economic recession. In 2008, the packaging waste, paper, electric waste and the bulky waste material recycling accounted for 1657849 tons, which is 179, 1 Kg per person.<sup>132</sup>

European Commission reports the data concerning the 2008 recovery results for each of the packaging materials.

174000 tons of glass packaging was recycled, which accounts for 94% of the total glass packaging waste.

71420 tons of plastic packaging was recycled, which accounts for 37% of the total plastic packaging.

482102 tons of paper and board packaging was recycled, which accounts for 74% of the total paper/board packaging

And finally, 47004 tons of metal packaging was recycled, which accounts for 71% of the total metal packaging.<sup>133</sup>

## Spain

According to Eurostat data the Municipal Waste Generated by person in 2008 was 575Kg per person. 57% of this waste was dumped in landfills, 9% incinerated with energy recovery, 14% recycled and 20% composted.<sup>134</sup>

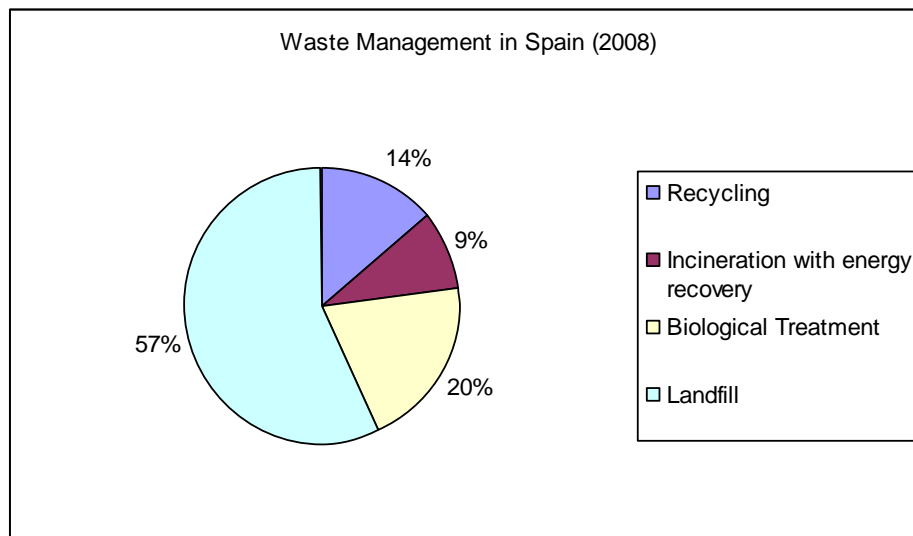


Figure 12: Waste Management in Spain<sup>135</sup>

European Commission reports the data concerning the 2008 recovery results for each of the packaging materials.

936350 tons of glass packaging was recycled, which accounts for 55,8% of the total glass packaging.

<sup>132</sup> Avfall, 'Swedish Waste Management', June 2009

<sup>133</sup> <http://ec.europa.eu/environment/waste/packaging/data.htm>, visited on 02-06-2010

<sup>134</sup> Eurostat Data

<sup>135</sup> Eurostat Data

391553 tons of plastic packaging was recycled, which accounts for 23,3% of the total plastic packaging

2537994 tons of paper/board packaging was recycled, which accounts for 70% of the total paper/board packaging.

301522 tons of metal packaging was recycled, which accounts for 62,8% of the total metal packaging.<sup>136</sup>

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<sup>136</sup> <http://ec.europa.eu/environment/waste/packaging/data.htm>, visited on 02-06-2010

## 4. Results and Analysis

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*In this chapter the reader will be introduced to the analysis of the results obtained in Sweden and Spain. The comparison between both countries will also be presented on this chapter.*

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### 4.1 Sweden

The great awareness of the environmental problem, as well as the awareness of the benefits that represents the organic food, make the Swedish organic market a consolidated market.

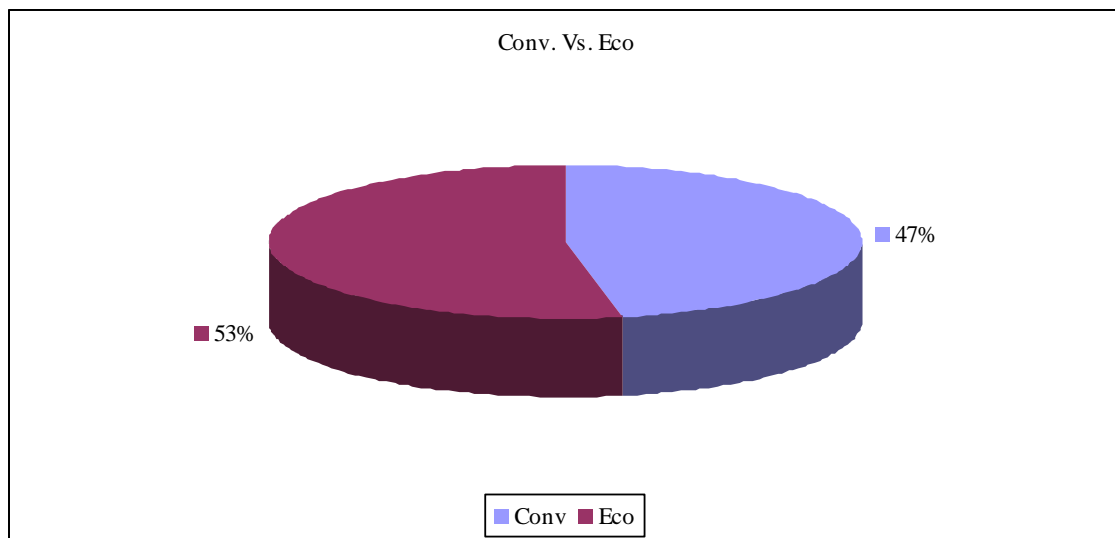


Figure 13: Proportion of Conventional and Organic consumers in Sweden

More than half of the Swedish consumers interviewed are organic food consumers. There is not gender dependence with consumption orientation. There are not more organic women consumers or vice versa.

Figures 14 and 15 show which are the main reasons why consumers do or do not buy organic food.

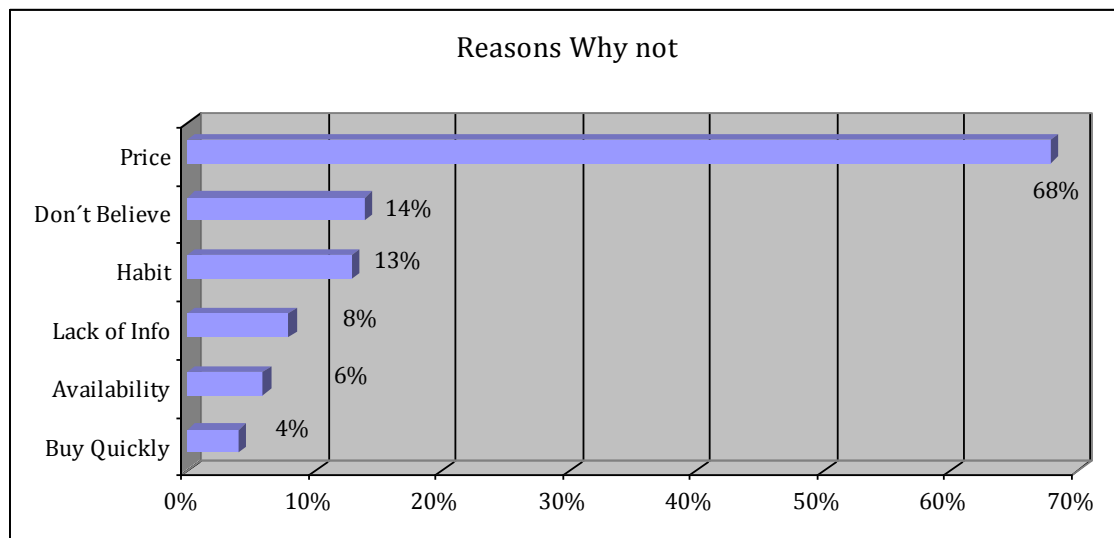


Figure 14: Reasons why consumers do not buy organic food

The higher price organic food normally has, make most consumers replace their ecological shopping for their conventional one.

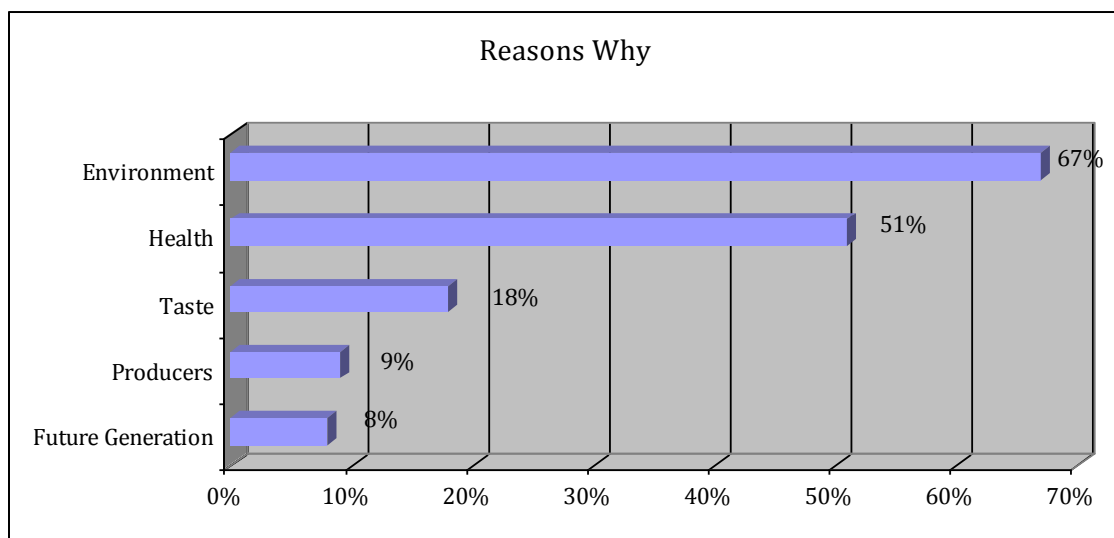


Figure 15: Reasons why consumers buy organic food

The Swedish organic consumer is a consumer concern with the environment as the sake of the earth is the main reason why organic food is bought. The health is also a matter of concern for the organic Swedish consumer. Consumers argue that organic food is better for your health. It was interesting to see that most women with small children answered that they would buy organic food for the health of their children.

Although the environment and health are two of the main reason why organic food is bought, most of Swedish consumers buy organic food for a combination of different reason, and not just for one reason. The environment and health combination were among the most chosen reasons.

### 4.1.1 Conventional Consumers

#### How much do conventional food consumers know about the packaging food disposal?

Conventional consumer’s knowledge about the food packaging disposal is high. However, it varies from one packaging material to another as figure 16 demonstrates.

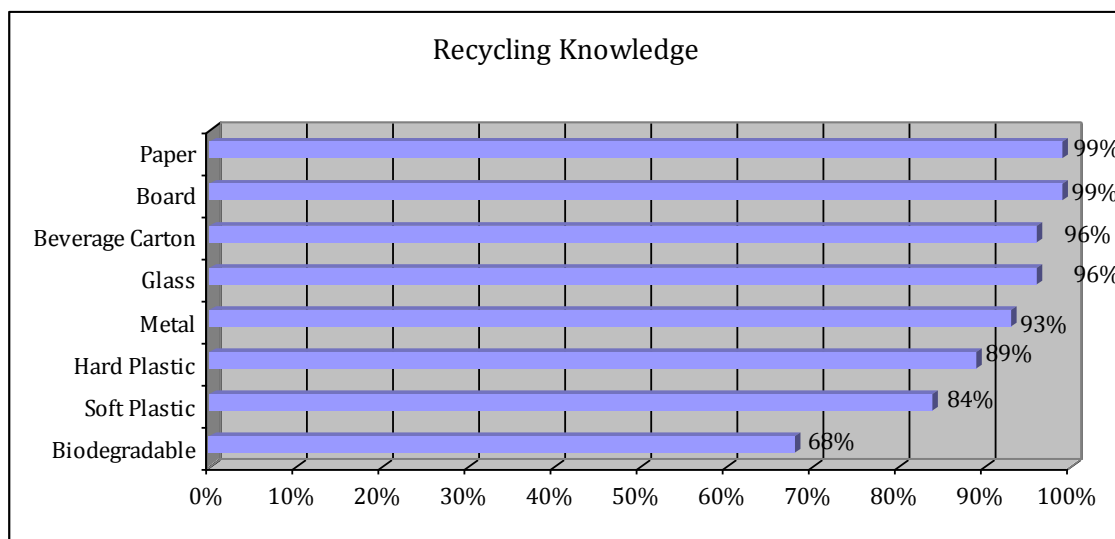


Figure 16: Conventional Recycling Knowledge in Sweden

99% of the conventional consumers interviewed know about the paper and board recycling possibilities. Paper and board are followed by beverage carton, glass and metal with 96%, 96% and 93% of knowledge, respectively. Hard plastic (89%) and soft plastic (84%) are less identified as recycling materials. Finally, biodegradable plastic packaging represents a special case. 68% of the conventional consumers interviewed say that it is possible to recycle and also more than half agree to have heard about it (69%). However, most of them admit that the definition of it is vague. The majority has heard about it, but has never seen them as a package. Biodegradable plastic bags are the only package identified as a biodegradable plastic packaging by consumers That demonstrates that what had to be done with this material is still quite confusing.

Conventional consumers have been dealing with the recycling world for quite a long time. All the information that the government and the recycling companies have spread through the entire country have been the engine of the conventional consumer’s knowledge. The most relevant sources of information are:

- Book Leaflet – Since around eight or nine years, a sorting guide is sent to all households in order to inform the population.
- Advertisement on Television – As an example, Panta mera advertisement, which advertised the bottle and can return system.
- Informative session in households.

It is also agreed that part of the knowledge that new generations have is thanks to the education they have been through the school, due to the great effort the government has done in its education environmental programmes.



### How do they behave when disposing the food packaging?

The packaging recycling habits are high as seen in figure 17. However, the rate also varies from one material to another. Glass (93%), paper (92%) and board (90%) are the three most recycled packaging materials. Metal (70%), beverage carton (70%), hard plastic (66%) and soft plastic (59%) have a medium recycling rate. And it is biodegradable (34%) the less recycled material.

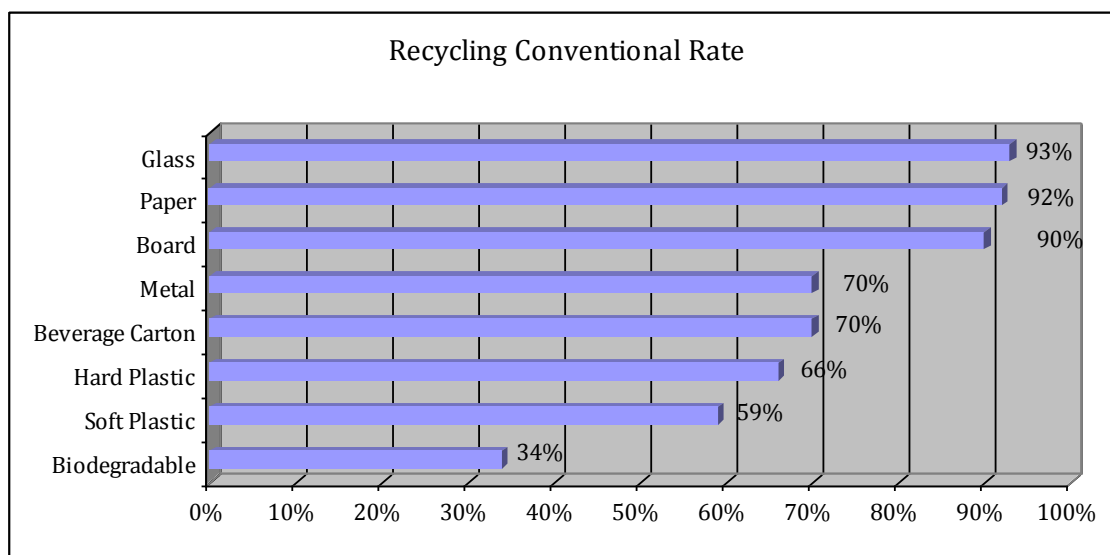


Figure 17: Conventional Recycling Rate in Sweden

A mix of the environmental concern, well informed consumers and economical reasons are the reasons why Swedish conventional consumers do it so well.

The conventional consumer is aware of the environmental problems affecting the earth. In that sense, a part from sorting the trash out, the Carbon Dioxide emissions are also tried to be reduced by avoiding the used of the car and instead walking, riding or using public transport.

It is so big the amount of information that they have been given, that they would feel guilty if the sorting is not practised. And also they would feel embarrassed if they are the only ones not practising it.

Economical reasons are also in their mind. If the separation of the different types of fractions is done, the money pay per kilo by households is less. The pant return system is practised for having also the money back. Finally, there are penalties for not separating the trash in Sweden. Consumers are aware of that and that is why they do it properly.

Regarding the Reuse of the packaging, conventional consumers try to give a second use to the used packaging. However, the reusing rate is not as high as the recycling rate. 69% of the conventional consumers agree that plastic is the most harmful packaging material for the environment. There is usually a sense of guiltiness when the plastic packaging is thrown away. That is why the plastic packaging is the most reused packaging (81%). Glass (28%) is the second most reused packaging material. As seen, there is a big gap between the plastic and glass reusing rate. Packaging materials such as metal, biodegradable or paper are very little or not at all reused.

The application given to the reused packaging is mainly storage of food. It is curious to notice that ice-cream boxes are used as lunch boxes by many consumers.

Storage of tools is also another application, but much less used than the food application.

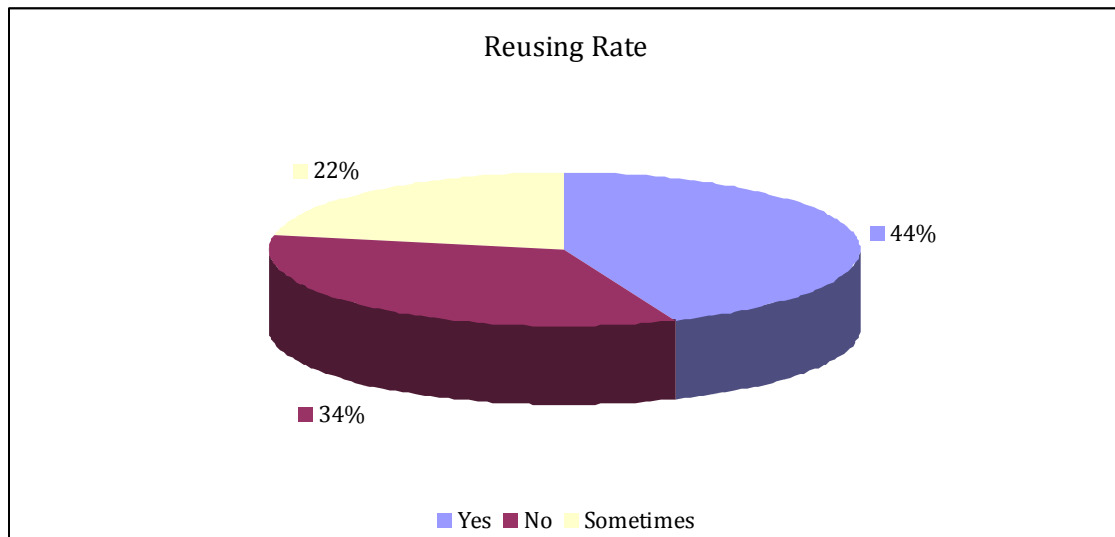


Figure 18: Conventional Reusing Rate in Sweden

Regarding the Reduce of packaging, just 34% of the conventional consumers admit to do it. A small part tries to do it but confess that it is very difficult to achieve this goal as products are usually over packaged. Unnecessary packaging annoys them but it is very difficult to avoid it. More than half of the consumers (52%) do not try to reduce package, as it is not a matter of concern for them. Convenience, taste, brand and quality are more important factors.

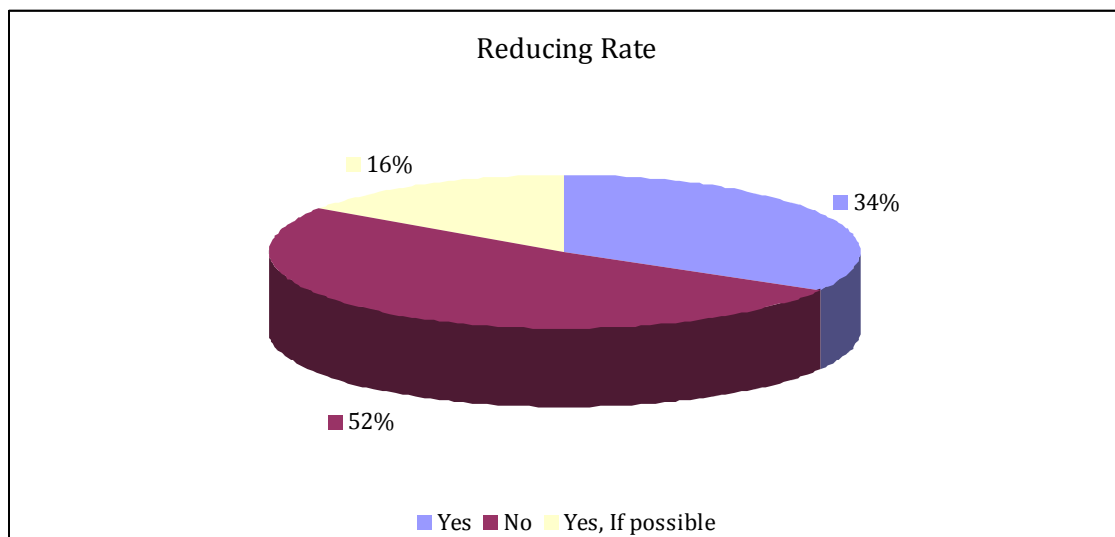


Figure 19: Conventional Reducing Rate in Sweden

Statistical analysis shows that there is not a significant relation between the Reusing rate and the Reducing rate, as well as between gender and reusing rate. However, there is a significant relation between the gender and the reducing rate. It can be said that women reduce more than men.

### What are the causes that make consumers not recycle or not recycle more?

Looking at the recycling data, it can be noticed the existing gap between the knowledge and the attitude. The next table resumes the differences between both. The knowledge percentages are higher than the attitude ones. In that sense, glass, paper and board are the materials where the gap is smaller. However, it is important to notice the big gap between metal, the two kinds of plastic and the beverage carton. Biodegradable packaging is a special case. Data shows less knowledge and attitude than in other materials. That demonstrates that there is confusion with the real natural of a biodegradable plastic packaging. Consumers do not really know what a biodegradable packaging is. Just a small part of the conventional consumers know the real disposal method of a biodegradable packaging; either throw it in the organic bin, so it auto decompose, or either compost it.

Packaging Material	Knowledge	Attitude	Difference
Glass	96%	93%	3
Paper	99%	92%	7
Board	99%	90%	9
Metal	93%	70%	23
Hard Plastic	89%	66%	23
Soft Plastic	84%	59%	25
Beverage Carton	96%	70%	26
Biodegradable	68%	34%	34

Table 1: Differences between Swedish Knowledge and attitude

Conventional consumers find the following causes with which they explain this existing gap:

- Confusion – Although the Swedish consumer admits to have received plenty of information, there is still some confusion on where to throw away some kinds of materials. Some packaging materials are not well identified.
- Bad Infrastructure – The placement and number of containers depends of the municipality and kind of house in where you live in. Not all consumers have the same types of containers. In some places, not all fractions can be sorted it out.
- Laziness – Laziness of separating all the fractions at home, both from having lots of bins at home and also from taking it to the right container.
- Lack of interest and trust – If there is apathy and incredibility in the recycling system, consumers will not contribute. Accurate information about what really happens with the used packaging is needed.

### 4.1.2 Organic Consumers

#### How much do conventional food consumers know about the packaging food disposal?

Organic Swedish consumers know very well about the recycling possibilities in Sweden. As figure 20 demonstrates, all the organic consumers interviewed know about the possibility to recycle glass, paper and board. Metal (97%), beverage carton (96%) and hard plastic (90%) are also identified as recyclables by the majority. Soft plastic (77%) and biodegradable (65%) represents the two options with less consumer’s knowledge. The definition of biodegradable plastic packaging is also confusing to organic consumers. A big percentage of the consumers interviewed (72%) have ever heard about it, but not all of them know what really is or even how they can dispose it. Some consumers think that it has to be thrown away with soft plastic, as it is argue that it is a kind of plastic. Just a few organic consumers really know how to dispose it. There is either the possibility of compost it, or if there is not a compost bin, it should be thrown away in to the organic bin. The data collected does not demonstrate this knowledge.

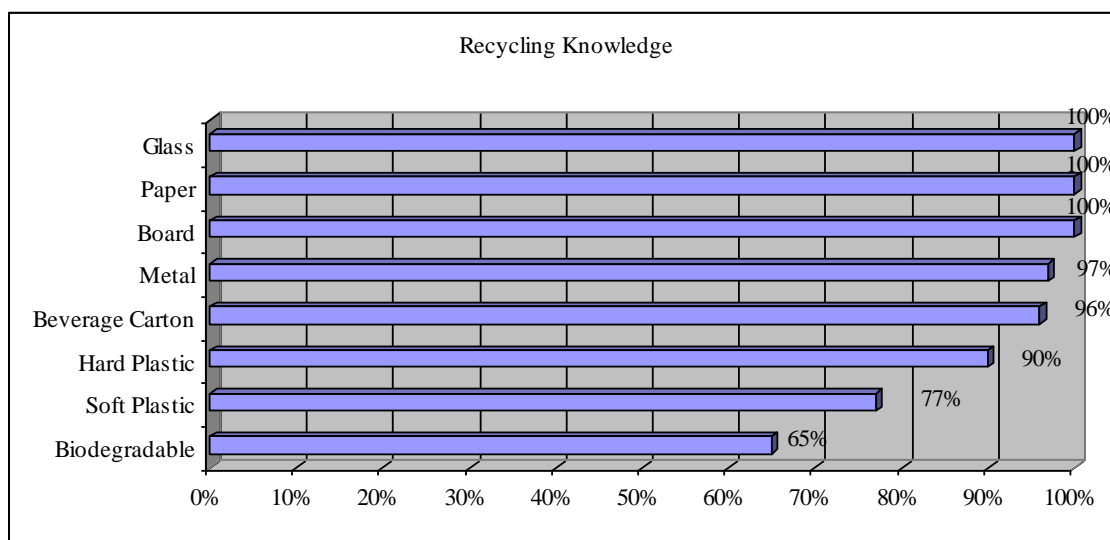


Figure 20: Organic Recycling Knowledge in Sweden

The organic Swedish consumer has acquired the recycling knowledge thanks to the information got from television, internet and the book leaflet that Swedish consumers received every year at home. It is also curious that the consumer also looks for information that is written on the packaging such as labels or signs. The information shared with friends and relatives is also an important source of information.

The organic consumer agrees that government plays a very important role in the education system for children.

#### How do they behave when disposing the food packaging?

Figure 21 show that the recycling rate among organic consumers is high. However, it varies from one packaging material to another. Glass (97%), metal (96%), paper (95%) and board (95%) are the most recycled packaging materials. Beverage carton (85%) and hard plastic (78%) have a medium recycling rate. It is soft plastic (54%) and biodegradable (37%) the two least recycled packaging materials.

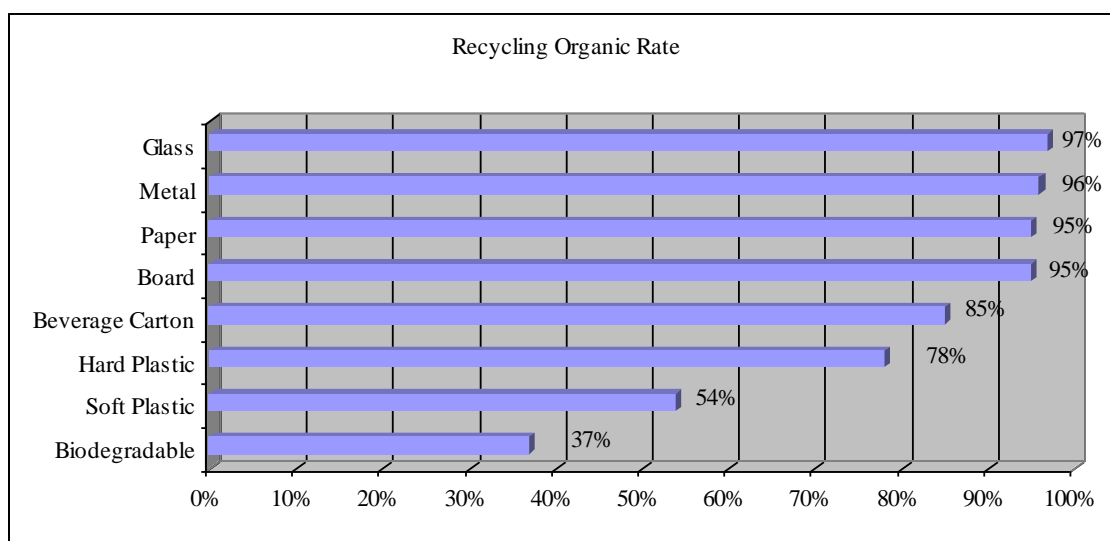


Figure 21: Organic Recycling Rate In Sweden

The reason why organic consumers recycle is mainly because of the environment. They would like to live in a greener and cleaner environment and the separation of the different packaging materials is a way of preserving the nature and having cleaner and more organised cities.

It is also mentioned that recycling is the greener solution of today’s “packaging-world”, since nearly all products are packaged. However, most of the organic consumers would like to live in a world of zero waste.

Regarding the Reusing rate of the packaging, the organic consumer also practises Reusing. More than half of the organic consumers interviewed (63%) reuses the packaging. The percentage of consumers not reusing is small, 25%. 93% of the consumers who admits to reuse packaging use plastic packaging for a second application. Plastic packaging is also found as the most harmful packaging material. Organic consumers reuse plastic packaging until it breaks as plastic is found very dangerous for the environment. Glass packaging is the second most reused, 32%. The rest of the packaging materials have a small reusing rate, but all of them are reused.

Food is the main application given to the reused package.

Reuse is seen as a good alternative for recycling. Consumers should reuse the packaging instead of recycling it, until it cannot fulfil its functions anymore. What is suggested is a reusing system in where once your packaging has been used, it can be taken back to the process.

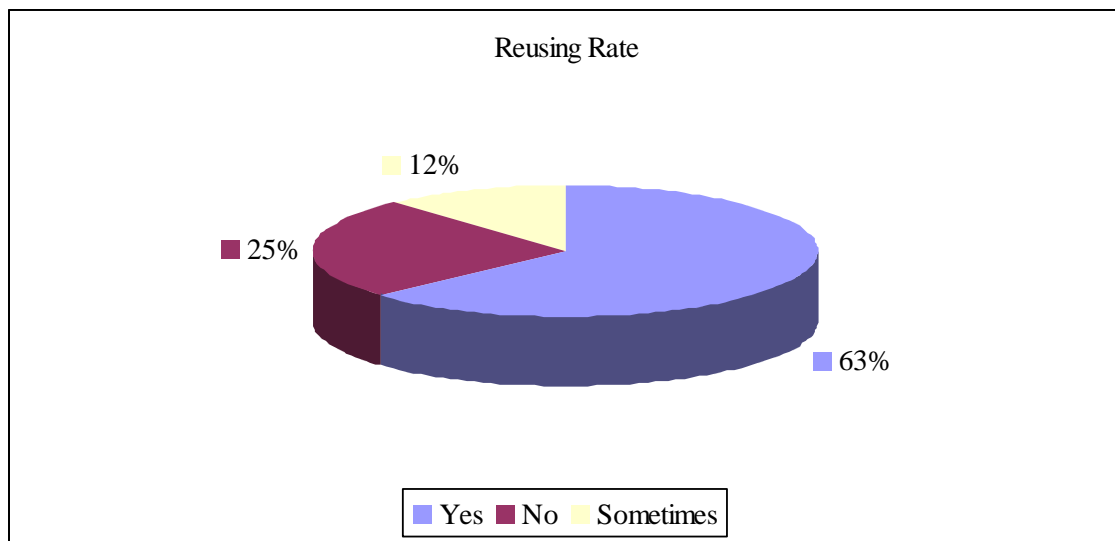


Figure 22: Organic Reusing Rate in Sweden

In regards with the reducing rate, the amount of organic consumers that do and do not do it is balanced. 44% of the organic consumers reduce while 40% do not do it. Although there is a high reducing rate, most of them admit that in the currently food industry is difficult to do it. Consumers try to reduce its packaging consumption by for example buying not packaged fruits and vegetables.

Statistical analysis shows that there is not a significant relation between the reducing and reusing variables, as well as between the gender and the reducing rate. There is, however, a relation between the reusing rate and the sex. Organic female consumers reuse more than men.

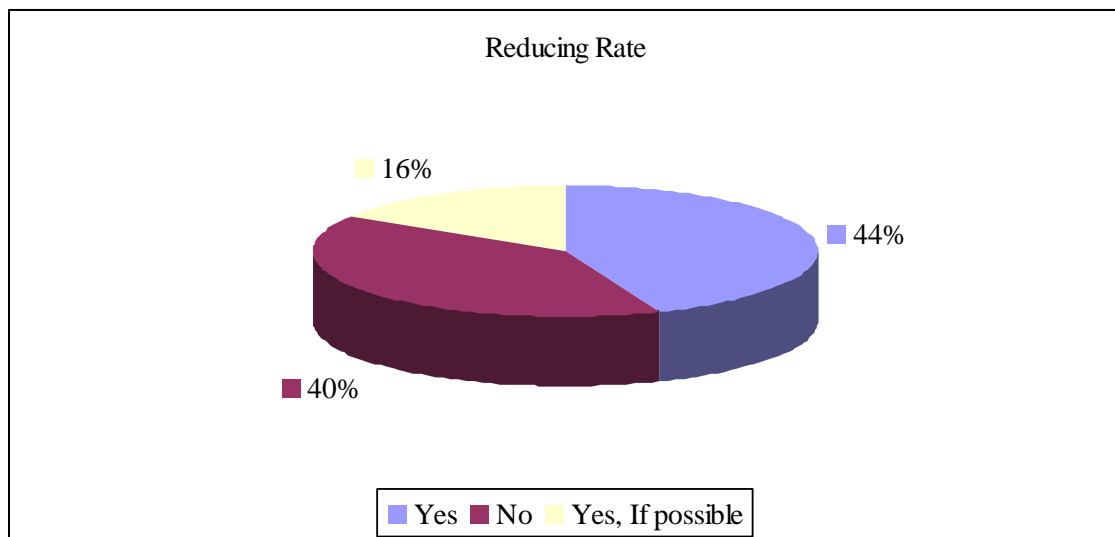


Figure 23: Organic Reducing Rate in Sweden

### What are the causes that make consumers not recycle or not recycle more?

The gap between consumer's knowledge and attitude is represented in the next table. Metal is the material with a smaller difference, as 97% of the consumers interviewed know about the recycling possibilities and 96% really do it. Glass, paper

and board also have small differences. Soft plastic and biodegradable are the one with higher differences.

Packaging Material	Knowledge	Attitude	Difference
Glass	100%	97%	3
Paper	100%	95%	5
Board	100%	95%	5
Metal	97%	96%	1
Hard Plastic	90%	78%	12
Soft Plastic	77%	54%	23
Beverage Carton	96%	85%	11
Biodegradable	65%	37%	28

Table 2: Differences between organic knowledge and attitude in Sweden

Organic food consumers find the following causes why consumers do not recycle more:

- Confusion – Lack of material knowledge.
- Bad recycling infrastructure
- Lack of space at home

### 4.1.3 Conventional vs. Organic consumers

#### How much do conventional food consumers know about the packaging food disposal?

The recycling knowledge that both consumers have is similar. Although as a whole organic consumers do it a bit better, statistical analysis demonstrates that this difference is not significant. All packaging materials recycling knowledge are ordered in the same way for both types of consumers.

Special mention has to be done to biodegradable plastic packaging. Nearly the same percentage of both types of consumers has ever heard about it. However, the definition and the disposal possibilities of it are very unclear for both.

The only difference found between them is among the sources of information that are used for informing themselves. While conventional consumers are informed thanks to the Informative sessions, book leaflets and advertisements on radio and TV, organic consumers go deeper in its recycling discoveries. A part from informing themselves with the existing media sources, organic consumers try to find other ways of information, such as other people’s knowledge and information written on the package. (Labels). Therefore, the organic consumer is keener of looking for the information, while the conventional consumer is content with the information that comes directly without a need of doing its own research.

#### How do they behave when disposing the food packaging?

The recycling rate as a whole is also bigger for organic consumers than for conventional consumers. However, statistical analysis shows any significant differences. It is just the recycling rate of metal the only one that represents a significant difference. 96% of organic consumers recycle metal in contrast with the 70% recycling rate of the conventional consumers.

The reasons why both types of consumers recycle are different. The environment, the economy and enough information are the conventional consumer's reasons. However, what only worries to conventional consumers is the preservation of the environment for us and for future generations. That matches with the organic consumer values, as the majority of them consume organic food for environmental reasons (67%). Economical reasons are not as important for them, as the bought of organic food means a higher expenditure. On the other hand, the conventional consumer is more concern with its economy affection. The economy is one of the reasons for recycling, as well as for not buying organic food.

As what Reusing rate concerns, although the percentage of organic consumers is higher, statistical analysis show no significant difference. Both consumers reuse plastic packaging and glass packaging as it first and second option respectively. However, the percentage of reused glass compared with re reused plastic is smaller in both consumers. Plastic packaging material is known as the most harmful for the environment. This could be the reason why plastic packaging is the most reused packaging material. Both consumers see in plastic a dangerous weapon for the environment, which must be used as many times as possible until it cannot fulfil its functions. Applications given to the reused packaging do not differ. It is food applications the most common ones.

As what Reducing rate concerns, it is also a bit bigger for organic consumers, but as before there is not a significant difference. The percentage of consumers that reduces if it is possible is exactly the same in both cases.

The environmental impact of food packaging is a matter of concern for all. In that sense, over packaging is an issue that annoys them.

What differ is the reasons why not reducing. Conventional consumers do not reduce because product characteristics are more important for them (price, quality or brand), while organic consumers do not reduce because they agree that in supermarkets there is not another option.

When looking at the statistical analysis, for conventional consumers just gender and reducing rate are related. Conventional female consumers reduce more than men. For organic consumers, gender and the reusing rate are related. Organic female consumers reuse more than women. In both cases, it is the women the consumer that have a better attitude.

Finally, when talking about the difference between knowledge and attitude, the gap is smaller for organic consumers than for conventional. Organic consumers obey better the citizen's obligations.

## **4.2 Spain**

The Spanish organic food market is still quite small. Out of the organic consumer interviewed, just 11% were organic consumers. There is not a gender and organic food consumption dependence.



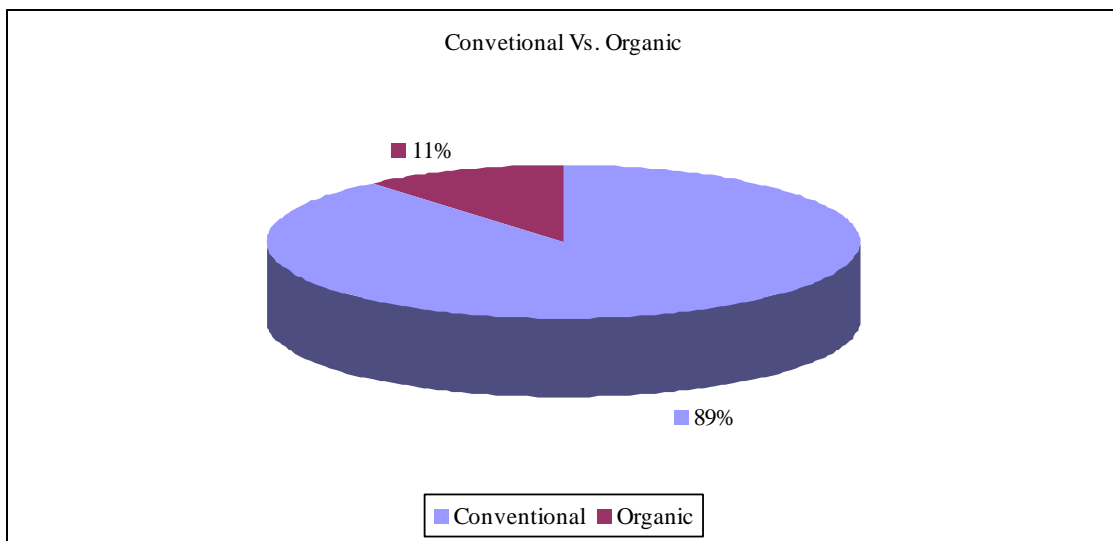


Figure 24: Proportion of conventional and organic consumers in Spain

The next figures show the main reasons why organic food is or is not bought.

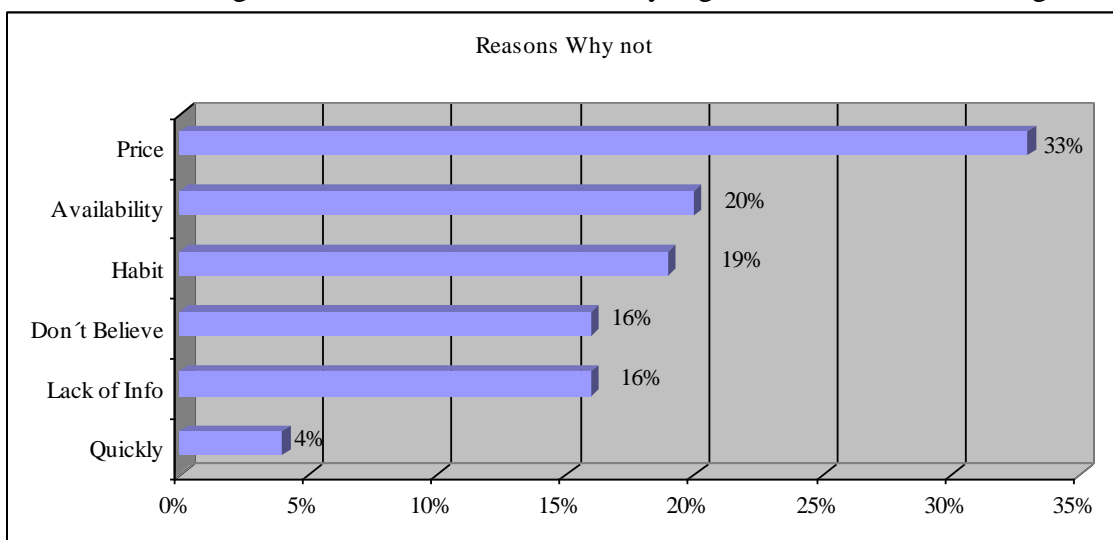


Figure 25: Reasons why not buying organic food

Price and availability are the two main reasons why organic food is not bought.

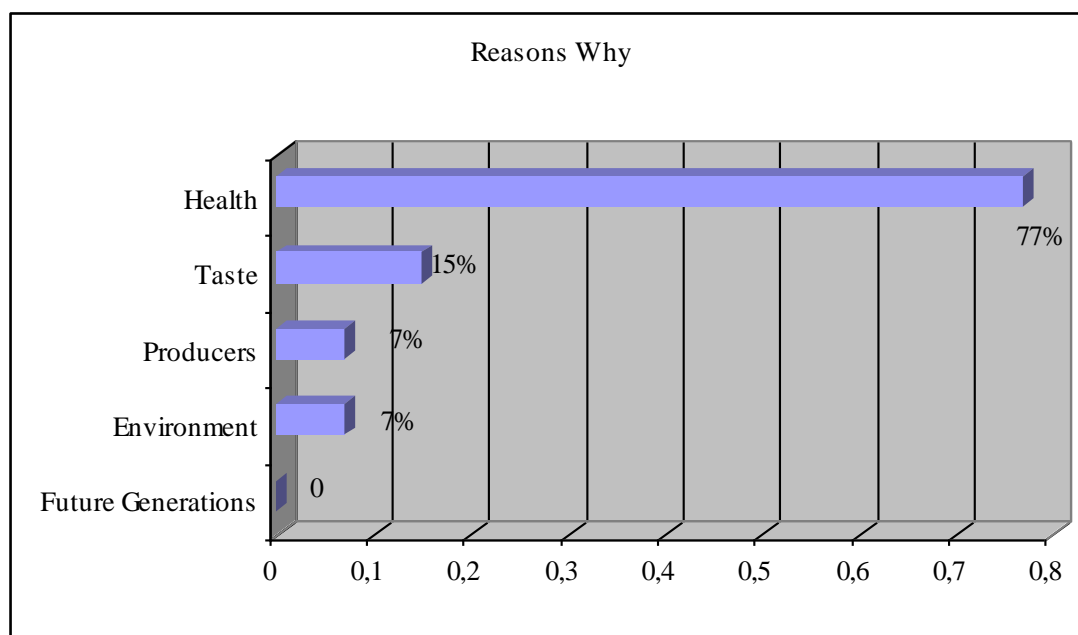


Figure 26: Reasons why buying organic food

The main reasons for buying organic food in Spain is for health reasons. Spanish organic consumers do not like at all the pesticides and chemical products that conventional food has, as they are harmful for the health. The taste, sake of the small/local producers and environment are second reasons. Although the health is the main reason, the bought of organic food is normally due to a combination of all the reasons.

#### 4.2.1 Conventional Consumer

##### How much do conventional food consumers know about the packaging food disposal?

Figure 27 shows the knowledge that Spanish conventional consumers have about the recycling possibilities of Spain. It is a high recycling knowledge what Spanish conventional consumers have as a whole, but it varies from one packaging material to another. The recycling possibilities of glass, paper and board are the better known of all, since 98% of the conventional consumers interviewed think that is possible to recycle these materials. Plastic (94%) and beverage carton (94%) represents a medium knowledge. Finally, the recycling possibilities of metal (70%) and biodegradable (56%) are the least known.

In regards with biodegradable plastic packaging, just 39% of the conventional consumers interviewed have ever heard about it. However, the definition of it is confusing for most of them.

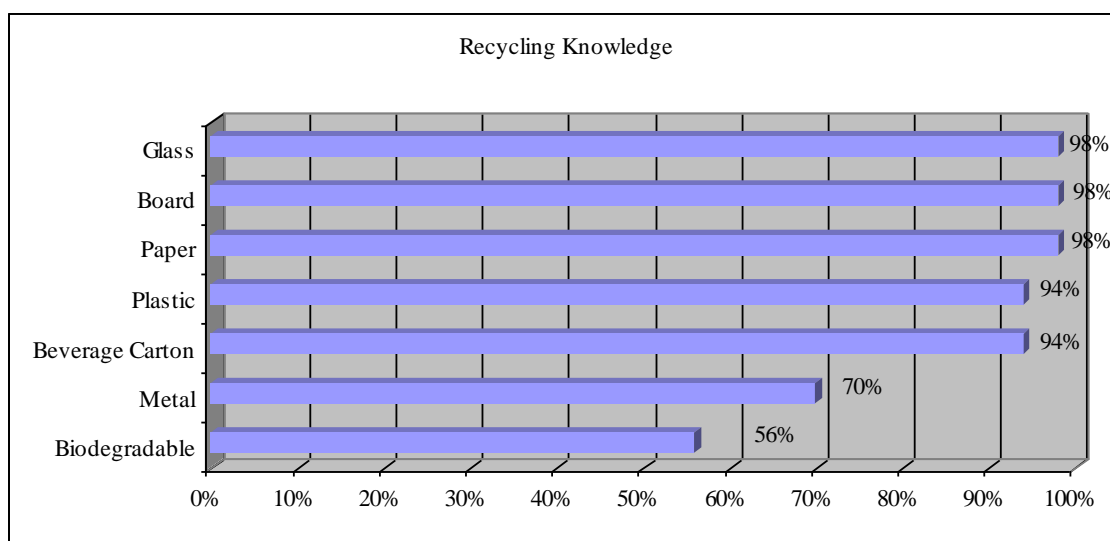


Figure 27: Conventional Recycling Knowledge in Sweden

There are still lots of unknown gaps about the way of recycling, although Spanish conventional consumers know it quite well. In particular, the fractions that have to go to the yellow container create the biggest confusions. The recycling world came to Spain later than in other countries and thus the existing information is unclear and limited. Information on TV, for example, is very unusual. Conventional consumers agree that the government is improving its information abilities. Nevertheless, its attitude is neither very active nor very informative.

As there are not enough information campaigns, the Spanish conventional consumer is keen on looking for its own information. The sources used are:

- Other people’s knowledge – The Spanish conventional consumer usually finds out the information needed by asking friends, relatives or work partners.
- Internet – Internet is a source also used by them.
- Book leaflet – Some book leaflets have been delivered. These leaflets are very unclear and not all the information is written in them.

Spanish conventional consumers think that one of the most important tasks for improving people’s knowledge is investing on education. Conventional consumers agree that the government is starting to invest on it, but this investment has appeared late and is also not sufficient.

### **How do they behave when disposing the food packaging?**

The recycling rate as a whole is not bad, as seen in figure 28, but it could be better. Material by material, glass is the most recycled packaging material, with an 88% of recycling rate. Plastic (82%), paper (81%), board (81%) and beverage carton (75%) have also a high recycling rate. On the other hand, just 48% of the conventional consumers interviewed throw metal packaging into the yellow container. Finally, biodegradable packaging has the lowest recycling rate, 29%.

The confusion with the different fractions that have to be thrown away in to the yellow container is demonstrated with the data, as, except from plastic packaging which

has a high recycling rate, metal and beverage carton packaging still need some recycling improvements.

The glass and paper/board recycling rate are higher than the average recycling rate of the fractions that had to be thrown away in to the yellow container. That is kind of an interesting issue. Although glass and paper/board containers are not normally next to households, its recycling rate is higher than the metal and beverage carton one, which are disposed in containers next to the households. A lack of information about packaging material knowledge and kinds of fractions that have to be thrown away in to the yellow container can be the answer for those recycling rates. Glass, paper/board are also material that started to be recycled before than plastic, metal and beverage carton.

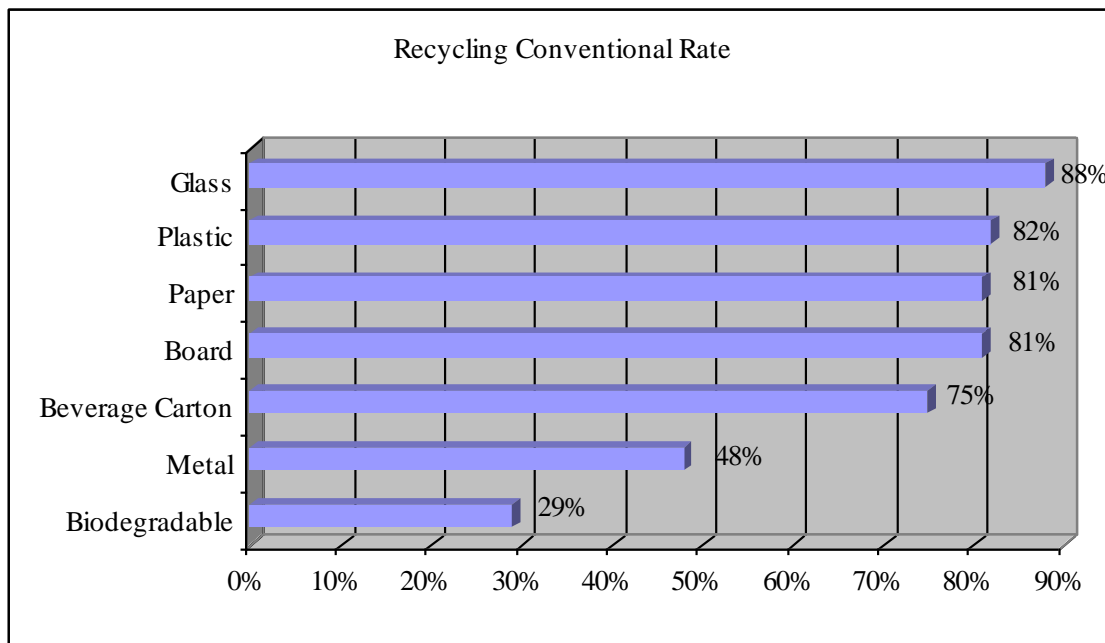


Figure 28: Conventional Recycling Rate in Sweden

The reasons why the Spanish conventional consumer recycles is because environmental reasons. Recycling activities are done to preserve and not dirty the world. A part from the separation of wastes, there are not many other activities that the Spanish conventional consumer does in order to live in a better environment.

Regarding the Reusing rate, more than half of the conventional consumers do not reuse at all, which means a low reusing rate. The most reused packaging material is glass with a 71% reusing rate. Plastic packaging is the second most reused material. However, just 43% of the conventional consumers who practice reusing activities, reuse plastic packaging. The main application given to the reused packaging is for storage of food, for lunch boxes, freezer or homemade food.

Plastic packaging material is considered to be the most harmful one. However, the reusing rate of plastic is lower than the glass one. Considering storage of food the main application given to the reused packaging, conventional consumers prefer to store food in a glass packaging better than in a plastic packaging, as there is some rejection of putting food in contact with plastic. That demonstrates, that preserving the quality of food is most important for conventional consumers than the harm that plastic could produce to the environment.

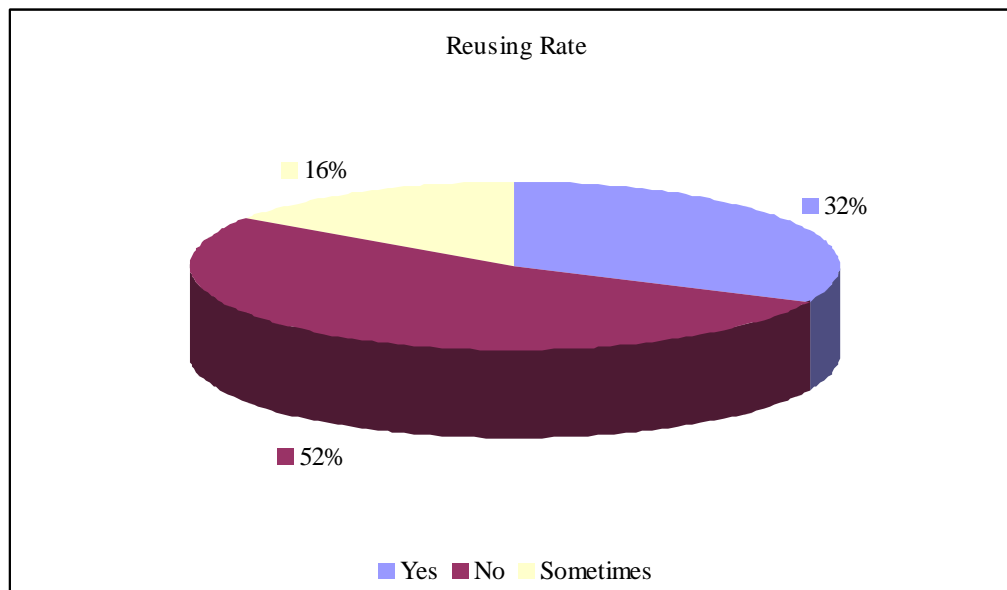


Figure 30: Conventional Reusing Rate in Spain

In regards with the Reducing rate, a high percentage of conventional consumers do not try to reduce the packaging consumption while doing the shopping. The quality, brand and price of the product are the factors that conventional consumer worry more about. A small part try to reduce the use of plastic bags, not just for environmental issues, but also for economical reasons, as some supermarkets are starting to charge for the plastic bags.

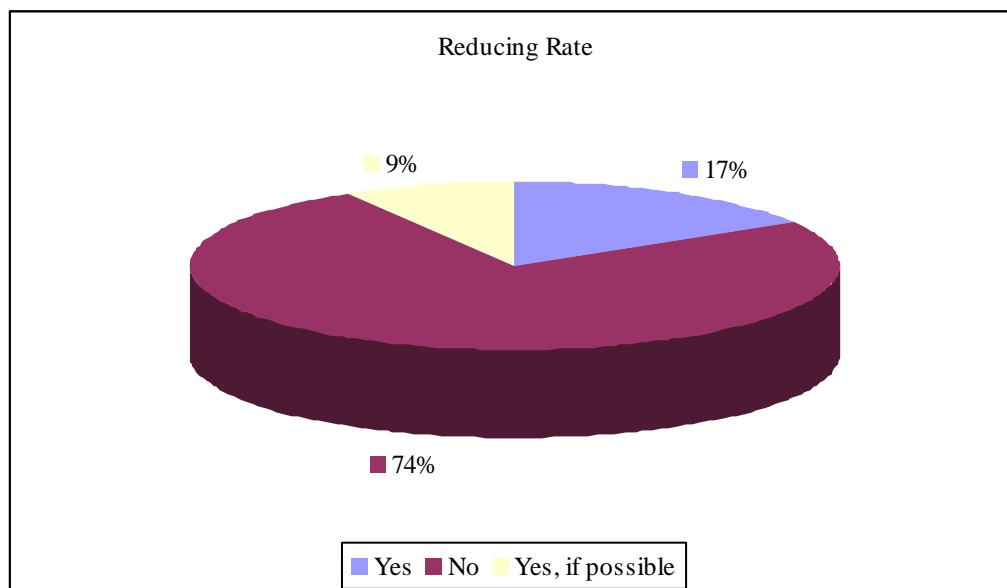


Figure 31: Conventional Reducing rate in Spain

Statistical analysis shows that there is not any significant relation between the reducing and reusing rate, the gender and the reusing rate and the gender and the reducing rate.

### What are the causes that make consumers not recycle or not recycle more?

The gap between the recycling knowledge and the recycling attitude is represented in the next table. The difference is smaller for glass. Metal represents a big gap. 70% know about the recycling possibilities in Spain while just 48% do it. The biodegradable plastic packaging is also a matter of concern, as the definition of it is vague and most of the consumers do not really know what to do with it.

Packaging Material	Knowledge	Attitude	Difference
Glass	98%	88%	10
Paper	98%	81%	17
Board	98%	81%	17
Metal	70%	48%	22
Plastic	94%	82%	12
Beverage Carton	94%	75%	19
Biodegradable	56%	29%	27

Table 3: Differences between conventional knowledge and attitude in Spain

Spanish conventional consumers think that the cause why consumers not recycle or do not do it more often are:

- Confusion – There is confusion with what fraction goes in each of the container. The yellow container represents the biggest problem for them. This confusion is due to the lack of information given by the government.
- Bad infrastructure – The quantity and quality of recycling containers vary from one region to another, as well as from city to city. There are not the same recycling possibilities everywhere, and in lots of cases the infrastructure is very bad.
- Lack of awareness – Not all consumers knows what is really happening with the earth.
- Lack of credibility – Lack of credibility in the recycling companies.
- Laziness – Laziness of having too many trash bins at home.

## 4.2.2 Organic Consumer

### How much do conventional food consumers know about the packaging food disposal?

The knowledge that Spanish organic consumers have about the recycling possibilities in Spain vary from one material to another. The recycling possibilities of glass, paper and board are completely learnt as all the organic consumers interviewed know about them. However, plastic (77%), metal (69%) and beverage carton (54%) represents more problems for the consumers.

In regards with biodegradable plastic packaging, 85% of the organic consumers interviewed have ever heard about it and 54% admits to recycle it. However, the

definition of it is vague. They have just heard about biodegradable plastic bags and not about other types of packaging. The majority admits to have never bought a product packaged with a biodegradable plastic packaging, or if they have, they have not notice it. There are different opinions of how to dispose it. Some consumers think that it has to be thrown away in the organic bin, while others in the same container as plastic packaging. Not many consumers know about the composting options. As it is seen, there is confusion about what really is a biodegradable plastic packaging and the ways of disposing it.

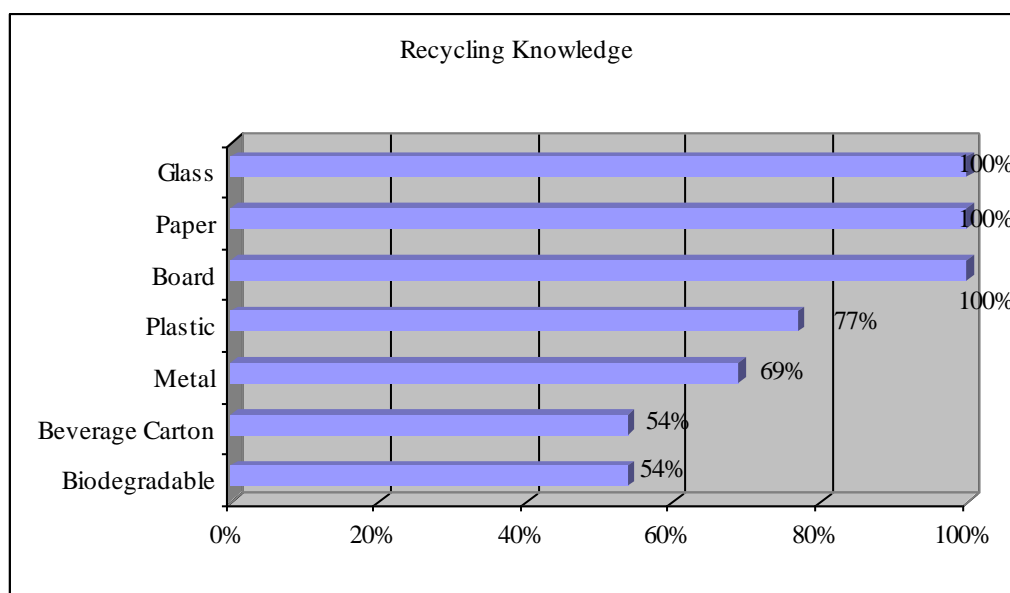


Figure 32: Organic Recycling Knowledge in Spain

Spanish organic consumers find that there is not enough information about how to sort out the different kinds of fractions.

The dissatisfaction about the very little information spread by the government is general among organic consumers.

The knowledge that organic consumer have is thanks to its own research and not by the existing information, as it is very limited. Most of the organic consumer's knowledge is due to the information shared with other people and also from the information coming from environmental friendly associations.

What it is thought to be the most influencing ways of improving the recycling knowledge is by a good education system, by creating a civic conscience and also by advertisements on TV and radio.

### **How do they behave when disposing the food packaging?**

The recycling rate differs from one material to another. Glass, paper and board are recycled by 92% of the organic consumers interviewed, while metal (62%), plastic (62%) and beverage carton (50%) have a lower recycling rate. Finally, biodegradable (46%) represents the lowest recycling rate.

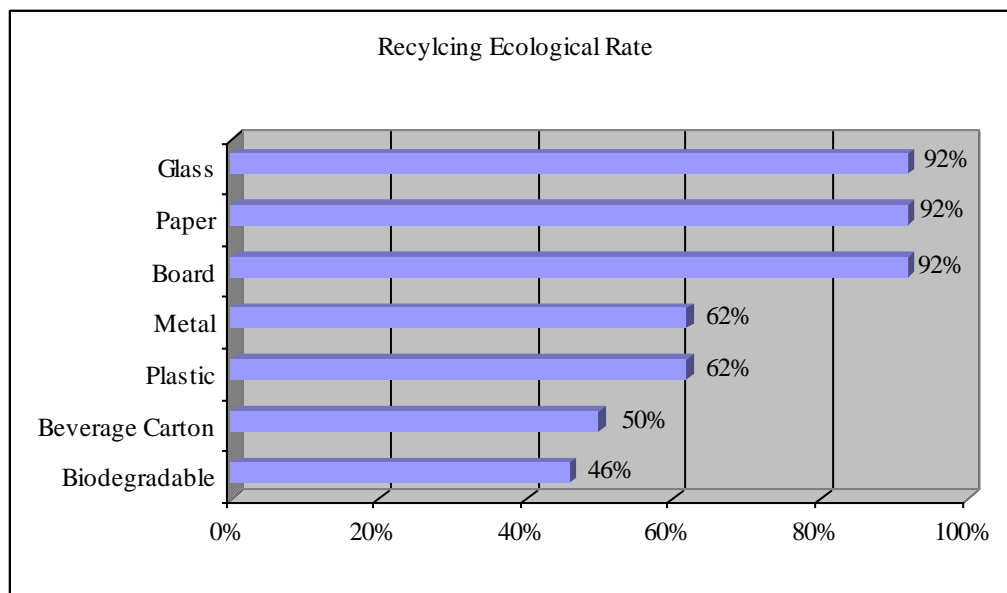


Figure 33: organic Recycling Rate in Spain

The oldest recycling history of glass and paper/board and the confusion about where to throw some types of packaging materials away could be some of the reasons of this existing gap between the different packaging materials.

The Spanish Organic consumer recycles for environmental reasons. The consumption is increasing, the amounts of resources are limited and in that sense, Spanish organic consumers think that recycling is a good solution for preserving the environment if the consumer society does not change. Organic consumers would prefer to reduce the consumption of packaging (zero packaging) and establish reusing systems. However, this is difficult in the current world.

Regarding the Reusing rate, nearly half of the organic consumers interviewed admit to reuse its food packaging for another application. Glass (86%) is clearly the most reused packaging material, while plastic (14%) is very little reuse. The rest of the materials are not reused at all. The main application is food storage.

Plastic packaging material is considered to be the most harmful one. However, the reusing rate of plastic is much lower than the glass one. For organic consumers putting food in contact with a plastic packaging is nearly forbidden, as it is considered a very harmful material. It is preferred to throw it away better than reducing it for food applications. This demonstrates that preserving the quality of food is most important for organic consumers than the harm the plastic could produce to the environment.



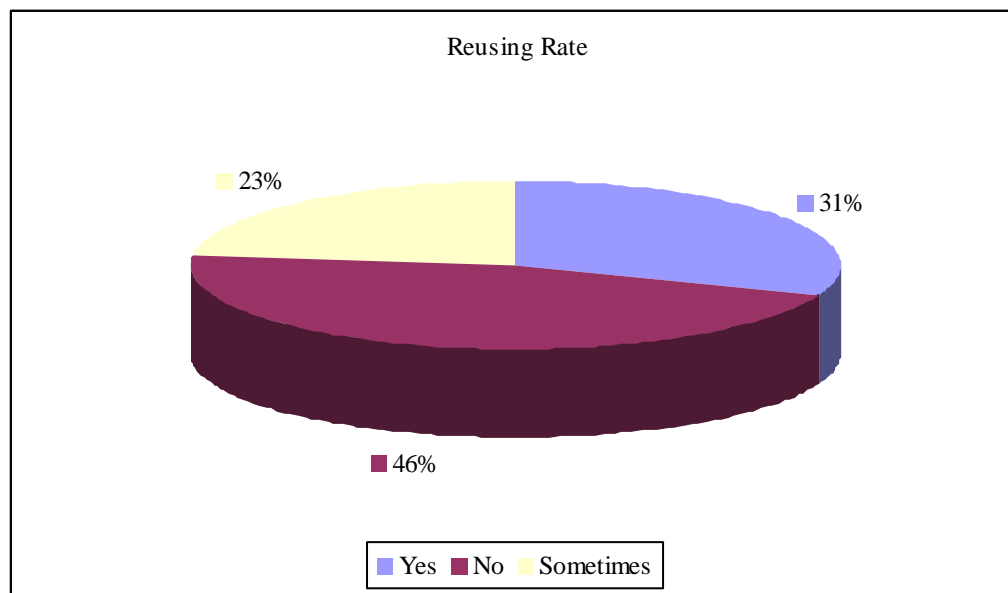


Figure 34: Organic Reusing Rate in Spain

Regarding the reducing rate, just 38% of the organic consumers interviewed admit to do it. The possibilities of reducing the packaging consumption depend on which type of shop the food is bought. In supermarkets it is said to be very difficult to achieve this goal as most of the products are packaged and often over packaged, while if products are bought in the local market is easier to reduce the packaging. Many organic consumers belong to organic groups. Being a member of an organic group let the consumer reduce the amount of packaging.

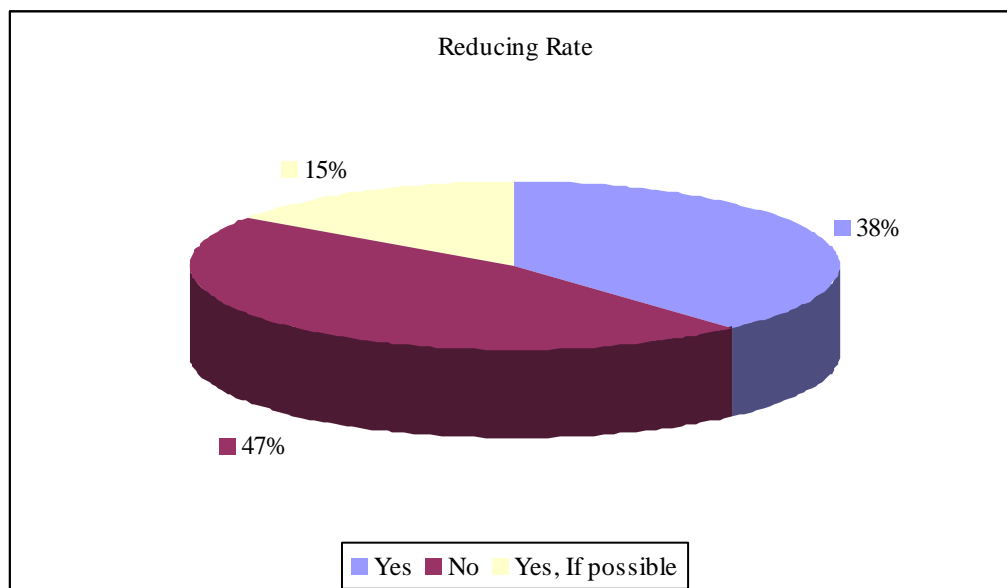


Figure 33: Organic Reducing Rate in Spain

Statistical analysis shows no significant differences with the next three pairs of variables: the reducing and reusing rate, the gender and the reusing rate and the gender and the reducing rate.

### **What are the causes that make consumers not recycle or not recycle more?**

Table 4 show the differences between knowledge an attitude. The biggest gap is represented by plastic. 77% of the organic consumers know about its recycling possibilities, while 62% really separate it.

Packaging Material	Knowledge	Attitude	Difference
Glass	100%	92%	8
Paper	100%	92%	8
Board	100%	92%	8
Metal	69%	62%	7
Plastic	77%	62%	15
Beverage Carton	54%	50%	4
Biodegradable	54%	46%	8

Table 4: Differences between organic knowledge and attitude in Spain

The causes why Spanish organic consumers think that the recycling rate is not better are:

- Lack of trust and knowledge in the recycling systems – It is considered that some consumers do not recycle because it is unclear the final destination of the package.
- Confusion – There is still some confusion with the different types of materials. The fractions that go into the yellow container are the most confusing ones.
- Lack of civil conscience
- Laziness – Laziness of dedicating too much space for all the different bins at home

### **4.2.3 Conventional Consumer vs. Organic Consumers**

#### **How much do conventional food consumers know about the packaging food disposal?**

The recycling knowledge that both types of consumers have is quite similar. The recycling possibilities of glass, paper and board are, in general, better known, while the plastic, metal and beverage carton ones (fractions that go in to the yellow container) are worst known. As mentioned before, some of the possible factors that could explain the similar gaps between these packaging materials are the later introduction of the yellow container but also the existing confusion about what kinds of fractions go in that container.

Regarding biodegradable plastic packaging, 85% of the organic consumers have ever heard about it in contrast with the 39% of the conventional consumer. Even if the organic consumer represents a higher proportion, the definition and the ways of disposing it is very unclear for both consumers.

Regarding the sources of information, both find that the information given by the government is very limited. Organic consumers are keener on looking for their own information (by other people’s knowledge or by internet sources), while conventional consumers a part from doing their own research, trust and pay more attention to the government’s information.

### **How do they behave when disposing the food packaging?**

Regarding Recycling, there is also difference between the recycling rate of glass, paper/board and of the fractions of the yellow container. The first ones have a higher recycling rate than the second ones. Except from metal, the recycling rates of the rest of the packaging materials are a bit higher than for organic consumers. However, there is not a significance difference. Statistical analysis demonstrates that it cannot be said that conventional consumers recycle more.

The preservation and cleanliness of the environment are the reasons why both types of consumers recycle. The separation of fractions is nearly the only environmental friendly activity practised by conventional consumers. However, organic consumers, a part from sorting out the trash, they consume organic food and try to do a more environmental usage of the energy resources.

Regarding the Reusing rate, statistical analysis shows no significant relation between the organic and conventional consumers reusing rate. It cannot be said that organic consumers reuse more. Glass and plastic are the two most reused packaging materials. Organic consumers do a smaller reuse of plastic packaging than conventional consumers. That could demonstrate that the organic consumer is more aware of the harm that plastic does to food. Conventional consumers also reuse beverage carton in a small fraction. The main applications do not vary and are still related to food storage.

Regarding the reducing rate, statistical analysis show that Spanish organic consumers recycle more than the conventional one. One of the reasons why the organic consumer’s reducing rate is lower could be its shopping habits. Most of the organic consumers prefer to buy organic food in local supermarkets or even by being a member of an ecological association than buying the products in a Supermarket. The organic food sold in supermarkets is considered to be an elitist and not trusted food due to the high price of the products and the industrialised food processes respectively.

Even though the reduction of the packaging consumption is a matter of concern to organic consumers the product itself is more important. The quality, health, sake of the local producer and preservation of the environment that the organic product offers are more important factors for the organic consumer than the damage that the packaging can produce to the environment. It is the shopping habits what makes organic consumers reduce more, but it is not the main goal for them. In conclusion, the product is much more important for them than the damage the package can do to the environment.

Quality, brand, price and not other choice are the issues for what conventional consumers worry more about.

Statistical Analysis show not significant difference between the reducing and reusing rate, the gender and reducing rate and the gender and reusing rate of both conventional and organic consumers.

Finally, if we take a look at the existing gap between the knowledge and attitude of the different packaging materials, this gap is in general smaller for organic consumer

than for conventional consumers. Organic consumers are more diligent, what they know they do.

### **4.3 Sweden vs. Spain**

The Swedish and Spanish conventional/organic food market is quite different. The proportion of organic consumers is much bigger in Sweden than in Spain. The data obtained show that more than half of the Swedish consumers interviewed are organic (53%), while the proportion of organic consumers in Spain just accounts for 11% of the consumers interviewed.

The environment is the main reason for the organic food consumption in Sweden, followed by health issues. However, for the Spanish consumer the environment is not that important, and is the preservation of the human health what really concerns them.

Finally, there are also some differences in the reasons for not buying them. While Swedish consumers do not do it in principle for a matter of price, the Spanish one, a part from price matters, the availability and food habits is what stops them for not buying them.

In conclusion, the proportion of organic consumers is higher in Sweden as the awareness for environmental reasons is bigger.

### **How much do conventional food consumers know about the packaging food disposal?**

The recycling knowledge that both countries have is high and quite similar for both types of consumers. However, is still a bit higher in Sweden than in Spain. The recycling possibilities of glass, paper and board packaging materials are well known by both Swedish and Spanish consumers. In particular, metal is a special packaging material as in general the recycling possibilities of it are better known in Sweden than in Spain.

In general the plastic, beverage carton and metal recycling possibilities are better known in Sweden. Some of the possible explanations of it could be the later introduction of these packaging recycling possibilities and the mix of these three fractions in the same container in Spain. The fact that in Spain there is not a container for each type of packaging material results in a confusion among the consumers.

The knowledge about the definition and disposal possibilities of the biodegradable plastic packaging is still very unclear in both countries. It is common for both countries that more proportion of organic food consumers have ever heard about it, being the Spanish organic food consumer the one that have heard more about it.

The more information spread by the Swedish government or the recycling companies through book leaflet, informative session or through media makes Swedish consumers to have a clearer recycling knowledge. The more limited and unclear information spread by the Spanish government, make the Spanish consumer a consumer who do its own research in order to acquire its own recycling knowledge. It is easier for the Swedish consumer to have a good knowledge than for the Spanish one due to the more quantity of information.

In general, conventional consumers pay more attention and trust more the information provided by the government or recycling companies than organic consumers. This fact together with the limited and unclear Spanish information makes

the Spanish organic consumer to have a lower knowledge in some types of packaging materials than conventional.

### **How do they behave when disposing the food packaging?**

The recycling rate of Swedish consumers is higher than the Spanish one and the gap differences in attitude also depends on the packaging material. For glass, paper and board packaging the recycling rate is a bit lower but similar. However, there are differences with the plastic, beverage carton and metal recycling rates, which are higher for Swedish consumers. Coming back to the same issue, the most possible reasons for that difference is the confusion of Spanish consumers due to the mix of these fractions in the same containers, as well as the later introduction of these recycling possibilities.

Environmental issues are the reason why most consumers recycle in both countries. A part from this reason, the Swedish conventional consumer also recycles for economical reasons and for all the information given to them. Just doing it for environmental reasons does not mean that the Spanish consumer is more aware with these issues, as sorting the trash is nearly the only activity done to live in a better environment by them.

Both Swedish and Spanish organic consumers agree that recycling is one of the greener solutions in the packaging world in where we live today. However, both of them would prefer a world with less packaging (even a world with zero waste) and suggest more reusing systems in where the packaging can be return to the process.

Regarding the reusing rate, Swedish consumers reuse more than Spanish, as they find more second applications to the used packaging and also because of the most environmental friendly thoughts of Swedish consumers. The environmental education started before in Sweden than in Spain. The Swedish consumer is more aware about the problems affecting the earth and is for that they try to do it better. They have a more environmental friendly way of living.

It is interesting to notice that the most reused packaging material in Sweden is plastic and the second one, and far for the reusing rate of plastic, is glass packaging. In Spain the most reused one is glass followed by plastic. Both countries think that plastic packaging is the most harmful packaging material for the environment. However, Swedish consumers reuse more plastic than Spanish consumers, while Spanish reuse more glass. This fact can show the more environmental concern of the Swedish consumers, who know about the damage that plastic packaging does to the environment and so they try to reused it as many times as possible before throwing it away. On the other hand, when Spanish consumers reuse packaging, they mostly think about the preservation of the food product that they would put in the reused packaging. As they know about the harmfulness of plastic packaging, they prefer to throw it away better than putting it in contact with food.

Regarding the reducing rate, Swedish consumers reduce more. The conventional and organic Swedish consumers reducing rate do not differ, while the Spanish organic consumer reduces mores than the conventional one. There is not a significant difference between the reducing rate of the conventional and organic Swedish consumer because the places of shopping are the same and the organic food sold in supermarkets is packaged food. In that sense, is difficult to fulfil the reducing mission. However, the reducing patterns do vary in the Spanish market, as the majority gets their organic products through cooperatives, which let them reduce their packaging consumption.

The reasons for not reducing and do it so if possible are the same for both countries.

Finally, the existing gap between the recycling knowledge and attitude is generally speaking, smaller for both organic consumers, which demonstrates that the organic consumer acts better and what is known for them, it is practised. Even though the conventional consumer’s knowledge is similar to the organic one, there is a lower recycling, reusing and reducing rate.

## 5. Problem, Causes and Alternative Solution

In this chapter the reader will be introduced to the problem and causes of a low recycling rate. An alternative solution to improve the recycling rate will also be presented to the reader.

### 5.1 Problems and Causes

The comparison in the 3Rs field between Sweden and Spain has demonstrated that Spanish consumers do a worse 3Rs practise than Swedish consumers. The Reducing, Reusing and Recycling rates are in general lower in Spain.

The problem, the causes and the alternative solution will be just concentrated in the improvements concerning the recycling rate. Improvements concerning the Reducing and Reusing rate will not be taken into consideration.

As Spain is the country that needs more and better improvements, the problems, causes and alternative solution would be concentrated in the Spanish framework.

In Spain, there have been identified 5 different problems and causes to these problems. After an in depth analysis of the problems and causes, the alternative solution will be shape in order to make the better improvements is the recycling field.

PROBLEM	CAUSE
<b><u>Confusion</u></b> – The Spanish consumer, both conventional and organic, find confusing the fractions to be thrown away in each of the containers.	The confusion is due to the lack of packaging material knowledge or due to the mix of materials in a single packaging. The lack of information generates this problem.
<b><u>Lack of awareness</u></b> – It exist a lack of awareness of what is really going on with the Earth and the environment.	The lack of information and environmental education are the main causes to this problem.
<b><u>Lack of credibility</u></b> – It exist a lack of credibility of the recycling systems. Many consumers do not really believe in what is done with the generated packaging waste	The lack of information about what is done to the generated waste and the way of doing it is what causes this problem.
<b><u>Lack of civil conscience</u></b> – Many Spanish consumers do not have a civil environmental conscience and do not care for example of throwing garbage on the floor.	Bad environmental education system
<b><u>Laziness</u></b> – Many consumers feel lazy to do the sorting as well as to take the sorted fractions to each of the containers, as some of the containers are not close to households.	Lack of space to put different bins at home and bad infrastructure are the main causes to this problem.

Table 5: Problems and Causes

These are the main problems found related to the lack of recycling. Looking them as a whole and contrasting them with the data obtained for the Spanish consumers knowledge and attitude, the main problem identified is the first one: Confusion. Data has demonstrate that the Spanish consumer do not do it that bad. However, the

consumer asks for an ease in the recycling task. Consumer want to be able to identified the packaging material in a better way and also get some feedback of what they do. That is, get information about what is really done with the sorted packaging as well as information about it.

Laziness seems another problem. However, the fact that the recycling rates of glass and paper/board packaging are higher than the recycling rates of the fractions to be thrown away in the yellow container, demonstrates that although glass and paper/board containers are not as close as the yellow one, consumers do separate these fractions and do not feel lazy to do that.

In conclusion, an alternative solution to decrease the consumer’s confusion will be developed.

## **5.2 Alternative Solution**




The alternative solution is focus on the fact of making easier the recycling activities to consumers, as they are the ones in charge of the activity.

### **New Packaging-Recycling System**

Spain has a colour code recycling system, in which the fractions must be thrown away in colour containers. A mix of packaging materials must be thrown away in the same yellow container. This packaging material mix confuses consumers and they do not really know where to throw the fractions away.

In order to decrease the consumer’s material confusion, a colour dot printed on the packaging food material could be used. In that sense, consumers will not have to worry about some of these questions: Which kind of material is this packaging? If the packaging is made out of several fractions, where should I throw it away?

A colour dot will be printed on the packaging as follows:

- Green dot for the packaging going to the green container – Glass packaging 
- Blue dot for the packaging going to the blue container – Paper and board packaging 
- Yellow dot for the packaging going to the yellow container – Plastic, metal and tetrabrik container 

The colour dot could substitute the current logo system.

The new colour dots system will represent a number of changes:

- Develop legislation for the implementation of this system to ensure that all food packaged carries the colour dots. Companies should print on their products the correspondent colour dot.
- Information to consumers about the easier way of identifying the type of packaging material to be disposed of. Taking ideas from the Swedish recycling market, a book leaflet for all types of consumers could be



developed and sent to households every year in order to inform consumers. This book will describe:

- I. The current environmental situation of our earth
- II. The packaging materials that can be sorted out, describing the colour container-packaging code
- III. What happen with the packaging material separated fraction
- IV. Finally, the benefits of recycling

In that way, and taking as an example the Sweden situation, the Spanish consumer would be more aware of the environmental problems and would be keener on practising the recycling activities, which would be an easier task with the colour code system.

Finally, not just Spain could improve its recycling activities by copying the fact that Swedish consumers received a lot of information, but also Sweden could copy from Spain some issues to try to improve its situation. Swedish consumers are also a bit confused when it comes to decide which container is suitable for the fraction to be thrown away. In that sense, the colour code container system that Spain possessed could be implemented in Sweden in order to make the sorting activity easier for the Swedish consumer. This colour code system would end with the reading and packaging material identification activities and would start with a simple identification of colours.

## 6. Conclusion and Recommendations

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*The conclusion and recommendation will be presented to the reader in this chapter.*

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### 6.1 Conclusion

In the Swedish framework, the knowledge and attitude that conventional and organic consumer have about the food packaging disposal are a bit higher but do not differ that much. **And it could be said that there is not a significance difference of what conventional consumers know and do compare to what organic consumers know and do.**

The recycling, reusing and reducing rates are closed, being a bit higher for organic consumers. However, the small attitude difference is not significant. It can just be said that organic consumers recycle more metal packaging than conventional do.

The more active research of information done by organic consumers could be the reason for the small difference in the consumer's knowledge. The organic consumer is keener on looking for the information itself, while the conventional consumer is content with the information that comes directly without a need of doing its own research.

The more environmental concern and the better comply with what to do are the reasons for these small differences.

In the Spanish framework, there are more differences between the knowledge and attitude of conventional and organic consumers. It is common for both consumers the existing confusion between the fractions to be sorted out in Spain, as there is little existing information.

The lack of information spread in Spain together with the distrust of organic consumers to the information given by the government, make organic consumers a bit worse in the knowledge and attitude of the recycling rate and possibilities.

The reducing rate is the same. However, the much more aware about the environmental problems plus the shopping habits make organic consumers reduce more packaging.

When comparing Sweden and Spain, Swedish consumers are better prepared and taught for these activities than Spanish consumers.

The recycling possibilities knowledge depends on the packaging material. There are bigger or smaller differences for one fraction to another, but, in general, the knowledge that Sweden has is higher than the Spanish one. There is much more information about the ways of doing it in Sweden than in Spain.

The reducing, reusing and recycling rates are higher for Sweden too. Swedish consumers are much more environmental friendly. There is an environmental concern, awareness of earth problems and sense of respect for nature and cities, which Spain does not have, or is starting to appear in the current days.

A special mention has to be done to biodegradable plastic packaging. It is a packaging material not very well known for both countries. Not just the definition of it, but also the ways of disposing it.

Finally, it is important to try to improve the habits of both conventional and organic consumers in Spain and also make small improvements in Sweden. The Spanish knowledge and attitude of consumers could be improved by copying good existing models of other countries that do it well, such as Sweden, and implementing them in the Spanish society.

## **6.2 Recommendations**

The recommendations for future research are to try to investigate if it is possible to implement the proposed packaging-sorting solution in Spain, and to try to find the ways of doing it. The change would just have to be done on the packaging itself and not on the recycling systems. Packaging producers, companies working with packaging, recycling companies and all the actors involved would have to be contact in order to try to implement the new system. If it does not result in a new possible system, I also suggest trying to find other ways to improve the Reducing, Reusing and Recycling rate of Spain, in order to leverage them into a higher level.

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## APPENDIX 1 “Questions and results obtained from the Supermarkets Interviews”

### Swedish Questionnaire

#### QUESTIONNAIRE

1. Do you normally buy organic food? (20% of the Food Products bought)

Yes	
No	

2. Why do or Why don't you buy it?

--

#### PERCEPTION

1. Which is the packaging material which you think is less and most harmful for the environment?

Glass	
Metal	
Paper & Board	
Plastic	
Hard Plastic	
Beverage Carton	
Biodegradable	

2. Which of the following materials are possible to recycle in your country?

Glass	
Metal	
Paper & Board	
Plastic	
Hard Plastic	
Beverage Carton	
Biodegradable	

#### ATTITUDE

1. Which of the following packaging materials do you recycle?

Glass	
Metal	
Paper & Board	
Plastic	

Hard Plastic	
Beverage Carton	
Biodegradable	

3. When do you think about the disposal of the packaging?

At the retail store, when buying the product	
At home	
Never	

4. Do you reuse food packaging?

Yes	
No	

5. What sort of packaging do you reuse?

6. Which is the application that you give to the reuse package?

7. Do you try to buy less packaged products in order to reduce the package consumption?

Yes	
No	

BIODEGRADABLE PLASTIC PACKAGING

1. Have you ever heard about Biodegradable plastic packaging? (or in swedish "Biologiskt nedbrytbar plast")

Yes	
No	

GAME

- Logos (What do the following logos represents?)

1)



2)



3)



4)



5)



6)



7)



8)



### YOUR PROFILE

<b>Gender</b>	
<b>Age</b>	
<b>Profession</b>	

### Spanish Questionnaire

### CUESTIONARIO

1. ¿Compra normalmente comida ecológica? (Aproximadamente 20% de sus alimentos)

Sí	
No	

2. ¿Por qué si o por qué no?



## PERCEPCIÓN

1. ¿Cuál de los siguientes materiales de envoltorios cree usted que es el más y el menos dañino hacia el medio ambiente?

Vidrio	
Metal	
Papel & Cartón	
Plástico	
Brick	
Biodegradable	

2. ¿Cuál de los siguientes materiales de envase es posible separar para el posterior reciclaje en su país? (España)

Vidrio	
Metal	
Papel & Cartón	
Plástico	
Brick	
Biodegradable	

## ACTITUD

1. ¿Cuál de los siguientes materiales de envase separa usted en casa?

Vidrio	
Metal	
Papel & Cartón	
Plástico	
Brick	
Biodegradable	

3. ¿Cuándo piensa en que contenedor tirar el envase, en el supermercado cuando está haciendo la compra (por ejemplo, mira el envase en busca de etiquetas) o en casa?

En el supermercado	
En casa	
Nunca	

4. ¿Reusa los envases de alimentos para darle otra aplicación?

Sí	
No	

A veces	
---------	--

5. ¿Qué tipo de envase reusa?

6. ¿Cuál es la aplicación que le da a ese envase reusado?

7. ¿Intenta usted comprar alimentos con menor cantidad de envoltorio para así reducir el consumo de envases?

Sí	
No	
Si, si es posible	

### ENVASES DE PLÁSTICO BIODEGRADABLE

1. ¿Había oído hablar antes de los envases de plástico biodegradable?

Sí	
No	

### JUEGO

- Logos: ¿Qué representan los siguientes logos? Si no lo sabe, ponerlo.

1)



2)



3)



4)



5)



6)





7)

8)



### SU PERFIL

<b>Sexo</b>	
<b>Edad</b>	
<b>Profesión</b>	
<b>Ciudad</b>	

### Swedish Conventional Consumer

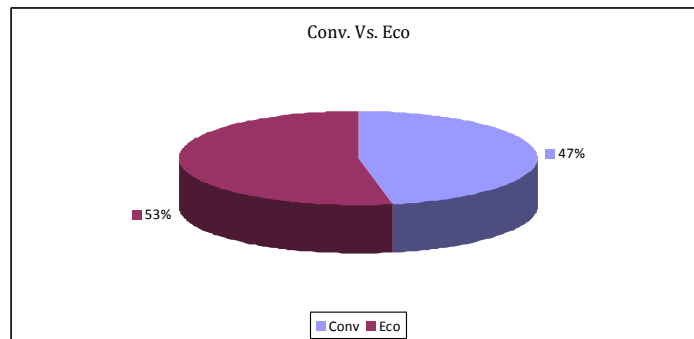


Figure 1. Proportion of Conventional and Organic Food Consumers in Lund's market

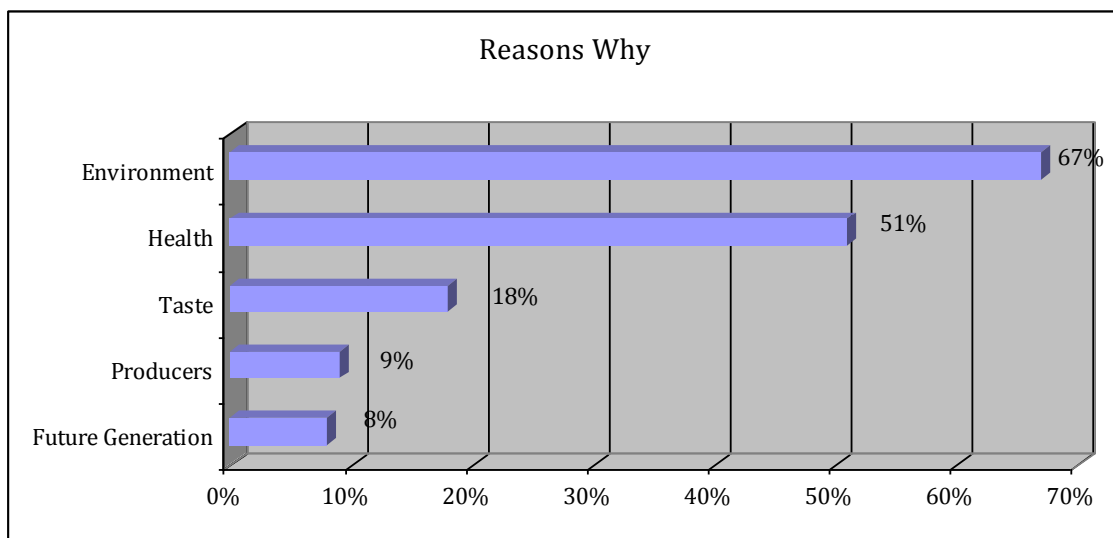


Figure 2 and 3 show which are the main reasons why consumers do or do not buy organic food.

Figure 2. Reasons why consumers buy organic food

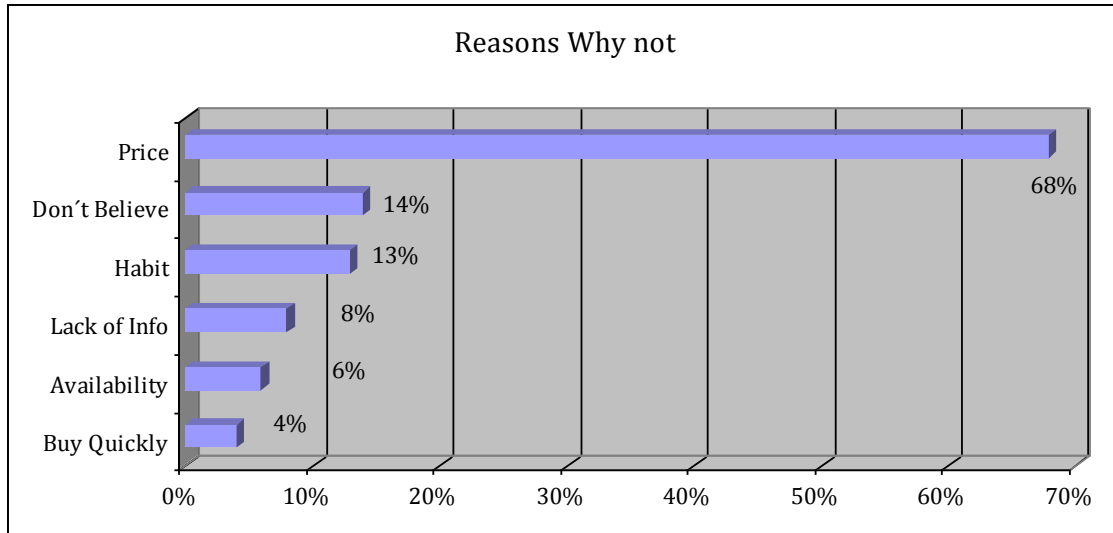


Figure 3. Reasons why consumers do not buy organic food

### *Conventional Consumers interviewed*

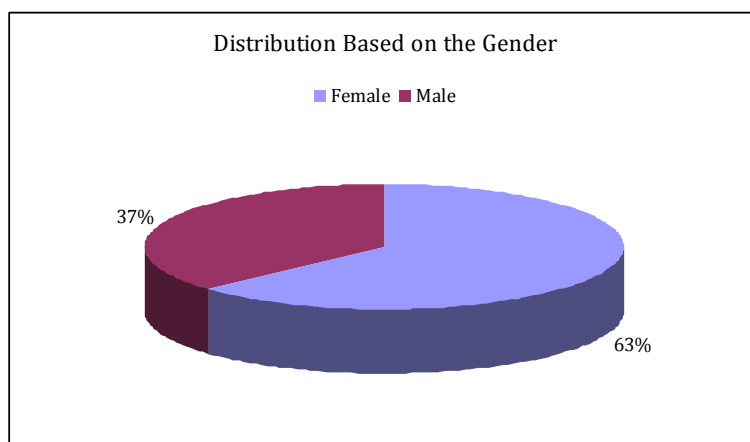


Figure 4. Distribution of conventional consumers interviewed based on gender

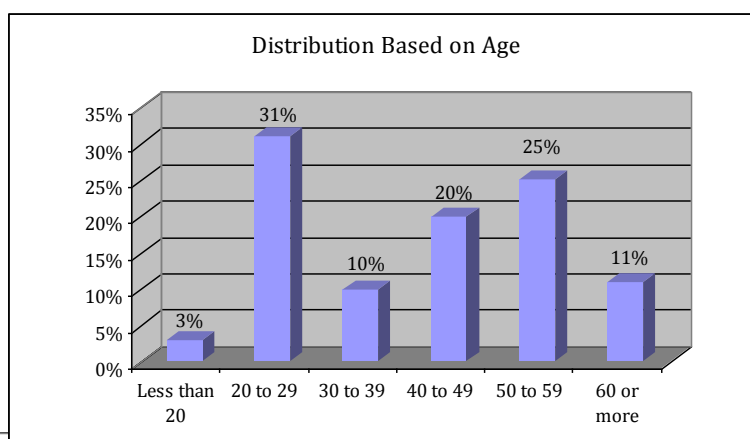


Figure 5. Distribution of conventional consumers interviewed based on age

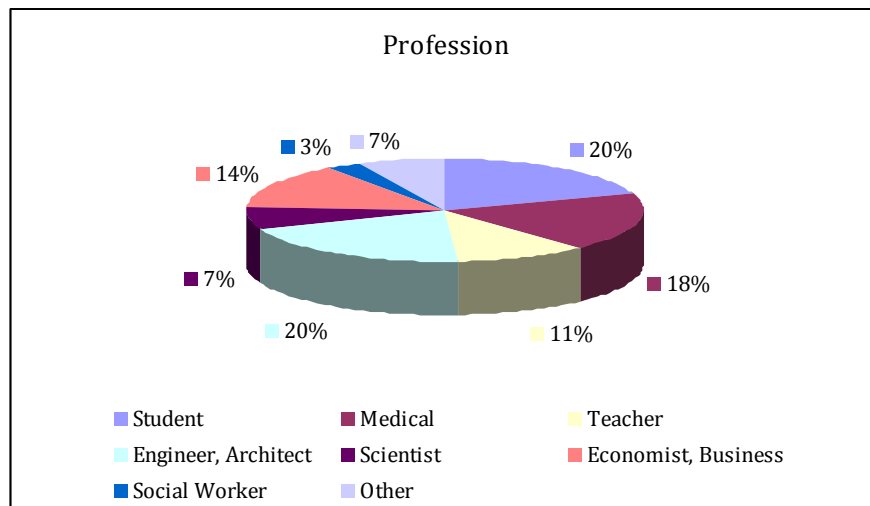
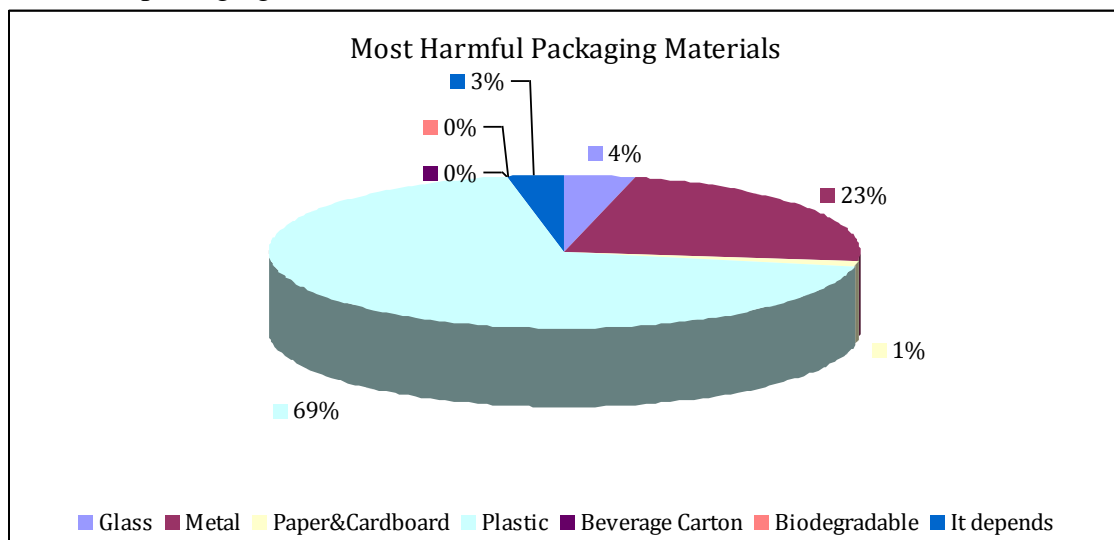


Figure 6. Distribution of conventional consumers based on profession

### Knowledge

❖ Which packaging material is the most harmful for the environment?



❖ Which packaging material is the least harmful for the environment?

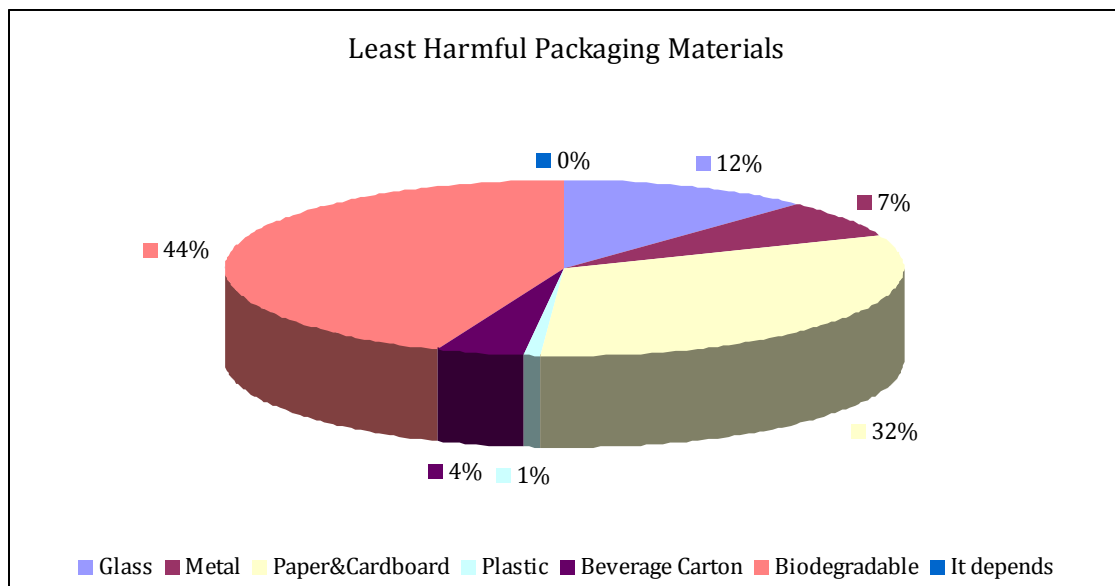


Figure 8. Least Harmful Packaging Materials

❖ Which packaging materials are possible to recycle in Sweden?

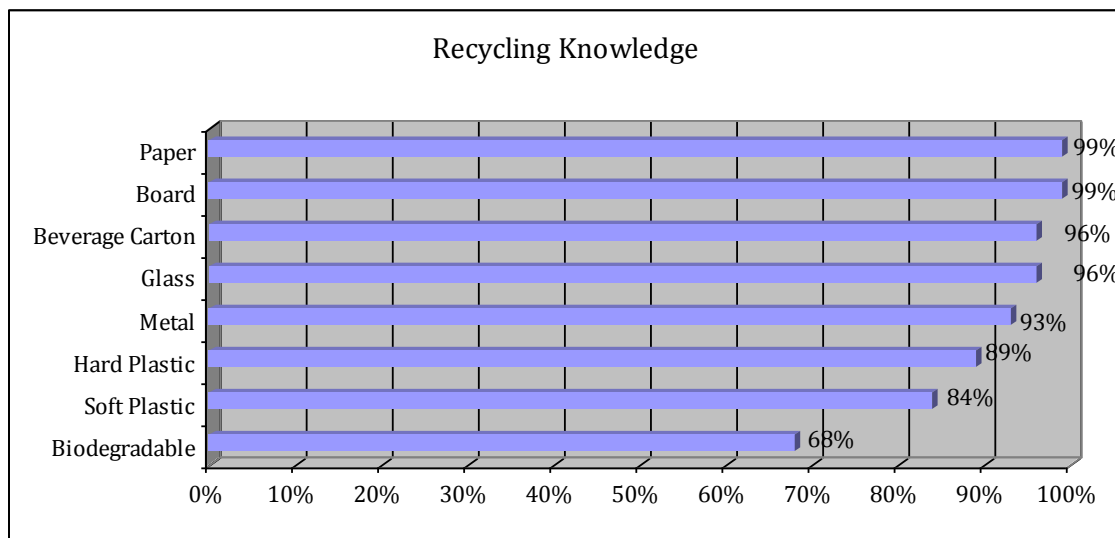


Figure 9. Recycling Knowledge

❖ Have you ever heard about Biodegradable Plastic Packaging?

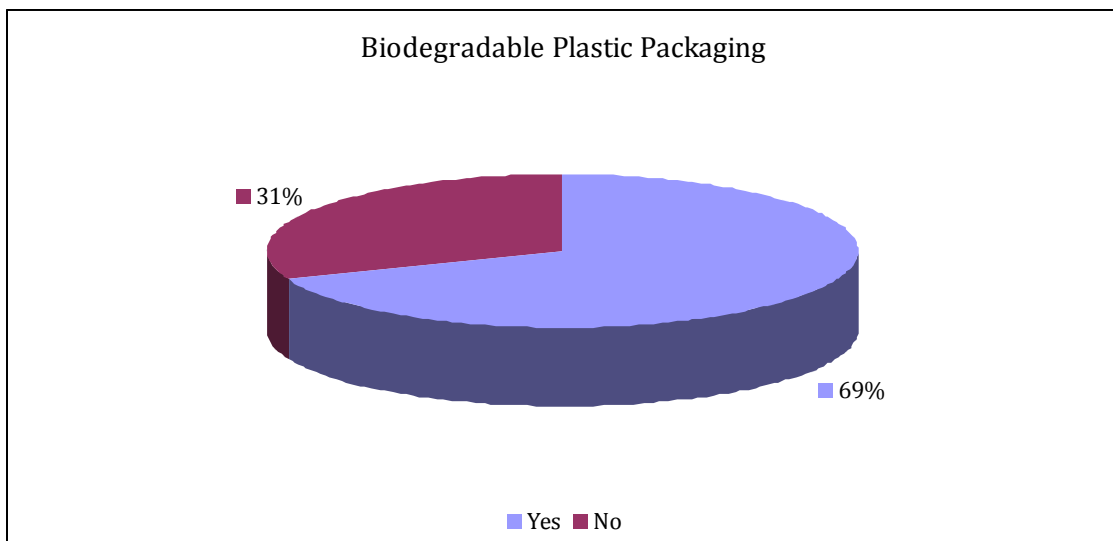


Figure 10. Biodegradable Plastic Knowledge

**Attitude**

❖ Recycle – Which packaging materials do you separate at home?

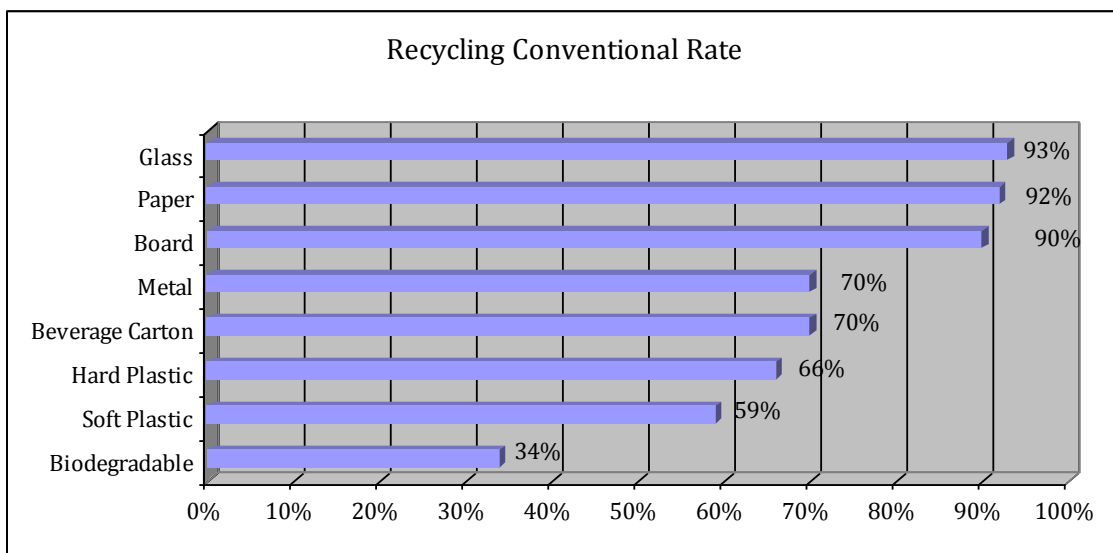


Figure 11. Recycling Attitude per packaging material

❖ Reuse – Do you reuse food packaging to give it another application?

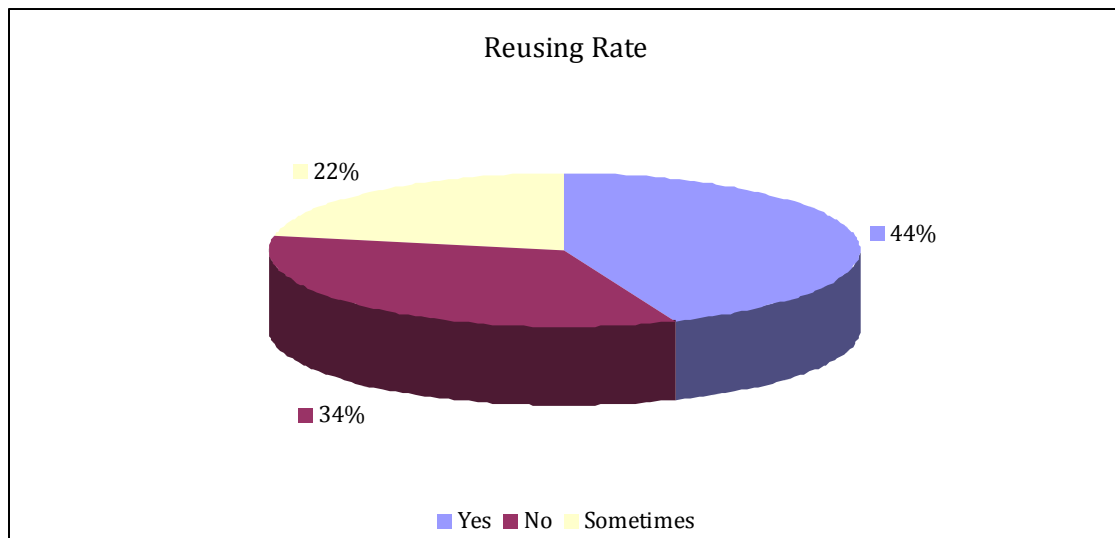


Figure 12. Reusing Rate

❖ Reuse – What sort of packaging material do you reuse?

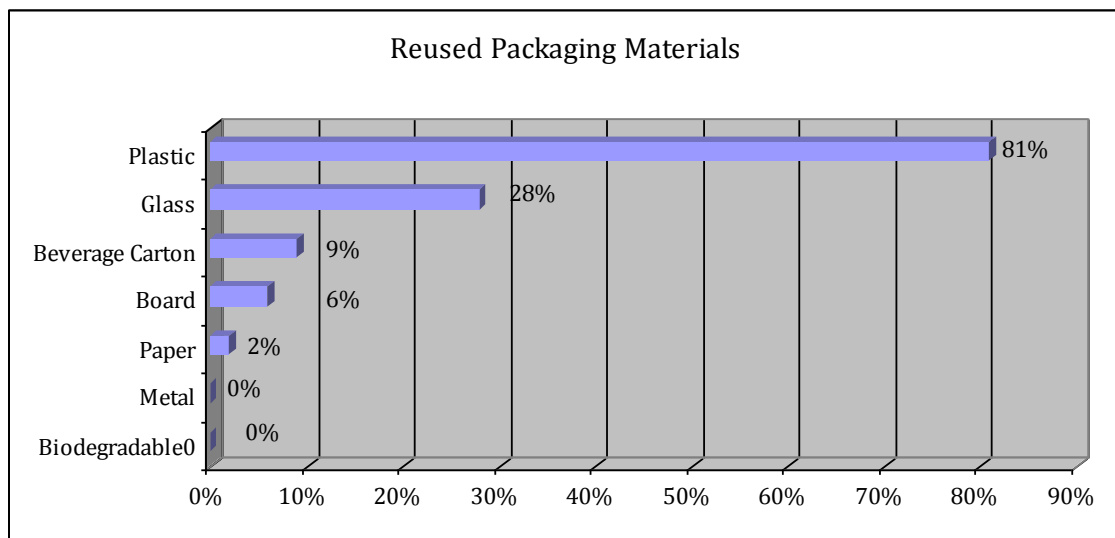


Figure 13. Reused Packaging Materials



- ❖ Reduce – Do you try to buy less packaged products in order to reduce the packaged consumption?

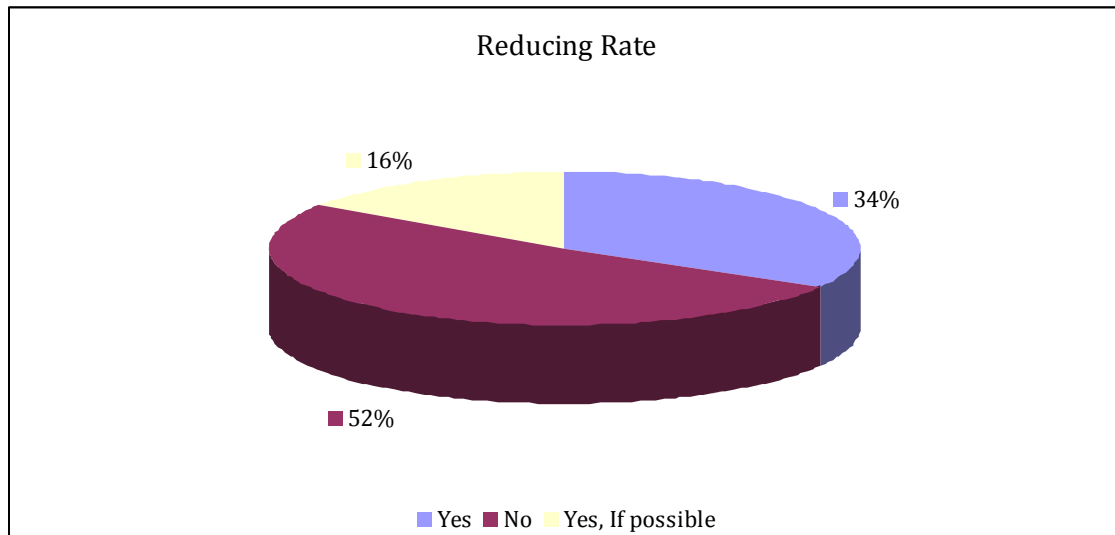


Figure 14. Reducing Rate

### Swedish Organic Consumer

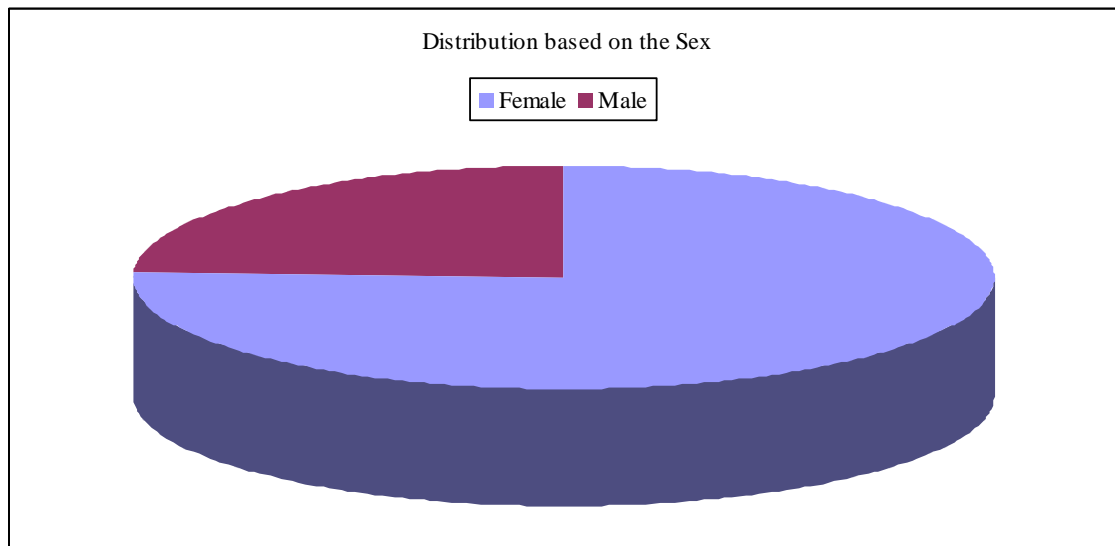


Figure 4. Distribution of conventional consumers interviewed based on gender

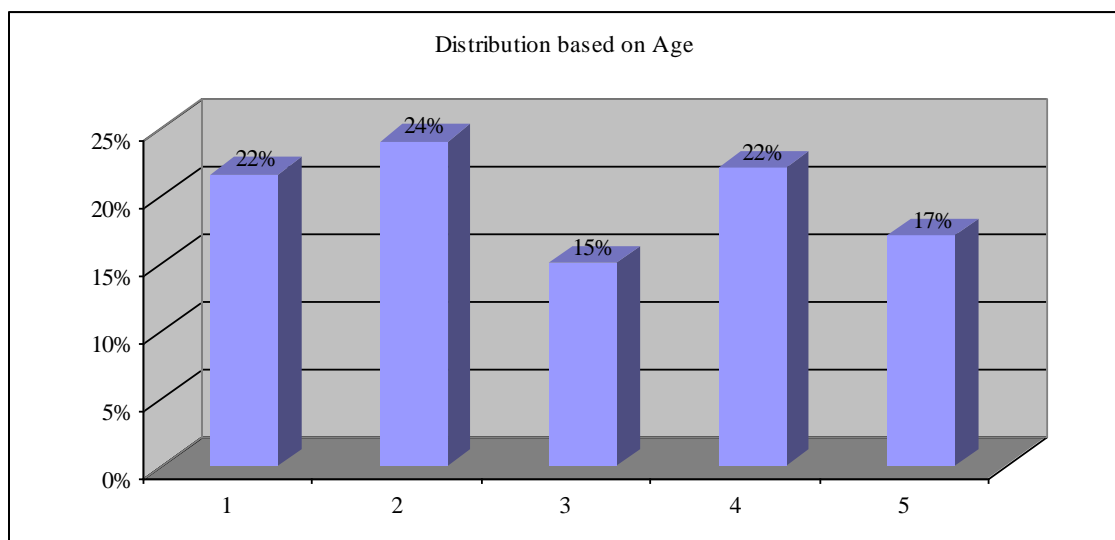


Figure 5. Distribution of conventional consumers interviewed based on age

Figure 6. Distribution of conventional consumers based on profession

### Knowledge

- ❖ Which packaging material is the most harmful for the environment?

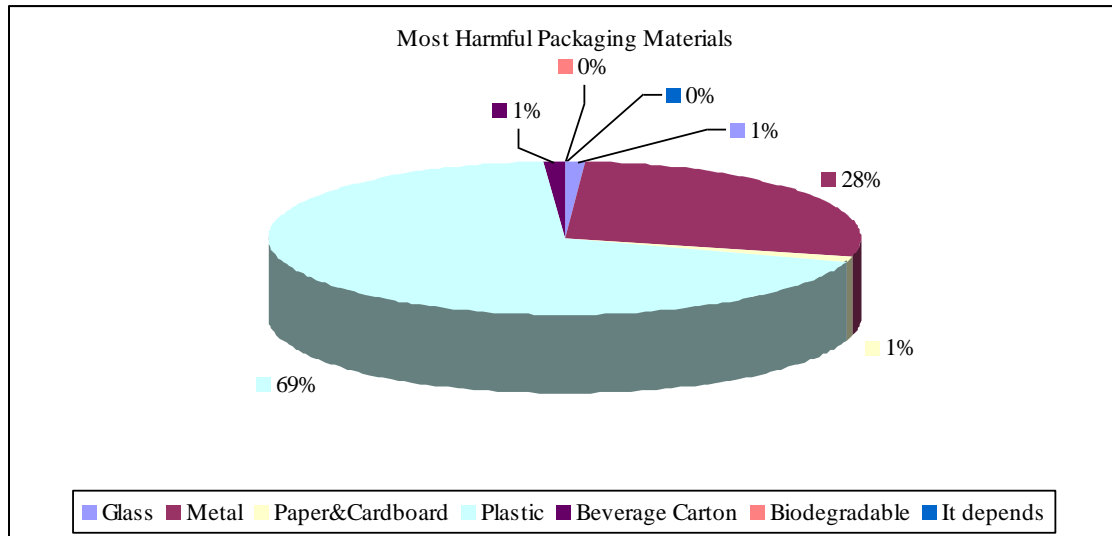


Figure 7. Most Harmful Packaging Material

- ❖ Which packaging material is the least harmful for the environment?

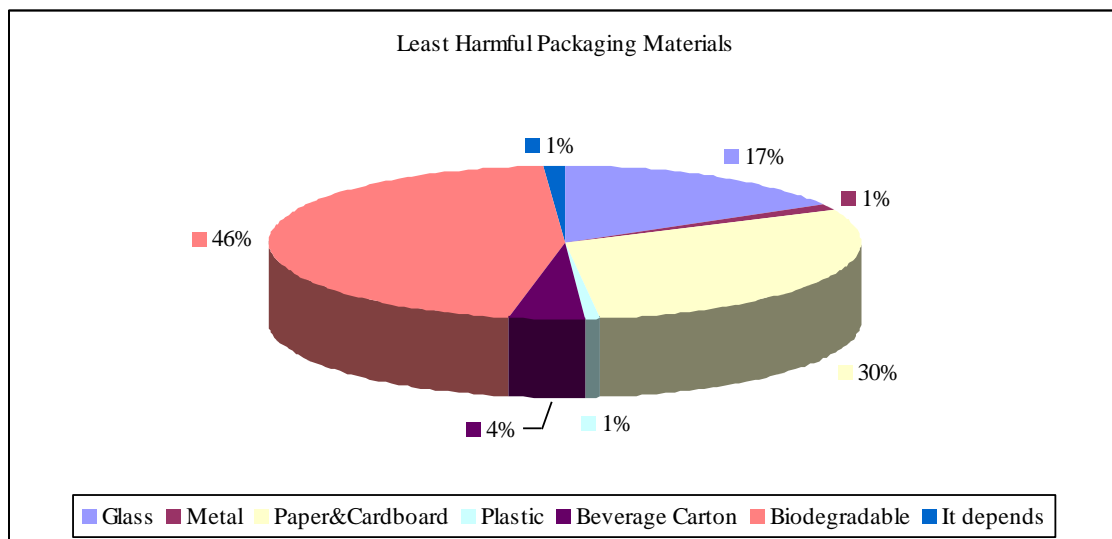


Figure 8. Least Harmful Packaging Materials

❖ Which packaging materials are possible to recycle in Spain?

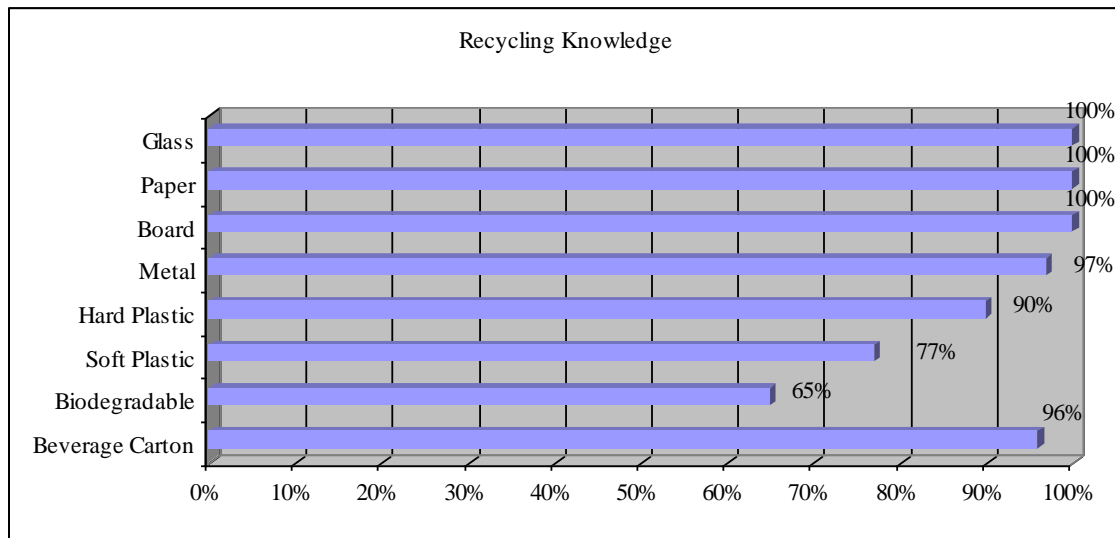


Figure 9. Recycling Knowledge

❖ Have you ever heard about Biodegradable Plastic Packaging?

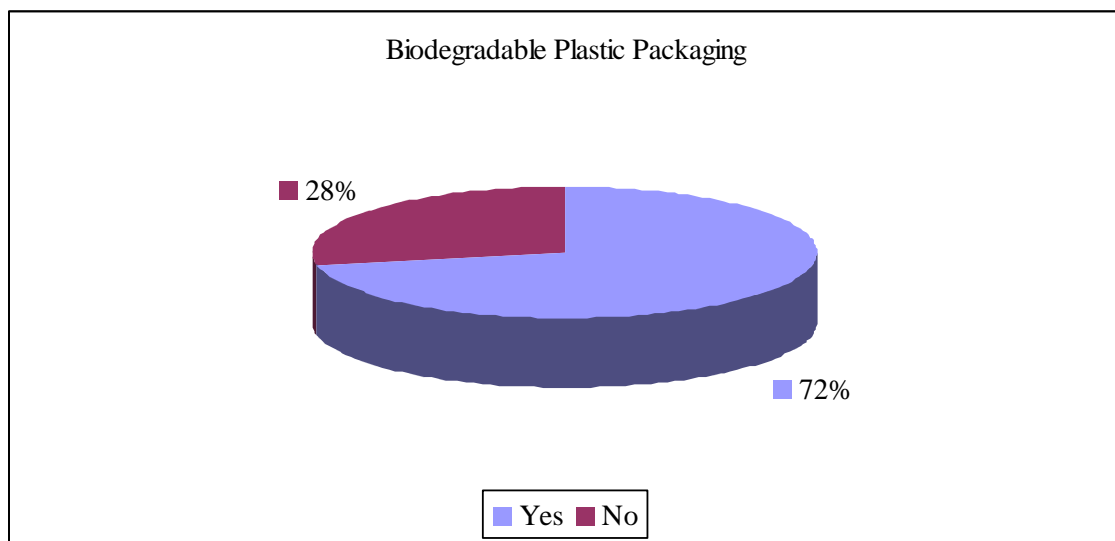


Figure 10. Biodegradable Plastic Knowledge

**Attitude**

❖ **Recycle – Which packaging materials do you separate at home?**

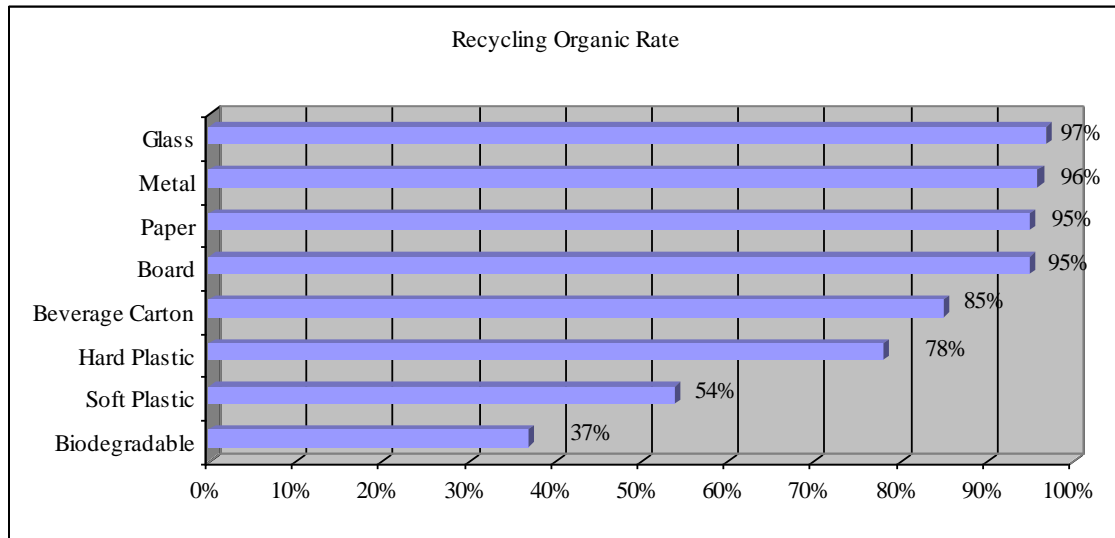


Figure 11. Recycling Attitude per packaging material

❖ **Reuse – Do you reuse food packaging to give it another application?**

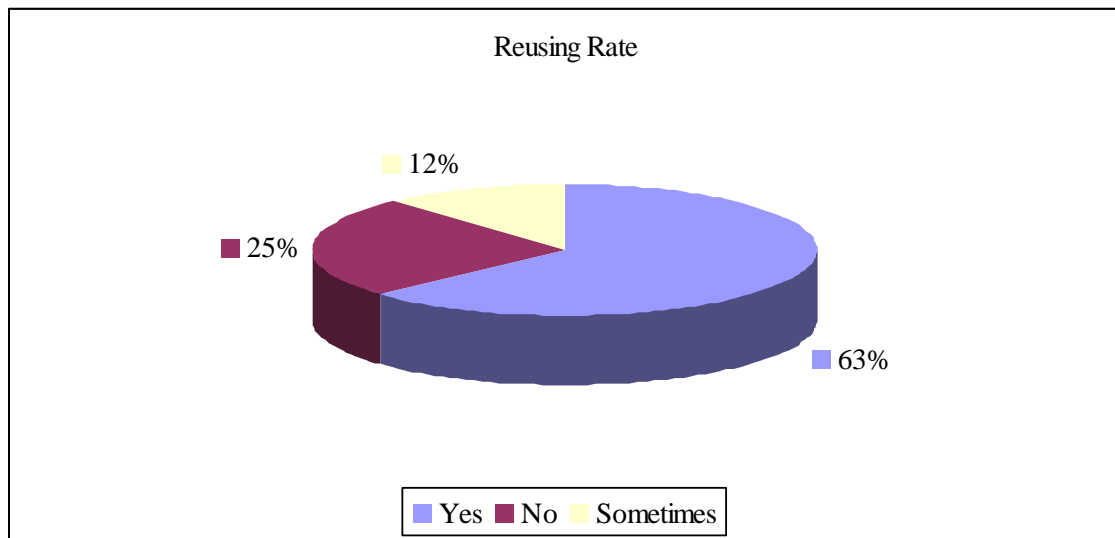


Figure 12. Reusing Rate

❖ Reuse – What sort of packaging material do you reuse?

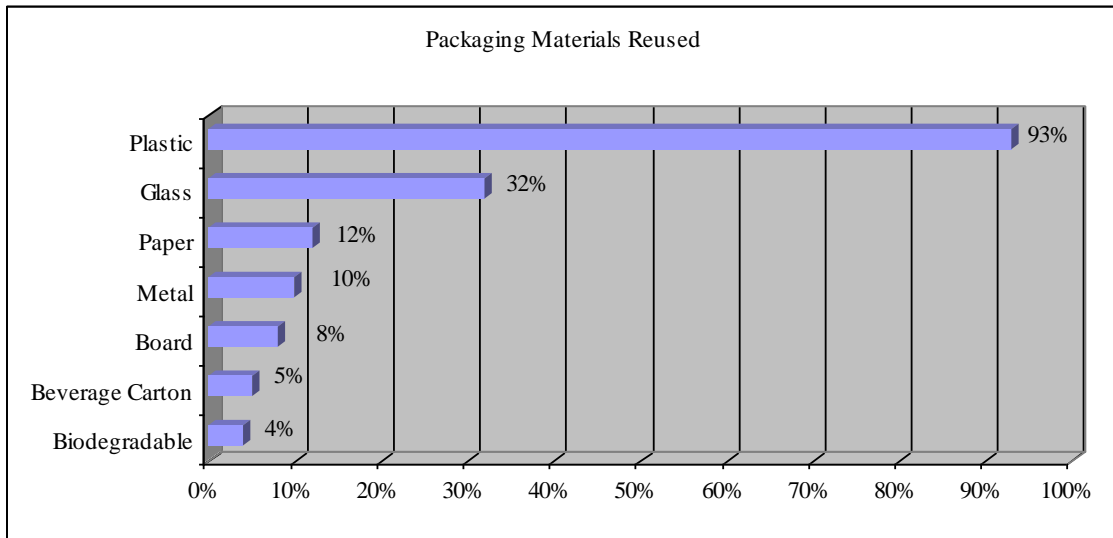


Figure 13. Reused Packaging Materials

❖ Reduce – Do you try to buy less packaged products in order to reduce the packaged consumption?

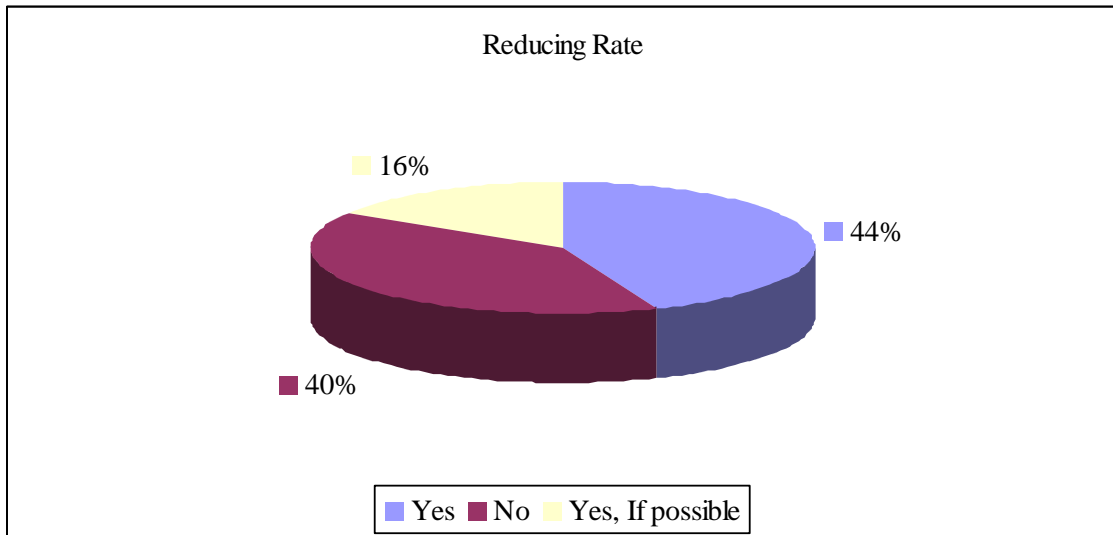


Figure 14. Reducing Rate

## Spanish Conventional Consumer

### 2.1. Spain

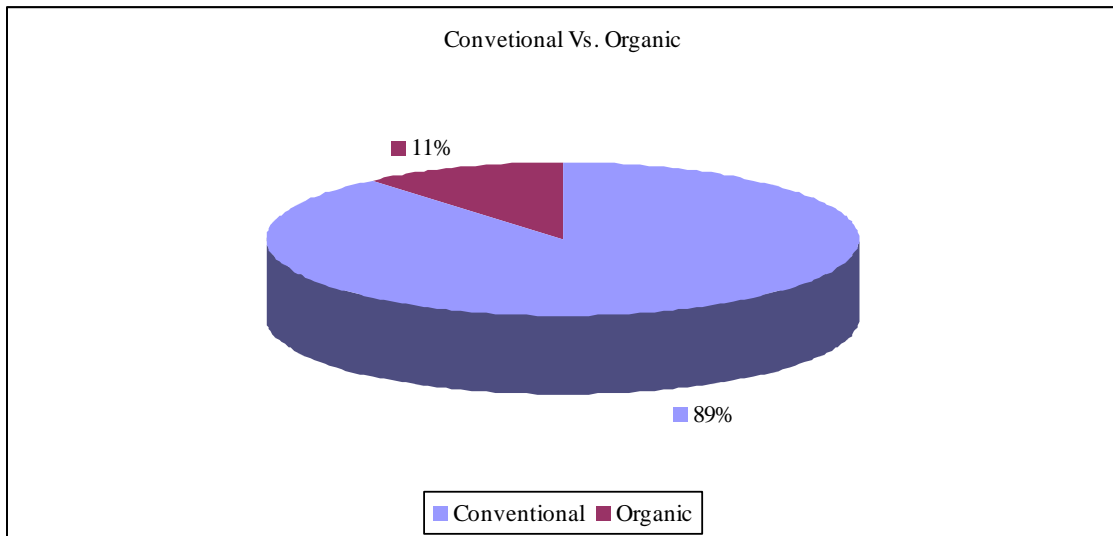


Figure 1. Proportion of Conventional and Organic Food Consumers in Madrid's market

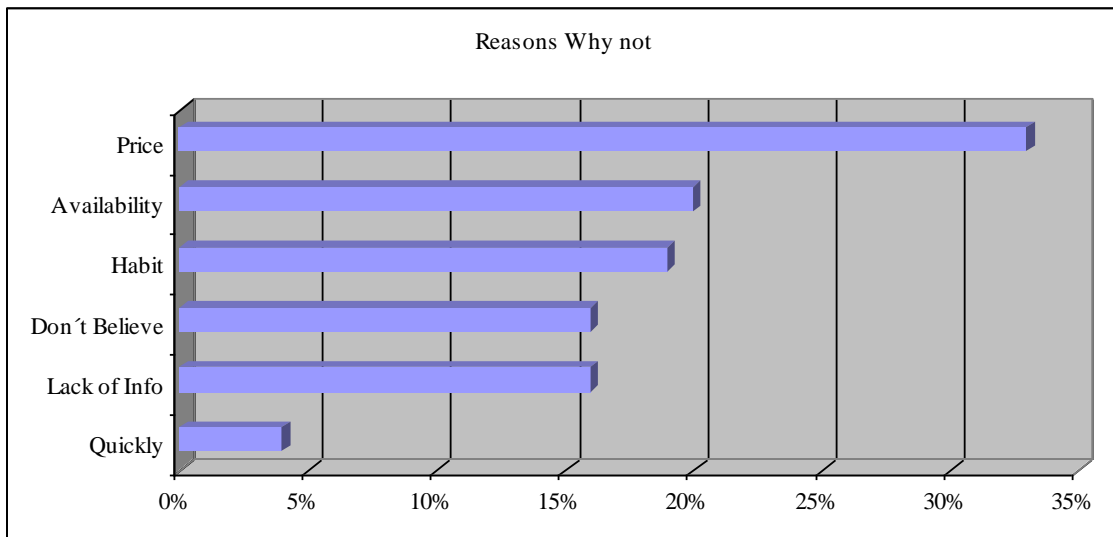


Figure 2. Reasons why consumers buy organic food

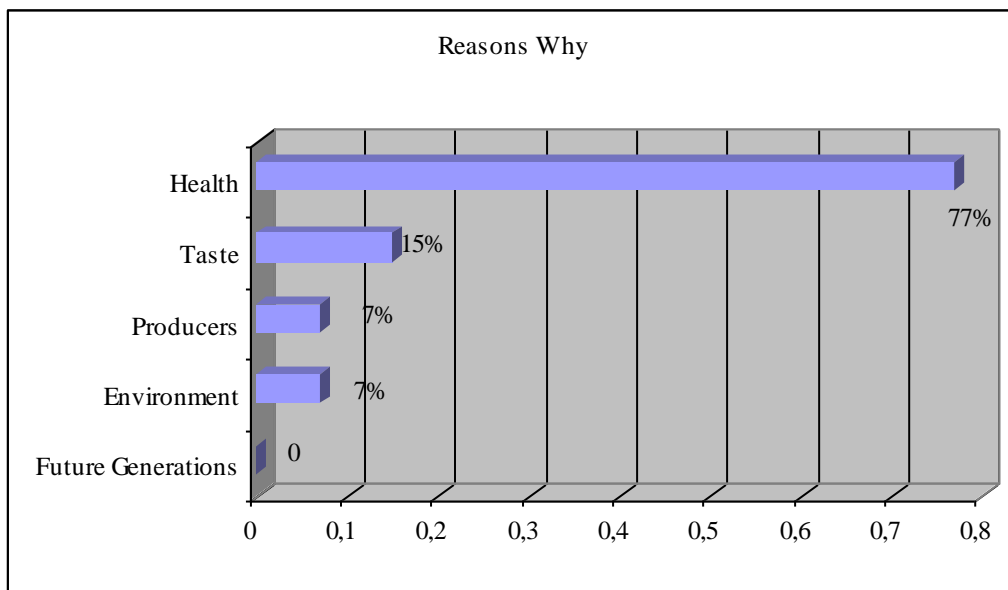


Figure 3. Reasons why consumers do not buy organic food

***Conventional Consumers interviewed***

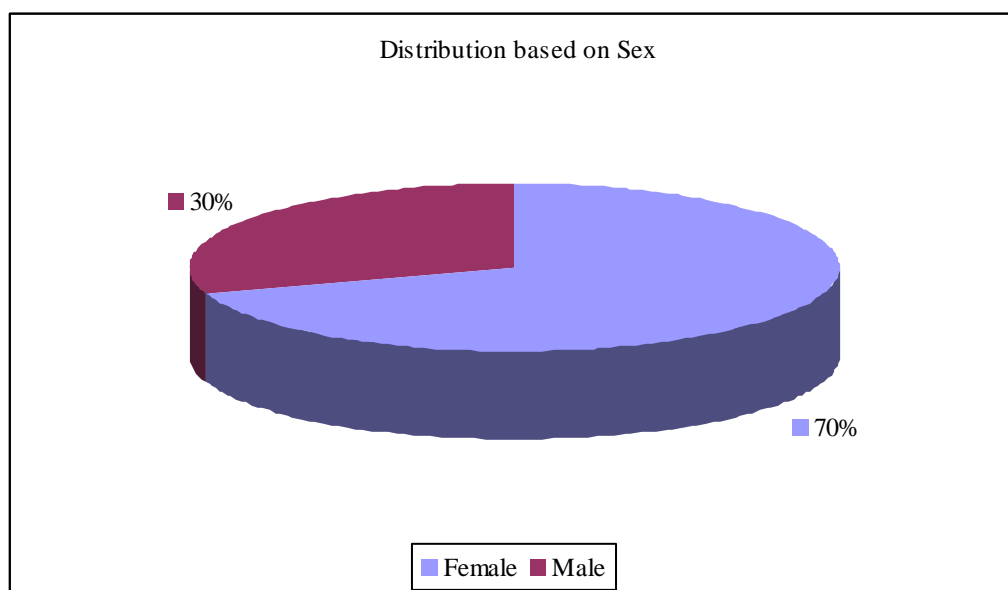


Figure 4. Distribution of conventional consumers interviewed based on gender



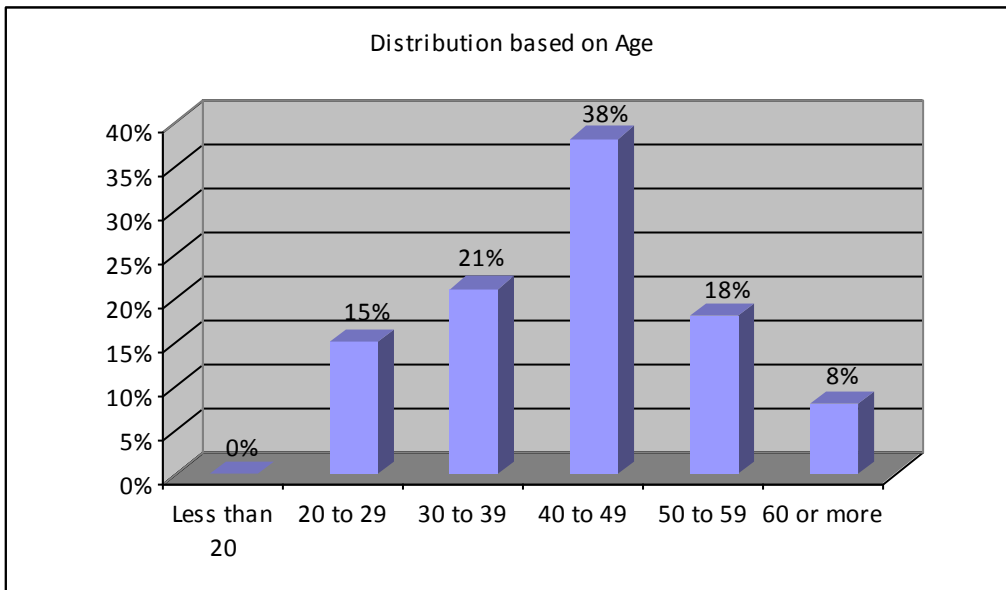


Figure 5. Distribution of conventional consumers interviewed based on age

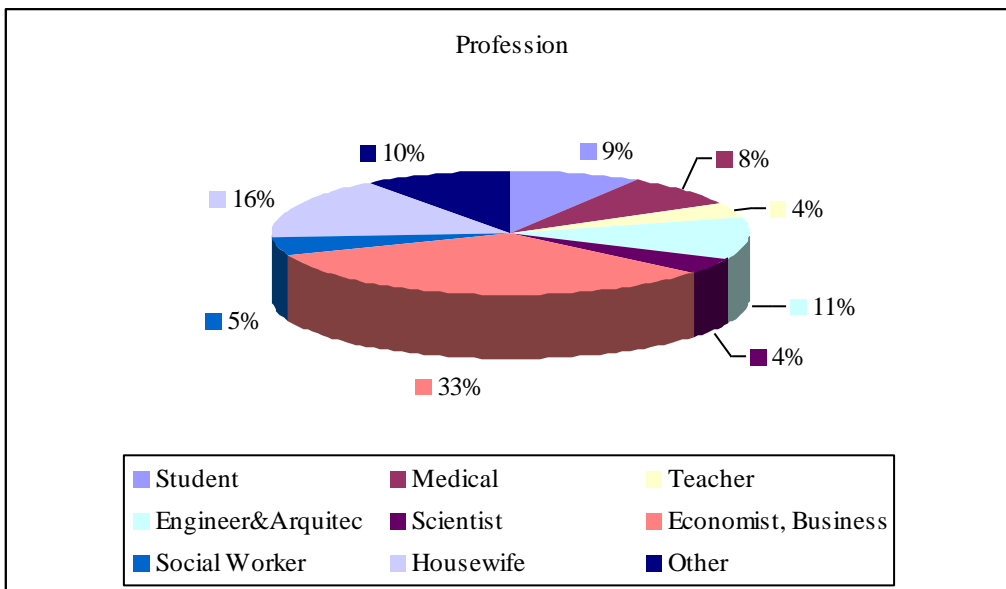


Figure 6. Distribution of conventional consumers based on profession

### Knowledge

❖ Which packaging material is the most harmful for the environment?

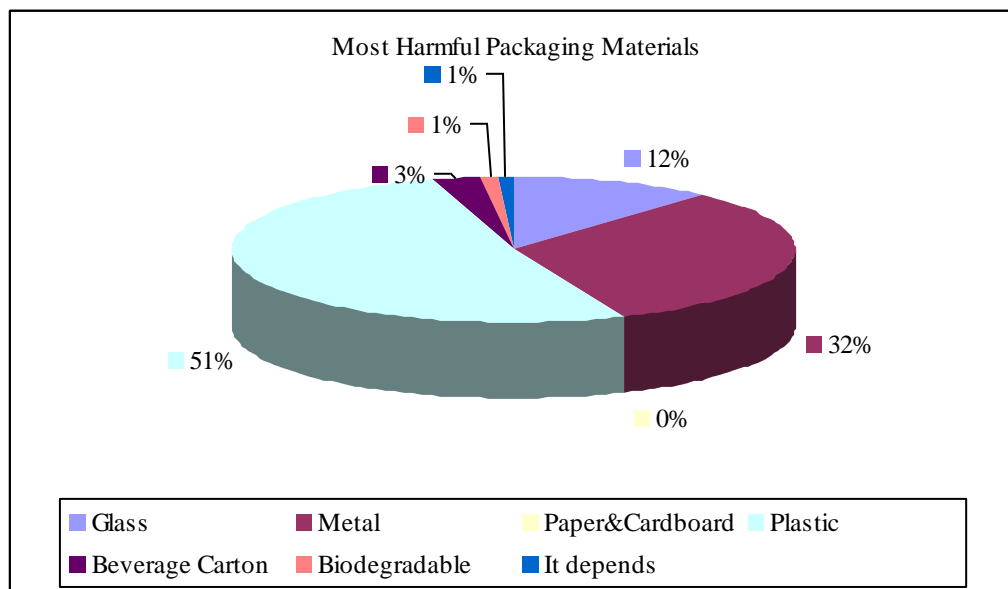


Figure 7. Most Harmful Packaging Material

❖ Which packaging material is the least harmful for the environment?

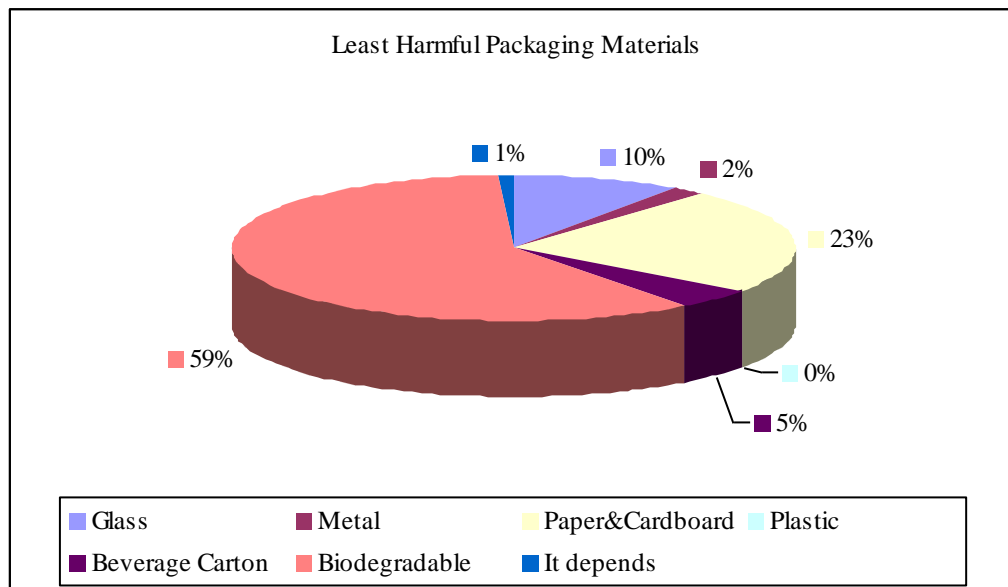


Figure 8. Least Harmful Packaging Materials

❖ Which packaging materials are possible to recycle in Spain?

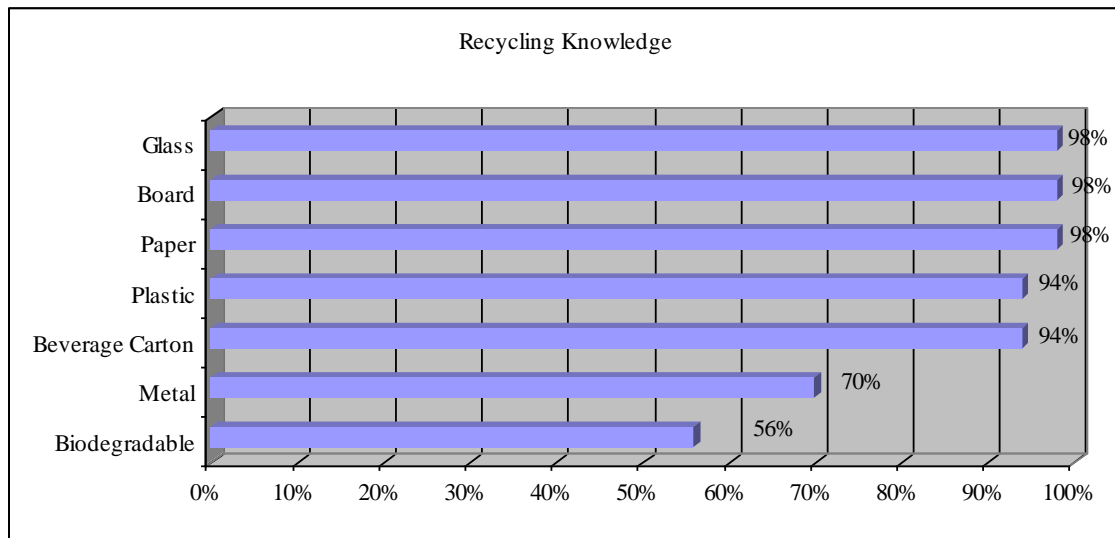


Figure 9. Recycling Knowledge

❖ Have you ever heard about Biodegradable Plastic Packaging?

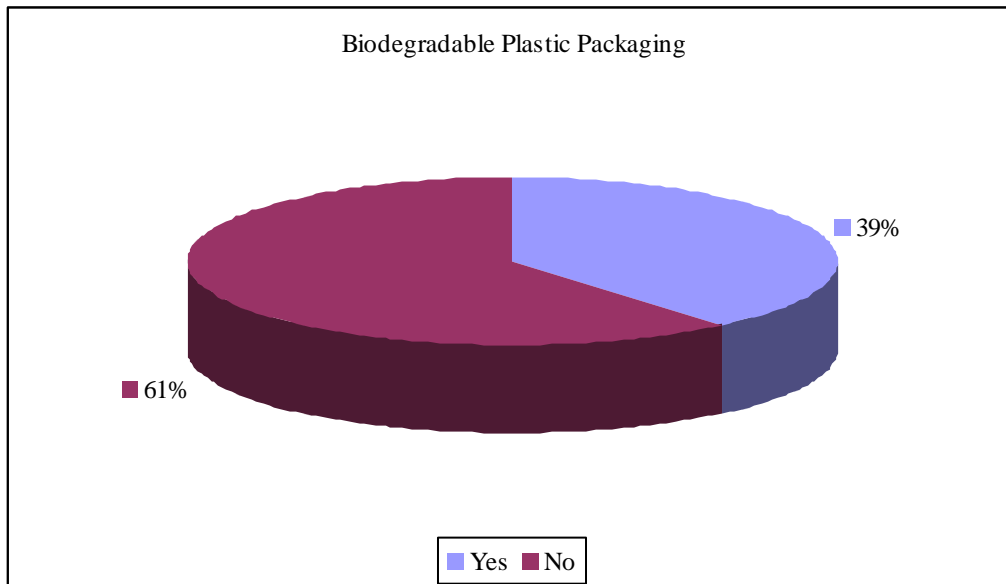


Figure 10. Biodegradable Plastic Knowledge

**Attitude**

❖ **Recycle – Which packaging materials do you separate at home?**

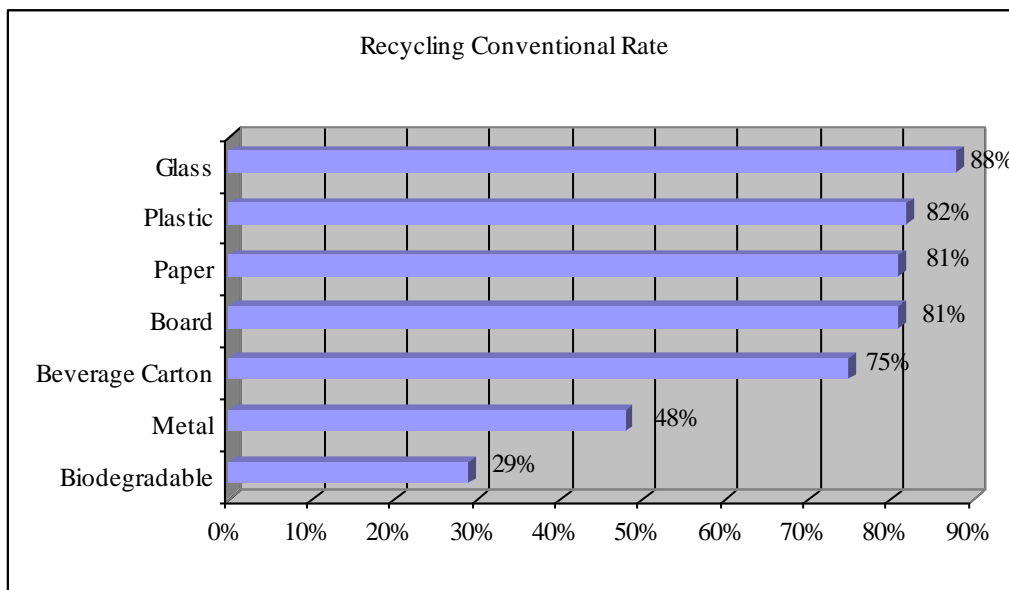


Figure 11. Recycling Attitude per packaging material

❖ **Reuse – Do you reuse food packaging to give it another application?**

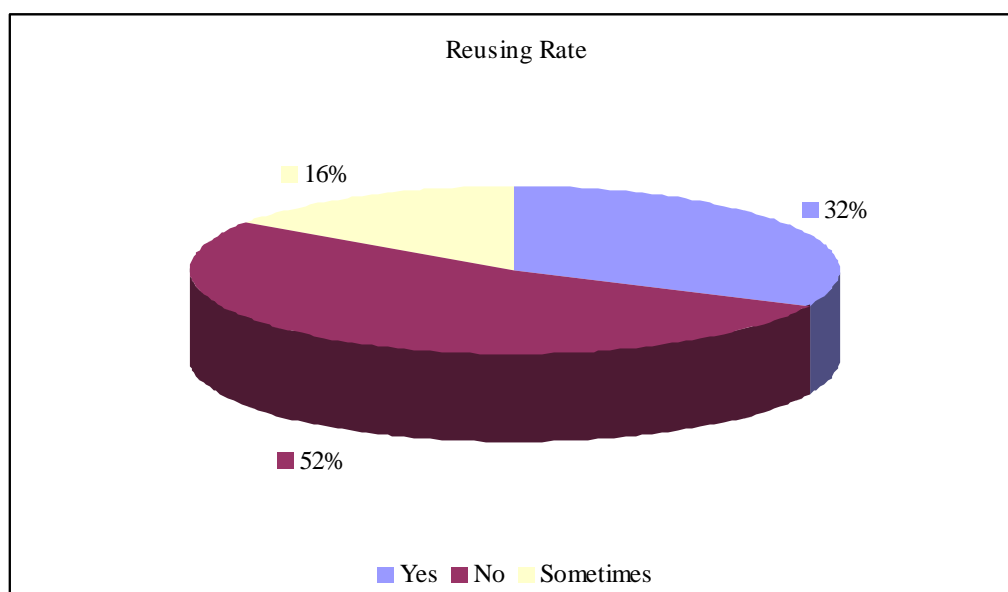


Figure 12. Reusing Rate

❖ Reuse – What sort of packaging material do you reuse?

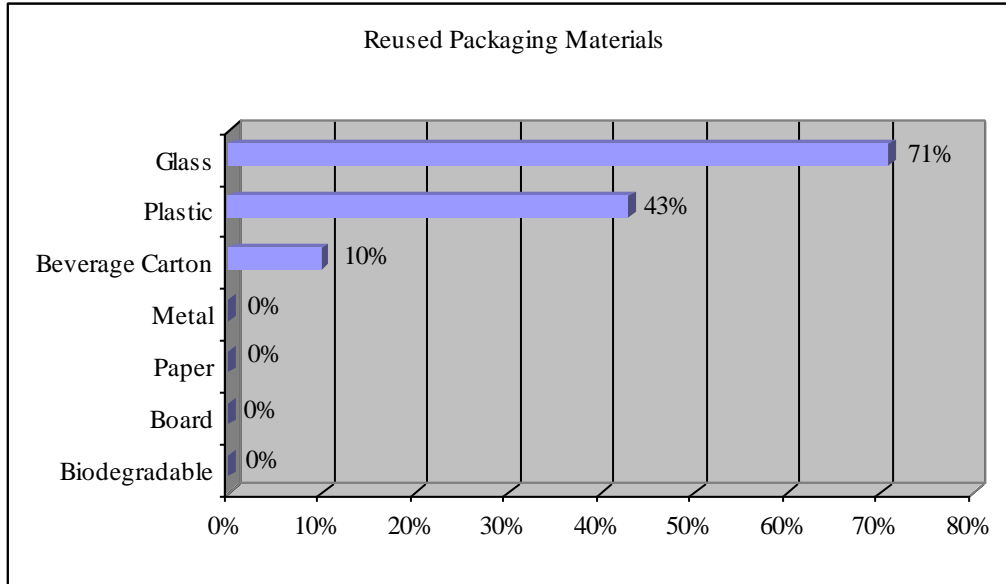


Figure 13. Reused Packaging Materials

❖ Reduce – Do you try to buy less packaged products in order to reduce the packaged consumption?

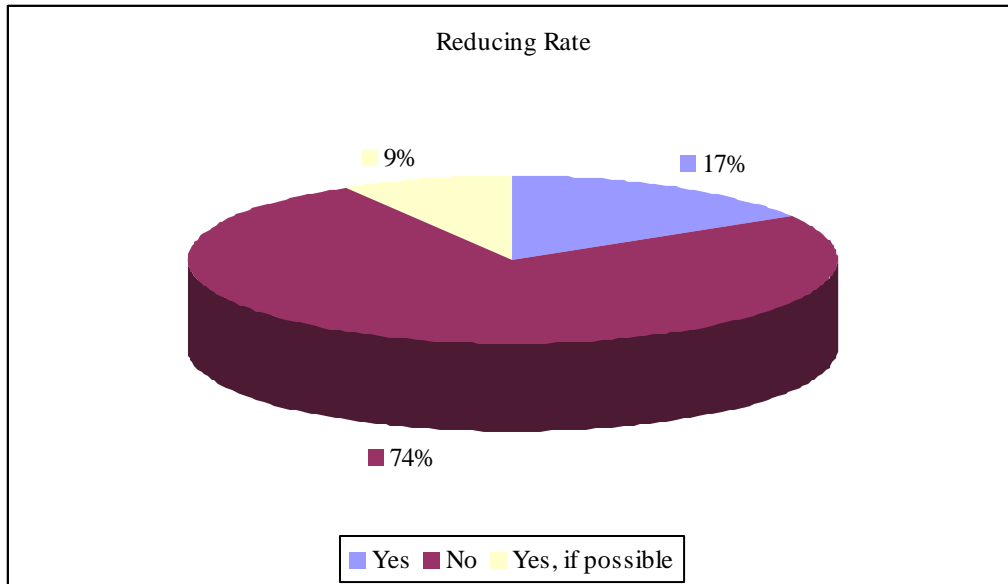


Figure 14. Reducing Rate

### Logo Recognition

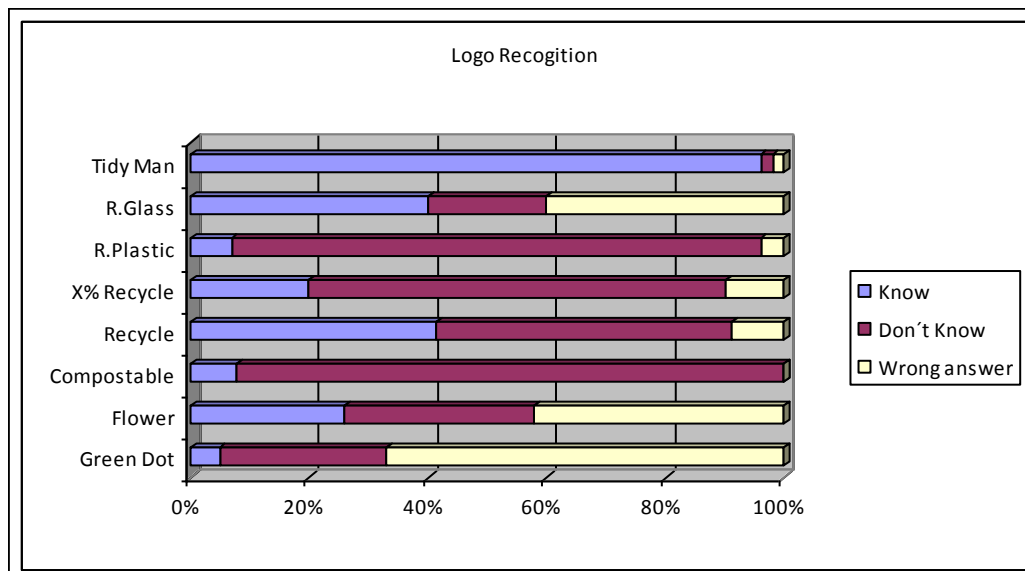


Figure 15. Logo Recognition

### Spanish Organic Consumers

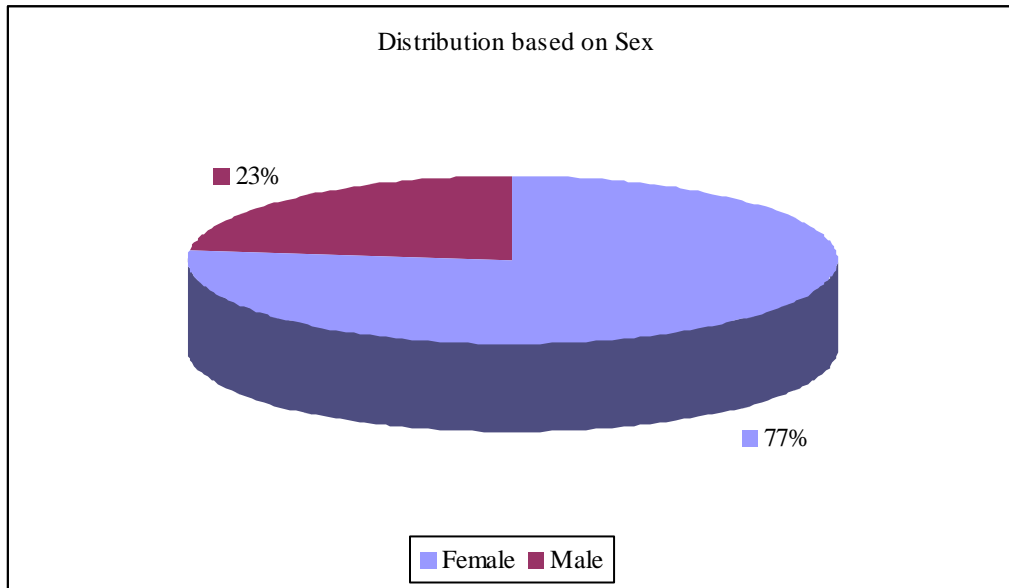


Figure 4. Distribution of conventional consumers interviewed based on gender

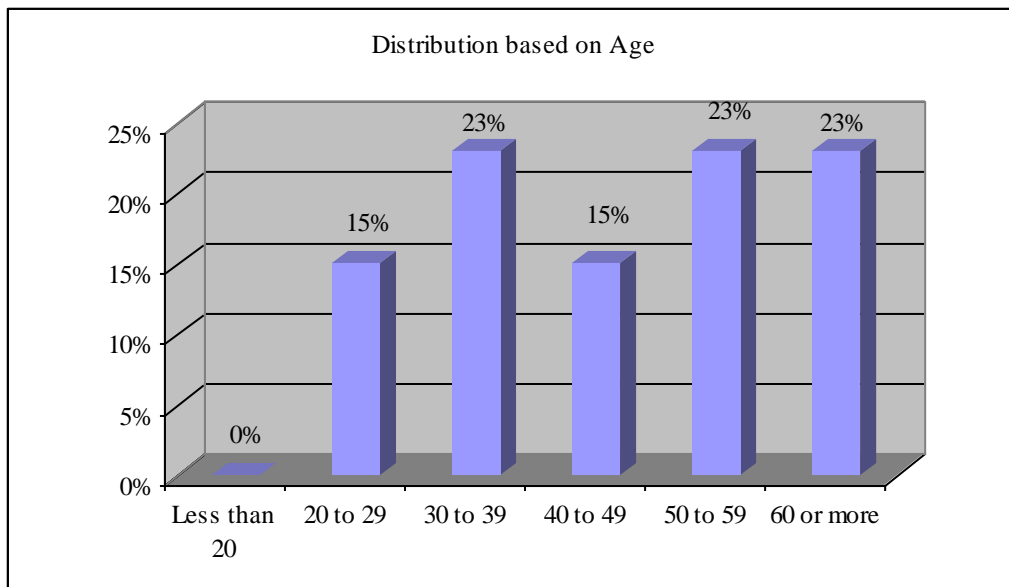


Figure 5. Distribution of conventional consumers interviewed based on age

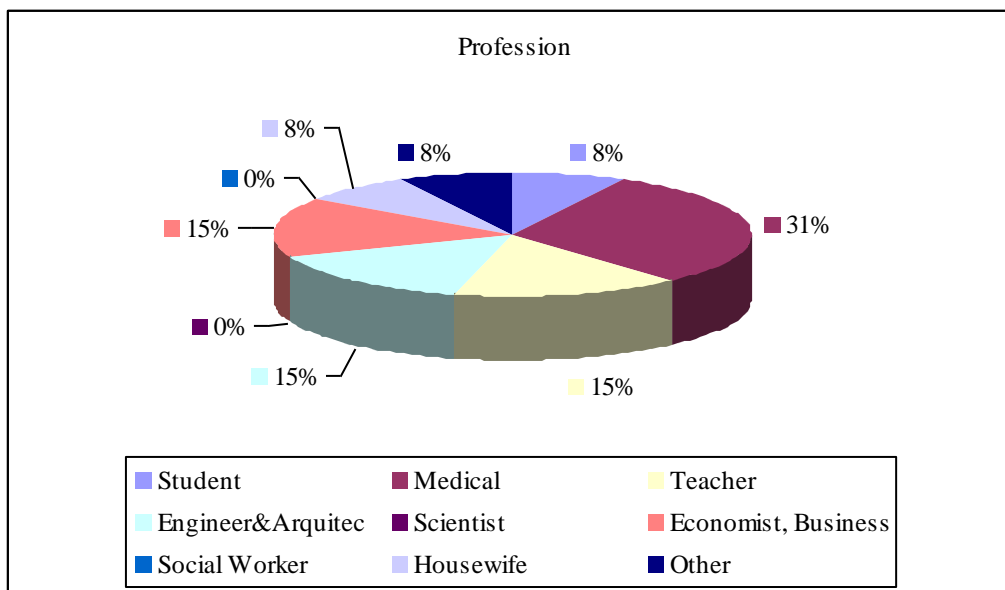


Figure 6. Distribution of conventional consumers based on profession

### Knowledge

❖ Which packaging material is the most harmful for the environment?

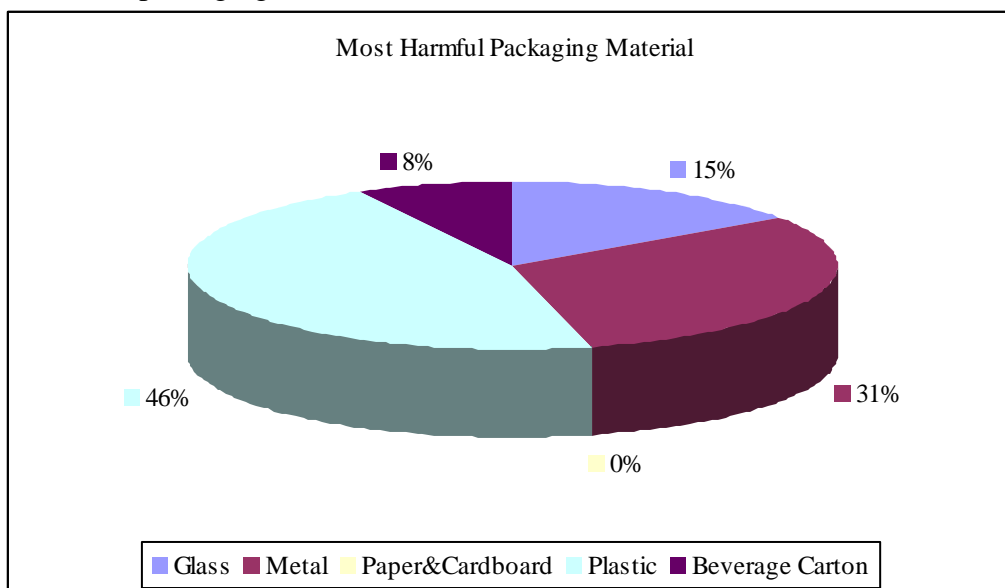


Figure 7. Most Harmful Packaging Material



❖ Which packaging material is the least harmful for the environment?

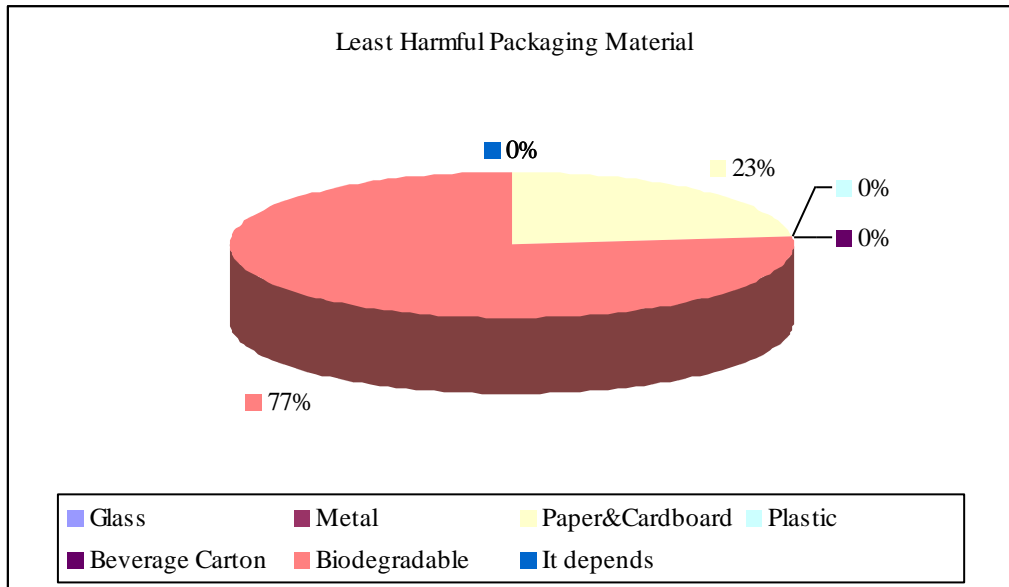


Figure 8. Least Harmful Packaging Materials

❖ Which packaging materials are possible to recycle in Spain?

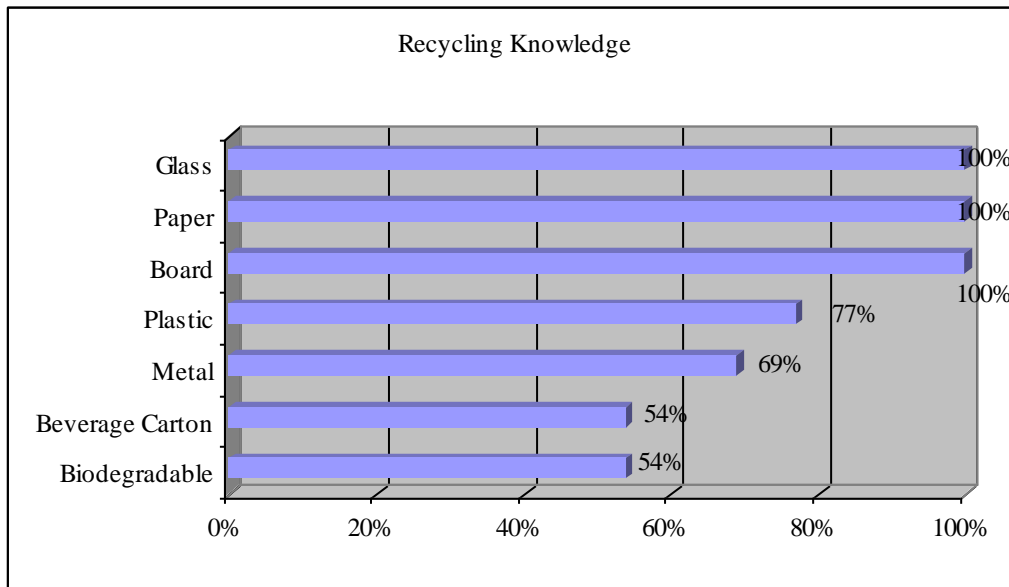


Figure 9. Recycling Knowledge

❖ Have you ever heard about Biodegradable Plastic Packaging?

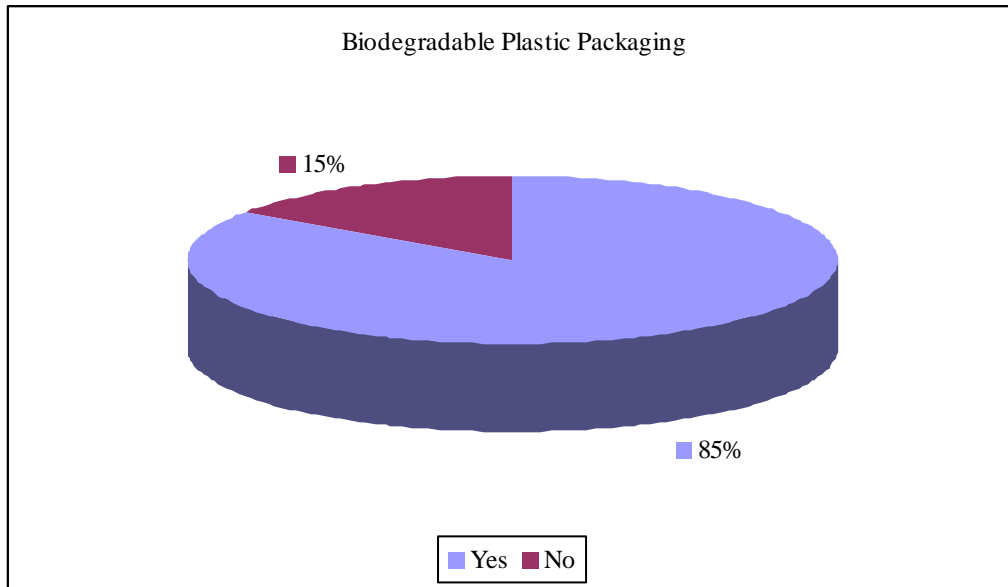


Figure 10. Biodegradable Plastic Knowledge

*Attitude*

❖ Recycle – Which packaging materials do you separate at home?

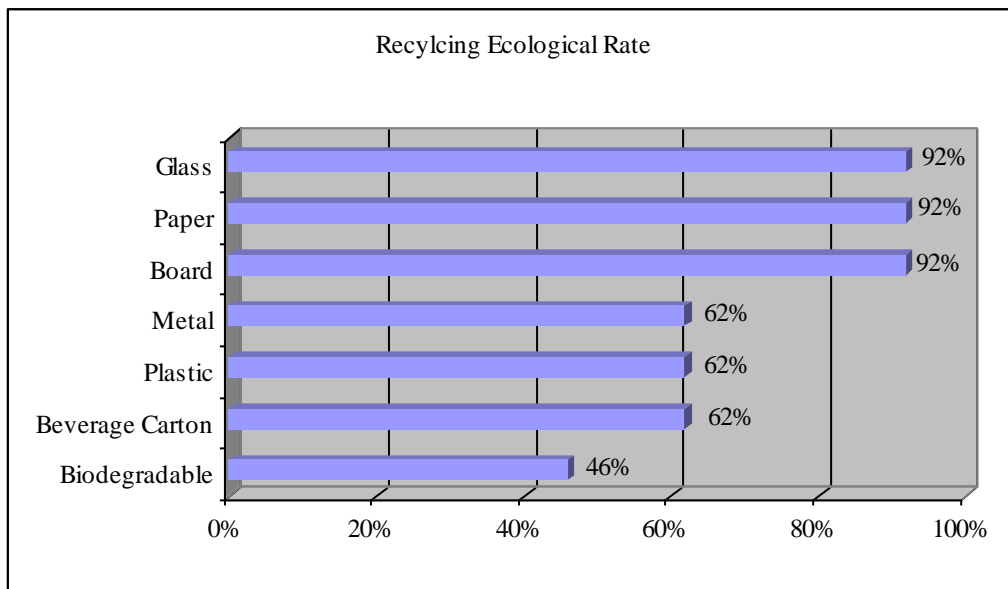


Figure 11. Recycling Attitude per packaging material

❖ Reuse – Do you reuse food packaging to give it another application?

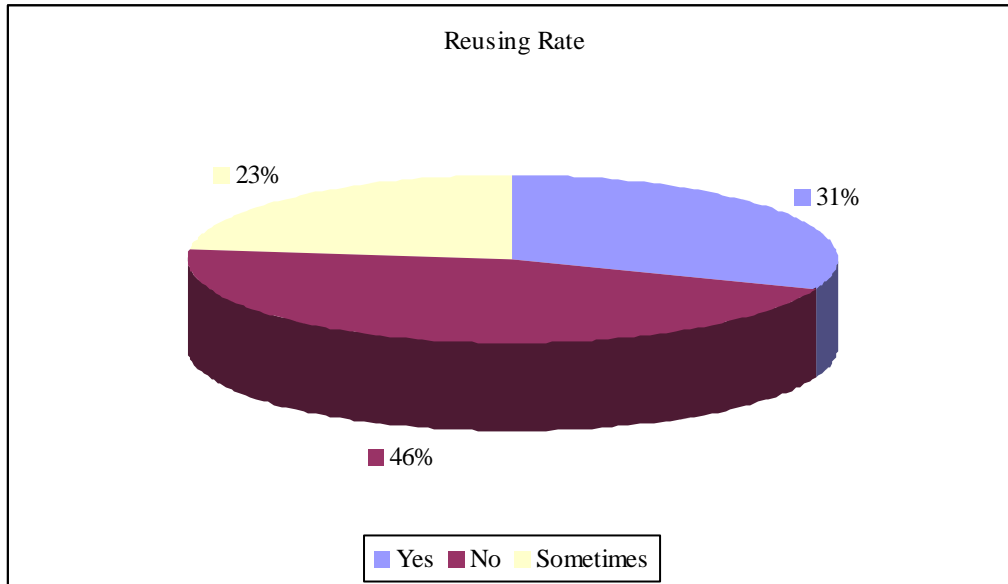


Figure 12. Reusing Rate

❖ Reuse – What sort of packaging material do you reuse?

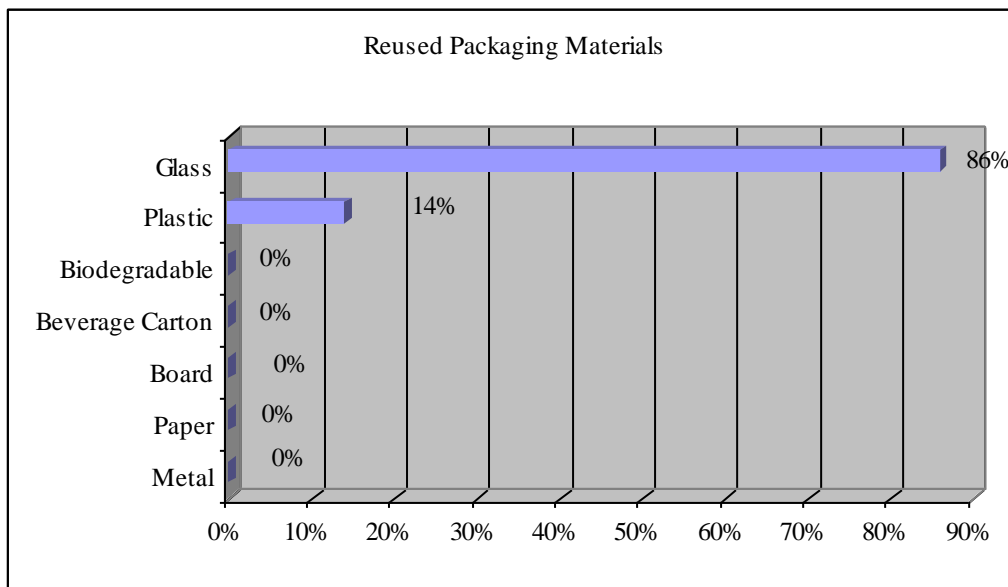


Figure 13. Reused Packaging Materials

- ❖ Reduce – Do you try to buy less packaged products in order to reduce the packaged consumption?

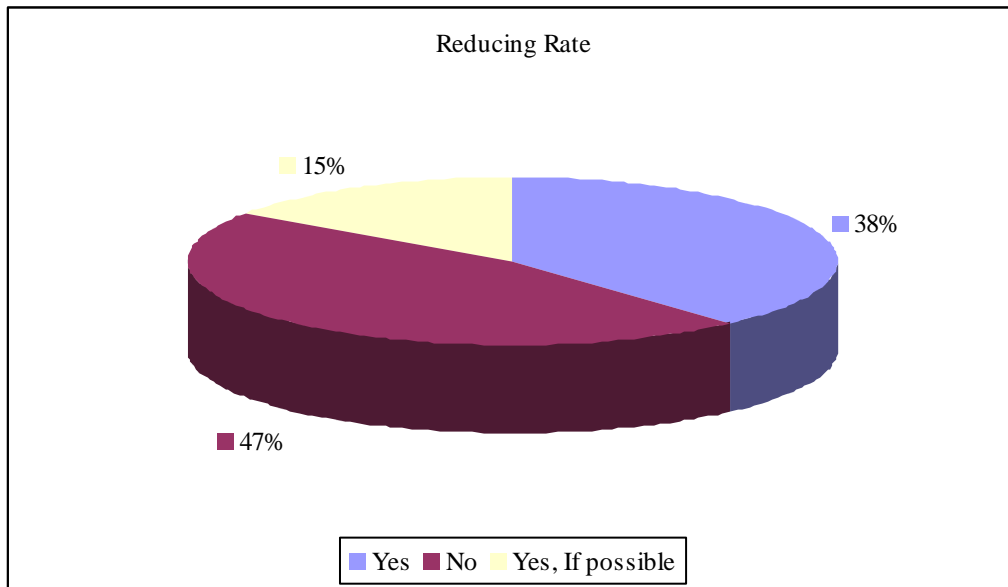


Figure 14. Reducing Rate

### Logo Recognition

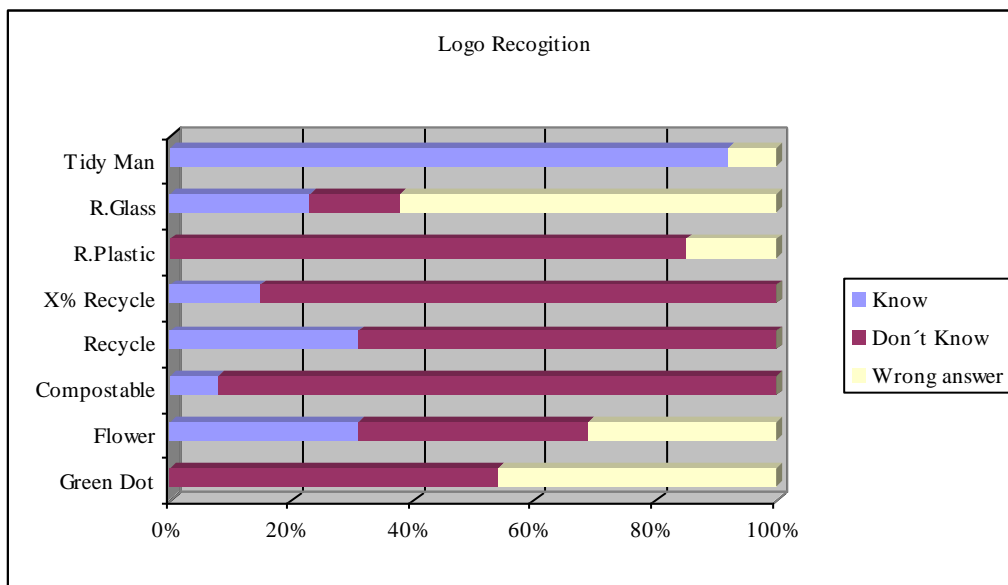


Figure 15. Logo Recognition

## APPENDIX 2 “Questions and answers obtained in the Focus Groups”

### Conventional Consumer Questions

#### FOCUS GROUP (Conventional Food Consumers)

1. Introduction
2. Waste Disposal
3. Disposal Knowledge
4. Disposal Attitude
5. Media
6. Games
7. Conclusion

#### 1. Introduction

- Do you do something in your day to day activities in order to live in a better environment?
  - Have you ever wonder about the environmental impact of the food package?
  - What would you sacrifice for a more environmental friendly package?
- #### 2. Waste disposal
- Describe the different ways of waste disposal and mention which of them is the most suitable to reduce waste.
- #### 3. Disposal Knowledge
- *Ways of Recycling.* Describe the different ways of packaging material recycling that, in your opinion, your country has.
  - Why do you think is good to recycle?
  - Describe the attitude that people in your country have about recycling.
  - Explain the attitude of the government about recycling.
  - Does your country have the proper facilities to recycle? (Enough containers, proximity or remoteness from your house...)
- #### 4. Disposal Attitude
- Why do you recycle?
  - What do you recycle?
  - How do you know how to recycle? (Sources)
  - Do you reuse your packaging? And if so, how do you reuse it?
  - Do you try to reduce the packaging food waste? How?
- #### 5. Media
- What do you think influences consumers attitude of recycling?
  - How could consumers be more aware of the packaging disposal?
- #### 6. Game reaction
- ### GAME REACTIONS
- Game. Give different packaged products, where will you throw them away?
- #### 7. Conclusion
- What would you do to have a package that is less harmful for the environment?

### **Organic Consumers added questions**

#### Biodegradable Packaging

- Does an organic food product need to have an environmental friendly package?
- What is for you a biodegradable packaging?
- Why are they appearing now in the market?
- Which are the main food areas where they are used?
- Have you ever bought a biodegradable packaging?
- How can you dispose it? Describe the methods.
- If an organic food product is packaged with biodegradable packaging, do you buy it because of its environmental packaging?
- Do you compost it?
- Have you thrown away a biodegradable packaging in the same container as plastic one?

### **Swedish Conventional Consumers**

#### ***Introduction***

- ❖ Do you do something in your day to day activities in order to live in a better environment?

The environment is link to the way the participants act in some of their daily activities. Sorting out the trash and avoiding using the car are the two most important activities done to preserve the earth. Sorting out the trash is an essential daily activity for all the participants. One of them also practices the compost at home. Avoiding the CO<sub>2</sub> emissions that transportation produces is also an important issue to consider. All of them prefer to ride a bicycle or to use public transportation rather than driving a car. One of them even does not have a car.

There are also other interesting activities such as the used of second hand clothes, the aim of decreasing the water consumption or the renovation of an apartment as an environmental friendly apartment, that the participants do.

- ❖ Have you ever wondered about the environmental impact of the food package?

The environmental impact of food packaging has been taken into account by all participants. Plastic food packaging is highlighted as the most harmful packaging material, in particular plastic bags.

The over packaging is an issue that also concerns participants. Unnecessary packaging annoys them and they usually wonder about the final destination of the packaging.

In general, packaging is an important issue for them.

- ❖ What would you give up for a more environmental friendly packaging?

The quality and the price of a product are considered to be of high importance. Eat food in hygienic and good conditions is a priority for participants, and will not ever give up the quality of the food for a friendlier packaging. Participants are also aware about the high prices of food products and will not be able to pay more for a more environmental friendly packaging.

#### ***Disposal Knowledge***

- ❖ *Ways of Recycling.* Describe the different ways of recycling packaging materials that, in your opinion, your country has.

The Swedish recycling possibilities are said to be very high. It is the consumer responsibility to sort the trash out in to different containers.

All the participants agree that the amount, location and quantity of recycling containers vary from one municipality to another and also depend on the type of house in where you live in.

Participants have found the following materials that can be recycled in Sweden.

Regarding food packaging:

- Food
- Newspaper and paper
- Cardboard and beverage carton
- Glass. Differentiating between green and white glass
- Metal
- Plastic. Differentiating between soft and hard plastic. One of them also talks about biodegradable plastic packaging that she throws away in the organic container

A part from food packaging, there are also other materials that have been identified as recyclables: Electronics, Light bulbs, garden disposal, refrigerators, tyres, TV and computers.

❖ Why do you think is good to recycle?

The reason why participants recycle is because of the environment and future generations.

One of them admits that recycling is a way of saving energy. If people recycle, fewer raw materials will have to be used and thus the amount of energy used to treat and produce the materials will decrease.

❖ Describe the attitude that Swedish consumers have about recycling.

Nearly all participants agree that the Swedish consumer recycle a lot. They agree that the Swedish consumer is aware of the environmental problems affecting the earth. Informative sessions about the way of recycling, have been taught for many years in Sweden. And it is this mix of environmental concern and well informed consumers the reasons why they do it so well it that sense.

A difference in the way of recycling has also been identified by participants. Children are said to be the ones doing it better. Kids really know how to sort all things out since the environmental education system is very good.

One of them answers that the consumer’s attitude is not that good. There are still lots of things to improve. She is still impressed by consumers throwing plastic bags in the organic containers after all the informative sessions that Swedish people have been through.

In general, confusion, not enough infrastructure and laziness are among the reasons why participants think consumers do not do it so well.

❖ Describe the government’s attitude about recycling.

Participants are very happy with the government’s attitude. It is crystal clear for them that one of the most important issues is education. They all agree that government is very focus on the education issue. Not only by informing the population through leaflets, TV adverts or informative session, but also by the great investment the government is making in children’s education.

On the other hand, they also criticize the existing contradiction about breaking the recycling laws. Consumers are over controlled, having the possibility to go to court for

small misleading, but the fees for the companies breaking the law are still too low. As an example, they mention a singular case in where an old lady went to court for throwing a freeing pan in the wrong container. However, companies do not sort all the materials out correctly.

❖ Does your country have the proper facilities to recycle?

Participants affirm that it depends on the municipality in where you live in and also on where you live in the municipality.

Each municipality decides which kind of fraction each municipality needs to have. One of the participants mentions Eslov as an example of a very well organised municipality. They also differ between the facilities existing in block of apartments, houses or country houses. Living in a block of apartments is identified as the better way of recycling, where there are normally recycling houses where all the materials can be sort it out easily. However, the existing facilities in houses are identified as not that good. Normally people living in that kind of houses need to take care of the trash themselves and then drive it to the nearest disposal station.

### ***Disposal Attitude***

❖ Why do you recycle?

All participants recycle for environmental reasons and for the future generations. They also admit that they have been so taught and tortured about the way of recycling and the impacts of not doing it that they would get a guilty conscience if they do not do it.

Economic reasons are also brought up in the debate. All of them practice the pant system and they admit they do it for having their money back.

❖ What do you recycle?

They recycle the same materials that they have said to be recycled. However, they do not do it in the same way, as some of them have the proper facilities at home and other live in the countryside and have to drive their trash to disposal facilities.

❖ How do you know how to recycle?

They have been dealing with the recycling world for quite a long time. It is the media world and the people’s knowledge the two most influencing sources. They talk about the following sources:

- Leaflet. Since around eight or nine years, all of them have been receiving in their houses a little book with information about the different ways of sorting the trash out.
- Advertisements on TV. As an example, Panta mera advert of the bottle and can return system.
- Informative Sessions in households.
- One of them, search for some information on the net.
- Other people’s knowledge.

They mention that at the beginning it was such a new thing to do, that information was more of a government’s task. However, nowadays recycling is everywhere. Ex. Do not print emails.

❖ Do you reuse your packaging? And if so, how do you reuse it?

This question has been obtained more different answers. Not all the participants reuse their packages or do it in the same level.

Out of the seven participants, one of them does not reuse

One of the participants, reuse plastic bottles to make fish traps for the kids.

Another participant just reuses some hard plastic boxes to plant seeds and flowers.



And finally, the rest of them reuse ice-cream plastic boxes for lunch and also glass jars for left over’s or homemade food. However, this reused rate is very low among them. They do not always reuse their packaging.

❖ Do you try to reduce the packaging food waste?

There are two different answers for this question: Yes, if possible or not.

Out of all the participants, just two of them admit to try to buy less package products (Ex. Plastic and not cardboard packaged toothpaste or fruits and vegetable). Although they try to do it, it is very difficult for them to achieve the goal.

The rest of the participants confess that convenience, the taste, the brand and the quality of the product are more important factors.

### Media

❖ What do you think influences consumers attitude of recycling?

- Media (TV, Internet, Informative books and sessions)
- Workmates. You could not be the only one not recycling.
- The recycling facilities
- Accurate information about what really happens with your used package. If there is not credibility in the recycling system, consumers will not contribute.

### Game

1.



2.



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5.



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7.



1. All of them: Cardboard container.
2. All of them: White Glass container the glass jar and they would also take out the lid and throw it away in the metal container. None of them would take the paper label off.
3. All of them: Hard Plastic container.
4. All of them: Metal container.
5. All of them: Paper container.
6. All of them soft plastic container.
7. All of them: Cardboard container.

Just one participant clean the packaging before throwing it away both for environmental and smell reasons.

### **Conclusion**

❖ What would you do to have a package that is less harmful for the environment?

Some of the proposals said are:

- Have a packaging material that is less harmful for the environment as Biodegradable plastic packaging.
- Decrease the unnecessary packaging, ex. The cardboard packaging covering the plastic packaged toothpaste.
- Reuse your packages to refill them with the same food or liquid. Return to the past systems.
- Increase the refilling packages of products. For example, refilling packaging of washing powder.

## **Swedish Organic Consumers**

### ***Introduction***

- ❖ Do you do something in your day to day activities in order to live in a better environment?

Sort the trash out, use alternative ways of transportation of car (such as bus, train, bike or walk) and consume organic food are the three common activities participants do to live in a better environment.

Reducing the meat and the staff consumption is also a daily activity practised. One of the participants also tries to save energy by reducing the heating consumption, admitting that it is easier to do that if you live in a village.

There are also some bad habits confessed: the used of very hot water for bathing.

- ❖ Have you ever wondered about the environmental impact of food packaging?

The environmental impact of food packaging is a matter of great concern for all of them.

The over packaging is an important issue which concerns them. And they are also aware about the damage each of the different types of materials do to nature. In particular, participants agree to try to decrease the consumption of plastic packaging. Plastic packaging is known to be very harmful to the earth.

- ❖ What would you sacrifice for a more environmental friendly package?

Quality of the package would not be sacrificed for a more environmental friendly package at all. It is more important for a package to fulfil its primary functions rather than be environmental friendly. As an example, the more environmental nature of the potato plastic bags led to a worse resistance of the bags. Consumers were not able to properly carry their shopping as the plastic bags ripped of.

Price brings up the debate. One participant would pay more money for a more environmental friendly package and agrees that society should pay more money for a more money to improve the nature of the packaging materials. On the other hand, the rest of the participants could think of improving many things instead of rising prices. For instance, Switzerland tries to use better materials for their packaging.

### ***Organic Food***

- ❖ Why do you buy organic food?

The combination of environmental and healthy aspects are said to be the main reasons why participants buy organic food. It is important for them to support the non-fossil fuel agriculture and to avoid having pesticides in the food.

What also concerns participants are the Industry processes. These processes are found untrustworthy. Therefore, organic food is the preferred food option. Participants also want to support the small farming.

Price is what makes some of them buy less organic products.

- ❖ Where do you normally buy organic products?

There are different places where organic food can be found. However, not all participants trust all of these places:

- Supermarkets – Participants buy organic food in supermarkets but they do not really trust them. Supermarket organic food seems industrialised. Why supermarkets have organic food produce in a far away country? Participants prefer to buy local non-organic food better than imported organic food for transportation and help of the local farmer’s reasons. Out of all the organic food sold in the supermarkets, just KRAV certified products are trusted.

- Market – It is their preferred option. It is organic and at the same if organic food is bought there, local farmers are helped.
- Special Shops – just one of the participant shops in this kind of commerce.
- Internet – None of them buy organic food by internet. Internet does not help the trader work.

### ***Disposal Knowledge***

❖ *Ways of Recycling.* Describe the different ways of recycling packaging materials that, in your opinion, your country has.

There has been identified the following packaging materials that can be separated into different containers in Sweden:

- Plastic – Differentiating between soft and hard plastic
- Metal
- Cardboard
- Glass – Differentiating between green and white glass
- Paper
- Food Waste
- Bio waste

A part from these packaging materials there are other products that in their opinion can be sort it out: Batteries, Paintings, Electronics, Chemicals, Garden rubbish, light bulbs and Clothes.

❖ Why do you think is good to recycle?

The main reason why participants think is good to recycle is because they would live in a cleaner and better environment. If consumers sort their trash out properly instead of dumping the trash away, nature and cities will be cleaner and more organised.

One of the participants argues that of course is good to recycle. However, there is an over believe in it. Consumers should reuse more instead of recycling ex. Plastic bags.

❖ Describe the attitude that Swedish consumers have about recycling.

The Swedish recycling attitude is answered to be very good. However, participants answer that consumers attitude depends on the existing facilities in each of the households. Swedish consumers are said to be worse at recycling if there are not the proper facilities nearby and it is necessary, for example, to drive all the rubbish to the nearest recycling station.

❖ Describe the government’s attitude about recycling.

Participants are not happy with the government’s attitude as they think they just make plans for money. On one hand, the government supports the packaging industry. There is not much pressure on this industry. Therefore, it has grown a lot and nowadays, twice as much of packaging is used than five years ago. On the other hand, government tries to take care of the trash by informing the population.

It is also thought that there are not enough penalties for breaking the recycling laws.

In general, they think that it is a selfish and insufficient attitude.

❖ Does your country have the proper facilities to recycle?

Depends on where you live in. However, in general it is possible to recycle a lot of types of fractions in Sweden.

### ***Disposal Attitude***

- Why do you recycle?
- The reason why organic consumers recycle is mainly because of the environment.

They would like to live in a greener and cleaner environment and the separation of the different packaging materials is a way of preserving the nature and having cleaner and more organised cities.

It is also mentioned that recycling is the greener solution of today’s “packaging-world”, since nearly all products are packaged. However, most of the organic consumers would like to live in a world of zero waste.

- What do you recycle?

They recycle the same materials that they have said to be recycled. However, they do not do it in the same way, as some of them have the proper facilities at home and other live in the countryside and have to drive their trash to disposal facilities.

- How do you know how to recycle? (Sources)

Participants have acquired the recycling knowledge thanks to the information got from television, internet and the book leaflet that Swedish consumers received every year at home. It is also curious that the consumer also looks for information that is written on the packaging such as labels or signs. The information shared with friends and relatives is also an important source of information.

- Do you reuse your packaging? And if so, how do you reuse it?

Not all participants reuse their packaging, as they do not find a second application to the used packaging.

Those reusing it, find that plastic and glass packaging are the most reused packaging materials. Most of the consumers give a food application to the reused packaging. Some participants think that reuse the packaging for another application is not a very good choice. In contrast, a new system where all packaging could be reused for the same application and brought back to the process could be a much better choice.

- Do you try to reduce the packaging food waste? How?

There are some participants that try to do it by buying unpackaged vegetables and fruit. However, most of them admit not to do it as it is very difficult. You are forced to consume a big amount of packaging as most products are over packaged.

- What do you think influences consumers attitude of recycling?

The most influencing factors are:

- Clear information
- Other people’s attitude: You get a bad consciousness if it is just you the only one not separating your household’s fractions.
- Good and proper facilities: If consumers have good facilities in where to sort all their trash out they would do it more and in a better way.

### Game

1.



2.



3.



4.



5.



6.



7.



1. All of them: Cardboard container.
  2. All of them: White Glass container the glass jar and they would also take out the lid and throw it away in the metal container. None of them would take the paper label off.
  3. All of them: Hard Plastic container.
  4. All of them: Metal container.
  5. All of them: Paper container.
  6. All of them soft plastic container.
  7. All of them: Cardboard container.
- All participants clean the packaging before throwing it away.

**Biodegradable Plastic Packaging**

❖ Does an organic food product need to have an environmental friendly package?  
 Yes. A participant would like to have in the future organic food and a future with zero packaging and zero waste. However, the reality differs of the thoughts.

❖ What is for you a biodegradable packaging?

Not all participants know what it is. One of them argues that if it has plastic on its composition, it would be made out of oil and thus it is not very trustful. Other participants just know that it is made of starch.

❖ Why are they appearing now in the market?

They do not know.

❖ Which are the main food areas where they are used?

They do not know. They have just seen biodegradable plastic bags.

• Have you ever bought a biodegradable packaging?

As it is unclear for them what it is a biodegradable plastic packaging and would do not know how to recognise them, they do not know if they have bought one or not.

• How can you dispose it? Describe the methods.

Some of them think that they must be thrown away into the plastic container, while other will just throw it away into the organic container. One of the participants says that the problem of throwing it into the organic containers is that the biodegradable plastic packaging does not take the same time to degrade than the fractions throw away in the organic bin. A separate box for this kind of packaging is suggested.

• If an organic food product is packaged with biodegradable packaging, do you buy it because of its environmental packaging?

No. They are more focus on the product and not that much on the packaging, since the product is what they are going to eat. Health is more important for them than the environment.

• Do you compost it?

None of them practise compost.

• Have you thrown away a biodegradable packaging in the same container as plastic one?

They do not know, as they do not know if they have bought an organic plastic packaging before. They would not know how to recognise them.

**Conclusion**

❖ What would you do to have a package that is less harmful for the environment?

Their suggested solution to have a packaging that is less harmful for the environment is to directly do not have packaging.

## **Spanish Conventional Consumers**

### **Focus Group – Conventional Consumers**

#### ***Introduction***

- ❖ Do you do something in your day to day activities in order to live in a better environment?

The main activity that Spanish conventional consumers do in order to live in a better environment is the separation of trash into the different kinds of fractions. Some of them also try to make consume less waster and light, not just for the environment, but also for economical reasons.

- ❖ Have you ever wondered about the environmental impact of the food package?

All of the participants have wonder about the environmental impact of packaging, and is something that concerns them.

Over packaging annoys them, but not for the possible environmental impact, for the big amount of waste to be thrown away.

- ❖ What would you give up for a more environmental friendly packaging?

The only thing that participants would give up for a more environmental friendly packaging would be the presentation of the packaged product. They would prefer < worse presentation rather than a very unfriendly packaging.

Spanish conventional consumers consider their health a very important matter, much more than the environmental matters. That is why they would never buy non hygienic products even if it is more respectful with the environment. Price is also a matter of concern and a higher price would never be paid.

#### ***Disposal Knowledge***

- ❖ *Ways of Recycling.* Describe the different ways of recycling packaging materials that, in your opinion, your country has.

The knowledge that conventional consumer have about the recycling possibilities is quite high. All of them know the different fractions that can be sort it out in Spain. The recycling possibilities known are:

- Green Container – Glass
- Blue Container – Paper
- Yellow Container – Plastic and metal
- Recycling Centers
- Normal garbage

Participants agree to have some confusion with the types of fractions that goes to the yellow container. Some types of glass are not known in where they should be thrown away.

- ❖ Why do you think is good to recycle?

Conventional consumers think that is good to recycle for environmental reasons. The preservation of the environment as well as the cleanliness of the cities and country is important matters for them.

- ❖ Describe the attitude that Swedish consumers have about recycling.

Conventional consumers agree that although Spanish consumers have a bad reputation, they do not do it that bad and each time the recycling habits are being better.

It is also said that consumer’s attitude depends on many factors such as age and region and municipality in where you live in. New families are the ones thought to do it better and the North of Spain is also said to have better recycling habits.



In general, lack of information, confusion and bad infrastructure are among the reasons why participants think consumers do not do it so well.

❖ Describe the government’s attitude about recycling.

Participants are not very happy with the government’s attitude. Some participants think that is not a good attitude, but each time is improving. This attitude is thought to be not very active and not very informative. It is also said that the attitude depends on the region and municipality, the facilities each regional government put in their region.

Finally, all of them agree that the government does not invest a lot on children’s environmental education, which is thought to be one of the key issues to do it well and grow up with a more environmental civil conscience.

❖ Does your country have the proper facilities to recycle?

It is agreed that the quantity and quality of the facilities depends on the region. The North of Spain is said to have better facilities than the South. Although all the regions have the same kinds of containers, the remoteness and proximity of them vary a lot from region to region, and even from municipality to another.

### ***Disposal Attitude***

❖ Why do you recycle?

All participants agree that environmental reasons are what it makes them recycle. They want clean cities and countries.

❖ What do you recycle?

They recycle the same materials that they have said to be recycled. However, there is confusion about some types of fractions. They do not do it in the same way, as some of them have the proper facilities at home and other live in the countryside and have to drive their trash to disposal facilities.

❖ How do you know how to recycle?

As there are not enough information campaigns, the participants are keen on looking for its own information. The sources used are:

- Other people’s knowledge – They find out the information needed by asking friends, relatives or work partners.
- Internet – Internet is a source also used by them.
- Book leaflet – Some book leaflets have been delivered. These leaflets are very unclear and not all the information is written in them.

One of the participants agrees to have called the Mayor Information telephone number. However, is difficult to get in contact with them.

❖ Do you reuse your packaging? And if so, how do you reuse it?

All participants agree to sometimes reuse the food packaging for another application. This application is mainly for food applications, such as lunch boxes, put food in the freezer, or put some homemade food in. One of them has brought some kinds of packaging to a school, so children can use them for doing manual activities.

Glass is the main packaging material reused followed by a lower reused of plastic packaging.

❖ Do you try to reduce the packaging food waste?

Participants agree to not try to reduce food packaging while their food is being bought. There are some factors which they worry more about such as the quality, the brand and the price of the food product that is being bought.

They try to make a reduction of plastic bags by bringing for example their own plastic bags to the shops or also by not using so much paper.

### Media

❖ What do you think influences consumers attitude of recycling?

Participants agree that what most influences consumers is publicity on TV, and in general all the media world. It is said that when an issue appears on TV consumers become more conscious.

Some of the participants also agree that economical reasons are of great importance, and if government put fines for not recycling, consumers will starts to do it more and better. They are worried about their own economy.

### Game

1.



2.



3.



4.



5.



6.



7.



1. All of them: Yellow container.
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  6. All of them: Yellow container.
  7. All of them: Blue container.
- None of them would clean any of the packaging materials before throwing it away.

### ***Conclusion***

❖ What would you do to have a package that is less harmful for the environment?  
Participants do not know what a biodegradable plastic packaging material is. However, they all suggest without any doubt to have biodegradable plastic packaging material, as it is thought to be very good and used with all types of materials

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