

# **The Acceptance of Sustainable Food and Beverage Packaging in Retail:** Showing Opportunities for Development and Action

Master Thesis

Submitted in Fulfillment of the Degree  
Master of Arts in Business

University of Applied Sciences Vorarlberg  
International Marketing & Sales

Submitted to  
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Dornbirn, 08. July 2021

## **Abstract**

### **The Acceptance of Sustainable Food and Beverage Packaging in Retail:**

Showing Opportunities for Development and Action

Packaging has important functions, such as the marketing function or protecting the product from spoilage. However, the supply in the supermarket must be viewed critically, as the majority of packaging is designed for single use. The question of how producers and retailers can increase customer acceptance of sustainable packaging in supermarkets has particular relevance in terms of the environmental impact of packaging waste. Although more and more customers are interested in the topic of sustainability, a gap between their attitude and behavior is apparent. This is addressed in more detail on the basis of two product categories. Expert interviews with international producers and retailers as well as a consumer survey allow the views of these three decision-makers to be taken into account. At the end, concrete recommendations for action are presented. These show that, among other things, information and transparency are essential in order to be able to influence consumers' purchasing decisions. In addition, the responsibility of all decision-makers is seen as the key to success.

Keywords: sustainable packaging, environmental impact, sustainability in retail, customer acceptance

## **Kurzreferat**

### **Die Akzeptanz von nachhaltigen Lebensmittel- und Getränkeverpackungen im Einzelhandel:**

Aufzeigen von Entwicklungs- und Handlungsmöglichkeiten

Verpackungen haben wichtige Funktionen, wie etwa die Marketingfunktion oder das Produkt vor Verderb zu schützen. Das Angebot im Supermarkt ist jedoch kritisch zu betrachten, da der Großteil der Verpackungen für den Einmalgebrauch konzipiert ist. Die Frage, wie Produzenten und Einzelhändler die Kundenakzeptanz von nachhaltiger Verpackung im Supermarkt erhöhen können, hat in Hinblick auf die Umweltauswirkungen des Verpackungsmülls eine besondere Relevanz. Obwohl immer mehr Konsumenten am Thema Nachhaltigkeit interessiert sind, zeigt sich eine Lücke zwischen deren Einstellung und Verhalten. Dies wird anhand von zwei Produktkategorien näher behandelt. Die Experteninterviews mit internationalen Produzenten und Einzelhändlern sowie eine Konsumentenbefragung ermöglichen es, die Sichtweisen dieser drei Entscheidungsträger zu berücksichtigen. Am Ende werden konkrete Handlungsempfehlungen aufgezeigt. Diese zeigen, dass unter anderem Information und Transparenz wichtig sind, um Einfluss auf die Kaufentscheidungen der Konsumenten ausüben zu können. Zudem wird die Verantwortlichkeit aller Entscheidungsträger als Schlüssel zum Erfolg gesehen.

Stichwörter: nachhaltige Verpackung, Umweltauswirkungen, Nachhaltigkeit im Einzelhandel, Kundenakzeptanz

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## List of Abbreviations

ARA	Altstoff Recycling Austria
AT	Austria
B2B	Business-to-Business
B2C	Business-to-Consumer
CH	Switzerland
CSR	Corporate Social Responsibility
COVID-19	Corona Virus Disease-19
e.g.	For example
etc.	Et cetera
EPR	Extended Producer Responsibility
EU	European Union
FMCG	Fast Moving Consumer Goods
FR	France
FSC	Forest Stewardship Council
GDP	Gross Domestic Product
HR	Croatia
HU	Hungary
IT	Italy
LCA	Life Cycle Analysis
LI	Principality of Liechtenstein
NABU	German Nature and Biodiversity Conservation Union
OECD	Organisation for Economic Co-operation and Development
SAT	Scholastic Assessment Test
SI	Slovenia
SPC	Sustainable Packaging Coalition
TBL	Tripple-Bottom-Line
TPB	Theory of Planned Behavior
TRA	Theory of Reasoned Action
UK	United Kingdom

# 1. Introduction

## 1.1 Relevance of the Research Topic

Food packaging has the important function of protecting the product from environmental influences like dirt, light, oxygen or moisture until it is consumed. The food product should be safe and have a long shelf life. Another function of packaging that is not to be underestimated is that of advertising space, it makes the products distinguishable.<sup>1</sup> Buying decisions are often made according to the visual appearance of a product, namely the packaging.<sup>2</sup> This supports the view of packaging being a crucial instrument when it comes to marketing and sales.<sup>3</sup>

The Environmental Protection Agency of the USA states that packaging is responsible for 30% of the total waste generation in municipalities.<sup>4</sup> When looking at the EU, an inhabitant produces on average 174 kg of packaging waste. It is important to note that the waste numbers differ significantly from one EU member state to another.<sup>5</sup> This is an indicator of the challenge of gaining acceptance of sustainable packaging on an international level.

Climate change and environmental degradation threaten economies all over the world.<sup>6</sup> The packaging industry is one of the sectors that uses the most resources, which means measures for prevention are urgently needed.<sup>7</sup> To stay competitive, the EU wants to become the first climate neutral continent by 2050.<sup>8</sup> As a result, there will already be initial restrictions on some single-use plastic products from July 2021, which will also affect the food sector.<sup>9</sup> EU households spend 12% of their household expenditure on food and beverages (excluding out-of-home consumption), making it the third most important category in terms of household expenditure.<sup>10</sup> This shows the importance and interest of international producers and retailers in this research area. The focus on the retail sector is related to the fact that they are the closest to the end customer in the value chain.<sup>11</sup> The consideration of producers is due to the fact that they are often reluctant to change the packaging, e.g., in order not to destroy the brand image.<sup>12</sup>

## 1.2 Problem Definition and Research Question

Especially in the supermarket, it is noticeable that there is almost no product without plastic packaging. Many products are also wrapped in packaging several times or are packaged again despite the presence of natural packaging.<sup>13</sup> According to a study by the German

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<sup>1</sup> Verein für Konsumenteninformation 2020.

<sup>2</sup> Lacy; Spindler 2019.

<sup>3</sup> US EPA 2017.

<sup>4</sup> US EPA 2017.

<sup>5</sup> Eurostat n. y.

<sup>6</sup> Europäische Kommission n. y.-b.

<sup>7</sup> European Commission n. y.-c.

<sup>8</sup> Europäische Kommission n. y.-b.

<sup>9</sup> Wirtschaftskammer Vorarlberg 2019.

<sup>10</sup> Handelsverband Deutschland (HDE) 2019; Statistik Austria 2018; Riedmann 2020.

<sup>11</sup> Willers 2016, p. 18.

<sup>12</sup> Mayer 2017, p. 12.

<sup>13</sup> Carstens 2016.

Nature and Biodiversity Conservation Union (NABU), 60 percent of the fruit and vegetables in grocery stores are packaged. The proportion of pre-packaged goods was reduced by three percent in the period 2016-2019. However, packaging waste in general has increased as fruit and vegetables are now offered in smaller portion sizes and more elaborate packaging.<sup>14</sup> A report from the World Economic Forum, dealing with the topic of plastic packaging, estimates that by 2050 the oceans will contain more plastics than fish (by weight).<sup>15</sup>

Customers are increasingly getting more interested in the topic of sustainability. Regardless of consumer's interest in sustainability, many companies are still not prioritizing environmentally friendly packaging, which becomes evident when looking at the majority of packaging being single-use or non-recyclable. On the other hand, consumers often do not recycle packaging waste in the correct way<sup>16</sup> and do not transfer their environmental awareness into buying habits.<sup>17</sup> Furthermore, the increase in packaging consumption is also due to consumers who prefer convenience, take-away food and drink, and smaller portions.<sup>18</sup> This highlights the two issues that this master's thesis addresses and from which the research question mentioned later is derived: the lack of sustainable packaging and consumer behavior.

Considering the high amount of non-sustainable packaging in supermarkets, the goal of this master's thesis is to develop suggestions to support the implementation of more sustainable packaging in order to be able to reduce food and beverage packaging waste and the related negative environmental impact.

This leads to the following research question:

**What do producers and retailers have to do to ensure that customers accept sustainable food and beverage packaging in the supermarket?**

### **1.3 Objectives and Target Achievement**

The problem to be studied is the unsustainable packaging of products in supermarkets and the related high amount of packaging waste. Many studies focus on speaking for or against a certain packaging material, here attention must be paid by whom the studies were conducted to determine if the presented result is in the company's own interest. In addition, the advantages and disadvantages of certain packaging materials are often location-dependent (delivery routes, recycling systems etc.). This makes it difficult to state international valid statements and would go beyond the scope, because a large number of criteria would need to be considered. For these reasons, this master's thesis does not include the discussion of the climate balance of different packaging materials. Furthermore, unpackaged stores can possibly serve as an example, but are not presented as the solution, as the focus lies on solutions for conventional retail.

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<sup>14</sup> NABU n. y.-b.

<sup>15</sup> World Economic Forum 2016, p. 14.

<sup>16</sup> Lacy; Spindler 2019.

<sup>17</sup> Orzan et al. 2018, p. 2.

<sup>18</sup> Schüler 2020.

There seems to be a lack of research about what needs to be done so that customers accept sustainable packaging and therefore actively choose and buy it. In order to fill in these gaps, the purpose of this master's thesis is to identify how products can be packaged more sustainably in such a way that it is both acceptable to customers and feasible for producers and retailers. Two product categories are examined more closely in the empirical part to gain deeper insights from the three stakeholders, further information to the approach can be found in the methodology chapter. The findings should, as a next step, also be adaptable to other product categories. It will become evident, if there are products where it is more and others where it is less feasible.

Based on the research results, this master's thesis provides international companies with clear recommendations for action on how they can changeover to more sustainable packaging alternatives and at the same time satisfy the needs and wants of the customers. These recommendations for action are developed based on the expert interviews with retailers, producers and the customer survey. This approach helps to minimize the risk for international companies to lose money due to a new packaging and enables them to have a successful implementation of sustainable packaging solutions, which should motivate other producers and retailers to adapt to this concept in the future. As a result, a broader offer of sustainable packaging solutions in supermarkets can be achieved. The findings of this master's thesis help to counteract the global problem of too much packaging waste described in the beginning and therefore bring benefits to society as a whole.

#### **1.4 Literature Review and Theoretical Classification**

There are already various studies that deal with consumer behavior with regard to sustainable packaging. Recent studies show that this theme is of great interest to the consumers.<sup>19</sup> According to Willers, for 80% of consumers ecological criteria is important when choosing a product.<sup>20</sup> A more detailed insight regarding the decision criteria is provided by the "low-cost" hypothesis, which states that interest in environmentally conscious consumption is particularly high when the cost pressure and unsightliness are low.<sup>21</sup> Nearly 50% of German consumers surveyed in a study claim the manufacturer is responsible for the reduction of packaging waste in the first place, followed by retail, legislation and finally consumers.<sup>22</sup> In the same survey, 90% of those questioned also stated that they would use sustainable packaging.<sup>23</sup>

When looking at articles regarding the topic of sustainable packaging, it is noticeable that within the last five years, the number of articles and those of conducted studies increased significantly. This represents the growing interest of research in the field.

In a broader context, the theme of sustainable packaging is settled in the area of green marketing. Therefore, it is also important to address the issue of greenwashing. Beneath these concepts, the term sustainability is important for this master's thesis. There are various efforts to define the term sustainability, as the term itself is very broad and

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<sup>19</sup> Pro Carton 2017; Bovensiepen et al. 2018; Geisseler et al. 2019.

<sup>20</sup> Willers 2015, p. 226.

<sup>21</sup> Meffert et al. 2019, p. 140.

<sup>22</sup> Bovensiepen et al. 2018, p. 28.

<sup>23</sup> Bovensiepen et al. 2018, p. 26.

depending on the context in which it is used it can be interpreted in different ways. To provide a clear theoretical basis for this master's thesis the Three-Pillar Model of Sustainability is used.<sup>24</sup> This will be explained in more detail in subchapter 2.2.

## 1.5 Methodic Procedure

The basis of this master's thesis is built by a detailed secondary research. This includes the discussion of recently written articles and studies from different countries, mainly EU-countries, dealing with the topic of sustainable packaging in retail. Furthermore, the understanding of important terms and mentioned theories in which the topic is to be classified are clarified. This provides the master's thesis with an international perspective and thus expands the target group. The inclusion of a review of current best practice examples helps to illustrate which implemented sustainable packaging options already work and why. The secondary research can be helpful in identifying essential questions for the practical part of the master's thesis.

In the secondary research, mainly studies from EU countries as well as EU policies are taken into account, therefore this limitation shall also apply to the empirical part. In order to further narrow down the population, the focus lies on the DACH region. The reason for this is that, according to the Environmental Performance Index, these three countries are among the ten most environmentally friendly countries in Europe.<sup>25</sup>

It is essential to find out where the limitations of the retail sector are in terms of packaging, for instance what problems could arise, what experience with sustainable packaging already exists and what improvements have already been successfully introduced. The same applies to the producers. It is important to find out what the retailers communicate to their suppliers.

Beneath the theoretical foundation, the focus of this master's thesis lies on the extensive practical part. In order to obtain the required information to answer the research question in a meaningful way, primary research is needed,<sup>26</sup> a combination of qualitative and quantitative research methods are used to do this. The objects of investigation (customers, retailers, producers) are examined by different approaches. Therefore, the practical part of the thesis consists of two parts: the first part consists of qualitative interviews with two experts each from retailers and producers. These are conducted as guided interviews, because it allows the questions to be answered freely and at the same time, the use of the guideline leads to a structure and a better comparability.<sup>27</sup> For the second part, a customer survey is conducted. The information gathered from the consumers is based on a structured primary research since it is a standardized questionnaire.<sup>28</sup>

The seven food groups (see footnote<sup>29</sup>), based on the food pyramid, which are also represented in retail, serve as a basis for the selection of the product categories for a closer

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<sup>24</sup> Purvis; Mao; Robinson 2019, p. 684.

<sup>25</sup> Urmersbach 2020.

<sup>26</sup> Meffert et al. 2019, p. 179.

<sup>27</sup> Mayer 2013, p. 37.

<sup>28</sup> Meffert et al. 2019, p. 180.

<sup>29</sup> 1) Fatty, sweet and salty 2) Fats and oils 3) Fish, meat, sausage and eggs 4) Milk and dairy products 5) Cereals and potatoes 6) Vegetables, legumes and fruit 7) Beverages

examination.<sup>30</sup> Within the empirical part of this master's thesis, the two product categories "milk and dairy products" and "vegetables, legumes and fruit" are examined in more detail. The reasons why these product categories are chosen are explained in the following. The average person is familiar with these product categories, since most of them have already bought the products themselves. This should increase the significance of the outcome of this master's thesis. Because they can make well-founded statements about the packaging of these products and what changes with regard to sustainable packaging they want.

A remarkable negative example for the product category vegetables are carrots: 82% of the supply in Austrian supermarkets are packed in plastic.<sup>31</sup> In Germany, berries, grapes and tomatoes account for the largest share of packaging waste in the fruit and vegetables category due to the small pack sizes and material-intensive peel packaging.<sup>32</sup> The second object of investigation is the product milk, as a revival of glass bottles can currently be observed in supermarkets. This is interesting because in Austria the debate on the sustainability of refillable glass milk bottles has already been held once before the end of the 1980s.<sup>33</sup> Furthermore, after comparing different studies, it is currently not possible to clearly answer which one of the offered milk packaging is the most sustainable solution.<sup>34</sup>

Taking into account the different perspectives of customers, retailers and producers will allow the researcher to answer the research question in a well-founded way. The goal is to find out how the different interests and challenges for each of the three stakeholders can be combined in the best way with regard to sustainable packaging. Based on the findings of the practical part with consideration of the conducted secondary research, the recommendation for action for a practical implication are defined as an output. These show what producers and retailers need to do to achieve acceptance of sustainable packaging. Possible outcomes could be an improvement in communication, price or design.

The target group of this master's thesis are international producers and retailers, who get well-founded recommendations for action on how sustainable packaging can be introduced successfully. It is important to consider the risk of socially desirable responses in the empirical part due to the high presence of the sustainability topic within society.

### **Structure of the Master's Thesis**

In the introduction, a general overview of the research topic in terms of relevance, problem definition and specific research question is given. In addition, a description of the objectives and how they are intended to be achieved is shown.

In the following chapters, the three main topics of the master's thesis, namely sustainability, packaging and retail are discussed with regard to the relevant aspects. The combination of recent studies and relevant literature form the theoretical basis for the empirical part that follows.

The empirical part consists of a qualitative and a quantitative study. This allows the opinions from practice to be taken into account. In each case, the approach, the sample and the

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<sup>30</sup> European Commission n. y.-c.

<sup>31</sup> Verein für Konsumenteninformation 2020.

<sup>32</sup> NABU n. y.-b.

<sup>33</sup> Iglar 2020.

<sup>34</sup> Berglandmilch 2020; Der Tagesspiegel 2019; Iglar 2020; Szombathy 2020.

result are presented. In the qualitative study, expert interviews are conducted with producers and retailers. In the quantitative study, consumers are asked about their attitudes and behavior with the help of an online questionnaire. This allows three decision-makers to be taken into account.

In the end, the theoretical and practical findings are compared and linked with each other, which results in an overview of the key findings. Furthermore, recommendations for action and suggestions for further research are given.

## 2. The Concept of Sustainability

### 2.1 Explanation of Terms

#### Sustainability

The concept of sustainability is derived from forestry. Back in 1713 people in Germany were advised to take only as much wood from the forest as could grow again.<sup>35</sup> The concept in relation to food packaging has previously been applied in earlier years when people conserved food until they could harvest again.<sup>36</sup>

Today, there are more than 300 different approaches that define the term sustainability. Like the already mentioned Three-Pillar Model of Sustainability, the term sustainability also has its origin in the Brundtland Report. There it was defined as:

*“The development that meets the needs of the present without compromising the ability of future generations to meet their own needs”.*<sup>37</sup>

This definition is nowadays one of the best known.<sup>38</sup> The intergenerational component in this definition shows that the topic of sustainability is taken into account over a long-term timeline.<sup>39</sup>

Sustainability was often only related to ecology. The economic and social parts were often excluded. In order to move sustainable action from a general philosophy to an implementable concept, it is important to integrate also the economic and social dimensions. To reach the desired target state of sustainable development in politics, economy and society, the balance between these three dimensions is decisive. The right measure of the three dimensions to achieve balance on a global level leads to a hardly solvable complexity, due to missing standards and individual assessments of scenarios.<sup>40</sup>

#### Green / Sustainable Marketing

The topics of sustainability in general and green marketing have been covered in literature for a long period of time. The term of green marketing first appeared as early as 1976 with a definition by Hennion and Kinnear, back then it was known as ecological marketing.<sup>41</sup> Over the years, the concept and the terms used have developed. One attempt to classify the different terms is the following: green marketing has different phases. The first one is ecological marketing, where environmental problems stand in the foreground. The second one is the environmental marketing, where clean technology with regards to pollution and waste was important. The third and last phase is sustainable marketing.<sup>42</sup> This definition includes economic, environmental and social factors.<sup>43</sup>

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<sup>35</sup> Willers 2016, p. 6.

<sup>36</sup> Boz; Korhonen; Koelsch Sand 2020, p. 3.

<sup>37</sup> Boz; Korhonen; Koelsch Sand 2020, p. 3.

<sup>38</sup> Willers 2016, p. 6.

<sup>39</sup> Willers 2016, p. 10.

<sup>40</sup> Willers 2016, p. 6.

<sup>41</sup> Dangelico; Vocalelli 2017, p. 1266.

<sup>42</sup> Sarkar 2012, p. 41.

<sup>43</sup> Dangelico; Vocalelli 2017, p. 1268.

The core task of green marketing is the marketing of ecological products (B2B and B2C), but the concept is very broad and can also involve services. Green marketing follows a holistic approach and deals with pro-environmental changes in the production, the product itself and what is especially important for this master's thesis: packaging.<sup>44</sup>

It is important to mention that the concept of marketing implies that companies are successful when they satisfy the needs and wants of customers. The concept of sustainable marketing distinguishes itself from it, because it also takes into account caring for tomorrow's customers.<sup>45</sup>

### **Green Washing**

In connection with the topic of sustainability, the concept of green washing must also be addressed. The term first appeared in 1986 and was increasingly used in scientific works from 2000.<sup>46</sup> The term stands for companies that gain an advantage by positioning themselves as green, but then do not behave accordingly. This means there is a gap between the claims and the actual behavior of the companies with regard to the environment.<sup>47</sup> An official definition says green washing is

*„...the act of misleading consumers regarding the environmental practices of a company or the environmental benefits of a product or service“.*<sup>48</sup>

### **Circular Waste Economy**

A circular waste economy is the opposite from a “take-make-waste” linear model.<sup>49</sup> One example in this context illustrates the potential: in Austria, 23% of plastic waste is currently recovered.<sup>50</sup>

## **2.2 The Emergence of Sustainability Models**

In 1972, the book “The Limits to Growth” predicted that the earth's resources are not unlimited. In the same year, the Stockholm Declaration offered a broad perspective about how environmental goals and economic development are linked and what aspects (governance, technology, culture, etc.) need to be considered to find solutions.<sup>51</sup>

The next, very important milestone in case of sustainability models is the Brundtland Report,<sup>52</sup> which was published in 1987<sup>53</sup> and can be seen as a further development of the Stockholm Declaration.<sup>54</sup> Brundtland Report is short for the report from the United Nations World Commission on Environment and Development, whose president was Gro Harlem

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<sup>44</sup> Sarkar 2012, p. 39 f.

<sup>45</sup> Kotler; Armstrong; Opresnik 2021, p. 603.

<sup>46</sup> Pimonenko et al. 2020, p. 2.

<sup>47</sup> de Jong; Huluba; Beldad 2020, p. 39.

<sup>48</sup> Pittner 2014, p. 70.

<sup>49</sup> Ellen MacArthur Foundation n. y.

<sup>50</sup> Dockter 2020.

<sup>51</sup> Clune; Zehnder 2020, p. 1002.

<sup>52</sup> Clune; Zehnder 2020, p. 1002.

<sup>53</sup> Sturges 2016, p. 3.

<sup>54</sup> Clune; Zehnder 2020, p. 1002.

Brundtland.<sup>55</sup> The Brundtland Report defined the term sustainability, which was mentioned in the chapter before. The definition already included environmental, economic and social aspects.<sup>56</sup> From this report the models explained in the following were developed.

### **Three-Pillar Model of Sustainability / Tripple-Bottom-Line (TBL)**

The Tripple-Bottom-Line (TBL) concept came up in 1999.<sup>57</sup> It considers three aspects: social, environmental and financial. In Europe, the concept is also called three P's, because the aspects people, planet and profit are considered. It is an accounting framework,<sup>58</sup> which is evident from the fact that it includes the introduction of metrics to track performance on these three criteria. The basic idea of the TBL approach is also reflected in political regulations, which is for instance visible in EU laws: the Energy Efficiency Directive of the EU requires large companies to conduct energy audits at least every four years.<sup>59</sup>

TBL says that a sustainable economy means drawing the balance (bottom line) of environmental, economic and social topics.<sup>60</sup> These are often represented as three pillars.<sup>61</sup> This is the reason why the model is also called the Three-Pillar Model of Sustainability.<sup>62</sup> Due to the frequent use of the Three-Pillar Model of Sustainability, there are also numerous adaptations.<sup>63</sup> For example, the model was expanded by other authors to include pillars such as culture, religion and politics.<sup>64</sup> The focus on the original model is related to the fact that it "is still the most common conceptualization."<sup>65</sup>

The emergence of the Three-Pillar Model itself is based on little theoretical foundation, but it has strongly influenced the origin of the term sustainability.<sup>66</sup> The decision to use this model as a theoretical basis is due to its strong presence in literature and its international recognition, which the concept gained thanks to the Brundtland Commission.<sup>67</sup> In addition, the three conceptual groups environment, social and economic are most frequently used in scientific papers to define the concept of sustainability, which form the three pillars of the model.<sup>68</sup> Another reason for choosing this approach is that the authors claim that the combination of taking into account stakeholders with its "diverse needs, expectations and representations" and considering the Three-Pillar Model is seen as decisive for sustainable development.<sup>69</sup> This reflects the aim of this master's thesis, which wants to show how the integration of three stakeholders (customers, retailers, producers) can lead to the successful introduction of sustainable food and beverage packaging. Furthermore,

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<sup>55</sup> Willers 2016, p. 6.

<sup>56</sup> Sturges 2016, p. 3.

<sup>57</sup> Sturges 2016, p. 3.

<sup>58</sup> Brien et al. 2015, p. 1.

<sup>59</sup> Handelsblatt 2016.

<sup>60</sup> Pittner 2014, p. 124.

<sup>61</sup> Brien et al. 2015, p. 1.

<sup>62</sup> Schweikert; Espinet; Chinowsky 2018, p. 377.

<sup>63</sup> Becker; Hofmann; van Dun 2018, p. 13 f.; Alexandrescu et al. 2018, p. 279.

<sup>64</sup> Alexandrescu et al. 2018, p. 279.

<sup>65</sup> Alexandrescu et al. 2018, p. 279.

<sup>66</sup> Purvis; Mao; Robinson 2019, p. 682.

<sup>67</sup> Purvis; Mao; Robinson 2019, p. 684.

<sup>68</sup> Spörrle; Bekk 2015, p. 286.

<sup>69</sup> Alexandrescu et al. 2018, p. 279.

sustainable products are in the field of tension of environmental, social and economic compatibility.<sup>70</sup>

The Three-Pillar Model and further explanation is visible below. The figure shows that the three sub-areas are interdependent and that sustainability can only be achieved through progress in all areas.<sup>71</sup>

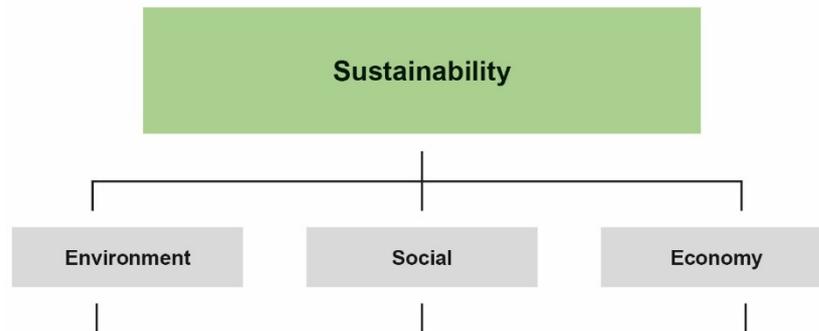


Figure 1: Three-Pillar Model of Sustainability<sup>72</sup>

- The environmental pillar is about minimizing hazardous substances, using fewer resources and energy, and instead using renewable energy and recycling. It therefore includes environmentally compatible performances and strategies.<sup>73</sup>
- The social pillar focuses on social responsibility and social justice. It is relevant to social and work psychology perspectives. The question arises under which influences persons assume personal responsibility and responsibility for others and are aware of the effects of their own behavior on others.<sup>74</sup>
- The economic pillar includes strategies taking into account the environment and social aspects. The aim is to succeed economically without exploiting the environment or other people. Examples are environmental accounting and eco-efficiency.<sup>75</sup>

After the definitions of the individual pillars, the topic of sustainable packaging can be classified under the term "environment."

### **Corporate Social Responsibility (CSR)**

A concept of sustainability that specifically places the responsibility on the companies is the Corporate Social Responsibility.<sup>76</sup> In 2011, after the financial crisis, the EU commission redefined the CSR definition as<sup>77</sup> "the responsibility of enterprises for their impacts on society."<sup>78</sup> There is discussion in the area of whether or not the assumption of responsibility should happen on the basis of laws. Nowadays, the concept is increasingly understood as

<sup>70</sup> Willers 2016, p. 14.

<sup>71</sup> Spörrle; Bekk 2015, p. 286 f.

<sup>72</sup> Own figure based on Spörrle; Bekk 2015, p. 287.

<sup>73</sup> Spörrle; Bekk 2015, p. 287.

<sup>74</sup> Spörrle; Bekk 2015, p. 287.

<sup>75</sup> Spörrle; Bekk 2015, p. 287.

<sup>76</sup> Willers 2016, p. 10.

<sup>77</sup> Willers 2016, p. 9.

<sup>78</sup> European Commission 2011, p. 6.

voluntary.<sup>79</sup> Pittner has a different view and claims that the new, shorter definition with the elimination of the word "voluntary" makes companies more responsible.<sup>80</sup>

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<sup>79</sup> Willers 2016, p. 9.

<sup>80</sup> Pittner 2014, p. 12.

## 3. The Investigation of Packaging

### 3.1 Functions of Packaging

The packaging of food and beverage products has to fulfil several different functions, which the following explanations will demonstrate. Packaging accompanies food throughout its entire life cycle, so to speak: from food processing to transport, consumption, and disposal.<sup>81</sup> The Life Cycle Analysis (LCA) method can be derived from this. It is used to develop solutions for more sustainable packaging designs<sup>82</sup> and will be discussed in more detail in the next subchapter.

From a consumer's point of view, the protection function of packaging is of utmost importance. Further needs and wants are that they can easily use and store the product<sup>83</sup> and that relevant information can be found on the packaging.<sup>84</sup> In case of the retail sector, especially information about the contents and the barcodes on the packaging are crucial.<sup>85</sup> However, consumers are not always aware of the functions of packaging. Their interest is mostly focused on the product itself and the desired information. As soon as the product is unpacked, the packaging is regarded as waste and not as a carrier of different functions.<sup>86</sup>

One identified issue is that packaging today is often “developed based on marketing and product protection only.”<sup>87</sup> The marketing function of packaging refers to the fact that consumers make purchasing decisions based on the packaging.<sup>88</sup> The packaging of a product is able to gain the attention of the customers. It also helps the buyers to assess the quality of the respective product. It is therefore “a very useful communication channel for the brand at the point of sale.”<sup>89</sup> Since we can generally speak of a saturated market in retail, packaging is an important means of differentiation from other products. An interesting fact to consider is that 76% of purchase decisions are made directly in the store;<sup>90</sup> other authors speak of 68% or 70%.<sup>91</sup> This is an explanation of why packaging is also called a “silent salesman.”<sup>92</sup>

Beneath the marketing aspect, two other basic functions of packaging should not be forgotten, namely environmental and logistical.<sup>93</sup> For companies that are internationally active it is also important to consider the type of transport, duration and transit conditions when thinking about packaging functions.<sup>94</sup> According to the study “Kano's Theory of Attractive Quality”, which addresses the quality attributes of packaging, the must-be's are “leakage, open-dating, protection, declaration of contents, instructions and appearance”.

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<sup>81</sup> Siracusa et al. 2014, p. 151 f.

<sup>82</sup> Siracusa et al. 2014, p. 152.

<sup>83</sup> Gustavo et al. 2018, p. 19; Rundh 2005, p. 671.

<sup>84</sup> Williams; Wikström; Löfgren 2008, p. 854.

<sup>85</sup> Vernuccio; Cozzolino; Michelini 2010, p. 339.

<sup>86</sup> Grant; Barichello; Fitzpatrick 2015, p. 568.

<sup>87</sup> Pires et al. 2015, p. 352.

<sup>88</sup> Monnot; Parguel; Reniou 2015, p. 330.

<sup>89</sup> Monnot; Parguel; Reniou 2015, p. 331.

<sup>90</sup> Monnot; Parguel; Reniou 2015, p. 330.

<sup>91</sup> Mayer 2017, p. 12.

<sup>92</sup> Zeng; Durif; Robinot 2021, p. 3.

<sup>93</sup> García-Arca; Prado-Prado; Gonzalez-Portela Garrido 2014, p. 326.

<sup>94</sup> Rundh 2005, p. 671.

Whereas the attribute “recyclable material” is seen as attractive, but does not count as the most important, similar to “resealability” and “containing the right quantity.”<sup>95</sup> García-Arca et al. state that a competitive advantage can be achieved through packaging.<sup>96</sup> The mentioned study defines what exactly is important to achieve this advantage: the before mentioned must-be’s have to be fulfilled and additionally attractive attributes.<sup>97</sup> In summary, it can be pointed out that “the requirements of any packaging system consist of those relating to the marketing, technical performance and legal requirements.”<sup>98</sup>

### 3.2 Environmental Impacts of Packaging

Generally speaking, it can be differentiated between two kinds of environmental impacts. Firstly, the direct one, which means to what extent the production of the packaging itself has an impact on the environment. Secondly, the indirect impact, which deals with the consumers recycling behavior. Many studies and countries’ laws only concentrate on the direct impact and not on the significant impact of consumer’s behavior.<sup>99</sup>

Packaging materials are responsible for water and land pollution. The reason for this is that, after the usage, a part of the waste ends up in landfills or becomes litter and can get into groundwater and soil.<sup>100</sup> Furthermore, it must be considered that food packaging not only has an impact on the environment, but can also be dangerous to the health of the consumers, because the use of certain chemicals can influence hormones that are responsible for crucial bodily functions such as growth, sleep and mood.<sup>101</sup>

The figure below shows a selection of different food and beverage packaging materials. It is an estimation of how long these packaging materials need to biodegrade. It becomes evident that some materials need very little time, whereas others need significantly longer.<sup>102</sup> The term biodegrade will be explained in more detail later.

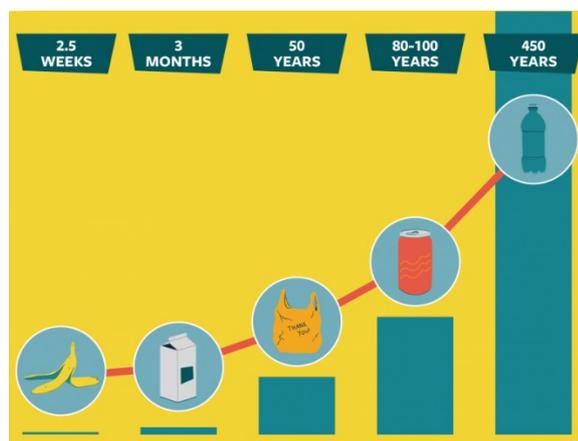


Figure 2: Duration of Food Packaging to Biodegrade<sup>103</sup>

<sup>95</sup> Williams; Wikström; Löfgren 2008, p. 855 f.

<sup>96</sup> García-Arca; Prado-Prado; Gonzalez-Portela Garrido 2014, p. 326.

<sup>97</sup> Williams; Wikström; Löfgren 2008, p. 856.

<sup>98</sup> Grant; Barichello; Fitzpatrick 2015, p. 568.

<sup>99</sup> Wikström; Williams; Venkatesh 2016. p. 895

<sup>100</sup> FoodPrint n. y.-b.

<sup>101</sup> FoodPrint n. y.-a.

<sup>102</sup> FoodPrint n. y.-b.

<sup>103</sup> FoodPrint n. y.-b.

Packaging does not only cause waste, the whole life cycle (production, use, disposal and recovery) needs “raw materials, water and energy, thus generating those emissions that are driving global warming.”<sup>104</sup> Conventional packaging can become more environmentally friendly through the following improvements: not having too long of a shelf life, thus using less packaging material, using recycled materials in production, making packaging that can be recycled after disposal, using renewable energy throughout the life cycle.<sup>105</sup>

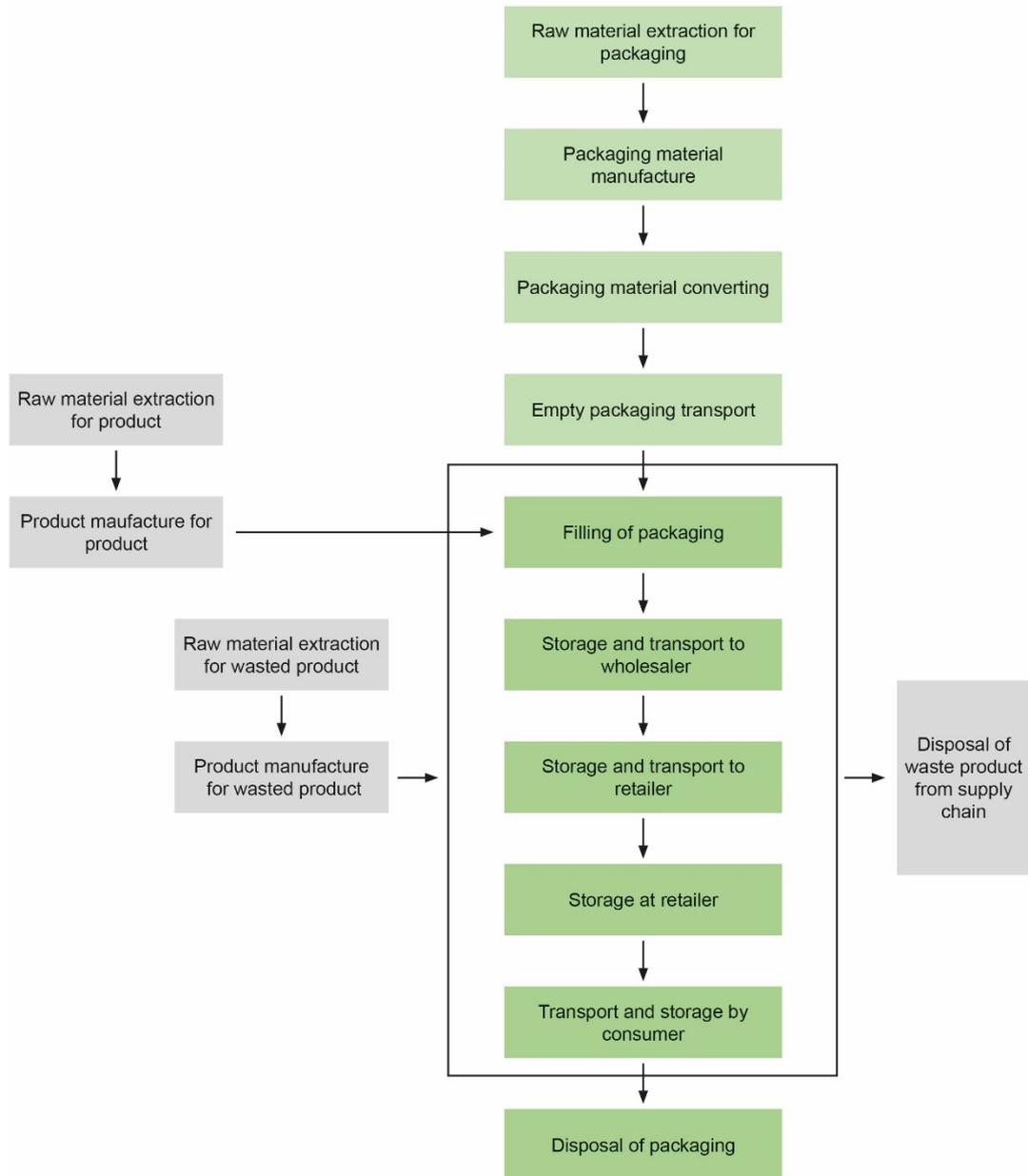


Figure 3: Life Cycle of Packaging<sup>106</sup>

The figure above shows the life cycle of packaging with a focus on the whole product supply chain. It begins with the needed raw material for the packaging and ends with disposal of the packaging. In this approach, the raw material and production of the product are also

<sup>104</sup> Herbes; Beuthner; Ramme 2018, p. 203.

<sup>105</sup> Siracusa et al. 2014, p. 158.

<sup>106</sup> Own figure based on Grant; Barichello; Fitzpatrick 2015, p. 569.

taken into account while determining the packaging performance. This helps to distinguish the environmental impacts of product and packaging in case of packaging design.<sup>107</sup>

This is important because many studies link the issue of food waste directly to packaging waste.<sup>108</sup> According to Williams et al. 20-25% of food waste can be attributed to packaging. Reasons given include packaging sizes that are too large and packaging that is difficult to empty.<sup>109</sup> It could also be the case that a higher packaging effort could lead to less product waste.<sup>110</sup> These factors need to be considered as the production of the food itself already needs many resources and therefore has a big impact on the environment. In fact, it accounts for one third of people's ecological footprint.<sup>111</sup>

### 3.3 Different Packaging Materials

In general, packaging can consist of the following materials: paper, glass, plastics, metal and wood.<sup>112</sup> These materials are present on the market in various forms, for example in the form of "plastic containers, metal cans, glass bottles, flexible packaging, paper and board boxes."<sup>113</sup> The respective industries try to present their material as the most sustainable one. This leads to uncertainty on the side of consumers, as they are unable to assess the real impact of a specific packaging material on the environment.<sup>114</sup> Sustainable packaging is also highly dependent on local conditions. This is proven by the example from some Asian countries where banana leaves serve as sustainable packaging.<sup>115</sup>

Studies conducted in Sweden, the Netherlands and Italy in different years came to very similar conclusions. The consumers surveyed rated the packaging materials plastic and metal as the least sustainable ones. In contrast, glass and bioplastics, followed by cartons, were perceived as the most sustainable packaging-options.<sup>116</sup>

The plastic material is especially criticised in connection with packaging waste.<sup>117</sup> Conventional plastic is not biodegradable, but new techniques like biocomposites or polymers from renewable resources are coming on the market.<sup>118</sup> "Bio-based plastics are produced from bio-based raw materials such as sugar cane, potatoes, corn, and agricultural and slaughterhouse waste."<sup>119</sup> The increased use of bio-based plastics instead of fossil-based plastics can be observed especially in the area of packaging for end-consumers.<sup>120</sup>

A study conducted in France, Spain and Germany demonstrated the importance of the transportation factor by comparing the two packaging alternatives glass and plastic in case

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<sup>107</sup> Grant; Barichello; Fitzpatrick 2015, p. 569.

<sup>108</sup> Wikström et al. 2014; Williams et al. 2012; Hanssen et al. 2017.

<sup>109</sup> Williams et al. 2012, p. 147.

<sup>110</sup> Grant; Barichello; Fitzpatrick 2015, p. 569.

<sup>111</sup> Wikström et al. 2014, p. 101.

<sup>112</sup> Boz; Korhonen; Koelsch Sand 2020, p. 5; Madival et al. 2009, p. 1184.

<sup>113</sup> Madival et al. 2009, p. 1184.

<sup>114</sup> Boz; Korhonen; Koelsch Sand 2020, p. 5.

<sup>115</sup> Su et al. 2021, p. 2.

<sup>116</sup> Steenis et al. 2017, p. 294.

<sup>117</sup> Fuentes; Enarsson; Kristoffersson 2019, p. 258.

<sup>118</sup> Garrido et al. 2014, p. 228.

<sup>119</sup> Mehta et al. 2021, p. 574.

<sup>120</sup> Mehta et al. 2021, p. 575.

of a baby food product.<sup>121</sup> The result of the study shows that assuming the same transport route, plastic packaging performs better in terms of environmental impact. The reasons for this, according to the study, are that plastic is lighter than glass, causes less impact on the environment during production, on-site preservation and disposal.<sup>122</sup> This, in turn, does not match the general consumers opinion about the sustainability of plastic packaging.

“Bio-based plastics are produced from renewable raw materials and can be either biodegradable or non-biodegradable.”<sup>123</sup> The figure below gives an overview of how bio-based and biodegradable plastics are differentiated from the opposites fossil-based and non-biodegradable. Furthermore, it is visible in which of the mentioned areas conventional plastic is located.

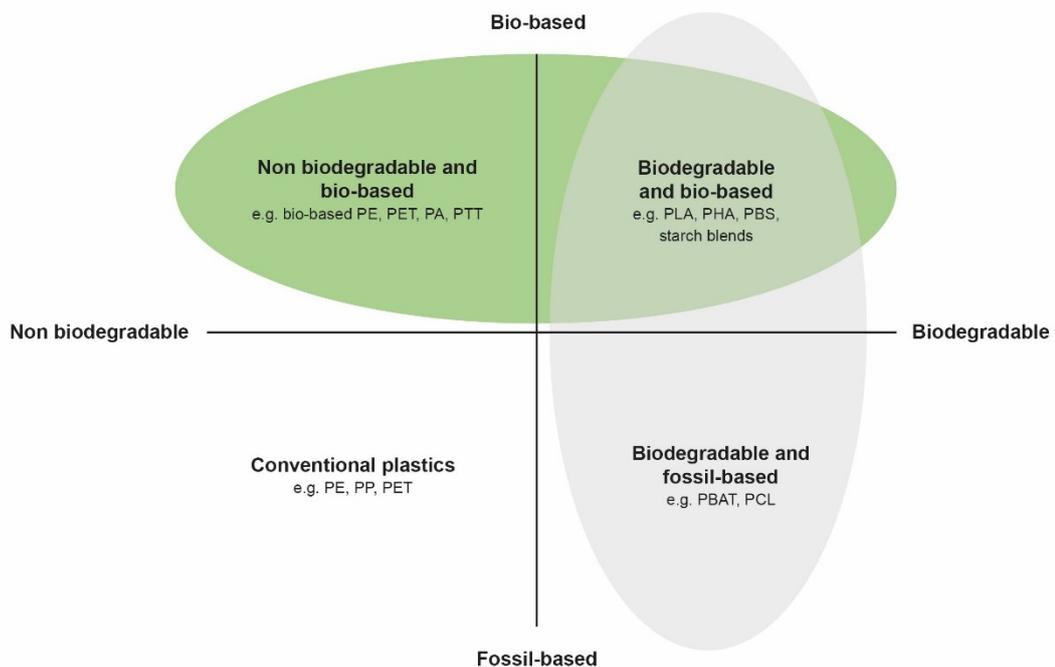


Figure 4: Overview of the Distinction between Bio-based & Biodegradable<sup>124</sup>

Reusable or biodegradable materials, as well as generally using less material, are currently seen as the future trends.<sup>125</sup> It is important to know that most of the biodegradable packaging materials need an industrial system with certain conditions in order to be able to decompose.<sup>126</sup> However, the problem is that many composting and anaerobic digestion facilities do not accept these new packaging materials because they have difficulty distinguishing conventional plastic from biodegradable plastic.<sup>127</sup> This is the reason why some companies are currently still rejecting the use of bioplastics,<sup>128</sup> like the later mentioned best practice example company Rügenwalder Mühle.

<sup>121</sup> Humbert et al. 2009, p. 95.

<sup>122</sup> Humbert et al. 2009, p. 104 f.

<sup>123</sup> Mehta et al. 2021, p. 575.

<sup>124</sup> Own figure based on Mehta et al. 2021, p. 575.

<sup>125</sup> Orzan et al. 2018, p. 2.

<sup>126</sup> Boz; Korhonen; Koelsch Sand 2020, p. 8.

<sup>127</sup> Rossi et al. 2015, p. 143 f.

<sup>128</sup> Rügenwalder Mühle n. y.

In summary, bio-based plastics could contribute to an increase in plastic waste first, as recycling facilities cannot yet process them.<sup>129</sup> This increases the confusion regarding sustainable packaging on the consumer side, because many misinterpret the term bio in combination with packaging.<sup>130</sup> The high cost of sorting bio-based and fossil-based plastics could further reduce the low plastic recycling rate and affect the quality of the recycled material. To ensure successful adoption, consumers would need to be well informed and provided with the necessary collection containers. Further research in this area could also provide a solution in the recycling process itself.<sup>131</sup>

### 3.4 EU Waste Policy

A law introduced by the EU in 1994 regarding recycling quotas of packaging waste, which was gradually introduced into national legislation, has been fulfilled, but the amount of waste has increased overall. Therefore, one cannot speak of success, since waste prevention has not been achieved. A rethink took place and in 2008, waste prevention was set as the ultimate goal on the part of the EU. However, to achieve this, the entire life cycle of a product must be taken into account and for the different stakeholders it means having to change their habits.<sup>132</sup>

The figure below demonstrates the five-stage waste hierarchy of the EU. It shows the least desired option of disposal and the preferred goal of waste prevention.<sup>133</sup>



Figure 5: EU Waste Hierarchy<sup>134</sup>

Plastic is a versatile material, but due to the long decomposition process and environmental pollution, the material is increasingly coming under criticism. According to the EU Commission, more than 80% of marine litter is plastic waste. This is not only harmful to marine animals but also enters the human food chain.<sup>135</sup> Therefore, the EU requires that the lids of beverage bottles are to be attached to them from 2024. Other EU requirements

<sup>129</sup> Mehta et al. 2021, p. 582.

<sup>130</sup> Boz; Korhonen; Koelsch Sand 2020, p. 8.

<sup>131</sup> Mehta et al. 2021, p. 584.

<sup>132</sup> Tencati et al. 2016, p. 36.

<sup>133</sup> European Commission n. y.-d.

<sup>134</sup> European Commission n. y.-d.

<sup>135</sup> Europäisches Parlament 2019.

are that from 2025 beverage bottles must consist of at least 25% recycled plastic, and from 2030 this figure will be increased to 30%.<sup>136</sup> Furthermore, member states must collect 90% of plastic bottles separately by 2029.<sup>137</sup> This should be made possible, for example, by introducing a reusable system or deposit system.<sup>138</sup>

### **Extended Producer Responsibility**

The concept of EPR “was first implemented for packaging in Germany in 1992.”<sup>139</sup> Other EU member states followed and the EU implemented several directives. As the national implementation lies in the hands of each member state, the laws differ significantly.<sup>140</sup> The EPR obliges the producers instead of the municipalities to pay for the collection and recycling of waste.<sup>141</sup> As a result, consumers can give electrical and packaging waste to a collection point at the municipalities without having to pay anything for it.<sup>142</sup>

The reasons for introducing EPR are to reaching recycling targets, improve resource efficiency and establish “closed loops.” The advantage is that the post-consumption phase is included, which is necessary for being able to create a greener supply chain.<sup>143</sup> In addition, producers should be motivated to consider green design, product innovation and waste prevention. However, now that the concept has been in use for several years, it is not possible to speak of success in achieving the desired effects. One positive point to highlight is that the recycling rate of packaging waste developed very well. This is not the case in countries which do not apply the concept of EPR.<sup>144</sup>

The OECD places EPR in the area of the polluter-pays principle, which means that it does not only include the polluter but also the product itself. In a critique of this definition, it is stated that it is not clear who the polluter is. Since it is not only the producer but also the consumer who buys the product. Therefore, “the responsibility should be shared along the entire supply chain.”<sup>145</sup>

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<sup>136</sup> Stoll 2019.

<sup>137</sup> Europäisches Parlament 2019.

<sup>138</sup> Stoll 2019.

<sup>139</sup> Kunz; Mayers; Van Wassenhove 2018, p. 47.

<sup>140</sup> Kunz; Mayers; Van Wassenhove 2018, p. 47 f.

<sup>141</sup> Kunz; Mayers; Van Wassenhove 2018, p. 46.

<sup>142</sup> Kunz; Mayers; Van Wassenhove 2018, p. 47.

<sup>143</sup> Massarutto 2014, p. 11.

<sup>144</sup> Massarutto 2014, p. 14.

<sup>145</sup> Massarutto 2014, p. 15.

## 4. Implementation of Sustainable Packaging

### 4.1 Requirements for Sustainable Packaging

The increase of global trade changes in household sizes towards smaller households and new lifestyles, including an increase in buyers who are looking for convenience, are all factors that support growth in the area of the food packaging industry.<sup>146</sup> This can be seen as a chance to rethink existing food packaging.

A sustainable packaging should combine both visual and verbal features. In terms of visibility, this can be achieved by using recycled or biodegradable materials. The verbal communication can be done through sustainable cues and labels.<sup>147</sup> However, the requirements for sustainable packaging vary. In connection with avoiding food waste, for example, the attributes of easy emptying of the packaging and resealability are important.<sup>148</sup>

In general, larger packaging is always more sustainable than smaller packaging, as less packaging material is needed per portion of food. This was also confirmed in a study on coffee packaging. However, larger packaging can also be seen as critical as it increases the risk of food waste.<sup>149</sup>

In literature, different terms are used by the authors in connection to sustainable packaging.<sup>150</sup> In this master's thesis, the definition from Sustainable Packaging Coalition (SPC) is used in order to clarify the understanding of what is meant by the term sustainable packaging. One reason for this decision is that the definition refers to the Three-Pillar Model, which serves as a basis for this master's thesis. Furthermore, the presented criteria below pursue a holistic approach where the entire life cycle of packaging is considered. The reasons why this is from major importance are discussed in subchapter 3.2. The order of the following eight criteria is not important in case of their relevance:

*A. Is beneficial, safe & healthy for individuals and communities throughout its life cycle*

*B. Meets market criteria for performance and cost*

*C. Is sourced, manufactured, transported, and recycled using renewable energy*

*D. Optimizes the use of renewable or recycled source materials*

*E. Is manufactured using clean production technologies and best practices*

*F. Is made from materials healthy throughout the life cycle*

*G. Is physically designed to optimize materials and energy*

*H. Is effectively recovered and utilized in biological and/or industrial closed loop cycles<sup>151</sup>*

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<sup>146</sup> Rundh 2005, p. 671.

<sup>147</sup> Zeng; Durif; Robinot 2021, p. 2.

<sup>148</sup> Zeng; Durif; Robinot 2021, p. 2.

<sup>149</sup> Williams; Wikström; Löfgren 2008, p. 853.

<sup>150</sup> Magnier; Crié 2015, p. 351.

<sup>151</sup> Sustainable Packaging Coalition 2011.

A critique to this previous explanation of sustainable packaging says that it is more a framework for companies, but does not include how consumers see sustainable packaging. To be able to reduce the environmental impact of packaging, it is important to implement sustainable packaging with regards to consumers' viewpoints, who in the end decide which packaging they buy.<sup>152</sup>

Generally speaking, it is important to clarify that sustainable packaging also has an impact on the environment.<sup>153</sup> The best way to reduce packaging waste is waste prevention. This simple solution is often forgotten, because the discussions about waste reduction and recycling stand in the foreground.<sup>154</sup> One example where this approach has already been implemented very well is the elimination of packaging cartons from toothpaste tubes.<sup>155</sup>

In order to provide a clear overview of the most important functions of sustainable packaging, the view of the three major overarching themes, namely physical, social and commercial, was chosen. These three functions are illustrated and explained in the figure below.<sup>156</sup>



Figure 6: Functions of Ecological Packaging<sup>157</sup>

## 4.2 Reasons for Absence of Sustainable Packaging

Going grocery shopping is a routine practice, because it counts as an everyday task. This means that there is little reflection and deliberation involved, customers often buy the same products and walk through the store in the same way. However, routine does not mean that it is unimportant. In fact, it illustrates the important point that changing customers' shopping practices is difficult.<sup>158</sup>

One of the problems of the sustainable market is the asymmetric distribution of information, which makes it difficult to assess the quality. The producers know more about the products and the life cycle than the consumers, who do not typically have this detailed knowledge. In addition, it is generally difficult for consumers to evaluate the credibility of claimed sustainable products.<sup>159</sup> Most of the companies have their own definition of sustainability. This lack of consent contributes to confusion on the consumer side about how sustainable a package is.<sup>160</sup>

<sup>152</sup> Magnier; Crié 2015, p. 351.

<sup>153</sup> Boz; Korhonen; Koelsch Sand 2020, p. 2.

<sup>154</sup> Beitzten-Heineke; Balta-Ozkan; Reefke 2016, p. 1528.

<sup>155</sup> Lorentsichitsch; Seeliger 2015, p. 111.

<sup>156</sup> Zeng; Durif; Robinot 2021, p. 2.

<sup>157</sup> Own figure based on Zeng; Durif; Robinot 2021, p. 2.

<sup>158</sup> Fuentes; Enarsson; Kristoffersson 2019, p. 259.

<sup>159</sup> Zeng; Durif; Robinot 2021, p. 2.

<sup>160</sup> Boz; Korhonen; Koelsch Sand 2020, p. 4.

Packaging can be seen as “a source of product, process and material innovation, which reinforces its strategic contribution to increased competitiveness”.<sup>161</sup> Decision-makers, who are involved in a packaging decision process, can therefore see it as an advantage to increase market competitiveness. On the other hand, it can also lead to a competitive disadvantage. The following are cited as reasons why more sustainable packaging solutions cannot be found on the market:

- *“Poor consumer acceptance of unknown technologies*
- *Cost*
- *Regulatory issues*
- *Lack of viable food product protection (such as moisture barriers)*
- *Inability to manufacture the packaging material (due to sourcing constraints or material properties)”<sup>162</sup>*

Furthermore, value chain complexities and negative consumer attitudes are mentioned as reasons why companies do not support the introduction of more sustainable packaging.<sup>163</sup> Improving the collaboration of the different organizations (stakeholders) along the value chain would help to avoid a shift of responsibility,<sup>164</sup> which was already mentioned in connection with the EPR concept.

Furthermore, good sustainable solutions will be accepted by the consumers. To be able to reach consumer acceptance, it is important to know “ecological material preferences, willingness to pay, recycling, and factors impacting sustainable behaviors.”<sup>165</sup> It is difficult to determine the true willingness to pay because respondents in hypothetical situations often indicate a willingness to pay that is not true. In this context, one can also speak of the “30:3-Syndrome.” This means that 30% of consumers have a positive buying attitude, but ultimately this only results in a market share of 3%.<sup>166</sup> The main reason why consumers are not willing to pay more is the general lack of information regarding sustainable packaging. This includes for instance the advantages of ecological packaging, better knowledge about recycling of different materials, impact on the environment and health.<sup>167</sup>

One study claims that “many companies do not promote their efforts on more sustainable packaging to consumers” because of the greenwashing risk and related loss of competitiveness.<sup>168</sup> Research gaps are mentioned in the area of “consumer’s opinions concerning sustainable packaging.”<sup>169</sup> Therefore, this shall be taken into account in the practical part.

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<sup>161</sup> García-Arca; Prado-Prado; Gonzalez-Portela Garrido 2014, p. 326.

<sup>162</sup> Boz; Korhonen; Koelsch Sand 2020, p. 2.

<sup>163</sup> Boz; Korhonen; Koelsch Sand 2020, p. 1.

<sup>164</sup> Mehta et al. 2021, p. 584.

<sup>165</sup> Boz; Korhonen; Koelsch Sand 2020, p. 1.

<sup>166</sup> Willers 2016, p. 13.

<sup>167</sup> Orzan et al. 2018, p. 7.

<sup>168</sup> Boz; Korhonen; Koelsch Sand 2020, p. 9.

<sup>169</sup> Pires et al. 2015, p. 352.

### 4.3 Understanding Sustainable Customer Behavior

Like already mentioned, the topic of sustainability is more present in the minds of today's consumers. However, the decisive point is that this mindset is not transferred to the actual buying behavior. The opposite is the case, the Western society is even titled as a "throw-away" society.<sup>170</sup> One can therefore speak of a gap between the consumer's green attitude and real action regarding their purchase behavior. The reasons given for this discrepancy are among others price, availability of sustainable packaging and social influences.<sup>171</sup> When food products are communicating sustainability, these products are also perceived to be of higher quality. In contrast, sustainability is a disadvantage for cleaning products, which are perceived as less effective.<sup>172</sup>

It is important that consumers recognize relevant information and realize the positive effects of their sustainable actions. The consumers must anchor sustainability in their thinking in order to change their buying behavior accordingly.<sup>173</sup> Other authors claim that there is a knowledge gap and skepticism on the side of the consumers. The consumers' needs and wants are not sufficiently taken into account during the design process of sustainable packaging.<sup>174</sup> In a study regarding the behavior in case of (non-)reduction of resources, it was found that the main reasons for reducing resource consumption are environmental protection and the well-being of future generations. The main reasons for not reducing it were personal reasons such as maintaining the current, easy lifestyle.<sup>175</sup>

Companies should pursue clear communication to overcome the problem of consumer dissatisfaction. Only when consumers have a good understanding in terms of packaging they are able to make informed decisions and can develop product preferences that are truly sustainable.<sup>176</sup> The problem here is that the described complexity of the different available packaging materials does not stop the consumers from building their own opinions about the most sustainable packaging option, which subsequently influences their possibly wrong purchasing decisions.<sup>177</sup> An example for this could be the before mentioned packaging alternatives of baby food. In countries where EPR is applied, the consumers' understanding on sustainable packaging is much better compared to those who do not have it. Therefore, those consumers can make better informed decisions.<sup>178</sup>

A study about sustainable packaging of beverages showed that taste and price are the only two product characteristics that need to be fulfilled, after that, the consumer takes the sustainability of the packaging into account.<sup>179</sup> Other studies claim that sustainable packaging materials, which include recyclable materials such as glass or paper, have twice

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<sup>170</sup> van Birgelen; Semeijn; Keicher 2009, p. 126.

<sup>171</sup> Orzan et al. 2018, p. 3.

<sup>172</sup> Magnier; Schoormans; Mugge 2016, p. 133.

<sup>173</sup> Orzan et al. 2018, p. 4.

<sup>174</sup> Zeng; Durif; Robinot 2021, p. 2.

<sup>175</sup> Richetin et al. 2012, p. 115.

<sup>176</sup> Boz; Korhonen; Koelsch Sand 2020, p. 2.

<sup>177</sup> Steenis et al. 2017, p. 286.

<sup>178</sup> Boz; Korhonen; Koelsch Sand 2020, p. 9.

<sup>179</sup> van Birgelen; Semeijn; Keicher 2009, p. 141.

as high an influence on the purchasing decision compared to other attributes such as brand, price or convenience.<sup>180</sup>

A study on Romanian consumers concluded that higher prices and a higher recycling effort are the main reasons for consumers deciding against sustainable packaging. Only about one third of the respondents stated that there were no disadvantages regarding sustainable packaging. However, respondents were aware of the environmental impact of packaging and cited environmental protection, recycling, reuse and resource conservation as positive effects of sustainable packaging.<sup>181</sup>

In science, different theories exist to try to explain sustainable consumer behavior. In the following a short overview of often mentioned theories is given:

- **The Theory of Reasoned Action (TRA)** takes into account two factors, the attitude and the subjective norm, to anticipate the attitude of a person. The TRA says that family and friends, thus persons in close relation to the consumer, can also influence to which extent an environmentally friendly buying and disposal behavior is developed.<sup>182</sup>
- **The Theory of Planned Behavior (TPB)** is an extension of the TRA, including a third aspect, namely the perceived behavioral control.<sup>183</sup> It is also often used in relation to better understand a consumers' pro-environmental behavior.<sup>184</sup>
- **The Self-Perception Theory** states that consumers transfer their behavior attitudes from one area to the other. This means, conversely, that consumers who choose sustainable products are also more likely to take care of the proper disposal of the resulting packaging waste.<sup>185</sup>
- According to the **Signaling Theory**, visual attributes such as sustainable labels are an advantage because they indicate quality and sustainability to consumers.<sup>186</sup>

#### 4.4 Designing Sustainable Packaging

In the FMCG sector, the packaging design is important because there is little differentiation between the products. It is, therefore, a help to decide on a product. From a consumer perspective, structure, images and information are important in terms of packaging design to recognize sustainable packaging.<sup>187</sup> The colour green is often used as this colour is linked to sustainability.<sup>188</sup> Physical features have a greater impact on consumer purchase intent than non-material features. This is because the materials and technology used have an impact on, for example, perceptions of food quality or credibility.<sup>189</sup> In addition, brands play

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<sup>180</sup> Zeng; Durif; Robinot 2021, p. 3.

<sup>181</sup> Orzan et al. 2018, p. 6.

<sup>182</sup> van Birgelen; Semeijn; Keicher 2009, p. 129 f.

<sup>183</sup> van Birgelen; Semeijn; Keicher 2009, p. 130.

<sup>184</sup> Richetin et al. 2012, p. 113.

<sup>185</sup> van Birgelen; Semeijn; Keicher 2009, p. 128.

<sup>186</sup> Zeng; Durif; Robinot 2021, p. 2.

<sup>187</sup> Magnier; Schoormans; Mugge 2016, p. 133.

<sup>188</sup> Steenis et al. 2017, p. 287.

<sup>189</sup> Zeng; Durif; Robinot 2021, p. 2.

an important role for consumers because it helps them to trust in the quality of a food product.<sup>190</sup>

Like already mentioned, the protection of food products is one of the main requirements of packaging. Designing sustainable packaging is all about the right approach. It is important to define the criteria for product protection first, and only then select the kind of packaging material, rather than the other way around. Otherwise, there is a risk of higher costs and less product protection, which in turn leads to food waste.<sup>191</sup>

Consumers tend to focus more on the post-consumption phase when evaluating the sustainability of certain packaging material and not on how the packaging itself was produced. This can be related to the visibility of the pollution from packaging waste. Pollution through plastic bags and fast-food cartons are much more present in the eyes of the consumers compared to the whole life cycle (creation to recycling) of a glass bottle. The visibility of environmental pollution can also support a certain consumer perception in terms of sustainable packaging.<sup>192</sup>

A study about the packaging of potato chips, conducted in Spain, came to the conclusion that consumers relate packaging made of paper to a higher quality product compared to metallized packaging. In addition, the perception of additional information was tested by means of a visual or verbal presentation. As in other studies, it was found that the visual presentation (e.g., a picture on the packaging) of additional information performed better than the verbal presentation (e.g., a text description on the packaging).<sup>193</sup> These findings also fit with a study from the Netherlands, which recommends the use of labels and logos to indicate the sustainability of packaging.<sup>194</sup>

Although labels are often mentioned as a suggestion for recognizing sustainable packaging, it also brings uncertainties. As it is difficult for consumers to distinguish companies with real efforts from those who do greenwashing. For consumers it is helpful if labels come from reliable and neutral organizations.<sup>195</sup> A study conducted in France concluded that sustainable packaging leads to the perception that the products inside are of higher quality when there is no additional information on the packaging. In this study, the findings showed that if a logo is used on the packaging, this effect is invalidated. Therefore, it can be concluded that “when it comes to sustainability the accumulation of cues does not appear to represent an efficient strategy.”<sup>196</sup>

In connection with the packaging design, the “design for recycling” approach is important. It implies that the focus lies on the recyclability of the packaging.<sup>197</sup> In addition, comparative LCA studies can help to determine which product packaging alternative performs best with considerations of environmental impact. This is a helpful tool during the design process of a packaging.<sup>198</sup>

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<sup>190</sup> Magnier; Schoormans; Mugge 2016, p. 133.

<sup>191</sup> Boz; Korhonen; Koelsch Sand 2020, p. 2.

<sup>192</sup> Boz; Korhonen; Koelsch Sand 2020, p. 8.

<sup>193</sup> Rebollar et al. 2017, p. 244.

<sup>194</sup> Magnier; Schoormans; Mugge 2016, p. 132.

<sup>195</sup> Mehta et al. 2021, p. 584.

<sup>196</sup> Magnier; Schoormans; Mugge 2016, p. 139.

<sup>197</sup> Der Grüne Punkt n. y.

<sup>198</sup> Grant; Barichello; Fitzpatrick 2015, p. 569.

## 5. Developments in Retail

### 5.1 Structure of the Retail Sector

Retail in general “refers to the sale of goods or services from companies to individual end-consumers.”<sup>199</sup> In this master’s thesis, the term “retail” is used in the sense of food retailing. It is made apparent out when the term is used in its more general form, including other sectors. The retail sector has a major impact on the economy, the environment and society. Since it satisfies a basic human need, that for food.<sup>200</sup> These are the same three aspects that are mentioned in the Three-Pillar Model of Sustainability.<sup>201</sup>

One of the biggest changes in the retail sector was the introduction of self-service, which took place after the Second World War.<sup>202</sup> Nowadays, the retail sector in general (not only food) is an important job provider for many people in the EU. In fact, one out of four companies is operating in the area of retail or wholesale. This is more than in construction, manufacturing or gastronomy.<sup>203</sup> Furthermore, the importance of the retail sector is visible with a contribution of 11% to the EU’s GDP.<sup>204</sup>

Retail takes place in many different forms, it can for example be a little corner shop, a supermarket or increasingly today also online.<sup>205</sup> When comparing the numbers of products in a grocery shop it becomes visible that the industry completely changed. Around 1950, the number of products was 1,400 whereas in recent years numbers up to 90,000 are possible.<sup>206</sup> An average retailer has 10,000 food products in their assortment.<sup>207</sup> The large assortment makes communication based on the packaging more difficult. Therefore, visual means (material, shape, color) are used to try to draw the consumer’s attention to the product. Examples of eye-catching packaging are Pringles potato chips and Toblerone due to the unusual shape of their packaging.<sup>208</sup>

The high competitiveness in the general retail sector leads to low profitability. The sub-sector grocers is amongst those where the market concentration is the highest. In addition, retailers are subject to regulatory intervention, which can affect their competitiveness. A further challenge, especially for international retailers, is that they must fulfill the needs of the local customers. Therefore, constant adaptation to the market to respond to the changing environment and being innovative is necessary to be successful.<sup>209</sup>

*“A retailer’s competitive capabilities derive from their ability to procure the range of goods that consumers will want to buy, and offer them in the right way, in the right location and at the right price.”<sup>210</sup>*

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<sup>199</sup> EuroCommerce n. y.

<sup>200</sup> Lienbacher; Metzler; Holweg 2016, p. 345.

<sup>201</sup> Spörrle; Bekk 2015, p. 286.

<sup>202</sup> Lorentsich; Seeliger 2015, p. 114.

<sup>203</sup> EuroCommerce n. y.

<sup>204</sup> European Commission n. y.-a.

<sup>205</sup> EuroCommerce n. y.

<sup>206</sup> Beitzel-Heineke; Balta-Ozkan; Reefke 2016, p. 1529.

<sup>207</sup> Lorentsich 2016, p. 337.

<sup>208</sup> van Ooijen et al. 2016, p. 33.

<sup>209</sup> Reynolds; Cuthbertson 2014, p. 8 f.

<sup>210</sup> Reynolds; Cuthbertson 2014, p. 12.

There is no retailer on a global or European level that has a large market share. This is very uncommon in comparison to other industries like energy or finance. The biggest retail company in Europe is Carrefour with a market share of 2.4%.<sup>211</sup> The retail sector in Germany is dominated by four big companies: Edeka, Rewe, Aldi and Schwarz Group. They control three quarters of the market.<sup>212</sup> In 2020, the market shares in the Austrian food retail were distributed as follows: Spar 35%, Rewe 33% and Lidl/Hofer 25%. The remaining 7% are shared by several retailers. This means that four retailers dominate more than 90% of the market.<sup>213</sup> In Switzerland, Migros and Coop dominate around 70% of the market.<sup>214</sup>

It can be observed that the number of discounters is growing, while at the same time the number of small supermarkets declines.<sup>215</sup> The large retail chains determine which products are included in their assortment and at what price, thereby demonstrating their market power. Suppliers are coming under increasing pressure due to the growing number of private labels, price pressure and other concessions they have to make.<sup>216</sup>

Despite the importance of innovation, there is a noticeable lack of it on the side of retail and politics.<sup>217</sup> Investments can currently be observed in self-scanning cash registers, loyalty systems and new payment options.<sup>218</sup> Also in the areas of new products and change of packaging efforts are visible, but retailers must always evaluate the associated costs and risks. When having a closer look at the development of private label products, it is remarkable that consumers have good trust in these products compared to named brands. Which is also visible in the numbers, private label products account “for over 30% of food retail sales volume across Western Europe.”<sup>219</sup>

In retailing, the customer stands in the center. This is the reason why many retailers increasingly see their responsibility for environmental and social concerns.<sup>220</sup>

## 5.2 Evolution of Sustainable Aspects in Retail

Food retailing is the interface between consumers and producers.<sup>221</sup> They have therefore a special position in the value chain. They can be seen as an ecological gatekeeper<sup>222</sup> because they have the opportunity to influence consumers' sustainable purchasing behavior and encourage them to reduce packaging waste. However, they should take into account consumer preferences. This is already being implemented in part, as evidenced by the current emergence of packaging-free stores.<sup>223</sup> Conventional retailers can make a contribution by giving priority to the presentation of sustainable products.<sup>224</sup> This means retailers can influence society in that they pick up on trends, giving them a higher chance

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<sup>211</sup> Reynolds; Cuthbertson 2014, p. 46.

<sup>212</sup> Handelsblatt Research Institute 2020, p. 74.

<sup>213</sup> Schultz 2021.

<sup>214</sup> Schultz 2019.

<sup>215</sup> Pittner 2014, p. 24.

<sup>216</sup> Bogner; Brunner 2007, p. 51 f.

<sup>217</sup> Reynolds; Cuthbertson 2014, p. 9.

<sup>218</sup> Reynolds; Cuthbertson 2014, p. 56.

<sup>219</sup> Reynolds; Cuthbertson 2014, p. 9.

<sup>220</sup> Reynolds; Cuthbertson 2014, p. 6.

<sup>221</sup> NABU n. y.-a.

<sup>222</sup> Pittner 2014, p. 27.

<sup>223</sup> Su et al. 2021, p. 2.

<sup>224</sup> Pittner 2014, p. 27.

of success.<sup>225</sup> Furthermore, they can transfer ecological demands to the manufacturer due to their market power. The production of private labels shows that retailers can make demands on the manufacturers.<sup>226</sup> Due to the increasing market concentration and growing importance of private labels, supermarkets are gaining a stronger influence.<sup>227</sup>

As a step towards the consideration of sustainable aspects in retail, a packaging regulation was introduced in 1993 in Austria. It provided for the return of all packaging waste along the supply chain from the customer via the retailers back to the suppliers. However, since this is not ecologically sensible, the retail sector has participated in the financing of a collection and recycling system for packaging waste called ARA (Altstoff Recycling Austria).<sup>228</sup>

Efforts on the part of the EU can be seen in the establishment of the “Retail Forum for Sustainability.” Sustainable development in the retail sector supports the goal of reducing the environmental footprint of the EU. The forum is, like the name already reveals, concentrating on the contribution of the retailers, as they are the connection between producers and consumers.<sup>229</sup> 16 large retailers and 3 associations are part of the programme. Among others, the following retailers are participating: Rewe Group, Lidl, Metro Group, Kaufland, Carrefour and El Corte Inglés.<sup>230</sup> To mention one commitment, retailer Lidl has the following goal for Germany:

*“We aim to use only recycled paper as raw material for the production of our own-brand food product packagings. If we need fresh fiber, the raw material should be FSC certified.”<sup>231</sup>*

Lidl did not set a specific target year, unlike other retailers which are part of the programme. In 2015, the initial situation was that 60% of their own brands packaging was from recycled or FSC certified material.<sup>232</sup>

Since the 1<sup>st</sup> of January 2020, the plastic carrier bag ban is valid in Austria. The implementation was based on the EU directives. However, this ban does not apply to very light plastic carrier bags, which are made predominantly from renewable raw materials and are suitable for self-composting. The plastic shopping bags are permitted, as the aim is to ensure that reusable shopping bags are used.<sup>233</sup> The ecological sense of banning plastic bags is also controversial, since the production of paper or cotton bags requires more resources. In addition, the thermal recycling of residual waste requires a certain amount of plastic, otherwise petroleum must be used for combustion.<sup>234</sup> But, the image of plastic bags in the ocean has become strongly anchored in the minds of consumers.<sup>235</sup> A factual argument about the actual environmental impact of plastic bags, which for instance is very low in the case of Austria, is therefore no longer possible. This example shows that there are also limits for retailers in influencing trends.<sup>236</sup>

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<sup>225</sup> Lorentschitsch; Seeliger 2015, p. 108.

<sup>226</sup> Pittner 2014, p. 27.

<sup>227</sup> NABU n. y.-a.

<sup>228</sup> Lorentschitsch; Seeliger 2015, p. 110 f.

<sup>229</sup> European Commission n. y.-a.

<sup>230</sup> “Signatories of REAP” n. y.

<sup>231</sup> European Commission n. y.-b.

<sup>232</sup> European Commission n. y.-b.

<sup>233</sup> Wirtschaftskammer Vorarlberg 2020.

<sup>234</sup> Lorentschitsch 2016, p. 339.

<sup>235</sup> Lorentschitsch; Seeliger 2015, p. 112.

<sup>236</sup> Lorentschitsch; Seeliger 2015, p. 113.

Another sustainable alternative to packaging is the so-called natural branding or natural labeling, which has already been used in Australia and New Zealand since 2009. The EU allowed laser labeling of fruit and vegetables in 2013.<sup>237</sup> In addition to the significant savings in plastic packaging, the natural labeling requires less than 1% of the energy needed to produce a sticker.<sup>238</sup> However, this variant has not yet become fully established, partly due to customer acceptance, non-applicability for some products, and concerns on the part of retailers.<sup>239</sup> The figure below shows what natural labeling looks like. In the picture, the organic logo of the EU is visible.<sup>240</sup>



Figure 7: Ginger with Natural Labeling<sup>241</sup>

Nowadays there are further innovative approaches in terms of smart packaging, which provide information on whether the cold chain has been interrupted or have radio chips, which are automatically registered by the cash registers.<sup>242</sup>

The development of retailers' move towards sustainability is attributed to consumers and authorities, who are increasingly demanding it.<sup>243</sup> An example for this would be the packaging changes at Spar, a graph including a timeline can be seen in the appendix.<sup>244</sup> Studies claim that there is a connection between a country's waste policy and general consumer demand for less packaging.<sup>245</sup> Supermarkets have the ability to bring change on the sides of consumers and suppliers. Furthermore, they can "pass down their external costs and responsibilities to food processors and farmers."<sup>246</sup>

Despite the improvements, the retail sector is still partly responsible for the large amount of waste generated and the related environmental impact. An identified problem is that the retail sector follows a linear waste management system, whereas a circular system would be more beneficial.<sup>247</sup> In a study in Italy, the packaging waste management of a retail chain was investigated. A concrete suggestion was made as to what extent policy could contribute

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<sup>237</sup> Kürten-Kreibohm 2020.

<sup>238</sup> Eosta n. y.

<sup>239</sup> Tillar 2018.

<sup>240</sup> Europäische Kommission n. y.-a.

<sup>241</sup> Eosta n. y.

<sup>242</sup> Fachverband der Lebensmittelindustrie 2019.

<sup>243</sup> Monnot; Parguel; Reniou 2015, p. 329.

<sup>244</sup> SPAR Österreich n. y.

<sup>245</sup> Yamaguchi; Takeuchi n. y., p. 547.

<sup>246</sup> Beitzten-Heineke; Balta-Ozkan; Reefke 2016, p. 1528.

<sup>247</sup> Marrucci; Marchi; Daddi 2020, p. 594.

to improving it: a tax discount as an incentive would motivate retailers to switch to circular waste solutions, as it would mitigate investments. Subsequently, it would help to achieve the circular economy target set by the EU.<sup>248</sup>

### 5.3 Customer Trends affecting Packaging Waste in Retail

When having a look at the Western society it is noticeable that there is a change regarding an ageing population and smaller households. This also affects the food industry, because the smaller packaging sizes lead to higher packaging use.<sup>249</sup> Other factors cited for the increasing amount of packaging waste include “higher incomes, urbanization dynamics, changing in lifestyles and consumption patterns.”<sup>250</sup> The trends that can be observed in retail are very contrary, like slow food and conscious eating compared to ready meals.<sup>251</sup> In case of convenience, take-away products and meals that have a heat resistant packaging for easy preparation influence the requirements for packaging.<sup>252</sup> According to a study by Hanssen et al. more than half of consumers are of the opinion that ready meals have too much packaging and more than a third think that it is difficult to separate and dispose of them properly.<sup>253</sup>

One group that is particularly of interest is the consumer group of LOHAS, which stands for Lifestyles of Health and Sustainability. This group consists of people who prioritize their purchasing decisions according to the sustainability of a product or service.<sup>254</sup>

The example of an own brand, “Ja! Natürlich”, within the international REWE group<sup>255</sup> shows that sustainable packaging is a process and that customers can bring about change. At first, the disposable glass bottle was introduced because it was uncertain to what extent customers would accept it and the investment in a new filling station would have been too risky. After the demand was high, the introduction of the returnable glass bottle became possible.<sup>256</sup>

#### Evolution of Unpackaged Stores

“Zero waste shopping is basically the new old.”<sup>257</sup> When shopping unpacked, customers bring their own containers. In most cases, the product range includes organic food, hygiene products and cleaning products.<sup>258</sup> Unpackaged stores follow a completely different approach. The goal is not to make packaging more sustainable, the focus lies on reducing or completely removing packaging.<sup>259</sup> Shopping at the unpacked store requires more planning, because there are less stores and thus often other routes have to be taken. In

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<sup>248</sup> Marrucci; Marchi; Daddi 2020, p. 600.

<sup>249</sup> Beitzel-Heineke; Balta-Ozkan; Reefke 2016, p. 1529.

<sup>250</sup> Tencati et al. 2016, p. 35.

<sup>251</sup> Beitzel-Heineke; Balta-Ozkan; Reefke 2016, p. 1529.

<sup>252</sup> Rundh 2005, p. 682.

<sup>253</sup> Hanssen et al. 2017, p. 400.

<sup>254</sup> “What is LOHAS?” n. y.

<sup>255</sup> REWE International n. y.

<sup>256</sup> Weber 2020.

<sup>257</sup> van Odijk; Poggenpohl 2019.

<sup>258</sup> van Odijk; Poggenpohl 2019.

<sup>259</sup> Fuentes; Enarsson; Kristoffersson 2019, p. 258.

addition, enough containers must be taken along and it should therefore already be determined before the purchase what quantity of which product is purchased.<sup>260</sup>

Being that packaging-free shopping has grown strongly in recent years, some large supermarket chains have followed suit.<sup>261</sup> Which gets evident with the following examples:

- Back in 2019, Tesco, the biggest retail chain in Great Britain, added unpackaged goods to its assortment in two of its stores as a test. Customers could choose between 45 items.<sup>262</sup>
- According to its own statements, retailer Interspar is the first large grocery store in Austria that offers customers filling stations for unpackaged food. The offer includes pasta, pulses, rice, cereals and dried fruit in organic quality. Customers can fill the products in their own containers or there are free paper bags available. Before, the range of packaging-free products was tested based on washing and dishwashing detergents.<sup>263</sup>

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<sup>260</sup> Fuentes; Enarsson; Kristoffersson 2019, p. 262.

<sup>261</sup> van Odijk; Poggenpohl 2019.

<sup>262</sup> Rützler 2021.

<sup>263</sup> Interspar n. y.

## 6. Best Practice Examples in the Food Sector

The selection of the following best practice examples was based on mentions in articles<sup>264</sup> and an interview with an expert on the subject of sustainable food packaging.<sup>265</sup> By using various product categories from companies in different countries, it was attempted to give as diverse a picture as possible.

### **Ja! Natürlich**

The mission of “Ja! Natürlich” is, according to their website, “Green Packaging.” In 2011, the company started an initiative to reduce plastic packaging in the area of fruits and vegetables. This was done through the usage of wood cellulose film and stickers as packaging. Two years later the switch from plastic trays to cardboard trays took place. Further changes followed, such as natural branding (lasering of fruits) or implementation of grass paper, which is a 100% renewable raw material. In 2018, the plastic bag packaging of their organic carrots was replaced by a biodegradable bag. In 2020, additional plastic lids have been omitted from some products and returnable glass packaging was introduced. This year, the range will be expanded to include another milk product in the returnable glass bottle.<sup>266</sup>

### **Pasta Manufacturer Wolf**

The company Wolf is the first pasta manufacturer worldwide to pack its noodles in paper. This required around 11 years of research by external companies. The reason for this is that there are certain limits in the case of using sealing material, which is needed to close the packaging, so that the packaging can actually be disposed of as paper. In addition, the paper must be particularly tear-resistant so that the product does not pierce the packaging. The production of the products is CO2 neutral and the company is energy self-sufficient.<sup>267</sup> The packaging is not only recyclable but also biodegradable. An important differentiation criterion exists with paper packaging that has a plastic film inside.<sup>268</sup>

### **Ritter Sport**

The Ritter Sport company shows its commitment through constant development in terms of packaging. Since 2018, FSC certified materials are used for the production of the packaging. This means that the wood which is needed for the packaging materials comes from sustainable forestry. In 2020, they managed to change their packaging to Cradle to Cradle certified, which means that now “all the material ingredients are transparently listed and evaluated to optimize the materials’ recyclability.”<sup>269</sup> In 2020, they also started with the practical test of packaging the chocolate in paper. The main thing was to take into account the factors of transport and storage in the store. After testing with the prototype, a firmer

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<sup>264</sup> Der Grüne Punkt n. y.

<sup>265</sup> Riedmann; Reitbauer 2019.

<sup>266</sup> Ja! Natürlich Naturprodukte Gesellschaft n. y.

<sup>267</sup> Wolf Nudeln n. y.

<sup>268</sup> Stoiber 2018.

<sup>269</sup> Ritter n. y.

paper was used.<sup>270</sup> This was necessary to improve the tear strength. The companies' goal is to have packaging made from renewable raw materials and to establish a circular waste system.<sup>271</sup> From 2025 at the latest, products will be offered exclusively in paper packaging.<sup>272</sup>

### **Rügenwalder Mühle**

The company primarily pursues the important approach of using as little packaging as possible. In one product category ("Veggies für warme Küche") the use of packaging material was reduced by 58% over a period of three years. The difficulty, according to the company, is that each product package must be considered individually because products have different requirements. Rügenwalder Mühle pursues the goal that the packaging is to be made from recycled material or can be completely recycled. The new packaging is already 96% recyclable. This means that the food packaging can be used to make flower pots, for example. Furthermore, the sales cartons for the supermarket shelf and the product labels are made of FSC-certified recycled paper.<sup>273</sup>

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<sup>270</sup> Packaging Europe 2020.

<sup>271</sup> Rehm 2021.

<sup>272</sup> Ritter n. y.

<sup>273</sup> Rügenwalder Mühle n. y.

## 7. Qualitative Study: Guided Expert Interviews

### 7.1 Method Selection and Interview Guideline

The first part of the empirical research consists of verbal data, which were gained through qualitative interviews with experts from retail and producer side. The interviews were carried out as guided interviews, because this survey instrument is suitable for the aim of getting concrete statements about the research topic.<sup>274</sup> A guided interview needs to be differentiated from a narrative interview, where storytelling should be stimulated, and an open interview, where only the topics to be talked about are given.<sup>275</sup>

Guided interviews are defined over the survey instrument, the guideline. Whereas the term expert interview means taking a specific target group, namely experts, into account.<sup>276</sup> The expert interview can therefore be seen as a special form of guided interviews. The interviewee represents the view of a group, in the present case the one of retailers or producers. The person itself is secondary, this would be important when carrying out biographical interviews. In this master's thesis, the person interviewed is important because of his/her position as an expert with regard to a specific field of action,<sup>277</sup> namely the topic of sustainable food and beverage packaging. As experts are often under time pressure, a guided interview as interview form is particularly suitable.<sup>278</sup>

Beneath the type of interview, further differentiations can be made:

- *“Number of respondents: individual interview, pair interview, group discussion*
- *Channel: face-to-face, telephone, online, no constant contact (diary)*
- *Mode: oral, written”<sup>279</sup>*

All interviews were conducted as individual interviews, online and oral, except for one, which was a pair interview, as the person contacted requested this in order to obtain expertise from another department to answer the questions. Nevertheless, this interview is considered as one in the coding (see next subchapter), since both interview partners spoke for the same company. Online surveys are particularly suitable for expert interviews, as these people are often very busy and difficult to reach. In addition, the geographical proximity is not given in most of the cases.<sup>280</sup> Another argument in favour of the decision to conduct the interviews online was the ongoing COVID-19 pandemic.

As a basis of guided interviews serves a guideline,<sup>281</sup> which the name already indicates. This means that pre-formulated questions are necessary.<sup>282</sup> For the design of the guideline, it is important to take open questions.<sup>283</sup> This method is characterized by the fact that it

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<sup>274</sup> Mayer 2013, p. 37.

<sup>275</sup> Loosen 2016, p. 143.

<sup>276</sup> Helfferich 2014, p. 560.

<sup>277</sup> Mayer 2013, p. 38.

<sup>278</sup> Flick 2011, p. 215.

<sup>279</sup> Meyen et al. 2019, p. 79.

<sup>280</sup> Meyen et al. 2019, p. 80 f.

<sup>281</sup> Mayer 2013, p. 37.

<sup>282</sup> Helfferich 2014, p. 560.

<sup>283</sup> Mayer 2013, p. 37.

should be as open as possible and as structured as needed.<sup>284</sup> Another important point is that using a guideline should help to make the interviews better comparable and give the data structure. The interviewer can judge whether a more detailed inquiry is necessary. However, off-topic explanations must be prevented.<sup>285</sup>

Designing the interview guideline was a process, which started with brainstorming and writing down all the topics that came into the researcher's mind after the previously conducted secondary research and with regard to the research question. These topics could then be assigned to three main groups, with the focus defined at the beginning serving as a guide. The three main groups and the allocated themes are visible in the table below.

<b>Packaging</b>	General development in the company Packaging changes Food waste Packaging materials and their perception
<b>Product Categories</b>	Fruit and vegetables Milk
<b>Stakeholders</b>	Politics Retail Customers Producers

Table 1: First Structure of Interview Guideline<sup>286</sup>

Based on this first structure, specific questions were subsequently derived. It should be noted that the questions were adapted to the interviewees in each case. Some questions were asked to both retailers and producers. Questions concerning only one party were asked only to that party. Occasionally, there were also questions that were only asked to one expert, as these were company-specific. The interview guideline with the questions as well as the details described before can be found in the appendix.

## 7.2 Sample Construction and Coding

Since retailers are closest to the end-consumer<sup>287</sup> and producers often resist packaging changes,<sup>288</sup> see subchapter 1.1, the research question of this master's thesis includes producers and retailers. Furthermore, the DACH region is being examined. Since it is not possible to survey all elements (retailers and producers) of this population, a sample is used.<sup>289</sup> "However, the sample has a different function in qualitative research than in quantitative research, which means that its formation is carried out according to different aspects."<sup>290</sup> The following explains what is considered in forming the sample.

Regarding the sample in the qualitative research, the content representation is decisive. The goal is to gain information that goes beyond the case under investigation. It can then be generalized and transferred, for instance to other product categories. In contrast,

<sup>284</sup> Helfferich 2014, p. 560.

<sup>285</sup> Mayer 2013, p. 37 f.

<sup>286</sup> Own table

<sup>287</sup> Willers 2016, p. 18.

<sup>288</sup> Mayer 2017, p. 12.

<sup>289</sup> Mayer 2013, p. 38.

<sup>290</sup> Mayer 2013, p. 38 f.

quantitative research strives for statistical representativeness.<sup>291</sup> It was particularly important to ensure an equal distribution of both industries to reach a balanced content presentation. This makes it possible to identify differences and similarities between producers and retailers with regard to the topic of sustainable packaging. Therefore, the aim was to interview the same amount of experts from each of the two sectors.

The sample structure was determined in advance, because there is a clear research question. This approach to sampling must be distinguished from a theoretical sampling, which is adapted during the survey.<sup>292</sup>

It was necessary to focus on retailers and producers that are based and predominantly active in the DACH region when forming the sample. As there was a greater chance to get access to potential interview partners, a further focus lies on Austrian companies. It was important to include retailers into the sample, which held a large market share. Additionally, regional active retailers and producers were also included. The reason for this was to obtain as heterogeneous a sample as possible to get meaningful results, which are not too biased or one-sided. In addition, with regard to the producers considered, it was important that they produce products of the two product categories more closely examined. The aim was to interview two producers per product category.

There is no scientifically based definition of an expert, as many different sciences deal with expert research. For this reason, it can be stated that experts are always to be regarded as domain-specific. As a decision criterion in this master's thesis, it is considered that experts have a great expertise in contrast to non-experts.<sup>293</sup> The target group can therefore be summarized as "employees of an organization in a specific function and with a specific (professional) experience knowledge."<sup>294</sup> In this case, the expertise needs to be in the field of (sustainable) packaging in food retailing for end-consumers.

In order to be able to guarantee an objective choice of interviewees, different criteria were defined. The interview partners were selected on the basis of their position in the company, as this indicates that the person has the necessary knowledge and is able to make meaningful statements. Within the company, persons that are working in the field of packaging, or more precise in the sustainability department, were preferred. For this purpose, each company was considered individually, as a greater specialization in terms of positions can be observed depending on the size of the company as well as the type of business. In companies where there is no separate sustainability department, possibly due to their smaller size, other persons that can give statements about the topic of sustainable packaging were interviewed. For instance, managing directors, product managers or press spokespersons, since they are used to giving interviews or taking care of interview requests and therefore also have the necessary knowledge or receive information through short channels within the company. Since the focus of the empirical part lies on the two product categories "fruit and vegetables" and "milk," it was, like already mentioned, necessary that the producers, who were included in the sample, came from these sectors.

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<sup>291</sup> Mayer 2013, p. 39.

<sup>292</sup> Mayer 2013, p. 39.

<sup>293</sup> Hillebrand 2018, p. 5. f.

<sup>294</sup> Flick 2011, p. 215.

Two interview partners did not meet these predefined criteria and were therefore not considered in the sample and further evaluation. In the end, the balanced ratio could be achieved by interviewing four experts each. It was important that the “selection of the cases is based on the most even and sufficient occupation of the cells”<sup>295</sup> (see table below).

The following table shows the function of the interviewee within the company, where the company operates in terms of geographical area, as well as the coding to be able to assign the later mentioned statements and at the same time to preserve anonymity. In order to obtain a clear presentation of the sample structure, the interviewees were divided into two groups, retail and producers.

	Code	Function of the Interviewee	Area of Activity
Retail	R1	Head of Sustainability at an international supermarket chain	AT, HU, HR, SI, Northern IT
	R2	Environmental Project Manager at a mainly nationwide supermarket chain	CH, LI, bordering FR
	R3	Spokeswoman of a supra-regional and on a small scale international supermarket chain	Tyrol, Salzburg, Carinthia, Vorarlberg, South Tyrol
	R4	Sustainability officer at a regional supermarket chain belonging to an international retail group	Vorarlberg
Producers	P1	Product Manager of a company that markets and sells ethnic dairy products worldwide	50 countries: e.g., DE, Benelux, FR, GB, AT, CH
	P2	Former Product Manager of an organic food private label that is available nationwide	AT
	P3	Managing Director of a cooperative that markets and sells organic food products supra-regional	Tyrol, Salzburg, Carinthia, Vorarlberg, DE
	P4	Managing Director of a cooperative that markets and sells dairy products regional	Vorarlberg

Table 2: Sample Structure and Coding of Interview Partners<sup>296</sup>

Regarding the sample, retailers and producers from the DACH region were taken into account. Representativeness is not given as there is a strong bias towards companies based in Austria, e.g., no retail market leader from Germany is represented and no producer based in Switzerland. Therefore, it is not possible to draw any conclusions about the population, which means that assumptions should be made with care.

### 7.3 Conduction of Interviews

It was not possible to find any interview partners via official inquiries, because all requests were rejected or not answered at all. Therefore, a different approach was chosen in a second attempt, where interview partners were recruited by using third party contacts, these persons are also called "door openers". In this approach, the request is presented in the researcher's own network and it is inquired whether suitable participants that belong to the population can be mediated.<sup>297</sup> Since this took more time than planned, the interviews and the online questionnaire were conducted at the same time and not consecutively as originally planned.

<sup>295</sup> Mayer 2013, p. 40.

<sup>296</sup> Own table. The sources of the countries where the companies operate are not mentioned in order to preserve anonymity.

<sup>297</sup> Meyen et al. 2019, p. 68 ff.

After the contact was made by third parties, as described above, direct contact was made with the respective interview partners via email. The content of the master's thesis as well as the concern was explained. Almost all interviewees wanted the questions to be sent in advance, among other things to make sure they were the right people to be interviewed or to have the questions approved by management beforehand.

As a next step, the appointments for the interviews were made. It is particularly important that both interview participants are familiar with the communication channel used, ideally through regular use.<sup>298</sup> For this purpose, the interviewees were asked about their preferred medium in advance. As a result, the interviews were conducted via different platforms, namely Skype, Teams and Zoom.

In the beginning, the interviewees received a short introduction about the procedure and the topic of the interview, detailed information was already given via email. It was clarified if the conversation could be recorded. As an introductory question, the person was asked about his/her position and the tasks in the company. Then, the questions of the interview guideline, visible in the appendix, were asked. In the end, questions on both sides were clarified and the researcher thanked the interview partners for their time.

The interviews were conducted in the German language in May 2021 and lasted between 24 and 37 minutes, the average length being 28 minutes. All interview partners had agreed that the conversation could be recorded. This made it possible to devote full concentration to the interview partners.

Before the analysis could take place, the interviews were transcribed based on the recordings.<sup>299</sup> At the recommendation of Hillebrand, phonetic sounds (like "uhm") were not taken into account, since this master's thesis focuses on the content and not on a linguistic analysis.<sup>300</sup> As already mentioned, the interviews were conducted in German, and this was also retained in the transcription. Dialect expressions were not taken over, but were translated into High German. "The transfer into normal written German is the most extensive protocol technique."<sup>301</sup>

## **7.4 Evaluation according to Mühlfeld**

The advantage of using the method of qualitative interviews is that there are already far-reaching developments in the evaluation procedures, in addition, information can be obtained undistorted and authentically and it is intersubjective. Furthermore, the possibility of reproduction is a significant factor.<sup>302</sup> "Especially the comparison of text and its interpretation results in control possibilities, which assign a methodologically and methodologically high status to the qualitative interview."<sup>303</sup>

There are different methods that can be used for the evaluation of interviews. The decision to choose the 6-step procedure of Mühlfeld et al. lies in the development of this method,

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<sup>298</sup> Meyen et al. 2019, p. 83.

<sup>299</sup> Bogner; Littig 2002, p. 83.

<sup>300</sup> Hillebrand 2018, p. 60.

<sup>301</sup> Mayring 2002, p. 91.

<sup>302</sup> Lamnek; Krell 2010, p. 301.

<sup>303</sup> Lamnek; Krell 2010, p. 301.

which occurred during a study on unemployed employees.<sup>304</sup> Although narrative interviews were conducted in that study, they were also conducted with a guideline, which is why there are parallels to the present study.

Mühlfeld et al.'s method of analysis arose from the consideration of how to bring the interesting contents of the interview closer to the readers without the need to read through the entire interview, while at the same time preserving originality.<sup>305</sup> The figure below shows the 6-step procedure for evaluating the interviews according to Mühlfeld.<sup>306</sup>

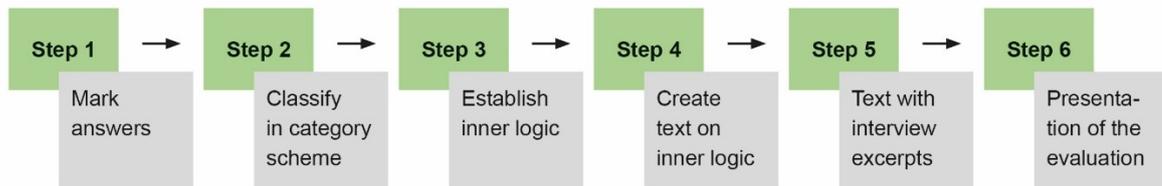


Figure 8: Six-Step Procedure for the Evaluation of Texts According to Mühlfeld<sup>307</sup>

As the first step, after the transcription, all interviews were printed out and the text parts, which were identified as answers to the questions in the underlying interview guideline, were marked.<sup>308</sup>

In the second step, the interview was broken down into individual pieces of information and classified into the category scheme that had already been prepared. The category scheme was created based on the information that was also used to develop the interview guideline. During this procedure, the category scheme was further expanded.<sup>309</sup> For the classification into the scheme, individual parts of the text were anonymized, because these would have allowed direct backtracking to the company of the respective expert, for instance through the mention of certain names. The schema categorization was done manually and without a program, which was very time-consuming. The use of a computer program in analysis can help, but in qualitative research, the focus is on "understanding meaning in the text."<sup>310</sup>

The third step consists of the creation of the internal logic of the previously split, individual information within the single interviews. In this step, particular attention is paid to statements with the same meaning and statements with contradictory meanings.<sup>311</sup>

The following stages, four, five and six were worked out in close connection.<sup>312</sup> First, the internal logic was written down, as Mühlfeld et al. had intended. Next, a text with statements from the respective interviews was created. Here a further, and at the same time last, alignment with the transcribed text took place. The last stage is the sixth, which contains

<sup>304</sup> Mühlfeld et al. 1981, p. 325.

<sup>305</sup> Mühlfeld et al. 1981, p. 326.

<sup>306</sup> Mayer 2013, p. 48 ff.

<sup>307</sup> Own figure based on Schmieja 2014, p. 76.

<sup>308</sup> Mayer 2013, p. 48.

<sup>309</sup> Mayer 2013, p. 49.

<sup>310</sup> Hillebrand 2018, p. 62.

<sup>311</sup> Mayer 2013, p. 50.

<sup>312</sup> Schmieja 2014, p. 77.

the presentation of the evaluation text.<sup>313</sup> This presentation of the evaluation can be seen in chapter 8.

## 7.5 Quality Criteria of Qualitative Study

The quality criteria have their origin in the classical measurement and test theory of psychology. These general criteria help to make different methods comparable with each other. The purpose of the quality criteria is to determine the degree of science of a particular research method.<sup>314</sup> The classical quality criteria are besides objectivity, validity and reliability. They were originally developed in quantitative research.<sup>315</sup> According to Mayer, "validity concerns whether what should be measured is measured (...). Reliability refers to stability and accuracy."<sup>316</sup>

One criticism of qualitative research refers to selective plausibility, which describes that the presentation of the results is only made transparent by using "illustrative" interview quotes.<sup>317</sup> The use of the two classical quality criteria reliability and validity is intended to solve this problem.<sup>318</sup> Therefore, these criteria, which are explained next, were applied for the qualitative part of this master's thesis to demonstrate the scientific significance.

### Reliability

The reliability was verified according to the understanding of Flick. Therefore, procedural reliability was applied, which means that the interview guideline was rechecked through a pretest interview with a packaging expert.<sup>319</sup> In addition, it was important to show how the data were obtained and that it is clear "what the statement of the respective subject is and where the interpretation of the researcher has already begun."<sup>320</sup>

### Validity

In qualitative research, validity gains more attention than reliability.<sup>321</sup> There exists different forms of validity.<sup>322</sup> In this master's thesis, the method of communicative validation is used. This means that respondents are confronted with the interpretation of the researcher. The back-up in relation to the interpretation results increases its relevance,<sup>323</sup> because "the content-related consent of the interviewed subject to his statements is obtained."<sup>324</sup>

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<sup>313</sup> Mayer 2013, p. 50.

<sup>314</sup> Lamnek; Krell 2010, p. 127.

<sup>315</sup> Lamnek; Krell 2010, p. 131.

<sup>316</sup> Mayer 2013, p. 55 f.

<sup>317</sup> Mayer 2013, p. 56; Flick 2011, p. 488.

<sup>318</sup> Flick 2011, p. 489.

<sup>319</sup> Flick 2011, p. 491.

<sup>320</sup> Flick 2011, p. 492.

<sup>321</sup> Flick 2011, p. 492.

<sup>322</sup> Lamnek; Krell 2010, p. 138.

<sup>323</sup> Lamnek; Krell 2010, p. 132; Mayer 2013, p. 57.

<sup>324</sup> Flick 2011, p. 495.

## 8. Presentation of the Qualitative Study

### 8.1 Packaging related Topics

#### General Development

One of the retail interviewees mentioned two important trends: firstly, convenience products,<sup>325</sup> e.g., ready-to-eat or ready-to-cook products, which are more processed foods that usually require more protection or are offered in more voluminous packaging. Second, the strong increase in small quantities, as there are more single-person households. The different requirements for packaging of convenience products<sup>326</sup> and the growth in case of smaller households and smaller packaging sizes<sup>327</sup> are also discussed in subchapter 5.3.

*R2: "The ratio is changing unfavorably at the moment. You need more packaging material to fill the same amount of product. But ecologically, small sizes make a lot of sense when it comes to avoiding food waste."*

#### Functions of Packaging

In general, there is consensus among the interviewees that packaging has important functions to fulfill. It was often mentioned that the requirements for packaging vary from product to product and are different, for example, for fresh products or products with a longer shelf life. In case of retailers, the most frequently mentioned is the protection of the product, e.g. against pressure marks or generally to extend the shelf life. The same applies to the interviewed producers, who also see product safety as a priority. This is consistent with the view of packaging functions in the literature. The easy usage,<sup>328</sup> protection<sup>329</sup> and further functions are explained in subchapter 3.1. Furthermore, subchapter 4.1 deals with the requirements, especially for sustainable packaging, and product protection is also explicitly mentioned by Zeng et al.<sup>330</sup>

*P2: "The packaging has a very clear purpose to ensure the shelf life of the products and also to extend it to a certain extent. (...)"*

*P1: "(...) that the packaging is easy to handle for consumers, e.g., that it meets the needs of consumers, is easy to open, is light and of course to protect the product well."*

*R1: "On the one hand, functions directly on the product, which is the preservation of freshness."*

*R3: "In terms of saving resources, it is most important that the product is well protected, has a long shelf life and reaches the consumer in top quality. (...)"*

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<sup>325</sup> Schüler 2020.

<sup>326</sup> Rundh 2005, p. 682.

<sup>327</sup> Beitzel-Heineke; Balta-Ozkan; Reefke 2016, p. 1529.

<sup>328</sup> Gustavo et al. 2018, p. 19; Rundh 2005, p. 671.

<sup>329</sup> Williams; Wikström; Löfgren 2008, p. 855 f.

<sup>330</sup> Zeng; Durif; Robinot 2021, p. 2.

## Food Waste

The interviewees themselves addressed the topic of food waste when talking about packaging. Up to a quarter of total food waste can be attributed to packaging design, e.g., too big packaging.<sup>331</sup> Therefore, another important function of packaging is to prevent food waste. Products without packaging often spoil quicker, while the packaging helps to keep the food longer fresh and thus reduces food waste. The interviewees also mentioned that packaging has a much lower ecological impact than the spoilage of the product. This is due to the fact that the production of the product requires a lot of resources, e.g., during cultivation in the form of fertilizer and required machinery, transport and storage. Furthermore, food waste also has economic consequences for producers and retailers. The link between packaging and food waste as well as the impact of production are explained in subchapter 3.2.

*P2: "(...) where we failed at the first attempt, because the packaging simply did not close tightly and thus the goods spoiled."*

*R4: "With unpacked carrots it is the case that much more food waste is produced. (...) For example, for us it is more expensive to buy organic meat, and then if we have to throw away a lot of organic meat, it costs us more."*

*R3: "When it comes to the question of packaging or not, the avoidance of food waste also plays an important role. This interdependency must be carefully weighed up."*

## Packaging Materials

The large number of available packaging materials lead to the fact that partially wrong opinions are formed by the consumers.<sup>332</sup> In terms of customer perceptions of packaging materials, retailers and producers have the clear view that customers have very strong opinions. Plastic has a very negative reputation, whereas glass and paper are viewed positively by customers. This opinion of the interviewees is also confirmed by various studies,<sup>333</sup> and is described in subchapter 3.3. Furthermore, the visibility of the pollution of certain packaging materials influences opinions.<sup>334</sup>

*R2: "It's really like that, plastic has an incredibly negative affliction."*

*R3: "Although paper consumes a great deal of water in its production and when recycled into waste paper, it has a positive image among customers. (...) Particularly in the media and among broad sections of the population, the opinion circulates that paper is better than plastic and that packaging made from renewable raw materials is sustainable. (...) Packaging made of mono-plastics (...) are more resource-efficient in production and can be easily recycled. As a result, they can be reused several times and are part of the circular economy. Nevertheless, plastic packaging is usually rejected per se."*

*P2: "You can see that paper packaging is becoming more and the topic of plastic is being discussed very widely as a catchword."*

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<sup>331</sup> Williams et al. 2012, p. 147.

<sup>332</sup> Steenis et al. 2017, p. 286.

<sup>333</sup> Steenis et al. 2017, p. 294.

<sup>334</sup> Boz; Korhonen; Koelsch Sand 2020, p. 8.

P3: "(...) 'Out of plastic' or 'plastic must be eliminated,' then all is well. It is certainly not that simple. Not every replacement for plastic packaging or plastic film is generally positive or generally to be unreservedly endorsed in terms of sustainability. (...)"

## Influencing Packaging Material

The retailers were asked about their possibilities for influencing the packaging material that is being used. In the case of private labels it is claimed that retailers have a greater scope of influence,<sup>335</sup> see subchapters 5.1 and 5.2, which was confirmed during the interviews. However, this does not apply to brand products.

R1: "It is unrealistic for us to approach Nestlé, Procter & Gamble or Coca Cola and tell them how they have to design packaging. In the case of private labels, we have an influence, although our influence on private labels is also limited in that there are very small amounts in international comparison. (...) The company will not set up its own packaging line because of us (...)"

R2: "There are many products that we manufacture ourselves and here we also have much more influence on how it is packaged. On the other hand, if you buy products from a brand supplier, then you usually don't have too much influence on the packaging."

R4: "Our sphere of influence is a bit larger with regional products or suppliers."

## Reusable Packaging

When assessing the packaging material, the influence of the transport route must not be underestimated.<sup>336</sup> This is the case with reusable offers, they are welcomed in general, but the experts interviewed have concerns about the ecological benefits with regard to transport distances. Additionally, the depot handling was mentioned often in this context. One retail expert also stated that further consequences should not be ignored, e.g., if this changes the means of transport used for shopping from bicycle to car.

R3: "Reusable packaging is environmentally friendly and ecologically sensible, if the filler, point of sale, washing plant and refilling are all located in the same region."

R2: "With the returnable bottle, I understand the customer's need, but you have to be careful that it doesn't become an ecological boomerang. Above all, it depends on the transport distance of this very heavy glass."

P3: "In the past, there have been repeated attempts to offer reusable or glass systems for certain beverages, and the Austrian retail in particular has said, 'We're not interested in that. We certainly do not want to have to manage all the collection, logistics, storage, containers, and so on. We only want one-way.' Without discussion. That is quite a harsh opinion."

## Sustainable Packaging

All interviewed producers and retailers are actively engaged in packaging changes with regard to more sustainable solutions. Several of them stated that the topic of sustainable packaging has become fundamentally more important in recent years and that it will gain further importance after the pandemic is over. When asking about concrete examples for the implementation of sustainable packaging, it became apparent that producers use very

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<sup>335</sup> Pittner 2014, p. 27.

<sup>336</sup> Humbert et al. 2009, p. 104 f.

different materials. Materials like sugar cane,<sup>337</sup> grass paper and cellulose film were mentioned. Beneath the use of sustainable materials, less packaging material is seen as a solution<sup>338</sup> and generally waste prevention.<sup>339</sup> These topics are addressed in subchapters 3.3 and 4.1.

*P3: “In the past, we used to take a plastic container, put the two zucchini on it, put a transparent plastic film over it, either as a stretch film or as a so-called flowpack, and then labeled it with the piece and name (...). In the meantime, with the agreement of the trading partner, we have gone over to this and said that we don't need that at all, we simply stick a 2 by 2 cm adhesive label directly onto the zucchini (...).”*

*P4: “There are also further steps already planned, it is always a process, a flow and probably in 3 years I will be able to report something again, which is another step that you can't even imagine today.”*

Challenges with sustainable packaging include, among other things, the protection of food products and the processing of the packaging material.<sup>340</sup> This means the requirements of the production department or the available packaging materials on the market must be checked. Here, exchange takes place within the entire industry, e.g., at trade fairs.

*P1: “It is currently very difficult to find more ecological materials in the food sector, because the requirements for food packaging are very high, both in terms of product safety, but also logistically and in terms of production technology.”*

The use of sustainable packaging helps to increase the perception of the products as being of higher quality.<sup>341</sup> For organic products in particular, the producers reported that it was important to be able to offer these products in the appropriate packaging.

*P1: “(...) to include the organic character also in the packaging”*

*P2: “(...) not only to sell organic products, but also to add sustainable packaging, because that is also what consumers expect...”*

*P3: “(...) we trade exclusively organic and exclusively regional products and, of course, out of this self-image, which we consider as very important, we also use resource-saving packaging materials.”*

All retailers surveyed indicated that it was possible for a customer to bring their own containers to the fresh food counters. This makes it possible to buy groceries without any packaging at all. However, only a small proportion of customers actually take advantage of this offer, although they demand it. This shows that sustainability considerations are not reflected in the purchasing behavior.<sup>342</sup>

*R4: “It is a great pity that many customers want it and in the end almost nobody does it. But at least we offer it.”*

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<sup>337</sup> Mehta et al. 2021, p. 574.

<sup>338</sup> Orzan et al. 2018, p. 2.

<sup>339</sup> Beitzel-Heineke; Balta-Ozkan; Reefke 2016, p. 1528.

<sup>340</sup> Boz; Korhonen; Koelsch Sand 2020, p. 2.

<sup>341</sup> Magnier; Schoormans; Mugge 2016, p. 139.

<sup>342</sup> van Birgelen; Semeijn; Keicher 2009, p. 126; Orzan et al. 2018, p. 2.

## Filling Stations

Filling stations are supposed to prevent packaging.<sup>343</sup> In particular, larger supermarket chains are following the trend,<sup>344</sup> see subchapter 5.3. This could be confirmed during the interviews with the retail experts. Especially the larger, nationally or internationally active retail chains are intensively involved with the implementation. However, since the stations for unpackaged food take up a lot of space, they are currently only planned for larger supermarkets. Other disadvantages were mentioned in relation to low utilization and the currently small range of products in bulk containers.

*R1: "The supermarkets have not been chosen arbitrarily so far, but are in regions where we tend to have persons with higher income who are interested in sustainability and are therefore more likely to invest the time to use such a filling station. An implementation in every supermarket would not work. We don't have the target group in every market to be able to implement such elaborate systems that take up so much space. (...) At the filling station we offer 40 products and if you use the same space for pre-packed products, a classic shelf simply where items are inside, then surely five times the amount will fit."*

*R2: "We have had certain foods in filling stations for a very long time, such as dried fruit. However, these were only very small quantities and by-products, so to speak. We recently launched two pilot projects. (...) So it's a recent finding that customers like to use that and we're working hard on that (...)"*

*R3: "Visually, filling stations have a positive impact and bring with them a positive image effect. On the other hand, however, filling stations require a lot of space and are particularly difficult to operate profitably. A supermarket stocks several thousand or tens of thousands of items that have to find their place. Other challenges, such as the high costs for employees who have to refill and clean the stations, as well as the space and storage requirements for the large containers in the stores, must also be taken into account."*

*R4: "The current position is to wait and see how the others are doing. (...) A critical point is the hygiene with open food, that the circulation is correct. If too few people fill things, then it can be that the same food is inside for months, (...) the question for us is how many people will actually use it. It has to pay off for us if we install a large system in the supermarket, this also has to be maintained."*

## Plastic Deposit

EU regulations state that by 2029 plastic beverage bottles must be collected separately.<sup>345</sup> To be able to reach this goal, the introduction of a deposit system could be helpful.<sup>346</sup> Further information regarding EU waste policy can be found in subchapter 3.4. The introduction of plastic deposits in Austria and Switzerland is not supported by those retailers who have commented on it. The reasons given are the already high return rates and the administrative effort involved. One supermarket chain even sees the introduction of plastic deposits as a disadvantage for customers. Contrary to this is the statement of one interviewee that there is not enough recycled material for the production of recycled PET bottles.

*P2: "In sum, it is indeed a difficult issue, because it requires a large investment and requires a major logistics changeover."*

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<sup>343</sup> Fuentes; Enarsson; Kristoffersson 2019, p. 258.

<sup>344</sup> van Odijk; Poggenpohl 2019.

<sup>345</sup> Europäisches Parlament 2019.

<sup>346</sup> Stoll 2019.

R2: “We would definitely oppose a system with deposit, because it would not lead to a higher return rate, this is already very high (...)”

R3: “Establishing an additional collection system would incur massive costs with little added value (...) The introduction of a deposit system would particularly affect small local suppliers, because there is usually absolutely no space for collection logistics and because increased personnel costs are not affordable. In the proposed model, where small stores do not have to take back all containers, customers are motivated to visit large stores where all deposit containers can be returned. In addition, taking back containers by hand leads to waiting times for customers, their tolerance is extremely low. The introduction of a deposit thus leads to a further concentration of trade at large locations and thus to more traffic and climate pollution.”

## 8.2 Product Categories

### Fruits & Vegetables

Regarding the first product category chosen for closer investigation, fruits and vegetables, the majority of the experts mentioned that it is possible to use less packaging or eliminate packaging completely. According to the interviewed retailers, they have greater scope for influencing the packaging of regional suppliers (which was already visible in subchapter 8.1), specifications can be made and there is a very direct contact. Retailers have the ability to impose regulations on the producers, which shows the power of retail.<sup>347</sup>

P3: “For example, we have received a requirement from a special retailer to be completely plastic-free with fresh fruits and vegetables in two years. That is a requirement that the trade has set.”

R3: “Reduction of packaging for fruits and vegetables as far as reasonable and seasonally possible, e.g., regional cucumbers. (...) However, as soon as the transport route becomes supra-regional, it is usually not possible without packaging.”

After the ban of plastic bags in Austria, only very light plastic bags from renewable materials are still allowed.<sup>348</sup> This also affects the fruits and vegetables section. In the case of the interviewed retailers, all supermarkets offer reusable fruits and vegetables bags for packaging-free shopping. In this context, the development towards smaller households, which was addressed in subchapter 8.1, was mentioned again.

P2: “(...) And you mustn't forget that there are also more and more small households that simply don't need six apples, but three are enough, and so in this respect loose sales are something where I see potential.”

P2: “In the fresh produce sector, where I have a corresponding rotation anyway, the packaging does not have to withstand quite so much, I would say, and that is why it was relatively clear for us to start in the fruit and vegetable sector. (...) Of course, it always has the disadvantage in the supermarket that everyone touches the products and then the shelf life is reduced. (...)”

### Milk in Returnable Glass Bottles

The second product category that was considered in more detail is milk. The discussion of milk in glass bottles was already held in Austria in the 1980s.<sup>349</sup> Due to the development with regard to high customer acceptance and customer demand, milk in returnable glass

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<sup>347</sup> Pittner 2014, p. 27.

<sup>348</sup> Wirtschaftskammer Vorarlberg 2020.

<sup>349</sup> Iglar 2020.

bottles is available again.<sup>350</sup> This trend is viewed very diversely by the interviewed producers. There are different opinions on how sustainable glass actually is as a resource and how sensible the reintroduction is. A comparison of studies also showed that opinions differ regarding the sustainability of milk packaging options.<sup>351</sup>

*P2: “(...) it was simply a matter of revitalizing the topic of glass in packaging again for us. (...) It was actually a success story that we had not expected in this form. (...) Then the pressure from the market built up in such a way that it became clear to the dairy: ‘Okay, we have to become reusable here’.”*

*P4: “This is a retro theme. People often associate it with the past or their childhood. (...) We do not see the future in it. Because there are many arguments that do not speak in favor of glass packaging. The disadvantages of glass are in the energy required for production. Then there are the transport kilometers. (...) One truck of Tetra Pack paper, not filled, is the equivalent of 28 trucks of empty glass bottles. (...) How often does a returnable bottle rotate, which is always quoted, this is often a myth, the figures are often embellished, e.g., too high rotations. (...)”*

*P3: “(...) If we were to consider it sensible to switch to a glass bottle, or to switch to returnable glass, then these are investments that may run into the millions of euros. (...) especially in Austria, that a very strong pressure is generated by a market participant from my point of view or also neutrally perceptible on the market. The message is being sent out: Please buy returnable glass now, because that is sustainable, everything else is not so sustainable. (...) the discussion about whether the returnable glass bottle is more sustainable is very broad and much more profound than it is perhaps portrayed in public. (...)”*

### 8.3 Involved Stakeholders

It can be stated that the interviewees see all mentioned parties (politics, media, retail, customers and producers) as equally responsible for the offerings of sustainable packaging. Nevertheless, specific statements about the individual players were made, which show possibilities and opportunities to support the establishment of sustainable packaging and the role of the individual stakeholders.

#### Politics & Producers

The EU strives to achieve the goal of a climate neutral continent.<sup>352</sup> In this context, restrictions in terms of packaging material are made.<sup>353</sup> Due to the EPR concept, the producers have to pay for the waste system.<sup>354</sup>

*R3: “Policy provides the framework and should create measures that benefit the environment but also do not provide an advantage for larger suppliers over smaller ones.”*

*P1: “And we are also watching the current legal regulations and are prepared for changes to come. (...) where probably soon a logo must be applied that this article is made of plastic and should be disposed of correctly. (...) The producers and distributors of packaging have a responsibility to think about reducing materials or using other materials, but also the policy.”*

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<sup>350</sup> Weber 2020.

<sup>351</sup> Berglandmilch 2020; Der Tagesspiegel 2019; Iglar 2020; Szombathy 2020.

<sup>352</sup> Europäische Kommission n. y.-b.

<sup>353</sup> Handelsverband Deutschland (HDE) 2019; Statistik Austria 2018; Riedmann 2020.

<sup>354</sup> Kunz; Mayers; Van Wassenhove 2018, p. 46.

P2: "At some point, political pressure or this political framework is also needed so that all the players become active. (...) because otherwise, everyone fears the disadvantage."

P4: "(...) we as producers support and promote the disposal system through these fees."

## Media<sup>355</sup>

P3: "(...) I assume that they are also firing up the topics in such a way that they attract interest, because ultimately the media landscape is also dependent on customers. These are not necessarily always scientific publications, nor are they always objectively high-quality documentaries that are displayed in many media outlets."

P1: "(...) if then the topic is to save CO<sub>2</sub>, which is discussed largely in the media, then the inquiries of the retail increase 'what do you make to save CO<sub>2</sub>.' So that the supermarket chains can then just advertise with it."

## Customers & Retail

According to Fuentes et al, grocery shopping is done routinely. Therefore, it is difficult to change the respective consumer behavior.<sup>356</sup> This view is confirmed by the retailers, but they have influence possibilities.

R3: "If there is insufficient demand, supply will be reduced as a consequence. (...) Habits are difficult to change: even though sustainability is very important to many people, it seems challenging to actually change one's own behavior."

R4: "The consumer really has a lot of power, because we sell what the customers buy from us in the store. (...) If a lot of people started buying organic, then we wouldn't be able to afford not to offer organic (...). There is a "gap" between what customers say and want and what they actually do in the end."

R1: "Of course, there is a consumer effect and a steering effect of the retail."

P2: "Retailers like to blame the consumer."

In subchapter 4.3, the customer understanding in relation to different packaging materials is discussed. It shows that customers need to be well informed in order to make sustainable purchasing decisions,<sup>357</sup> but the complexity of the topic is a problem.<sup>358</sup> A logo helps to identify sustainable packaging.<sup>359</sup> These topics are addressed in subchapter 4.4.

P4: "What is a challenge is that the mass of the population is not really informed, has relatively little knowledge. That would also be important for me to say, that knowledge is sometimes frighteningly low. People simply adopt opinions that they have heard somewhere. (...) The logo remains, so that the customer verifiably knows how the packaging is produced."

P3: "(...) consumers are becoming very sensitive to sweeping judgments, which can then also have an impact on companies or on the requirements of retailers. Because retailers, of course, react to what people buy and not necessarily to what is sustainable. (...) Smaller producers in particular are more likely to face larger or more serious problems if consumers demand a change in packaging. (...)"

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<sup>355</sup> The role of the media was addressed by the experts interviewed, no references to the literature are made here, as this topic was not explicitly dealt with earlier in the master's thesis.

<sup>356</sup> Fuentes; Enarsson; Kristoffersson 2019, p. 259.

<sup>357</sup> Boz; Korhonen; Koelsch Sand 2020, p. 2.

<sup>358</sup> Steenis et al. 2017, p. 286.

<sup>359</sup> Magnier; Schoormans; Mugge 2016, p. 132.

## 8.4 Discussion of Interview Results

Both groups (producers and retailers) see product protection as a priority. One main difficulty is that the packaging requirements are different for each product. The trend toward smaller households and convenience products was mentioned as being a further challenge. It is essential to avoid food waste because the production of an item already requires many resources. However, for retailers and producers, this is also essential in the sense of economic consequences.

Specific examples of sustainable packaging changes were mentioned from both sectors, like using less or more sustainable materials. However, it is very complex for producers to assess the sustainability of a particular packaging material according to R2. The opinions of retailers and producers were very contrary when it comes to the packaging materials returnable glass and plastic or the topic of plastic deposit.

Retailers have the ability to influence the type of packaging in the case of regional suppliers, especially for the discussed product group fruits and vegetables. This can be confirmed by the fact that the producers mentioned that they partly receive specifications from the retail sector, for instance, being plastic-free in two years, according to P3.

What also needs to be considered is that the acquisition or retention of customers is a priority for retailers. It has been mentioned that they want to give customers a choice regarding packaging. Otherwise, they would buy from a competitor. It can be concluded that they partly want to pass on the responsibility for deciding on the proper packaging to customers. Critical to consider in this context is the battle for the customers, which is assumed particularly in Austria, since the density of the supermarkets is one of the highest.<sup>360</sup> Retailers try to present themselves as sustainable as possible and thereby partly convey a false image to the customers concerning the sustainability of various packaging materials, keyword plastic.

Customer opinions were described as very rigid by the interview partners. There would be a lack of informed customers, who would also tend to have sweeping judgments, and purchasing decisions would occur accordingly.

It became apparent that retailers and producers use the opportunity of test markets to see how new packaging materials or new concepts, like filling stations, are accepted by customers. Regarding an increase of the supply of sustainable packaging, the interviewees see all decision-makers as responsible.

### Key Conclusions Regarding the Research Question

- The complete elimination of packaging is recommended above all for short transport distances, e.g., regional products, and with appropriate rotation, for which sufficient customer frequency is necessary. The reason for this is that the fruits and vegetables need to look fresh to being bought by customers and non-packaged items spoil faster.

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<sup>360</sup> Nielsen 2016, p. 37.

- Almost all packaging materials have advantages and disadvantages, and the complexity of the issue is often underestimated due to the different product requirements and the high number of materials available. For example, there is a difference even for the same product, cucumbers from Spain have thinner skin, so plastic packaging is necessary. In contrast, summer cucumbers from Austria have thicker skin and can be sold unpackaged without the problem of food waste according to R1.
- It is necessary to make consumers more aware of the ecological footprint of different packaging materials. Since consumers seem to think that glass, paper and returnable packaging are always better. They do not take into account, for example, the high water consumption of paper and the environmental impact of the transport routes of returnable bottles. In addition, the weight of the packaging is often forgotten according to P4.
- Customer awareness must be raised that their product choices and shopping behavior do have an impact. For instance, customers would like to be able to take their own containers to the service counters, but after it was made possible there is low usage of the offer.

## 9. Quantitative Study: Customer Online Survey

### 9.1 Method Selection, Population and Sample

The second part of the empirical research was a standardized survey strategy.<sup>361</sup> The quantitative study aimed to obtain the opinions of customers. An online questionnaire was chosen as a survey method because it offers the advantage that the study can be conducted independently of the agreement of retail chains. A further advantage is that a geographically broader spread of respondents can be achieved, which is not limited to the Vorarlberg area. This allows international customer opinions to be taken into account. Therefore, the online questionnaire was created in German and English. The disadvantage is that the grocery shopping did not take place immediately before. As a result, customers may give different answers than they would directly after a shopping experience. Since the two product categories under closer investigation belong to those of daily life, this point is negligible. A post-purchase survey would be beneficial, but the COVID-19 pandemic and the recommendation of social distancing are not suitable. Beneath the already mentioned agreement of retail chains, the time factor and participation rate speak in favor of an online survey.

In order to obtain a similar sample to the interviews from a geographical point of view, it was important to be able to recruit customers from the DACH region to answer the questionnaire. Therefore, the target population consisted of all customers in the DACH region who are older than 14, as it is allowed to make small purchases from this age onwards.<sup>362</sup> There was no upper age limit, but since an online questionnaire is used as the survey method, it was expected that the number of older participants would be limited.

As already mentioned in the qualitative part, it was not possible to consider all elements of the population due to time and cost constraints.<sup>363</sup> “The aim of the sample is to make generalizations to the population.”<sup>364</sup> However, such conclusions may only be made if the sample is representative, e.g., if it is a reduced image of the population. To achieve this, Schumann suggests to use probability selection, namely random sampling.<sup>365</sup>

Since a post-purchase survey was planned at the beginning, there is no list of the population available. This means simple random sampling is not applicable.<sup>366</sup> Other procedures were also excluded due to time and cost constraints.

Therefore, a so-called convenience sample was used, which means the sample is uncontrolled. However, this implies that only limited conclusions can be drawn about the population, as the subsequent test for representativeness in subchapter 10.1 shows.<sup>367</sup>

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<sup>361</sup> Hüttner 1999, p. 68.

<sup>362</sup> Bundesministerium für Digitalisierung und Wirtschaftsstandort 2021.

<sup>363</sup> Mayer 2013, p. 59.

<sup>364</sup> Raithel 2008, p. 54.

<sup>365</sup> Schumann 2012, p. 84.

<sup>366</sup> Mayer 2013, p. 61.

<sup>367</sup> Raithel 2008, p. 56 f.

*“Selecting research participants for experiments based on their availability (convenience sampling) has served an important role in social science research for several decades as a low-cost alternative to probability sampling”.*<sup>368</sup>

Due to the increase of social media platforms, study participants are increasingly found online.<sup>369</sup> The online questionnaire was published via Instagram as well as an internal company app. Furthermore, it was sent to students of University of Applied Sciences Vorarlberg and School of Health and Nursing Feldkirch and the social environment. The link to the survey was sent via email or personal message of the respective medium. In addition, the addressed people were invited to share the link to the questionnaire. The goal was to reach at least 150 customers with an even distribution across the three DACH-countries.

## **9.2 The Measurement Model and Quality Criteria**

The measuring instrument, the standardized questionnaire, was used to collect the required information on the subject of sustainable packaging. The purpose was to gather the attitudes of the respondents. “Attitudes are theoretical constructs that are not directly observable and are also referred to as latent variables.”<sup>370</sup> Furthermore, demographic data such as age, education and gender were asked.<sup>371</sup> In contrast, these are directly observable and are referred to as manifest variables.<sup>372</sup>

The attitudes of the customers were measured through their response to the items set up by the researcher, also see subchapter 9.3, namely by their positive or negative responses.<sup>373</sup> “This methodological step is called operationalization.”<sup>374</sup>

The development of the measurement model was based on considerations about the interrelationships of the influencing variables, value attitudes as well as resulting effects.<sup>375</sup> The individual questions or statements of the questionnaire can be seen in the appendix. Once in the form in which they were visible to the participants and a second version with sources from which the items were derived.

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<sup>368</sup> Antoun et al. 2016, p. 232.

<sup>369</sup> Antoun et al. 2016, p. 231 f.

<sup>370</sup> Krebs; Menold 2019, p. 490.

<sup>371</sup> Krebs; Menold 2019, p. 490.

<sup>372</sup> Mayer 2013, p. 75.

<sup>373</sup> Krebs; Menold 2019, p. 490.

<sup>374</sup> Krebs; Menold 2019, p. 490.

<sup>375</sup> Mayer 2013, p. 58.

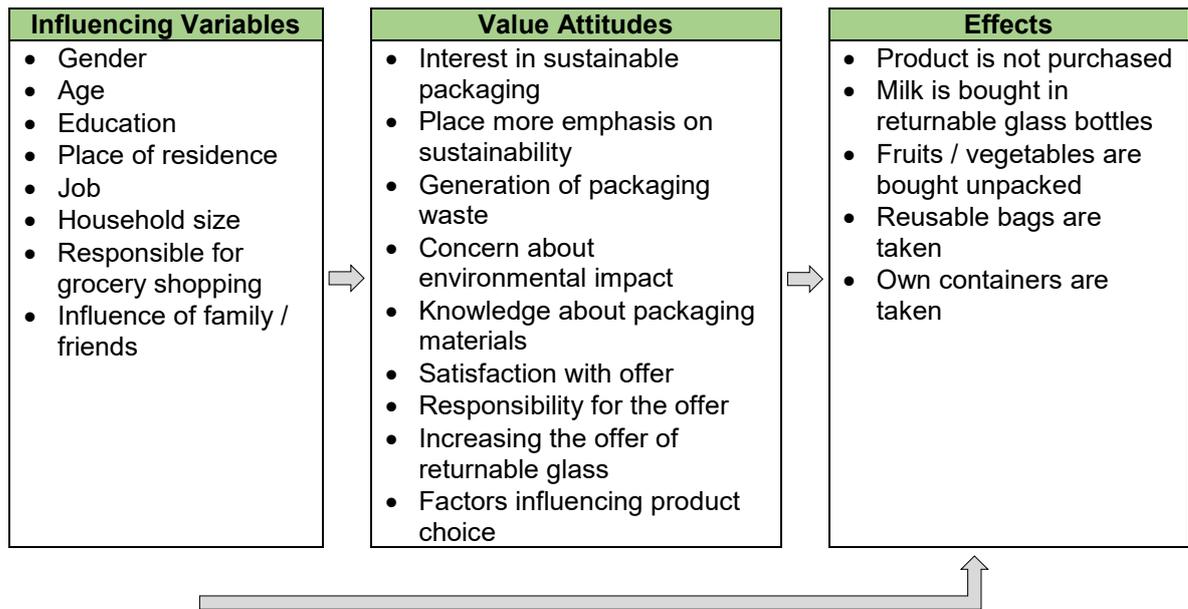


Figure 9: Measurement Model<sup>376</sup>

The two quality criteria validity and reliability have already been dealt with in connection to the qualitative study, see subchapter 7.5. In relation to the quantitative survey, the quality criterion of objectivity is particularly relevant.<sup>377</sup>

### Objectivity

Generally, three types of objectivity can be distinguished: interpretation objectivity, implementation objectivity and evaluation objectivity.<sup>378</sup>

Due to the use of a standardized questionnaire, with identical questions for all survey participants, the implementation objectivity is given. Furthermore, evaluation objectivity is given by the fact that in chapter ten, when presenting and analyzing the study results, it is explained exactly how the individual variables were handled during the SPSS analysis, e.g., whether recoding took place or new variables have been built.<sup>379</sup> It is also called intersubjective verifiability and means "any empirical test of a statement must be traceable to other researchers."<sup>380</sup>

### Reliability

For reliability, it is important to have clearly formulated questions and to be able to demonstrate a standardized research method. This is because it indicates "the extent to which the same result is obtained in a repeated measurement under the same conditions."<sup>381</sup> This is given due to the use of a standardized questionnaire in the present case. The comprehensibility of the formulated questions was tested by means of a pretest.

<sup>376</sup> Own figure, based on Mayer 2013, p. 68.

<sup>377</sup> Mayer 2013, p. 90.

<sup>378</sup> Krebs; Menold 2019, p. 490 f.

<sup>379</sup> Krebs; Menold 2019, p. 491.

<sup>380</sup> Schumann 2012, p. 7.

<sup>381</sup> Mayer 2013, p. 90.

## Validity

Validity "indicates whether a measurement instrument also measures what it is supposed to measure."<sup>382</sup> Three forms of validity can be distinguished: content validity, criterion validity, and construct validity.<sup>383</sup> Whereby the first two mentioned are often not applicable, because there are no or few criteria for the measurement.<sup>384</sup>

### 9.3 Design of the Questionnaire

The questionnaire was designed based on the findings of the secondary research. The corresponding sources can be found in the appendix.

The online questionnaire was created using the website "umfrageonline.com" and was online for the duration of 4 weeks in May and June 2021. It was available in German and English. The data were collected anonymously, this means that no tracing to the individual participants is possible. The participation of the individuals was voluntary and without incentives. In the following, the procedure of designing the questionnaire is described.

It is recommended to choose an easy entry question at the beginning. The reason for this is that the first questions are decisive for whether the questionnaire is answered until the end or not. A dropout usually takes place at the beginning.<sup>385</sup>

It can be distinguished between different answer options.<sup>386</sup> In case of closed questions, respondents can answer through predetermined answer choices. This can lead to the absence of needed answer categories. Therefore, when creating the questionnaire, care was taken to supplement predefined answer options with an "Other" field if this was deemed necessary.<sup>387</sup> For two questions a so-called ranking was used, this means that several stimuli have to be available.<sup>388</sup> The given objects had to be ranked according to importance or responsibility. In addition, a five-point Likert scale was used. "For each item, the respondent must indicate the level of agreement."<sup>389</sup> This allows to measure attitudes in terms of numbers.<sup>390</sup>

In formulating the questions, the following principles according to Hüttner were applied:

- a) The questions must be kept simple and easy to understand.*
- b) The questions must be unambiguous and precise.*
- c) The questions must not have a suggestive effect.*
- d) The questions must not tempt the respondent to answer incorrectly for reasons of prestige, etc."<sup>391</sup>*

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<sup>382</sup> Kempe 2011, p. 170.

<sup>383</sup> Schnell; Hill; Esser 2013, p. 144 f.

<sup>384</sup> Schnell; Hill; Esser 2013, p. 145 f.

<sup>385</sup> Schumann 2012, p. 75.

<sup>386</sup> Hüttner 1999, p. 100.

<sup>387</sup> Hüttner 1999, p. 103 f.

<sup>388</sup> Hüttner 1999, p. 114.

<sup>389</sup> Hüttner 1999, p. 115.

<sup>390</sup> Mayer 2013, p. 81.

<sup>391</sup> Hüttner 1999, p. 122.

The order of the questions and the use of different types of questions must also take into account the dramaturgy. The aim is to create a stimulating and exciting sequence. Furthermore, the length of the questionnaire is crucial in order to avoid deterrence.<sup>392</sup>

At the beginning of the questionnaire, the purpose of the survey was briefly described to the participants, and anonymity was assured. Furthermore, the participants were provided with the approximate duration and contact details for any further questions or comments. The online survey included 17 main questions. After an easy initial question, the first part began with questions about the participant's grocery shopping behavior. After that, questions concerning packaging and packaging waste were asked. As recommended, the demographic questions formed the last part of the questionnaire.<sup>393</sup>

Continuation of the questionnaire was only possible after answering the respective question, since all questions were created as mandatory questions. The advantage of this approach is that data comparability is increased. However, there is a risk that the participants only answer randomly in order to be able to finish the questionnaire.<sup>394</sup>

For further details regarding the questions and answer options, see presentation of the whole questionnaire in the appendix.<sup>395</sup>

## **Pretest**

Before the questionnaire and thus the data collection can be carried out, a pretest must be done.<sup>396</sup> During the pretest, people fill out the questionnaire. This makes it possible to find out if there are any ambiguities.<sup>397</sup> The questionnaire can then be revised on the basis of the findings. After the design of the questionnaire was finished, a pretest was held with five participants from the social environment. A heterogeneous selection of persons was made in order to take into account the needs of different age groups and gender.

Subjects were advised that ambiguities should be noted immediately and that the response time should be stopped. Feedback after the pretest led to the following findings:

- The average response time was nine minutes.
- A spelling error was corrected.
- A term was adjusted in terms of better readability.
- A term in the indication of education was additionally explained by giving examples.
- In the English version of the questionnaire, translation errors of individual words were corrected after proofreading by a native speaker.

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<sup>392</sup> Hüttner 1999, p. 122 f.

<sup>393</sup> Schumann 2012, p. 75.

<sup>394</sup> Pittner 2014, p. 146 f.

<sup>395</sup> The English version can be requested from the researcher.

<sup>396</sup> Mayer 2013, p. 59.

<sup>397</sup> Kirchhoff et al. 2003, p. 24.

## 10. Presentation and Analysis of the Quantitative Study

### 10.1 Description of the Participants

In order to be able to carry out the following statistical analyses, the questionnaire data were transferred into SPSS version 26.0.<sup>398</sup> Before the analysis could be done, the collected data were coded with the help of the computer program. To give an example, the first question could be answered with yes or no. Therefore, the coding was done with yes=1 and no=2.<sup>399</sup> It should be noted that to improve readability, the percentages in this subchapter were rounded in commercial terms.

A total of 682 people took part in the survey; 96% of them have answered the questionnaire until the end, which means 657 participants remained. Only the fully completed questionnaires were further taken into account. There were two choices in language, and the questionnaire was available in German and English. 97% answered the German version and 3% the English version.

Of the 657 participants, 79% stated that they are mainly responsible for grocery shopping, while the remaining 21% answered no. This variable is considered in more detail later in connection with gender.

Since, as already mentioned, the customer survey considered the DACH region, the three countries Germany, Austria, and Switzerland were taken into account regarding the place of residence. Therefore, a new variable was created with these three countries. Participants who indicated another country as their place of residence were not included in the subsequent distribution. With 564 participants (86%), the most significant part lived in Austria, 50 people in Germany (8%), and 33 in Switzerland (5%).

Since the largest share of respondents (86%) was from Austria, the sample of Austrian participants was used to verify if representativeness is given or not. For this purpose, the SPSS dataset was filtered for participants who indicated Austria as their place of residence. The following descriptions in this subchapter refer only to these participants.

In terms of gender, there were three possible response categories. Due to the low number of entries in the category "diverse," the data were recoded into only two categories, namely female and male. This resulted in the following gender distribution: 35% male participants and 65% female participants. In the table below, the gender distribution is shown in connection with who is responsible for grocery shopping. This leads to the result that representativeness is given concerning gender distribution regarding responsibility for grocery shopping.

Gender	Sample	Austria <sup>400</sup>
Male	30%	30%
Female	70%	70%

Table 3: Gender Distribution Responsibility for Grocery Shopping

<sup>398</sup> The entire data set can be requested from the researcher.

<sup>399</sup> Mayer 2013, p. 108 f.

<sup>400</sup> Mayer 2017, p. 23.

In Austria, people aged 14 and older are allowed to make small purchases.<sup>401</sup> For the topic of grocery shopping, the younger target group is therefore irrelevant. As a result, not the entire population is considered for comparison, but only a part. In addition, it must be taken into account that the use of an online questionnaire is expected to limit the number of older participants. The average age of the respondents is 29. In comparison, the average age according to Sutterlüty's target group definition is 47.<sup>402</sup>

The comparison of the age distribution of the participants and that of the Austrian population, see table 4, shows that representativeness is not given with regard to age.

Age structure	Sample	Austria <sup>403</sup>
14-24 years	21%	12%
25-34 years	48%	14%
35-44 years	16%	13%
45-54 years	7%	15%
55-64 years	6%	14%
65 years and older	2%	19%

Table 4: Age Structure

In addition, the age structure of retail customers in Germany was examined, as no figures were available for Austria. The age distribution is very similar for Rewe, Edeka and Lidl. In case of all three retailers, the group of 50-59 year olds makes up the largest customer group with around 20%, followed by the group of 70 year and older with around 17%. All other age groups have a similar distribution, except for the 14-19 year olds with only 6%. In general, it can be seen, that the age structure of customers is almost identical to the age structure of the population.<sup>404</sup> This shows that the previous comparison with the Austrian population figures makes sense, as these can be seen as analogous to the age structure of retail customers.

In the case of the highest level of education completed, there were five predefined answer options. In addition, an open field was available. This resulted in two additional categories in the course of coding, namely six for master craftsman examination and seven for the diploma. In further evaluation, it was decided to assign category seven to the category of "A-levels/SAT" and exclude category six due to the small number of responses. In the end, it got visible that 46% of the respondents have a university degree, and another 33% have graduated with SAT. This shows a bias because over three-quarters of the respondents have a higher level of education. The table below only shows an excerpt of the results since these groups were also available from Statistic Austria. This means that particularly in the area of education, it can be seen that the sample deviates significantly from the distribution in the population and is not representative. Persons with a university degree or SAT are overrepresented, persons who have completed compulsory school or an apprenticeship are underrepresented, see table 5.<sup>405</sup>

<sup>401</sup> Bundesministerium für Digitalisierung und Wirtschaftsstandort 2021.

<sup>402</sup> Feyel; Mayer 2017, p. 49.

<sup>403</sup> Statistik Austria 2021b.

<sup>404</sup> Pawlik 2020b; 2020a; 2020c.

<sup>405</sup> Aschemann-Witzel 2009, p. 112.

Education	Sample	Austria <sup>406</sup>
Compulsory school	2%	18%
Apprenticeship	12%	34%
A-levels / SAT	33%	6%
University	46%	16%

Table 5: Highest Level of Education

The occupational group was asked in a two-stage procedure according to Ganzeboom's recommendation. In the first part, the respondents were given the opportunity to choose between nine different occupational groups.<sup>407</sup> In addition, an open category was added to the proposed query. In the course of recoding, the first six categories were retained as they were asked for in the questionnaire, see appendix. Category nine (agricultural profession) included one person and was added to category six (skilled workers). Categories seven and eight were defined as missing values. The same applied to the newly created categories on the basis of the information in the "Other" field. This resulted in 3% defined as missing values. An exception to this is the newly formed category of students, which was recoded into category seven. Categories four and five (commercial and service occupation) were added together to compare with the Austrian distribution, see table below, since Statistic Austria combines them as one category. The appendix shows how the occupational groups from the questionnaire were assigned to those from Statistic Austria. The comparison in the table below shows that the occupational groups are not representative.

Occupational Groups	Sample	Austria <sup>408</sup>
Scientific, technical or similar specialist	34%	19%
Managerial position in public service / business	9%	4%
Office worker or related occupation	24%	9%
Commercial and service occupation	17%	19%
Skilled workers	3%	14%
Students	10%	4% <sup>409</sup>

Table 6: Occupational Groups

The second part referred to whether the respondent is self-employed or dependently employed in the current profession.<sup>410</sup> It became apparent that 93% of the participants were dependently employed, while the remaining 7% were self-employed. To compare this result, again the Austrian average was taken, which showed that 87% are dependently employed and 12% are self-employed.<sup>411</sup>

According to Statistic Austria, the development of household sizes in Austria shows a clear trend towards small households.<sup>412</sup> This development was also observed in the course of the expert interviews, see subchapter 8.1. There were ten possible answer categories in case of the question of how many people live in the household. In the process of coding, the categories from one to five persons were retained. The higher categories were grouped under six persons or more, as there was very little data in this area, and thus a direct comparison with the scale of the Austrian statistics could occur. Household size was

<sup>406</sup> Statistik Austria 2020a.

<sup>407</sup> Züll 2015, p. 9.

<sup>408</sup> Calculation see appendix

<sup>409</sup> Statistik Austria 2021a; Mohr 2021.

<sup>410</sup> Züll 2015, p. 10.

<sup>411</sup> Statistik Austria 2019.

<sup>412</sup> Statistik Austria 2021c.

therefore examined in more detail using six specifications. The table below shows the respective percentages per household size as well as a comparison with the distribution of the Austrian population by household size. The result of the customer survey showed that the largest category is built by two-person households with 41%. In case of the Austrian distribution, the largest category is also built by this size. However, since the deviations from the Austrian population are too large, the household sizes are not representative.

Household Size	Sample	Austria <sup>413</sup>
1 person	14%	17%
2 persons	41%	28%
3 persons	17%	20%
4 persons	19%	21%
5 persons	7%	10%
6 persons or more	2%	4%

Table 7: Household Size

### Sample Structure<sup>414</sup>

- More women than men (approx. 65% vs. 35%) participated in the survey.
- Approx. 79% are mainly responsible for grocery shopping.
- The majority of respondents live in Austria (approx. 86%).
- Almost half of the respondents have a university degree (approx. 48%) the next majority has graduated with SAT (approx. 30%).
- Approx. 42% live in a 2-person household.
- Most of the participants (approx. 81%) agree very strongly or strongly with the statement that they are very interested in the topic of sustainable packaging.

It must also be taken into account that there may be a connection between the queried topic and the participants. As a result, it is conceivable that only people who are generally interested in the topic of sustainable packaging have filled out the survey.<sup>415</sup>

Since the distributions of the characteristics do not represent the population, it is not possible to draw conclusions from the sample to the population.<sup>416</sup> This must be taken into account in the following shown results.<sup>417</sup> These have to be interpreted with care and cannot be applied to the population.

## 10.2 Attitude towards Sustainable Packaging

Attitudes can become visible in the form of thoughts, feelings, and behaviors. They do not necessarily have to be stable. Reactions can change depending on the situation.<sup>418</sup> In the subchapter 10.4, the relationship between attitude and behavior is examined in more detail.

The participants' attitude on the subject of sustainable packaging was measured by agreeing or disagreeing with the statements in the questionnaire. There were five scale

<sup>413</sup> Statistik Austria 2021c.

<sup>414</sup> Pittner 2014, p. 163.

<sup>415</sup> Kirchhoff et al. 2003, p. 34.

<sup>416</sup> Mayer 2013, p. 60.

<sup>417</sup> Pittner 2014, p. 164.

<sup>418</sup> Kessler; Fritsche 2018, p. 53 f.

points to choose from to indicate the strength of agreement, ranging from "I strongly agree" to "I strongly disagree." Further details regarding the answer options can be found in the previous subchapter 9.3. The problem is that many people do not disclose their attitudes towards sensitive issues.<sup>419</sup> Therefore, it may be that the answers on the topic of sustainable packaging will be in terms of social desirability, which could influence the results.<sup>420</sup> In the following, the results of the statements of the questionnaire are presented, including a short discussion of the individual result.

### Interest in the Topic of Sustainable Packaging

The expert interviews already showed that the retailers and producers interviewed are intensively dealing with the topic of sustainable packaging, for instance, in terms of packaging changes, see subchapter 8.1.

*P4: "The importance of packaging issues is increasing, of course. When Corona is over, we will have other topics again. Packaging, the environment, climate change, etc. are key elements. We know that packaging is an essential topic, it is a future topic and the importance is growing."*

It was, therefore, important to find out whether consumers are also interested in the topic of sustainable packaging. An agreement could be given using a five-point scale. In addition, this question served as an accessible introductory question. The results showed a high level of agreement and are in line with a representative consumer study from Germany in 2018, where 85% of respondents stated that sustainable packaging is crucial to them, see subchapter 1.4.<sup>421</sup>

In total, 81% stated that they are interested in the topic of sustainable packaging. In the figure below, the results are visible. The labeling of the x-axis shows the levels of agreement, where one stands for strong agreement and five for strong disagreement. The labels on the y-axis show the number of people who chose each option. In order to make the result clearly visible, the percentage values were given to the respective answer categories.

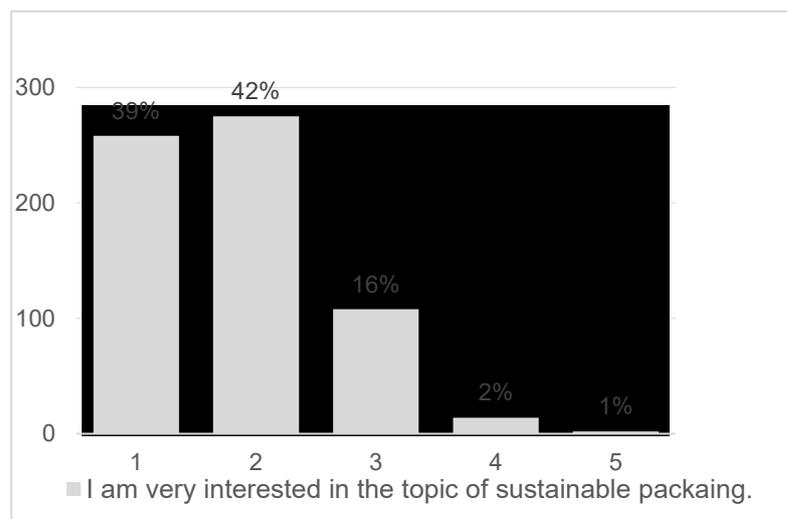


Figure 10: Interest in Sustainable Packaging

<sup>419</sup> Kessler; Fritsche 2018, p. 56.

<sup>420</sup> Kessler; Fritsche 2018, p. 58.

<sup>421</sup> Bovensiepen et al. 2018, p. 19.

## Placing More Emphasis on Sustainability

Monnot et al. indicated that the demand for sustainability in the retail sector increased on the side of consumers.<sup>422</sup> In the course of the expert interviews, it was confirmed by the side of retailers and producers that the topic of sustainable packaging has become extremely important to them in recent years, see subchapter 8.1. Accordingly, they want to offer customers more sustainable solutions.

*P1: "For our new organic line, which we have had on the market since last year, we specifically looked for more ecological packaging and found out what the possibilities were. (...) and are now pursuing this topic for other products as well."*

Therefore, the third question in the questionnaire was used to check whether the customers surveyed actually place more emphasis on sustainability when they buy their groceries than they did a few years ago. 39% of respondents strongly agreed that sustainability is currently more important to them, and another 38% agreed. These results together show with 77% a high level of agreement. 20% partially agreed, and the remaining 4% disagreed or strongly disagreed.

## Influence of Buying Decisions by Family / Friends

As already mentioned, attitudes can be influenced according to the TRA by family and friends,<sup>423</sup> see subchapter 4.3. Only 4% strongly agreed that family or friends influence their buying decisions in the supermarket. With 22%, about a quarter of the respondents agreed. The most significant proportion can be found in the category of partial agreement with 46%. In total, with 28%, nearly a third of the respondents disagreed or strongly disagreed.

The evaluation of this statement showed, that the participants' answers are not corresponding with the view of van Birgelen et al., who expected that family or friends do have an influence on the purchasing behavior.<sup>424</sup>

## Generation of Packaging Waste

The previously mentioned trend toward smaller households also has an impact on the volume of packaging waste, see subchapter 8.1. The producers and retailers interviewed also mentioned the advantages of packaging.

*R1: "I think there are still some items that are certainly packed too much. In general, I see in the public discussion to talk packaging bad in general. This tendency or this concern of NGOs is a very dangerous one, insofar as packaging is not around products for nothing, but has some functions."*

*R3: "Packaging is useful if it protects the item."*

Bovensiepen et al. claim that customers think that too much packaging material is used.<sup>425</sup> In addition, Carstens and NABU agree that food is often packaged nonsensically.<sup>426</sup>

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<sup>422</sup> Monnot; Parguel; Reniou 2015, p. 329.

<sup>423</sup> van Birgelen; Semeijn; Keicher 2009, p. 129 f.

<sup>424</sup> van Birgelen; Semeijn; Keicher 2009, p. 130.

<sup>425</sup> Bovensiepen et al. 2018, p. 21.

<sup>426</sup> Carstens 2016; NABU n. y.-b.

The evaluation of the statement that grocery shopping generates too much packaging waste showed high agreement. 96% of the participants agreed or strongly agreed with the statement. Only 4% partially agreed or disagreed. None of the respondents strongly disagreed with this statement. The results are visible in the figure below.

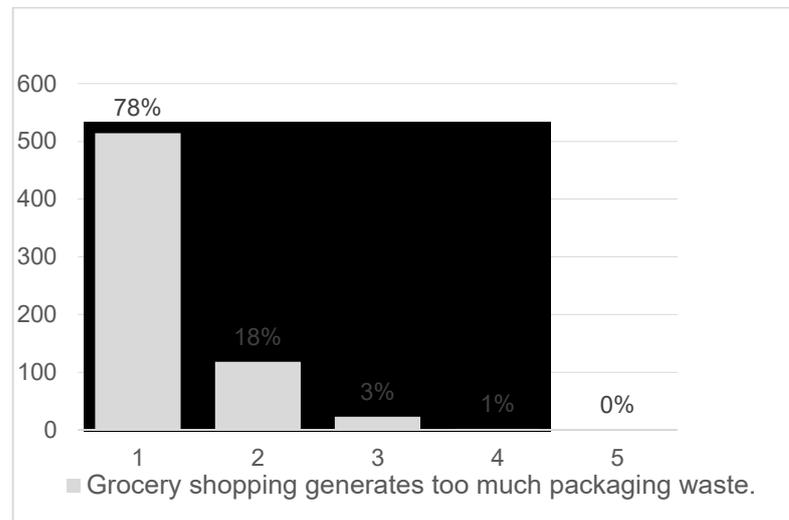


Figure 11: Generation of Packaging Waste

### Concern about Environmental Impact of Packaging Material

In a study by Pro Carton, 75% of consumers said that the sustainability of the packaging has an influence on their purchase decision.<sup>427</sup> The World Economic Forum dealt with the effects of plastic waste in the ocean and predicted that it will come to that point that the ocean will contain more plastic than fish.<sup>428</sup> The aim was to determine to what extent consumers, in general, are concerned about the environmental impact. It was deliberately refrained from only asking about plastic, since this topic is already very negatively afflicted,<sup>429</sup> see subchapter 3.3, and the questionnaire answers should not be influenced by bias.

18% strongly agreed that they are very concerned about the environmental impact of different packaging materials when grocery shopping. Nearly balanced is the proportion of those who agreed with 38% and those who partially agreed with 34%. Another 8% disagreed, and 2% strongly disagreed. This means that more than half of the consumers surveyed agreed to be concerned about the environmental impact.

It also got evident from the expert interviews that customers pay attention to the type of packaging material, like the following statements show.

*R3: "Although paper consumes a great deal of water in production and when recycled into waste paper, paper packaging has a positive image among customers. That is why we prefer alternatives made of paper, cardboard or carton. (...) Packaging made of mono-plastics such as transparent PET, white PP and PE are more resource-efficient in production and can be easily recycled. As a result, they can be reused several times and are part of the circular economy. Nevertheless, plastic packaging is usually rejected per se."*

<sup>427</sup> Huber; Schmidt 2019, p. 6.

<sup>428</sup> World Economic Forum 2016, p. 14.

<sup>429</sup> Steenis et al. 2017, p. 294; Fuentes; Enarsson; Kristoffersson 2019, p. 258; Bovensiepen et al. 2018, p. 22.

R2: "So, for example, anything where plastic is avoided is usually great for the customer. We communicate it, of course."

## **Knowledge about Sustainable Packaging Materials**

During the expert interviews, producers mentioned that the majority of the population has very little knowledge about sustainable packaging.

P4: "(...) knowledge is sometimes frighteningly low. People simply adopt opinions that they have heard somewhere. But not many consumers are really informed, it is rather general."

Furthermore, consumers get wrong ideas about how sustainable a specific packaging is due to marketing strategies, see subchapter 8.3. This is also visible in the before mentioned interview statements of R3 and R2.

In case of knowledge about sustainable packaging materials, 15% strongly agreed that they know which materials are sustainable and 35% agreed. Which results in 50% being secure about their knowledge. Nevertheless, 42% decided to only partially agree. Another 6% denied and 2% strongly disagreed. This shows that there is a lot of uncertainty, which is consistent with the study by Steenis et al.<sup>430</sup> Further information can be found in subchapter 3.3, where the topic of different packaging materials was addressed.

## **Satisfaction with Range of Sustainable Packaging**

The study of Pro Carton says 64% of customers think companies are not doing enough to implement sustainable packaging.<sup>431</sup> However, often a packaging change is not as easy as customers imagine.

P1: "It is currently very difficult to find more ecological materials in the food sector, because the requirements for food packaging are very high, both in terms of product safety, but also logistically, production-wise."

R4: "(...) producers are already taking responsibility and slowly converting their processes, and there is sometimes a lack of understanding (note: on the customer side) that it takes a little more time."

Only 4% of the participants agreed or strongly agreed that they are satisfied with the range of sustainable packaging in the supermarket. With 34%, a big part partially agreed, whereas the majority disagreed with 46% and another 16% strongly disagreed. This shows that almost two-thirds of the respondents are not satisfied with the offer. This leads to the next question, as it is interesting to know precisely whom consumers see as responsible.

## **Responsibility for Offering Sustainable Packaging**

The five response options consumers, retail, politics, producers, and others had to be ranked according to the respondent's own opinion, and the first place stood for being most responsible and the fifth for being least responsible. The exact ranking results are visible in the following table. Since 90% of respondents considered others to be least responsible, this category was excluded from the detailed listing.

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<sup>430</sup> Steenis et al. 2017, p. 294.

<sup>431</sup> Huber; Schmidt 2019, p. 6.

	Consumers	Retail	Politics	Producers
1	16%	12%	37%	32%
2	17%	31%	22%	30%
3	22%	39%	21%	17%
4	40%	17%	18%	19%
5	5%	1%	2%	2%

Table 8: Responsibility for the Offer

59% of the participants ranked politics in first or second place in case of responsibility; for the producers, it was 62%. Retailers and consumers were both ranked less often in the first two places. It was 43% in the case of retailers and 33% for consumers. In summary, producers are seen as most responsible, politics is second, followed by retail, and consumers are seen as least responsible.

In the study of Bovensiepen et al., consumers were asked whom they see responsible for reducing packaging waste. Here, the producer was seen first, followed by retailers, legislation, and consumers.<sup>432</sup> During the expert interviews, the role of politics was viewed positively in terms of legislation creating equal conditions for all market participants. Furthermore, it was emphasized that the producers and retailers consider all stakeholders to be equally responsible for the offer of sustainable packaging, see subchapter 8.3.

*R4: "It needs an interaction of all players."*

*R3: "Everyone bears a share of the responsibility: manufacturers can, for example, produce beverages in reusable containers that are made available by retailers, but consumers are also asked to buy them in preference. If there is not enough demand, the supply will be reduced as a consequence."*

### Range of Products in Returnable Glass is to be Increased

In Austria, the returnable packaging quota is currently around 20 percent. Twenty years ago, the rate was higher with 50 percent.<sup>433</sup> A higher share exists with regard to beverage packaging; in Germany it was 42% in 2017.<sup>434</sup> However, in general, a decrease in the proportion of reusable packaging and an increase in case of disposable packaging can be observed.<sup>435</sup> It is therefore interesting to find out what customers think about it.

It became clear that 41% strongly agreed that the range of products in returnable glass is to be increased, another 39% agreed. The remaining answers were distributed as follows: 17% partially agree, and 3% disagreed or strongly disagreed. This shows that with 80% agreement among the respondents, there is an outstanding attitude towards increasing the offer of returnable glass.

This is in line with the study of Bovensiepen et al.<sup>436</sup> and reflects the opinion of "Ja! Natürlich", who decided to introduce a returnable system due to the high level of customer acceptance,<sup>437</sup> also see chapter 6. On the subject of returnable packaging, the retailers

<sup>432</sup> Bovensiepen et al. 2018, p. 28.

<sup>433</sup> Steinmüller-Schwarz 2020.

<sup>434</sup> Mescoli 2016; Suhr 2019.

<sup>435</sup> Leighty 2020, p. 58.

<sup>436</sup> Bovensiepen et al. 2018, p. 23.

<sup>437</sup> Ja! Natürlich Naturprodukte Gesellschaft 2020.

interviewed emphasized above all that it is important to consider the transport distance so that it makes ecological sense; for further information see subchapter 8.1.

*R2: "It depends mainly on the transport distance of this very heavy glass."*

*R1: "It has taken 20 years for reusable to drop to this level, as it currently is. In the meantime, all production facilities have been replaced by others."*

## **Fruits & Vegetables**

Concerning the closer investigated product category fruits and vegetables, the retailers interviewed see a lot of potential in terms of packaging savings, see subchapter 8.2. This raises the question of customer acceptance. For this purpose, the opinion of packaged fruits and vegetables was explicitly asked in order to avoid socially desirable answers. The answer options and the results are visible in the table below. The statements have to be considered individually, as it was possible to decide whether or not there was an agreement with each statement.

<b>Packed Fruits / Vegetables</b>	
...are better protected.	18%
...have a longer shelf life.	10%
...are more hygienic.	33%
...are more convenient (no weighing etc.).	30%
None of the options mentioned.	42%

Table 9: Attitudes towards Packaged Fruits and Vegetables

It became clear that with over 40%, a large proportion of the participants do not agree with any of the given answer options. However, a third of the participants believe that fruits and vegetables in packaging are more hygienic and are more convenient. The topic of hygiene was also addressed in the interviews.

*R1: "Fruits and vegetables in particular were bought less in Corona times if they were unpackaged, because consumers were concerned that someone else had already touched them before."*

## **10.3 Customer Behavior in the Supermarket**

The statements, which will now be dealt with, refer to customers' behavior in the supermarket. In the next subchapter, 10.4, the previously addressed attitudes and the behavior discussed in the following will be related to each other. As before, the statements from the questionnaire are presented with the results, which are each briefly discussed and related to the theory and the conducted interviews.

### **Not Buying a Product Because of too Much Packaging**

For consumers, the sustainability of the packaging also plays a role in the purchase decision according to the German Packaging Institute. One-fifth of the respondents stated that they

regularly do not buy products because of unsustainable packaging. 70% have already done so at least once.<sup>438</sup>

34% of the participants strongly agreed that they once did not buy a product because of too much packaging and 27% agreed to this statement. Whereas 21% partially agreed, 18% disagreed or strongly disagreed. With 61% agreement, it is twice as high compared to the study by Bovensiepen et al., where only one-third indicated that they would not buy a product because of too much packaging.<sup>439</sup>

The interviewees stated that they try to reduce or avoid packaging where possible, see subchapter 8.1. Nevertheless, some areas are particularly packaging-intensive.

*R2: “Especially ready-to-eat convenience or ready-to-cook convenience are rather voluminous packages, e.g., a salad bowl. Small quantities are also increasing very strongly.”*

*R3: “We continuously review where we can avoid unnecessary packaging and save packaging material. Cardboard outer packaging was removed (...) and switched to coated paper, resulting in a material reduction of 75%.”*

### Buying Milk in Returnable Glass Bottles

The topic of milk in returnable glass bottles was discussed during the expert interviews; further details can be found in subchapter 8.2. Opinions are divided on this subject regarding sustainability and customer acceptance, as is generally the case with returnable packaging.

*P2: “(...) then market research is actually always good, only there we always have the issue with the socially desirable response behavior and of course everyone says glass is great, but whether they then really buy it and carry the glass bottles home, we could not really estimate.”*

*P4: “The big issue is product quality. Milk is extremely sensitive to light. (...) how often does a returnable bottle rotate, (...) the figures are often glossed over, e.g., too many rotations are indicated.”*

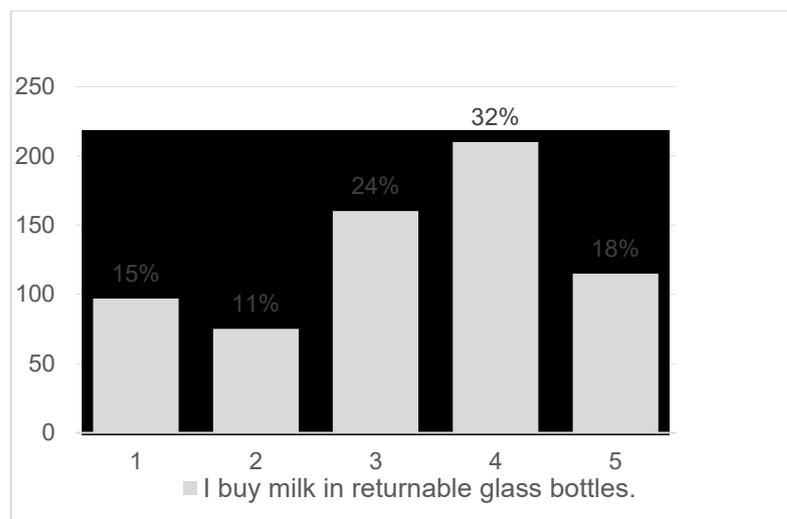


Figure 12: Buying Milk in Returnable Glass Bottles

<sup>438</sup> Nink 2019.

<sup>439</sup> Bovensiepen et al. 2018, p. 21.

15% of the respondents strongly agreed that they buy milk in returnable glass bottles, another 11% agreed. With 24%, nearly a quarter of them partially agreed. However, 32% disagreed, and 18% strongly disagreed. This means that half of the participants disagreed with this statement. The distribution of responses can be seen in figure 12, previous page. The result differs from the general question about products in returnable glass. Therefore, this question will be examined in more detail in subchapter 10.4.

## Fruits & Vegetables

The participants were asked about their opinion of packaged fruits and vegetables, see subchapter 10.2. Based on this, customer acceptance of unpackaged fruits and vegetables was queried concerning behavior. Over half of the participants, 57%, strongly agreed that they like to buy fruits or vegetables unpacked. Another 29% agreed. 12% partially agreed, and the remaining 2% disagreed. With 86% agreement, this indicates a high level of acceptance. From this, it can be concluded that acceptance on the side of consumers is given in the context of this study.

These results show agreement with the Bovensiepen et al. survey, where 83% believed that packaging is, among other products, unnecessary for fruits and vegetables.<sup>440</sup> In addition, NABU demands that fruits and vegetables are sold loose by default.<sup>441</sup> The interviewed experts do generally support unpacked fruits and vegetables, but also see disadvantages.

*P2: "In principle, I am very much in favor of loose sales. Of course, it always has the disadvantage in the supermarket that all touch the items and then the shelf life is reduced."*

## Sustainable Shopping Behavior

Consumers can save packaging material by taking their own containers with them.<sup>442</sup> Prevention is the EU's top priority with regard to packaging waste,<sup>443</sup> see subchapter 3.4. A study from Switzerland indicated that 92% of respondents would be willing to use a reusable bag when buying fruits and vegetables.<sup>444</sup> The participating customers were confronted with statements about their behavior in the supermarket, visible in the table below. They could agree to the statements by clicking on them.

Customer Behavior in the Supermarket	
I take my own shopping bag with me.	95%
I take my own containers with me, e.g., for sausage / meat / bread products.	8%
I take reusable fruits / vegetables bags with me.	44%
None of the options mentioned.	4%

Table 10: Results of Customers' Shopping Behavior

<sup>440</sup> Bovensiepen et al. 2018, p. 21.

<sup>441</sup> NABU n. y.-b.

<sup>442</sup> Kröger et al. 2019.

<sup>443</sup> European Commission n. y.-d.

<sup>444</sup> Rohrer 2019, p. 13.

The ban on plastic carrier bags specified by the EU was implemented at the beginning of 2020.<sup>445</sup> It can be assumed that this legal change is having an effect, as 95% indicated that they bring their own bag for grocery shopping.

In the area of fruits and vegetables, all retailers interviewed stated that they offer reusable transport nets, more information see subchapter 8.2. Furthermore, it was made possible for customers to bring their own containers to the service counters. However, according to the retailers interviewed, very few take advantage of this offer, see subchapter 8.1. The low customer acceptance was also confirmed by a survey of Swiss retailers<sup>446</sup> and is visible in the results of the present consumer survey, as only 8% agreed to take their own containers.

*R3: "We offer reusable transport nets for fruit and vegetables made of recycled plastic."*

*R4: "A major customer request was packaging-free shopping at the service counters. (...) It is a great pity that many customers want it and in the end almost nobody does it."*

### Criteria for Product Selection

In the context of product choice, there are different approaches to what is essential to consumers. An excellent example of this is the willingness to pay, which is difficult to assess,<sup>447</sup> or the high trust in private label products.<sup>448</sup> About the opportunity to save packaging, local products, in particular, was mentioned by the interview partners, see subchapter 8.2. Therefore, the origin was included in this question. Comfort was queried in the background to lose sales, see subchapter 8.2 and filling stations, see subchapter 8.1. In addition, the importance of packaging and product quality for customers was to be determined.

	Brand	Price	Packaging	Origin	Comfort	Quality
1	4%	6%	2%	34%	1%	53%
2	8%	17%	9%	32%	4%	30%
3	12%	32%	30%	12%	5%	9%
4	19%	28%	30%	11%	10%	2%
5	29%	14%	21%	7%	27%	2%
6	29%	3%	8%	4%	53%	4%

Table 11: Criteria for Product Selection

The six given criteria, visible in the table above had to be ranked, with first place being the most important when choosing a product and sixth place being the least important. Consumers see quality (83%) as well as origin (66%) and price (23%) as most important. Packaging and brand are equally important with 11% each. The criterion of convenience is remarkably unimportant at just 5%. For the percentages, the first two places were added together in each case. The table above shows all results in detail.

<sup>445</sup> Wirtschaftskammer Vorarlberg 2020.

<sup>446</sup> Rohrer 2019, p. 17.

<sup>447</sup> Willers 2016, p. 13.

<sup>448</sup> Reynolds; Cuthbertson 2014, p. 9.

## 10.4 Correspondence of Attitude and Behavior

Survey results with the background of the perceived megatrend of sustainability are often interpreted to the effect that acceptance is equivalent with purchase or, in the negative case, with non-purchase. Differentiation between social acceptance and willingness to buy is often neglected.<sup>449</sup> With their consumption choices, consumers can influence which products are produced. In recent years, a higher awareness regarding the environmental impacts of food choices could have been noticed on the side of consumers. However, consumers are not really consistent regarding their interest and everyday purchases.<sup>450</sup> This view is also confirmed by the conducted expert interviews, especially from the side of retailers. The problem is that the mere collection of consents does not reflect actual purchasing behavior. This is the case with many studies and limits their validity.<sup>451</sup>

For this reason, the following subchapters focus, among other things, on investigating whether attitudes and behavior of the participants correlate with the help of hypotheses. A hypothesis is a conjecture about an issue. A relationship between at least two variables is assumed to be provisionally true.<sup>452</sup> The hypothesis is tested with the aim of finding out whether the statement is true or false with a certain probability.<sup>453</sup>

### 10.4.1 Hypotheses: Gender

#### Responsibility for Grocery Shopping

In order to be able to answer the research question, namely how customer acceptance of sustainable packaging can be achieved, the question of the relevant target group or customer group subsequently arises.<sup>454</sup> Therefore, it is essential to clarify whether there is a gender-specific difference in terms of responsibility for grocery shopping.

*H<sub>1</sub>: There is a significant difference between the male and female gender in terms of being responsible for grocery shopping.*

A chi square test showed that there is a significance difference. The probability of error (asymptotic significance) was 0% and is therefore below the frequently used 5%-level.<sup>455</sup> The hypothesis can be accepted. There is a significant difference between gender and responsibility for grocery shopping. According to the survey data, 30% of men and 70% of women are responsible for grocery shopping. This is consistent with Sutterlüty's gender distribution data.<sup>456</sup>

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<sup>449</sup> Willers 2016, p. 13.

<sup>450</sup> Mancini; Marchini; Simeone 2017, p. 1841.

<sup>451</sup> Kröger; Wittwer; Pape 2019, p. 46.

<sup>452</sup> Raithel 2008, p. 14.

<sup>453</sup> Hüttner 1999, p. 59 f.

<sup>454</sup> Bohg; Leger 2013, p. 98.

<sup>455</sup> Mayer 2013, p. 136.

<sup>456</sup> Mayer 2017, p. 23.

Bohg and Leger state that although men are increasingly taking part in grocery shopping, women are still mainly responsible for the task. This view is also shared by Wieser and the RWI - Leibniz Institute for Economic Research.<sup>457</sup>

### Sustainable Shopping Behavior

The proportion of women responsible for grocery shopping clearly predominates. Therefore, the next hypothesis is to find out whether there is also a difference between the genders in sustainable shopping behavior. Because gender can have an impact on the interest in sustainability.<sup>458</sup> As visible in the measurement model, see subchapter 9.2, gender can be an influencing variable regarding sustainable behavior in the supermarket.

*H<sub>1</sub>: There is a significant difference between the male and female gender in terms of sustainable shopping behavior.*

For this hypothesis, a new variable for sustainable purchasing behavior was formed with the help of a formula, which considered the four answer options weighted. The least sustainable behavior was rated with zero points. The other statements were evaluated based on the extent to which the participants agreed, see subchapter 10.3. For example, most consumers bring their own shopping bag, so only one point is awarded for this. The allocation of points can be seen in the following table.

Shopping Behavior in the Supermarket	
I take my own shopping bag with me.	1 point
I take my own containers with me, e.g., for sausage / meat / bread products.	3 points
I take reusable fruits / vegetables bags with me.	2 points
None of the options mentioned.	0 points

Table 12: Point Scheme for the Calculation of the Formula

To calculate sustainable shopping behavior, each of the four behavioral characteristics is multiplied by the respective points and then added up.<sup>459</sup>

Formula
None of the options * 0 + own shopping bag * 1 + reusable fruits/vegetables bags * 2 + own containers * 3 = sustainable shopping behavior

Table 13: Formula for New Variable

A comparison of the two groups using the Mann-Whitney U test reveals a highly significant difference. Women show significantly more sustainable purchasing behavior than men do. Which is in line with the view of Spörrle and Bekk, who state that women are more concerned about environmental issues and are also more environmentally friendly in their behavior than men.<sup>460</sup>

<sup>457</sup> Bohg; Leger 2013, p. 102; Wieser n. y.; RWI - Leibniz-Institut für Wirtschaftsforschung 2013.

<sup>458</sup> Magnier; Crié 2015, p. 353; Bovensiepen et al. 2018, p. 20.

<sup>459</sup> Krebs; Menold 2019, p. 491.

<sup>460</sup> Spörrle; Bekk 2015, p. 292.

## 10.4.2 Hypotheses: Returnable Glass & Milk

The fact that glass packaging is perceived as sustainable by customers see subchapter 3.3, could indicate that interest in sustainable packaging and the purchase of products in returnable glass correlate. In general, the share of reusable packaging is declining; see subchapter 10.2. With regard to milk, a countertrend is noticeable; since 2020, returnable glass bottles are again available in Austria.<sup>461</sup> In contrast, it is still a niche product in Switzerland,<sup>462</sup> but according to a survey by Greenpeace, there would be a high willingness to use them. 68% of respondents said they would buy milk in returnable bottles.<sup>463</sup> In this context, it is now examined whether the attitudes and behavior of the participants in this study fit together.

### Interest in Sustainable Packaging & Effect

*H<sub>1</sub>: The more interested someone is in sustainable packaging, the more often he/she buys milk in returnable glass bottles.*

The relationship between the two variables was examined using correlation analysis. The Pearson correlation coefficient was 0.270. The probability of error was 0.000. This means that, in this case, the attitude and behavior coincide. Persons who are more interested in sustainable packaging are more likely to buy milk in returnable glass bottles more often.

### Attitude & Effect

*H<sub>1</sub>: The two statements “The range of products in returnable glass is to be increased.” and “I buy milk in returnable glass bottles.” are compared with each other with regard to frequencies to determine if there is a gap between attitude and behavior.*

The correlation analysis showed a Pearson correlation coefficient of 0.338 and a probability error of 0.000. This means that there is a significant correlation between the two variables.

As a next step, for calculating the frequencies, those people who strongly agreed or agreed with the statements were added.

Attitude and Behavior	
Range of products in returnable glass is to be increased	80%
Buy milk in returnable glass bottles	26%

Table 14: Comparison of Attitude and Behavior: Milk

The previously performed correlation analysis showed that there is indeed a significant correlation between these two statements. However, table 14 shows that more than three-quarters of the respondents would like to see an increase in the offer of returnable packaging, but only about one-quarter actually buys milk in returnable bottles. This comparison, therefore, shows a discrepancy between attitude and behavior. From this, it

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<sup>461</sup> Pladerer n. y.

<sup>462</sup> Rohrer 2019, p. 16.

<sup>463</sup> Rohrer 2019, p. 13.

can be concluded that if the supply of products in returnable packaging is increased, this must also be advertised accordingly.

### 10.4.3 Hypothesis: Fruits & Vegetables

*H<sub>1</sub>: The two statements “I like to buy fruits/vegetables unpacked.” and “I take reusable fruits/vegetables bags with me.” are compared with each other with regard to frequencies to determine if there is a gap between attitude and behavior.*

Although a t-test shows a significant difference, e.g., people who want to buy fruits or vegetables unpackaged use reusable bags more often, this is more of an expected result.

Therefore, the following result regarding the comparison of frequencies is of importance. For the first statement, those persons who agreed or strongly agreed that they liked to buy fruits and vegetables unpackaged were added. Those who agreed to take reusable fruit and vegetable bags were included in the second statement. The results are visible in table 15.

Attitude and Behavior	
Like to buy fruits/vegetables unpacked	87%
Take reusable fruits/vegetables bags with me	44%

Table 15: Comparison of Attitude and Behavior: Fruits & Vegetables

The results show that only half of those who say they like to buy fruits and vegetables unpackaged also take a transport aid with them when they do their grocery shopping. There is obviously a gap between attitude and behavior.

## 10.5 Discussion of Questionnaire Results

The theory of cognitive dissonance says that a state perceived as unpleasant occurs when attitude and behavior do not match. As a result, people want to justify their behavior, as in the case of smokers who know that it is not good for their health.<sup>464</sup> The TPB, see subchapter 4.3, says that information “is the connection between attitude and behavior.”<sup>465</sup> The expert interviews confirmed that this is precisely what is lacking.

It became apparent that in some cases attitude and behavior did not match. This can be explained by the fact that respondents answered accordingly to avoid cognitive dissonance.<sup>466</sup>

The results and following key conclusions are not applicable to the general public because, as already mentioned, this customer study is not representative. In addition, it could be assumed that there is a tendency to answer the questions in the affirmative.<sup>467</sup>

<sup>464</sup> Furnham 2010, p. 108.

<sup>465</sup> Garms-Homolová 2020, p. 26.

<sup>466</sup> Aschemann-Witzel 2009, p. 117.

<sup>467</sup> Aschemann-Witzel 2009, p. 116.

## Key Conclusions Regarding the Research Question

- It is mainly women who are responsible for grocery shopping. In addition, women also show significantly higher sustainable purchasing behavior than men.
- 81% of respondents claimed that they were very interested in the topic of sustainable packaging. In addition, it was found that over two-thirds of respondents pay more attention to sustainability when buying groceries than they did a few years ago.
- 96% of respondents believe that too much packaging waste is generated when buying groceries. However, comparatively few (56%) are concerned about the environmental impact of different packaging materials; this could indicate that consumers lack information. Nonetheless, half of consumers feel they are well informed about sustainable packaging. Which does not necessarily mean that they actually do, because according to the interviewed experts, consumers tend to make sweeping judgments. An indication of this could be that 80% think that the supply of reusable glass should be increased, despite the fact that reusable glass is to be viewed as critical, keyword transport routes. Although there is a high demand for reusable bottles, only about a quarter actually buys milk in glass bottles, which shows a gap between attitude and behavior. Since the supply is currently very limited, e.g., not available in conventional retail except for Austria, the non-purchase may also have other reasons in the sense of a critical view (e.g., preferred brand, size not available).
- Politics and producers are seen as mainly responsible for the supply of sustainable packaging.
- Only 10% of consumers believe that packaged fruits and vegetables have a longer shelf life, although it was clear from the expert interviews that unpackaged fruits and vegetables reduce shelf life. One third of consumers think that packaged fruits and vegetables are more hygienic and convenient. 87% said they like to buy fruits and vegetables unpackaged; only half of them actually take reusable bags with them. In terms of a critical view, it could be argued that the items are taken home loose or that bags are used from the store. However, according to the interviewed retailers, those must be paid for in most cases, see subchapter 8.2, and the disposable bags again produce waste.
- 61% of the respondents said that they had once not bought a product because of too much packaging. This shows that the risk of changing packaging can be worthwhile for producers.<sup>468</sup>
- The consumers surveyed indicated that quality, origin and price are most important for their purchase decision.

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<sup>468</sup> Mayer 2017, p. 12.

## 11. Closing Chapter

### 11.1 Conclusion

The packaging of food and beverage items has to fulfill important functions.<sup>469</sup> Nevertheless, the increasing volume of packaging waste and the associated negative environmental impacts raise the question of more sustainable packaging. A higher interest in sustainability can be observed among customers.<sup>470</sup> However, there is a gap between their attitude and actual purchasing behavior.<sup>471</sup> In addition, there is a lack of sustainable packaging in supermarkets. Therefore, this master's thesis dealt with how producers and retailers can increase customer acceptance of sustainable packaging. For this purpose, interviews were conducted with experts from both sectors, retail, and producers. In addition, consumers were asked about their attitudes and behavior in an online survey.

The expert interviews and different studies showed that avoiding packaging waste is the most sustainable approach, which is in line with EU policy.<sup>472</sup> However, the experts stated that finding the proper packaging is a complex topic and a packaging changeover is very time-consuming. Each product must be considered separately and new materials must be evaluated for their true sustainability and whether the production machines can process the material. Furthermore, the topic of food waste needs to be considered. In addition, the lack of knowledge and sweeping judgments on the part of consumers was described as a significant challenge for them.

Two product categories, fruits, vegetables and milk, were examined in more detail. This should make it possible to transfer the findings to other product categories. However, it became apparent that each product must be viewed individually. There may even be different packaging requirements for the same product depending on where it comes from, which got evident in the example of cucumber. In general, decisive factors for the complete elimination of packaging in fruits and vegetables are pressure sensitivity, transport routes, and customer frequency in the supermarket to avoid food waste.

The non-representative customer survey showed that consumers are very interested in the topic of sustainable packaging, which is in line with the findings of Bovensiepen et al.<sup>473</sup> They have a positive attitude towards loose sales and returnable glass packaging. Nevertheless, it was found that the majority of respondents do not take reusable bags or containers with them for shopping packaging free. Legislative changes, analogous to the abolition of plastic carrier bags, could affect the possibility of increasing the currently low acceptance since it became apparent during the customer survey that nearly all customers take their own shopping bag with them.

The analysis of different studies<sup>474</sup> and the expert interviews showed that it is not easy to evaluate returnable packaging solutions. The opinions are very contradictory. Here, as

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<sup>469</sup> Mayer 2017, p. 11.

<sup>470</sup> Monnot; Parguel; Reniou 2015, p. 329.

<sup>471</sup> Orzan et al. 2018, p. 3.

<sup>472</sup> European Commission n. y.-d.

<sup>473</sup> Bovensiepen et al. 2018, p. 19.

<sup>474</sup> Berglandmilch 2020; Der Tagesspiegel 2019; Iglar 2020; Szombathy 2020.

decisive factors can also be seen transport routes and the number of refills. According to an interviewed producer, standardized packaging solutions that enable return and refilling on a regional basis are recommended.

The comeback of the milk in returnable glass in Austria indicates that consumers are also prepared to change their purchasing habits in other areas. It will always be essential to achieve a balance in using different sustainable packaging materials since even sustainable packaging consumes resources. The top priority should be the avoidance of superfluous packaging and, if possible, the complete omission or reduction of the packaging material required to save resources.

Based on the findings from the two conducted studies, expert interviews, and customer survey, the recommendations for action were developed, which answer the research question and are presented in the following subchapter.

## 11.2 Recommendations for Action

The Three-Pillar Model shows that collaboration among three areas (environment, social, economy) is necessary to achieve sustainability.<sup>475</sup> The model can analogously be applied in the context of this master's thesis in that the responsibility of all decision-makers, and not only those examined in more detail, is necessary to increase the range of sustainable packaging in the supermarket.

The following recommendations present the most critical aspects in a clear form to increase customer acceptance and should motivate the retailers and producers to take action and develop new ideas. Since the research question refers to the producers and retailers, the following recommendations are particularly for them. The footnotes indicate which recommendations were derived from which expert. In addition, the most important statements are quoted.

### Packaging Design

- Since it became apparent in the customer survey that women especially attach more importance to sustainability and are mainly responsible for grocery shopping, these aspects should be considered when designing sustainable packaging.

### Test Markets

*P1: "So rather small changes and then also do a test run, e.g., with traditional consumer groups."*

- A packaging changeover should first be tested on the basis of a test project in order to prevent costs due to product spoilage<sup>476</sup> or missing customer acceptance<sup>477</sup>. For

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<sup>475</sup> Spörrle; Bekk 2015, p. 286 f.

<sup>476</sup> P2

<sup>477</sup> P1

example, as some retailers have done with test projects for filling stations<sup>478</sup> or milk in glass bottles.<sup>479</sup>

## New Solutions

*R3: "Promotion of products in the assortment that make it easier for households to save packaging, e.g., Sodastream. Offer unpackaged food when it makes sense to do so."*

- Filling stations could be considered as part of the solution of generating less packaging waste, especially in larger supermarkets. However, this under the condition that it is possible to take along one's own containers and that this is also actively supported by the supermarkets.

## Information & Transparency

*R3: "Educate about "half-truths" and communicate transparently why the packaging is used and which packaging has been chosen, e.g., food waste prevention, RePET packaging to use circular economy of packaging, reusable packaging. Constantly inform about more sustainable packaging, communicate changeover, e.g., press releases, social media postings and provide information on website. Provide tips for those interested in what more sustainable purchasing can look like, but don't dictate anything."*

- Informing customers can help to close the gap between their sustainable attitude and actual purchasing behavior. Information campaigns are important to counteract the sweeping judgments that consumers have (e.g., extreme negative bias against plastic).
- Print information about proper disposal on the packaging, which is especially important for new materials like bio-plastics and due to the different waste separation systems.

## Incentives as Motivation

*R3: "Customers get a 30-cent discount for filling reusable cups they bring with them."*

- A reward system, e.g., discount, for those who bring their own containers.
- Encourage consumers to carry own containers for products from the service counter by offering specific reusable containers that make it trendy to use them.<sup>480</sup>

## Handling & Logo

*P1: "If you can offer customers ecological packaging without any disadvantages, e.g., at the same price or perhaps even cheaper, and it looks the same and offers the same convenience as the old packaging, then customers are more likely to accept it."*

*P4: „The absolutely cool thing is that the customer doesn't even notice any difference. If you look at the packaging today and it would not be obvious with the logo, the customer would not notice it at all."*

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<sup>478</sup> R1, R2

<sup>479</sup> P2

<sup>480</sup> Rohrer 2019, p. 21.

- In the case of packaging changes, communicate these to customers in the form of advertising campaigns and information directly on the packaging.<sup>481</sup> A logo helps consumers to identify sustainable packaging.<sup>482</sup> A uniform solution is suggested in order to avoid ambiguities.
- Low switching costs, in terms of the price itself but also the handling (same or improved), can increase customer acceptance.

### 11.3 Future Research

In connection with the findings obtained, see subchapter 11.1, it became apparent that, above all, there is a need for knowledge formation on the part of customers. Therefore, further studies could investigate how this knowledge transfer could look like, which tools can be used or how consumers like to acquire knowledge in the unique field of sustainable packaging. For instance, knowledge could be driven through information campaigns to support sustainable purchasing decisions. Furthermore, a concept could help identify how cooperation between all decision-makers (e.g., policy, retail, producers, customers, media) can succeed. In this context, it would be recommendable to consider the support of the EU-goal regarding the prevention of food packaging waste from occurring in the first place.

Another recommendation is to not only focus on producers and retailers but to investigate the role of policy. According to an interviewed producer, there can currently be a lack of incentives for companies committed to changeover to sustainable packaging. Further research could identify concrete solutions on how policy can encourage companies to engage in sustainable packaging changes, analogous to the study of Marrucci et al.<sup>483</sup> This would help to improve the low current supply of sustainable materials on the market and promote new, innovative solutions. In doing so, the requirements of all market participants must be taken into account.

Particularly interesting would be the investigation of the role of waste management since there is a close relationship between them to retailers and producers. It would be interesting to know what effects this relationship and the existing payment obligations of the producers have for placing packaging on the market.

In future studies, a representative sample regarding the customer survey should be obtained in order to be able to transfer the results to society in general or specific groups of society. In addition, questions could be asked in greater depth in order to be able to interpret them better. Not only the knowledge about sustainable packaging but also how sustainable individual packaging materials are regarded. This is already available for the classic packaging materials, but not or only limited for the many new materials currently coming onto the market. Furthermore, additional hypotheses can be developed to gain further insights into the correlations between influencing variables and purchasing behavior. As a result, the packaging can be better adapted to the needs of the target group, and higher customer acceptance can be reached.

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<sup>481</sup> p4

<sup>482</sup> Magnier; Schoormans; Mugge 2016, p. 132.

<sup>483</sup> Marrucci; Marchi; Daddi 2020, p. 600.

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## **Appendix**

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## Packaging Changes at Spar



Figure 1: Packaging Changes at SPAR Austria<sup>484</sup>

<sup>484</sup> SPAR Österreich n. y.

## Interview Guideline

Interview-Leitfaden	
Welche Entwicklungen in Bezug auf nachhaltige Verpackung gab es bei Ihnen in den letzten Jahren? Gab es z.B. konkrete Verpackungsänderungen?	Produzenten & Handel
Bekommen Sie von den Kunden Rückmeldungen zu Verpackungen?	Produzenten & Handel
Sind Sie der Meinung, dass es aktuell zu viele Produkte in Einweg- und Plastikverpackungen im Handel gibt?	Produzenten & Handel
Wer ist Ihrer Meinung nach für das Angebot von nachhaltigen Verpackungen im Supermarkt verantwortlich? Handel, Produzent, Konsument oder Politik?	Produzenten & Handel
Inwieweit werden Sie vom Handel/den Konsumenten beeinflusst bei der Wahl der Verpackung für einzelne Produkte?	Produzenten
Inwieweit kann der Handel die Hersteller bei der Wahl Ihrer Verpackung beeinflussen?	Handel
Was halten Sie davon Obst / Gemüse ...unverpackt an den Handel zu liefern? ...ohne Verpackung anzubieten?	Produzenten Handel
Was können Sie dazu beitragen, dass nachhaltige Verpackungen von den Kunden angenommen werden?	Produzenten & Handel
Was halten Sie von der Einführung eines flächendeckenden Pfand-Systems (wie es bereits in anderen Ländern der Fall ist) als Lösung des Müllproblems? Ein aktuelles Beispiel hierzu ist die Rückkehr der Milch-Mehrwegflasche?	Produzenten & Handel
Was halten Sie von einer verpflichtenden Mehrweg-Quote als Lösung des Müllproblems?	Produzenten & Handel
Wie stehen Sie zum Thema Abfüllstationen für unverpackte Lebensmittel?	Handel
Was sehen Sie zukünftig als die größten Herausforderungen in Hinblick auf das Thema nachhaltige Verpackung?	Produzenten & Handel
Merken Sie Unterschiede hinsichtlich der Nachhaltigkeitsthematik in Bezug auf die Länder in denen sie aktiv sind?	unternehmensspezifisch
Hat ihr Unternehmen das Öko-Logo selbst entworfen?	unternehmensspezifisch

Table 1: Interview Guideline

## Questionnaire with Sources

Frage	Quelle / Anlehnung an
Das Thema nachhaltige Verpackung interessiert mich sehr.	Bovensiepen et al. 2018, p. 19
Ich bin maßgeblich für den Haushaltseinkauf zuständig.	Bohg; Leger 2013, p. 102; Wieser n. y.; RWI - Leibniz-Institut für Wirtschaftsforschung 2013
Aktuell lege ich beim Lebensmitteleinkauf mehr Wert auf Nachhaltigkeit im Gegensatz zu vor ein paar Jahren.	Monnot; Parguel; Reniou 2015, p. 329
Familie / Freunde beeinflussen meine Kaufentscheidungen im Supermarkt.	van Birgelen; Semeijn; Keicher 2009, p. 129 f.
Beim Lebensmitteleinkauf fällt zu viel Verpackungsmüll an.	Carstens 2016; NABU n. y.-b; Bovensiepen et al. 2018, p. 21.
Ich habe einmal ein Produkt aufgrund von zu viel Verpackung nicht gekauft.	Nink 2019
Die Umweltauswirkungen von unterschiedlichen Verpackungsmaterialien beschäftigen mich beim Lebensmitteleinkauf sehr.	Huber; Schmidt 2019, p. 6; World Economic Forum 2016, p. 14
Ich weiß welche Verpackungsmaterialien nachhaltig sind.	Steenis et al. 2017, p. 294
Ich bin mit dem Angebot an nachhaltigen Verpackungen im Supermarkt zufrieden.	Huber; Schmidt 2019, p. 6
Wer ist Ihrer Meinung nach für das Angebot von nachhaltigen Verpackungen verantwortlich?	Bovensiepen et al. 2018, p. 28
Das Angebot von Produkten in Mehrweg-Glas soll vergrößert werden.	Ja! Natürlich Naturprodukte Gesellschaft n. y., Leighty 2020, p. 58, Steinmüller-Schwarz 2020, Mescoli 2016; Suhr 2019.
Ich kaufe Milch in Glas-Mehrwegflaschen.	Pladerer n. y.; Rohrer 2019, p. 13
Obst / Gemüse kaufe ich gerne unverpackt (lose) ein.	Bovensiepen et al. 2018, p. 21; Carstens 2016; NABU n. y.
Verpacktes Gemüse / Obst ist... besser geschützt / länger haltbar / hygienischer /komfortabler (kein Abwiegen etc.)	Gustavo et al. 2018, p. 19; Rundh 2005, p. 671
Ich nehme... meine eigene Einkaufstasche / Behältnisse mit z.B. für Wurst-/Fleisch-/Brotwaren / wiederverwendbare Obst-/Gemüsesäckchen mit	Wirtschaftskammer Vorarlberg 2020; van Odijk; Poggenpohl 2019; Rohrer 2019, p. 13.
Was ist Ihnen bei der Produktwahl am Wichtigsten? Marke / Preis / Verpackung / Herkunft / Komfort / Qualität	Reynolds; Cuthbertson 2014, p. 9; Price: Willers 2016, p. 13
Welchem Geschlecht fühlen Sie sich zugehörig?	Bohg; Leger 2013, p. 102; Wieser n. y.; RWI - Leibniz-Institut für Wirtschaftsforschung 2013
Wie alt sind Sie?	Pawlik 2020b; 2020a; 2020c
Wo wohnen Sie hauptsächlich?	Zur Eingrenzung der DACH Region
Was ist Ihre Berufsbezeichnung?	Züll 2015, p. 9
Wie viele Personen leben in Ihrem Haushalt?	Rundh 2005, p. 671

Table 2: Questionnaire with Sources

# Questionnaire in German (Online View)

## Verpackung im Supermarkt

Bitte wählen Sie eine Sprache aus. / Please choose a language.

- Deutsch  
 English

### Seite 1

Herzlich Willkommen!

Liebe Teilnehmer\*in,

im Rahmen meiner Masterarbeit an der FH Vorarlberg beschäftige ich mich mit dem Thema „Nachhaltige Verpackung im Supermarkt“.

Beim folgenden Fragebogen geht es darum, Ihre persönliche Meinung in Erfahrung zu bringen. Die Beantwortung dauert max. 10 Minuten. Ich darf Sie bitten die Fragen wahrheitsgetreu zu beantworten, es gibt keine richtigen oder falschen Antworten. Die Umfrage ist anonym und die Antworten werden nur für diese Arbeit verwendet.

Vielen Dank für Ihre Teilnahme!

Ruth Stadelmann

[ruth.stadelmann@students.fhv.at](mailto:ruth.stadelmann@students.fhv.at)

#### Wie stark stimmen Sie folgender Aussage zu? \*

	Ich stimme sehr stark zu.	Ich stimme stark zu.	Ich stimme teilweise zu.	Ich lehne ab.	Ich lehne stark ab.
Das Thema nachhaltige Verpackung interessiert mich sehr.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

#### Ich bin maßgeblich für den Haushaltseinkauf zuständig. \*

- ja  
 nein

#### Wie stark stimmen Sie folgenden Aussagen zu? \*

	Ich stimme sehr stark zu.	Ich stimme stark zu.	Ich stimme teilweise zu.	Ich lehne ab.	Ich lehne stark ab.
Aktuell lege ich beim Lebensmitteleinkauf mehr Wert auf Nachhaltigkeit als vor ein paar Jahren.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Familie / Freunde beeinflussen meine Kaufentscheidungen im Supermarkt.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Wie stark stimmen Sie folgenden Aussagen zu? \***

	Ich stimme sehr stark zu.	Ich stimme stark zu.	Ich stimme teilweise zu.	Ich lehne ab.	Ich lehne stark ab.
Beim Lebensmitteleinkauf fällt zu viel Verpackungsmüll an.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ich habe einmal ein Produkt aufgrund von zu viel Verpackung nicht gekauft.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Die Umweltauswirkungen von unterschiedlichen Verpackungsmaterialien beschäftigen mich beim Lebensmitteleinkauf sehr.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ich weiß welche Verpackungsmaterialien nachhaltig sind.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ich bin mit dem Angebot an nachhaltigen Verpackungen im Supermarkt zufrieden.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Wer ist Ihrer Meinung nach für das Angebot von nachhaltigen Verpackungen verantwortlich? \***

Bitte reihen Sie von 1 (=am Meisten verantwortlich) bis 5 (=am Wenigsten verantwortlich).

- ⌵  Konsumenten
- ⌵  Handel
- ⌵  Politik
- ⌵  Produzenten
- ⌵  Andere

**Wie stark stimmen Sie folgenden Aussagen zu? \***

	Ich stimme sehr stark zu.	Ich stimme stark zu.	Ich stimme teilweise zu.	Ich lehne ab.	Ich lehne stark ab.
Das Angebot von Produkten in Mehrwegglas soll vergrößert werden.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ich kaufe Milch in Mehrwegglas.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Obst / Gemüse kaufe ich gerne unverpackt (lose) ein.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Welchen Aussagen stimmen Sie zu? \***

Mehrfachnennungen möglich.

- Verpacktes Gemüse / Obst ist besser geschützt.
- Verpacktes Gemüse / Obst ist länger haltbar.
- Verpacktes Gemüse / Obst ist hygienischer.
- Verpacktes Gemüse / Obst ist komfortabler (kein Abwiegen etc.).
- Keine von den genannten Möglichkeiten.

**Welchen Aussagen stimmen Sie zu? \***

Mehrfachnennungen möglich.

- Ich nehme meine eigene Einkaufstasche mit.
- Ich nehme eigene Behältnisse mit z.B. für Wurst-/Fleisch-/Brotwaren.
- Ich nehme wiederverwendbare Obst-/Gemüsesäckchen mit.
- Keine von den genannten Möglichkeiten.

**Was ist Ihnen bei der Produktwahl am Wichtigsten? \***

Bitte reihen Sie von 1 (=am Wichtigsten) bis 6 (=am Unwichtigsten).

- ▲ ▼  Marke
- ▲ ▼  Preis
- ▲ ▼  Verpackung
- ▲ ▼  Herkunft
- ▲ ▼  Komfort
- ▲ ▼  Qualität

**Welchem Geschlecht fühlen Sie sich zugehörig? \***

- männlich
- weiblich
- divers

**Wie alt sind Sie? \***

Bitte tragen Sie ganze Zahlen ein.

**Was ist Ihre höchste abgeschlossene Ausbildung? \***

- Pflichtschule
- Lehre
- Fachschule (z.B. HAS)
- Matura / Abitur
- Hochschule (z.B. Fachhochschule, Universität)
- Sonstiges

**Welche Staatsangehörigkeit haben Sie? \***

- Deutschland
- Österreich
- Schweiz
- Sonstiges

**Wo wohnen Sie hauptsächlich? \***

- Deutschland
- Österreich
- Schweiz
- Sonstiges

**Zu welcher Berufsgruppe gehört Ihr jetziger Beruf? \***

- Wissenschaftliche, technische oder ähnliche Fachkraft (z.B. Arzt/Ärztin, Lehrer\*in, Techniker\*in)
- Leitende Tätigkeit im öffentlichen Dienst oder in der Wirtschaft (z.B. Banker\*in, leitende Position in einem Großunternehmen)
- Bürokraft oder verwandter Beruf (z.B. Sekretär\*in, Büroangestellte\*r, Verwaltungsangestellte\*r)
- Handelsberuf (z.B. Verkaufsleiter\*in, Geschäftsbesitzer\*in, Verkäufer\*in, Versicherungsvertreter\*in)
- Dienstleistungsberuf (z.B. Polizist\*in, Friseur\*in)
- Facharbeiter (z.B. Vorarbeiter\*in, KFZ-Mechaniker\*in, Elektriker\*in)
- Angelernter Arbeiter (z.B. Busfahrer)
- Ungelernter Arbeiter (z.B. Bauhilfsarbeiter)
- Landwirtschaftlicher Beruf (z.B. Landwirt\*in)
- Sonstiges

**Sind Sie in Ihrem jetzigen Beruf... \***

- selbständig (z.B. eigener Betrieb, eigenes Büro)
- abhängig beschäftigt (z.B. Arbeiter\*in, Angestellte\*r, Beamt\*in)

**Wie viele Personen leben insgesamt in Ihrem Haushalt? \***

Bitte zählen Sie sich selbst auch dazu.

- 1 Person
- 2 Personen
- 3 Personen
- 4 Personen
- 5 Personen
- 6 Personen
- 7 Personen
- 8 Personen
- 9 Personen
- 10 Personen und mehr

Die Umfrage ist beendet. Das Fenster kann nun geschlossen werden.

Herzlichen Dank für Ihre Teilnahme!

Rückfragen oder Anregungen an: [ruth.stadelmann@students.fhv.at](mailto:ruth.stadelmann@students.fhv.at)

## Calculation of Occupational Group

Groups from Customer Survey	Groups from Statistic Austria <sup>485</sup>	
Managerial position in public service / business	Führungskräfte	155.200
Scientific, technical or similar specialist	Akademische Berufe	803.900
	Technikerinnen und Techniker und gleichrangige nichttechnische Berufe	657.700
Office worker or related occupation	Bürokräfte und verwandte Berufe	390.700
Service occupation Commercial occupation	Dienstleistungsberufe und Verkäuferinnen und Verkäufer	823.000
	Fachkräfte in Land- und Forstwirtschaft und Fischerei	40.700
Skilled workers	Handwerks- und verwandte Berufe	591.200
	Bedienerinnen und Bediener von Anlagen und Maschinen und Montageberufe	292.000
	Hilfsarbeitskräfte	510.000
	Angehörige der regulären Streitkräfte	12.700
	Insgesamt	4.277.100

Table 3: Calculation of Occupational Group

<sup>485</sup> Statistik Austria 2020b.

## **Statement of Affirmation**

I hereby declare that all parts of this thesis were exclusively prepared by me, without using resources other than those stated above. The thoughts taken directly or indirectly from external sources are appropriately annotated. This thesis or parts of it were not previously submitted to any other academic institution and have not yet been published.

Dornbirn, 08. July 2021

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