Industrial Design Engineering Master Thesis

CONFIDENTIAL

# Next generation drinking solution for beverage carton portion packs, balancing sustainability and convenience

Matthijs Mondria

DPM 1985 | February 2023


UNIVERSITY OF TWENTE.

# NEXT GENERATION DRINKING SOLUTION FOR BEVERAGE CARTON PORTION PACKS, BALANCING SUSTAINABILITY AND CONVENIENCE


## MATTHIJS MONDRIA
s1853074

## EDUCATION
Faculty: Faculty of Engineering Technology
Department: Design, Production and Management
Master programme: Industrial Design Engineering
Master track: Human Technology Relations

## EDUCATIONAL INSTITUTION
University of Twente
Drienerlolaan 5
7500 AE Enschede

## COMPANY
Royal FrieslandCampina N.V.
Global Packaging Development
Bronland 20
6708 WH Wageningen


## EXAMINATION DATE
09-02-2023

## EXAMINATION BOARD

| | |
|---|---|
| Prof.dr.ir. R. ten Klooster (Roland) | (chair) |
| Ir. M. Mulder - Nijkamp (Maaike) | (supervisor) |
| Dr. ir. B.L.A. de Koeijer (Bjorn) | (external member) |
| Ir. A. Garcia (Andrea) | (mentor from company) |

# Acknowledgements

First of all, I would like to thank the colleagues from Global Packaging Development at FrieslandCampina for making me feel welcome and supporting me during my graduation assignment. Starting with my (first) supervisor Randy Kommerkamp, who I am very thankful to for sharing his knowledge about the world of packaging, for taking me along to factories and for guiding me in this process which has not always been easy. Because Randy pursued his dreams and found a new job at another department within FrieslandCampina, he was not able to continue supervising me. Luckily, Andrea Garcia was there to hop in. This transition was very smooth because I already worked with her before, and she was up to date on my research. I want to thank Andrea for taking over and assisting me in the last phase of my thesis where her consumer and design expertise was of great value. I also want to thank the colleagues from the TET Beverage Cartons, Erik Lentink and Ger Standhardt, for making me feel welcome in the team and involving me as much as possible. I would also like to thank Daan van Urk, who was always available to give some quick advice on how to approach certain things when I was in doubt. As an intern, it was also very nice to have other interns to talk to and share experiences with. That is why I would like to thank Casper Kroon, Maarten van Domselaar, Rianne Hagen and Robert Buess for their support. Lastly, I want to thank Patrick van Baal for the opportunity to write my thesis at FrieslandCampina.

I would also like to thank some colleagues that are not part of GPD, but also were of great help during the research. Firstly, I would like to thank Melissa Smeets for taking the time to meet with me every other week during a period of a few months to answer all my Chocomel related questions and for helping with the Check & Learn sessions. I am also very thankful to Marjolein Rouwhof, Louise Snelders and Kim Stadman for guiding me during the preparation and execution of the Check & Learn sessions which would not have taken place without them.

Also, I would like to thank my supervisor from the University of Twente: Maaike Mulder – Nijkamp for her expertise and enthusiasm. Because of that, I left every meeting with fresh motivation.

Finally, I would like to thank my family and friends for supporting me throughout this process, which has not always been easy. Especially my mother, who was always there to help me get back on track when needed.

I hope you will enjoy reading this thesis.

**MATTHIJS MONDRIA**

Enschede, 11-1-2023

# Summary

Everything needs to get more sustainable, also in the world of packaging. However, this sustainability improvement often does not benefit the convenience of the packaging. Examples of this are the capless yoghurt packs or paper straws that respectively replaced the plastic cap and plastic straws. Looking at paper straws, they do have benefits for nature, as they do not add to the plastic soup when they end up in the ocean, but simply degrade. However, with this new material, there are also some drawbacks: complaints about the taste of the paper, the straw getting soggy after a while and even parts of the straw getting loose and ending up in a child's throat. The challenge thus is to find a new drinking solution that does not have these kinds of drawbacks and has a good balance between sustainability and convenience.

To tackle this challenge, firstly the current drinking solutions used at FrieslandCampina were inventoried, as well as the state of the art of new drinking solution concepts. In the analysis phase, a consumer test was carried out to get a taste of what consumers think about the current packaging formats and what themes to investigate further in the next consumer test. Additionally, complaints that FrieslandCampina received about several packaging formats were analysed. To find out where the possibilities for improvement were within the company, interviews were conducted with relevant brand managers and technology experts. Also, literature research was done to gain insights into packaging functions, sustainability, convenience, and consumer research. Based on the consumer test, complaints, interviews, and literature, four scenarios were created of possible drinking solution improvements. After one scenario was chosen and the requirements were clear, a model was made aiming to help finding the right balance between sustainability and convenience. In addition, more interviews were conducted to dive deeper into the chosen scenario.

After the analysis phase, the ideation phase started, in which multiple concepts were created using brainstorms. From a selection of these concepts, realistic renders were made. These renders were used in several group discussions with consumers. From these group discussions, multiple interesting insights arose. These insights were then translated into recommendations to be used by FrieslandCampina to aid in future drinking solution developments with the right balance between sustainability and convenience.

# Glossary of terms

| | |
|---|---|
| **Auxiliaries** | Extra packaging components like caps, straws, wrappers. |
| **Check & Learn session (C&L)** | Session held by the Sensory and Consumer Insights department to evaluate new product ideas, using focus groups / group discussions. |
| **Consumer** | The party that consumes the product. |
| **Convenience** | Designed for easy and comfortable preparation and use. |
| **Customer** | The party FrieslandCampina sells its products to, like supermarkets who then sell it to the consumer. |
| **Drink** | Products that one can drink, like plain milk, flavoured milk, drinkyoghurt, Chocomel, Fristi. |
| **Drinking Solution** | Component of the packaging that fulfils the drinking function. |
| **Eat** | Products that one can eat, like yoghurt, quark, and custard |
| **Expert Team (ET)** | Team of Experts in a certain field, like sustainability. |
| **Gable top** | Traditional fresh beverage carton format, with a tent shape on the top of the packaging. This packaging format is used for most fresh dairy drink products, like milk and drinking yoghurt. |
| **Private label** | Products produced by FrieslandCampina for a brand from a supermarket itself, like Jumbo, Albert Heijn, Aldi or Lidl, instead of for FrieslandCampina brands. (Dutch: huismerk) |
| **Product** | At FC, the 'product' is what is inside the packaging, like milk, yoghurt, custard, quark etc. The 'product' does not include the packaging. |
| **Stock Keeping Unit (SKU)** | Unique item with a code that identifies characteristics like manufacturer, material, size and packaging. |
| **Technology Expert Team (TET)** | Team of Experts in a certain field of packaging technology, like beverage cartons or metal. |

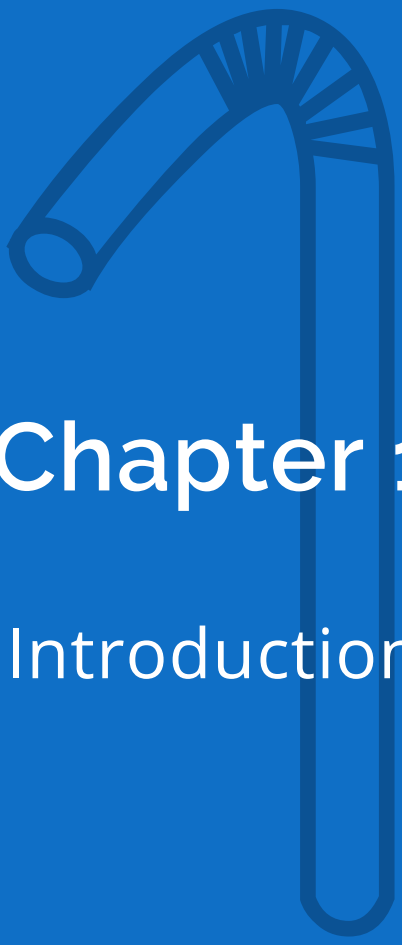
# Glossary of abbreviations

| | |
|---|---|
| **BC** | Beverage Carton |
| **C&L** | Check and Learn (sessions) |
| **ET** | Expert Team |
| **FC** | FrieslandCampina |
| **PLH** | Pre-Laminated Hole |
| **PMD** | plastic packaging, metal packaging and beverage cartons |
| **SKU** | Stock Keeping Unit |
| **TET** | Technology Expert Team |

# Table of Contents

# List of Figures

# List of Tables



# Chapter 1

## Introduction

# 1. Introduction

In this chapter, the context of the research, the company FrieslandCampina where the research is carried out, the challenge, the research questions and the report structure are covered.

## 1.1 Context

Sustainability is a hot topic, also in the packaging industry. FrieslandCampina is also doing its best to make its packaging more sustainable. Some of these sustainability improvements are intrinsically motivated, others are based on legislation like the Single Use Plastics Directive (SUP) which prevents the incorporation of single-use plastics. More on this legislation can be found in section 2.1. Apart from invisible improvements like making the caps out of biobased materials instead of oil and using recycled PET for bottles, there are also some measures that are perceptible to the consumer. A few examples of that can be found in figure 1.

The first example here is the paper straw that has replaced the plastic straw on the Chocomel 200ml beverage cartons, which was driven by the SUP directive. The second example is the removed cap for the Campina Biologisch (organic) 1L range, bringing back the traditional opening where the consumer must tear open the beverage carton to form a spout and pour out the product. The third example is the Chocomel 300ml PET bottle. This format consists of three components: the bottle, the sleeve and the cap. Currently, only the bottle is made from 100 % recycled plastic (rPET). The sleeve and the cap are not made from recycled plastics but are made from new (virgin) materials and are not recyclable. To be able to recycle the bottle itself, the sleeve needs to be removed. This can be done by a zipper on the side of the bottle, also see figure 20.


**Figure 1: From left: Chocomel 200ml with paper straw, Campina organic buttermilk without cap, Chocomel 300ml PET bottle with removable sleeve**

All these examples have to do with the consumer experience of the packaging. The first and second example have a direct effect on the user experience, as the product cannot be consumed without the use of the straw or the capless opening. The third example does not have a direct influence on the experience of consuming the product but does have an influence on the disposal of the packaging after use. As mentioned before, the bottle itself can only be recycled if the sleeve is removed. To enable the recycling, it should be made easy for the users who are

willing to dispose the packaging as intended to remove the sleeve, so it is part of the overall consumer experience of the packaging.

Although all three of these packaging formats positively contribute to more sustainable packaging, they do not necessarily positively contribute to a good user experience. Rather, they can worsen the convenience of using the packaging. Especially the first two examples were not received well by the audience after launch. Although there were some confused tweets about the Campina Biologisch range, the paper straws caused significantly more agitation. The capless Campina Biologisch format caused some confusion, as it was marketed as an innovation, but most people just saw it as a return to the traditional packaging. Although there are some improvements compared to the traditional packaging, the fundamental idea is the same. With the paper straws, there were complaints about the mouthfeel, the taste and the straw getting soggy after some time, making it hard or even impossible to drink. The sogginess also caused more serious issues, like children choking on (loose parts of) paper straws after sucking on it for too long. All these complaints do not only apply to the straws used by FrieslandCampina, but to paper straws in general. The Netherlands Food and Consumer Product Safety Authority (NVWA) even started an investigation on this choking hazard after three reports, asking if more people who had similar experiences could report to them (NVWA, 2022). Following this call, more than 400 reports were received where a piece of a paper straw ended up in a child's throat (NVWA, 2022). In most of the cases, the child was able to cough out the piece. According to (NVWA, 2022), there were no reports of suffocation or situations where medical intervention was needed. This news also reached the House of Representatives, where member Fleur Agema asked questions about the matter to the minister of Health, Ernst Kuipers. In a reaction to this news, minister Kuipers mentioned that this risk should be a motivation for the industry to look for an alternative to the current paper straws (Rijksoverheid, 2022).

Another interesting development in the world of beverage cartons is the move away from the use of aluminium, so called Alu-free packaging. This is done because of the relatively high carbon footprint of the material. When removing this layer, this needs to be replaced by another layer or coating to compensate. With the current straw packs, the paper straw punctures through the pre-laminated hole, through the aluminium. As this material tears relatively easily, it is easy to puncture, although the paper straw makes it harder than the plastic straw before. When the aluminium is replaced by another layer, however, this layer probably will be tougher and thus harder to puncture, especially with the paper straw. To tackle this issue, a sharper or stronger straw would be needed.

From the initial talks with the colleagues at FrieslandCampina, when asking about their opinion on this subject, a common theme arose. Multiple colleagues mentioned that it would be ideal to come up with a solution without a straw to replace the current straw packs. In their mind, this could be something still based on the current format, but with some type of spout to be able to directly drink out of the pack without a need for a straw.

All of the aspects above lead to the assignment to come up with solutions that overcome the current problems. More about this assignment can be read in section 1.3.

## 1.2 FrieslandCampina

This research project is executed at FrieslandCampina (FC), which has its Innovation Centre in Wageningen, within the Global Packaging Development (GPD) department. Within GPD, there are multiple Technology Expert Teams (TET) and Expert Teams (ET). Because the scope of this research lies within beverage cartons, the TET Beverage Cartons is the right team to join. The knowledge present in this team, but also ETs like Sustainability are of great help.

FrieslandCampina is one of the largest dairy companies in the world, with 15.703 member dairy farmers and 22.961 employees in 2022. Together, everyday millions of consumers are using products of one of the many brands of FrieslandCampina. An overview of most of these brands can be found in figure 2.


**Figure 2: Global brand portfolio of FrieslandCampina**

As visible in figure 2, FrieslandCampina has many brands worldwide. The largest brands in the Netherlands are Campina, Chocomel, Optimel, Fristi, Friesche Vlag, Milner, Mona, Parrano, Valess and Vifit. With these brands, there also many types of packaging ranging from the Campina beverage carton, to the Chocomel can to the Fristi plastic bottle. As mentioned in section 1.1, packaging needs to get more sustainable and FrieslandCampina is also working on that. Because they find it so important, it is even one of the six sustainability priorities within FC: Better packaging (figure 3). FrieslandCampina's goal is to have 100% recyclable or reusable packaging and more than 99% of the waste materials reused by 2025. More about sustainability at FrieslandCampina can be read in section 4.3.


**Figure 3: Six sustainability priorities of FrieslandCampina**

## 1.3 Challenge

As mentioned before, there are quite some challenges arising from the new legislations and from the goals set by companies like FrieslandCampina. Most of these challenges focus on making the packaging more sustainable, which can be done in multiple ways. However, when packaging becomes more sustainable, it could be that the packaging simultaneously becomes less convenient, like the examples mentioned in section 1.1.

The challenge for this thesis is thus to develop a new packaging that is more sustainable, but also still convenient, so the balance between sustainability and convenience is right. Considering the examples mentioned before, the convenience is affected by the user experience. Here, this user experience is mainly determined by the negative change in drinking experience, because of the (paper) straw and the (lack of a) cap. That is why the focus will be on the drinking solution in this research. A drinking solution can be defined as: **'a component of the packaging that fulfils the drinking function'**. However, this does not mean that only the drinking solution will be changed, and the rest of the packaging stays the same. As mentioned before, from the initial interviews an ideal arose that a packaging should not have a straw or cap but should be drinkable directly from the pack. This may mean that the whole packaging format needs to change, and not only the 'drinking solution' part of it. That is why the drinking solution can be seen as broader than a straw or cap, as it can also be seen as the entire packaging. The examples of the straw and cap are both applied to a beverage carton, which is why this type of packaging material will be the scope for now. Later, more research will be done to determine if this is indeed the best choice to develop a new drinking solution with by also looking at other packaging types and materials.

Based on this, the main research question thus is:

**What does the next generation of drinking solutions for beverage cartons look like, finding the right balance between sustainability and convenience?**

Here, sustainability is defined as: "packaging that has a comparatively low environmental impact as assessed by life-cycle assessment models." Convenience is defined as: "designed for

easy and comfortable preparation and use". More about the background of these definitions can be found in section 3.1.

Based on this main research question, several sub-questions are drawn up which together lead to an answer to the main research question. Firstly, research must do done to consumers and their opinions. To do this research in the best way possible, it is crucial to find out how to get the best insights from these consumers to come to better drinking solutions. Because these consumers might have persistent rituals and habits, it also could be wise to find out how to make a solution that fits these rituals and habits, or how to anticipate on this when the solution might not fit immediately. This leads to the first sub-question:

1. **How to get the best insights from the target consumer to come to better drinking solutions that fits the rituals and habits?'**

Because the balance between sustainability and convenience is of great importance in this research, it might help to find out what the current literature states about this balance. Also, how this resonates and coheres with the different stakeholders is important to find out. This leads to the second sub-question:

2. **What does current literature state about the balance between sustainability and convenience and how does this resonate and cohere with the different stakeholders in relation to a new drinking solution?**

When a possibly radically new drinking solution is proposed, it might happen that the balance between sustainability and convenience is not completely right yet, and there is a certain threshold to be overcome. If this happens, so the drinking solution is not intuitively convenient enough, it's interesting to find out how to overcome this possible threshold. Possibly, visual cues can be used for this to remove the threshold of interacting with the new drinking solution, for example how to open or dispose the packaging. This leads to the third sub-question:

3. **How to remove the threshold, if present, of interacting with the new drinking solution using visual cues?**

To develop a good new drinking solution, it is of great importance to listen to the end users and find out what the context of use is of a certain packaging type. But also, what the potential limitations are when implementing the new drinking solution. This leads to the fourth sub-question:

4. **What are the contexts of use for the end user and potential limitations when implementing the new drinking solution?**

After the outcome of the research above is clear and the requirements are set, how the future concept of drinking solution for beverage cartons can be materialized must be explored. This leads to the fifth sub-question:

5. **How to materialize a future concept of drinking solution for beverage cartons given a specific context of use by the end user?**

## 1.4 Report structure

Now it is clear what the context, the challenge and the research questions are, the approach on how these questions will be answered follows.

Based on the main research question and the sub-questions, the research is split into five phases. These phases are ideally subsequential but could also be carried out simultaneously.

Phase 1 is about finding out how to get the best insights from the target consumer and what influence rituals and habits could have and how to take that into account. This is done by literature research and a field study. The desired deliverable here is the research approach and theory about rituals and habits.

Phase 2 is about the balance between sustainability and convenience, and what is already done in that area both in literature, concepts or products already on the market. The stakeholders and their wishes should also be mapped. The methods used are state of the art research, literature research and interviews. The desired deliverables are an analysis of the current portfolio, an analysis of new drinking solution concepts, relevant knowledge from literature about the balance between sustainability and convenience, a stakeholder analysis and user analysis requirements.

Phase 3 is about how to remove the potential threshold that could arise when interacting with the new and possibly radically different concept with visual cues, if needed. The methods used here are literature and consumer research. The desired deliverable are contextual requirements.

Phase 4 is about the contexts of use for the end user and potential limitations when implementing the new drinking solution. The methods that could be used for this are questionnaires and interviews. The desired deliverable are functional and technical requirements.

Phase 5 is about how to materialize the future drinking solution concept for beverage cartons, taking the specific context of the end user into account. The methods used here are the ones of a typical design process, but now also done with users from the start: ideation, specification and realization. The desired deliverable here would be a concept advice.

An overview of the phases, with their respective question, method and deliverables can be found in table 1.

**Table 1: Overview of phases with question, method and deliverable**

| Phase | Question | Method | Deliverable |
|---|---|---|---|
| 1 | How to get the best insights from the target consumer to come to better drinking solutions that fits the rituals and habits? | Literature research<br>Field study | Research approach<br>Rituals and habits theory |
| 2 | What does current literature state about the balance between sustainability and convenience and how does this resonate and cohere with the different stakeholders in relation to a new drinking solution. | State of the art<br>Literature research<br>Interviews | Current portfolio<br>Stakeholder analysis<br>User analysis<br>Requirements |
| 3 | How to remove the threshold, if present, of interacting with the new drinking solution using visual cues? | Literature research<br>Consumer research | Contextual<br>Requirements |

| | | | |
|---|---|---|---|
| **4** | What are the contexts of use for the end user and potential limitations when implementing the new drinking solution? | Questionnaire<br>Interviews | Functional/Technical Requirements |
| **5** | How to materialize a future concept of drinking solution for beverage cartons given a specific context of use by the end user? | Design process with users<br>• Ideation<br>• Specification<br>• Realization | Concept advice |

For this research, the Double Diamond model (Design Council, 2019) is used. This model consists out of two diamonds with 4 phases, 2 phases per diamond. Each phase consists either of converging or of diverging activities. It starts with the challenge and ends with the outcome. The first diamond is used to formulate the assignment and challenge more clearly. The second diamond is used to find solutions to this challenge. In figure 4, this model is adapted to show the corresponding chapters of each phase.

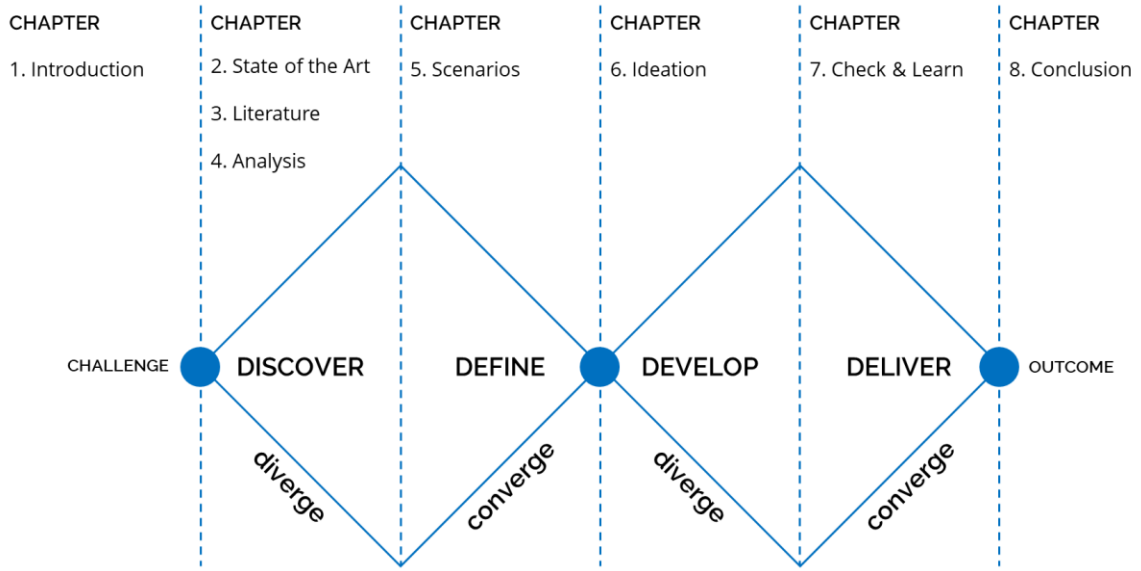



**Figure 4: Adapted Double Diamond model (Design Council, 2019)**

To help find the right usability method in new packaging development processes, former fellow UT student and FrieslandCampina intern Joanan Blei developed the usability method decision tool. In this tool, three main phases are distinguished: Research and Analyse, Conceptualise, and Develop. Per phase, also the goals are listed. Below these goals, four quadrants with methods that can be deployed are visible. These quadrants are shaped by effectiveness on the y-axis and resource heaviness on the x-axis, with the top right quadrant being the most ideal: most effective and lowest on resources. Based on this, the methods to be used in the packaging development can be picked. For the 'research and analyse' phase, 'interviews' (effective but high on resources) and 'Audit current solutions' could be good methods to find answers. With the 'audit of current solutions', also some 'observation' could be done, although this is ranked as only 'moderately effective'. For the 'conceptualise' phase, again 'interviews' (effective and low on resources) but also 'focus group' (effective and low on resources) and 'informal usability test' (effective and low on resources) can be interesting

methods to use. The third and last phase is 'develop', but this is out of scope of this research. An adapted version of the 'Usability Method Decision Tool' (Blei, 2020) with the most interesting methods highlighted can be found in figure 5.

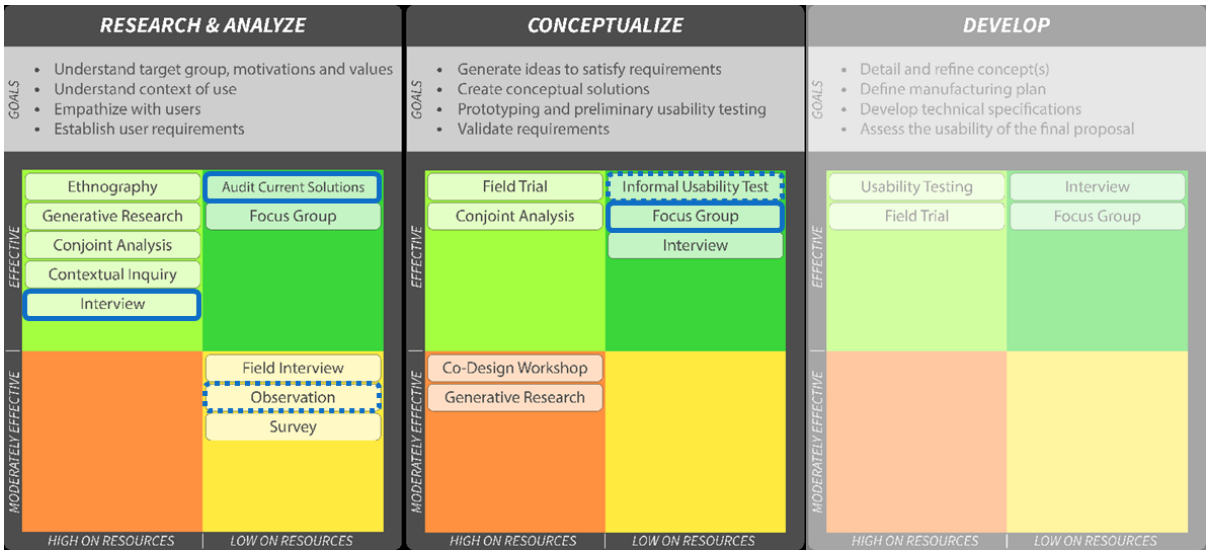
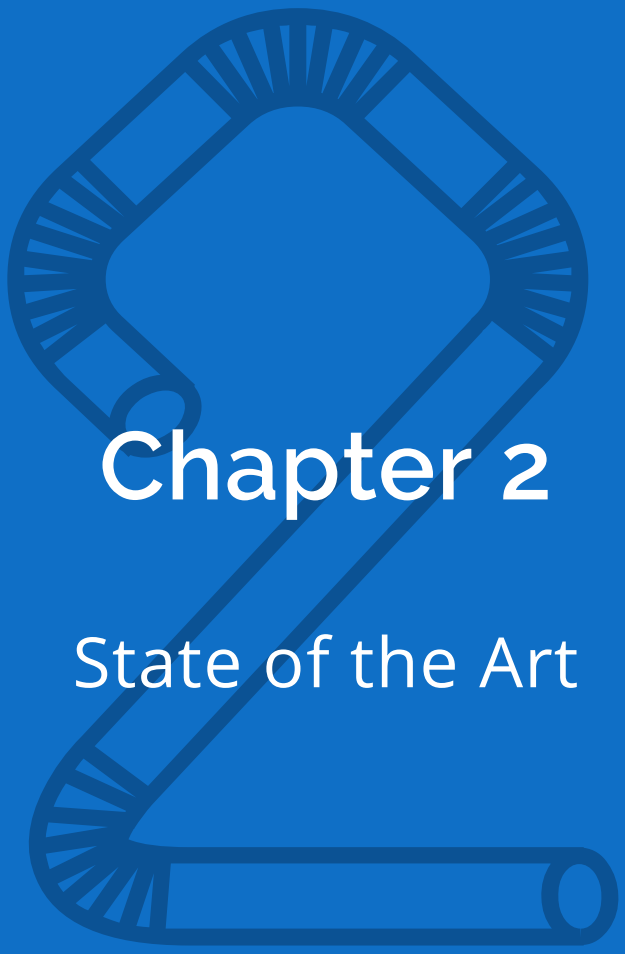



**Figure 5: (Adapted) Usability Method Decision Tool** (Blei, 2020)



# Chapter 2

## State of the Art

# 2. State of the Art

In this chapter, the second sub-question is partially answered: 'What does current literature state about the balance between sustainability and convenience and how does this resonate and cohere with the different stakeholders in relation to a new drinking solution.' To do this, this chapter will give some more background information behind the challenge of this thesis and will dive deeper into the SUP directive, the currently available and applied drinking solutions, the new developments in drinking solutions. Also, a matrix is presented to understand the relation between sustainability and convenience together with an overview of stakeholders. Together with chapter 3 and 4, this chapter is part of the 'discover' phase, which fills the first half of the first diamond in figure 6.

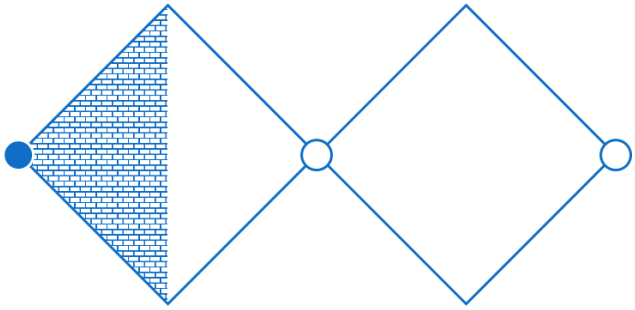


**Figure 6: Double Diamond model, building first half of first diamond**

## 2.1 Single-Use Plastics (SUP) Directive

The 'directive (EU) 2019/904 on reducing the impact of certain plastic products on the environment', better known as 'single-use plastics (SUP) directive', "aims to prevent and reduce the impact of certain plastic products on the environment, and to promote a transition to a circular economy throughout the European Union (EU) by introducing a combination of measures tailored to the products covered by the directive, in particular, by ensuring that single-use plastic (SUP) products, for which more sustainable alternatives are available and affordable, cannot be placed on the market" (Publications Office of the European Union, 2019). Not all single-use plastics are in the scope of this directive, only the 10 items that are most found on European beaches are addressed, representing 70% of all marine litter in the EU (Publications Office of the European Union, 2019). The SUP items that cannot be placed on the market are (Publications Office of the European Union, 2019):

- cutlery (forks, knives, spoons and chopsticks);
- plates;
- straws and cotton bud sticks (except those used with active implantable or other medical devices);
- beverage stirrers;
- sticks to be attached to and to support balloons and their mechanisms, except balloons for industrial or other professional uses and applications that are not distributed to consumers;

- food containers made of expanded polystyrene (i.e. boxes, with or without a cover) for immediate consumption without any further preparation, typically consumed from the container or ready to be consumed without further preparation;
- products made from oxo-degradable plastic;
- beverage containers made of expanded polystyrene, including their caps and lids; and
- cups for beverages made of expanded polystyrene, including their covers and lids.

Focussing on beverage cartons, there is one interesting item to point out: the straw. These are used for 200ml beverage cartons at FrieslandCampina for several brands like Chocomel, Fristi and Campina. These straws cannot be made out of plastic anymore since 3 July 2021. Because of this legislation, FrieslandCampina and many others introduced the paper straw as a replacement. However, as mentioned in section 1.1, the current straws are not perfect.

Apart from the list above, there are other single-use plastics that are in the scope of this directive. For beverage cartons, one design requirement is relevant: "Those with caps and lids made of plastic may be placed on the market only if the caps and lids remain attached to the containers during the products' intended use stage" (Publications Office of the European Union, 2019). This has an effect on many products from FrieslandCampina, like the 1 litre beverage cartons for Campina milk, Optimel drink yoghurt and Chocomel. This product design requirement will apply from 3 July 2024. The capless solution that was discussed in section 1.1 would be compliant, but also has some disadvantages. Making the cap stick to the beverage carton after opening could also have some disadvantages, like the cap hitting the nose while drinking or some product being present in the cap which could cause spilling.

## 2.2 Drinking Solutions

Now the (future) legislation that is relevant to beverage cartons is clear, it is interesting to find out more about the beverage cartons themselves. Because the focus is on drinking solutions for beverage cartons, firstly, the currently available drinking solutions from the major beverage carton suppliers will be explored. Secondly, the currently used drinking solution for the five major Dutch FC brands will be explored. Thirdly, new and innovative drinking solution concepts are explored to serve as an inspiration and state-of-art.

### Currently available

There are three main beverage carton suppliers: Elopak, Tetra Pak and SIG. These suppliers are system suppliers, which means that they both supply the machine but also the material to be used in the machine. Because these three suppliers are system suppliers, there is not much flexibility for companies like FC to make large adjustments to the packaging. These machines can be blank fed or roll fed. Blanks are mostly used for chilled beverage cartons and material on a roll for ambient beverage cartons. More about the difference between these types of beverage cartons can be read below. All of these suppliers also have their own openings. This can be in the shape of a screwcap, a flip cap, a peel back tab, a peel back lid, a perforation or a strawhole. There are also different material and cap suppliers apart from the three discussed above, but the material still runs on the machines of the three main suppliers. A collection of all the different openings of these three main suppliers can be found in figure 7, illustrating that

there are many different openings available with some only being slightly different than the other.

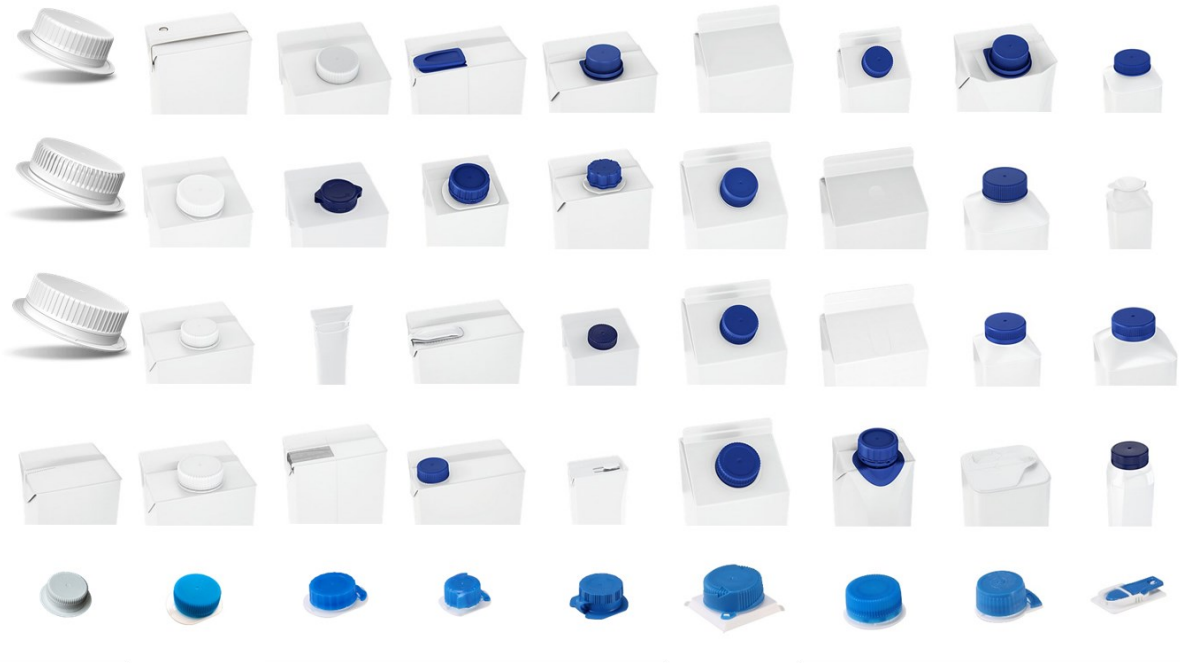


**Figure 7: Overview of all openings of Elopak, Tetra Pak and SIG anno 2021**

Most openings visible in figure 7 are openings that do not need another component to be used. However, some only have a Pre-Laminated Hole (PLH) or strawhole that needs a straw of some sort to be used. As mentioned before, in the past these straws were made out of plastic, but because of the SUP legislation these were changed to paper straws. When working on replacing the plastic straws, also other materials were examined like pasta or bamboo. However, for multiple reasons like lack of bendability and food safety these were not an option. Currently there are numerous developments in the area of paper straws to improve the drawbacks of the current paper straws used. Also, straws made from other materials are being developed. Examples of these can be seen in section 2.3.

## Currently used

As mentioned before, Elopak, Tetra Pak and SIG are the three main beverage carton suppliers. At FrieslandCampina, beverage carton formats from these suppliers are also used. For the five main Dutch brands, the beverage carton formats are displayed in figure 8. As visible in the figure, mainly Elopak and Tetra Pak formats are used at FC. There is currently only one SKU that uses a SIG format. In figure 8, below the logos of the different suppliers, it says ambient and/or chilled. This has to do with the layers of the material and how the beverage carton is filled, which has an influence on shelf life and how to store the packaging. Where ambient does not have to refrigerated after filling, chilled packaging does. More information about beverage cartons can be found in chapter 4. Tetra Pak mainly produces ambient packaging, Elopak mainly produces chilled packaging but also ambient.

As visible in figure 8, there is not much variety within the world of beverage cartons; looking at the Tetra Pak column, there are four brands with a total of 8 SKU's (Stock Keeping Unit) that are using packaging formats from this supplier, but there are only two different

packaging formats. With Elopak, there are sixteen SKU's with six different packaging formats. Also, within these few different packaging formats, apart from the artworks, they look very similar. Considering the SUP directive, all packaging formats in this figure 8 are affected. The straw packs from Campina, Chocomel, Fristi and Optimel already have the paper straw. The rest of the packaging formats have caps that need to be tethered from 2024.


**Figure 8: Overview of beverage cartons packaging per major Dutch FrieslandCampina brand per packaging brand**

Now the overview of beverage cartons is clear, it is also interesting to look a bit broader than beverage cartons and include metal cans and plastic cups and bottles to gain a more complete picture of the packaging volumes and types offered by FrieslandCampina for these brands. In figure 9, an overview of all packaging formats for the 5 major Dutch FC brands is visible, sorted by volume. It clearly shows which packaging type covers each volume (range). Still, most of the packaging is a beverage carton, but for the 250-500ml range also cans and PET bottles are used. For Fristi and Chocomel, there is not even a beverage carton format in this range.


**Figure 9: Overview packaging per major Dutch FrieslandCampina brand, sorted by volume**

## 2.3 New drinking solution concepts

Now the current openings and packaging formats available and used by FC are clear, it might be interesting to have a look at new and innovative drinking solutions concepts. Below, a small overview of some interesting drinking solutions can be found. Most solutions are based on beverage cartons, but there are also other concepts included that are inspiring. In figure 10, a collage of a selection of new drinking solution concepts is visible. The complete overview with links to sources can be found in appendix A.

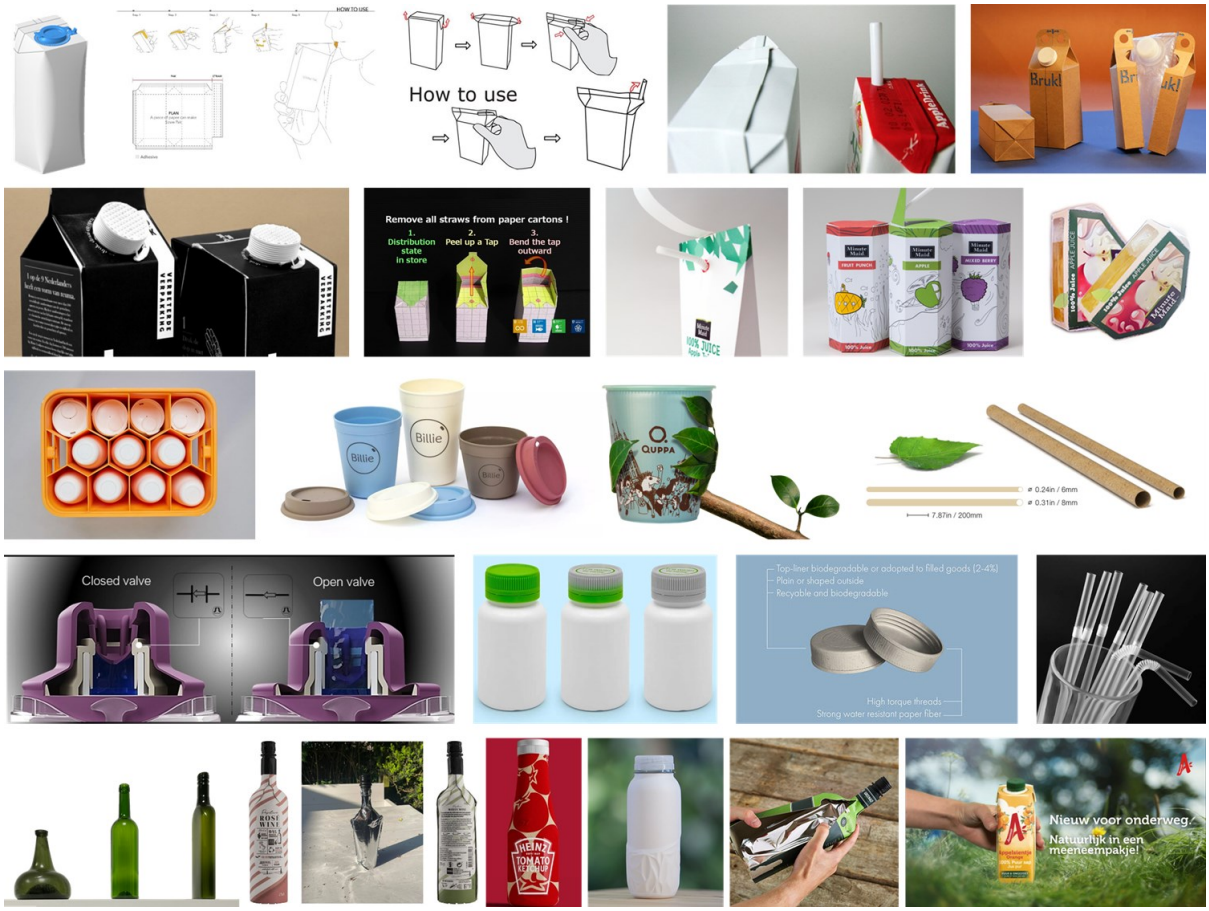



**Figure 10: Collage of new drinking solution concepts**

A wide variety of packaging concepts can be found in figure 10. On the first two rows, mainly examples of beverage carton portion packs are visible, showing drinking solutions without an external straw. On the third row, reusable cups are shown, together with a straw made from alternative material. The fourth row includes some interesting cap concepts and another straw concept made from non-plastic material. The fifth and last row shows several interesting wine bottle concepts either completely from plastic or from carboard with an aluminium bag insert. In this row, also new paper bottle concepts from Heinz and Coca-Cola are visible together with a newly introduced 'meeneempakje' from Appelsientje.

These new drinking solution concepts mainly serve as inspiration for the ideation phase. The beverage carton concepts can be used as direct inspiration, where the other concepts are used to broaden the horizon and think out of the (carton) box. For example, the Billie cups (also recently introduced at the University of Twente) are a great example of how something can be reused. Now, beverage cartons are not made to be reused, but it is interesting to play with this idea and think about what audience beverage cartons serve and if they are needed at all. When choosing for a radically different packaging concept, however, it is important to consider whether it fits with the current rituals and habits. Looking at the wine packaging in the bottom row of figure 10, a shift in material is visible. The most left image shows the move from a glass to a flat plastic bottle. To the right of that, a wine bottle that can be defined as a beverage carton or bag in box is visible, using a metallized pouch with carton around it.

## 2.4 Matrix

To find a relation between the convenience and sustainability of a packaging format, a matrix is visualised, see figure 11. The content in this figure is mostly based on personal experience and common sense. The x-axis represents the sustainability, ranging from unstainable on the left to sustainable on the right. The y-axis represents the convenience, with inconvenient at the bottom and convenient at the top. In the ideal world, a packaging is both convenient and sustainable. That is why at the top right corner of the matrix, the dark green 'ideal' circle is placed. When the packaging is both unsustainable and inconvenient, something has gone completely wrong, and one could say the packaging is 'amiss', indicated with a red circle. Although one would strive to find the 'ideal' solution, it might be wiser to focus on the 'good' solution, as this might be more feasible in the scope of this assignment.

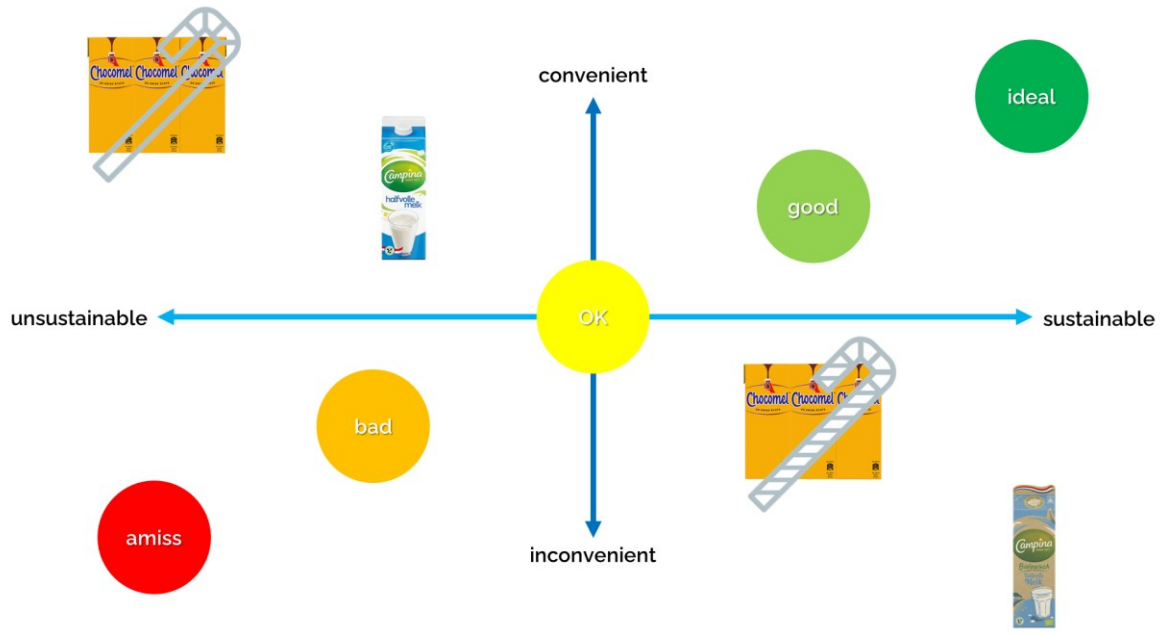



**Figure 11: Convenience-Sustainability matrix**

Having looked at the circles, now the focus will be on the images of the FrieslandCampina products that are placed in the matrix. On the top left, the old Chocomel 200ml beverage carton with transparent plastic straw is placed, being very convenient but not very sustainable. Slightly down to the right of this, the Campina 1L Halfvolle Melk beverage carton is placed, with traditional bleached board and a plastic cap. This position means that the packaging format is fairly convenient, but also fairly unsustainable. Moving further to the bottom right, another Chocomel 200ml beverage carton is placed, but now the current packaging with paper straw. Because of this paper straw, the packaging can be seen as fairly sustainable, but also fairly inconvenient. On the far bottom right, the Campina Biologisch Halfvolle Melk Pure-Pak Imagine is placed, with unbleached carton and without a plastic cap. This packaging format can be seen as very sustainable, but also very inconvenient. Connecting the images in this matrix, a trend is visible that sustainability and convenience would be inversely proportional. This means that when a packaging format becomes more sustainable, it simultaneously becomes less convenient and when packaging format becomes more convenient, it becomes less sustainable.

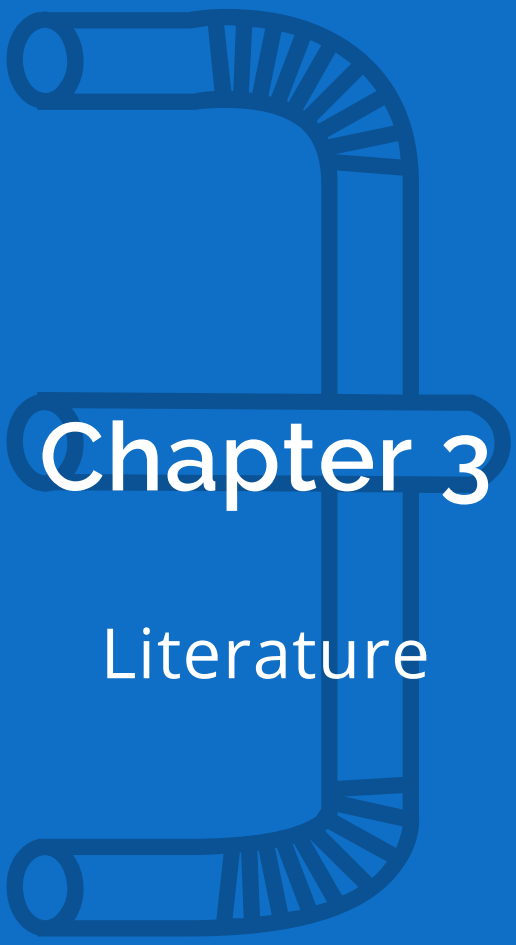
Based on this matrix, the challenge is to break this trend and come up with a new drinking solution that is more sustainable but is also still convenient to use.

## 2.5 Stakeholders

In the development of a new drinking solution for beverage cartons, there are many stakeholders involved. To know what stakeholders to take into account, an overview of all stakeholders is available below.

From the perspective of Global Packaging Development, the stakeholders can be divided into two groups: internal and external stakeholders. Starting with the internal stakeholders, which can again be divided into seven groups: 1. Marketing, 2. Factories, 3. Commercialization, 4. Engineers, 5. Product development, 6. Sensory & Consumer Insights, 7. Regulatory affairs. The external stakeholders can be divided into nine groups: 1. Packaging supplier, 2. Waste processor, 3. Recycler, 4. Government, 5. Umbrella organisations, 6. Customers: retailers, 7. NGO's, 8. Farmers, 9. Consumers: end users.

For this research, not all stakeholders are evenly important. However, it is good to know who all the stakeholders are to choose which are important to consider in this research. From the internal stakeholders, the most important ones are marketing and sensory & consumer insights. Marketing is important to gain insights into how brands are positioned and who are the users of the products. Sensory & consumer insights is important to get more information on how packaging is perceived. From the external stakeholders, the packaging supplier, government and consumers are the most important for this research. The packaging supplier is important, because, especially with beverage cartons, the supplier is very powerful. More about beverage carton packaging suppliers can be read in section 2.2. The government is important, because legislation made by the European government is one of the main reasons for this research. The last important external stakeholder is the consumer. Especially for this research, where the goal is to involve the consumers in the development process.



# Chapter 3

## Literature

# 3. Literature

In this chapter, the first, second and third sub-questions are partially answered. Starting with the first question: 'How to get the best insights from the target consumer to come to better drinking solutions that fits the rituals and habits?' This is answered by the research into consumer research and rituals and habits. The second sub-question is: 'What does current literature state about the balance between sustainability and convenience and how does this resonate and cohere with the different stakeholders in relation to a new drinking solution?' This question is partially answered by defining convenience and sustainability, and research about the importance of packaging functions. The third sub-question is: 'How to remove the threshold, if present, of interacting with the new drinking solution using visual cues?' This question is partially answered by research about sustainability perception.

## 3.1 Definitions

The main research question in this thesis is: 'What does the next generation of drinking solutions for beverage cartons look like, finding the right balance between sustainability and convenience?' There are several important terms in this question. Drinking solution and beverage carton have already been discussed in chapter 1 and 2. Two other important terms are sustainability and convenience. To define these terms, this section is split into two parts. Firstly, the definition of convenience related to packaging is discussed. Secondly, the definition of factual sustainability is covered.

### 3.1.1 Convenience

There are many ways that 'convenience' can be defined. To find out what convenience is, first several resources will be consulted including literature and dictionaries. Based on this, a personal definition is formed to make clear what is meant with convenience in the context of drinking solutions.

According to Cambridge Dictionary (2022), there are already eight different definitions. The top definition there is in the context of 'being easy': 'the state of being convenient', which covers the load, but at the same time makes it very broad. 'Convenience' can also be used in the context of a machine, where it means: "a device or machine, usually in the house, that operates quickly and needs little effort". This has no relation to packaging. Another definition is "a public toilet", which certainly has nothing to do with the convenience of packaging. Cambridge Dictionary also has an American Dictionary, which has slightly different definitions. In American English, convenience can also mean "the fact that something is suitable for your purposes and causes no difficulty for your schedule or plan". This definition is more focused on time and services, instead of objects. A definition that is more suitable to packaging is: "anything that is easy to use and makes life comfortable". The example provided with this definition is that of a microwave oven, being a "modern convenience". Again, this is quite a broad definition, but can be applied to packaging. Another part of Cambridge Dictionary is Business English, which might have the best definition for packaging convenience: "the fact of something being easy to do, get to, etc., or something that is useful and helpful". A definition that also has to with nutrition, but

more with the food than with the packaging of it, is: “convenience food or meals are ready to eat when you buy them or can be cooked very quickly”. As these types of foods mostly also come in packaging that is easy to open and use, this definition could also be interesting to use.

According to Morganosky, (1986) convenience is: “the ability to accomplish a task in the shortest time with the least expenditure of human energy”. Compared to other definitions, this one focusses more on the energy part than others which are more about ease. Combining these definitions, one could conclude that because something is easy to do, it should not cost much energy. However, when talking about ease, usually when one executes an action repeatedly the action becomes easier anyways. The physical energy needed stays the same, however.

The dictionary by Marriam-Webster has some more definitions to be considered. One of the most interesting ones is: “something (such as an appliance, device, or service) conducive to comfort or ease”. Unlike Cambridge, here the word “comfort” is used which could also be a valuable addition. Another interesting definition by Marriam-Webster is: “freedom from discomfort: ease”, where both ease and comfort are called, but in a reversed form. A definition that is also very applicable is: “designed for quick and easy preparation or use”.

All the above definitions of convenience do include some form of ease, but not all talk about comfort. For a drinking solution, ease is very important, but comfort should also be considered. Looking at drinking solutions, ease is important for the first part of using the packaging with drinking solution, namely opening the packaging: making the package ready to drink. Here comfort can also play a role, as it should also be comfortable to open, but the ease of opening is more important at this stage. For the next part of the drinking experience, the drinking itself, ease is important, but now comfort is at least as important: a drinking solution should be comfortable to use, including aspects like mouth feel and (lack of) material taste.

Based on the definitions above, a new definition is formed to be used for this research:

**‘Designed for easy and comfortable preparation and use’.**

In the context of drinking solutions, preparation means opening the packaging to make it ready to drink, and use means drinking out of the packaging.

### 3.1.2 Sustainability

Sustainability is a broad term. According to the Cambridge Advanced Learner's Dictionary & Thesaurus (2022), sustainability in relation to the environment is: “the quality of causing little or no damage to the environment and therefore able to continue for a long time.” This definition being general makes it more widely applicable. The Cambridge Business English Dictionary, (2022) definition is slightly more specific: “the idea that goods and services should be produced in ways that do not use resources that cannot be replaced and that do not damage the environment.” This makes it slightly less widely applicable, but in the case of packaging, which can be seen as a ‘good’, makes it easier to apply. Specifically looking at packaging, (Steenis et al., 2017) define sustainability as: “packaging that has a comparatively low environmental impact as assessed by life-cycle assessment models.” This definition in some way combines the definitions above, being broad but also specific. Because life-cycle assessments (LCA’s) are meant to analyse the whole life cycle of the packaging, it not only focuses on the production but also on disposal and recycling of the packaging after use. This thesis bases sustainability on this last definition.

## 3.2 Sustainability perception

Apart from the factual sustainability, it's also very interesting to look at how consumers perceive sustainability and how to use this in packaging design. Looking at global issues, which includes sustainability themed issues but also broader environmental themes, (Innova Market Insights, 2021) did research on awareness and caring about a selection of global issues. The question was asked: "How aware are you and how much do you care about these global issues?", on which the answers can be found in figure 12 (Innova Market Insights, 2021). What is clear in figure 12 is that 'plastic waste' is one of the issues with the highest awareness and concern, together with 'ocean pollution' and 'deforestation' which can be seen as sustainability themes connected to packaging, as plastic waste and ocean pollution are both themes in the SUP directive and deforestation can be caused by paper (packaging) production companies. What is also interesting in figure 12 is that 'CO2 emissions' is one of the issues with the lowest awareness and concern, which is also a main theme in packaging sustainability. Overall, a trend is visible that the higher the awareness is of a certain global issue, the higher the concern is too.

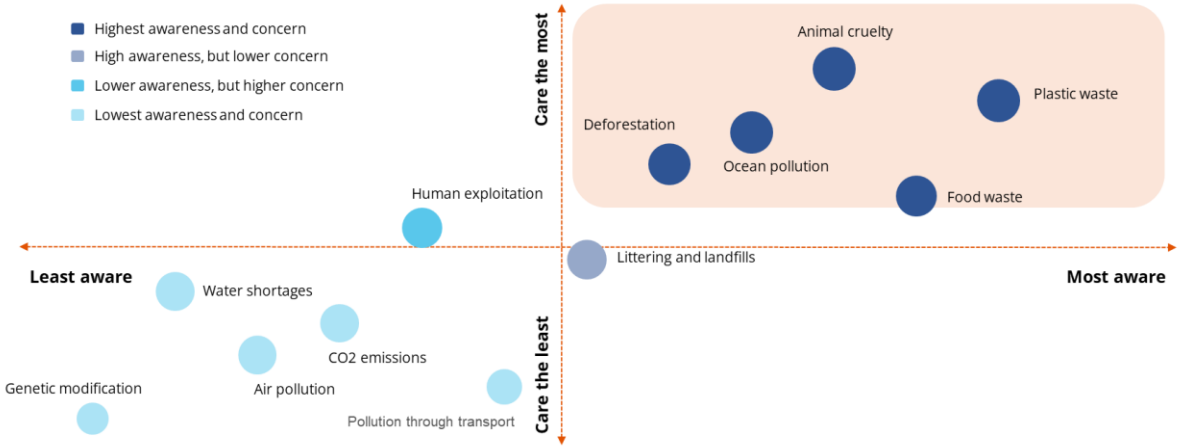



**Figure 12: How aware are you and how much do you care about these global issues? (Innova Market Insights, 2021)**

When looking at how consumers perceive sustainability and how to use this in packaging design, it is crucial to know how sustainable packaging can be considered from a consumer perspective: "a packaging design that evokes explicitly or implicitly the eco-friendliness of the packaging" (Magnier & Crié, 2015). How this eco-friendliness can be evoked is discussed below.

Starting with the environmental impact of packaging materials, according to (Lindh et al., 2016), paper-based and glass are regarded by consumers as materials with the least negative environmental impact. The greatest environmental impact regarded by consumers are plastic and metal materials (Lindh et al., 2016). This would root for beverage cartons as they are paper-based, although there is also a layer of plastic and aluminium inside. Innova Market Insights also did research in this area and created with a list of packaging types ranked by consumer perception of sustainability (Innova Market Insights, 2021). Looking at paper-based packaging, only respectively 6% and 9% of consumers said that 'cardboard' and 'paper' was 'not sustainable, with 'aseptic cartons' being mentioned by 14% as such (Innova Market Insights, 2021). Considering plastics, respectively 29% and 38% of consumers said that 'single layer plastics' and

'multilayer plastics' was 'not sustainable', while only 8% mentioned 'bioplastic' as such. Lastly, 4% of consumers said that 'glass' was not sustainable and 16% of consumer found 'metal' packaging 'not sustainable' (Innova Market Insights, 2021). From these lists, it becomes clear that paper-based packaging materials are regarded as sustainable and plastics as not sustainable.

According to (Konstantoglou et al., 2020), an interesting thing to note is that a pro-environmental consciousness has been acquired by consumers. Although this consciousness is there, this does not mean that the perception of sustainability for all consumers are the same: "consumers' sustainability perceptions of packaging are highly diversified, possibly because they perceive different aspects of sustainability (e.g., recyclability vs. reusability) and vary in how they believe packaging performs on such aspects" (Steenis et al., 2017). This perception can be influenced by salient cues that can mislead the consumers relying on their own beliefs, although these cues might not even be relevant for objective environmental impacts (Steenis et al., 2017).

The main contributor to direct environmental impacts is packaging material, signalling sustainability (Lindh et al., 2016). To make sure sustainable packaging is accepted by consumers, it should try to enhance perceptions of product quality and taste (Steenis et al., 2017). When packed in a sustainable packaging, the perceived quality of the food product can even be perceived as more positive compared to a conventional packaging (Magnier et al., 2016). Other ways to signal sustainability than materials can be graphics and colours used on packaging, like the colour green which is implicitly associated with sustainability (Magnier & Schoormans, 2015). Apart from (green) graphics and colours, "verbal features can be used to communicate sustainability explicitly, for instance, through labelling" (Magnier & Schoormans, 2015).

## 3.3 Rituals & habits

When designing a (radically) new packaging format with convenience on top of mind, it might still not be accepted because it does not fit the rituals and habits of the end user. A solution that fits these rituals and habits is more likely to be accepted. There is not much literature about this in context to packaging development, but there are some takeaways.

There is a distinction to be made between rituals & traditions versus habits & routines. Rituals & traditions can be defined as "automated acts that help in surviving the repetitive nature of everyday life" (Ryynänen & Rusko, 2015). Habits & routines "make everyday life easier and safer but are hard to break" (Ryynänen & Rusko, 2015). In addition, he mentions that packaging solutions may be unsuccessful if they are not compatible with lifestyles that are culturally determined (Ryynänen & Rusko, 2015). To overcome this and make a design for the new packaging type that does fit the rituals and habits of the consumer, the "challenge for a packaging developer is not only to investigate the repertoire of consumer routines and rituals connected to a particular package but also to create a solution that does not go against the grain of everyday practices" (Ryynänen & Rusko, 2015).

An interesting principle that connects to this theme is MAYA (Most Advanced Yet Acceptable (Loewy, 1951)): "In order to create a successful design, the designer should strike a balance between novelty and typicality in trying to be as innovative as possible while preserving, as much as possible, the typicality of the design" (Hekkert et al., 2003). This can also be translated to keeping the rituals and habits in mind when designing a new packaging concept and trying to find the right balance. Considering the balance between sustainability and

convenience, sustainability can be seen as most advanced in this theory and convenience as typicality with rituals and habits attached. MAYA can be used as a tool during the development to come to a design that is more likely to be accepted, using with novel and typical features.

## 3.4 Packaging functions

To design a good packaging format, it is crucial to know what the main packaging functions are to consider. Because this thesis only focuses on a specific part of the whole packaging development process, this means that also only a specific part of packaging functions needs to be considered. The other functions are still discussed, to make clear that there are many more that also should be kept in mind. After these functions are explained, the importance of these functions according to the consumer are discussed.

According to (ten Klooster, n.d.), packaging functions can be divided into two categories: strategic based functions and tactical based functions (figure 13). The strategic based functions can again be divided into three sectors: 'Design related', 'business management' and 'social'. 'Design related' has three themes: 'design and styling', 'psychological' and 'way of use'. All three sectors are of great importance to consider during this research. Starting with 'design and styling', which is about the colours, graphic elements, fonts, pictures, logo's etc. can be important to help recognize the possibly radical new design and help to overcome the potential threshold of interaction, which is also linked to the second subcategory; 'phycological'. The third theme in this sector is 'way of use', which is also crucial in developing a drinking solution that is both sustainable but still convenient to use. The second sector within 'strategic based functions' is business management. While this is a very important aspect of the development and viability of a new packaging format, for now this is out of scope for this thesis. This is done to allow for more freedom, as these aspects can restrict the process which might not lead to a substantially better packaging format. However, to make sure the research will not deliver totally unfeasible options, this will of course still be kept in mind. The last sector of this category is 'social', divided into 'political aspects' and 'regional / global', which is important as packaging has to comply to many legislations like the Single Use Plastics directive mentioned before. Moving to the other category, 'tactical based functions', there are four themes to be distinguished: 'to be able to use the product', 'conserving / protecting', 'distributing' and 'informing'. 'To be able to use the product' is in fact not really a theme, but rather the 'ultimate goal'. The themes 'conserving / protection', 'distributing' and 'informing' are the three main functions of packaging (ten Klooster, n.d.). 'Conserving / protection' is important to keep the product good and to avoid spoilage. While developing a new packaging format, it is crucial to know the needed requirements to conserve and protect the product inside the packaging. The second main function is 'distributing': "How can we get our products to the right place on time against acceptable costs?" (ten Klooster, n.d.). For this research, this is not as important as some of the other functions, but still has to be taken into account while designing by making sure the concepts are sturdy and are efficiently shaped for transport. The last main function of packaging is 'informing'. Apart from the mandatory information like nutritional values, it is interesting to see whether information needs to be added to help support the user with opening and using the packaging to improve the convenience, and how this can be done best.

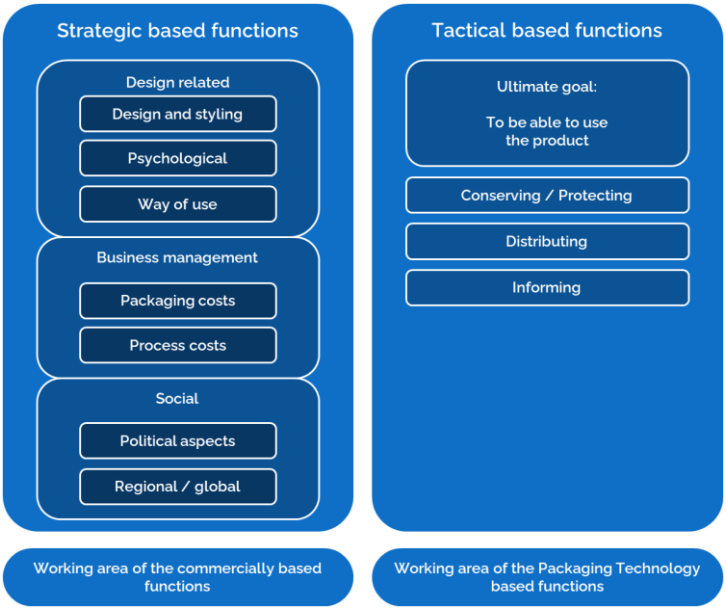



**Figure 13: Functions of packaging** (ten Klooster, n.d.)

The two main packaging categories from figure 13 (strategic & tactical) are also in some way supported by Ryynänen, but here the distinction is made between graphic components ("colour, typography, graphical shapes and images") which can be connected to 'strategic based functions', and structural components ("shape and size of the containers and materials used in the packaging") which can be connected to 'tactical based functions' (Ryynänen & Rusko, 2015). Although this distinction is less complete than the one in figure 13, it might be better suitable for the development process in this thesis, which focusses more on the design side than the business side of packaging. This distinction also is reflected well in this definition of packaging: "Packaging can be viewed as consisting of an array of structural graphical and verbal design features that may serve as consumer cues" (Steenis et al., 2017).

Now it is clear which packaging functions are important to consider during development, it might be interesting to find out how consumers think about packaging functions and which are the most important to them. According to (Dopico-Parada et al., 2021), there are eight main packaging functions to be distinguished. In order of importance for consumers, these are: 1 Protection, 2 Sustainability, 3 Informational value, 4 Convenience, 5 Portability and storage, 6 Economic function, 7 Branding, and 8 Engagement. Although convenience does not have the highest importance according to consumers, being fourth in the list is still high. This is also confirmed by Löfgren, stating: "If the package of the product does not fulfill customer demands in the ergonomic entity, that is, if the package is not easy to use or functional, the customer will consider buying a different brand next time" (Löfgren & Witell, 2005). So, convenience can be seen as crucial for maintaining brand users. "This is often done by providing packaging that is functional, user-friendly, and fun – that is, packaging that focuses on customer benefits" (Löfgren, 2005). According to this, apart from functionality and user-friendliness it might also be interesting to discover how 'fun' can be included in the packaging experience. Like Ten Klooster, 'protection' is the most important to consumers here.

Looking at the balance between sustainability and convenience, it is interesting to learn that sustainability scores higher than convenience, with sustainability even being the second

most important function to consumers after 'protection' and before 'informational value'. The importance of protection and informational value are also supported by (Konstantoglou et al., 2020), stating that: "consumers recognize the important role that packaging plays in food safety and quality, and in relation to the information that it provides." Diving deeper into these packaging functions, he also found that "the quality of a food product is inextricably linked to the quality of its packaging" (Konstantoglou et al., 2020). This is an extra motivation to make sure the quality of the packaging (look) is good, especially for A-brands like from FrieslandCampina. Continuing this theme, (Ryynänen & Rusko, 2015) even states that "Packaging and the product are not actively separated by the consumer", making the packaging an even more important part of the consumer experience. Apart from that, he also mentions that the communication of brand cues, the persuasion of consumers and the justification of quality claims of a product are important packaging functions, because "most of the packaged food products in a certain product category look similar without packaging that differentiates them" (Ryynänen & Rusko, 2015). The importance of this is also reflected by his conclusion that the consumer only reports negative issues as the basic functions of packaging are taken for granted (Ryynänen & Rusko, 2015).

## 3.5 Research with consumers

When doing research with consumers, it is crucial to find out how to get the best insights from these consumers to come to better drinking solutions with the right balance between sustainability and convenience. The information about consumer research specific for packaging development is limited, but there are a few things to be taken away here.

According to (Clark et al., 2020), time and cost of implementing behavioural study methods are the main limitations for application within the food to go packaging development process, because this often already is a fast-paced commercially competitive process. For FTG (Food-to-go) packaging development, he mentions: "This could be overcome through repeat use of the methods, iteratively improving them, so that they become both routine and valued procedures within the FTG packaging development process" (Clark et al., 2020). This way, Clark et al. (2020) adds, the insights of behavioural research methods are not overlooked because of other project objectives like product safety, as they become valued within the decision-making process. This illustrates that research with consumers is not always a priority in packaging development, but this could be changed by doing it more often and can be of great help.

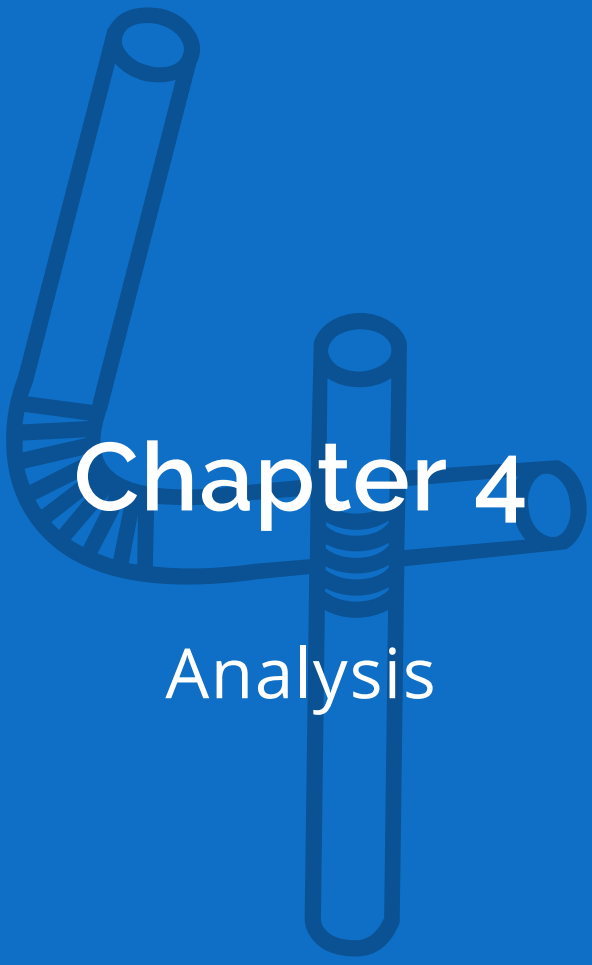
Focusing on communication strategies with packaging elements, (Boz et al., 2020) mention that these are ideally obtained with the feedback from initial descriptive consumer studies, in the design phase. "However, biases and misinterpretations of the packaging elements by consumers can prevent success in the marketplace" (Boz et al., 2020). So, it is good to ask for feedback from consumers but even when doing this, there is no guarantee that all communication strategies will work. That is why it might be a good idea to execute consumer studies more thoroughly, to make sure it will be a success.

## 3.6 Conclusion

Concluding, several answers to the first three sub-questions can be given. Starting with the first sub-question: 'How to get the best insights from the target consumer to come to better drinking solutions that fits the rituals and habits?' This question can be answered by stating that rituals and habits are very important to consider when designing a new packaging format, and just focussing on convenience alone is not enough. To develop a packaging solution that fits the rituals and habits of the consumer, the repertoire of routines and rituals should be investigated because solutions that do not fit the lifestyles may be unsuccessful. A tool to help with this, is the MAYA principle. Doing research with consumers are mostly limited by time and cost, but when done more often they might become valued and incorporated more often.

The second sub-question is: 'What does current literature state about the balance between sustainability and convenience and how does this resonate and cohere with the different stakeholders in relation to a new drinking solution?' This question can be answered by stating that both convenience and sustainability are important packaging functions according to consumers, but sustainability is mentioned to be more important than convenience. Apart from factual sustainability, it is also important that the packaging is perceived as sustainable.

The third sub-question is: 'How to remove the threshold, if present, of interacting with the new drinking solution using visual cues?' This question can be answered by stating that packaging material can be seen as the main contributor for sustainability perception, and paper is perceived as one of the most sustainable materials. Also, graphics, colours, and verbal labelling are important contributors.



# Chapter 4

## Analysis

# 4. Analysis

In this chapter, the first and second sub-questions are partially answered. Starting with the first question: 'How to get the best insights from the target consumer to come to better drinking solutions that fits the rituals and habits?' This is answered by the first consumer test in section 4.1. Using the Usability Method Decision Tool (figure 5), 'auditing current solutions' and 'observation' are applied in this first consumer test. The second sub-question is: 'What does current literature state about the balance between sustainability and convenience and how does this resonate and cohere with the different stakeholders in relation to a new drinking solution?' This question is partially answered by conducting interviews with brand managers, technology experts, and market experts. The answers to these questions will help to shape the scenarios in chapter 5.

## 4.1 First consumer test

Now the conclusions from literature are clear, it is interesting to see how this translates to practice. To find out what real consumers think about packaging and whether the balance between convenience and sustainability is also visible here, a first consumer test is carried out.

### 4.1.1 Goal

The key-goal of this first consumer test is to gain insights into the use and frustrations with packaging in the size range of 200 till 300ml. The packaging insights can be used with the development of the new drinking solution. Apart from the packaging insights, doing this test is also a good method to learn about how to set up and execute such a test, which results in process learnings. The process learnings can be applied in the larger consumer tests later in the development process. Another goal of this test is to find out how important convenience and sustainability are to the participants when using packaging in this size range.

### 4.1.2 Setup

In table 2, an overview can be found of the products used in the test. The volume of the products ranges from 200 to 300ml. Four of the products are from FrieslandCampina brands, the others are from other companies. Seven out of the eight products used for the test can be bought in the (larger) regular supermarket in the Netherlands. Only the 'Campina Biologische halfvolle melk' cannot be bought in the supermarket but is widely available in canteens and other catering industry. Apart from their availability, the products were selected on their characteristics. The products can be divided into four groups: straw packs (Dutch: drinkpakjes), beverage cartons with caps, cans, and PET bottles. There are five straw packs included in this test. Four of them are beverage cartons, one is a pouch. All straw packs have (slightly) different straws and straw holes. As some products have a rather long name, abbreviated versions are used. These abbreviations can also be found in table 2. In figure 14, the products used are displayed.

**Table 2: Details of products used in the first consumer test**

| Product name | Type | Volume | Packaging name | Abbr. | Image |
|---|---|---|---|---|---|
| **Chocomel** | U-bend paper straw beverage carton | 200ml | Elopak Roll Fed | Pakje | |
| **Capri-Sun Orange** | Straight paper straw pouch | 200ml | | Pouch | |
| **Appelsientje Sinaasappel** | U-bend paper straw beverage carton | 200ml | SIG | Appel | |
| **Bambix halfvolle chocolademelk** | U-bend paper straw beverage carton | 200ml | Tetra Pak<br>Tetra Brik Aseptic | Bambix | |
| **Alpro Chocolade** | Telescopic straw beverage carton | 250ml | Tetra Pak<br>Tetra Prisma Aseptic | Alpro | |
| **Chocomel** | Can | 250ml | | Blik | |
| **Campina Biologisch halfvolle melk** | One step screw cap beverage carton | 250ml | Elopak | Gable | |
| **Chocomel** | PET bottle | 300ml | | PET | |

Before the test, all products were put in front of the participant in a random order to avoid bias (figure 15). It was made clear that the test is only about the packaging, not about the taste of the product inside. Because the think aloud protocol was used, the participant was asked if he or she is familiar with this protocol. If not, a brief explanation was given.


**Figure 14: Products used in the first consumer test**

The test was done in Dutch, because all the participants are Dutch, and this allowed them to express themselves in the best way possible. The test was done with six participants, 3 males and 3 females, aged 22 till 87, in Enschede, Groningen and Hattem. The questions were asked in a semi-structured interview. Apart from the questions, the participants were also observed while using the packaging. The think aloud protocol was used, meaning that the participants were asked to simply verbalize their thoughts and what they were doing. The session was video recorded enabling the interviewer to pay full attention to the test itself. The

recording is purely used to be able to easily process the data later. All participants verbally agreed with the session being recorded.


**Figure 15: Products in front of the participant, halfway through the interview after opening and drinking**

Because it is a semi-structured interview, the questions were used as a guideline. The original Dutch questions are available in appendix B. These questions can be divided over 4 topics: carrying, opening, drinking and disposing. Starting with carrying, the participant was asked which packaging they found most suitable to take with them, so which pack is deemed the strongest. To find out more about the context of use, the participants were asked where they would or would not use each packaging, and if there was a difference between the packaging types of the same brand of product. After this first section, the participants were asked to prepare the packaging for drinking (opening), drink from the packaging and show explain they would dispose the packaging. Asked was in which container they would dispose the package: organic (GFT), packaging (PMD), residual waste or paper? If the participant lived in a place where there is no PMD (Plastic packaging, Metal packaging and Beverage cartons (Dutch: Drinkpakken)) waste stream, the participant was asked how he or she would dispose the packaging in their system. After that, it was explained what PMD stands for and asked how the participants would dispose the packaging then. Now all the different packs are explored, the evaluation could begin. The participants were asked to rank the packaging on convenience, first in terms of opening and then in terms of drinking. After this was completed and the motivations were clear, it was asked whether they would change anything to where they would use the packaging, now they are (more) familiar with them. Thereafter, the participants where asked what their ideal packaging would look like within this range. Lastly the question was asked if there were any comments.

A couple of times, the participant is asked to rank the packs. When they do not see a difference between two or more products, they can give them the same place in the ranking. Eight points are given to the product that is ranked to be the best, seven for the second best, until one point for the worst product.

### 4.1.3 Results

The results of the first consumer test are presented per theme: carrying, opening, drinking, disposing and suggestions.

## Carrying

The first question asked was which packaging the participant thought was most suitable to bring with you. All the products were lined up in front of the participant so the participant could see them well and was also able to touch and feel the products, which was also encouraged to get a good idea of the sturdiness of each product. The results were that both the PET and the can scored well, see figure 16. The following four products, which are in some way comparable as they are all squared off beverage cartons, had a similar score. Although the 'alpro' can also be classified as a beverage carton, this one scored lower. This had to do with the shape of the product, as this one does not have squared off corners but rounded corners. Because of this shape, the participants deemed it to be less sturdy. One participant even mentioned that the pack looked bulged, like it was going to explode. The product that has the lowest score is the 'capri' pouch. One of the participants has bad memories of this product, as they often started to leak while in the bag when taking it to school.

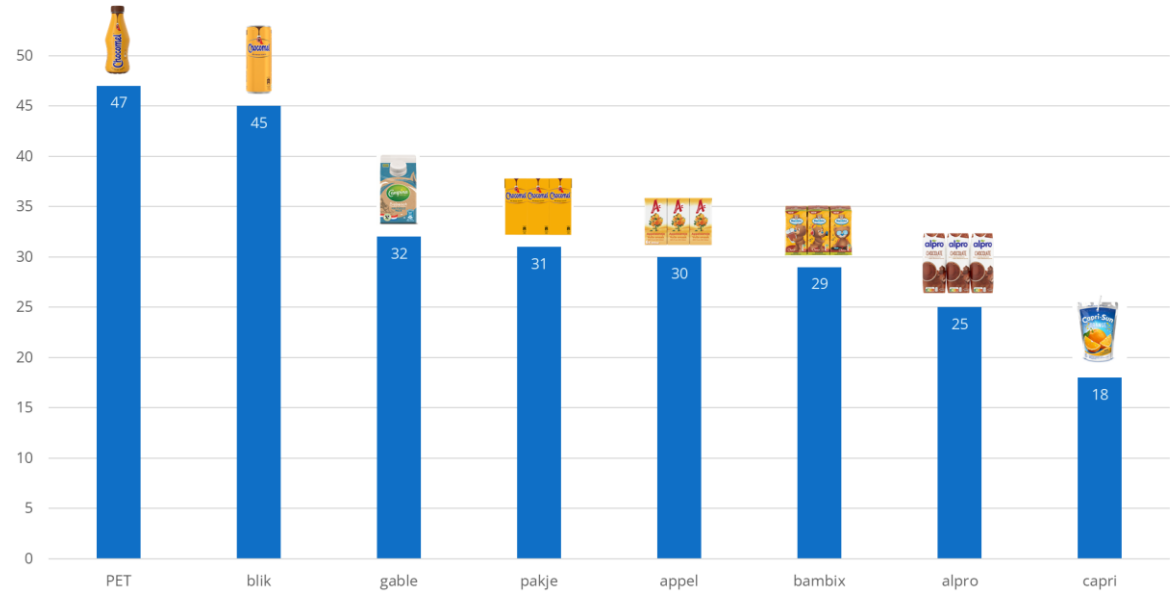



**Figure 16: Scores per product on how suitable the packaging is to bring with you**

When asked how the participants would take the products with them, for example in a bag, it became clear that there are two different philosophies. The first one is that people put the packaging next to the other vulnerable items, like laptops, because these items should be protected, just like the packaging. The second one is that, because the packaging can be vulnerable and could possibly damage other items, it should be kept away as far as possible from other vulnerable items like laptops.

## Opening

Looking at how easy the products are to open and prepare for drinking (figure 17), again the 'PET' and 'gable' have the highest score, both having a screw cap. Strikingly, the 'can' is on the same score level as the three squared off straw packs, although the can does not have a (paper) straw to deal with. This has to do with the older participants having a harder time opening the can, which results in a lower overall score. The 'alpro' has a lower score than the other straw packs because this one has a telescopic straw. The 'capri' pouch again has the lowest score.

There are multiple reasons for this. The first reason has to do with the material of the pouch, which is flexible and makes it hard to setup the pack and the straw hole to be punctured. What also does not help is the fear of not only puncturing the straw hole, but also the back of the pack, making it leak. The second reason has to do with the way the wrapper of the straw is attached to the pouch. This is done with a single drop of strong glue in the middle. Because most people do not see the arrow on the wrapper indicating that the straw should be pushed out of the wrapper, leaving the wrapper attached to the pouch, they try to remove straw with the wrapper from the pouch. Because the glue is strong and on applied on one spot in the middle of the wrapper, when trying to pull the wrapper off, the wrapper does not come off easily and the result is a bended straw. After some participants noticed that the wrapper would not come off, they tried to get the straw out of the wrapper still attached to the pouch by pushing it out. But now the straw was already bent, while the pouch still had to be opened to be able to drink out of it. The bended straw makes it even harder to open an already difficult packaging. Like every other straw pack, the 'capri' pouch also has a paper straw, which are usually weaker and have a less sharp tip to pierce trough the straw hole. Although this reduces the chance to pierce through both the front and back of the pouch, it does make it even more difficult to make the 'capri' ready for use.

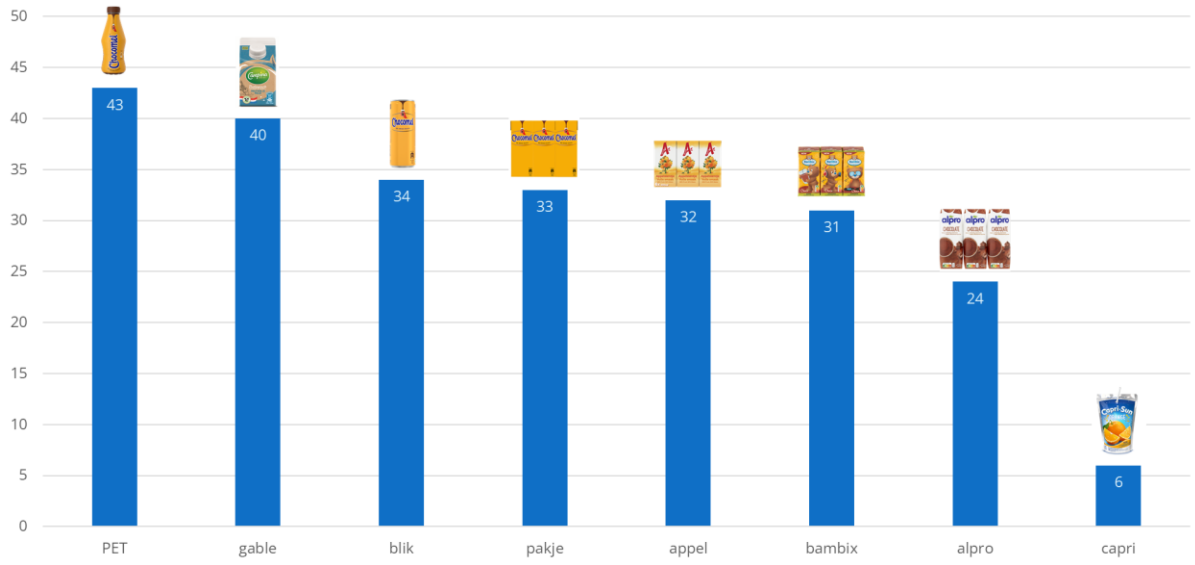



**Figure 17: Scores per product on how easy the packaging is to open**

## Opening straw packs

Zooming into the opening of the straw packs, an interesting pattern comes up. All five straw packs in this test have a paper straw in a plastic wrapper attached to the side with glue, see figure 18. To have the best possible recycling and the least possible litter, it is important to keep the wrapper attached to the pack when removing the straw. All U-bend straws should be pushed out of the wrapper at the top, where there is also a small notch available to pull the top off. When doing this, the wrapper can easily be taken out without damage. However, most participants took the wrapper off before removing the straw, potentially damaging the straw already. When the wrapper was taken off, most participants also did not take the straw out of the wrapper at the top but pushed the straw through the bottom. This can also damage the straw, as the bottom part of the straw, and thus the wrapper is smaller. When trying to push the

bigger top part of the straw through the smaller part of the wrapper and the tiny hole created, the top part of the straw could be squeezed, damaging the u-bend, and potentially causing leaks while drinking.


**Figure 18: Chocomel straw packs ('pakje') with the u-bend straw attached to the back**

In table 3, an overview can be found of how many times the wrapper was taken off or left on and if the straw exited the wrapper from the top or bottom. As visible in the table, most participants took the wrapper of and exited the straw through the bottom, which is not the way it is intended. There are two interesting things to note here. The first one is that the 'bambix' and 'capri' both had arrows printed on the wrapper indicating where the straw had to be pushed out, both pointing upwards. As visible in the table, this did not have much effect with the 'bambix', but the capri has a better score so one would think the participants saw this arrow and acted accordingly. However, unlike the rest of the straw packs, with the 'capri' the sharp point of the straw was pointing upwards, which was the reason the participants exited the straw through the top. The second interesting thing is that the 'capri' has a higher score on 'wrapper on'. This has to do with the glue of the wrapper being stronger than others, resulting in participants not being able to take the wrapper of and leaving it on the pack after some tries.

**Table 3: Overview of how the straw packs were prepared**

| | wrapper on | wrapper off | exit top | exit bottom |
|---|---|---|---|---|
| **pakje** | 1 | 5 | 1 | 5 |
| **bambix** | 1 | 5 | 1 | 5 |
| **appel** | 1 | 5 | 1 | 5 |
| **alpro** | 1 | 5 | 1 | 5 |
| **capri** | 4 | 2 | 5 | 1 |
| *total* | 8/30 | 22/30 | 9/30 | 21/30 |

## Drinking

Ranking the packaging on ease of drinking, again the 'PET' and 'gable' have the highest scores, see figure 19. Although both products feature a round drinking spout, the diameter

differs. Some participants prefer the wider opening of the 'PET' because it enables a larger flow where other participants prefer the smaller opening because it is easier to surround the spout with the mouth and there is a smaller chance to get a "(chocolate) milk moustache" than the 'PET'. Apart from that, the 'gable' scores slightly lower than the 'PET' because of its gable top, which can make it harder to drink comfortably because the top part might touch the nose when held upright. A simple solution for this is to hold the packaging in a 90-degree angle while drinking, moving the top from the nose to the cheek, which some participants did. Others tried to push down the top, which removes the top a bit further from the nose while drinking out of the 'gable' holding it upright. The rest of the products all have paper straws, which are not popular with the participants. All participants said that they do not like paper straws, mentioning the bad mouthfeel and paper taste. The next three packs have a similar score, followed by the 'bambix' and 'pakje'. These two have a slightly lower score because the participants mentioned that these packs required them to suck quite hard on the straw to get something out of these packs, the 'pakje' being worse than the 'bambix'. Again, the 'capri' has the lowest score. Like the two preceding packs, the user also needs to suck on the straw hard to get something out, but with this packaging it was even worse. A possible cause could be that the straws were already damaged by removing it from the straw and making the packaging ready to drink, making it even harder.

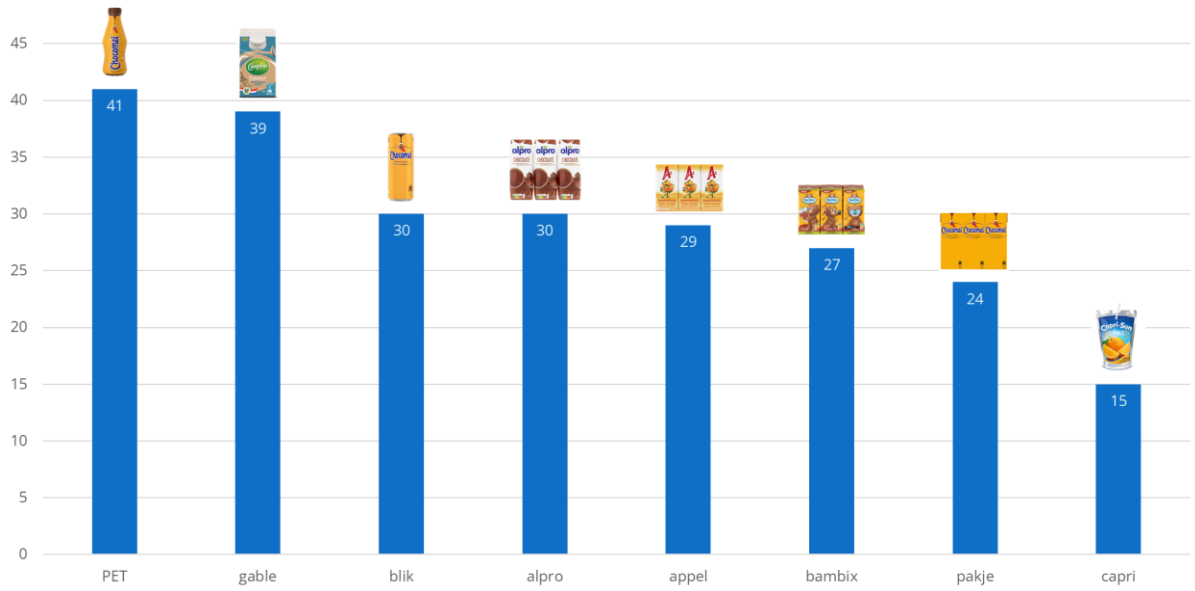



**Figure 19: Scores per product on how easy the packaging is to drink from**

## Disposing

The last step in using the packaging, after opening and drinking, is disposing the packaging. Four out of six participants lived in a place where there is no PMD waste stream. They were first asked to dispose the packaging how they would normally do it in their system. All four participants mentioned they would dispose all the packaging material in the residual waste. One, however, would dispose the paper straws in the paper bin, which is not allowed. Only 'clean' paper should be thrown away with the paper stream and used paper straws are not clean anymore. The two participants living in an area where there is a PMD waste stream would dispose all the packaging in the PMD stream, except for the paper straws. These would go into

the paper bin if it was up to them. A very interesting product in this category is the 'PET'. The packaging consists out of three parts: the transparent bottle, the brown cap with temper evidence ring, and the sleeve with print on the outside and carbon black on the inside. To be able to recycle the packaging after use, the sleeve must be taken off the packaging using the zipper on the side, see figure 20. Both the bottle (with cap) and the sleeve must separately be thrown away in the PMD stream. With the sleeve still attached to the bottle, the bottle cannot be recognized by the waste facility and cannot be recycled. When there is no PMD stream, the waste is only sorted out later and thus is it still needed to separate the sleeve from the bottle. Two out of six participants took off the sleeve, of which one knew that it had to be done and the other found out by reading the packaging. None of the participants understood why the sleeve had to be removed, especially because they end up in the same stream afterwards. Four out of six did see the instructions, but two of them decided that it was not needed to take the sleeve off because there is no PMD stream in their area. When asked what they would do if there was a PMD stream, they mentioned they would take the sleeve off, but still not understanding why. Three out of six participants wanted more information on why the sleeve needs to be removed on the packaging. There is also a text on the pack that mentions that a code can be found printed on the carbon black inside of the sleeve. The text stating this is bigger and in a more serious font than the recycling text, accompanied by a large arrow. Two participants thought the code was the only reason to take off the sleeve and did not bother.


**Figure 20: Chocomel PET bottle with partially detached zipper**

## Suggestions

When the participants were asked what their ideal packaging would look like, some interesting answers came up. They were told that they could 'go crazy' and come up with something completely new, or they could just pick one of the packages from the test or they knew from somewhere else and adjust this packaging to be perfect in their eyes. Most participants chose the latter and picked the packaging they liked the most and mentioned what had to be done to this packaging to make it even better. One of the participants mentioned that

the naked 'PET' had to be combined with the 'gable', resulting in a PET bottle with the smaller cap from the 'gable' without the sleeve. Another participant took the 'pakje' as a base, getting rid of the straw and replacing it by some sort of cap that is more sustainable. The current cap material did not come across as very sustainable to this participant. It is interesting to note that sustainability was mentioned here, while it was not mentioned in any of the questions. Someone else had a different approach and did not replace a function from the packaging but wanted to add one. Namely, another aluminium layer or similar, to keep the packaging cool for a longer period. Yet another participant liked the 'PET', but did not like the loose cap. After talking about putting a 'can'-like opening on the PET, the final idea was to keep the cap but make it stay attached to the bottle. This would make it quick to open, re-closable and without loose parts. Although the participant did not notice, this last comment is very interesting as from July 2024, bottles like the 'PET' have to have a tethered cap so it cannot be separated from the bottle anymore.

### 4.1.4 Conclusion

As visible in figure 21, combining the scores of bringing, opening, and drinking, the 'PET' has the highest score. This format scores well on all three categories. The 'gable' and 'blik' have a similar score but are built up of fairly different sub scores. The 'gable' mainly scores well in opening and drinking, where 'blik' does not score brilliantly on those aspects but has a significantly better score on carrying. So, depending on preferences or situation, the 'gable' is better than 'blik' or vice versa. Both 'PET' and 'blik' score high on carrying. Based on this, it can be said that consumers are more comfortable bringing a packaging format that is made from plastic or metal than a paper-based packaging format. 'PET' and 'gable' both score high on opening and drinking. From this, it can be concluded that a packaging format with a cap positively affects the opening and drinking experience. Looking at the straw packs, 'appel', 'pakje', and 'bambix', all have a similar score and the sub scores also do not differ much. Alpro has a slightly lower score than the other paper based straw packs, which was mainly caused by the opening experience but also has a slightly lower carrying score. As in every category, overall, the capri has also the lowest score. Although the drinking and bringing score are already low, the opening score is extremely low.

Considering the balance between sustainability and convenience, there are some interesting things to be mentioned. Looking at the PET bottle from Chocomel, the removable sleeve was only removed by a third of the participants. The other participants either did not notice it could be removed or did not think it was necessary. When the sleeve is removed, the bottle can be recycled, which benefits sustainability. When it is made easier or clearer that the sleeve has to be removed, more people might take it off. So, here convenience could be used to possibly help sustainability, instead of interfering with sustainability. This could be done by improving communication, using (better) visual cues or supplying more information.

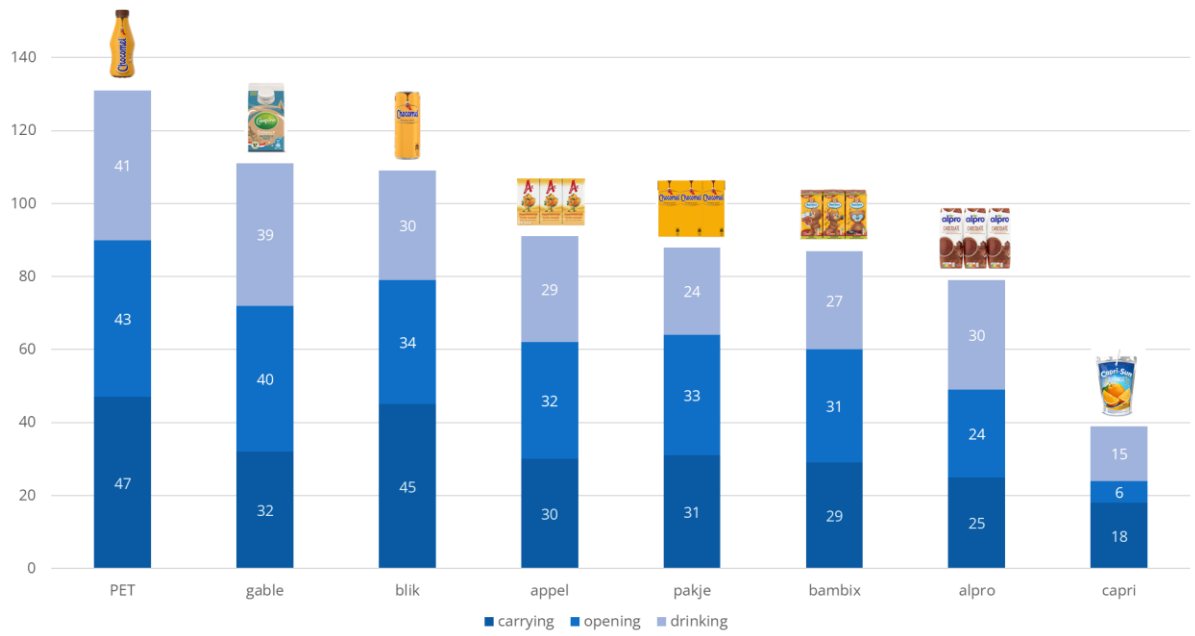



**Figure 21: Combined scores of bringing, opening, and drinking**

Apart from the scores, some other conclusions can be drawn from this first consumer test. The first one is that participants are inconclusive on how to take the packages with them: close to vulnerable items or as far away as possible from vulnerable items. The second one is that participants find it unclear how to dispose the PET bottle and its sleeve. The third one is that paper straws are not popular amongst participants. The fourth one is that wrappers are mostly removed from the pack with the straw, contrary to how it is meant to be done. With this, the straws are mostly taken out of the wrapper at the wrong side, possibly damaging the straw.

### 4.1.5 Discussion

From this first consumer research, not only useful insights arose but also process learnings were obtained. After opening and drinking from the packs, the participants were asked to assess the ease of opening and drinking separately. Especially because this was done at the end of the interview instead of directly after opening and directly after drinking people found it hard to separately rate the opening and the drinking experience. When asked to dispose the packaging, this was unclear because the participants could not actually throw the packaging away as they were still needed later on in the test. This made clear that explaining how you would throw away a packaging is a lot harder without actually doing it. An aspect that was not assessed in this test was the emptying of the pack. This could give a different experience, as it can be hard to get the last bit out of the packaging in some cases. This choice was made as the it was not deemed to be reasonable to ask the participants to drink up all eight packs, 1,75L combined. When asking questions at the end of the interview, sometimes the participant did give an answer, but not to the question asked. It can be interesting of course to hear a participant think about the question, but eventually getting an answer to the question is the most important. In this last part of the test, the participants were also asked to look back on the scenario question asked before, and if they would want to change anything, now they are more familiar with the packaging. However, either the formulation of this question was too vague or the question itself was too vague or difficult. When asking to throw away the packaging, which

was already more difficult because the participants could not actually dispose the packaging but only imagine it, it was hard to avoid bias. Because people were having a hard time grasping what they had to do, the interviewer was tempted to explain a bit more to help them answer the question by rephrasing the question to: 'prepare the packaging to be thrown away', which can imply that they need to do something to the packaging while maybe otherwise they would not have done anything before to the packaging before throwing it in the bin.

There are some improvements that can be implemented when this test would be done again. The first thing that can be done is to buy two packs of everything per participant instead of one. This way, the participants can throw away the packaging instead of having to imagine. Another option to solve this would be to move this question to the end of the interview when they are no longer needed. As people find it difficult to think in scenarios, like disposing, there are two things that can be done. The first thing is to prevent it as much as possible. The second thing is to support it, by printing images with locations or a scale. Looking at how to catch more raw emotions and fears, another strategy could be applied to gain information. Instead of directly asking how someone does something or thinks about something, one could ask the participant to do a certain (random) task and then (casually) ask them to empty the bottle and throw it away. This way, no special attention is paid to this task, and the information gained will be more natural.

## 4.2 Complaints

To gain more insights into what the consumers are encountering when using FrieslandCampina products, an analysis was done of complaints that were submitted to the consumer service of FrieslandCampina by calling, sending an e-mail or filling in the contact form online. To obtain a good overview, the choice was made to analyse complaints of 14 packaging formats, ranging from small straw packs, PET bottles to gable top beverage cartons up to 1,5 litres. In table 4, an overview of the packaging formats can be seen. The complaints were filtered on packaging complaints by the consumer service desk. The remaining complaints were gathered in an excel file and then grouped by category, like complaints about the paper straws, the opening, or the use of plastic. The complaints were requested in May 2022 and are about the prior two years.

There are some interesting packaging formats from this analysis to highlight. The first ones are the straw packs (pakje) for the brands Chocomel, Fristi and Campina that have paper straws with a transparent plastic wrapper around them. The second ones are the PET bottles for the brands Fristi and Chocomel, that are transparent but have an opaque sleeve applied which must be taken off before disposal. The third interesting packaging format are the 'Campina Biologisch' 1L packs, which removed the plastic caps and went back to the traditional opening where the top of the gable must be teared open.

**Table 4: overview of complaints**

| *SKU* | Still plastic | Disposal | Missing | Paper straw | Deposit | Text unclear | Opening |
|---|---|---|---|---|---|---|---|
| **Chocomel (half)vol 200ml pakje** | 40 | 4 | 9 | 22 | | | |
| **Campina Langlekker 200ml pakje** | 2 | | | | | | |
| **Fristi Rood Fruit 200ml pakje** | 2 | | 2 | 2 | | | |
| **Fristi Rood Fruit 200ml PET** | | 3 | | | 1 | | |
| **Chocomel 200ml PET** | | 3 | | | | 1 | |
| **Fristi Rood Fruit 300ml PET** | | 5 | | | | | |
| **Chocomel Vol 300ml PET** | | 12 | 7 | | 6 | 6 | |
| **Campina Halfvolle Melk 1,5L** | | | | | | | 3 |
| **Campina Halfvolle Melk 1L** | | 1 | | | | | 19 |
| **Campina Bio Halfvolle Melk 1L** | | 4 | | | | 3 | 2 |
| **Campina Bio Volle Melk 1L** | | | | | | 4 | 5 |
| **Campina Bio Karnemelk 1L** | | 5 | | | | 6 | 5 |
| **Campina Bio Halfvolle Yoghurt 1L** | | 2 | | | | 3 | 1 |
| **Campina Bio Halfvolle Melk 500ml** | | | | | | | 1 |

Out of the number of complaints per packaging format, a few conclusions and takeaways can be drawn. The most obvious and interesting conclusion is that there are almost two times more complaints about still having a plastic wrapper around the paper straw, than about the paper straw itself. The takeaway here is that people are more bothered by the lack of consistency when implementing a new solution than by the solution itself. To overcome this, an option could be to explain why the wrapper is still plastic, and that it can be recycled when left on the packaging after taking out the straw. With the development of a new drinking solution, the best option might be to avoid using plastic completely. A complaint that was not surprising, also based on the first consumer test executed before, is that people don't understand why the sleeve of the PET bottle needs to be removed and thrown away separately in the same bin. The takeaway here is that people like to know why things must be disposed in a specific way. To tackle this, an option could be to explain why it must be disposed separately. Maybe this should not be done directly on the packaging, but with a (QR) link to more information. What was surprising, it that with the 'Campina Biologisch' beverage cartons (without a cap), there are more complaints about where to dispose and the unreadable best before date (because it is printed on a flag), than about the opening itself. With this format, some consumer thought the packaging must be disposed in the paper bin, as it does not have a plastic cap anymore. The takeaway here is that people like to know the best before date and the other important information. The solution to this could be to stay away from printing this information on dark or multi-coloured backgrounds like flags. To tackle the confusion about where to dispose the packaging, the communication should be improved to clearly state where the pack with the new drinking solution needs to be disposed, because waste streams otherwise might get contaminated. In table 4, it is visible that there is another packaging format that received a moderately high number of complaints, which is the regular 'Halfvolle Melk 1L'. Most of these complaints were about the cap, talking either about the plastic cap not being sustainable or about the cap not being easy to open. The first complaints suggest that the plastic is not needed and FrieslandCampina should return to the original tear opening without cap. The second complaints probably have to do with a faulty batch of caps. Looking at the table again, one can see that the number of complaints about the Chocomel straw packs is significantly higher than the Fristi straw packs, although the packaging format is generally the same. This has to do with the sales volumes of Chocomel being higher than Fristi. This effect is also visible with the PET bottles.

Overall, based on this complaints analysis, it can be said that sustainability perception is a very important theme. Both with the straw packs which still have plastic wrapper and with the sleeve around the PET bottle this is something consumer complain about. Based on this, it can be said that consumers might be willing to give in on convenience when it benefits sustainability, but only when the sustainability gain makes sense in their eyes. That is why it might be important to either make sure the choices made in improving the sustainability are intrinsically logical to consumer or to explain the choices made (better). Preferably, the first strategy is applied, but when this does not work it can still be explained or made clear using (visual) cues.

## 4.3 Interviews

To be able to make choice which packaging brand and format was the best option to be used for further development, some semi-structured interviews were conducted. Firstly, with brand owners of the main FrieslandCampina brands in the Netherlands. Secondly, with technology experts of the main packaging formats used and thirdly, with market experts. The outcomes of the interviews help to fill the building blocks for the scenarios in chapter 5.

### 4.3.1 Brand managers

For the brand interviews, the five most important brands for beverages were chosen. These are Campina, Chocomel, Fristi, Optimel and Vifit. Because the Fristi portfolio is very similar to the Chocomel portfolio, but smaller, Fristi does not have a separate section. For Vifit, the information was already available, so no interview was needed. The interviews were semi-structured, with three main themes. The first theme was priorities, divided in volume, price, sustainability, growth, and future. The second them was usage, divided in category, target group, and packaging use. The third theme was solutions, where the opinion was asked about new drinking solutions and how the brand would fit.

#### Campina

For Campina, an interview was done with Daniëlle van Reenen, former brand manager for Campina. Talking about the most important volumes for Campina, the main ones are the 2,4-litre jug and the 1 litre beverage carton. Comparing drink (milk) to eat (yoghurt, quark, custard), she adds that drink is more focused on conservation instead of growth. The focus is on eat sour, so yoghurt and quark. Looking at price, eat is also much more interesting. The reason why Campina is still big in milk, is to maintain market share, but also because there is too much milk and then it is preferable to sell it as Campina instead of private label. Looking at sustainability, Campina is very proud of its planet proof milk stream and its organic milk stream. For the packaging, the focus is on design for recyclability, reduction of plastics and a CO2 footprint that is as low as possible. Talking about growth, as mentioned before, there is no growth in milk, only conservation. For fresh milk, the customers can go to other parties. For long shelf-life milk, they cannot as consumers necessarily want Campina (LangLekker). Especially in the south of the Netherlands, where the people drink less fresh milk. Long shelf-life milk is also still used often for holidays. Looking at the future of Campina, the biggest moment of growth is the breakfast occasion. Where people used to eat bread in the morning, it now shifts to (crunchy) muesli with

dairy. Mostly for yoghurt and quark, there is a lot to win there. There is also a shift in how people drink milk. In the past, it was mandatory to drink milk. Now people do not necessarily drink less milk, just in another way then they did before. In coffee for example, like Latte Macchiato or Cappuccino. The target group of Campina is very broad, and it is used by people from all ages. For media, the target group is 20 to 65 years old, and TV 20 to 45. For eat innovations, the target is 20 to 40, and especially 20 to 30. Quark is doing quite well with the younger generation, but custard is not. Here it is losing from Mona, Danio and ice cream. Another trend is that dinner time is more fluid, meaning that families do not eat together anymore all the time because of other activities in the evening. This also has an impact on the desert tradition, that they do not take it at the same time, or do not take a desert at all.

## Optimel

To get to know more about the Optimel brand, an interview has held with Irene Kros, brand manager for Optimel. Around 75% of the volume for Optimel is drink. Especially the 1 litre beverage carton is important, as it is more than 50% of the drink volume. Currently, Optimel is looking to expand the 500 ml range. Like Campina, the margins on the eat portfolio is better than for drink, where the drink also differs per flavour. Looking at sustainability, the biggest impact can be made with the litre packs. At Optimel they were working on tethered caps for their packaging to replace the current screw off cap, but this project was stopped because consumers thought it was not convenient. Because of new regulation from July 2024 all caps must be tethered, but now Optimel is waiting for others to be the first movers and they will follow when the people are more used to the new cap. In the category of Optimel, mainly the small plastic packaging with Yakult and Actimel are growing. She adds that people want to act sustainably, but in the end, they still buy wat they like the most. Also, when the convenience is not good, the product is sold less. Looking at the future, plant-based products will grow, and to accompany that also the packaging will be more sustainable. There will also be more single households, so portions are more important. This means portion control which allows more variety, but also more waste. The target group for Optimel is mostly households with children. The Limited-Edition drinks are also attractive to the younger generation. For the elderly, Optimel is becoming less attractive. Considering the packaging use, the larger 1 to 1,5 litre packs are poured into a glass, the 500 ml pack is mostly consumed directly from the pack, and the 200 to 250ml are consumed at once.

## Chocomel

For Chocomel, an interview was held with Jolien Koelewijn, brand manager for Chocomel. The most important packaging format for Chocomel is the 200 ml can, which does better than the 250 ml PET bottle. In the supermarket, the most important packaging format is the 1 L beverage carton. For the catering industry, the glass bottle is very important. Looking at the price, the can and PET bottle are very interesting. Sustainability wise, cans will have a deposit from 2023 onwards. This means the consumer will have to return the can to the store to receive the deposit back. However, the can is currently not re-closable. Because Chocomel is fairly stain sensitive, the consumers are probably not very keen on putting the opened Chocomel can in the bag to return it to the store. The prediction is that because of this, the Chocomel cans will be sold less. And because of the added deposit the cans will also be almost the same price as the PET

bottle, people will buy that instead. Another point where the sustainability could be improved is the plastic wrapper around the sixpack of minipacks, the wraparound for the cans and the box around litre packs. Looking at growth, because of the new deposit system mentioned before, the PET bottle will grow at the expense of the can. However, the PET bottle also has some flaws. Firstly, the new PET bottle is not always recognised as 'real' Chocomel as the name is printed vertically on the sleeve and the brown arches above and below are left out. Secondly, because the legislation for tethered caps from 2024 onwards is also applicable to this bottle, this might also cause spilling or irritation of the cap when it might touch the nose. Looking at the future, shops without packaging could be interesting, where it is possible to get Chocomel from a tap and pour it into a glass bottle. Another interesting idea is to have a concentrated soap like bar or pasta to which water can be added. With concepts like this, hygiene and shelf-life are still a challenge, however. The largest buyer group of Chocomel are households with children. This group mostly buys 200ml beverage carton minipacks and 1L beverage cartons. The focus group for Chocomel is 18 to 35. Currently, the challenge is to get a higher penetration removing the image that Chocomel is only for winter.

#### Vifit

For Vifit, the most important packaging is the 500 ml beverage carton. Two-thirds of the volume for Vifit is in small packaging. Looking at sustainability, the ideal is to have a paper bottle by 2025. The growth lies in the pouch segment and the convenience channel. Looking at the future, new convenient products should be brought to market and the core portfolio should be reset to convenient packaging. The target group of Vifit is young and urban, with the main occasions being in-between and on-the-go.

### 4.3.2 Technology experts

To gain more insights into relevant packaging technologies, interviews were conducted with an expert on PET bottles and an expert on Beverage Cartons. Using the insights gained by the interviews, a well-founded decision should be made on which packaging technology is interesting to use for the development of a new drinking solution later.

#### PET bottles

To get to know more about PET bottles, an interview was done with Natalie Englert. Within FrieslandCampina she works at the plant in Heilbronn, Germany, where she works a lot with plastic bottles, especially Polyethylene Terephthalate (PET) these days. These bottles can be opaque or transparent, where transparent is preferred over opaque because it is better recyclable. This simply has to do with the recycling system being in place or not, she mentions. Carbonated drinks like cola are not that sensitive to light, so they do not need to be protected. Because milk is quite sensitive to light, it needs to be protected from it. That's not needed for all products, but for 99% of the products it is. And because the transparent bottle does not block any light, a light barrier sleeve is added. Nowadays, these sleeves have a zipper on the side for easy removal, but before this was not the case. Back then, the consumer was not able to remove the sleeve from the bottle, making the combination not recyclable. For now, the strategy is that the bottle is transparent and when there is a light barrier sleeve, it should have a zipper so the

consumer can remove it and it is recyclable. This means that the bottle and the cap are recyclable. The sleeve itself cannot be recycled yet at this point, this is incinerated. The bottle and cap being recycled now depends on the consumer taking off the sleeve. When this is not done, the bottle and cap cannot be recycled as it is not recognised by the sorting machine at the waste facility when the sleeve is still attached. There are some new developments, where the sleeve can remove itself from the bottle in the waste facility, when the consumer forgot. So, PET sustainability can be a nice story, but only with a transparent bottle and some decoration that is not a light barrier sleeve, or a removable light barrier sleeve. For PET in general, recycled content can be used because there is a closed recycling loop in place. Now, this is mechanical recycling, but chemical recycling is being investigated. Chemical recycling has the advantage that the material has a much better quality, almost like virgin PET. With this material, there is no change in processing needed, no discussion on food safety and no difference in colour. Mechanically recycled PET can have a slightly darker transparent material, which not everyone may like, or think looks 'premium' enough. Chemical recycling does have a higher CO2 value and is more expensive. Currently there is an availability issue with PET because of new legislation, per 2025 all bottles should use at least use 20% recycled content (rPET). Currently, there is not much available so there is a challenge ongoing who is getting the rPET. It is hard to say that the PET bottles are circular in the current form. Because the sleeve is there and it cannot be confirmed that 100% of the bottles are recycled, mostly it is said that the bottles are designed for recycling. Talking about the recyclability of the sleeve itself she mentioned: "The light barrier sleeve is the supporter of making the bottle recyclable, but it will never be recycled in in itself." She also made a comparison to beverage cartons: "The aluminium and the PE layer in the beverage carton can be compared to the light barrier sleeve with PET bottles. It's protecting and really, definitely needed, but for now I do not know if there's a real solution out there."

When asked about what the ideal PET bottle would look like, she had a few ideas. Starting with the realistic ideal, it would be a transparent PET bottle made from 100% rPET with a combination of mechanical and chemical recycling. For protection, an additive into the resin could be an option or a sleeve that is recyclable with special markers or inks. Talking about a futuristic ideal, the packaging should be made of safe material like a polymer, glass, or fibre and easy to handle. She also mentioned that the general public mainly thinks that glass and fibre-based packaging is sustainable, where plastics are deemed to be bad for the environment. According to her, this image is mainly caused by the negative media coverage on plastics. Another solution she mentioned that could reduce waste, is to add value to a source: "As soon as you give a certain source a value, it is a source and not waste". This could be a solution, as one would not throw away value.

## Beverage cartons

To find out more about the benefits and drawbacks of beverage cartons, an interview was done with Erik Lentink, from the Technology Expert Team Paper Laminates. A beverage carton (BC) is a multilayer packaging format, which means that it consists out of multiple layers of different materials. Within beverage cartons, two types can be distinguished: chilled (non-aseptic/fresh) and ambient (aseptic/long-life). Products packed in chilled beverage cartons can stay good for 21-25 days, where products in ambient beverage cartons can stay good for 9-12 months. This has to do with the barriers present in the beverage cartons. Where the chilled BC

only has a liquid barrier, the ambient BC also has an oxygen, light and odour barrier. That is why the chilled BC only consist out of 3 layers (PE, paperboard, PE) and the ambient BC consists out of 5 layers (PE, paperboard, PE, aluminium, PE), see figure 22. Nowadays, most packaging is assessed on whether they are mono-material or circular. Looking at BC's, they do not do well on these criteria. It is hard to reuse the paper fibres, the LDPE on them, and the aluminium in beverage cartons. So, it does not score well on mono-material or circularity, but this does not necessarily mean the packaging format is flawed. Looking at the bigger picture of using a packaging that do not harm the earth too much, beverage cartons can be interesting. The first reason is the fact that BCs are renewable, because the paper is made out of wood and the plastics used are increasingly plant based. The second reason is that the CO2 footprint is low, also when compared to a PET bottle that is fully circular, while a beverage carton contains all virgin material. Used beverage cartons are increasingly seen as a valuable resource. When beverage cartons are recycled, two main materials come out: PolyAl (30%) and paper (70%). PolyAl is a combination of the polyethylene layer and aluminium layer that are clumped together in the waste facility. This PolyAl currently cannot be recycled well. Now, the plastic is burnt, and the aluminium is used in the cement industry as reinforcement. However, within a few years, the recycling of this stream can grow to significant volumes with some adjustment of the pulper. This way, it is possible to separate the aluminium from the plastic. The paper can be recycled and used in liners for corrugated board. The quality of these fibres is high because the fibres are long and have been wrapped in plastic, so they are not damaged. Looking at recycling, in 2020 70% of the BC's are collected and 30% is recycled. For 2021, this should be 45%. For 2030, the goal is to have 90% collection in the EU and 70% recycling. Looking at the Dutch waste stream of beverage cartons, the BCs are relatively dirty compared to other countries. The reason for this is that the Dutch like to eat a lot of custard (Dutch: vla) and yoghurt, which sticks to the packaging a lot more than milk, for example. Another reason for the waste stream being less clean is that in some places in the Netherlands, there is a system of post-separation. This causes other waste to stick to the beverage cartons as well. Talking about reusing the paper fibres, this is difficult from a chemical view. The fibres need to be cleaned and bleached first. This needs to be done thoroughly, as dairy is very sensitive to odours. A good question to ask is if it is worth all the effort because there is large market for carboard boxes, where the fibre can be reused seven to ten times. Box manufacturers also are not interested in virgin paper fibres, as these are more expensive. Looking at the bigger picture, according to Erik, multiple formats are needed. Beverage cartons cannot be the only format, because then one would need two planet earths to produce all the paper needed. He thinks that the beverage carton is best suitable for bigger packs. On the other hand, only using PET is also not a solution, but PET bottles are more suitable for on-the-go packaging.

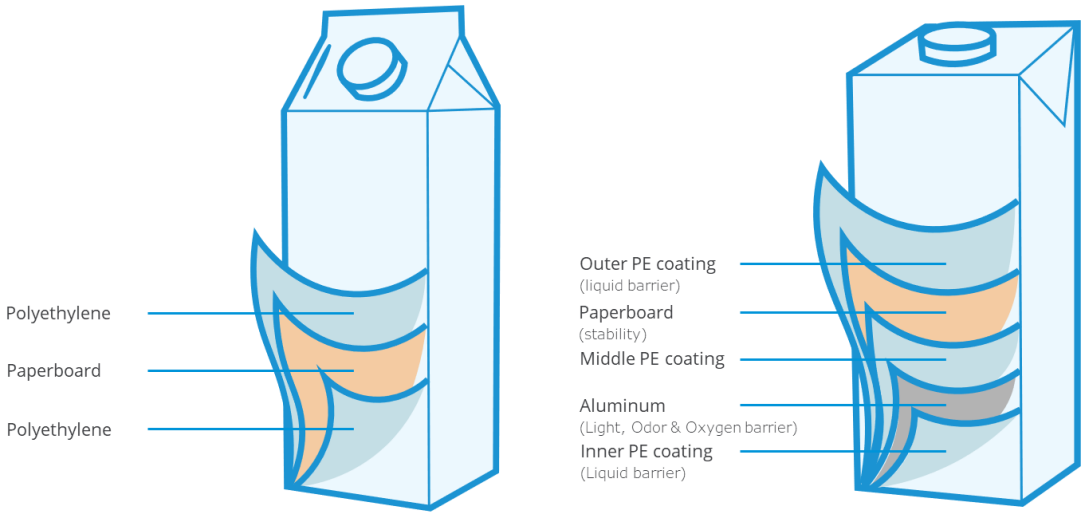



**Figure 22: Left: chilled BC, right: ambient BC**

### 4.3.3 Market experts

To gain more insights into relevant aspects in the market, interviews were conducted with the Sustainability and Innovation Manager, and the Manager Development for the Asian market. This is done to know what aspects to consider when implementing a new drinking solution in Europe, but also for Asia which is a very large market for beverage cartons.

#### Sustainability & Innovation

To gain more information about what FrieslandCampina is doing around sustainability and innovation, an interview was done with the Daniëlle van Reenen, the new Sustainability and Innovation Manager Dairy NL. Looking at packaging development, in her eyes there are two ways to approach improvement. The first way she called renovation, meaning minor adjustment to the packaging to make it more sustainable and comply with new legislation like tethered caps. The second way is to develop a completely new packaging, ideally incorporating intuitive sustainability. This means that when looking at the packaging or feeling it, the consumer feels like he or she is doing a good job.

These days there are a lot of logos, stating that the packaging is sustainable. According to her, a lot of consumers think you can just a buy a logo, and people barely read what the logo stands for anyway. One of the logos FC uses is the 'On the way to PlanetProof' logo. For her, this logo stands for a better milk stream, allowing FC to do more quickly do better things. She adds that this logo does not do anything towards the consumer. However, to the customer (supermarkets etc.) it does a lot, raising more money. So there the logo absolutely has its value according to her. Towards the consumer, her goal is to go 'logo-less' on packaging, integrating the promise instinctively into the pack.

Talking about the packaging of the future, she thinks that one should not think within existing resources but start all the way from scratch. Otherwise, one will not come to something substantially new that will substantially contribute to sustainability.

From sustainability perspective, an interesting packaging is the Campina Biologisch range, see figure 23. This product started with a packaging of bleached (white) carton with a brown print and a (small) screw cap. Campina Biologisch used to be called Boer en Land, which

sold fine. At a certain point it was rebranded to Biologisch (organic), but Campina was a bit of a late mover which affected the sales. To try to raise the volumes, the idea was to remove the cap. When this was introduced, there were quite some positive reactions. However, the sales dropped again. Because of this, the major supermarkets asked for improvement and thus the cap was brought back.


**Figure 23: Campina Biologisch Karnemelk packaging in chronological order. Left: bleached beverage carton with small cap, middle: unbleached beverage carton without cap, right: unbleached beverage carton with big cap**

Another interesting packaging story are the paper straws. These were introduced because of the new SUP legislation starting from July 2021. Although the straws were now made of paper, the wrapper around the paper is still made out of plastic. According to Daniëlle, this is also not a convincing story, as this still means that small plastic is put into the world. Ideally, the solution should intrinsically be in the packaging format, so you can directly drink out of the packaging without spilling. The paper straws can be seen as evolutionary step, where the revolutionary step is a packaging format with the same requirements that the straw fulfils, but then without a straw.

Something that must be taken into account when developing a new packaging format are the consumers. This sounds logical, but when this is forgotten, the innovation might fail completely. Daniëlle mentioned two examples of this. The first has nothing to do with dairy or food in general but is still very educational. A few years ago, Robijn came up with a new product range: Klein & Krachtig (Small & Powerful). The idea was that it would have the same washing performance, with less product. This means that the packaging could be smaller, which would decrease the transport, more products would fit on the shelf, but the consumer has to do the dosing themselves. Sounds like a good idea to improve sustainability. However, the 20 years before the launch of the new product, the use of a washing ball was praised and now suddenly the consumers had to dose the product into the old-fashioned drawer. This transition was way too fast for most consumers. The competition also did not go along with this idea, so most customers switched away from Robijn. The conclusion here is that such innovations must be explained in small steps, and on should not leave out valued parts of a packaging format.

## Asian market

FrieslandCampina is present in six different Asian markets: Vietnam, Thailand, Malaysia, Indonesia, Philippines, and Pakistan. To get to know more about these markets, an interview was

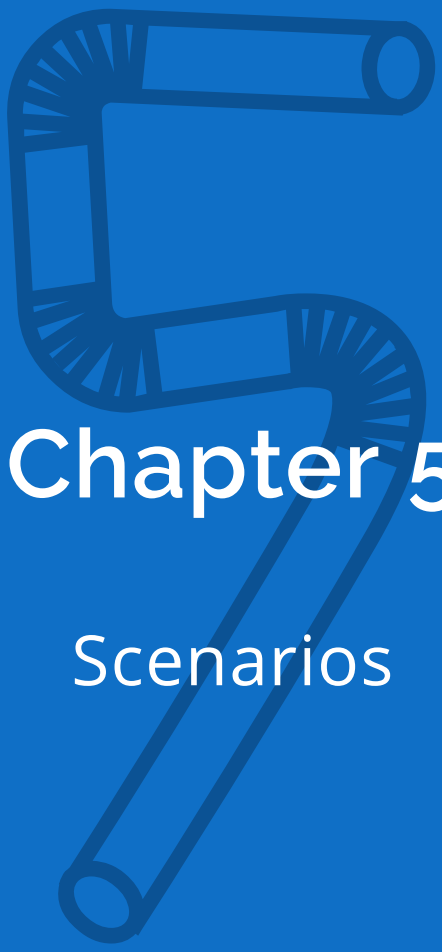
done with Craig Miller, Manager Development based in Singapore. In Asia, the main category is consumer dairy. There is a little part of specialised nutrition powders, but mainly sweetened condensed milk and evaporated milk. These are packed in metal cans, beverage cartons and pouches. The beverage cartons are mainly portion packs, and some 1L packs. They also do some plastic bottles like HDPE for sterilized milk and are currently investigating if PET will grow enough to invest in their own line. When talking about how to improve sustainability on liquids and drinks, the advice was to focus on beverage cartons. One of the biggest challenges in these markets is the price competitiveness between brands. Also, because of the inflation, they are trying to find ways to reduce the cost of packaging. One way of doing this is to find alternative suppliers that are cheaper. The main goal here is to reduce the cost without impacting the consumer. An example is to go from Tetra Pak to LamiPak. This way, the price for the consumer stays the same, but there is a better margin. Out of six markets, Malaysia is the wealthiest with the most disposable income. That is why there is a pilot with aluminium free beverage cartons, but still, it is a challenge to get the consumer to pay more for sustainability. In the Asian market the paper straws were also introduced, like Indonesia and Vietnam. After the introduction there were no huge complaints because the communication on pack was done well. Currently, they are trying out a glossier version of the paper straw. Regarding sustainability, there are a few things that can be done. One of them is to incorporate recycled content. However, in China this recycled content is not allowed for food contact purposes. Malaysia and Indonesia both have a large Muslim community. Because of this, ingredients need to be halal certified, but also recycled packaging. Currently, it is not possible to use rPET in food contact. Overall, one can say that Asian countries are fragmented around sustainability requirements and legislations. Talking about waste, this is completely different to the European market. Firstly, waste is more visible because the recycling chains are undeveloped and there is no kerbside recycling. There are so called ‘pickers’, which are private individuals that collect PET bottles to make a living. PET is chosen as it is easier to recycle and has the highest value. Beverage cartons are more difficult to recycle and have a lower economic value. Summarizing, the main challenge in the Asian market is cost. Everything must be done as affordable as possible. The sustainability also must be improved in the most affordable way because you don’t want to charge the consumer anymore.

## 4.4 Conclusion

Looking back at the double diamond (figure 6), it can be said that the first diamond has been climbed by executing state of the art, exploring literature, doing a first consumer test, analysing complaints and conducting interviews. The first consumer test showed the way consumers (wrongly) use packaging and what are found to be important features of packaging. The complaints analysis showed the importance of sustainability perception with packaging. The interviews with brand managers gave useful insights to be used as building blocks for the scenarios. The interviews with technology experts made clear that the beverage carton format is interesting to use for further development. From the interviews with market experts, interesting insights were gained on how to approach development of new drinking solutions. The sustainability and innovation manager explained an interesting theory of renovation versus innovation, and evolution versus revolution: ideally, one should not think within existing resources, but start from scratch. Only this way, one can come to something substantially new

that can substantially contribute to sustainability. The paper straws can be seen as evolutionary step, where the revolutionary step is a packaging format with the same requirements that the straw fulfills, but then without a straw. This theory explains the challenge for this research very well and is adopted in the further development of a new drinking solution. Also, because there are already people working on the next generation (paper) straw, it is more interesting to look at the next step with a possibly strawless solution.

After all these diverging activities, al gained information will now be brought back to scenarios of which one is picked and worked out further in chapter 5.



# Chapter 5

## Scenarios

# 5. Scenarios

To answer the main research question, a choice has to be made for which kind of product and brand the new drinking solution should be developed. Looking at the double diamond again (figure 24), the first half of the first diamond is filled, and now the second half can be built using converging activities like building scenarios. Although the new packaging to be developed could be usable for multiple brands and products, it is wise to pick one brand and product to focus the packaging on. To help make this choice, four scenario options are shaped. In this chapter the information from the analysis phase is combined into building blocks for four scenarios, of which one is chosen to pursue. Next, the chosen scenario option is researched further with interviews from which full scenarios are drawn up. Lasty, based on the chosen scenario, the requirements needed for the ideation phase are drawn up and, together with drinking solutions options. All information in this chapter aims to help in the next phase: ideation.

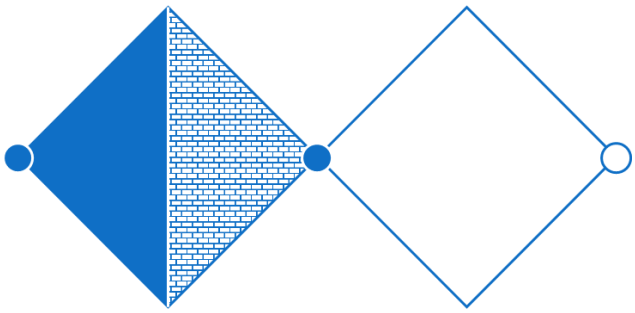


**Figure 24: Double diamond, building second half of first diamond**

## 5.1 Scenario options and selection

Based on the first consumer test and interviews with brand owners and technology experts, four options for scenarios were created, one per major FrieslandCampina brand in the Netherlands. The overview of these scenarios can be found in table 5. From the interviews, the most important volume, target group and occasion noted. Also, the problems that the brands are facing now or might be facing in the future are deducted from the interviews. Per brand, there is also a specific aspect to consider. The viability was based on the profits of different packaging formats. The impact of the scenario is estimated based on the interviews and is connected to how fast the innovation could be implemented, so when the impact can be made: short-term, medium-term, or long-term. Desirability is estimated based on the interviews and indicates how much relevance there is currently to tackle this scenario. Feasibility is estimated based on the interviews indicates with what the difficulty of solving the scenario could be. Finally, sustainability gain is estimated based on the interviews and indicates how much there could be gained on sustainability by finding a solution to the scenario.

**Table 5: overview of scenario building blocks**

| | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| *Brand* | Chocomel | Optimel | Campina | Vifit |
| *Volume* | 200-300ml | 500ml-1000ml | 1000ml | 300-500ml |
| *Target group* | (18-35 with) children | youth | 20-65 | urban youth |
| *Occasion* | on-the-go | at home | at home | in-between on-the-go |
| *Problems* | paper straw<br>lack of sustainable consistency<br>unclear how to dispose<br>can with deposit<br>PET with tethered cap<br>PET looks 'fake' | tethered cap<br>more single households: portion control & more waste | no cap<br>unclear where to dispose<br>tethered cap | tethered cap<br>lack of convenience |
| *Take into account* | stain sensitive | convenience is key | competitive market on fresh | format and closablity most important |
| *Viability* | can and PET very interesting | eat more interesting | milk not interesting | currently low premium works better |
| *Impact* | Short-term | Medium-term | Long-term | Long-term |
| *Desirability* | High | High | Medium | Medium |
| *Feasibility* | Medium | Low | Medium | Medium |
| *Sustainability gain* | Medium | Medium | Low | Low |

To continue with the development of a new drinking solution, one of the four options for scenarios must be chosen. Based on the problems, impact, and desirability, the choice was made to continue with option one to develop a new drinking solution for. This means that the rest of this thesis will be focused on developing a new drinking solution for Chocomel 200-300ml. The current packaging format that covers this scenario option is the 200ml beverage carton with paper straw, that has also been discussed before during the first consumer test. Because of (upcoming) legislation on cans and PET bottles and the current issues with the paper straw, the new drinking solution will be based on a beverage carton. Because of the current developments in paper straws and alternatives from other materials, combined with the wish from colleagues to find a new strawless solution, the aim is not to develop a directly applicable packaging concept but go a bit further and develop something truly new that does not need a (separate) straw at all.

## 5.2 Chocomel brand background

### 5.2.1 Chocomel Brand Manager

Now that the choice is made to develop a new drinking solution for Chocomel, another interview was done with Chocomel brand manager Jolien Koelewijn to dive a little deeper into the brand and find out what the brand is about and focus more on straw packs.

According to Jolien, Chocomel is seen as a treat for yourself and for your kid. Elderly also use the straw packs, for example when going for a walk. The thing that is appreciated here is that one can drink from the straw pack while walking without spilling and not having to stop to have a sip. Looking at schools, there is a trend visible that some do not accept drinks containing sugar for lunch. Concerning the drinking experience, for a child it is important that the packaging is

easy to drink. Where teenagers can drink out of a packaging without a straw, small children are less capable, and parents are more afraid of spilling. To avoid spilling, some users fold out the flaps on the side of the pack to hold onto that, so the children will not squeeze the pack. The main motivations for consumers to use Chocomel are energy and indulgence, also from parent to child. Looking at the buyer of Chocomel straw packs, the main group is households with children. Talking about till what age the Chocomel straw pack is relevant, she mentioned that as a teenager it is cooler to drink from a can or a PET bottle because the current straw pack is associated with children. That could also be an area where there could be something to win: make the new concept less childish, but still drinkable for a kid, without a straw. Lastly, she mentioned that the current paper straw just makes the experience less enjoyable: "The deliciousness of Chocomel, which is actually the main motivation, is a lot less delicious because you have that paper straw."

### 5.2.2 Sensory Expert

An important aspect of the complete user experience is the sensory part. When finding the right balance between sustainability and convenience, this could be something to consider. Especially the convenience of the packaging can be influenced by the sensory experience. To find out more about how this can be taken into account when developing the next generation of drinking solutions, an interview was conducted with Kim Stadman, Sensory Expert at FrieslandCampina.

According to Kim, a benefit should connect to the look and feel of the packaging, so to the five senses: how it should look, how it should feel, how it should smell, how it should taste, but also how to put the benefits into the market as credible as possible with sound. Applying this to paper straws, one does not want to feel the paper. However, people should be aware that it is more sustainable. The plastic wrapper that is still around the paper straw does not help with this. With this wrapper, you lose your credibility when saying 'look at us being good with our paper straws', while also after sucking from it three times the straw is already unusable. This hurts the brand; the complete image needs to make sense.

To gain more information for developing a new drinking solution, one should talk to the consumer. The consumer should be able to experience the concepts and criticize them. A good group to talk to would be people with children, as the straw packs are mostly used by children. It might even be possible to let the children experience the concepts. From the sensory expert team, it would be possible to support with setting up these sessions. At sensory, more often these kinds of sessions are organised, which are called 'Check & Learn' sessions. These are used to check the concept and learn from the consumers by letting them taste some products. During these sessions, lots of questions are asked: what feeling does it evoke, what do you think, what do you experience, what appeals to you, what does not appeal to you, etc. To get a reliable result, 3 sessions of 6 people are organised, which are analysed afterwards to find a common thread.

It would be good think about a plan together to organise such a session for new drinking solution concepts. For that, it is needed to think about how to set up the test and what is the desired result of the session. Most of the times, an agency will recruit the consumers or will completely carry out the test. The sessions could take place in Amersfoort, as Wageningen has a lot of students, which is not necessarily the Chocomel consumer. In the region of Utrecht and

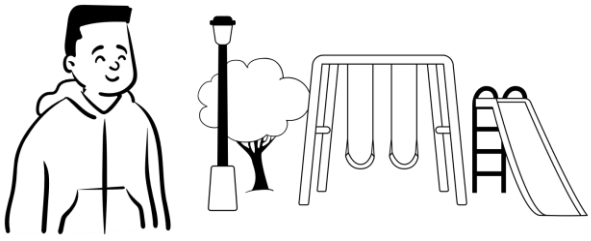
Amersfoort, more Chocomel consumers should be present. It's good to have the sensory department involved in the test, as the last time there were sensory tests done with the paper straws, but no consumer tests were done. It just had to be implemented back then. This would be the second chance, so it would be nice to do it right this time. For these Check & Learn sessions, it would be possible for Sensory & Consumer Insights to carry out the test and to let the agency still recruit the right participants.

Because the drinking solution is aimed at Chocomel portion packs, it is also important to take the Chocomel product into account. Like Jolien Koelewijn already mentioned before, Kim also emphasizes that Chocomel represents enjoyment. Enjoying in a sustainable way should also be possible, but enjoyment is really what the brand represents, a bit cheerful and crazy. That is why with Chocomel, the experience is more important than with plain milk, for example. Although when a new drinking solution is found for Chocomel, this can also be applied to milk of course. If it's good enough for Chocomel, then it's good enough for everything.

### 5.2.3 Scenarios

To give more body and context to the dry requirements, scenarios were created. These scenarios can later also be used to check if the concepts created solve the problem. First, the individual scenarios are visualised and explained. After that, an overview of all scenarios is presented.

#### Individual scenarios



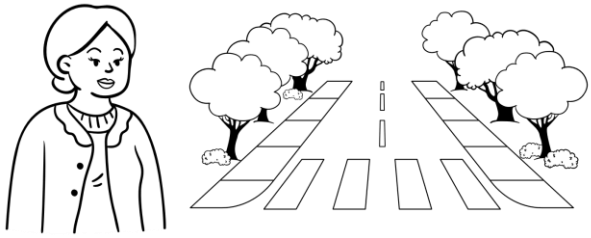
**Noah (8)** has loved to drink Chocomel since he was 5 years old. When going to the amusement park, his mother always takes a few packs with her. After his favourite attraction, he likes to have a Chocomel to gain some energy to go once again. Before, his mother always opened and prepared the pack for him, but now he starts wanting to do it himself. He's getting better at opening without spilling. He does not really like the new straws because if he a little slow in the drinking the pack, the last few sips are harder to get out. Once, he was playing with the straw in his mouth too long, even a part of the straw came off. Luckily, he noticed it quickly, but he didn't like it.


**Jim (16)** used to drink a lot of Chocomel when he was younger. He still likes it, but thinks the package is a bit childish so he does not dare to bring it with him when meeting up with friends in the park. When gaming at home, he still drinks a lot of Chocomel because there his friends cannot see him if he does not have his webcam on. He rather takes the small pack, because then he does not have to use a glass and when it's pushed over accidentally during an intense gaming session, the damage will be limited. Sometimes, he does forget that he did not fully empty the pack, but when he finds out it is hard to get the last sip out because the straw has become a bit soggy, which annoys him.


**Lisa (24)** is a student and is nearly finished with her studies. Sometimes she takes a pack of Chocomel to college, for a boost of energy, but mostly on holidays or days out. When going somewhere with a small group of friends, it's convenient to just have 6 or 12 packs in the bag, so everyone has something to drink. Although she is not a fan of the mouth feel of the straw, she is very concerned about the environment and thinks the paper straws are a step in the right direction. However, she does not understand why there is still a plastic straw around the paper wrapper. Can't that be paper as well?


**Claire (32)** is a mom of three and works parttime in a call centre. She loves the convenience of the small packs for the kids. When going to the playground or the amusement park, she always takes a 6-pack with her. The things she likes most is that the packaging is spill free. She understands that something must be done to save the environment but is not happy with the new paper straws. The other day she read an article about children who were sucking on the straw for too long, and a part came loose. Luckily, no one choked on it, but she is not reassured that it will not happen again. Now, she is paying more attention to her children when drinking and making sure they are not sucking on it for too long.

**Peter (56)** works in the lab. He likes Chocomel, but unfortunately, he cannot take drinks into the lab. Occasionally, he does take a pack with him when he knows he is only working behind his computer or when he must visit a factory or supplier abroad. Most of the Chocomel is consumed when he is on a holiday with his wife. They always have a 6-pack in the caravan or in the car, just for the convenience. He does not like the new paper straws and prefers the old plastic ones. He does understand why this was a necessary change but thinks there must be a better solution than the current one.



**Josephine (72)** has been retired for a few years now and is enjoying her freedom. Together with her husband she likes to take long walks. She always takes a few packs with her for the road. When walking, she prefers to just keep walking in the same pace and not having to stop. That is why she likes that you can just drink out of the straw while walking without spilling. She knows how hard it is to get the chocolate stains out of her clothes. At home, she always keeps a 6-pack in the pantry just in case the grandchildren quickly visit or for a birthday party. She thinks it is convenient to have the small packs available, so she can have a large variety of drinks available at a birthday without having to open large 1L packs and having to drink everything herself after the party.

## Scenario overview

**Table 6: Overview of scenarios and their characteristics**

| Group | Children | Teenagers | Young parents | Young adults | Adults | Elderly |
|---|---|---|---|---|---|---|
| **Age** | 3 to 13 | 13 to 18 | 18 to 35 | 18 to 35 | 35 to 65 | 65+ |
| **Drinker** | self | self | self & children | self | self | self |
| **Opener** | parents | self | self & for children | self | self | self |
| **Disposer** | parents | self | self & for children | self | self | self |
| **Attractiveness** | high | low | high | medium | medium | high |
| **Place** | on-the-go, at home | on-the-go | on-the-go, at home | on-the-go | on-the-go | on-the-go |
| **Main application** | excursion | excursion | excursion | vacation | vacation | walking |
| **Extra application** | school | gaming | vacation | excursion | excursion | party's |
| **#1 Function** | easy to drink | spill-free | spill-free | easy to bring | easy to bring | spill-free |
| **#1 Feature** | straw | straw | straw | rigidity | rigidity | straw |
| **Value sustainability** | N/A | low | medium | high | high | medium |
| **Use frequency** | high | low | low | medium | medium | high |
| **CCM buy frequency** | N/A | low | high (37%) | medium (26%) | low (10%) | medium (27%) |
| **Lz Fd Cd 200 ml** | N/A | low | high (39%) | medium (20%) | low (7%) | high (34%) |

In table 6, an overview of the age groups of Chocomel users is visible. Each scenario covers a different age group, but this overview is more general than the individual scenarios. Per age group, there are different characteristics. All data in the table is based on FrieslandCampina data and interviews with members of the Chocomel team. Going from top to bottom, the drinker means the one who is drinking out of the pack. This does not necessarily have to be the same person as the opener and disposer, so these are different categories. Especially with children, the parents might be the opener and disposer. Attractiveness indicates how attractive the current packaging is to the user group. Place indicates where the packaging is consumed most, at home or on-the-go. Main application indicates more specifically on which occasion the pack is used most. Extra application indicates in which occasion the pack is also used, but less often than the main application. #1 Function indicates which function of the pack is most important to the specific age group. #1 Feature is connected to this, and indicates which current feature enables the #1 function. Value sustainability has to do with to what extent each age group cares about sustainability. Use frequency indicates how often the packaging is used by that aged group, which is based on the two categories below: CCM buy frequency and Lz Fd Cd 200ml. The numbers in these categories are based on the GFK Marketing – Buyer Profiles. CCM buy frequency stands for Chocomel buy frequency, which includes all packaging formats of Chocomel, so not only the 200ml straw pack. Lz Fd Cd 200ml stands for Langverse zuivel (Long shelf-life dairy) Flavoured drinks Chocolate drink, which means that this category includes all chocolate drink 200ml packs, so not only Chocomel. What is interesting here, is the elderly age group almost has the same buying frequency for 200ml Chocolate drinks as the young parents. Based in these numbers, both the young parents and elderly age group could be interesting to execute the consumer test with.

## 5.3 Requirements

Based on the first consumer test, expert interviews, complaints, and literature a list of requirements is formed. Because the scenario option for Chocomel portion packs is chosen, of which the current packaging format is the 200ml beverage carton with paper straw, the requirements are based on this format. These requirements are later used for the ideation phase, chapter 6.

Firstly, these requirements are categorised in four themes: convenience, sustainability, features and basic packaging. These themes are the most relevant for answering the main research question. All requirements all built up by blocks. Inside these blocks, there are smaller blocks with additional information relevant to the main requirement.

### 5.3.1 Convenience

To be able to find the right balance between convenience and sustainability, it is of importance to find out what convenience exactly is and what the requirements are that influence this theme. In figure 25, a list of basic convenience requirements can be found. The first three requirements (easy to open, drink, and dispose) are also the three main themes in the first consumer test. These can be considered as the main convenience requirements related to drinking solutions. The other requirements arose from the first consumer test, the complaints analysis, and the interviews with the brand managers and technology experts.

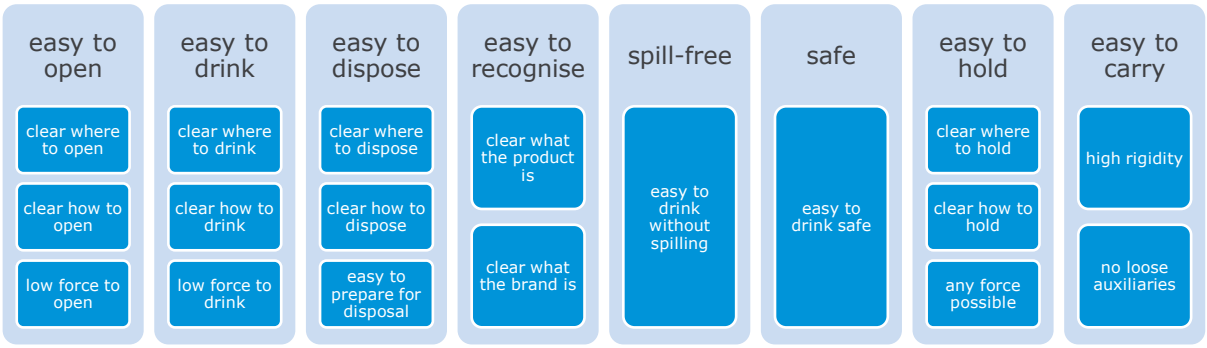



**Figure 25: Basic convenience requirements**

### 5.3.2 Sustainability

The other theme that is of utmost importance to find the right balance, is sustainability. It is important to make clear that these are factual sustainability requirements, and not necessarily requirements to influence the sustainability perception of consumers. These requirements are based on the interviews with technology experts and the internal Sustainable Packaging information database used at FrieslandCampina. The list of sustainability requirement is visible in figure 26.

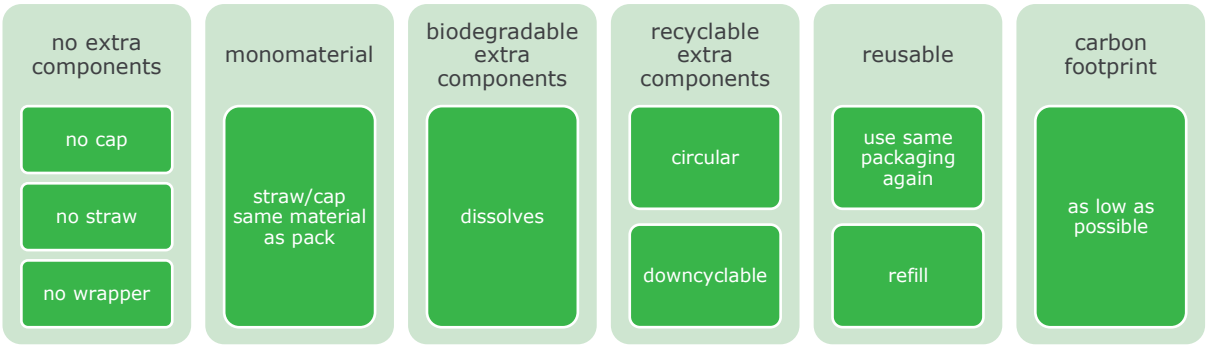



**Figure 26: Sustainability requirements**

### 5.3.3 Features (present & lacking)

In figure 27, the current and lacking features of the Chocomel 200ml straw pack are listed, with current in orange, and lacking in red. The orange features are not necessarily requirements, as it is not clear that all these features are valued by the consumer. The red features are negative characteristics and thus should be eliminated if possible. How important these factors are, will be found out later in the consumer tests.

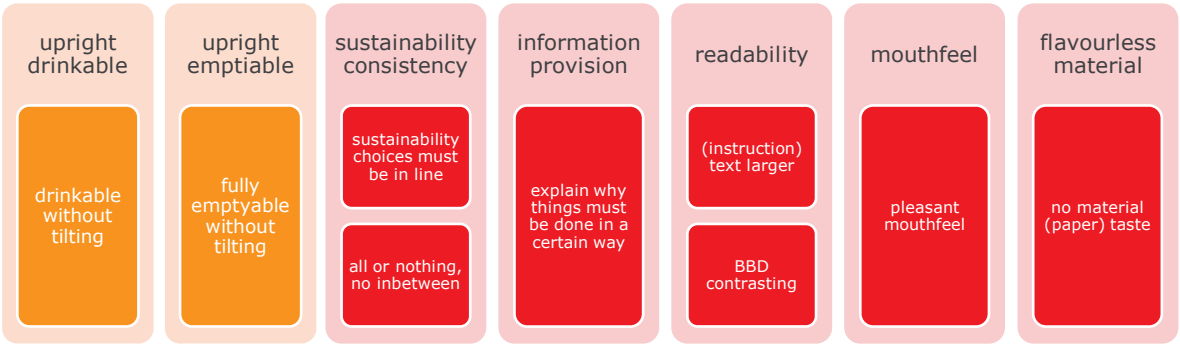



**Figure 27: Packaging features for current Chocomel 200ml straw pack**

### 5.3.4 Basic packaging

Apart from the convenience requirement of the packaging that make the packaging easier to use, there are basic requirements that every packaging should have, displayed in figure 28. These are divided into three categories, the first one being the most important: protection of the product, from grease, gas, water vapor, light and odour. Not all products are as sensitive to all these factors, but it is wise to take these into account. Another important basic packaging feature is tamper evidence. In case of a cap this is often taken care of by a ring around the spout, between the cap and the pack: the temper evidence ring. In other packaging formats, other solutions are applied. The third feature here is a clean drinking surface. The importance of this feature is not evident, because there is no clear legislation in this area. The only legislation that could be applicable is the legislation on toys. There is also rather some difference in how packaging formats deal with this. For example, looking at a Chocomel can, there is no protection of the drinking surface before opening and use, where a plastic or paper straw is protected well by a plastic wrapper around it. The importance of this feature to the consumer will be researched later during the consumer tests.

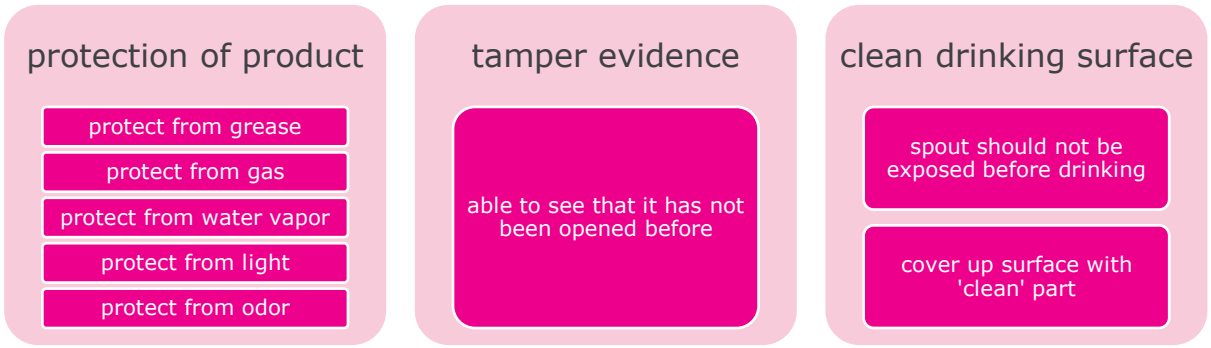



**Figure 28: Basic packaging features that all packaging must comply to**

## 5.3 Drinking solutions options

Next to the requirements, from the literature and background research also a list of drinking solution options is formed to aid with the ideation process. The drinking solutions are divided into four categories, as seen in figure 29.

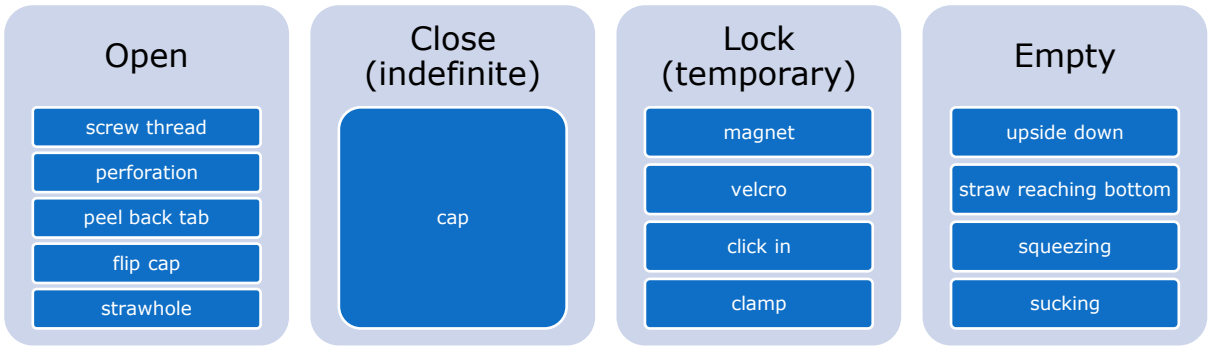
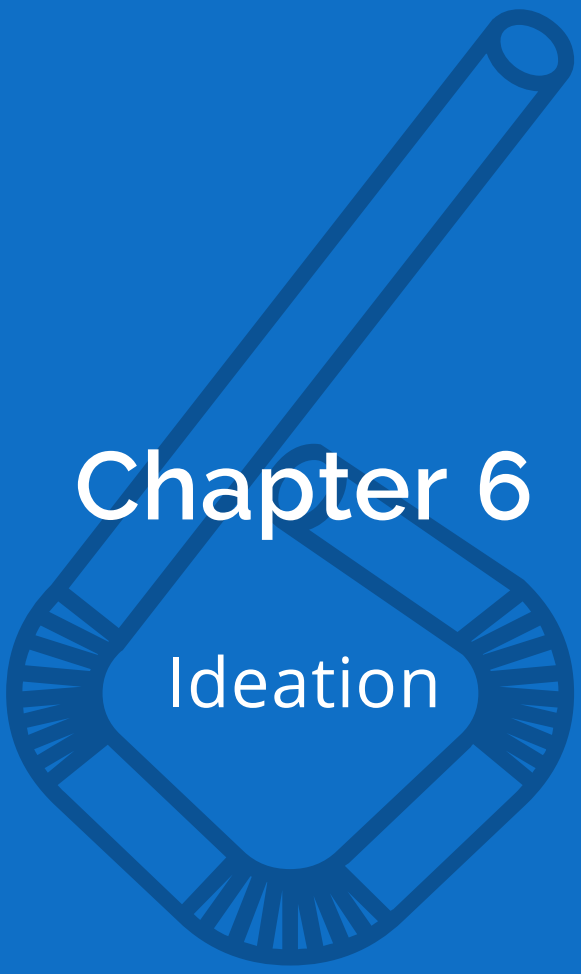



**Figure 29: Options for drinking solutions to be used in ideation**



# Chapter 6

## Ideation

# 6. Ideation

In this chapter the fifth sub-question is partially answered: 'How to materialize a future concept of drinking solution for beverage cartons given a specific context of use by the end user? This is done by ideation: the formation of ideas or concepts. Looking at the double diamond again (figure 30), the first diamond is full now and the second diamond can be filled. The first half of the second diamond will consist out of diverging activities like ideation. The goal of the ideation phase is to come up with as many ideas as possible, to then bring these back to a few concepts to be used in the consecutive phase. In the analysis phase, some requirements have been set that the concepts must meet. However, it is important to keep an open mind at the start of this phase, to make sure that all potentially good ideas can arise. One of the methods used to come up with ideas is a brainstorm session.

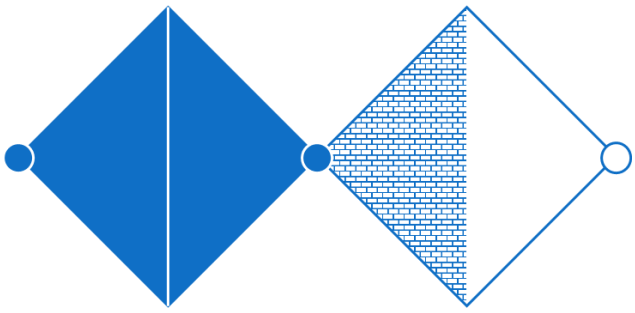


**Figure 30: Double diamond, building first half of second diamond**

## 6.1 Brainstorm

The brainstorm session was organised to come up with as many ideas to be used for the concept creation. From interviews conducted both already at the start of the research and later, combined with the sustainability guidelines from FrieslandCampina, it became clear that the ideal drinking solution for beverage cartons would be one without extra or loose components like straws or caps. This way, there would be no extra material needed and no extra material type, which is beneficial for recycling. This ideal was the starting point of the brainstorm session.

**Figure 31: Colleagues working on concepts individually**

Figure 32: Colleagues working on concepts in groups of 3 or 4

After a brief introduction into the subject, a summary of the analysis was presented with the scenario that was chosen consequently: a new drinking solution for Chocomel, replacing the 200ml (paper) straw pack for families with children that mostly use it on-the-go. Then, the four major drawbacks of this current packaging were presented: paper taste, (poor) mouth feel, loose parts that can result in choking hazard, and the sustainability inconsistency (paper straw still in plastic wrapper). When that was clear, the setup was explained. In total there were ten people participating in the brainstorm. They were handed A4 paper and pencils to use during the brainstorm exercises. After two groups of three colleagues and one of four were formed, they were told that they first had 5 minutes per round to come up with concepts by themselves by drawing and writing (figure 31), and then 5 minutes to discuss the concepts in their group and combine the ideas on a new A3 (figure 32). When the time was up, one of each group was asked to briefly present the best combined concepts to the rest of the group. After every group was finished, the next round started. Between the explanation of the setup and the start of the exercises, a small overview was shown of the material they would all be working with during the brainstorm: beverage carton (figure 33). This was done now, so it would be freshly in their mind when starting the exercises. The choice was explicitly made to present the layers in this way instead of showing a gable top beverage carton with the same layers, to not influence the participants and avoid bias. To let the participants get a feeling with the physical material, some material samples were put on the table so everyone could touch and hold the material. The choice was made to only show the flat material instead of the assembled packaging to avoid bias again.

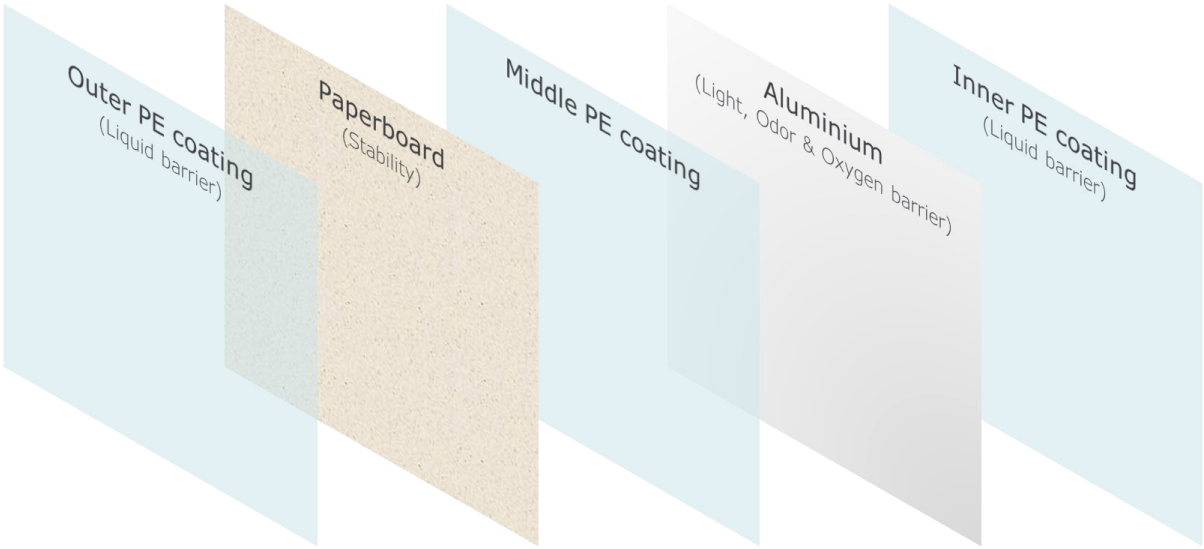



**Figure 33: Layers of beverage carton (ambient/aseptic)**

In total, there were four rounds of exercises. With every round, the requirements became less strict. As mentioned before, the ideal drinking solution for packaging is one without external or loose parts. That is why the first exercise was to design a drinking solution for a 200ml beverage carton without any extra or loose components like straws or caps. This means that the participants were only allowed to come up with solutions that were integrated into the packaging itself. The second exercise allowed slightly more freedom in design, as now it was possible to design a solution that had extra or loose components, but only with the materials that were already present in the beverage carton: PE, paper and/or aluminium. With the third exercise, the requirements became even less strict, as now it was allowed to use an extra material type besides PE, paper, and aluminium. The fourth exercise did not have any limitations, except that it still had to be a drinking solution for beverage cartons of around 200ml size, like every other round. The balance between sustainability and convenience was mentioned at the start of the brainstorm by showing the main research question. The requirements as listed in section 5.3 were deliberately not mentioned during the brainstorm, to make sure the participants were not overwhelmed by all the requirements and the outcomes of the brainstorm would be more creative and out-of-the-box. The goal of this setup is to end up with different concepts that vary in complexity and materials, to be used as inspiration for the final concepts to be offered to consumers later and see how what is accepted. An overview of these four exercises can be found in figure 34. After these rounds, a small coffee break was planned before the second part started.

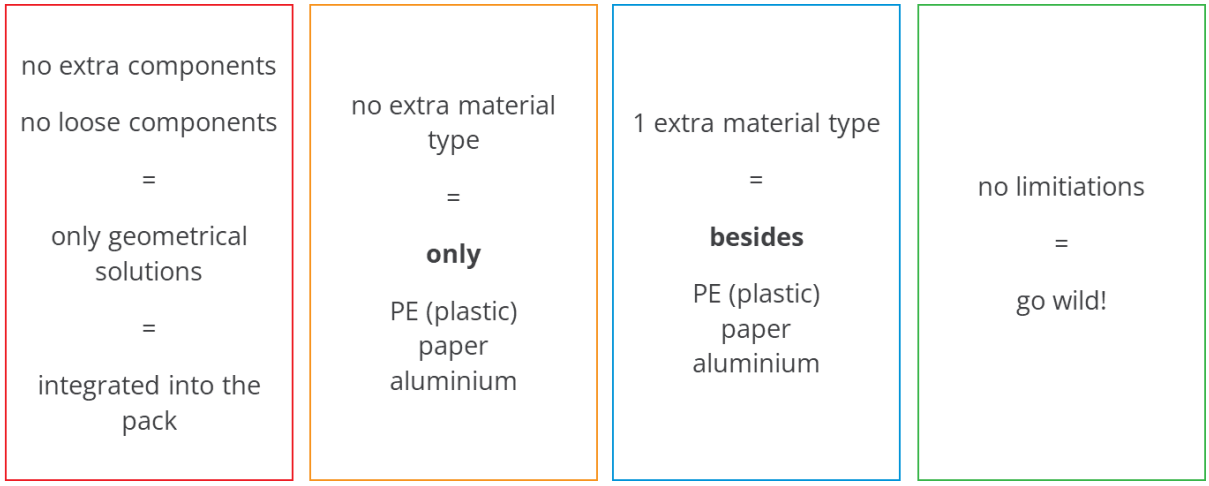



**Figure 34: Brainstorm exercises 1-4**

While preparing the brainstorm exercises, there was already doubt if it would be feasible to do four exercises since the last exercise might be too similar to the exercise before and the creativity of the participants might be exhausted by then. During the third exercise, it already became clear that not everyone had enough ideas anymore and thus it was decided to skip the fourth exercise and continue to the break already. As this was already forecasted, this was not a substantial issue because the most interesting concepts would have raised from the first two rounds anyways, as this would fit the ideal that was mentioned by colleagues before. It was decided to keep the fourth exercise in just in case it was doable, both time wise, creativity wise and energy wise.

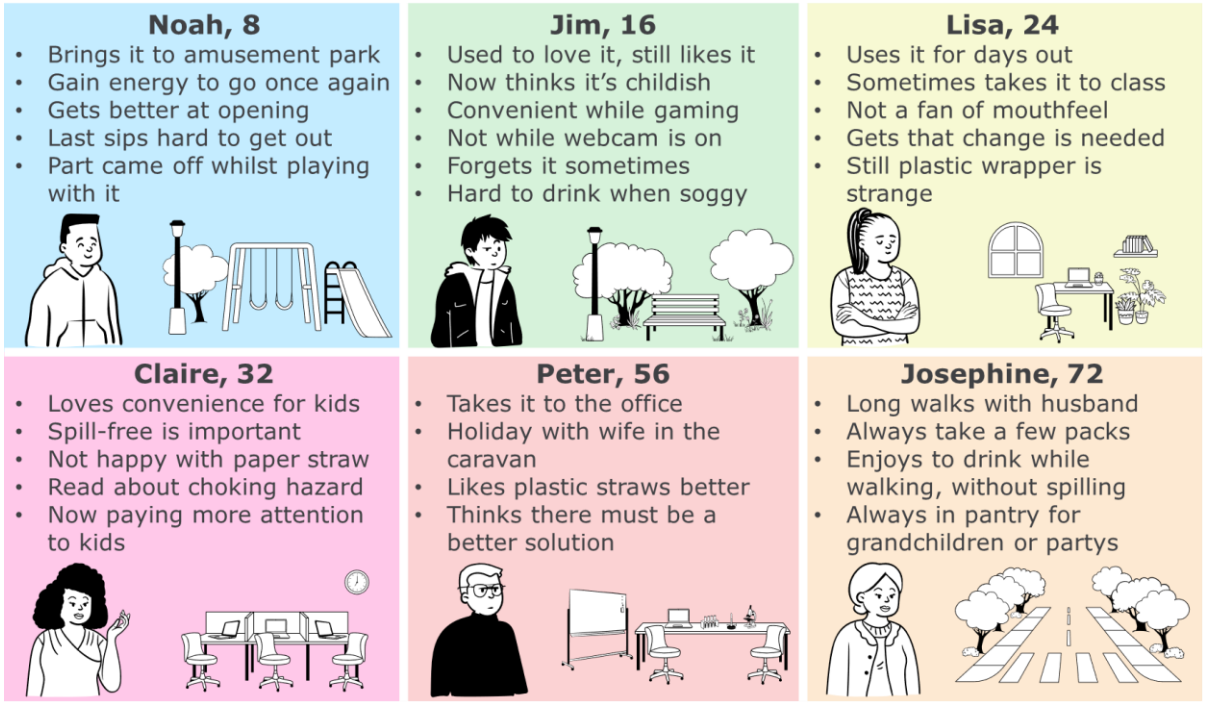



**Figure 35: Summarized scenarios used during brainstorm**

After the break, the participants were ready to start with the second part. Not all participants could make it to this part and had to leave already during the first part due to other

obligations. The second part was about matching the concepts to the scenarios. To do this, first the scenarios were briefly explained, see figure 35. The participants were asked to take the distributed post-its and paste them on each concept on the A3 papers. On the post-it's the participants were asked to write down which scenario suits the concept best, which scenario suits the concept worst and a short motivation for these choices. This way, all concepts were matched with the scenarios to get more insight into how the makers of the concepts think about the use of the concepts. In figure 36, an example of what this looks like is visible. After everyone was done with matching, the session was concluded an everyone was thanked for their participation.

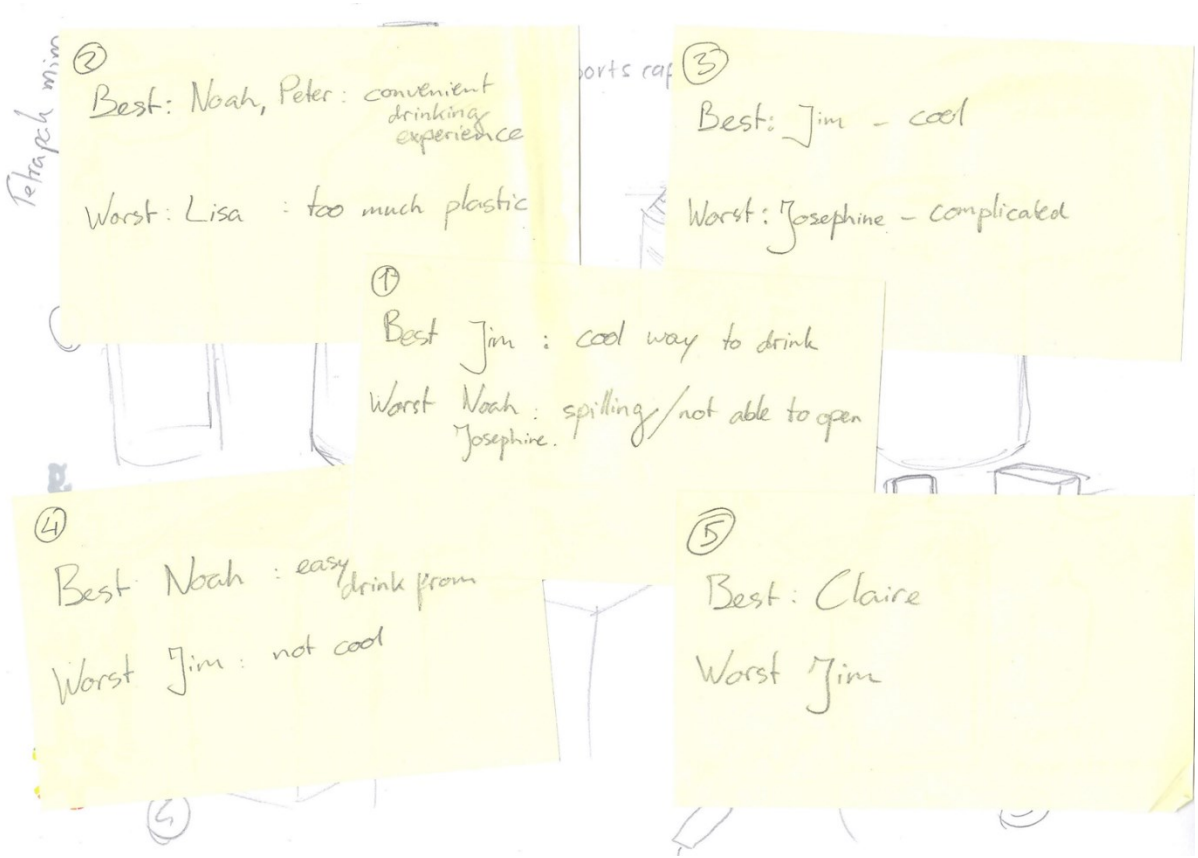



**Figure 36: Concepts from participants with matched scenarios**

## 6.2 Concept development

From the brainstorm session with colleagues, some interesting ideas were gathered. Together with the ideas already created, these form the basis for the concepts that will be discussed in the focus groups. To have a good variety of concepts, but also not too much to cover in a focus group, the number of concepts was set to six.

All the concepts created in the brainstorm session were gathered and analysed. From these drawings and the personal ideas created before, eight concepts were selected to develop further (figure 37). The first step was to discuss these with members of the Consumer & Design Team at FrieslandCampina to hear their expert opinion on these concepts and see which one of these eight were the most promising and how they could be combined or improved.

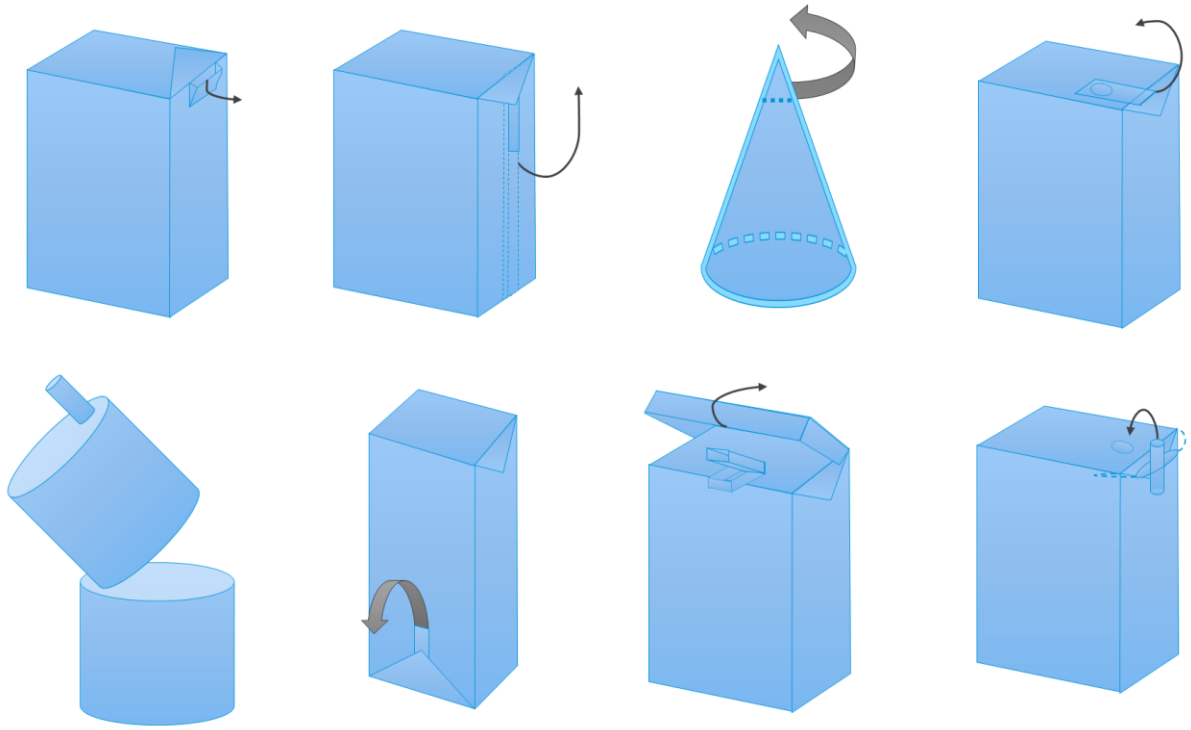


**Figure 37: Selected concepts after the brainstorm session**

From these eight concepts, six were chosen to develop further. According to the colleagues from Sensory & Consumer Insights, six is the right number of concepts to use for a group discussion, as one would like to have as much concepts as possible, but the participants also still need to be able to compare the concepts so there should not be too many. The six concepts that were selected are visible in figure 38. One concept is already rendered, two others have some improvements in drawing next to them to be incorporated into the renders. More about how this selection was made can be read in section 6.3.8.

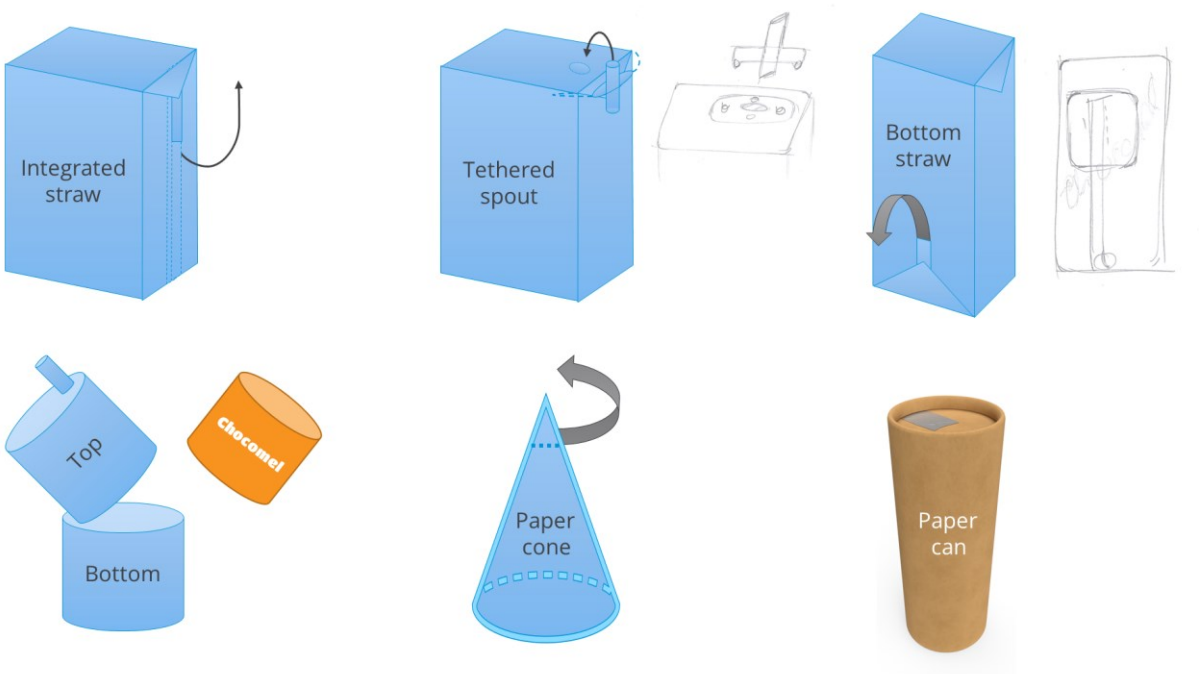



**Figure 38: Six final concepts selected**

From all six concepts, renders were created in Chocomel yellow. Two of these are visible in figure 39. Apart from the renders of the complete unopened packaging (left), also a close-up of the opened packaging is included (right). The next step is to put the artwork on the renders and make them ready to be printed to be used in the Check & Learn sessions.

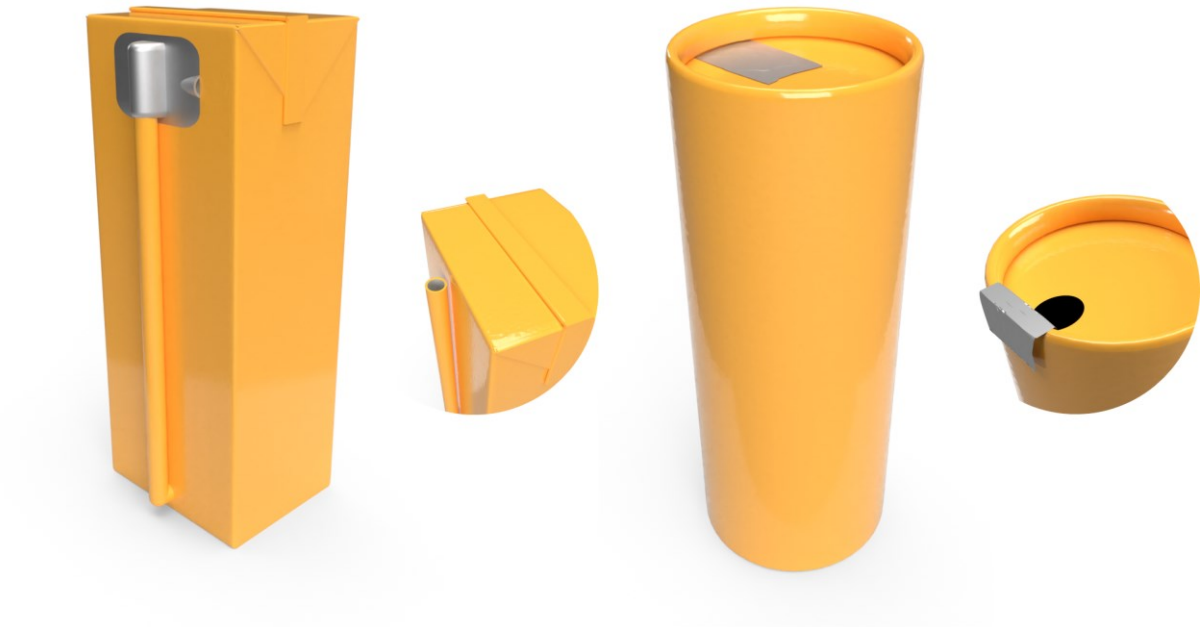


**Figure 39: First renders in Chocomel yellow**

## 6.3 Final concepts

Below, the concepts are visualised how the consumers will also receive the concepts during the Check & Learn sessions, but here at a 60% scale and translated to English. In appendix F, the original Dutch concepts are available on a larger 83% scale. All concepts are numbered for the sessions, with a three-digit number on the bottom right. These numbers are completely random and only serve as a reference so during the session it is easier for the participants and moderators to refer to a certain concept.

### 6.3.1 Concept 457 - Bottom Straw

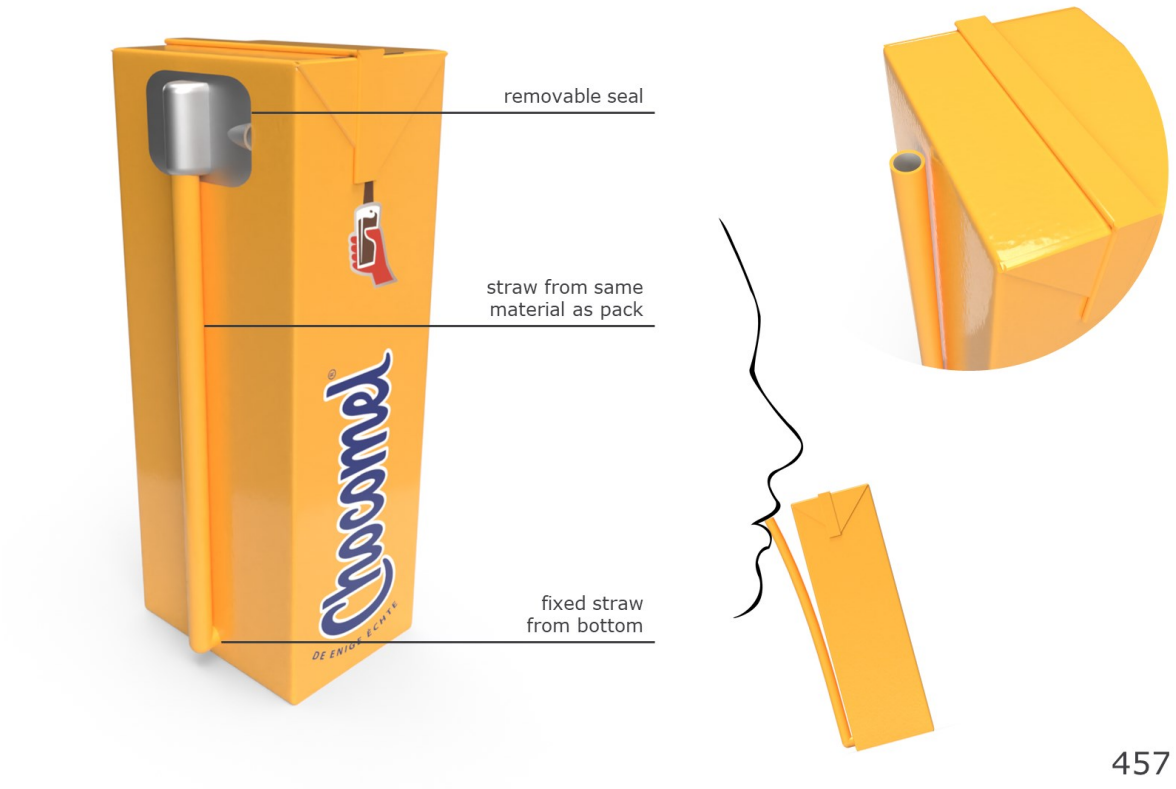



**Figure 40: Concept 457 - Bottom Straw**

Concept 457 is based on the current shape of the 200ml straw pack. The measurements and folding are the same, only the strawhole on the top is missing because there is no separate straw attached. To drink out of the pack, a straw is permanently attached to the front of the pack from the bottom. The straw is made of the same material as the rest of the basic pack, so beverage carton material (paper, plastic, and aluminium). The top of the straw is sealed by an aluminium seal. This also keeps the straw attached to the pack on the top side. The idea behind this concept is to still have a straw, but not from plastic, not from paper that can get soggy, and not separate to the pack but firmly attached. Because the straw is made of a paper laminate, it will not get soggy while drinking. When taking off the removable seal, the pack is opened, and one is able drink out of the pack as shown in the picture on the bottom right in figure 40. Because of the length of the straw being as tall as the pack itself, the spilling should be eliminated as well, in contrast to a U-bend straw that can hang and drip. The straw Because the

straw is on front of the pack, where the Chocomel logo normally lives, the logo is moved to the side of the pack, so the straw does not block it.

### 6.3.2 Concept 781 – Paper Can

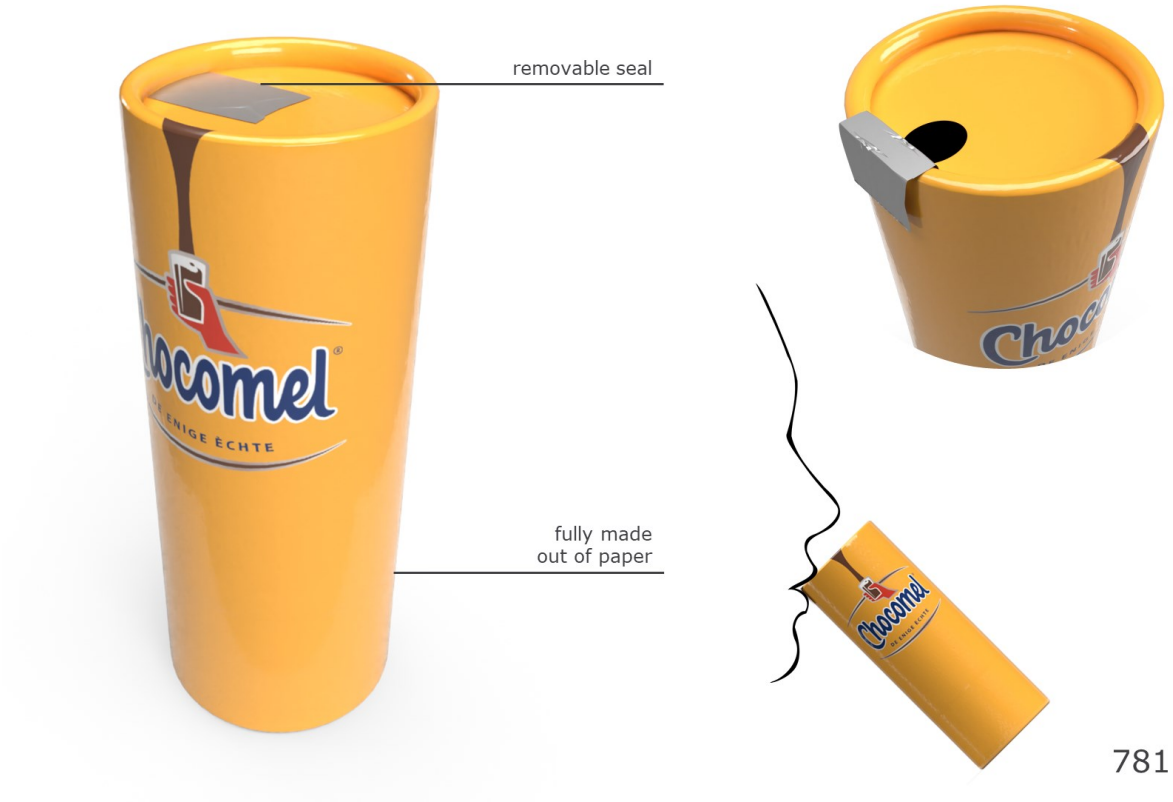



**Figure 41: Concept 781 – Paper Can**

Concept 781 is based on the well-known can from Chocomel, but now made out of beverage carton material. Similar paper-based cans are already on the market, but not widely available in the Netherlands. Clearly, this concept has a completely different way of drinking than the current Chocomel straw pack because it does not have a straw or similar device. The drink opening is also different from the current metal cans, as it uses a removable seal. An interesting feature of this concept is that this seal is removable but can be wrapped around the edge of the can. Doing this, the user's mouth only touches the underside of the seal, which is clean, and does not touch the edge of the pack itself. This way, a clean drinking surface is created, as visualised in figure 41.

### 6.3.3 Concept 326 – Tethered Spout

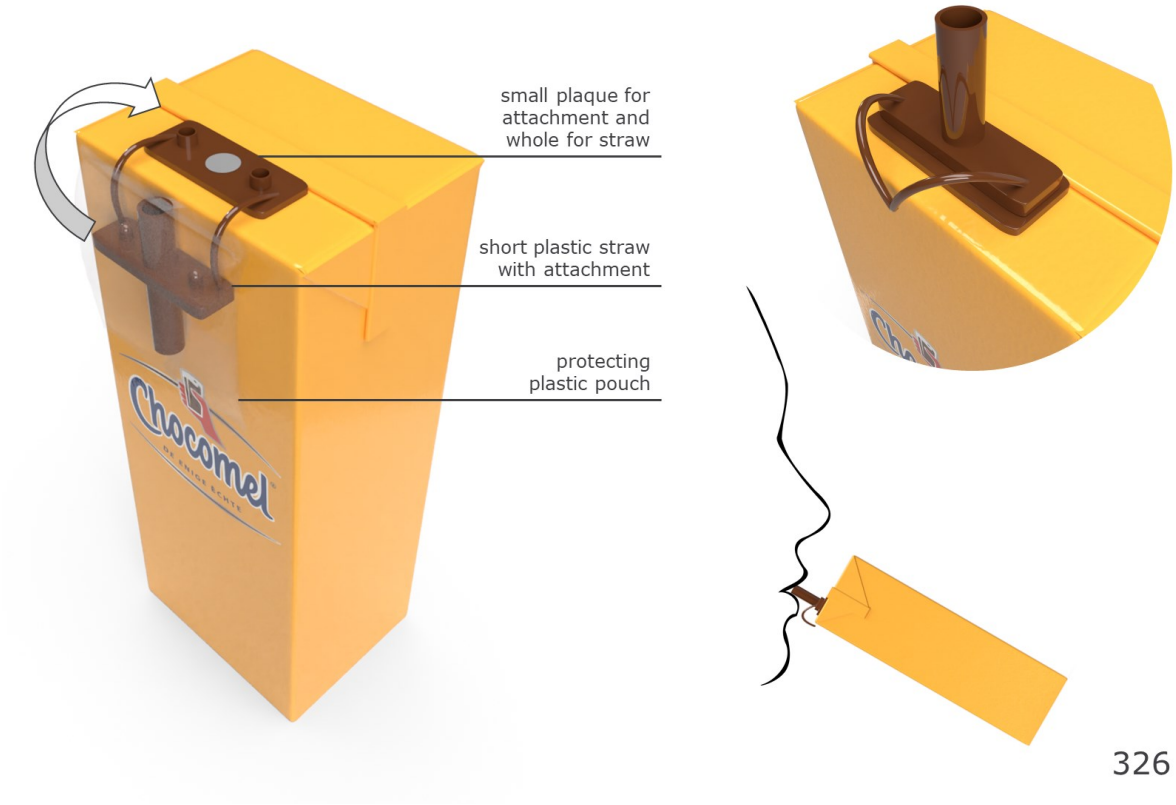



**Figure 42: Concept 326 – Tethered Spout**

Concept 326 is based on the current 200ml straw pack and inspired by tethered caps. The base shape is the same as the current packaging, but now the strawhole on top of the pack is extended by a small plastic plaque with attachment points. This plaque is connected by two small plastic strings to the short plastic straw with plaque and attachment points. Following the arrow in figure 42, this straw can be clicked into the top plaque, resulting in the top right picture in figure 42. With this concept, the consumer can still enjoy the benefits of a plastic straw, without the straw being able to end up in nature and adding to the plastic soup. Compared to the old plastic straw, this straw is considerably shorter, using less plastic for the straw part. However, there is plastic used for the attachment plaques as well, but the total plastic content is reduced to a minimum by keeping the straw/spout as short as possible. There is also still a plastic pouch around the straw for protection. What would be interesting to find out with this concept is whether consumers still accept this amount of plastic and whether they understand why this would be legal and the old plastic straw is not anymore. Another interesting characteristic of this concept is that the consumer cannot empty the pack upright but must tilt it to be able to drink it. The group discussion must show whether consumers care about this change or not.

### 6.3.4 Concept 207 – Cone


**Figure 43: Concept 207 – Cone**

Concept 207 is not based on the current straw pack, but is still made of the same base material, like all concepts. The idea behind this concept is to use a shape that when opened should form a natural straw shape. The most interesting shape found for this is a cone. When taking of the top of the cone, using the tearing line, a circular opening is revealed to drink out of. Like concept 326, here it is also interesting to see whether consumers mind that the packaging must be tilted to be able to drink, as shown in figure 43.

### 6.3.5 Concept 350 – Internal Straw

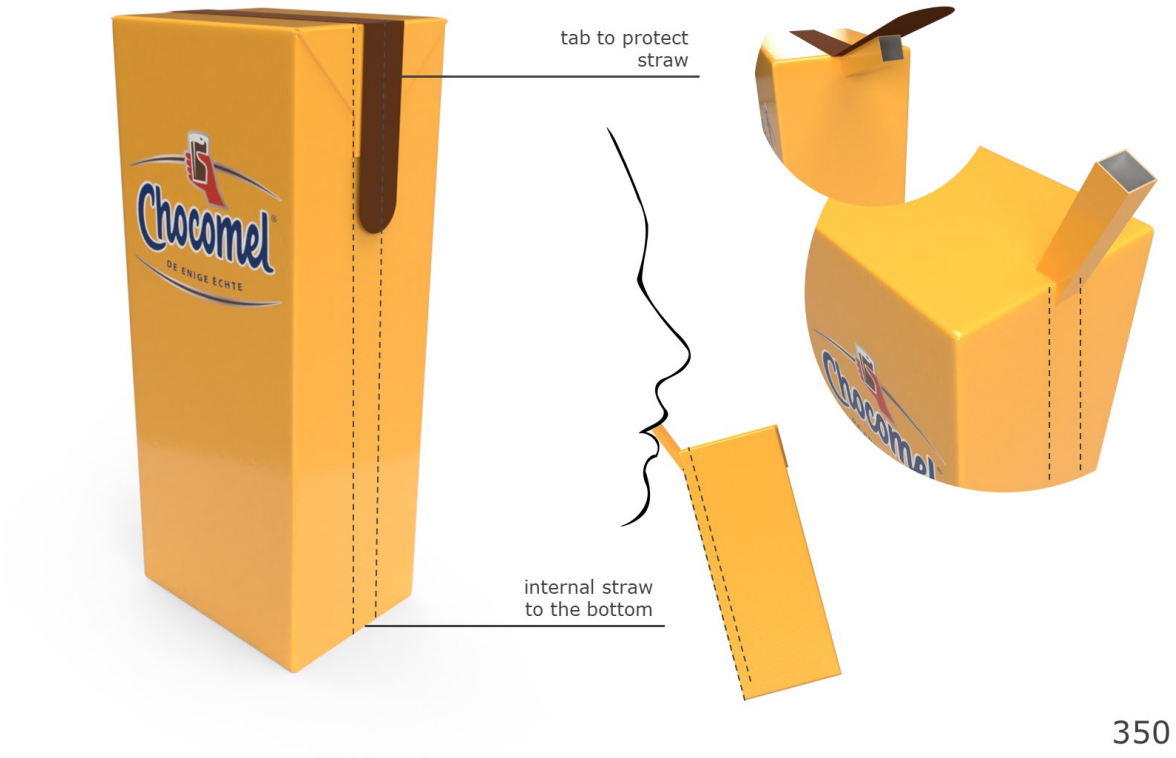



**Figure 44: Concept 350 – Internal Straw**

Concept 350 is based on the current straw pack, but also inspired by existing concepts found online (see section 2.3 New drinking solution concepts: 'Straw Pak', 'Straw In' and 'Last Straw'). Instead of having an external straw with a wrapper that is attached to the outside of the pack, this concept features an internal straw that reaches to the bottom of the pack, as shown in figure 44. To open the packaging, the paper tab that protect the straw can be pulled up revealing the straw that is also pulled up simultaneously. Doing this, the straw (which is flat until this point) folds open to form a square. Pulling the tab back, this can be removed, and the straw can be used to drink out of the packaging. Because the straw reaches to the bottom, the user can empty the pack upright. Interesting factors with this packaging are whether the consumers think the tab is enough to protect the straw and whether they mind the square straw or not.

### 6.3.6 Concept 642 – Capsule with Holder


**Figure 45: Concept 642 – Capsule with Holder**

Concept 642 is based on the same material as the current pack but does not look anything like it. The idea behind this concept is to reuse the parts that the consumer interacts with when drinking and hereby minimizing the single use material. The capsule that contains the Chocomel does not have any more material than needed, so no straw or additional plastic. The capsule can be placed in the lower part of the holder, and the upper part can slide into the lower part, puncturing through the strawhole in the capsule, as shown in figure 45. The holder protects the capsule and enables the user to drink out of the pack. After the capsule is empty, the holder can be taken apart again, releasing the empty capsule. The capsule can then be disposed into the PMD stream, and the two parts of the holder can be washed in the dishwasher. In the supermarket, the capsules are available in a six-pack. The holder only must be bought once or can be gifted when buying multiple packs of capsules.

### 6.3.7 Colours, finishes and graphics

One of the interesting choices that had to be made was if there should be difference in materials and colour between the different concepts, and if so, how this should be filled in. To get more insights into how people perceive sustainability, it could be interesting to make some of the concepts have a different finish or colour. Also, because from literature it is clear that this could have an influence on the perception of sustainability (section 3.2). Examples of this could be to have a concept that is glossy yellow (like the current 200ml straw pack), another one that has the same colour but has a matte finish, one that has a matte unbleached paperboard look and one that has a glossy brown paperboard look. This way, one would have already four different looks for the concepts. Looking back at the main research question, which is about the drinking solution, the choice was made to not have differences in colours and finishes of the concepts and focus on the structural aspect of the packaging for now. Although these colours and finishes could result in interesting data, this choice was made as these differences could make it harder for the participants to judge the drinking solution itself.

Another choice that had to be made was whether include Chocomel graphics in the concepts. This would give the concepts a more realistic look, which would have a beneficial effect on the ability of the focus group participants to judge the concepts fairly. However, a concern here was whether it would be possible to make the concepts look realistic with the Chocomel branding, because some of the concepts have rather extreme shapes that might not fit the Chocomel artwork well. This might then have an adverse effect on the realism, which might make the participants judge the concepts unfairly. Although this is a risk, the choice was made to include the artwork of Chocomel and try to adjust it to the packaging to make it fit the format as well as possible. The final renders of each concept with the right materials, colours and artworks are visible in figure 46.


**Figure 46: Overview of the six concepts used for the check and learn sessions**

### 6.3.8 Typicality and novelty

As mentioned before, a selection of six concepts was made to use in the Check & Learn sessions. These six concepts were carefully selected to cover as many packaging features as possible. The different characteristics are listed in table 7. More about these characteristics per concept can be read in section 6.31 until section 6.3.6, where the concepts are discussed in detail.

**Table 7: Overview of packaging characteristics per concept**

| Concept | | Characteristics | Code | Image |
|---|---|---|---|---|
| 1 | Bottom straw | Recognizable shape<br>External straw from bottom<br>Drink upright<br>Clean drinking surface<br>Aluminium seal | 457 |  |
| 2 | Paper can | Other recognizable shape<br>No straw<br>Drink upside down<br>Clean drinking surface<br>Aluminium seal | 781 |  |
| 3 | Tethered spout | Recognizable shape<br>Small plastic straw<br>Drink upside down<br>Clean drinking surface<br>Plastic straw, tether and wrapper | 326 |  |
| 4 | Cone | Unfamiliar shape<br>'Natural' straw<br>Drink upside down<br>Non-clean drinking surface<br>No other material | 207 |  |
| 5 | Internal straw | Recognizable shape<br>Internal straw, but square<br>Drink upright<br>Semi-clean drinking surface<br>Paper seal | 350 |  |
| 6 | Capsule with holder | Unfamiliar shape<br>Straw in holder<br>Drink upright<br>Semi-clean drinking surface<br>Plastic holder | 642 |  |

Apart from the different packaging features and characteristics, the concepts of typicality and novelty can also be applied, using the MAYA (Most Advanced Yet Acceptable) principle (Hekkert et al., 2003). When the concept gets more advanced, usually the acceptability lowers and vice versa. This principle is applied to the rendered concepts, as shown in figure 47. Here, the least advanced concept is number 457 and the most advanced concept is number 642. According to the MAYA principle, concept 457 would thus have the highest acceptability and concept 642 the lowest. Using this principle, the goal is to find the right balance between advancedness and acceptability, to find the concept that is most advanced, yet acceptable. To do this, the designer can play with typical and novel features.

Looking at the concepts in figure 47, concept 457 has a very typical basic shape, with a relatively typical straw. Concept 350 also has a very typical basic shape but has a relatively novel straw. Concept 326 still has a very typical basic shape but has a very novel straw/spout. Concept 781 has a relatively typical basic shape, with a relatively typical drinking solution. Concept 207 has a very novel basic shape and relatively novel drinking solution. Finally, concept 642 has a very novel basic shape and a very novel drinking solution.

When a solution is too advanced, it is often not accepted. Whether the order in figure 47 is correct and where the balance lies with these concepts will be found out later during the group discussions with consumers.

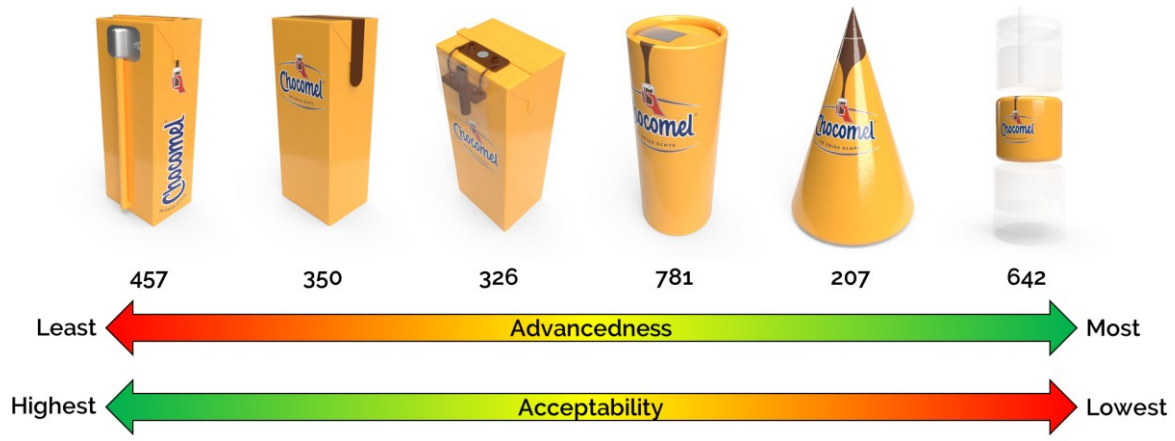



**Figure 47: MAYA principle applied to concepts**

## 6.4 SUP legislation check

To find out whether the concepts created would be compliant with the current Single Use Plastics (SUP) directive, an interview was done with legislation expert Ger Standhardt. During this interview, all concepts from figure 48 are discussed.

Starting with concept 457, a key word within the SUP directive is that here the straw is attached, an integral part of the rest and thus it is not a straw. It could be called a sucking utensil or device instead. Because it is fully attached to the pack, it does not fall in the scope of straws that could end up roaming around. Because it is an integral part of the packaging, not meant to be removed and not easy to remove as it seems, this concept should not be limited by the SUP legislation.

According to the SUP directive, concept 781 is a beverage container, so not a beverage bottle and thus does not need to have a tethered cap in the future, or a cap at all. The concept is similar to a Cartocan but has the nice addition of a seal that stays attached to the pack after opening. Talking about seals, it is interesting to make a comparison to the pull tab that is still present on the old Tetra Pak Edge beverage cartons. Namely, according to the SUP directive this pull tab is not a problem because it is not a cap, while it complete comes off and might end up in nature which diminishes the original idea of the SUP directive. That is why the seal that stays attached to the pack is a nice addition.

Concept 326 can be considered as a tethered spout, so as long as it stays attached according to the norms there should be no problem. It should be able to withstand 12N of pulling resistance in both vertical and horizontal direction, also after opening and closing fifteen times. This amount does not make sense for this packaging type, but the 12N of force is easily achievable with this design. Reading the SUP directive, this concept is in a category that does not exist, so it is unclear if this is allowed or not.

Considering concept 207, there is nothing in the law that says something about the top that is teared off and can be lost. However, with the spirit of the law in mind this is not desirable but no problem for the SUP directive.

Talking about concept 350, this design should not be a problem for the SUP directive, as long as the internal straw is not loose and cannot come out of the pack. About the paper tab, it would be better if it stays attached to the pack after opening so it does not end up in the environment.

Concept 642 is in fact not too dissimilar to a standard 200ml beverage carton with a standard drink holder that has an integrated reusable straw. These are holders that standard sized straw packs can be put into, to prevent children from squeezing the packs and spilling the product. Instead of still using the paper straw or a different (metal) straw with it, now a top part with an integrated straw is added.


**Figure 48: Numbered concepts discussed in section 6.4 and 6.5**

## 6.5 Sustainability check

To check whether the new concept could be more sustainable than the current packaging, an interview was done with Erica Ording, ET Sustainability Lead. Because the legislation that was one of the reasons for this research is about littering and not about carbon footprint, it is interesting to also take this into account and see whether the new packaging format can also be an improvement in that area.

Starting with concept 457, she mentions that it looks very efficient to fully empty, because the straw is already on the bottom, and it makes use of gravity. Looking at food waste, this could be a good one. Looking at recycling, it should fit well because only more of the same materials is used. However, it looks like significantly more of the same material is used, which could have an impact on carbon footprint. Especially because the extra material added is aluminium, which often relatively has the highest carbon footprint in a beverage carton. Because

the seal is a loose component, this could be creating some extra litter. However, good aluminium does not create microplastics and just oxidizes when it is not covered with other materials.

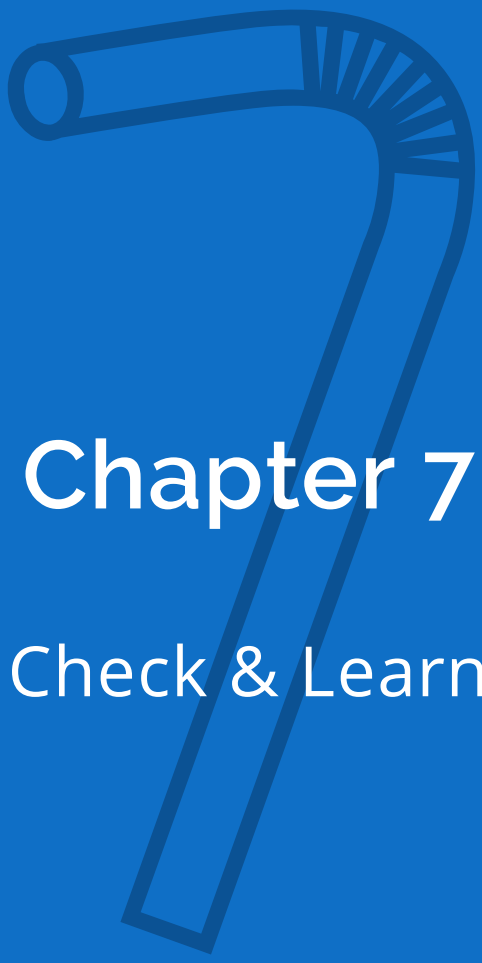
Considering concept 781, the thickness of the material is something that possibly could be reduced relative to the current packaging, as a round shape is inherently stronger than a square, reducing carbon footprint. However, this round shape of the concept does not benefit the transport efficiency as there is more space between the packs than when they are squared off. Like concept 457, this also has an aluminium seal that could be removed, although it is meant to stay attached. However, when this comes loose it could create more litter.

About concept 326, Erica mentions that it has a relatively large amount of plastic, nearly as much as a plastic cap. However, she thinks that this concept still would be more sustainable than concept 457, as the carbon footprint of aluminium is much higher. The consumer might experience this concept as too much plastic when offered as an alternative to the paper straw, though.

For concept 207, a potential littering issue can be the top that has to be teared off and that might end up in the environment. Transport wise, it has a similar issue as concept 781 as it is not as efficiently to store as a square packaging. Stacking the packs alternately upside down could help improve this, but there will still be gaps between the packs.

Concept 350 is similar to concept 457, only with an internal straw and a paper tab instead of an aluminium tab, which has a lower carbon footprint. Compared to a paper straw, it adds some aluminium so the footprint could be higher.

Talking about concept 642, she mentions that something like this could work if all packs would introduce such a system. It is a semi reuse model which is a hype now, but the question is if people will use this. Looking at recycling, this concept is good, footprint wise it is unclear and depends on how many times the holder must be used. Reusables should be very practical, so consumer do not have to buy something new every time they want to reuse something. However, this concept is very specific to this packaging and not generally (re)usable. One advantage of this concept, though, is that there should be no litter.



# Chapter 7

## Check & Learn

# 7. Check & Learn

In this chapter, the fourth sub-question is partially answered: 'What are the contexts of use for the end user and potential limitations when implementing the new drinking solution?'. This is done by evaluating the concepts created in the ideation phase. Looking at the double diamond again (figure 49), the first half of the second diamond is filled and now the second half can be built by doing converging activities like evaluating the concepts.

To evaluate the concepts, the idea was to have a focus group or group discussion with consumers. At the Sensory and Consumer Insights department, similar sessions are held more often which they call Check & Learn sessions. As the title of this suggests, these sessions are used to check one or multiple concepts and to learn from the users. Usually, these sessions are executed to evaluate new product developments, like a new version of Chocomel. This is the first time these sessions are organised for evaluating packaging concepts.

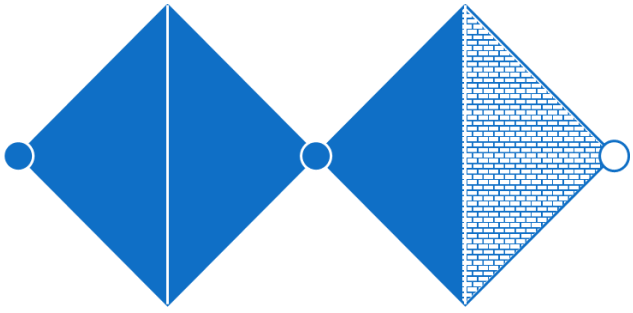


**Figure 49: Double diamond, building second half of second diamond**

During the preparation of the check and learn sessions with the colleagues, Development Specialist Louise Snelders mentioned that it is very good to do this research with consumers already in this early stage. Traditionally, what happened a lot is that the development team itself decides which packaging concepts has the most potential which would then be the concept that was developed further, but the opinions of the consumers were not considered at all. So, it is great that this project is approached in this way.

## 7.1 Goal

The main objective for the Check & Learn sessions is:

**To explore the opinions of consumers on the different drinking solution concepts, so that a clear recommendation can be made for further research.**

The key interests of this research are:

- What is the best solution to replace the paper straw according to the consumer?
    1. What do they think about the convenience of the concepts?
    2. What do they think about the sustainability of the concepts?
    3. What do they think is more important, sustainability or convenience?
    4. What are the most promising concepts: Which should be developed further?

## 7.2 Method

Together with the colleagues from Sensory and Consumer Insights, to prepare for the sessions, a screener and a discussion guide are created. After finishing these preparations, the sessions are executed. The recruitment of the participants is done by an external agency and the sessions are executed by colleagues of FrieslandCampina. Because the desired participants were not available in Wageningen, the sessions are executed at the FrieslandCampina headquarters in Amersfoort. Three sessions are organised with five or six participants per session, with a total of 16 participants. This number of sessions is chosen so that when the first and second session would have different outcomes, the third session could help to make things clear. The number of five or six participants is picked as from experience this enables a good discussion without resulting in chaos. The sessions are spread over two days. This way, after the first sessions there was still time to make some adjustments before the second and third sessions if needed. As mentioned before, the sessions took place in Amersfoort, but were also streamed via Microsoft Teams, so others who could not join in Amersfoort but were still curious could listen in. This way, the sessions are also recorded. Screenshots of the recordings can be seen in figure 50. The concepts were presented on A4 papers, one concept per sheet, as visible in appendix F.

**Figure 50: Screenshots of session 1, 2 and 3**

The moderation of the sessions is done by Marjolein Rouwhof and the flipover notes are made by Louise Snelders. These notes are used to provide some grip and overview during the sessions, for example while turfing how many participants liked a certain concept best. Afterwards these notes also form a brief summary of the discussion. During the sessions, Matthijs is observing which could be done more intensively while other were noting were noting the important conclusions and making notes to be used for processing the data later.

The setup of the sessions consists of five phases. It starts with the introduction, where the goal is to get to know each other and get the participants at ease for ten minutes. After this introduction, the warmup starts, aiming to understand the associations and usage of portion packs using the homework exercise for 15 minutes. After this, the individual assignment starts where the participants are asked about a first impression, score, and explanation per concept individually for 15 minutes. Then the group discussion starts, during which the different concepts are discussed in the group for 45 minutes. Lastly, there is a summary and closure to wrap up the session for 5 minutes. Altogether, one session takes about 90 minutes.

## 7.3 Screener

Based on the scenarios, both the group of young parents and elderly are interesting to do the research with. The choice was made to focus on young parents because from experience of Consumer Insights elderly people often have complex underlying motivations that are sometimes impossible to understand and could make the research outcomes less reliable. This choice can still offer rich information because the parents can talk about their personal experience and judge the concepts form their own perspective but also about their children's experience and judge the concepts from their perspective. This way, two groups are represented by one group of participants.

The sample description of this group has a few characteristics. The ratio between males and females should ideally be 50/50. The participants should ideally be between 25-45 years old. The participants ideally should have one or more children in the age of 3 to 12. The participants should not be working in marketing, market research, food/drink industry. The participants should be category users, meaning that somebody in the family uses portion packs. The participants should all be non-rejecters of Chocomel, meaning they do not dislike Chocomel.

To find the right participants, the external agency is handed a screener. The original version of the screener is available in appendix C.

The participants who pass the screener are asked to take some pictures and upload them to a website, later called the homework exercise. Three pictures have to be taken: one pictures of their favourite drink or food packaging, one picture of something they consider very convenient and one picture of something they consider very sustainable. These pictures can be photos made by the participants or images from the internet.

## 7.4 Discussion Guide

To make sure the sessions run smoothly, and the same questions are asked in each session, a discussion guide is created. The discussion guide consists of the structure with timings, the questions that need to be asked but also questions or comments that can help to fuel the discussion if needed.

After all participants are present in the room and are offered a drink, the session starts with the introduction of 10 minutes. In this introduction, the moderator and notetakers introduce themselves and the setup is explained: a 90- minute discussion on portion pack concepts. Remarks are made that the moderator is just curious about personal experiences and opinions, so there are not right or wrong answers. The participants are also told that the session is recorded, and the data is handled carefully and only for the purpose of this research. Then the participants are asked to introduce themselves: first name, age, profession, residence, family etc.

Now the introduction is done, the first part of the actual research can start which is the warmup, taking about 10 minutes. Firstly, the moderator refers to the pictures of everyone's favourite packaging from the homework exercise and asks if they can tell something about it. This homework exercise is added to enable the participants to talk about the picture they brought, already at the start of the session. That is because from experience, participants are often proud that they did the homework exercise and are eager to show the others what they handed in. The other images of the homework exercise are used later in the session. The next

question is about the use of portion packs, and a picture is shown on the screen of three general straw packs (figure 51); the moderator asks the participants what their last experience is with a packaging like this. This question asked to find out what the participants think of a packaging format similar to the current Chocomel 200ml straw pack, and what they think of the paper straws.

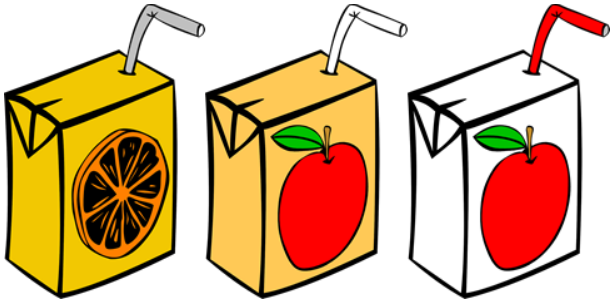


**Figure 51: Picture of straw packs used during the Check & Learn sessions**

After the warmup is done, the individual assignment starts. A short introduction to the objective is given by saying that the Chocomel team is looking for a new packaging and we would like to have your input on different packaging concepts. Additionally, it is mentioned all concepts are made from the same material, which is also the material that the current Chocomel 200ml straw pack is made of. To let the participants get a feel of the material, a small sample is brought of a general non-Chocomel roll. The A4 sheets with the concepts are already handed out before the participants enter the room and are randomised. Every concept sheet is accompanied by a form sheet with a matching number. On this form, the participants are asked to give a first impression of the concepts in a few words, rank the concept on a scale from 1 to 9 on appeal, and motivate this ranking. The participants are asked to fill out the forms individually for each of the six concepts. Around 10 minutes are reserved for this part. The goal of this assignment is to let the participants all form their own opinions without the influence of others, to bring that into the discussion later. Also, for the analysis of the data it is interesting to have a record of the unbiased opinion of all participants.

When all participants are done with their individual assignment, the group discussion can start. The aim is to discuss all concepts in the group, one after the other. Firstly, the participants are asked which one or two concepts is the most appealing to them and why. After this round, the question was asked which one or two concepts the participants found least appealing and why. All participants are parents of young children, so the question was asked which concept they would most likely give to their children if they had to choose one but also which concept they would never give to their children and why. Before moving to the next topic for the discussion, the moderator explains that convenience is something the Chocomel team is working on a lot. The question is then asked what convenience means to them, whether they pay attention to convenience when buying something and what is the most convenient concept to them. When this is clear the same questions are asked, but then for sustainability instead of convenience. If the discussion does not go smoothly, the pictures from the homework exercise can be used to help to fuel the conversation. After this, the participants are asked what they find more important: sustainability or convenience or that it is dependent on the pricing. This part takes around 45 minutes.

When the conversation has died out and everyone has had their say, the session can be closed. If there is some time left, the participants are asked to form their ideal packaging based on the concepts by combining components. If there are no more questions or comments the sessions is closed and everyone is thanked for their participation and insights.

The original version of the discussion guide is available in appendix D.

## 7.5 Results

After the Check & Learn sessions are finished, the outcomes can be gathered and analysed. In this section, the results are discussed and analysed. This is done per theme and in the same order as in the sessions.

### 7.5.1 Warm up

The warmup was done with the entire group and consists of three sections: first responses, current use, and current straws.

#### First responses

The first responses of the consumers are about the homework exercise with the picture of their favourite packaging and why, what makes this packaging their favourite. Main insight is that consumers find it important that a packaging is re-closable. This is mentioned most often. Consumers also like packaging that is re-usable. Other things mentioned that are important to the consumers are easy opening (children can do it themselves), size of the packaging (so it fits in the lunchbox), packaging is brought for daytrips (convenience) and appealing appearance.

#### Current use

Current use is about the associations and experiences with straw packs, like the central image in figure 52. By far most mentioned by consumers when using this type of packaging is when they are on a day trip. Consumers also like to use this type of packaging for school, at the playground or at home. Some of the associations with this type of packaging are visible around the centre image in figure 52.

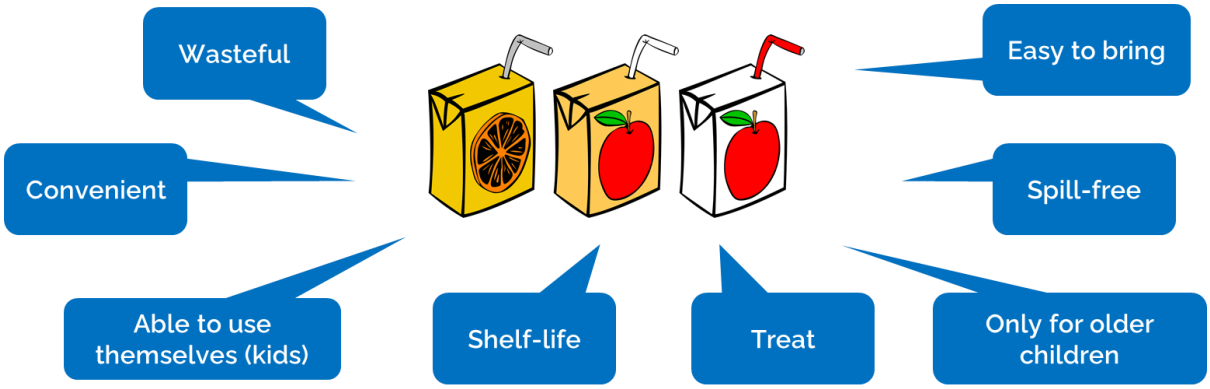



**Figure 52: Consumer's associations of straw packs**

## Current straws

'Current straws' is a part of 'current use' focused to straws. By far most mentioned by consumers when using the paper straw is the unpleasant taste and mouthfeel of the paper. Quotes that support this claim are readable in figure 53. Reading these quotes, it becomes clear that consumers are aware of the sustainability in connection to the straws, but the lack of convenience this causes tends to take the upper hand. Based on this, it can be said that the balance between sustainability and convenience with the current paper straws does not appear to be right.


**Figure 53: Consumer's quotes on paper straws**

## 7.5.2 Individual assignment

The results of the individual assignment consist of two sections: concept appeal and themes.

Concept appeal is based on the individual forms filled in by the consumers where they gave their first impression, ranked the concept, and motivated this score. Concept 781 is liked by most consumers because of no extra materials and convenience. Concept 207 is least preferred because of the inconvenient shape and worry about spilling. Apart from the individually best and worst rated concepts, concept 642 shows that this solution does not fit the current ritual and concept 326 shows that consumer are worried about sustainability (lot of plastic). Some more motivations can be found in figure 54, where the concepts are positioned by their average ranking.


**Figure 54: Ranking of concept with motivations**

Themes are based on the aspects mentioned in the individual forms. Almost all consumers mentioned sustainability in some way when ranking the concepts. This means mentioning 'waste' (afval), 'plastic', 'sustainable' (duurzaam) or 'environment' (milieu) with a negative connotation. Half of the consumers mentioned spilling when ranking the concepts. Also, half of the consumers mentioned carrying when ranking the concepts. Again, half of the consumers mentioned drinking when ranking the concepts. A quarter of the consumers mentioned opening when ranking the concepts. Overall, this shows that sustainability is top of mind for these consumers. But also spilling, carrying, drinking and opening are important aspects to take into account when developing this type of packaging.

### 7.5.3 Group discussion

The results of the group discussion consist of three sections. Starting with best & worst, where the goal is to find out which concepts are mentioned as best and as worst, but more importantly why they mention the concepts as such. After that, sustainable & convenient, where the goal is to find out which concepts are considered sustainable or convenient, and why. Lastly, the consumers were asked to come up with their ideal packaging, combining several concepts or other packaging formats. The overview slides per concept with scores and positive and negative characteristics can be found in appendix E.

#### Best & Worst

For this section, the two questions asked are: 'If you could choose one or more concepts as best concept, which would you choose?' and 'If you could choose one or more concepts as worst concept, which would you choose?'. Concepts 350, 781 and 457 were equally mentioned as best concepts. Concept 326 was both mentioned as best and as worst concept. Concepts 207 and 642 were mentioned as worst concepts, 642 being mentioned more than 207. An overview of these results is visible in figure 55.


**Figure 55: Overview of best and worst concepts**

All advantages and disadvantages, according to the participants, per concept can be found in appendix E. Below, a summary of this can be read.

Starting with the best concepts, concept 350 is liked because it has less plastic and waste than other concepts, but still has the most normal shape. The internal straw is liked because it cannot be lost and the packaging is one single piece, making it sturdier. Disadvantages to this concept are the straw that is not round but square, the position of the straw making it more prone to spill, and fear for the internal straw being at the expense of the product volume (shrinkflation).

Concept 781 is liked because it is drinkable with and without a straw, there are no loose parts like straws, it looks familiar/old school, it's good for adults and the mouth does not touch the carton because of the seal so it's hygienic. Disadvantages are the fear of not being comfortable to drink and spilling because of the lip, not being suitable for kids, and taking up more space than the current pack.

Concept 457 is liked because it looks funny/creative/striking and most like the current straw pack which makes it also fit in lunchbox, it has the familiar round straw, it's made from one single piece so the straw cannot be lost, and it can be drank upright. Disadvantages are the fear of the straw ripping and making a mess, the fear of spilling when squeezing, and the doubt if it is nice to drink out of with the lip or nose possibly against the pack.

Concept 326 is liked because it looks easy, the spout cannot be lost, it's convenient for kids and it has a familiar shape. Disadvantages are the large amount of plastic, doubts about the functionality with the fear of the straw/spout being too short, and not being re-closable or re-usable.

Concept 207 is liked because it looks pretty, like candy or a special edition which would be nice for horeca or parties. Disadvantages are the fear of spilling while opening or drinking and making a mess, being unpractical to hold and store, and the sharp point being dangerous.

Lastly, concept 642 is liked because it looks funny/cute/creative and is reusable. Disadvantages are the fear of being too complicated, taking too long to prepare, not being more sustainable than the current pack, multiple holders are needed, and parts will go missing.

## Sustainable & Convenient

For this section, the two questions asked are: 'If you could choose one or more concepts as most convenient, which would you choose?' 'If you could choose one or more concepts as most sustainable, which would you choose?'. These questions were only discussed in two out of the three groups. These questions are asked separately, so concepts could both be mentioned

as most sustainable and most convenient. Concepts 457 and 326 were only mentioned as convenient. Concepts 350 and 781 were both mentioned as convenient and as sustainable. Concept 207 was only mentioned as sustainable. Concept 642 was neither mentioned as convenient or sustainable. An overview of these results is visible in figure 56.


**Figure 56: overview of convenient and sustainable concepts**

During the discussion, and to support the answers to the question above, some interesting comments came up. A selection of these quotes can be read in figure 57. An interesting quote to highlight is the top right quote in figure 57. Translated, this says: "If it is sustainable, but I don't think it is convenient and the other one with plastic is convenient, I choose the on with plastic." Similar comments are made by other consumers. The conclusion of this discussion is that when talking about sustainability and convenience, participants mention that convenience is more important, especially with portion packs.


**Figure 57: Quotes about sustainability versus convenience**

Another interesting question in this discussion is: 'With this kind of packaging, if you would have to pick between convenience or sustainability, what would you choose? Or is it price dependent?' This question was asked to find out whether price also plays a role when making a choice between sustainable and convenient packaging in the supermarket. Main conclusion is that convenience is the most important driver for consumers. A few find price also an important driver and sustainability is not really a topic for them with this kind of packaging.

### Ideal

For this section the question was: 'What would your ideal packaging look like if you could combine the packaging concepts. Also, other packaging types can be included.' Most consumers found concept 350 the most ideal. Improvements could be a round straw instead of a square straw and repositioning the straw to the middle. Consumers also liked concept 781, but mostly for older children (5+). Other ideal solutions included a bottle with a cap that is not too big, reusing the tethered spout from concept 326 and just improve the straw with the current packaging.

## 7.6 Conclusion

The results are measured from three sessions, of which this is an average. From these results, it can be concluded that convenience is of great importance to consumers when using this type of packaging, more important than sustainability. However, consumer also found it harder to judge concepts on sustainability than on convenience. This type of packaging is bought for its convenience. This type of packaging is mainly used for day trips. Of the current paper straws, it can be said that they are bad, which is why consumers start finding other solutions themselves to open and/or to use the packaging and product inside.

Looking at the concepts, there are two most promising: concept 350 and concept 781 (figure 58). Both concepts score high in the individual ranking, are mentioned as 'best' during the group discussion, are mentioned as being both 'convenient' and 'sustainable' and are mentioned when asked for the most ideal concept(s).


**Figure 58: Most promising concepts, 350 and 781**

Although these conclusions are insightful, the Check & Learn sessions also brought up more questions that need further research. Some aspects were mentioned during the discussion, but no clear consensus could be distilled. One of these aspects is how important the ability is to drink upright. Another aspect that is not clear is how important the hygiene of the drinking surface is to the consumers. Lastly, the importance of having a straw is not clear. Could a (short) spout be enough? Or a hole with a reusable straw? A theory on whether a straw or spout is needed can be found in section 7.7.

## 7.7 Discussion

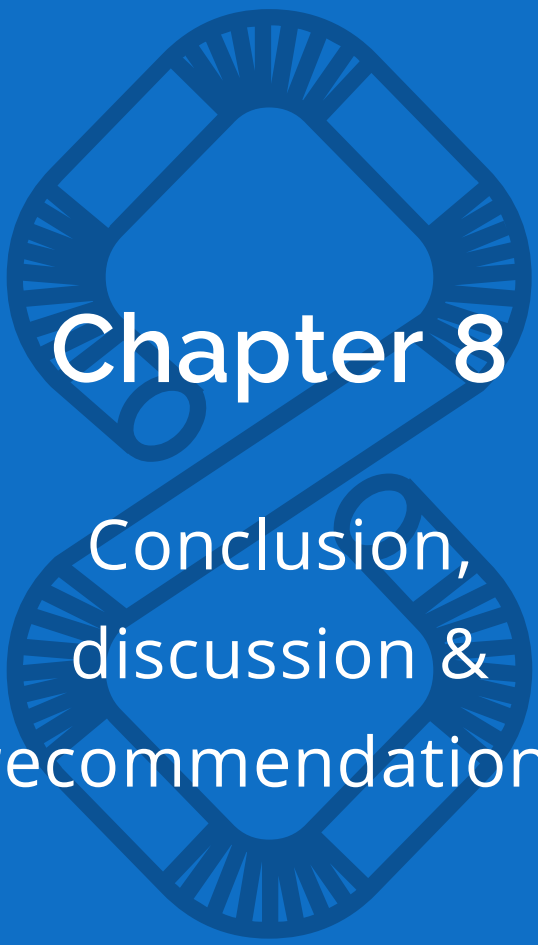
When the session moved to sustainability and convenience, participants found it hard to judge a concept on its sustainability when they did not think the concept was convenient or good in general. For example, some said that a certain concept was sustainable, but directly added that it was not convenient to them, discarding the concept completely. So, it seems that consumers first try to understand the concepts based on their experience of the convenience of the packaging and only then focus on other aspects like sustainability. Because of this, there could be less concepts that were found to be sustainable than when these concepts would have scored better on other aspects as well in their eyes. This, again, confirms that convenience is of high importance.

One of the risks of using concepts printed on paper instead of using real prototypes for the C&L sessions was that the participants would not be able to associate with the concepts well enough and thus could not judge them as if the concepts were real. Luckily, the participants did not have this problem at all and even sometimes recognised them as photos of the concepts mentioning that “they already produced them of course”. However, the participants also made some assumptions based on the renders on the sheets that were not right and were mentioned as negative aspects of that concept. This has to do with the way the detailed image on the top right of the concepts sheets is rendered. Because this image is a close-up of the drinking solution, the perspective on the render is quite extreme. This makes the holes look bigger than they really are. Especially with concept 207 (cone) and concepts 350 (internal straw) this might have caused a difference in opinion on this concept. For concept 207 this resulted in comments on the opening being too large and insect possibly being able to enter the packaging. For 350 there were possibly more comments on the shape of the straw being square, as it would not be comfortable to drink from a (large) square straw. Some participants still mentioned that this would not be a problem at all, since the straw is small and the difference between a round and a square straw would barely be noticeable.

As mentioned in section 7.2, the number of sessions was chosen to be three, because there could be a significant difference between the consumers and their reactions in each session. After the sessions, it became clear that this was indeed the case. The first session was fine, although the mood of the participants was not very positive at the start. This probably mostly had to do with the way the participants were treated by the receptionist, when not parking their bike in the designated area. Luckily, the mood became better throughout the session. To prevent this happening for the second and third session, extra attention was paid to make sure the reception of the participants ran smoothly. The participants of the second session were very enthusiastic and complimentary about the concepts. Because of this enthusiasm, the session went very smoothly resulting in a lot of valuable feedback. The participants of the third session were the least enthusiastic which resulted in the least the least smooth session of the three. During the session, also the feeling arose that there were some Chocomel rejecters among the consumers, which should not have been possible. However, after checking this with the agency, they did not find evidence of this. Some members of this group also seemed to talk along with others and giving socially desirable answers instead of their own opinion.

One of the questions that cannot be answered yet but is crucial to judge the potential of both most promising concepts, is how important the straw is to the consumer. For concept 350

this is important as the concept now has an internal straw but could save material by only having the outside part of the straw, forming a spout. For concept 781 this is also important, as this concept currently does not offer a straw or spout, but only a drinking hole with a seal and a lip. Because drinking from a hole requires more skill than drinking from a straw, this concept was deemed only suitable for older children and adults during the sessions. Based on the things mentioned during the C&L sessions, a theory is deducted. For now, this is just a theory that needs confirmation by further research but can be used to help get things clear. Looking at the ages of the consumers, a straw can be used from the age of 1. Because the current packaging is sometimes experienced as childish, children from the age of 12 and older do not want to be associated with this packaging. So, the current packaging with paper straw is suitable for consumers aged 1 to 12. Considering the current Chocomel metal can, consumers mentioned that this packaging is not suitable for children as it can be sharp and thus dangerous. So, this packaging is only suitable for consumers aged 12 and older. Because a can is not perceived as childish, this is not a problem. About concept 781 (Paper can), consumers said that children from the age of around 5 would be able to drink from this packaging and because the can is not made of metal but paper there is no danger of giving it to a young child. Considering all the above, this leaves the age group of 1 to 5 years old as users that are not able or willing to use concept 781. This group would then have to use a separate straw (from metal, silicone etc.) that the parents must bring. The question is whether people are willing to do this. During the C&L discussions there were already some consumers that said they sometimes bring metal straws to use instead of the attached paper straws. However, whether this would be an option for all parents is unclear as it could take away from the convenience of the packaging experience.



# Chapter 8

## Conclusion, discussion & recommendations

# 8. Conclusion, discussion, and recommendations

In this chapter, firstly, a conclusion is drawn by answering the main research question and sub-questions. Secondly, the discussion of the overall research is drawn up. The discussions of the first consumer test and the C&L sessions can be found in their respective chapters. Thirdly, some recommendations are given. Lastly, future research is discussed. Looking at the double diamond for the last time, both the diamonds are filled now and only the last circle must be built yet (figure 59).

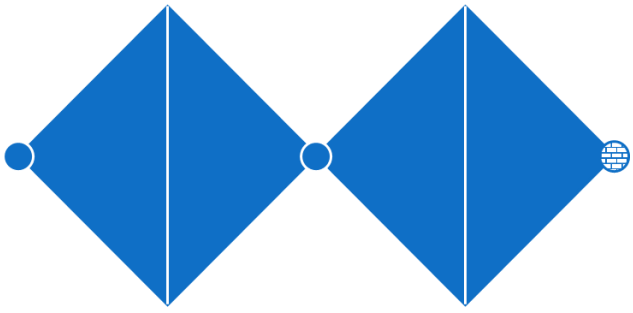


**Figure 59: Double diamond, both diamonds filled**

## 8.1 Conclusion

This research has been started with the main research question and has led to a conclusion on how to balance sustainability and convenience in packaging, and a recommendation to FrieslandCampina for further research. The most important aspects are discussed below.

### What does the next generation of drinking solutions for beverage cartons look like, finding the balance between sustainability and convenience?

Both from field research and literature, it can be concluded that the balance between sustainability and convenience is mostly dominated by convenience, although sustainability is gaining ground since few years. Based on the results from field research and literature, multiple concepts have been developed with a central focus on the balance between sustainability and convenience.

From this research, it became clear that convenience is of great importance to consumers when using this type of packaging. This is more important than sustainability, as this type of packaging is bought for its convenience. From the research, two concepts emerged as most promising, concept 350 and 781 (figure 60). Concept 350 has an internal straw which forms a spout when opened by pulling the protective paper tab. This concept is liked because it has less plastic and waste than other concepts, but still has the most normal shape. The internal straw is liked because it cannot be lost and the packaging is one single piece, making it sturdier. Dislikes with this concept are the straw that is not round but square, the position of the straw making it more prone to spill, and fear for the internal straw being at the expense of the product

volume (shrinkflation). Concept 781 is a paper can that can be opened by a removable seal that subsequently covers the lip, protecting the lip and creating a clean drinking surface. Concept 781 is liked because it is drinkable with and without a straw, there are no loose parts like straws, it looks familiar/old school, it's good for adults and the mouth does not touch the carton because of the seal so it's hygienic. Dislikes with this concept are the fear of not being comfortable to drink and spilling because of the lip, not being suitable for kids, and taking up more space than the current pack.


**Figure 60: Most promising concepts, 350 (left) and 781 (right)**

Apart from the balance between sustainability and convenience, the concepts were developed to also vary in advancedness. The MAYA principle (Most Advanced Yet Acceptable) connects this to the acceptability of the concepts, using novel and typical features. While developing the concept, a scale was made with the expected order of the concepts ranked on advancedness and acceptability. More about this can be read in section 6.3.8. Based on the outcomes of the C&L sessions, the order of the concepts on the MAYA scale can be revised (figure 61). Concepts 207 and 642 stay on the same spot as in figure 47, namely on the right, being too advanced and thus not accepted. The first four concepts have changed in order though. Where concept 457 was placed on the far left before, being least advanced and thus most accepted, it now is placed as third. Concept 350 was before placed on the second spot but now moved to the first place. Concept 326 moved from the third place to the fourth place in the revised figure. Concept 781 moves from the fourth spot to the second spot after the new insights.

Looking at figure 61, the concepts can be divided into three groups: least advanced (350 and 781), medium advanced (457 and 326), and most advanced (207 and 642). Based on this new order, it can be said that concepts with relatively few (extra) components have the highest acceptability, as these are interpreted as being both sustainable and convenient (least advanced). Concepts with more components are seen as convenient but not as sustainable (medium advanced). Looking at most advanced, these could also be considered to have relatively few (extra) components, like least advanced. However, the reason these are not accepted has to do with its convenience. Because these concepts are not considered as convenient, these concepts are discarded right away and also not even considered to be sustainable because they are just not 'good'. Based on the MAYA principle, the design of these concepts does not include typical features and differs too much from familiar packaging formats, which could compromise the recognition and rituals. For example, when asked about the most sustainable concept, one of

the participants mentioned 207 but directly added: “but it’s not good”, although that was not relevant to the question at all. This again emphasises the importance of convenience with this type of packaging.


**Figure 61: MAYA principle applied to concepts (revised)**

## 1. How to get the best insights from the target consumer to come to better drinking solutions that fits the rituals and habits?

During this research, several behavioural methods are applied in different phases of the process to obtain a good picture of the context of use and perception of consumers. Especially the use of these means in an early stage of development has led to good results.

During the Check & Learn sessions, which can be compared to focus groups, the concepts are discussed with consumers. As mentioned before, usually this only happens in a later stage after the concepts have been developed into working protypes and not already in an early stage using only renders on paper. Based on the Check & Learn sessions, it can be said that executing these using only renders on paper can result in valuable and rich information to be used in the further development of a new packaging format. An important aspect to consider when executing C&L sessions in a similar way is to make sure that the renders are realistic so the participants can easily associate themselves with the concepts. Something to pay close attention to when making renders is the perspective of the images, especially when zooming in on certain packaging elements. When a perspective is used that is too extreme, some elements might look bigger than they should be. Whether the outcomes of the focus groups when only using rendered images on paper are comparable to the outcomes when using physical prototypes should be researched by executing the same Check & Learn sessions again, but now with physical prototypes that resemble the renders well.

### 2. What does current literature state about the balance between sustainability and convenience and how does this resonate and cohere with the different stakeholders in relation to a new drinking solution.

The answer to this question can be split up into three parts: literature on the balance, stakeholder conclusions, and how these resonate and cohere. About the balance between sustainability and convenience, not much explicit literature that is relevant for packaging development can be found. Nevertheless, about the importance of sustainability and convenience some interesting things were found. The importance of sustainability has taken off over the past couple of years, and consumers are also more aware of this. Because of this, the balance between sustainability and convenience has also become more relevant in packaging development. The importance of sustainability in relation to convenience, however, has not become clear from literature. Nevertheless, from the Check & Learn sessions it became clear that the balance between sustainability and convenience heavily depends on the type of packaging. For the type of packaging that is discussed, convenience is of great importance to the consumer. Although sustainability related items were also mentioned and can be seen as top of mind, convenience is more important in this case. That is also the main reason why concept 642 (capsule with holder) was not liked at all by the consumers as it was not considered to be convenient whatsoever. This probably also has to do with this concept having another ritual than the current packaging.

The most important stakeholders in this research are internally marketing and sensory & consumer insights, and externally the beverage carton suppliers, the government and the consumer. From interviews with stakeholders like brand managers and technology experts, the conclusion is that the most interesting scenario currently is the Chocomel 200ml portion pack beverage carton. More about this can be read in chapter 4 and 5.

### 3. How to remove the threshold, if present, of interacting with the new drinking solution using visual cues?

The answer to this question can be split up into two parts, namely cues that signal sustainability, and cues that help to make the concept more convenient. About this perception of sustainability, plenty of literature is available. Packaging material can be seen as the main contributor for sustainability perception, and paper is perceived as one of the most sustainable materials (Lindh et al., 2016). Also, graphics, colours, and verbal labelling are important contributors. Because of the later focus on the structural packaging, this last aspect is left out of scope and is subject for further research. On how to use visual cues to improve the convenience of packaging, not much literature is available. Whether this threshold exists and how to overcome this was not found out during the Check & Learn sessions as the concepts were presented on paper. Although the participants were able to associate themselves with the packaging concepts well, whether these associations are correct is subject for further research. The most promising concepts should be refined and made into prototypes which can be tested to find out whether the convenience of the concept is good enough or that it should be improved by visual cues. This, however, should be approached per concept and together with consumers to come to solutions that could work.

### 4. What are the contexts of use for the end user and potential limitations when implementing the new drinking solution?

The answer to this question can be split up into two parts: the context of use for the end user, and potential implementation limitations. Cues can be materials, but also graphics or colours. The context of use was covered in the first consumer test and discussed during the Check & Learn sessions. The main conclusion here is that this type of packaging is mostly used for days out, that the current straws are bad, and that convenience is of great importance. This type of packaging is bought for its convenience, which matters more than sustainability. More about this can be read in section 7.5.1. The potential implementation limitations can be split into two parts: implementation of the drinking solution into the packaging, and implementation of the packaging to be producible on the line in factories. Implementation of the drinking solution into the packaging format was not tested during this research but is part of further research. However, as mentioned before, there could be threshold to be overcome by visual cues. Implementation on the line means that these must be adapted to fit the new packaging. More about this implementation can be read in section 8.4.

### 5. How to materialize a future concept of drinking solution for beverage cartons given a specific context of use by the end user?

Developing the concepts was done in multiple steps. Firstly, sketches were made to come up with initial ideas. To gather more ideas and sketches, a brainstorm was organised. Combining the outcome of this brainstorm with the initial sketches, eight concepts were distilled and discussed with design experts. Again, these concepts were combined which resulted in six concepts. These concepts are built into 3D models and rendered with realistic artworks. All concepts were also discussed with legislation and sustainability experts to make sure they would be compliant. The MAYA principle is used as a tool to make sure the different concepts differ in advancedness to be able to see what is still accepted. The renders are professionally printed on high quality paper and used during the Check & Learn sessions. The concepts only went through the ideation phase. Before implementation of any of the concepts, also the analysation and realisation phases need to be passed.

## 8.2 Discussion

In this thesis, the focus is on the balance between sustainability and convenience in packaging. The decision was made to look one step further than the small steps that are usually taken by the company itself. To do this, a more radical approach is needed. Instead of building on the current concept, one should return to the basic need of the packaging and build from there. A part of this different approach is also the way the consumers are involved in the process. Usually, consumers tests are only done in a later stage when the packaging is almost done. Because of this, it could happen that only in this late stage of development it is found out that the packaging concept is not accepted by consumers. The reason for consumers not accepting the concept could be something elementary, that could have been avoided when they

would have been involved in an earlier stage. To avoid this and to find out whether it could work for packaging development, consumers were involved in an early stage of development during the Check & Learn sessions.

For this research, only rendered images were used and no real protypes were developed and tested. It might have been possible to also include a usability test and validation with refinements after every step but doing this would have meant that the evaluation of the first concepts could not have taken place in the way it has now with the full Check & Learn sessions according to the FrieslandCampina standards. This would also mean that the results possibly would not have been as reliable and complete. When continuing the development of a new drinking solution with unreliable outcomes, wrong conclusions could have been drawn, eventually leading to a drinking solution that might not be better than the current. The recommendations then would have had no real added value for FrieslandCampina. The research might have to be done all over again in the worst case. Because of this, the choice was made to only do the ideation and evaluate these concepts thoroughly with consumers during Check & Learn sessions. This way, the recommendations are most reliable and FrieslandCampina can use these results to continue the development later.

As mentioned in section 6.3.7, the choice was made to render all the concepts with similar Chocomel colours and renders. This was done to make sure that the focus from the consumers would be on the structure of the packaging and there would be no distraction by other materials or colours. This way, the results should be most reliable. However, this means that it has not been tested whether such cues could influence the perception of the packaging by consumers. As mentioned above, the choice was made to execute the Check & Learn sessions as professionally as possible which costs a lot of time. Because of that, it was not possible anymore to produce physical prototypes of the most promising concepts to execute usability tests. From these tests, it then would have become clear whether the concepts are usable but also whether cues need to be incorporated to improve the sustainability perception or to aid with the convenience.

Although this thesis aims to provide some tools to help find the balance between sustainability and convenience, and this can be tested using methods like Check & Learn sessions, eventually it is up to the companies themselves what to do with this. As mentioned before, with beverage cartons, the (machine) suppliers have a lot of power. However, eventually it is up to companies like FrieslandCampina to decide how to approach this. Even within the company, there might be different points of view. Packaging Development might come to marketing with two different options of a certain packaging, accompanied by factual details on sustainability. Marketing might then still pick the packaging that factually is less sustainable but would be better for sales. Eventually, the direction of companies needs to decide what is more important to them. This also applies to convenience and sustainability. If the direction decides that the convenience should not suffer when the packaging becomes more sustainable, they should also be willing to accept the (higher) research costs.

## 8.3 Recommendations

Below, the recommendations are made that apply to the concepts created. From the Check & Learn sessions, two concepts came out as the most promising: concept 350 and concept

781 (figure 62). Both concepts score high in the individual ranking, are mentioned as 'best' during the group discussion, are mentioned as being both 'convenient' and 'sustainable' and are mentioned when asked for the most ideal concept(s).


**Figure 62: Recommended concepts, 350 and 781**

To find out whether these concepts could be realistic replacements for the current packaging, there are a few topics for further research:

- Importance of ability to drink upright
- Importance of having a straw
- Importance of hygiene of the drinking surface

The reasoning behind these topics and the approach on how to do this further research can be found in section 8.4. Here, also the next steps in testing and implementing are discussed.

Considering the Check & Learn sessions themselves, using only rendered imagery instead of physical prototypes, it can be said that these can deliver valuable and rich information. What is important to note here is the quality and perspective of the rendered images. To make sure the consumers can easily associate themselves with the concepts, the renders should be made to look as realistic as possible. Considering the perspective, when zoomed in on certain packaging elements, the perspective should not be too extreme, because this might lead to elements looking bigger than they should be. This could lead to misinterpretations and thus unreliable feedback. Keeping in mind these aspects, executing Check & Learn sessions for packaging in an early stage of development can be recommended.

## 8.4 Further research

As mentioned before, the research that has been done is only a small part of the total research needed for developing a new drinking solution. Looking back at the double diamond method (figure 4), one or two diamonds can be added to represent the following steps needed. With the outcomes of the Check & Learn sessions, the next phase would be to pick one or two of the most promising concepts and refine them according to the feedback. The improved concept can then be prototyped, which should be tested with consumers. From this round of feedback, the prototypes can be refined. If it turns out that there is a conv whereafter they should be

evaluated whether one of these concepts could be a serious replacement for the current packaging. If one of the concepts is evaluated well, the next step is to find out how it can be implemented and produced. Because the manufacturing of beverage cartons is a very closed system that is offered by only a few suppliers that both deliver the filling machines and (often also) the paper to be used in the machines, it is wise to talk to them. As FrieslandCampina is a large customer of these suppliers, they are in a good position to talk to these companies about future developments. Of course, these companies should have good faith in the concept for them to adopt it and to make the massive investments that come with the implementation of a new packaging format.

As mentioned in the recommendations, there are some aspects that need further research to come to conclusions. The first aspect is the importance of the ability to drink upright. This could be implemented in the refined concepts to test whether consumers value this function or not. This could be done by taking concept 350 and removing the internal part of the straw, only leaving the external part. With this, it probably also helps to have physical prototypes, so the drinking can be experienced. If this function is not valued, this could save material.

The second aspect is connected to the first and is about the importance of having a straw. If a straw is not needed and a spout or only a drinking hole would be sufficient, this could benefit the material use and/or carbon footprint. However, when it is not important to be able to drink upright, a spout or hole could be an option. Compared to a straw, a spout could already save some material, but a hole could save even more. While the spout could also easily work for small children, the hole could cause more challenges. The benefit of a hole like in concept 781 is the ability to drink both with or without a straw, although in this case the straw is not included, and the consumer must bring it. Some consumers already bring (metal) straws to use with the current pack to replace the unpopular attached paper straws, but the question is whether this is something that could be accepted by all consumers when it is not included with a packaging like concept 781. Another thing to find out is whether parents would give a combination of a self-brought straw with a pack that has a relatively large hole to their children. Especially if the straw is not able to puncture through the seal, and the seal must be removed. This way, the diameter of the hole will be larger than the diameter of the straw, which might cause spilling.

The third aspect that needs further research is the importance of the hygiene of the drinking surface. As mentioned before, some respondents named this during the group discussion, but there was no clear consensus on this. This could be tested by having different versions of drinking solution concept that vary in drinking surface protection. Both concepts 350 and 781 can be used for this, by respectively altering the tab or the seal. If the tab or aluminium seal is not needed and can be replaced by another material, this could save material and/or lower the carbon footprint of the packaging.

Overall, there are still quite some steps to be taken. However, when this results in packaging that has the right balance between sustainability and convenience, it is all worth it.

# References

# References

## Literature


Blei, J. (2020). *Concept development of stand-up pouches for on-the-go. Developing a tool to select usability methods that involve users in new packaging development.* University of Twente.

Boz, Z., Korhonen, V., & Sand, C. K. (2020). Consumer considerations for the implementation of sustainable packaging: A review. *Sustainability (Switzerland)*, *12*(6). https://doi.org/10.3390/su12062192

Clark, N., Trimingham, R., & Wilson, G. T. (2020). Incorporating consumer insights into the UK food packaging supply chain in the transition to a circular economy. *Sustainability (Switzerland)*, *12*(15). https://doi.org/10.3390/su12156106

Dopico-Parada, A., López-Miguens, M. J., & Álvarez-González, P. (2021). Building value with packaging: Development and validation of a measurement scale. *Journal of Retailing and Consumer Services*, *63*. https://doi.org/10.1016/j.jretconser.2021.102685

Hekkert, P., Snelders, D., & van Wieringen, P. C. W. (2003). 'Most advanced, yet acceptable': Typicality and novelty as joint predictors of aesthetic preference in industrial design. *British Journal of Psychology*, *94*(1), 111–124. https://doi.org/10.1348/000712603762842147

Konstantoglou, A., Folinas, D., & Fotiadis, T. (2020). Investigating food packaging elements from a consumer's perspective. *Foods*, *9*(8). https://doi.org/10.3390/foods9081097

Lindh, H., Olsson, A., & Williams, H. (2016). Consumer Perceptions of Food Packaging: Contributing to or Counteracting Environmentally Sustainable Development? In *Packaging Technology and Science* (Vol. 29, Issue 1, pp. 3–23). John Wiley and Sons Ltd. https://doi.org/10.1002/pts.2184

Loewy, R. (1951). *Never leave well enough alone*. The Johns Hopkins University Press.

Löfgren, M. (2005). Winning at the first and second moments of truth: An exploratory study. *Managing Service Quality*, *15*(1), 102–115. https://doi.org/10.1108/09604520510575290

Löfgren, M., & Witell, L. (2005). Kano's Theory of Attractive Quality and Packaging. *Quality Management Journal*, *12*(3), 7–20. https://doi.org/10.1080/10686967.2005.11919257

Magnier, L., & Crié, D. (2015). Communicating packaging eco-friendliness: An exploration of consumers' perceptions of eco-designed packaging. *International Journal of Retail and Distribution Management*, *43*(4–5), 350–366. https://doi.org/10.1108/IJRDM-04-2014-0048

Magnier, L., & Schoormans, J. (2015). Consumer reactions to sustainable packaging: The interplay of visual appearance, verbal claim and environmental concern. *Journal of Environmental Psychology*, *44*, 53–62. https://doi.org/10.1016/j.jenvp.2015.09.005

Magnier, L., Schoormans, J., & Mugge, R. (2016). Judging a product by its cover: Packaging sustainability and perceptions of quality in food products. *Food Quality and Preference*, *53*, 132–142. https://doi.org/10.1016/j.foodqual.2016.06.006

Morganosky, M. A. (1986). Cost- versus convenience-oriented consumers: Demographic, lifestyle, and value perspectives. *Psychology & Marketing*, *3*, 35–46.

Ryynänen, T., & Rusko, E. (2015). Professionals' view of consumers' packaging interactions - A narrative analysis. *Packaging Technology and Science*, *28*(4). https://doi.org/10.1002/pts.2107

Steenis, N. D., van Herpen, E., van der Lans, I. A., Ligthart, T. N., & van Trijp, H. C. M. (2017). Consumer response to packaging design: The role of packaging materials and graphics in sustainability perceptions and product evaluations. *Journal of Cleaner Production*, *162*, 286–298. https://doi.org/10.1016/j.jclepro.2017.06.036

ten Klooster, R. (n.d.). *Packaging and dilemmas in packaging development*.

## Websites

*Cambridge Academic Content Dictionary*. (2022, August 2). Retrieved from https://dictionary.cambridge.org/dictionary/english/

*Cambridge Advanced Learner's Dictionary & Thesaurus*. (2022, August 2). Retrieved from https://dictionary.cambridge.org/dictionary/english/

*Cambridge Business English Dictionary*. (2022, August 1). Retrieved from https://dictionary.cambridge.org/dictionary/english/

Design Council. (2019, May 17). *Framework for Innovation: Design Council's evolved Double Diamond*. Retrieved from Design Council: https://www.designcouncil.org.uk/our-work/skills-learning/tools-frameworks/framework-for-innovation-design-councils-evolved-double-diamond/

Innova Market Insights. (2021). *Innova Packaging Survey 2021.* Retrieved from Innova Market Insights: https://www.innovamarketinsights.com/

Innova Market Insights. (2021). *Innova Trends Survey 2021.* Retrieved from Innova Market Insights: https://www.innovamarketinsights.com/

*Marriam-Webster Dictionary*. (2022, August 3). Retrieved from Marriam-Webster: https://www.merriam-webster.com/dictionary/

NVWA. (2022, February 23). *NVWA onderzoekt verstikkingsgevaar papieren rietjes*. Retrieved from NVWA.nl: https://www.nvwa.nl/nieuws-en-media/nieuws/2022/02/23/nvwa-onderzoekt-verstikkingsgevaar-papieren-rietjes

NVWA. (2022, April 21). *NVWA: let op bij gebruik van papieren rietjes*. Retrieved from NVWA.nl: https://www.nvwa.nl/nieuws-en-media/nieuws/2022/04/21/nvwa-let-op-bij-gebruik-van-papieren-rietjes

Publications Office of the European Union. (2019, October 4). *Document 32019L0904.* Retrieved from eur-lex.europa.eu: https://eur-lex.europa.eu/legal-content/EN/LSU/?uri=CELEX:32019L0904

Rijksoverheid. (2022, May 30). *Antwoorden op Kamervragen over papieren rietjes.* Retrieved from Rijksoverheid.nl: https://www.rijksoverheid.nl/documenten/kamerstukken/2022/05/30/antwoorden-op-kamervragen-over-papieren-rietjes

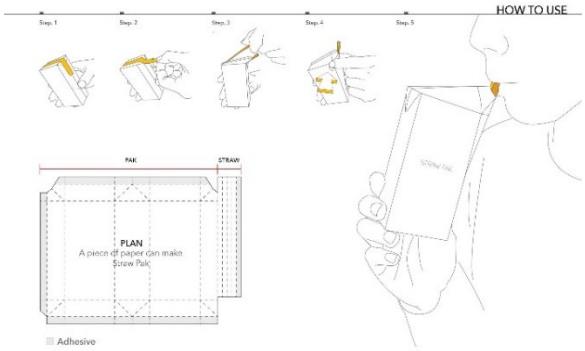
# Appendices

# Appendices

## A. New drinking solution concepts

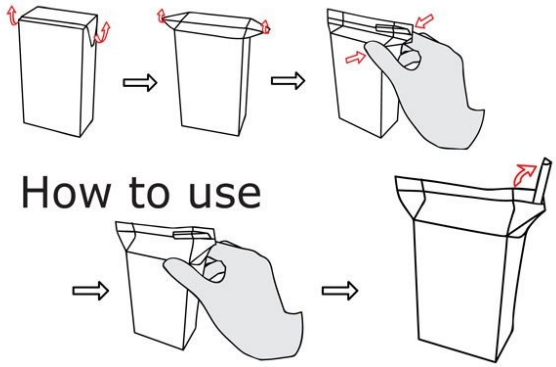
### TETRA PAK TSA (STELO) PACK WITH MIM (MICRO INJECTION MOULDING)

### STRAW PAK




iF - STRAW PAK (ifdesign.com)
Straw Pak (Student Project) – Packaging Of The World

### STRAW IN




A milk box by any other name - Yanko Design

### BRUK!


Bruk: A Better, More Recyclable Design for Carton-Based Beverage Containers - Core77
Pushan Panda — Bruk - Sustainable packaging

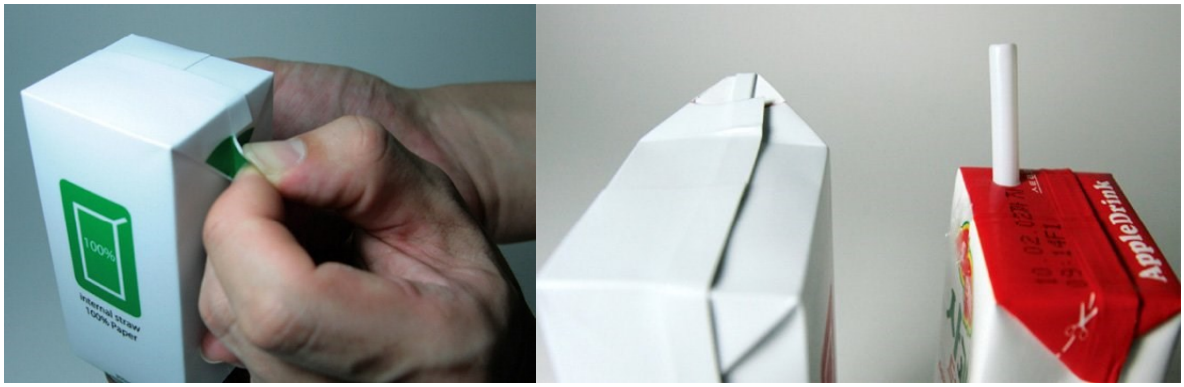
### LOKK-DOP

user-friendly closure developed for beverage cartons for people who have difficulty opening beverage cartons, such as people with rheumatism


Drankpak makkelijker openen met LOKK-dop | VerpakkingsManagement |

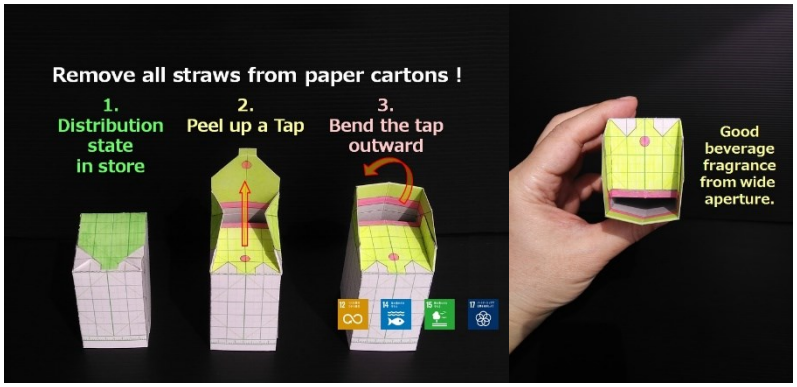
### THE LAST STRAW

Internal Straw




The Last Straw - Yanko Design

### STRAWLESS BEVERAGE PAPERCARTON




Strawless beverage PaperCarton – WDCD No Waste Challenge (whatdesigncando.com)

### STI-RAW (STICKER + STRAW)

Solution for losing straw and not being able to open it easily


Sti-Raw (Sticker + Straw): Minute Maid Package for Kids – 48HR REPACK

### MINUTE MAID KIDS JUICE

Solution for losing straw and not being able to open it easily


Minute Maid Kids Juice – 48HR REPACK

### MINUTE MAID BOX JUICE

Solution for losing straw and being able to see if the product inside is OK


Minute Maid Box Juice – 48HR REPACK

### CLUBZERO (CUPCLUB)

Returnable packaging for takeaway, also food

CLUBZERØ, Formerly CupClub | Returnable Packaging for Takeaway (clubzero.co)

### BILLIE CUP


One cup for all - Billie Cup

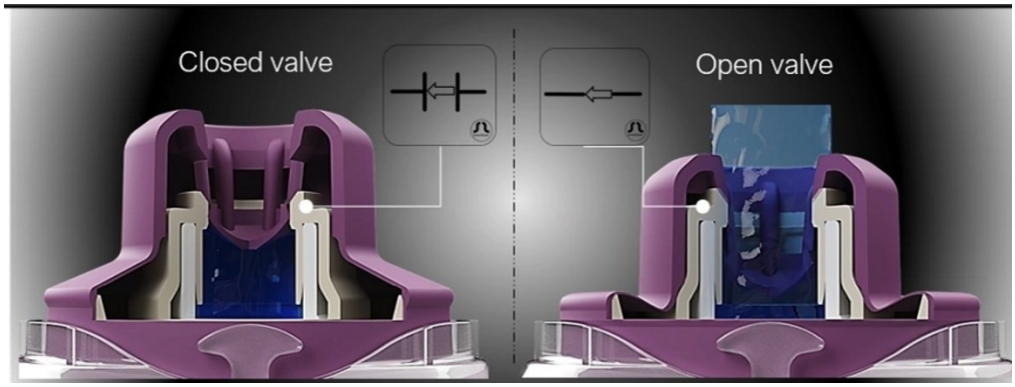
### QUPPA

Smart and reusable cup for take-away coffee


Quppa: your alternative to disposable cups. No waste, just taste

### SMARTSEAL CLOSURES

No spill, apply suction to drink



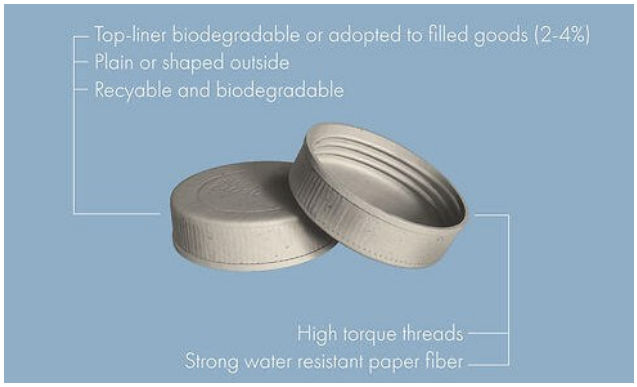

Smartseal - Closures, Packaging

### CAPS & CLOSURES THEMROSHIELD

ThermoShield - Caps & Closures (capsandclosures.com.au)

### BLUE OCEAN CLOSURES

Biobased, ocean biodegradable and recyclable fibre based screw cap




Hem | Blue Ocean Closures

### SULAPAC STRAW

Bio-based straw, non-soggy. Made from wood from industrial side streams and biodegradable biopolymers


Sustainable straws that don't get soggy - Sulapac

### MAISTRAW

Made from bio-PLA from renewable sources such as corn, starch tapioca roots, chips or starch, or sugarcane. Can withstand long immersion in water

Maistraw™ (ecoinnovatorsinc.com)

### PACKAMAMA FLAT WINE BOTTLE (GARCON WINES)

100% rPET 63g flat wine bottle

Packamama | Packaging Protecting Mother Earth | Home of eco-flat wine bottles

### POSITIVE WIJN IN KARTONNEN JASJE

Recycled carton with a plastic inner lining to prevent leaking

Bag in box


positive rosé in kartonnen jasje 0.75L - HEMA

positive witte wijn in kartonnen jasje 0.75L - HEMA

### PAPER BOTTLE FOR HEINZ TOMATO KETCHUP (PROTOTYPE)

Pulpex makes the first patented, adjustable, single-mould paper bottle from FSC-certified, responsibly produced wood pulp


Heinz en Pulpex ontwikkelen papieren fles voor Heinz tomatenketchup | VerpakkingsManagement |

### COCA COLA PAPER BOTTLE (PROTOTYPE)

Made by Paboco. First generation still uses plastic closure and inner layer. Ideally being able to recycle it with the paper stream.

Coca Cola toont prototype papieren fles - Duurzaam Ondernemen (duurzaam-ondernemen.nl)

### PAPER-BASED FRUGAL BOTTLE

Made from 94% recycled paperboard with a food grade pouch to contain the gin, the paper bottle is five times lighter than a normal glass bottle, while its carbon footprint is six times lower and its water footprint is four times lower, asserts Frugalpac.


Gin in paper bottles: Frugalpac finds favor with Greenall's for carbon-cutting potential (packaginginsights.com)

### APPELSIENTJE ORANGE 330ML BEVERAGE CARTON WITH CAP



Puur sap | (appelsientje.nl)

# B. Questions first consumer test

### ORIGINAL QUESTIONS ASKED DURING THE FIRST CONSUMER TEST, IN DUTCH

1. Welke verpakking vind je het meest geschikt om mee te nemen, het sterkst. Graag rangschikken.
    a. Hoe zou je het vervoeren? (tas, positie etc.)
    b. Met welke zou je geen probleem hebben om hem in je tas te vervoeren?
2. In welk scenario zou je elke verpakking gebruiken? Waar zou je welke verpakking gebruiken?
    a. Waar wel, waar juist niet?
3. Vragen drinkklaar te maken, uitleggen wat je doet en wat je vindt (thinking aloud)
4. Vragen te drinken
5. Vragen weg te gooien, uitleggen hoe, waar en waarom. Je bent klaar met drinken, wat doe je dan?
    a. In welke container weggooien: GFT, PMD, rest, papier?
6. Nagesprek, opmerkingen
    a. Welke verpakking vind je het meest gebruiksvriendelijk en waarom?
        i. Qua openen
        ii. Qua drinken
    b. Terugkomend op een eerdere vraag, zou je iets veranderen aan waar je de verschillende verpakkingen zou gebruiken nu je ze hebt gebruikt?
    c. Carte blanche: hoe ziet jouw ideale verpakking eruit, wat zou je willen veranderen?
    d. Nog opmerkingen? Iets vergeten te vragen, wat je nog kwijt wil?

# C. C&L screener

## ORIGINAL CHECK & LEARN SESSION SCREENER, IN DUTCH

Chocomel Drinkoplossing Focus Group

***Let op: vragen over opleidingsniveau, sociale klasse en werkend/niet werkend zijn niet toegevoegd in onderstaande screener. Graag jullie standaardvragen hiervoor gebruiken.***

### Vraag 1

**Wat is uw leeftijd?**

| | |
|---|---|
| 1. Jonger dan 25 jaar | **STOP** |
| 2. 25-45 jaar | **100% good spread** |
| 3. Ouder dan 45 jaar | **STOP** |

### Vraag 2

**Wat is uw geslacht?**

| | |
|---|---|
| 1. Man | **50%** |
| 2. Vrouw | **50%** |

### Vraag 3

**Heeft u één of meerdere kinderen?**

| | |
|---|---|
| 1. Nee | **STOP** |
| 2. Ja | **CONTINUE** |

### Vraag 4

**In welke leeftijdsgroep heeft u kinderen?**

| | |
|---|---|
| 1. jonger dan 3 jaar | **STOP** |
| 2. 3-4 jaar | **CONTINUE** |
| 3. 5-6 jaar | **CONTINUE** |
| 4. 6-7 jaar | **CONTINUE** |
| 5. 7-8 jaar | **CONTINUE** |
| 6. 9-10 jaar | **CONTINUE** |
| 7. 11-12 jaar | **CONTINUE** |
| 8. ouder dan 12 jaar | **STOP** |

## Vraag 5

**Bent u, of is één van de personen uit uw huishouden, werkzaam in één van de onderstaande sectoren?** *Meerdere antwoorden zijn mogelijk.*

| | |
|---|---|
| 1. Bank | ○ |
| 2. Marketing | STOP |
| 3. Onderwijs | ○ |
| 4. Marktonderzoek | STOP |
| 5. Journalistiek | ○ |
| 6. Voedingsmiddelenindustrie | STOP |
| 7. Bouw | ○ |
| 8. Media | ○ |
| 9. Geen van bovenstaande | ○ |

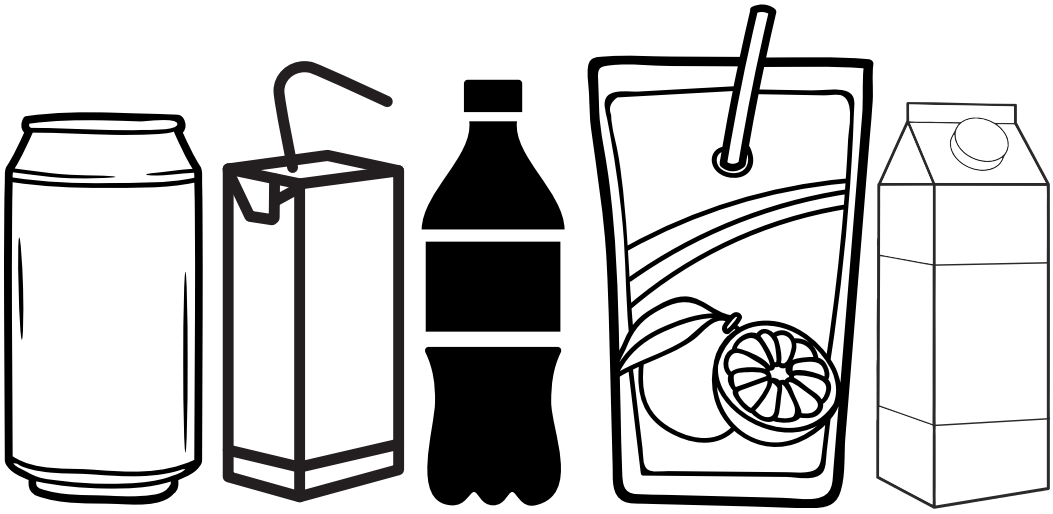
## *Category user*

## Vraag 6

**Welke van de volgende verpakkingen gebruikt u of uw kind regelmatig?**

*Meerdere antwoorden mogelijk, randomiseren 1 t/m 8, "geen van bovenstaande dranken" altijd als laatste antwoordoptie*

| | |
|---|---|
| 1. Blikje | ○ |
| 2. Drankenkarton met rietje | CONTINUE |
| 3. Plastic flesje | ○ |
| 4. Pouch met rietje | ○ |
| 5. Drankenkarton met dop | ○ |



## Vraag 7

**Welke van onderstaande merken frisdrank, vruchtensappen en/of zuiveldranken zou u nooit (meer) willen drinken?**

| | |
|---|---|
| 1. Chocomel | STOP |
| 2. Huismerk (AH, Jumbo, etc.) | ○ |
| 3. Coolbest | ○ |
| 4. Fanta | ○ |
| 5. Coca-Cola | ○ |
| 6. Taksi | ○ |
| 7. Sprite | ○ |
| 8. Lipton | ○ |
| 9. Pepsi | ○ |
| 10. 7-UP | ○ |
| 11. Appelsientje | ○ |
| 12. Fuze Tea | ○ |
| 13. Spa & Fruit | ○ |
| 14. Fristi | ○ |
| 15. Roosvicee | ○ |
| 16. DubbelFris | ○ |
| 17. Anders, namelijk (open question) | ○ |

# D. C&L discussion guide

## ORIGINAL CHECK & LEARN SESSION DISCUSSION GUIDE, IN DUTCH

### Discussion Guide

Setup:

- 3 focus groups 6 participants
- 17 October: 13.00-14.30, 1 group (**AMF 1.29** van 12.30-15.00)
- 18 October: 10.30-12.00, 13.00-14.30, 2 groups (**AMF 2LB.10** van 10.00-15.00)

Language:

- Dutch
- Use consumer language, think about how to call convenience and sustainability. Be consistent.

Respondent criteria:

- 50/50 males and females
- 25-45 years old
- One or more children in the age of 3 to 12
- Not working in marketing, market research, food/drink industry
- All category users (somebody in the family uses portion packs)
- All non-rejecters of Chocomel

Goal of test:

1. What is the best solution for the paper straw according to the consumer?
    a. What do they think about the convenience of the concepts?
    b. What do they think about the sustainability of the concepts?
    c. What are the most promising concepts?
        i. Which should be developed further?

Materials needed:

- Printed answer sheets
- Concepts on A4 paper
- Pencils

### Homework

- Please come prepared:
    - bring a picture of your favourite drink or food packaging
    - bring a picture of something you consider very convenient
    - bring a picture of something you consider very sustainable

### Focus group

**Introduction (10 min)**

- Introductie moderatoren: Marjolein en Louise, wij zijn ingehuurd om dit onderzoek voor FC te doen.
- Opzet: 90 minuten discussie over verpakkingen
- We zullen er niet alleen over praten, maar we laten ook wat afbeeldingen zien.
- Enkele huishoudelijke mededelingen:
    - Persoonlijke ervaringen en meningen
    - Geen goede/foute antwoorden
    - Vertrouwelijk omgang met gegevens (opname van audio/video, live kijken)
    - Nog niet alle verpakkingen zijn op de markt, dus respecteer de vertrouwelijkheid.
- Korte introductieronde: voornaam, leeftijd, woonsituatie, werk

**Part 1: Warm up (15 min)**

- Laten we beginnen. Allereerst wil ik beginnen met de eerste huiswerkopdracht. Jullie hebben allemaal een foto van jullie favoriete eet of drink verpakking opgestuurd. Kunnen jullie hier wat over vertellen. *(iemand aanwijzen om te beginnen, ingestuurde foto's in PowerPoint slide laten zien, alles op 1 slide)*
    - Waarom is dit voor jou je favoriete verpakking?
    - Zijn er speciale details aan de verpakking die ervoor zorgen dat dit jouw favoriete verpakking is of is het de verpakking in zijn totaliteit?

**Gebruik van portie verpakkingen**

- Nu we over jullie favoriete verpakkingen hebben gepraat, wil ik het graag hebben over jullie gebruik van drinkpakjes (foto op beeld laten zien)
- Kunnen jullie me wat vertellen over jullie laatste ervaring met zo'n pakje? (kwadrant invullen)
    - Kun je wat meer vertellen wanneer en waarom je dit pakje gebruikt hebt
    - Wat vond je fijn aan deze ervaring?
    - Wat vond je minder fijn aan deze ervaring?
    - *Als niet genoemd: Doorvragen over het rietje.*

**Part 2: Individual assignment (10 min)**

- Het team van Chocomel is op zoek naar een nieuwe verpakking voor hun drinkpakjes. Ze hebben een aantal ideeën op papier gezet en we willen graag jullie gedachtes weten over deze ideeën.
- Alle ideeën zijn gemaakt van hetzelfde materiaal. Deze laten we even rondgaan.
- *Moderator: Zelfde materiaal, laat materiaal rondgaan.*
- Voor je ligt een stapeltje met 6 Afbeeldingen. Wij willen je vragen om:
    - Je eerste gedachtes op te schrijven over dit idee.
    - Geef het concept een schoolcijfer van 1-9
    - Enkele sleutelwoorden over uw voorkeuren/niet-leuks (open vraag)
- Jullie mogen dit allemaal individueel doen.

***Concepts are printed on paper; forms are handed out***

**Part 3: Group discussion (45 min)**

Laten we de concepten nu 1 voor 1 klassikaal bespreken.

*Belangrijke vraag: noem de 3-cijferige code altijd hardop tijdens het gesprek en wijs er niet alleen naar, want dan weten we over welk product je het hebt (ook onze collega's die online meekijken).*

Oké, laten we eens bespreken wat jullie allemaal hebben opgeschreven. Laten we beginnen met de score vraag; de scores die jullie aan de producten hebt gegeven.

Moderator: schrijf de antwoorden van de groep op een flip-over

- Welk concept **sprak jullie het meeste aan**? Kun je er iets over vertellen.
    - Wat is er zo aantrekkelijk aan dit product?
- Welk concept **sprak jullie het minste aan**? Kun je er iets over vertellen.
    - Wat is er minder aantrekkelijk aan dit product?
- Als het goed is hebben jullie allemaal kinderen op basisschool leeftijd. Als jullie één van deze concepten aan jullie kinderen moeten geven, welke zouden jullie dan geven?
    - Kunnen jullie hierbij vertellen waarom dit concept?
- Welke van de concepten zouden jullie nooit aan jullie kinderen geven?
    - Waarom?

**Connect** met projectteam via Teams; nog vragen/aanvullingen? Zo niet, dan gaan we naar het volgende onderwerp.

Laten we het nog even hebben over een aantal specifieke kenmerken van de concepten.

**Opening**

- Welke van de concepten heeft voor jullie de beste opening?

    - Kun je me iets vertellen over **opening** van het concept dat jullie het beste vonden?
    - Is er iets specifieks aan dit concept dat het de beste opening heeft?
    - Is dit de opening die een nieuwe drinkverpakking zou moeten hebben?

- En welke de slechtste?
    - Kun je me iets vertellen over **opening** van het concept dat jullie het slechtste vonden?
    - Is er iets specifieks aan dit concept dat het de slechtste opening heeft?

Hierboven herhalen voor

- Vorm
- Morsen
- Zonder te morsen drinken
- Mondgevoel tijdens het drinken.
- Gebruiksvriendelijkheid
- Duurzaamheid

**Vorm**

- Welke van de concepten heeft voor jullie de beste vorm?
    - Kun je me iets vertellen over de **vorm** van het concept dat jullie het beste vonden?
    - Is er iets specifieks aan dit concept dat het de beste vorm heeft?
    - Is dit de vorm die een nieuwe drinkverpakking zou moeten hebben?

- En welke de slechtste?
    - Kun je me iets vertellen over **vorm** van het concept dat jullie het slechtste vonden?
    - Is er iets specifieks aan dit concept dat het de slechtste vorm heeft?

**Stevigheid**

- Welke van de concepten heeft voor jullie de beste stevigheid?
    - Kun je me iets vertellen over de **stevigheid** van het concept dat jullie het beste vonden?
    - Is er iets specifieks aan dit concept dat het de beste stevigheid heeft?
    - Is dit de stevigheid die een nieuwe drinkverpakking zou moeten hebben?

- En welke de slechtste?
    - Kun je me iets vertellen over de **stevigheid** van het concept dat jullie het slechtste vonden?
    - Is er iets specifieks aan dit concept dat het de slechtste stevigheid heeft?

**Mondgevoel**

- Welke van de concepten heeft voor jullie de beste opening?
    - Kun je me iets vertellen over **Mondgevoel** van het concept dat jullie het beste vonden?
    - Is er iets specifieks aan dit concept dat het de beste Mondgevoel heeft?
    - Is dit de Mondgevoel die een nieuwe drinkverpakking zou moeten hebben?

- En welke de slechtste?
    - Kun je me iets vertellen over **Mondgevoel** van het concept dat jullie het slechtste vonden?
    - Is er iets specifieks aan dit concept dat het de slechtste Mondgevoel heeft?

- We hebben het nu gehad over verschillende verpakkingen en onderdelen van verpakkingen. Het Chocomel verpakkingsteam is ook veel bezig met gebruiksvriendelijkheid.
    - Wat is gebruiksvriendelijkheid voor jullie? *Jullie mogen hiervoor de huiswerkopdracht gebruiken*
    - Letten jullie op de gebruiksvriendelijkheid van een verpakking als jullie een product in de winkel kopen?
    - Wat is een hele gebruiksvriendelijke verpakking/wat is gebruiksvriendelijkheid voor jullie.
- Het Chocomel verpakkingsteam is naast gebruiksvriendelijkheid ook veel bezig met duurzaamheid
    - Wat is duurzaamheid voor jullie? *Jullie mogen hiervoor de huiswerkopdracht gebruiken*
    - Letten jullie op de duurzaamheid van een verpakking als jullie een product in de winkel kopen?

***Als er tijd is:*** **Morsen**

- Welke van de concepten heeft het minste kans om te morsen?
    - Kun je me iets vertellen over dit concept in relatie tot het morsen
    - Is het iets specifieks aan dit concept?
    - Is dit de juiste verpakking dat morsen tegengaat?

- En welke de slechtste?
    - Kun je me iets vertellen over het concept dat jullie het slechtste vonden?
    - Is er iets specifieks aan dit concept?

**Connect** met projectteam via Teams; nog vragen/aanvullingen? Zo niet, dan gaan we naar het volgende onderwerp.

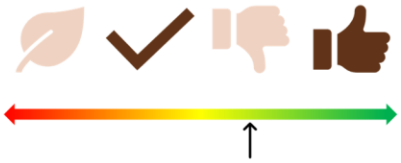
**Samenvatting & closure (5 min)**

- Als er tijd is: Laten we, om deze sessie af te sluiten, samen de ideale portieverpakking voor jullie en voor jullie kind samen door voorbeeldproducten aan te wijzen voor elk van deze kenmerken.
- Moderator: noteer op omslag
- Zijn er nog dingen die nog niet genoemd zijn die jullie nog willen delen?
- **Connect** met projectteam via Teams; nog vragen/aanvullingen? Zo niet, dan sluiten we deze sessie af.
- Bedankt voor deelname!

# E. C&L results slides

## OVERVIEW SLIDES OF EACH CONCEPT

### 457
### bottom straw

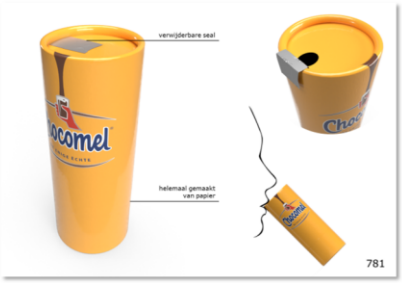





+ Looks most like pack with straw
+ Looks funny
+ Familiar round straw
+ Fits in lunchbox
+ One single piece
+ Creative
+ Striking
+ Cannot lose straw
+ Drink upright

– Why not this material, but separate?
– Makes a mess when it rips
– Does it rip easily?
– Nose against pack?
– Kids will break off straw
– Spilling when squeezing
– Doesn't it flow out when squeezing?
– Easy to empty?
– Picture needed to understand
– Does the straw stay strong?
– Doesn't the straw break off?
– Is it nice to drink with your lip against the pack?

### 781
### paper can

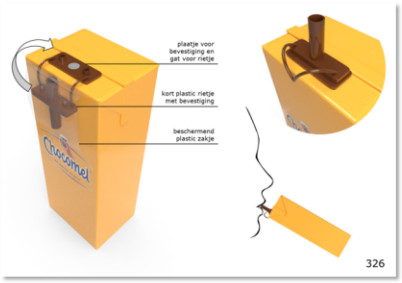


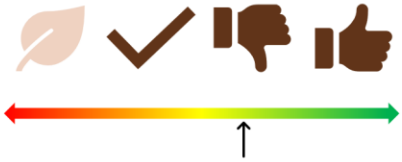



+ Old school
+ Drinkable with and without straw
+ Hygienic because of edge
+ Familiar as before
+ Good for adults
+ For adults
+ No loose parts
+ No straw
+ Bring straw yourself
+ No straw, so also cannot get nasty
+ Mouth does not touch the carton
+ Handy for kids
+ Because of the lip, it does not get soggy

– Takes up more space than current pack
– Does it drink nicely?
– Does it spill because of the lip?
– Just keep it to deposit cans
– Not suitable for kids (toppling over)

## 326
### tethered spout

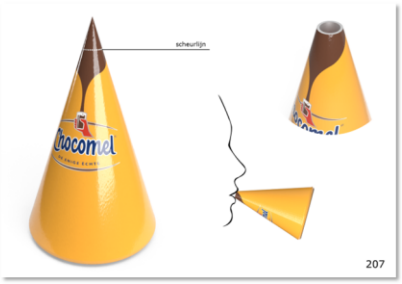


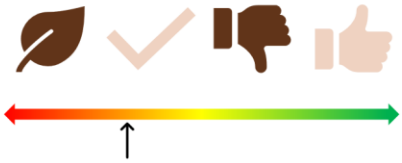



+ Easy
+ You will not lose it
+ Convenient for kids
+ Familiar shape of pack

– Straw too short?
– Still plastic, better?
– Should be able to separate mouth piece
– Does it work easily?
– Not reclosable
– Not reusable
– How sustainable is plastic?
– No improvement compared to plastic straw
– Should not spill
– Still plastic straw

## 207
### cone

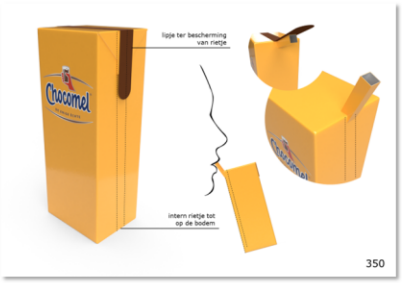


+ Pretty
+ Looks like candy
+ Special edition
+ Nice for horeca
+ Nice for parties

– Will be a mess
– Does it tear easily?
– Spilling
– Opening too big? (insects)
– Not easy to hold
– Kids spilling
– Unconvenient shape to store
– Unpractical shape
– Not practical to store
– Tear off line easy?
– Tear off line vulnerable
– Spilling when tearing off
– Sharp point is dangerous

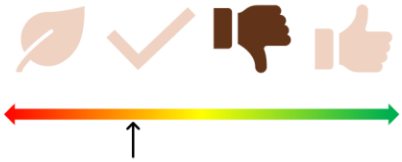
## 350
### internal straw




+ Less plastic
+ Most normal shape
+ Shape of straw does not matter, small enough
+ Internal
+ Cannot lose straw
+ One single piece
+ No loose straw falling off
+ Easy to use for kids
+ Less waste than 457
+ Sturdy
+ Straw till bottom is easy to empty

– Square shape does not drink nicely
– At the expense of the volume? (shrinkflation)
– Does not have a round straw
– Would like to have a round straw
– Straw on the corner not convenient, rather on top
– Square straw
– More spilling danger than 457
– Image needed to understand how it works

## 642
### capsule with holder

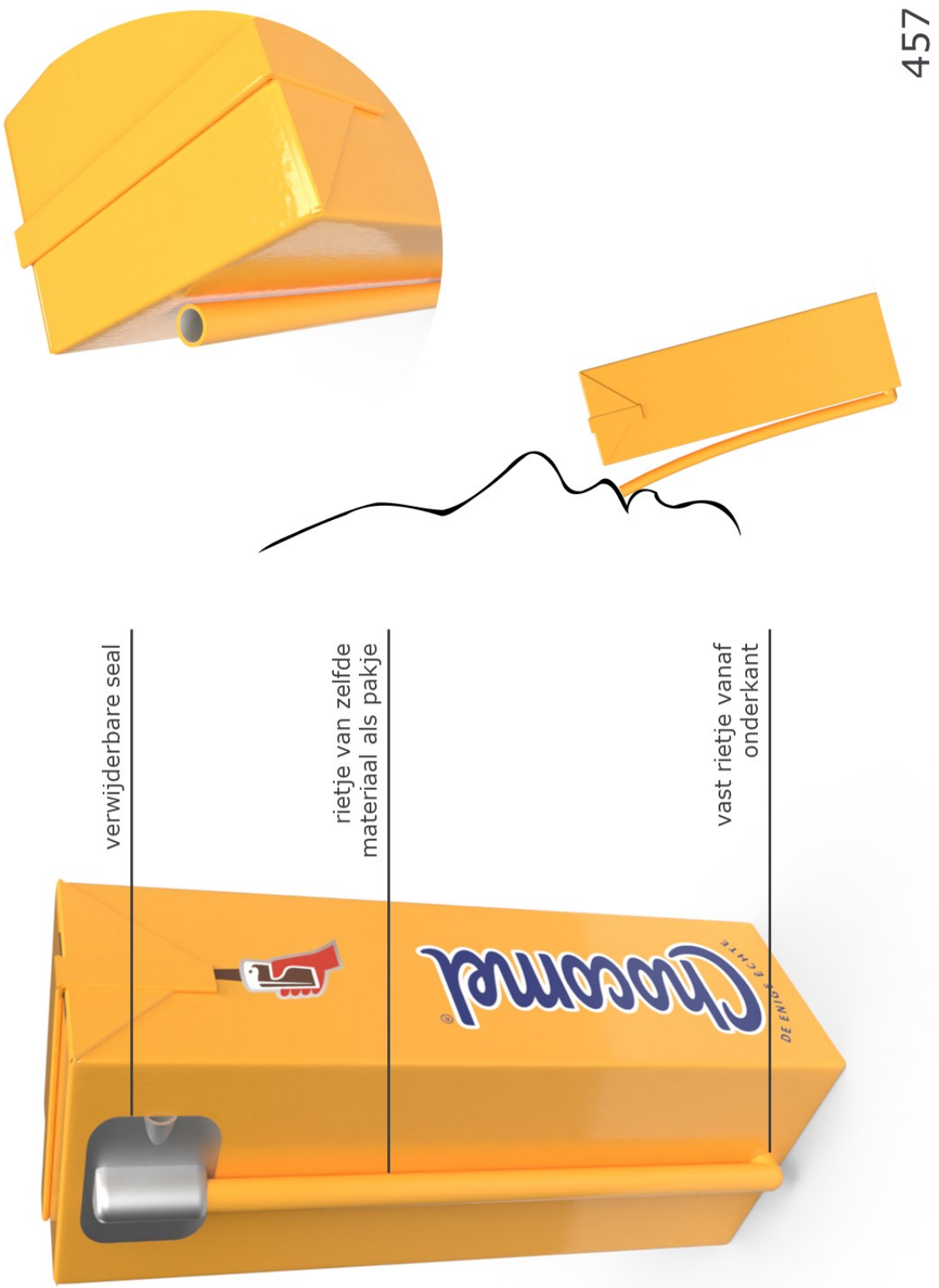



+ Funny
+ Sustainable
+ Only for kids if they can handle it
+ Reusable
+ Creative
+ Cute

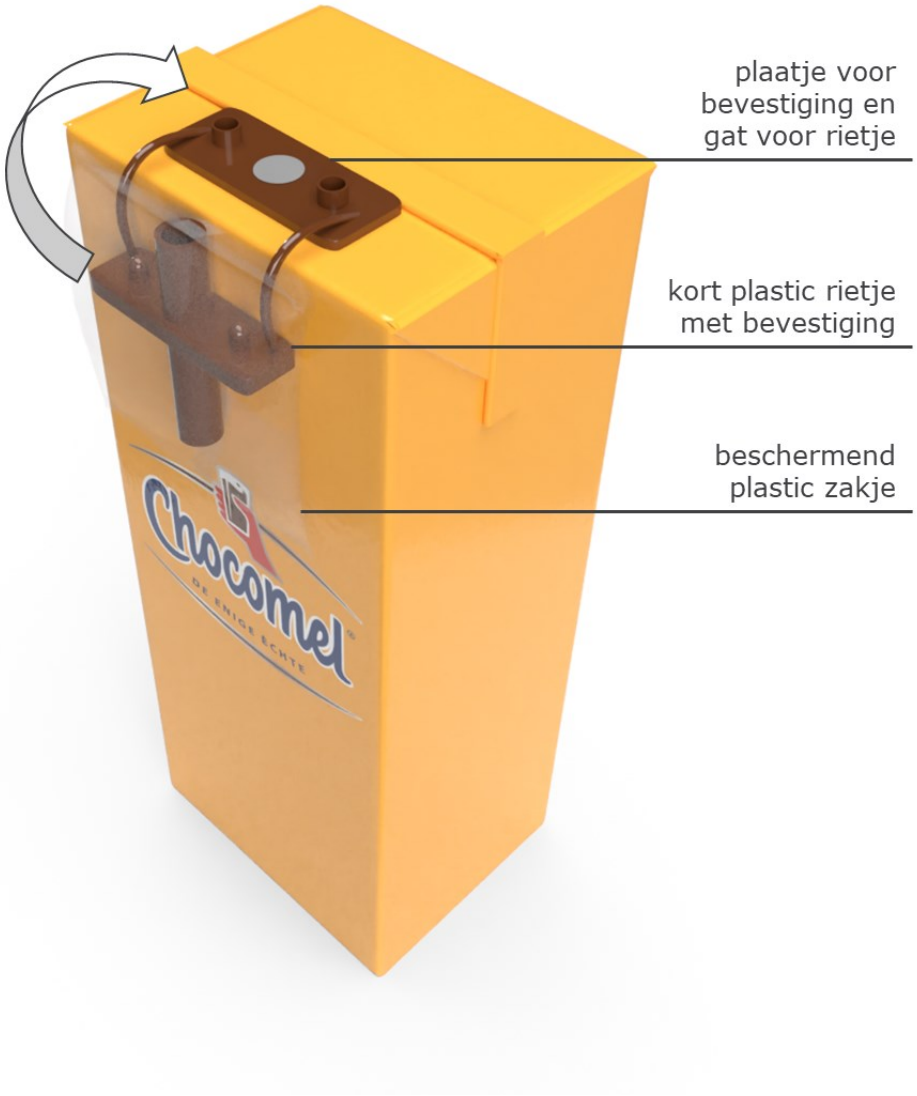
– Difficult
– Could just as well pour over
– Too complicated
– Holder will be lost
– Takes too long
– Not convenient
– Not more sustainable
– Hassle, will just use a cup
– Too much of a puzzle
– Will it get clean?
– Parts will go missing
– Not quick/easy
– Kids will forget parts
– What is the added value?
– Too big
– Not convenient
– Complicated, hassle
– What do you save?
– Holder still has to go in the dishwasher
– Does not save waste
– Multiple holders needed

# F. Concept sheets

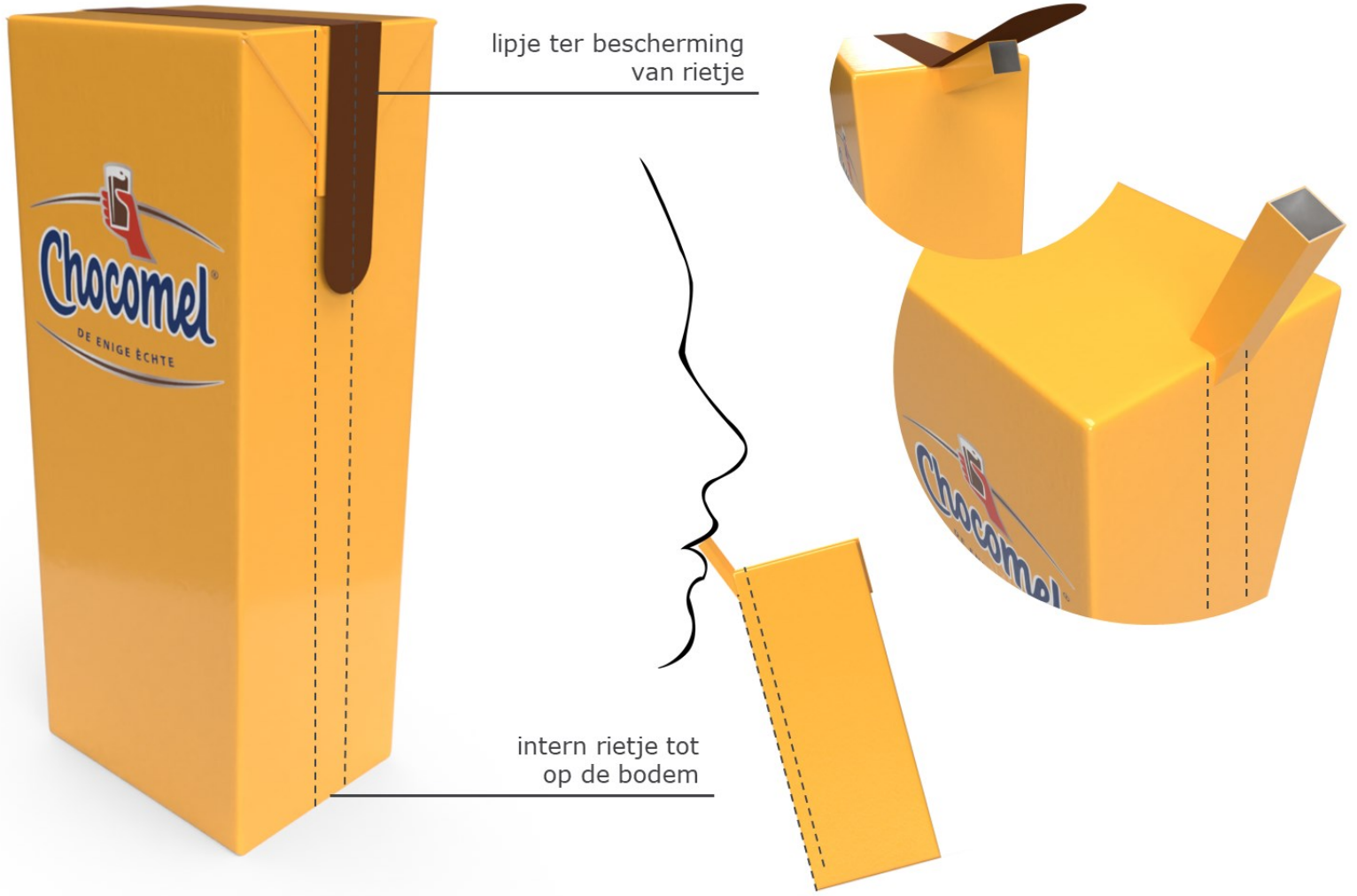
## CONCEPTS AS PRESENTED TO PARTICIPANTS IN CHECK & LEARN SESSIONS (AT 83% SCALE)




781


plaatje voor
bevestiging en
gat voor rietje
kort plastic rietje
met bevestiging
beschermend
plastic zakje
Chocomel
DE ENIGE ECHTE

207


lipje ter bescherming
van rietje
intern rietje tot
op de bodem
Chocomel
DE ENIGE ECHTE


bovenste deel van houder
met vast rietje
*schuift in onderste deel*
capsule
+
één keer
elke keer
onderste deel van houder
*schuift om bovenste deel*
642