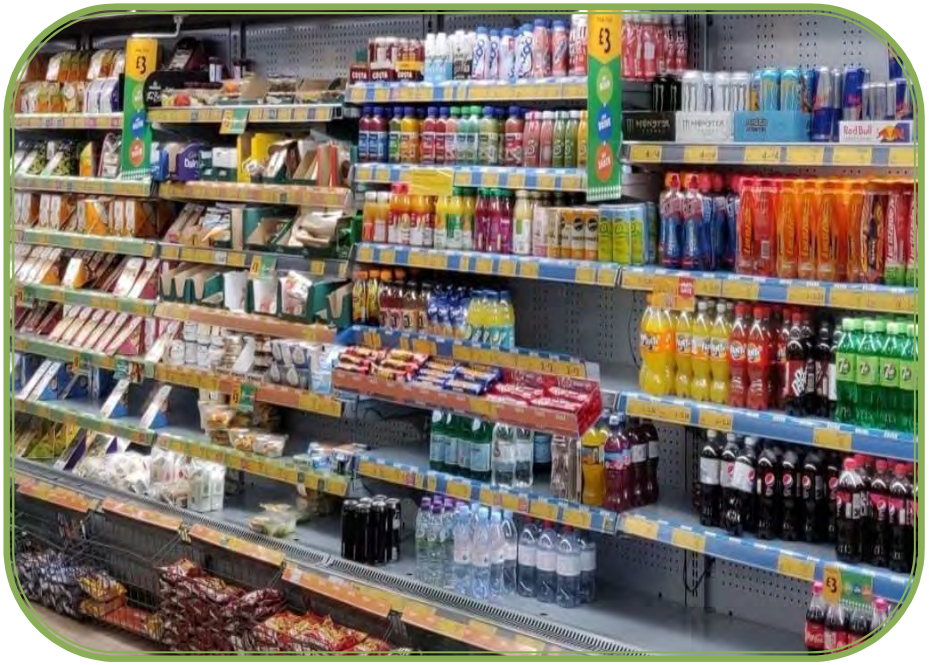
On-the-Go Case Studies 2021

Recyclability by Design

February 2021



RECOUP

About RECOUP

RECycling of Used Plastics Limited (RECOUP) is a charity and leading authority providing expertise and guidance across the plastics recycling value chain. Built on a network of valued members, collaboration is central to its activities. RECOUP is committed to securing sustainable, circular, and practical solutions for plastic resources both in the UK and world-wide.

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RECOUP works to maximise plastic recycling through stimulating the development of sustainable plastics waste management, including the improvement of plastics collection and sorting activities across the UK, undertaking research and analysis to identify good practices and remove barriers to the adoption of efficient recycling systems.

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INTRODUCTION: The Benefits and Challenges Around 'On-the-Go' Recycling

Recent years have seen away from home settings becoming more popular with citizens, with the continual increase in accessibility of pre-prepared snacks and convenience meals. For example, most supermarkets (as well as other high street retailers) have offerings such as the 'Meal Deal' which provide a cost-effective and convenient way of having a meal while out and about. The availability of these options makes it easy for consumers to move away from conventional mealtimes and locations. Due to this, it is essential to provide convenient points to dispose of used packaging 'On-the-Go', as well as clear signage to make sure items are placed in the correct bin, and to discourage littering.

'On-the-Go' can be defined as: the consumption and disposal/recycling of material in a public place such as a street, train station, shopping centre, etc. This differs to 'Away from Home', which is defined as: the consumption and disposal/recycling of material by the public anywhere, except at home. This includes 'On-the-Go', but also at work, school, events, cafes, etc.

Recycling 'On-the-Go' schemes involve placing units in public places for the collection of used packaging from members of the public and are often alongside general waste bins. Packaging disposed of using these schemes is often varied in terms of material and format and can include drinks bottles; sandwich packs; plastic pots, tubs and trays (PTT); and disposable drinks cups.

Data taken from the RECOUP Household Plastics Collection Survey 2020 reported that 47% of Local Authorities in the UK provide 'On-the-Go' recycling bins. If an 'On-the-Go' recycling scheme is well designed and properly maintained it can potentially generate good quality material, as well as help reduce litter and encourage positive recycling behaviours. However, there are potential barriers that can limit the success of these schemes, for example:

- The packaging used – often there may be parts of the packaging that are not easily recyclable, if at all. It may require effort from the consumer to separate out the different components in order for the packaging to be recycled successfully, and this may be missed through lack of awareness, or other factors such as if the person is in a rush, or doesn't have anywhere to dispose of non-recyclable components.
- Contamination – target material is often mixed with waste food, liquid, or other objects due to the nature of the packaging. This contamination makes finding a recycling solution technologically challenging and costly. It is important products are designed to ensure levels of contamination are minimised as much as possible.
- Area-specific limitations – where 'On-the-Go' bins are made available, the collection of the material can differ dependent on area. Often it is collected as part of the kerbside collection process, and therefore the material classed as 'target' will be dependent on the recycling capabilities of that area. For example, a carrier bag may be able to be placed in the recycling bin in one Local Authority area, but not in another. This can lead to confusion, especially as citizens using the 'On-the-Go' recycling bins may not be from the area and therefore may not be familiar with the rules, reducing the quality of material collected through the scheme.

Zero Waste Scotland estimated in Scotland alone that at least £1.2 million is lost through littered materials that could be recycled[1]. By maximising the recyclability of the packaging used on items designed to be consumed 'On-the-Go' it could help to encourage recycling behaviour and tap into this lost revenue.

The aim of this case study is to highlight selected packaging within the 'On-the-Go' sector, looking at how items are packaged, what materials are used and how they can be improved. It will highlight any good and bad packaging designs and the reasons behind this.

For the purpose of this report the formats investigated have been organised in relation to their intended consumption role: Snacks, Main Meals, Desserts, and Drinks.

General Principles When Considering Recyclability of 'On-the-Go' Packaging

There are many key points to consider when it comes to packaging for 'On-the-Go' items, for example:

- Small detachable items under 50mm diameter should be avoided if possible as they do not get through the sorting process and are therefore unlikely to be recycled.
- Clear PET, clear and coloured PP, and natural and coloured HDPE all have good current sorting and reprocessing capacity in the UK.
- Unpigmented polymer has the highest recycling value, and the widest variety of end uses. If colour is necessary, strong colours should be avoided.
- Clear and consistent instruction on how to recycle all components of the packaging should be available to consumers on pack labelling.
- Collection and recycling of pouches and film are currently less well developed than for rigid bottles, pots, tubs and trays.
- Mono-materials or mixed materials of the same type should be used where possible, but if not, the different materials should have different densities so they can be separated easily.
- If the item is a bottle, the label should not cover more than 40% of the pack. If it is a pot, tub or tray, the label should not cover more than 60% of the pack.
- Adhesives for labels should be used sparingly to maximise yield and ease of reprocessing. Adhesive that is water soluble (or dispersible) at 60 to 80^{o}C and hot melt alkali soluble adhesives are optimal as they are more easily removed during reprocessing.
- Use of paper labels should be carefully considered, as if they delaminate, they can cause fibres to be carried over into the recycling plastic, causing issues for the quality of the recyclate. The paper can also pulp in the wash tank. If they are to be used, they are acceptable if the correct adhesive is used, and are easy to separate for removal during processing.

Further details can be found in RECOUP's 'Recyclability by Design' which can be downloaded here - https://www.recoup.org/p/173/recoup-reports.

[1] https://www.zerowastescotland.org.uk/sites/default/files/RoTG%20Guidance_0.pdf

Case Study 1: Snacks

There are many different savoury snacks available to eat 'On-the-Go', providing a wide variety of choice for the consumer. From the conventional snack such as crisps or nuts, to ones focusing on macronutrients like protein, offerings in the space continue to diversify as public health perceptions change.

The Snack, Nut and Crisp Manufacturers Association (SNACMA) estimated in February 2020 that the total value of the UK's savoury snack industry for the coming year would be £3.2 billion[2]. Although this was likely impacted by the Covid-19 pandemic, it still provides an indication on the size of the marketplace.

Sausage Roll

The sausage roll is a very popular snack for 'On-the-Go' eating. They are typically packaged using film flow wrap to protect the item and preserve it. While many sausage rolls are found in flow wrap that is not currently recyclable, Tesco have changed the type of film used in order to be able to boast that it can be recycled alongside plastic bags at large supermarkets. This is clearly marked on the packaging to direct the customer accordingly.

This is not ideal as it still involves effort from the consumer to return the item to a store rather than recycle at kerbside, however it is a step in the right direction in offering an alternative that can be recycled.

[2] https://www.snacma.org.uk/wp-content/uploads/2020/02/SNC-Celebrating-UK-Snacks-A5-2020-WEB-1.pdf

Carrot Sticks with Houmous Dip

The carrot sticks with houmous dip come in a clear PET plastic tray with a plastic film lid and paper sticker base label. Recycling instructions on the pack advise that the tray is widely recycled but the film is not yet recyclable. The fact that the film is not recyclable provides an opportunity for potential littering. There is also the instruction to rinse the packaging before recycling. As this product is intended to be eaten 'On-the-Go', the consumer will not be likely to have the facilities to rinse the packaging before placing it in a recycling bin. This therefore suggests that food contamination will be an issue when disposed of.

Falafels with Houmous Dip

Another packaging alternative to food with a dip is used in this instance. The falafel is housed in a clear PET pot with a PET lid, and a smaller clear PP pot with a film lid is used for the houmous. Although the PP pot would still suffer from food contamination due to the houmous, the outside PET pot would remain relatively clean as it is not coming into contact with the houmous.

Note: Always include recycling instructions on pack

The pack has a top label that spans over the sides to act as an extra seal for the pot but does not cover over 60% of the pack.

'Reduced' labels have been added by the store, and these could pose a problem if the adhesive used is not easily removed through washing during the recycling process.

A major issue with this packaging is that there is no instruction on how to recycle any of the components. This could mean that high value plastic (especially the outer pot that would be largely free from food contamination) could be lost.

Fruit

Freshly prepared fruit is always a popular snack to reach for due to its health benefits and the convenience of not having to prepare the fruit yourself. In many cases they offer the opportunity to reduce waste by providing the correct portion size needed, as well as offering a variety of fruit in one container, something that might be expensive to recreate at home. In addition to this, fruit is often found as a snack in the 'Meal Deal' offerings of many retailers, making it a cost-effective option.

When it comes to 'On-the-Go', fruit is either offered in a bag or a pot.

This pink lady apple is wrapped in a plastic PP bag. Currently this type of packaging is not widely recycled, and this is reflected in the messaging printed on the packaging for consumer guidance.

An alternative option to the bag is to place the fruit in a pot.

This fruit is housed in a clear plastic PET pot with a film lid and paper sticker base label. It may be a preferable option to the bag from a recyclability standpoint as the pot is able to be recycled, however the film lid is not, something that is clearly communicated on the base label. The fact that the film is not recyclable could cause a litter problem if there is nowhere to dispose of this component. Also, dependent on the type of fruit found in the pot, there could be high amounts of liquid (as was the case here). This could cause contamination if the liquid is not removed from the pot before it is placed in the recycling bin.

Case Study 2: Main Meals

The main meal options for food designed to be eaten 'On-the-Go' is extensive, not only in flavours but in formats. From conventional items such as sandwiches, wraps, and salad trays, to more exotic items such as sushi, packaging needs to be versatile in order to perform the required purpose of housing and protecting the product, as well as maximise recyclability.

Salad Pot

This Gro salad pot is packaged in a clear plastic PET tray, with a film lid, and a paper label that is stuck from the top around to the bottom but does not cover over 60% of the pack. The pack also comes with a wooden fork in order to eat the salad 'On-the-Go'.

The packaging label advises that the tray is widely recycled, but the film is not yet recyclable. Due to the design of the label, the film is difficult to remove from the tray. This could help to prevent littering; however, it does not aid recyclability as the recyclable and non-recyclable components cannot be separated easily.

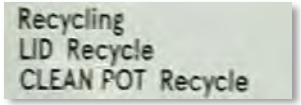
There is no advice when it comes to the wooden fork. This could pose a litter risk unless a general waste bin is available for disposal. Also, even if the fork is able to be recycled, it will be contaminated with food and therefore could pose a problem to other recyclables in the bin.

The packaging label advises that the tray should be rinsed before it is recycled. As this salad is designed to be eaten 'On-the-Go' rinsing is not likely to be a viable option for the consumer before placing it in the recycling bin, and therefore food contamination is likely to be a problem.

Pasta Pot

Another type of pot used for food ‘On-the-Go’ are those with a rigid lid.

This pasta pot is packaged in an rPET clear pot with a rigid lid. A plastic PP fork is also provided in the pack, housed underneath the paper label, which covers the top, and down two sides of the pack (but not covering over 60%).



The pack label advises that both the lid and the pot can be recycled as opposed to a film lid which cannot be recycled. However, it does not provide any guidance for the plastic fork, which therefore could risk being littered.

The label also advises to clean the pot before recycling. This is not practical as this item is designed to be eaten ‘On-the-Go’ where opportunities to clean the pot will not be available. This will pose the risk of food contamination.

Sandwiches

The British sandwich industry is estimated to be worth more than £8 billion a year[3]. The very design of a sandwich makes it the perfect 'On-the-Go' meal, as it is easy to eat with minimal effort (even with one hand).

This sandwich is packed in mostly cardboard with a clear plastic film window. This packaging design is popular for sandwiches, providing stability as well as retaining freshness for the product.

Recycling information on this packaging is limited, with only the vague instruction to 'recycle'. The pack is only recyclable if the card is not spoiled by the food, and the plastic window is removed, therefore this limited instruction is not enough to educate the consumer and ensure the pack is disposed of correctly.

Note: Specific instruction to consumers on how to prepare the item for recycling is needed

Recently Tesco has introduced a new packaging design to many of its sandwiches (and wraps) to try and combat the recyclability issues.

The packaging still consists of a cardboard pouch with a plastic film window. However, on the side of the pack there is clear guidance which states to 'use tab to remove plastic from the box' and recycle with carrier bags at large supermarkets. The cardboard has also been fitted with a tab that is perforated to ease the process, and text around this tab making its location and purpose clear. The front of the sandwich pack highlights to the consumer that the pack is now 'fully recyclable'.

There is still the potential that food contamination could hinder the recycling process, however this type of sandwich packaging alongside the clear guidance for the consumer ensure the packaging has the highest possible change to be processed and recycled successfully.

[3] https://www.ft.com/content/b91777ad-040b-4491-a0d8-a55414501ed6

Heated Meal Pot

Tesco's Meal Deal section is found at front of store and includes all the food designed to eat 'On-the-Go'. However, they have recently started to include in this promotion mains that are designed to be heated up before eating. They also have further 'heat before you eat' products not included in the deal but located in this area of the store.

This seems to go against the idea of eating 'On-the-Go', as there would be no facility to heat the product in these scenarios. However, it does suggest that consumers are purchasing products from this area for eating in general, not necessarily for 'On-the-Go' consumption, perhaps due to their convenience. They could be targeted at more 'Away from Home' settings, for example in an office, where the option to heat the product would more likely be available.

This product from Yo! is an example of an item found in the 'On-the-Go' section but needs heating up to consume. Interestingly, this product actually advised to transfer the contents into a microwavable container before heating, another step that would not be possible if designed to be eaten in an 'On-the-Go' setting.

The product has a cardboard pot with a clear plastic PP lid. There are also plastic labels stuck to the top around the sides to the bottom of the product. There is no information about the recyclability of the product, and there is also a high chance of food contamination, especially on the cardboard container.

Note: Always include recycling instructions on pack

Case Study 3: Desserts

The dessert section of food 'On-the-Go' is dominated by the popularity of chocolate bars. However, there are some alternative options.

Brownie Bar

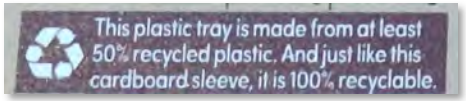
A common option in the 'On-the-Go' section is a slice of cake, brownie or flapjack.

This brownie has a cardboard sleeve inside a clear plastic flow wrap. Interestingly, the cardboard has printed recycling instructions that advise that neither the cardboard nor the film are currently recyclable. This could potentially be due to expected food contamination and residue from the brownie bar.

Graze Flapjack

Another way of packaging a similar product is used in this Graze flapjack.

The product has a cardboard sleeve that slides over a clear PET plastic tray with a plastic film lid. The cardboard sleeve has information regarding recycling, stating the plastic tray and the cardboard sleeve are 100% recyclable, as well as boasting the plastic tray is made from at least 50% recycled plastic.



However, there are no instructions on how to dispose of the film lid found attached to the plastic tray. This could lead to confusion and therefore littering, or the film lid being placed in the same recycling bin, which could be an issue further on in the recycling process.

Case Study 4: Drinks

It has been suggested that almost 20,000 plastic bottles are produced by humans every second[4]. Although not all of these will be drinks bottles, it is thought that the UK consumes around 14.1 billion drinks bottles every year[5]. It is clear that steps must be put in place to ensure the majority if not all of these bottles are recycled and not left to litter our environment.

Coca-Cola Bottle

The Coca-Cola bottle is a good example of bottle design that maximises recyclability as well as prompting consumers to recycle.

The packaging consists of a clear PET bottle with a screw top lid made from HDPE. It also has a label that does not cover over 40% of the bottle surface.

The label has clear recycling instructions that stand out to the consumer. They also advise for the bottle to be recycled with the cap on, helping to reduce the chance that the cap could be littered, or if placed in the recycling separately, lost in the sorting process. PET and HDPE polymers have different densities; therefore, the cap can be recycled alongside the bottle as they will be separated in the float sink process.

Coca-Cola urges the consumer to recycle through messaging on the cap as well as on the label, with the label also highlighting that the bottle is made from 50% recycled plastic.

[4] https://www.theguardian.com/environment/2017/jun/28/a-million-a-minute-worlds-plastic-bottle-binge-as-dangerous-as-climate-change
[5] https://www.independent.co.uk/extras/indybest/outdoor-activity/sports-equipment-accessories/best-reusable-water-bottle-a9388851.html

Water Bottle

Another good example is this water bottle from Buxton.

In this instance, the clear plastic bottle is made from PET with a strip label and a PP sports cap which is tethered to the bottle. Having the cap tethered to the bottle helps reduce the opportunity to litter the cap. PET and PP polymers have different densities, therefore the cap can be recycled alongside the bottle as they will be separated in the float sink process.

Just like the Coca Cola bottle, the Buxton bottle has a recycling label that advises the customer how to recycle. It includes the instruction to leave the cap on, as well as to flatten the bottle. Labels like these make it easy for consumers to see how to recycle the item at a glance, rather than having to search for information.

The Buxton bottle also has messaging on its label promoting recycling, with a graphic boasting the bottle is 100% recycled and recyclable, as well as a sentence saying ‘I am made from other bottles’.

Lucozade Sports Drink

This Lucozade sports drink is once again packaged in a clear PET bottle with a sports cap that is tethered to the bottle. However, this drink has a sleeve instead of a label, that covers more than 40% of the bottle.

The sleeve does provide recycling instructions which advise that the bottle itself is recyclable (along with the cap which should be left on) but the sleeve is not recyclable.

Note: Follow recommended guidelines for sleeve coverage

It doesn't however tell you that the sleeve needs to be removed from the bottle. The term 'sleeve' could be mis-interpreted or mis-understood. Also, there is no obvious perforation in order to make it easy to remove. This could cause issues when it comes to recycling, as if the sleeve is left on, there is a risk that the bottle may not be correctly recognised by modern Near Infrared (NIR) sorting equipment, and therefore the bottle could either be misread, or possibly rejected and sent to landfill.

Galaxy Chocolate Drink

In this instance the bottle is still PET but it is white opaque rather than clear like the previous bottles. This is not ideal as due to its colour it would be processed with other coloured PET which has a much lower economic value than non-pigmented plastic. It also has a screw top lid rather than a tethered lid, which could potentially pose an issue in terms of littering.

The bottle features a design with a full sleeve like the Lucozade drink, however it also features a zip graphic to highlight that the sleeve should be removed. This is twinned with a perforation in the sleeve that runs from top to bottom, helping the consumer to remove.

The problem with this bottle is that it is missing any written recycling instructions. Apart from the zip graphic, there is no mention of recycling on the label, and as the zip could be open to interpretation (or the consumer might miss the recycling logo) the lack of clear instruction poses an issue. In turn it also doesn't tell the consumer whether the bottle or sleeve (once removed) are recyclable.

Ribena Bottle

In the past Ribena opted for a full sleeve on their bottle. However, the product went through a redesign with recyclability in mind and the new bottle has been available in stores since January 2021.

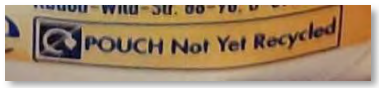
The bottle is clear PET with a HDPE screw top lid. It has '100% recycled' embossed into the bottom of the bottle as well as 'recycle me' above the label.

The new label is in line with similar other bottles and does not cover more than 40% of the surface. It features recycling instructions that are clear to the consumer and advise to recycle with the cap on, reducing risk of littering. They have further promoted the fact that the bottle is made from 100% recycled plastic through graphics on the front and back of the label, with one also urging the customer to recycle again.

Capri-Sun drinks pouch with spout

This Capri-Sun drink is packaged in a foil lined pouch with a plastic screw top spout.

Pouches are being seen as alternatives to plastics in a lot of markets, for example pouches are being used as re-fills for hand wash to reduce the demand for plastic bottles. However, these pouches are made from flexible materials and are actually harder to recycle than their plastic counterparts as they often cannot be recycled mechanically. This pouch also has the added complication of a rigid spout, meaning it would be rejected from recycling schemes for films and flexibles. Is not currently recyclable and is labelled as such.



When removed, the plastic lid is very small. This poses the risk of being littered, but also, if it was to be made recyclable, it may not get through the sorting process as it is less than 50mm in size.

Note: Avoid using materials that are not currently recyclable and components less than 50mm in size

SUMMARY & RECOMMENDATIONS

Food and drink intended to be consumed 'On-the-Go' comes in a variety of different formats, raising individual challenges for the packaging designed to house it. Maximising recyclability of this packaging is important to reduce opportunities for plastics to end up in landfill or littering our environment.

In relation to the products examined in this case study, **the majority have been made from highly recyclable materials,** largely clear PET, which has the highest value and the widest variety of end markets. This is ideal, as heavily coloured plastic is strongly light absorbing and therefore may interfere with automated sorting machinery that uses Near Infrared (NIR) spectroscopy to identify the nature of the plastic.

It has become clear that there is **inconsistent messaging with some of the products when it comes to instructions on how to recycle.** This can lead to confusion for the consumer and, due to the nature of 'On-the-Go' food and drink, can lead to contamination of the material rendering it difficult to recycle successfully. It should be communicated to consumers to remove any plastic film, paper, cardboard, or foil and as much food residue as possible before putting the container in the recycling bin. However, **the environment in which the item is most likely to be consumed should be considered.** Some of the packs investigated included instruction such as 'rinse' which is not a practical instruction in an 'On-the-Go' setting and could generate confusion for the consumer on whether they should recycle the pack as it is or discard in general waste. It also should be noted that **recyclability instructions can differ dependent on location.** Some of the bottles advised to recycle with 'cap on', however the RECOUP Household Plastics Collection Survey 2020 found that 29% of Local Authorities actually advise for bottles to be recycled with the caps off. These inconsistencies add to citizen confusion when it comes to how to accurately prepare items for recycling, potentially leading to recyclable items being lost.

Designers should **take care when deciding what label or sleeve to include** on the packaging. As a rule, labels on a bottle should not cover more than 40% of the surface, and for pots, tubs, and trays it is 60%. This is to ensure the NIR sorting equipment correctly interprets the colour of the plastic and sorts it as such. As seen in this case study, some bottles have opted for sleeves that cover the entire bottle surface. It is recommended to include as much direction as possible for the consumer when it comes to recycling, therefore combining the written instruction on the Lucozade bottle with the zip graphic and perforation on the Galaxy bottle would be optimal.

Size of items should also be considered at design inception. The current recycling system for plastics will not sort any rigid plastic below 50mm in dimension. In the case of the Capri-Sun pouch, even if the cap was recyclable, its size would mean it would be lost and discarded early on in the process. Wider bottle necks and in turn larger caps, or tethered caps, may be a way of addressing this issue.

In order to ensure packaging will be accepted and processed in the UK's recycling streams, **recyclability guidelines, such as RECOUP's 'Recyclability by Design'[6] or UK Plastics PACT's 'Design Tips for Recycling'[7] should be consulted.**

As food or liquid residue is likely to be the largest contaminant when it comes to 'On-the-Go' packaging, it is **important that products are designed to ensure these contamination levels are minimised as much as possible**. Examples of ways to achieve this could be: including a wider neck on bottles to aid removal of as much liquid as possible, developing an ability for the packaging to stand inverted to ease emptying, or through use of non-stick additives to help contents to not cling to the container (although this must not affect the recyclability of the pack). Past research and material analysis conducted by RECOUP of 'On-the-Go' packaging found that a high percentage of drinks bottles were disposed of that still contained liquids. This would cause the recyclable bottles to be rejected due to their weight, and there is no means for these bottles to be emptied once disposed of. Clear instruction should be provided to empty bottles before disposal, as well as removing parts of packaging contaminated with food residue, in order to maximise recyclability.

Where possible, **mono-materials or mixed materials of the same type should be used** to maximise opportunities for mechanical recycling. This is especially highlighted in packs such as the sandwiches where cardboard and plastic are used together, which may limit the recyclability. However, approaches such as that taken by Tesco as seen in this case study can help to ensure the consumer is educated and has a way to increase the likelihood the packaging is recycled successfully.

It is important to understand that **improving the recyclability of packaging should never be at the expense of the core purpose of the packaging**. The base abilities of the packaging to provide product safety, functionality, and consumer acceptance should not be jeopardized in order for the pack to be recyclable; they should work in conjunction to provide the best possible packaging option, taking into consideration what is the most environmentally and economically sound choice for each individual pack design.

[6] https://www.recoup.org/p/173/recoup-reports
[7] https://wrap.org.uk/sites/files/wrap/Design%20tips%20for%20making%20rigid%20plastic%20packaging%20more%20recyclable.pdf

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