

From waste to value:

Unlocking sustainability and new efficiencies in the supply chain



Improving sustainability is high on the global agenda for governments, businesses, and consumers alike. However, with multiple different factors contributing to the overall sustainability of operation, or the lack of it, many businesses struggle to decide where to start. Fortunately, when it comes to green initiatives, some relatively small changes can have a big impact. One area where the problem is tangible, and the results of any efforts are quickly visible, is waste.

Reducing the amount of waste generated is a concrete step towards greener operation, particularly in waste-heavy sectors such as packaging, food production, and transportation. In many industries, including grocery retail, these areas are often interlinked and closely connected to how the supply chain is managed. While being completely Zero Waste¹ is still an unattainable goal for many operators, forward-thinking retailers are actively looking for ways to address the issue. Moving on from relying on recyclable materials for packaging, such as cardboard boxes, towards alternatives that are reusable, like crates

made of polypropylene plastic, is a simple first step that can help retailers reduce waste and their environmental impact across critical areas of operation.

This whitepaper focuses on three areas that can generate large amounts of waste in a traditional grocery retail setting: packaging, food storage, and transportation. It explores the activities that contribute to the problem and explains how retailers can use reusable plastic crates to optimize sustainability while cutting costs and improving productivity.



Packaging reusing and recycling

Packaging plays a crucial role in protecting products during storage, transport, and display and enabling them to be moved quickly through the supply chain. It is also a significant contributor to waste in retail environments. Today, corrugated is the dominant packaging material due to its perceived low cost, light structure, and recyclability. In North America alone, over 95 percent of consumer goods are packed and transported in corrugated boxes², with the food and beverage sector accounting for nearly 40 percent of all corrugated packaging produced³. Meanwhile, in Europe, more than 75 percent of goods are moved in corrugated, according to industry association FEFCO⁴. As the material is relatively easy to recycle, it is often seen as an environmentally friendly option. Unfortunately, however, not all corrugated will or can be recycled.

This can be a problem in many retail settings where the nature of the products and the operating environment can contaminate the corrugated boxes, making them unsuitable for recycling. Excessive moisture, for example, or the presence of other materials, such as plastic tape, can mean that boxes will not get processed at the recycling facility⁵. This is especially an issue in the grocery industry, as moisture is a major part of transporting perishables.



Even in the best case, corrugated boxes can only be recycled a limited number of times, typically around seven⁶, due to the structural damage the material incurs during the recycling process. Corrugated consists of fibres, and every time a box is mulched and formed into a slurry paste during the recycling phase, the fibres get shorter. Eventually, they will be too short to adhere together, at which point the material can no longer be repurposed⁷.

From a retailer perspective, in addition to the potential challenges relating to recycling, the material presents several other issues that can directly damage both sustainability and profitability. The below examples demonstrate four common problems experienced with corrugated boxes and suggest how polypropylene plastic crates could resolve them.



1. Corrugated cannot handle moisture

Moisture is associated with various grocery products, especially perishables, such as vegetables. Unfortunately, corrugated does not tolerate it well; it absorbs condensation and any leakages from its contents. As a result, its structural integrity can be compromised, putting the products at risk, and making stacked boxes unsteady. Moisture can also promote the presence of fungi and bacteria, jeopardizing hygiene. **Solution:** Plastic crates are resistant to moisture and keep the products well-protected, therefore they are the ideal solution for shipping perishables. Plastic crates are also better ventilated than corrugated boxes, which keeps the products fresher for longer. Unlike corrugated, plastic is easy to keep clean, pooled plastic crates can be washed after every use, preventing contamination. Therefore, plastic crates do not hold fungus or pests, further protecting the quality of the products.



2. Corrugated boxes crush easily

When corrugated boxes are stack can often crush easily, particularly if the structure has already suffered as a result of moisture or other damage, or if the stacks are too heavy or piled up too high. If the stack falls over, both the boxes and their contents are at risk.

Solution: Polypropylene crates are up to four times stronger than corrugated boxes⁸, which means they can be safely stacked higher, and with heavier loads. With an interlocking design, they also provide better load stability, so products can be stored in higher stacks without the risk of the stack tipping over, saving valuable space, and improving efficiency.

3. Corrugated boxes are inefficient in transport

Corrugated boxes come in a range of shapes and sizes. The diversity often causes valuable space to be wasted during storage and transport, as the items cannot be stacked tightly the cube utilisation is poor on the pallet and truck with different box sizes. This is a key issue during transportation, as any empty spots in a truckload contribute to fuel waste and low efficiency.

Solution: Polypropylene crates are uniform in shape and size, so they enable more efficient use of space during storage and transport. With all available space utilized, the trucks travel at full cube utilization so that fewer trips are needed, reducing emissions and fuel costs.

4. Corrugated is timeconsuming to recycle

In order to be recycled, corrugated needs to be managed. Workers have to break down the boxes, then take them to the baler for processing in preparation for transit to the recycling facility. This

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translates to significant effort and cost spent on using, discarding, and recycling hundreds of single use boxes each week.

Solution: Plastic crates eliminate the time spent managing corrugated waste. They can be ready for reuse immediately, and the time spent handling them is a direct contribution to productivity.

These examples highlight the reliance of retailers on corrugated boxes and the challenge they face when it comes to meeting their sustainability and profitability targets. If the products get damaged due to packaging issues, profitability suffers. Furthermore, if stained or damaged boxes are unsuited for recycling, the time and resource spent managing the recycling process is ultimately counterproductive to the green initiatives. Polypropylene plastic is highly durable as well as recyclable. Unlike corrugated boxes, polypropylene crates can be reused over 100 times, after which they are recycled and turned into new products. Every plastic crate used in a grocery retail supply chain eliminates 1-1.5 pounds of corrugated from entering the supply chain, leading to a tangible reduction in waste⁹. This offers retailers a simple way to eradicate a significant source of corrugated packaging waste and mitigate the potential issues listed above to protect profitability.



Case study: Removing corrugated from the supply chain

Challenge:

In North America, most retail supply chains rely heavily on corrugated for all packaging. However, as wet or stained corrugate is difficult to recycle, large amounts of the material used to pack and transport perishables end up in landfills, damaging business' sustainability efforts and contributing to emissions.

Solution:

Tosca wanted to address the issue and help businesses eliminate corrugated from their operation. It started to ship perishables in reusable plastic crates in 2000 and has since helped prevent over 1 million metric tons of corrugated cardboard from entering the perishables supply chain. With every new plastic crate, the savings are multiplied. Every crate used prevents approximately 1-1.5 pounds from entering the supply chain. Over multiple uses, this means that the impact of a single crate can amount to hundreds of pounds of cardboard saved.

Food waste keeping it fresh

Driven by growing consumer awareness and high-profile campaigns by international organizations, such as the UN, local governments, and NGOs, reducing food waste is on the top of mind for consumers and businesses alike. The cost that it incurs to humanity, the environment, and economy is staggering. The UN estimates that 821 million people worldwide are undernourished¹⁰, with over 2 billion lacking access to safe drinking water. Conversely, the use of surface and groundwater resources (blue water) attributable to food lost or wasted represents around 6 percent of total water withdrawals.¹¹

The resources and energy spent on cultivating and transporting products that end up wasted increase the carbon footprint, while food rotting in the landfill contributes to the methane emissions, adding to the cost to the environment. According to the UN's Food and Agricultural Organization (FAO), food waste accounts for around 8 percent of all greenhouse gas emissions caused by humans¹². The problem is global. In the US, around 40 million tons of food is wasted every year¹³, and food is the single largest product group found in landfills. In Europe, the figures vary between countries, but the region wastes approximately 88 million tons per year – nearly 20 percent of all food produced in the area¹⁴. Finally, from a business perspective, the amount of revenue lost in food waste is substantial. It is estimated to cost the global economy around 750 billion dollars per year¹⁵. Local estimates paint an even bleaker picture. In the US, for example, the cost to the retail sector is 18 billion dollars in lost value.¹⁶ With consumers increasingly



T tosca expecting retailers to lead the way in reducing food waste¹⁷, many operators are feeling the pressure to up their game.

To effectively address the issue, it is essential first to identify the factors that contribute to food waste in a retail environment.

Here are some typical examples of situations and practices that result in products being discarded¹⁸:

- Damage to products on the shop floor
- Contamination of products
- Pests, mold, or fungus in products
- Damage due to unsuitable choice of containers
- Poor ventilation during transport and storage
- Poor handling during transportation
- Environmental conditions during transport
- Delays in the supply chain

These examples highlight that one of the main reasons for product waste is damage, either resulting from transport or storage, contamination from other products, or poor handling. Fortunately, the issue is easy to address by selecting a more durable, hygienic, and efficient method for packaging and transporting the products. Reusable polypropylene crates can help retailers tackle many of the causes of food waste. More robust by design, they protect products throughout their journey from the farm to the warehouse and the shop floor. The strong, stackable crates help simplify product handling, reducing the risk of damage during storage and transport. Unlike corrugated boxes, plastic crates are durable yet well ventilated, keeping fresh produce and protein in the best possible condition, minimizing the risk of fungus and mold. Plastic is also more hygienic by design, making it easy to maintain optimal hygiene. Additionally, when the products are displayed in the store, the plastic



The problem is global. In the US, around 40 million tons of food is wasted every year³, and food is the single largest product group found in landfills.

crates protect them while making them readily available to customers.

Tackling all food waste in a retail operation presents many challenges, with some contributing factors – such as any fluctuation in customer demand or changes in preferences – hard to predict. However, with the right packaging choice, retailers can eliminate a significant portion of food waste in their supply chain to enhance sustainability and cut costs.



Case study: Protecting fresh products

Challenge:

Tomato producer APS Group has a complex supply chain stretching from greenhouses to storage warehouses to supermarkets. It required a solution that would enable it to safeguard the quality of its products to ensure they reach the end-customer in perfect condition.



Solution:

Tosca supplied APS with plastic crates to optimize its supply chain. The crates help APS maintain its high hygiene standards, as the surface is easy to wipe clean, helping protect valuable stock against damage from moisture, insects, or fungi. The crates are extremely light to handle so that workers can move them safely, yet robust enough to protect the delicate contents during storage and transport. Switching to plastic crates has enabled the company to keep the product fresher for longer and speed up the journey from farm to store, allowing it to reduce product waste and improve operational efficiency. The reusable crates have also allowed the company to achieve significant cost savings over traditional disposable packaging options.

Transport making miles matter

Transportation is an integral part of a retail supply chain, and every mile travelled adds to the environmental cost of operation through fuel usage and emissions¹⁹. While these factors are hard to erase completely, targeting the efficiency of the process can play a crucial role in reducing the impact. If each truck on the road operates at full capacity, more products can be moved with fewer journeys, resulting in a direct reduction in emissions. It also helps retailers improve costefficiency, with fuel costs reducing in line with the mileage.

One of the main challenges preventing retailers from leveraging these benefits is uneconomical packaging. As corrugated boxes come in a range of sizes, packing them efficiently for transport can be difficult. Due to the structural challenges, the boxes are often tricky to stack efficiently without compromising stability and safety. This results in wasted space, especially in loads with different products, as the space between the stacks can be hard to fill.

Using reusable plastic crates can help overcome these challenges. With a standardized footprint, the pallets are easy and fast to load, stack, and organize. The uniform size and stronger construction mean that the crates can be stacked higher, and more products fitted in each truck. This helps optimize every truckload to reduce the number of trips required, saving emissions as well as cutting fuel costs.



In addition to the benefits to the environment, plastic crates can also help overcome many of the challenges associated with corrugated boxes that contribute to low transportation efficiency:

- Polypropylene is structurally around four times stronger than corrugated. It can be stacked without fear that the weight compromises its structure and damages the products.
- Many plastic crates interlock, resulting in stacks that are stronger, easier to manage, and safer to transport, as they do not topple in transit.
- RCPCs offer a standardised footprint, improving cube utilisation from distributor to retailer.
- Unlike corrugated, plastic is also less vulnerable to environmental conditions such as spilled liquid during transport and storage, protecting the products and reducing food waste.



Case study: More efficient transport

Challenge:

A meat supplier was experiencing frequent box failures throughout its supply chain. Corrugated boxes often got crushed during transport, with products arriving at the store already damaged. This resulted in lost revenue, while the poor quality of products risked damaging its reputation.

Solution:

The meat supplier trialled two alternatives to traditional corrugated boxes: more robust corrugated ones and reusable plastic crates from Tosca. While both options protected the products from damage, the plastic crates proved over 25 percent more efficient to transport. The corrugated boxes could only be stacked ten high before crushing would occur. In contrast, the plastic crates could reach 18 high, utilizing all the available space in the truck.



Conclusion

This whitepaper has outlined how moving away from single use corrugated boxes can help retailers increase sustainability. It has also demonstrated the business benefits a reusable packaging solution can offer by providing optimal product quality, reduced costs, and improved efficiency. Corrugated cannot rival the strength, ease of use, hygiene, and reusability benefits of plastic crates. These features play a key role in reducing packaging and food waste in the retail supply chain.

While becoming fully Zero Waste is currently not yet feasible for many businesses, removing wasteful processes from the supply chain can help contribute to that goal. Moving from 'recyclable' towards 'reusable' is a good starting point and working with a strong packaging partner can further help simplify the journey. Tosca is an expert in building high-performing supply chains. Its reusable containers are designed for superior durability to protect products and maximize their freshness and shelf life. They provide retailers with a straightforward way to eliminate inefficient practices and address many of the issues that contribute to the environmental impact to help enable greener operation and, ultimately, improve the bottom line.

To find out more about how Tosca can help you optimize the sustainability of your supply chain, visit: https://www.toscaltd.com/sustainability/

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