Integrated Value Proposition: Journey of an Egg

Advancing customer goals through our sustainability value proposition

Tosca contributes to our customer's sustainability goals all along the value chain. Our LCA process quantifies the benefits, delivering data to select the right packaging solution for each customer's unique supply chain objectives.

100+ Number of LCAs we completed for customers to support their decision-making in 2024.

Tosca's value chain efficiencies result in:

Elimination of single-use packaging:

- Little to no costs related to packaging waste regulations, such as EPR fees in the U.S., U.K. and EU
- Zero cost for disposal of non-recyclable packaging
- Support for PPWR compliance in the EU

Reduction in emissions and lower environmental footprint:

- Emissions reduced by over 60% on average
- Simplified compliance with emissions reporting requirements, saving time and associated costs
- Reduced disposal costs and carbon credit purchase requirements

Minimization of food damage, loss and shrink:

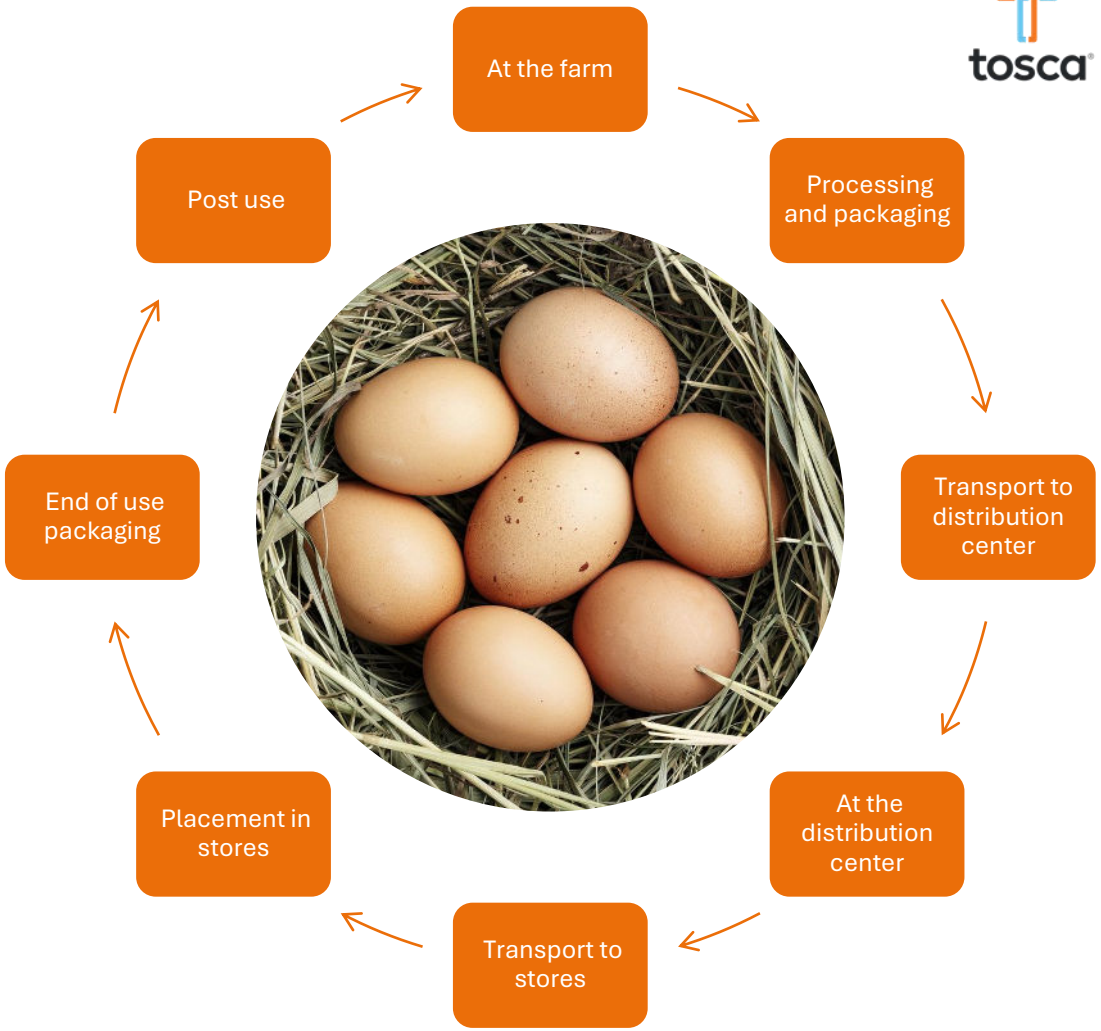
- Average 3.3%+ reduction in lost income from food damage
- Lower replacement costs due to less spoiled or damaged food
- Increased profit margin at constant prices
- Less food sent to landfill, reducing associated emissions by up to 50% on average

Take the journey of an egg

Amid fluctuating global egg prices, the protective role of packaging is even more critical. The optimal solution not only safeguards this increasingly valuable product from damage but also enhances handling efficiency and minimizes environmental impact along the supply chain.

Tosca's RPCs provide benefits that ripple through the supply chain.

Tosca’s reusable packaging solutions do more than safely move eggs — they protect profits, reduce environmental impacts and simplify operations at every point along the journey from farm to store — resulting in cost savings **of around 24%** and emissions savings of up to **80%,** compared to traditional packaging.



By following the journey of ten million eggs from chicken to table, we see how Tosca’s packaging solutions support every stage of the journey.

Reducing shrink, increasing value: The case for reusable packaging

Eggs are fragile and can experience up to 10% loss across the supply chain. Reducing this damage through a rigid reusable packaging solution means more food reaches the shelf, cutting production losses, fines for unmet supply and replacement and transport costs and associated emissions. The benefits of Tosca's RPCs in reducing shrink are highlighted throughout each stage of the journey of the egg on the following slides.

Estimated cost and emissions associated with lost eggs

(includes losses during transport and at distribution center as well as retail store)

RPCs	Cardboard Boxes
10,000,000 eggs	10,000,000 eggs
Loss rate = 2.3%	Loss rate = 4.8%
-230,000 eggs	-480,000 eggs
Cost of unusable eggs	Cost of unusable eggs
$47,917	$100,000
Emissions from production of lost eggs	Emissions from production of lost eggs
42 MT CO_2e	88 MT CO_2e

At the farm

Egg production

The U.S. and EU each produce around 95 billion eggs annually. Egg farming at this scale is a resource-intensive operation, with high input costs spanning feed, utilities, labor and regulatory compliance.

Transport packaging production and delivery

Tosca's reusable plastic egg RPCs can hold more eggs than industry standard corrugated boxes and, along with reusable plastic pallets, can be used over 100 times before being recycled back into new products. Because of this, customers using our egg RPCs and plastic pallets have an opportunity to lower their emissions *and* lower costs associated with moving eggs through the supply chain.

Estimated cost at the farm

TOTAL COST OF PRODUCTION FOR TEN MILLION EGGS

$750,000

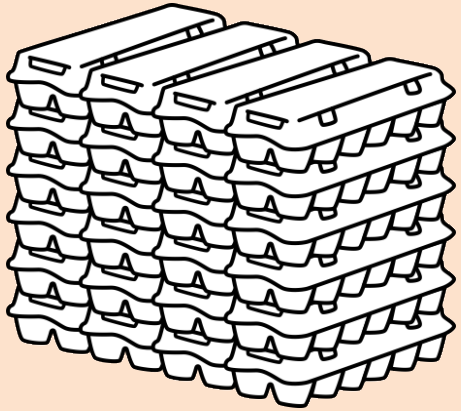
Estimated emissions at the farm

TOTAL EMISSIONS FROM PRODUCING TEN MILLION EGGS

1,833 $MTCO_2e$

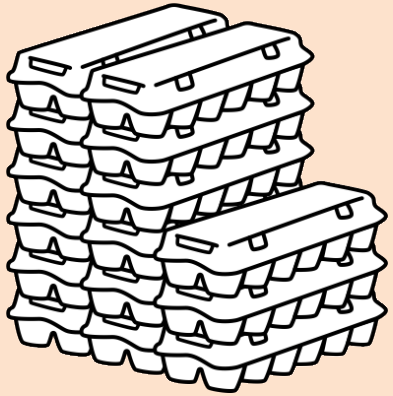
Tosca's egg RPCs can hold 24 dozen eggs vs. 15 dozen in an industry standard corrugated box. Plastic pallets are also safer (no nails or splinters) in a food environment.

Tosca



VS.

Traditional



Processing and packaging

Processing, quality control and packaging

Once eggs are harvested, they are washed (U.S. only), quality-checked and packed into Tosca's RPCs either on-site or at a separate facility.

One of the most crucial factors for maintaining egg quality is how quickly they cool. With Tosca Egg RPCs, eggs reach optimal temperature in just over a day versus five to six days in traditional corrugated boxes. This faster cooling process helps preserve freshness and gets products to store shelves quicker.

The rigid structure of the Tosca Egg RPCs also offers the ability for double stacking of full pallets, freeing up valuable cooler space, which would in turn contribute to a more efficient and cost-effective cold chain.

Estimated cost savings in processing and packaging

Tosca packaging vs. single use

14% cost reduction for packaging procurement
50% potential reduction in refrigeration space required

Estimated emissions savings in processing and packaging

Tosca packaging vs. single use

93% emissions reduction from packaging manufacturing
50% possible emissions reduction from required refrigeration

Transport to distribution center

After collection, eggs are typically transported to a distribution center (DC) before heading to retail stores. During transit, they're exposed to shock, humidity and temperature changes — all of which can impact quality and shelf life.

Tosca's Egg RPCs are designed to handle the demands of refrigerated transport. Their rigid, durable structure reduces egg damage, while their consistent size and compatibility with reusable plastic pallets ensure optimal truckload efficiency.

While reusable crates are heavier than single-use options, which may lead to marginally higher emissions from transportation, they offer a net reduction of the total environmental footprint. With shrink reduced by well over 51%, use of RPCs avoids replacing 35,000 lost eggs out of every ten million — and the packaging and transport that come with them. The result? A 50+% cost saving from shrink and a net reduction in total emissions from transportation and food waste.

Estimated cost

Tosca packaging vs single use

Up to 5% increase in transportation cost to the DC for the first trip

51+% reduction in cost from avoided shrink

At the distribution center

Tosca's reusable packaging solutions streamline operations at the distribution center in more ways than one.

- **Automated packaging compatibility:** RPCs and pallets are uniform in size and designed for automation, improving throughput and reducing labor demands compared to cardboard boxes and wooden pallets.
- **Lower pallet disposal costs:** Plastic pallets have a longer service life than wooden pallets and can be repaired and reused through Tosca, avoiding and reducing EPR fees associated with broken wooden pallets.
- **Reduced cooler space, costs and emissions:** The ability to double stack the full Egg RPC pallets provides the potential to free up valuable cooler space and reduce emissions on a per occupied square foot/square meter basis.
- **Future-proofing against regulatory changes:** With new U.S. regulations requiring low global warming potential (GWP) refrigerants starting January 2025, refrigeration equipment costs are expected to rise by 7-10%, increasing the value of space-saving solutions like RPCs.

Emissions

By using 50 % less cooler space, Tosca Egg RPCs on plastic pallets could significantly cut emissions compared with corrugated boxes on single-use wooden pallets.

Transport to stores

Repalletized eggs are transported from the DC to the retail store, mostly in mixed loads. During transportation, eggs are once again vulnerable to shock (vibration), humidity and temperature fluctuations along with damage due to being stacked with other heavy products in the truck. All of these can compromise product quality, shorten shelf life and increase the risk of breakage.

Placement in stores

- Tosca egg crates can be placed directly on store shelves, reducing handling time and **cutting associated costs by more than 37%**. In contrast, transferring eggs to shelf from corrugated boxes can take up to twice as long.
- Hours used for stocking or handling slip sheets and corner boards plus collapsing corrugated boxes can be reallocated to other tasks, further reducing overall labor costs.
- Opening corrugated boxes using box cutters can result in injuries that can cost anywhere from **$540 - $26,000** per injury.

Average time required to stock 8-foot display case

Tosca

10 mins

To stock RPCs

Corrugated boxes

21 mins

To stock corrugated boxes

End of use packaging: Post use

Once eggs reach the store and transportation packaging is no longer needed, the end-of-use processes differ depending on the packaging system.

Tosca's reusable RPCs and plastic pallets operate within a closed-loop reuse system. After use, they are collected via reverse logistics (often on return hauls to the DC), thoroughly cleaned, expertly repaired if needed and seamlessly redistributed into the supply chain.

Wasted time adds up

- Folding and stacking empty egg crates takes about **5 minutes a day** — adding up to **4 full workdays a year**.
- Breaking down boxes and baling waste takes even longer: **30 minutes a day**, or nearly **23 days per year**.

Switching to reusables eliminates this hidden labor drain.

Tosca assets: Reused

Single-use packaging: Recycled

	RPCs	Plastic pallets	Corrugated cardboard boxes	Single-use wooden pallets
Total number of assets used	275,593	7,770	5,291,395	91,277
Sent for recycling	After 100 turns	After 80 turns	Immediately	Immediately
Sent for disposal	0	0	5%-30%	5%
End of life (recycling) GHG emissions (Metric Tons CO2e)	0 (Total over life 1,795)		2,365 (Total over life 7,298)	
Water use (m^3)	0 (Total over life 32,494)		23,462 (Total over life 1,687,301)	
EPR fees	EU and U.S. – Exempt	EU and U.S. – Exempt	EU and U.S. - Local fee x 100	EU and U.S. - Local fee x 80

Cumulative impact of reusable packaging: From farm to table

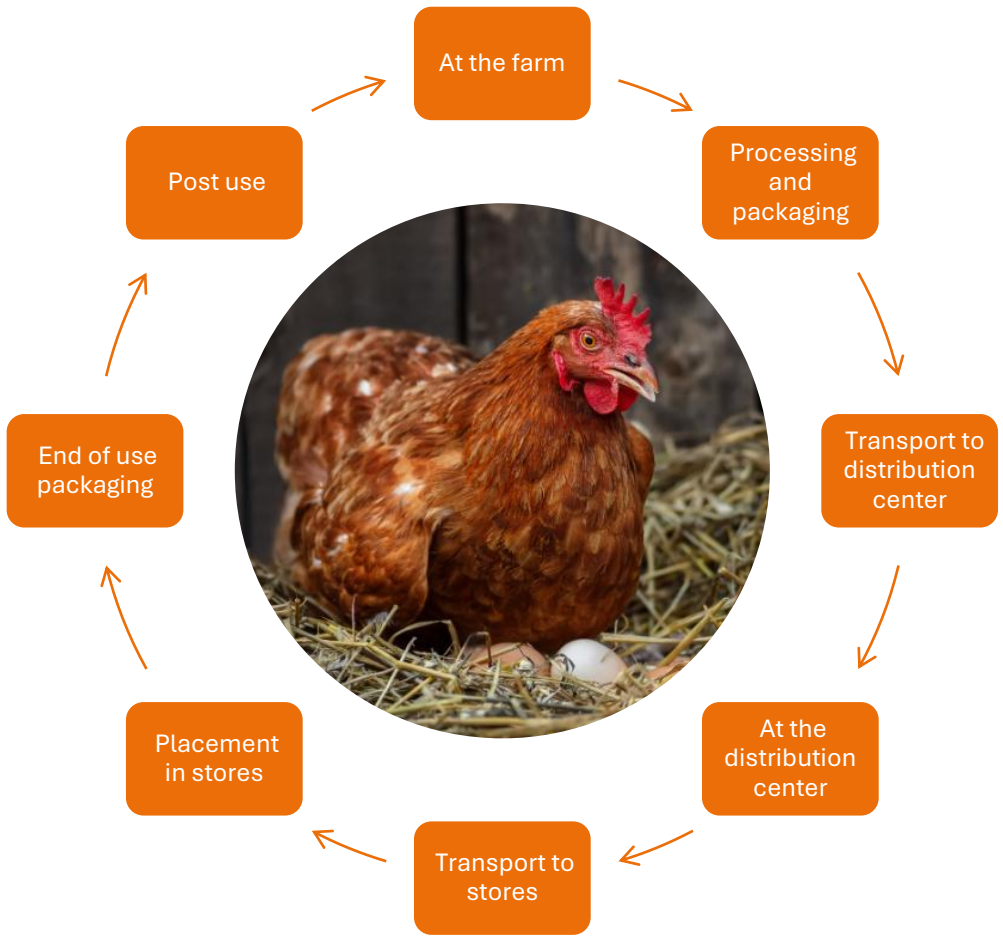
We've modeled the journey of ten million eggs to compare Tosca's reusable RPCs and plastic pallets against single-use corrugated boxes and wooden pallets. The numbers below reflect cumulative shrink and system-wide impacts.

1. Producer to DC

Tosca's RPCs begin delivering value early — the reuse option offers a tenfold reduction of the emissions from lifecycle components "material" and "manufacturing" compared to single-use cardboard.

4. Producer to end of packaging use

By the time packaging completes its full lifecycle, the total cumulative impact is clear: 24% cost savings and up to 80% reduction in emissions — driven by reduced damage, improved efficiency and reuse at every step.



2. At DC

Adding in handling and storage at the DC, the total impacts result in 14% cost savings (this includes base EPR fees as of June 2025 in Oregon for paper and wood) and a 64% emissions reduction compared to single-use solutions.

3. Transport to retail store

As eggs move through the full supply chain to retail, the transport packaging advantage of the RPCs combines with a reduction in product loss to offer an even larger reduction in cost and emissions.

Real results through collaboration

Our greatest impact happens when we partner with others. These case studies show how working side by side with our customers leads to tangible results — lowering emissions, reducing food waste and delivering significant cost savings through reusable, data-driven solutions. Together, we're proving that sustainability and efficiency go hand in hand.

CASE STUDY

Versova

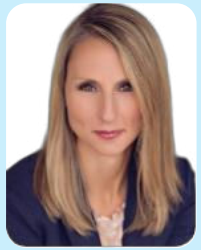
To eliminate packaging-related contamination risks, Versova transitioned to Tosca's RPCs — a sanitized, traceable and structurally stronger alternative to corrugated boxes. The main driver for switching to Tosca RPCs was the reduction in broken eggs during transportation. The RPCs allow additional protection for the egg cartons that resulted in an average 66% reduction in egg loss.

Read the full case study.

7x

MORE EMPTY FOLDABLE CRATES CAN BE TRANSPORTED IN A SINGLE VEHICLE COMPARED TO TRADITIONAL RIGID PLASTIC CRATES.

"Our strong focus on designing our assets to afford better protection of transported goods has resulted in reduced damage/shrink rates for product moved. We have seen significant reduction in produce damage shrink, over 51% of eggs moved and over 20% of total meat and poultry moved, **saving our customers millions of dollars** in lost sales while **reducing emissions** from the disposal and replacement of damaged food by **85%**."



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