



STRAWBERRY CASE STUDY

SHIPPING STRAWBERRIES IN CORRUGATED SAVES \$6.6 MILLION ANNUALLY VS. SHIPPING IN RPCS

Executive Summary

Using data provided by a large strawberry grower in Salinas, California, the Full Disclosuresm modeling tool was used to analyze total annual costs involved in using corrugated containers vs. reusable plastic containers (RPCs) to ship 144 million pounds of strawberries to Cincinnati, Ohio.

- Corrugated demonstrates an annual cost advantage of \$6.6 million vs. RPCs.
- RPCs require backhauling to return from the retailer to the next point of use. During the backhaul leg of the trip, RPCs incur \$8.3 million in costs for shipping, handling, and washing. These costs are avoided altogether by using corrugated, since it does not require back-shipping.

Shipping strawberries in corrugated costs less.

Grocery retailers are looking to improve profits by reducing costs throughout the entire distribution channel. Transportation packaging is one area that retailers scrutinize for possible cost savings.

Real-world data to analyze the cost-effectiveness of shipping container options is available using the Full Disclosure modeling tool, which makes it possible to study the impact of multiple cost drivers on different container choices.

Full Disclosure was used to perform a direct cost comparison between using corrugated containers and using RPCs.

This analysis showed that, in this scenario, the corrugated solution realized a cost advantage of \$6.6 million compared to RPCs.

Strawberries scenario

In this study, it was assumed that 144 million pounds of strawberries would be shipped annually over a distance of 2,400 miles to the distribution center and then to retail stores. (This approximates the distance from Salinas, California to Cincinnati, Ohio.)



These strawberries are first picked and transported to a facility where they are cleaned and sorted, packed into containers (either 8-lb. capacity corrugated or 9-lb. capacity RPCs), loaded onto standard pallets and placed in 53-foot refrigerated trailers. Since each pallet holds 105 RPCs or 132 corrugated containers, and each truck holds 28 pallets, trucks cube out holding 2,940 RPCs or 3,696 corrugated containers. Each truckload carries either 26,460 lbs. of strawberries in RPCs or 29,568 lbs. in corrugated containers; more truckloads are required to ship the same total amount of strawberries in RPCs than in corrugated.

The semi-trailer trucks then transport the strawberries to distribution centers where pallet loads are reconfigured for retail, loaded onto delivery trucks and distributed to retail outlets.

Once at the retail stores, pallets are unloaded from the trailers and the strawberries are set up for retail presentation. Used corrugated containers are broken down and compacted for recycling. RPCs accumulate at stores to fill one or more trailers, which then go to a washing facility in Chicago. The washing cost is estimated at \$0.10 per RPC. After washing, the RPCs are shipped back to Salinas (2,217 miles).

Clear total cost picture

Corrugated Containers		Reusable Plastic Containers		Variance
Annual Container Cost:	9,360,000 \$	Annual Replenishment Cost:	1,182,476 \$	-8,177,524 \$
Annual Label Cost:	0 \$	Annual Label Cost:	700,800 \$	700,800 \$
CC Trucking Costs:	35,497,477 \$	RPC Trucking Costs:	45,847,743 \$	10,350,266 \$
<i>Total trucking costs include trucking and any standing costs at unloading and loading.</i>		<i>Total trucking costs include trucking and any standing costs at unloading and loading.</i>		
CC Handling Costs:	90,909 \$	RPC Handling Costs:	1,746,032 \$	1,655,123 \$
<i>Total handling costs include unloading, handling, and loading.</i>		<i>Total handling costs include unloading, handling, and loading.</i>		
CC Operating Impacts:	0 \$	RPC Operating Impacts:	0 \$	0 \$
<i>Operating impacts are detailed at various distribution points.</i>		<i>Operating impacts are detailed at various distribution points.</i>		
Disposal Cost (or Recycling Value):	-919,800 \$	Disposal Cost (or Recycling Value):	-289,143 \$	630,657 \$
CC Inventory Value:	260,000 \$			
CC Inventory Interest Cost:	20,800 \$			
		RPC Initial Cost:	6,466,667 \$	
		RPC Annual Amortization:	1,505,927 \$	1,505,927 \$
Annual CC Cost:	44,049,386 \$	Annual RPC Cost:	50,693,834 \$	6,644,449 \$
			Variance without RPC Amortization:	5,138,522 \$

Figure 1

The Full Disclosure analysis summarized above shows a total annual cost of more than \$44 million for corrugated vs. \$50.7 million for RPCs (assuming that the cost of initial RPCs in the float are amortized). In other words: total packaging, shipping and handling costs were 15.1 percent (about \$6.6 million) higher using RPCs.

This analysis reveals that RPCs incur \$12 million higher trucking and handling costs than corrugated. This is the result of higher trucking costs to ship strawberries to the distribution center in RPCs, the RPC backhaul trip requirements, handling costs at return distribution centers, plus washing and warehousing costs. At an estimated \$0.10 per container, washing alone adds \$1.6 million to the annual cost of using RPCs.

Who pays for what?

With corrugated shipping containers, the grower pays for the containers and labor associated with managing them. Once the truckload leaves the grower's packing operation, retailers pay all handling and shipping costs but benefit from the sale of the used corrugated containers at the end of the one-way trip (when they are recovered for recycling). This is not the way it works with RPCs.

A fair cost comparison must focus primarily on the effect that either packaging alternative has on the total system costs of distribution. If total costs go up, no one party in the supply chain (grower, distributor or retailer) can realistically save money. As the total cost picture (Figure 1) demonstrates, RPCs increase total system cost.

Details ("Drill Down") of RPC Rental Costs vs. Corrugated							
0S180 Strawberries 11-25-13							
Cost Owner: Retailer							
	Full Disclosure Model			Rental Costs		Total RPC Rental Cost (6)=(2)+(4)+(5)	RPC Rental vs. Corrugated (7)=(6)-(1)
	Corrugated (1)	RPC (2)	Variance (3)=(2)-(1)	Fees (4)	Other (5)		
Container	0	0	0	0		0	0
Label	0	0	0			0	0
Trucking	35,497,477	39,197,732	3,700,256			39,197,732	3,700,256
Handling	90,909	125,291	34,382		0	125,291	34,382
Operating Impacts	0	0	0			0	0
CC Inventory	0	0	0			0	0
Recycling/Disposal	(919,800)	0	919,800			0	919,800
RPC Amortization		0	0			0	0
Total	34,668,586	39,323,023	4,654,438	0	0	39,323,023	4,654,438

Figure 2

A study of the data using a special rental analysis module of Full Disclosure shows that, in a typical leasing arrangement, the retailer pays \$4.6 million (13.4 percent) more to receive strawberries shipped in RPCs as opposed to corrugated (Figure 2). The grower pays \$3.8 million (40.5 percent) more to ship in RPCs (Figure 3).

Details ("Drill Down") of RPC Rental Costs vs. Corrugated							
0S180 Strawberries 11-25-13							
Cost Owner: Grower-Shipper							
	Full Disclosure Model			Rental Costs		Total RPC Rental Cost (6)=(2)+(4)+(5)	RPC Rental vs. Corrugated (7)=(6)-(1)
	Corrugated (1)	RPC (2)	Variance (3)=(2)-(1)	Fees (4)	Other (5)		
Container	9,360,000	0	(9,360,000)	12,480,000		12,480,000	3,120,000
Label	0	700,800	700,800			700,800	700,800
Trucking	0	0	0			0	0
Handling	0	0	0		0	0	0
Operating Impacts	0	0	0			0	0
CC Inventory	20,800	0	(20,800)			0	(20,800)
Recycling/Disposal	0	0	0			0	0
RPC Amortization		0	0			0	0
Total	9,380,800	700,800	(8,680,000)	12,480,000	0	13,180,800	3,800,000

Figure 3

Conclusion

Both growers and retailers lose money when RPCs are used to ship strawberries in this case scenario.

Initial arguments to justify the use of RPCs vs. corrugated were based on a supposition that RPCs were more economical because they were reusable. Full Disclosure case studies detail the impact of major cost sensitivity factors on the total distribution system; and shipping container economics now present a clear picture that corrugated containers offer the lowest-cost supply-chain solution.

Once again, the facts demonstrate that corrugated is the most economical transport packaging solution. These cost benefits, in addition to the ability to customize every corrugated structural design and graphics for in-store merchandising, make corrugated the most versatile and economical shipping container solution.

Full Disclosure was developed by the American Forest & Paper Association (AF&PA) and the Fibre Box Association (FBA).

The Corrugated Packaging Alliance (CPA) is a corrugated industry initiative, jointly sponsored by the American Forest & Paper Association (AF&PA), the Association of Independent Corrugated Converters (AICC), the Fibre Box Association (FBA) and the Technical Association of the Pulp and Paper Industry (TAPPI). Its mission is to foster growth and profitability of corrugated in applications where it can be demonstrated, based on credible and persuasive evidence, that corrugated should be the packaging material of choice; and to provide a coordinated industry focus that effectively acts on industry matters that cannot be accomplished by individual members. CPA members include corrugated manufacturers and converters throughout North America.



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