



# FOOD RESIDUE STUDY

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FOODSERVICE PACKAGING  
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## Background

The Foodservice Packaging Institute's Paper Recovery Alliance and Plastics Recovery Group have been working on overcoming barriers to recovery of foodservice packaging. One of the often-cited reasons foodservice packaging is not accepted for recycling is the concern about increased levels of food contamination.

## The Study

To address this concern, a study was conducted to learn whether foodservice packaging (such as take-out containers, cups or pizza boxes) set out for recycling were more contaminated than food contact packaging (such as peanut butter jars, cans or pasta boxes) that has traditionally been accepted at single-stream material recovery facilities (MRFs). This study took place at a MRF in Michigan (Nov 2022) and served as a follow-up study to the previous two studies conducted in Boston, Massachusetts (Sep-Oct 2013) and in Milford and New Castle, Delaware (July 2014).

The process for the study included sorting 13 200-pound samples of randomly selected residential curbside recyclables from recently tipped loads at the MRF. For all recycling samples, corrugated packaging, paper and paperboard, molded fiber, plastic containers, and aluminum cans and trays/plates were sorted into two categories: foodservice packaging or packaging in contact with food (e.g., jars, tubs, cans and boxes from prepackaged grocery store items). The sort team used a visual rating system to assess individual packages in each of the selected categories to record the impact among foodservice vs. food contact packaging, utilizing a rating scale from 1 to 5, where packaging found to be clean was rated 1 and packaging found to be highly contaminated was rated 5.

## The Results

The study found that the vast majority of foodservice and food contact packaging in the recycling stream are relatively clean and were rated as a 1 or 2, a finding similar to the previous two food residue studies conducted in 2013 and 2014. For paper and paperboard and plastic containers, both food contact and foodservice categories had similar, and extremely low rates of significant residue (ratings of 4 and 5 totaled 0% for paper and paperboard, and 2% for plastic containers regardless of foodservice/food contact).

The packaging types that contained the most food residue included both food contact and foodservice items, and were peanut butter jars, plastic salad clamshells, ice cream cartons and pizza boxes. Across all materials and uses, the only categories that had more than 10% of packages with significant residue (ratings of 4 and 5) were Corrugated Foodservice Packaging with 17% and Molded Fiber Foodservice with 23%. All of the other categories had 7% or less of packages with significant residue (ratings of 4 and 5 together).

The category with the largest difference in food residue between food contact and foodservice packaging was molded fiber, with the foodservice subcategory significantly more frequently observed to contain food residue. This is both due to some common foodservice molded fiber applications being prone to residue, as well as the most common food contact application (e.g., egg cartons) being exceptionally clean. Molded Fiber Foodservice packages rated a 1 or 2 were typically a drink cup holder, and those rated a 3 or 4 were typically a clamshell or a



plate with food residue. The only Molded Fiber Food Contact packaging observed was egg cartons, which occasionally had minimal food residue but was typically clean, and overall had the lowest average rating of all sort categories.

## Other Notes

As part of the sorting process, samples were initially characterized in terms of total foodservice, total food contact, other recyclables and trash, by weight. An average of 13% of the sampled material contained contaminants consisting of trash or other items that are not accepted by the MRF. This low contamination rate is an indicator of strong education programs, presumably making it less likely that residents would deposit highly contaminated packaging into their recycling carts.

## Conclusions

With the exception of molded fiber items, the percentage of foodservice and food contact items within the sorted material categories (OCC, plastic containers, aluminum, etc.) containing significant amounts of food residue is roughly the same.

Additional studies will be needed at varying locations to develop a robust dataset, though all three studies conducted to date have provided similar conclusions.

*More information on FPI's recovery work is available at [www.recycleFSP.org](http://www.recycleFSP.org).*