

CONSUMPTION OF PACKAGING AND SERVICE PRODUCTS IN MCDONALD'S RESTAURANTS AND ANALYSIS OF CUSTOMER BEHAVIOR AND SEPARATE WASTE COLLECTION RESULTS

Executive Summary

Edited by
Duccio Bianchi,
for Comieco



comieco
Consorzio Nazionale Recupero e Riciclo
degli Imballaggi a base Cellulosica

Consumption of Packaging and Materials

Compared to 2022—when Comieco did its first survey of McDonald's fast-food operations—there was an increase in the consumption of food packaging, though this increase was lower than the increase in the number of McDonald's restaurants.

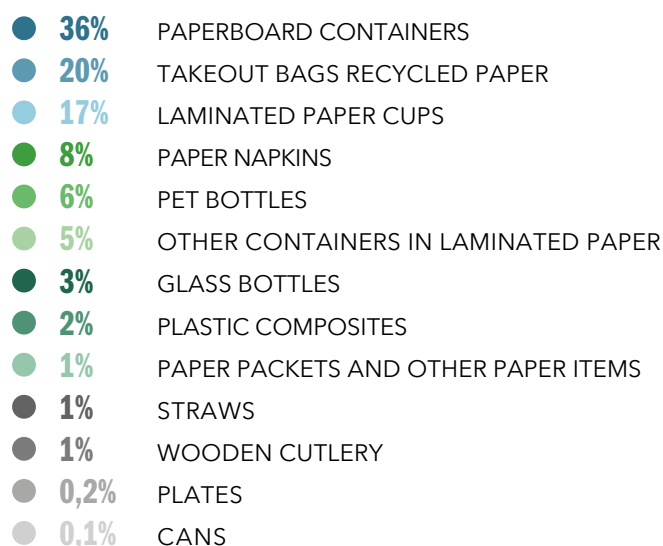
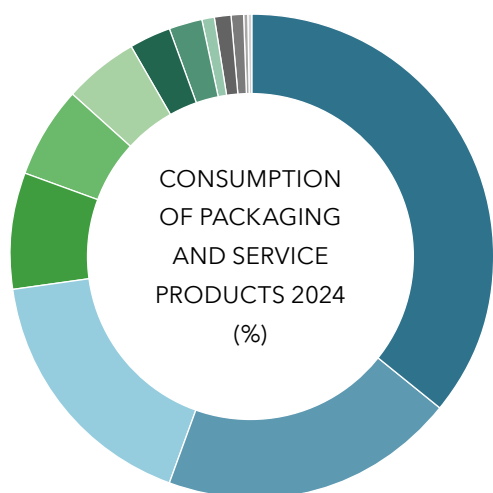
Of the total consumption of packaging and service products—just under 20,000 metric tons in 2024—90% consisted of packaging, with the remainder made up of other products (napkins, straws, etc.).

Over 88% of consumption consists of cellulose-based products, a figure that has increased compared to previous years.

The types of packaging used have remained structurally similar from 2022 to today, but with the notable phase-out of polystyrene lids, which have been replaced with laminated paper lids. All paper packaging is produced by Seda.

Single-cellulose paper and paperboard (such as boxes and bags) account for 67% of total consumption; laminated paper (cups, ice cream containers) for 21%, plastic (mainly bottles) for 7%, glass for 3%, with the remainder consisting of wood and aluminum.

CONSUMPTION OF PACKAGING AND SERVICE PRODUCTS 2024 (%)



When breaking down composite packaging by constituent materials, 66.2% of total material consumption consists of virgin paper (entirely from sustainable forestry) and 20.3% of recycled paper. Plastic polymers account for 9.2% of consumption, mainly PET (including recycled PET).

Recycling potential of the packaging used

Nearly all the packaging and service products used—such as containers, paper bags and napkins, cans, glass and PET bottles—are recyclable.

Apart from minor items (such as receipts), the only type of packaging that is potentially problematic is paper-based composites. But even these can be recycled in conventional paper mills.

Composite paper packaging consists mainly of cups. Those for hot beverages or foods are made of cellulose with a single layer of LDPE (low-density polyethylene); those for cold beverages and foods, instead, have a double layer on both the inside and outside. The plastic content in these composites ranges from 5-6% in single-layer packaging to 8-11% (on average less than 9%) in double-layer packaging. This packaging can be processed in standard pulping cycles (the “pulping” typical of recycled paper production processes) with a high recovery rate (>90%) of the cellulose fiber present and with coarse waste of less than 15%.

This packaging achieves Levels A and B of the Italian Aticelca classification for paper recycling and is compatible with recycling in conventional paper mills.

One widespread concern regarding the recycling potential of this type of food packaging is food contamination. This concern appears to be unfounded. Firstly, because material analysis of McDonald’s separate paper collection shows that “contaminated” paper accounts for less than 4% on average of the cellulose fraction in the analysis of waste from dining areas and storage facilities. Secondly, while containers containing food or completely saturated with it are unacceptable, new industry guidelines specify that surface stains from sauces and fats—or even small traces of food—are compatible with the recycling process.



Separate waste collection system and user behavior

All restaurants have multiple waste collection points. The collection bin has five openings, each with a different geometric shape and rim color for each waste category: Paper (the largest opening), Liquids, Plastic and Metals, Organic Waste, and Non-Recyclables

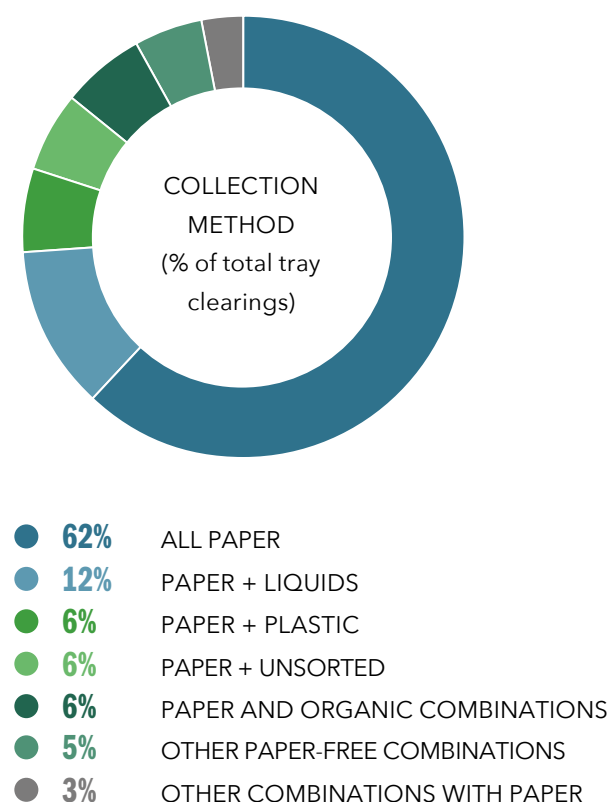
Above the bin is a shelf for placing glass (bottles and glasses) and ceramic items such as plates, mugs, and cups, as well as trays. To encourage correct disposal, there is a large instructional sign above the bin.

To analyze user behavior, as well as the results, the project involved direct observations conducted at 19 different restaurants in the province of Milan, for a total of 1,020 observed tray clearings. The observations were conducted in June 2025.

The main findings of the observations can be summarized as follows:

- **customers tend to sort the various waste streams**, and despite the significant prevalence of paper waste (for which “paper-only” disposal is generally the correct method), there is a significant proportion of combined separate waste collections, involving the separation of liquids, plastic, and unsorted waste (where napkins and receipts are frequently mixed together);

SEPARATE WASTE COLLECTION METHODS AND ERRORS



- **users prefer a simplified waste management system** (prevalence of “all paper”). However, there are still some minor disposal errors, regarding: tray clearings in 11% of cases, as well as cups (4%), bottles (3%), and organic waste (2%);
- **the separation of ceramics, glass, and cans is always correct**, with no evidence of mixing. The same applies to paper containers;
- **there are no significant differences in user behavior based on age groups**, while women are statistically more likely to sort correctly than men. The presence of support staff appears to be helpful in preventing incorrect disposal.



Efficiency of separate waste collection

From June to August 2025, an analysis was conducted to quantify the waste generated and collected separately in the dining areas of McDonald's restaurants.

The waste was analyzed at seven different restaurants located in Milan, Baranzate (MI), Parma, Perugia, Rome, Bari, and Palermo.

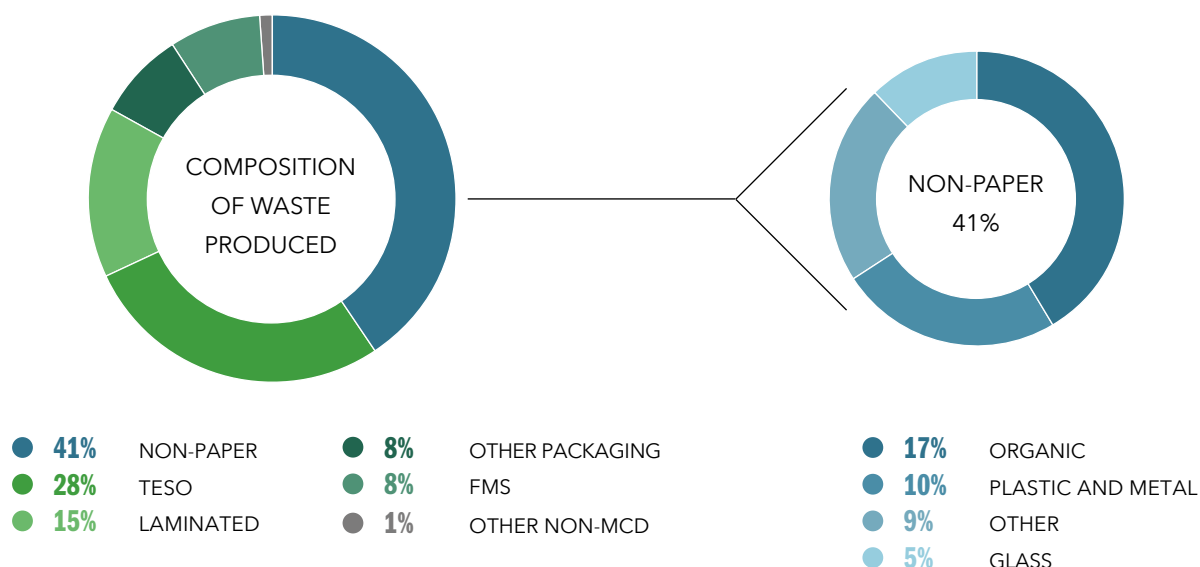
A total of 38 product-specific analyses were conducted, including 12 on the separate paper component, 7 on unsorted waste and plastic, and 6 on glass and organic waste.

For the paper component, 7 analyses were conducted on waste collected in storage areas and 5 analyses limited to dining area waste (bags collected directly from collection points in the dining area).

Waste generated by McDonald's restaurants—consisting of packaging and food waste (food and beverages)—is divided into 5 streams: paper, plastic and metals, glass, organic waste, and unsorted waste. Of the waste delivered, separate paper collection accounts for 62.2%, unsorted waste for 16.6%, plastic for 9.9%, organic waste for 7.7%, and glass for 4%.

Considering the actual composition of the various separate waste components (which also contain non-target materials) and the unsorted waste, 59% of the waste produced consists of various paper components, with the remainder consisting of organic waste (17%), plastics and metals (10%), glass (5%), and other materials (receipts, ceramics, dust etc.).

COMPOSITION OF WASTE PRODUCED



The analysis demonstrated the efficiency of the separate waste collection system.

Separate waste collection (defined as the sum of the waste collected, except for unsorted waste and liquids), on average accounts for approximately 84% of waste at the McDonald's restaurants involved in the survey.

Net of contaminants present in the separate waste streams, the recycling rate is 67% of the waste produced; that is to say 67% of the waste is correctly sorted into the designated separate waste collection channel.

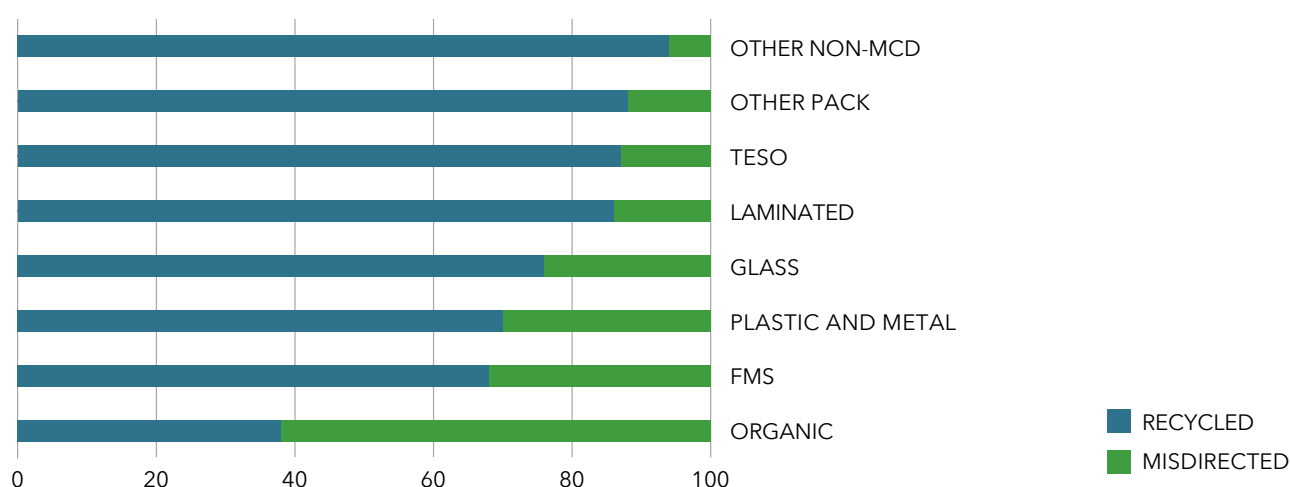
In both cases, these figures are significantly higher than those achieved in Italy for the separate waste collection of household and municipal waste (84% vs. 68%) and for the recycling rate (67% vs. 52%)

The collection rate for paper is very high, with an average recovery rate exceeding 84% (although there are two "outlier" readings among the 12 available).

The misdirection of paper packaging and cellulose-based composites into other recycling streams (primarily unsorted waste) is 12-14%. The misdirection rate for napkins is higher at 32%. The recycling rate for paper packaging is therefore 87%.

For other materials—plastic, glass—the misdirection rate is around 25%, which corresponds to a high recovery rate even for these smaller fractions of the total packaging used by McDonald's.

RECYCLED AND MISDIRECTED FRACTIONS OF PACKAGING AND SERVICE PRODUCTS



The various separate waste collection streams in restaurants always contain non-target materials.

In paper collection, the presence of non-target materials averages 14%; it is generally below 20%, but is below 5% in only two cases. This value is, however, consistent with the acceptance limits for recycled paper, but requires processing at a waste management facility to comply with the “End of Waste” non-target material limit.

The non-target portion present in paper is mainly attributable to the organic component (55%) and “other waste” (mainly receipts, 32%).

Glass collection, on the other hand, is very good quality (less than 3% non-target material), while contamination is higher in organic waste (17%) and plastic (33%), although these figures are not very different from those found in household recycling.

TAB.9. PRODUCT-SPECIFIC ANALYSIS (AVERAGE FIGURES) OF THE VARIOUS WASTE STREAMS

	SWC (separate waste collection) paper*	SWC plastic	SWC organic	SWC glass	Unsorted
FMS McD napkins, straws, tray liners, tray, graphic paper	9,0%	0,6%	2,4%	0,0%	14,1%
TESO food box happy meal cont fries	38,6%	0,6%	0,7%	0,0%	20,9%
OTHER PACKAGING bags, cling film burgers	10,7%	0,6%	1,0%	0,1%	4,6%
PACKAGING LAMINATED PAPER Cups, ice-cream tubs	21,0%	7,7%	1,1%	0,0%	8,1%
OTHER CELL non McD	1,2%	0,0%	0,0%	0,0%	0,2%
Plastic	2,3%	67,5%	4,5%	0,1%	4,2%
Metals	0,1%	4,4%	0,0%	0,0%	2,7%
Glass	0,1%	7,5%	3,9%	97,4%	0,0%
Organic	10,8%	0,8%	83,0%	0,0%	21,0%
Other	6,3%	10,3%	3,4%	2,4%	24,3%
CELLULOSE-BASED	80,4%	9,5%	5,2%	0,1%	47,9%

* Figures include the outlier value for Rome. Excluding this value, the proportion of cellulose in paper swc is 86.1%.

A critical factor in improving separate waste collection—primarily of paper—is adjusting the collection schedules of the waste collection service. This type of restaurant is characterized by a higher volume of paper packaging to organic food waste compared to other types of restaurants. To prevent materials from being compacted—and possibly contaminated- and reduce the risk of incorrect waste disposal, the frequency of waste paper collection must be tailored to the volumes produced and the storage capacity of the premises.

The study produced several recommendations to increase recycling of the waste generated, focusing both on the characteristics of packaging and service products (for example, by introducing receipts made from non-carbonless recycled paper) and on the organization of the collection service.





Revision
may 2026