

# Thermal paper cash register receipts account for high bisphenol A (BPA) levels in humans

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Vom Saal's team is providing the first data that BPA from thermal paper used in cash register receipts accounts for high levels of BPA in humans. Credit: University of Missouri-Columbia

Bisphenol A (BPA) is a chemical that is used in a variety of consumer products, such as water bottles, dental composites and resins used to line metal food and beverage containers, and also is used in thermal paper

cash register receipts. Now, research conducted at the University of Missouri is providing the first data that BPA from thermal paper used in cash register receipts accounts for high levels of BPA in humans. Subjects studied showed a rapid increase of BPA in their blood after using a skin care product and then touching a store receipt with BPA.

"BPA first was developed by a biochemist and tested as an artificial estrogen supplement," said Frederick vom Saal, Curators Professor of Biological Sciences in the College of Arts and Science at MU. "As an endocrine disrupting chemical, BPA has been demonstrated to alter signaling mechanisms involving estrogen and other hormones. Store and fast food [receipts](#), airline tickets, ATM receipts and other thermal papers all use massive amounts of BPA on the surface of the paper as a print developer. The problem is, we as consumers have hand sanitizers, hand creams, soaps and sunscreens on our hands that drastically alter the absorption rate of the BPA found on these receipts."

In the study, researchers tested human subjects who cleaned their hands with hand sanitizer and then held [thermal paper](#) receipts. As an added step, subjects who had handled the thermal paper then ate French fries with their hands. The result was that BPA was absorbed very rapidly,, vom Saal said.

"Our research found that large amounts of BPA can be transferred to your hands and then to the food you hold and eat as well as be absorbed through your skin," vom Saal said. "BPA exhibits hormone-like properties and has been proven to cause reproductive defects in fetuses, infants, children and adults as well as cancer, metabolic and immune problems in rodents. BPA from thermal papers will be absorbed into your blood rapidly; at those levels, many diseases such as diabetes and disorders such as obesity increase as well. Use of BPA or other similar chemicals that are being used to replace BPA in thermal paper pose a threat to human health."

**More information:** "Holding thermal receipt paper and eating food after using hand sanitizer results in high blood bioactive and urine total levels of bisphenol A (BPA)" *PLOS ONE*, October 22: [dx.plos.org/10.1371/journal.pone.0110509](https://doi.org/10.1371/journal.pone.0110509).

Provided by University of Missouri-Columbia

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