Do you want your receipt? BPA and BPS in thermal paper

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July 28, 2015
The MPCA...

Working to protect and improve our environment and enhance human health.
BPA on thermal paper in the news

You’re Absorbing BPA From Receipts, Study Shows

The risky chemical lurking in your wallet.
New research finds that the BPA in cash register receipts is absorbed through skin.

Published: March 29, 2014 08:15 AM
How does thermal paper work?
Is it thermal paper or bond paper?
Project approach

- EPA Grant
- Hospitality sector
- Tested papers
- Assistance with switch to digital receipts
- Exploration of other strategies
- Voluntary, pollution prevention approach
Why not regulate “BPA-free”? 

“To every problem there is a solution that is simple, clean, and wrong.” -HL Menken

- Regrettable substitutions
- “BPA-free” does not mean “safer”
Meet the cousin

Micrograms per cm$^2$ of BPA and BPS in tested samples of thermal paper
BISPHENOL A ALTERNATIVES IN THERMAL PAPER

For most endpoints, the criteria define “High,” “Moderate,” and “Low” concern. Very few chemicals had measured data for all endpoints; therefore, estimation methods were applied to fill data gaps. Since estimation methods come with a lower degree of confidence, this circumstance may be an important consideration for decision-making. No clearly safer alternatives to BPA were identified in this report – most alternatives have Moderate or High hazard designations for human health or aquatic toxicity endpoints. Persistence and bioaccumulation potential were not distinguishing for this group of alternatives.
Bisphenol A (BPA)

- 13.5 billion pounds per year globally
- Used in polycarbonate plastic, epoxy resins, specialty coatings
- Present in almost all of us
- Present in Minnesota surface waters
- Degrades quickly, but is “pseudo-persistent”.
BPA impacts

- Affects health of humans and aquatic life.
- Endocrine active – mimics estrogen.
- Linked to obesity, proliferation of breast cancer cells, attention and other developmental issues, early onset of puberty.
- In aquatic species, reduces ability to reproduce (ex. feminization of males.)
BPA

- Minnesota Priority Chemical
- California Prop 65 list as female toxicant (2015)
- EPA considering rulemaking to add BPA to Concern List: unreasonable risk of injury to the environment.
What we know

- Cashiers have more BPA in blood and urine.
- Unbound on receipts, 1-2% by weight
- Easily transferred to skin and absorbed.
- Transfer and uptake are facilitated by moisture, alcohol sanitizers, lotions, grease.
- 10-60% of BPA on hands will be absorbed.
- Less chemical on unprinted side
What we don’t know

- Dose and timing interactions
  - Low dose vs. higher doses
  - Accumulated doses
  - Dose timing
Alternatives and actions?
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Steps employees can take

- Minimize handling of thermal receipts.
  - Minimize friction/wipe action, crumpling
  - Handle with just two fingers
  - Minimize grip pressure
  - No moisture, grease, lotion, alcohol-based cleaners
- Fold printed side in
- Wash hands before eating
Steps businesses can take

- Ask “Do you want your receipt?” don’t print unwanted receipts (8-37% reduction)
- Don’t print merchant copies if kept electronically (~50% reduction)
- Switch to e-receipt system (18 - 90% reduction)
- Shorten receipts (paper reduction but no occupational exposure reduction)
- Double-sided thermal paper (no chemical reduction; 40-50% less paper)
- Switch to a non-phenol paper (99.9% chemical reduction; little or no paper reduction)
Small retail results

- 8 businesses:
  - 7,300 pounds of paper
  - 109 pounds of BPA/BPS reduced
  - 10-30% reduction

- 14 additional project partners could reduce
  - 1,052 – 3,155 pounds of paper
  - 12-36 pounds of chemical use
Large retail and beyond

- Best Buy – over 7,000 lbs chemical reduction with change in paper

- MPCA estimates
  US thermal paper use ~146,000 tons annually. 10-30% paper reduction:
  - 14,600 – 43,800 tons less paper
  - 219-657 tons less endocrine-active chemical use
There is potential for pollution prevention through active promotion of strategies for using less thermal receipt paper
BPA in thermal receipt paper

The MPCA encourages Minnesota businesses to voluntarily reduce the amount of thermal receipt papers they use and distribute to their customers. These papers typically contain relatively high concentrations of the chemical Bisphenol-A or related chemicals. BPA is useful as a heat-triggered developer for thermal receipt papers used at the point of sale in everyday retail outlets. Because of this, the receipts have become an avenue for BPA exposure for all who handle receipts, and a mechanism for spreading BPA through the environment.

While the rate of absorption through the skin and calculating added risk from handling receipts is not completely certain, thermal paper receipts are recognized as a pathway for BPA exposure for people who handle receipts (especially cashiers), and as a mechanism for spreading BPA through the environment.

If you are a business or employee interested in this issue, check this website regularly for updates, tools and information being developed from this project. If you would like assistance or additional information, please contact Madalyn Cioci, 651-757-2276

MPCA thanks the U.S. Environmental Protection Agency’s Pollution Prevention Program for the grant which supported this project.

Local business goes paperless

The idea is of paperless receipts is catching on, and many businesses are making the change.

Find out more about how Claddagh Coffee made the switch.
Thank you!

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Thermal Paper Project  www.pca.state.mn.us/receipts