

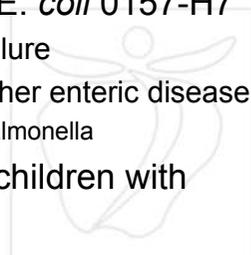


Environmental Potpourri III.



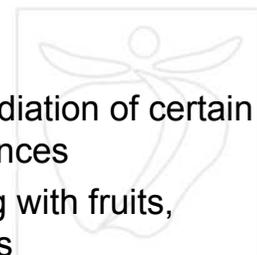
Food irradiation – is it harmful?

- No.
- Is it a benefit to children. Yes.
 - Irradiation can reduce risk of *E. coli* 0157-H7
 - A significant cause of kidney failure
 - Can also likely reduce risk of other enteric disease
 - Especially *Campylobacter* and *Salmonella*
 - May be of particular value to children with immune deficiencies



Aim of food irradiation

- decrease disease risk
- kill microbes causing deterioration of food products
- decreasing food waste
- Hungarian case – EU
 - 1992/2/EK decree allows irradiation of certain food under special circumstances
 - only for one company dealing with fruits, vegetables, pepper and herbs



Why has Irradiation been so Strongly Opposed?

- Public anxiety about radiation
 - Concern that there will be persistent radioactivity in the food
 - This is not the case
 - Concern that taste, texture, or nutrition will suffer
 - Small decreases in vitamin levels may occur
 - Less than cooking
- Mistrust of government & industry motives
 - Will increase shelf life and reduce loss and spoilage
 - Public perceives is being done primarily for industry profit, not health
- Public identification with anti-genetic modification?
- Strong campaigns by some consumer groups

One Legitimate Risk

- Irradiation commonly uses isotope gamma sources (ie Cobalt-60 or Cesium-137)
 - These could be susceptible to theft and used to cause harm
 - Unlikely that industries (including hospitals) which have cobalt sources can guard them adequately to protect against this theft
 - There is also risk that employees could be harmed if proper procedures not followed

Irradiation of Foods will Likely Benefit Children (and adults)

It is unlikely that this practice poses significant environmental health risk.



Is it safe to grill food for children?

- Cooking foods (primarily meat) over very hot fire produces polyaromatic hydrocarbons (“heterocyclic amines”)
 - These are carcinogenic
 - Similar to cancer-causing compounds found in cigarette smoke
 - All meats (including chicken and fish) are risk
- **Should we feed cooked meat to children?**

Is it safe to grill food for children?

- Even though some cultures like to eat raw meat (“steak Tartar”), this is not healthy for children – especially ground meat that can be a major source of *E. coli* O157-H7.
- Slow cooking like boiling or stewing or roasting cooks meat safely without producing much HCA.
 - Frying, grilling, barbecuing increase HCA
 - But HCA consumption can be reduced significantly if
 - Meat does not char – use low fire and good distance from meat
 - Marinade generously and use *lean* meat
 - Meat is turned every minute
 - Any charred areas are cut off before serving
 - You have a microwave: partially cook (2 minutes) before barbecuing

Risks of HCA

- Epidemiologic risks are for GI cancers and prostate cancer
 - We don’t know yet whether these are caused by childhood or adult consumption of HCAs
 - Seem likely to be primarily a risk for adults
 - Some experimental risk of lymphoma from HCAs but
 - No evidence for leukemia or brain cancer
 - Two major childhood risks
- No current evidence that children are at risk

Biggest Risk of Cooking over Open Fire

- Burns
 - Children must be kept away from the fire and from all hot utensils
 - Risk of burn is much greater than risk of cancer
- Carbon monoxide
 - No open-fire cooking should be done except in well-ventilated areas
 - Almost always only outside or with a well-functioning chimney

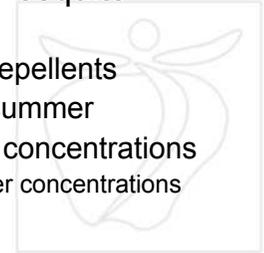
Should we worry about heterocyclic amines and children?

Probably not. Careful food preparation can reduce risks for adults *and* children.



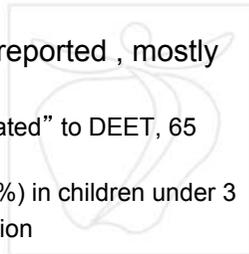
Are insect repellents with DEET safe for young children?

- Probably
- The spread of West Nile virus in both Europe and North America and the risk of Lyme disease in many parts of Europe make mosquito repellants important
 - About 1/3 of US population uses repellents
 - Typically for about a week in the summer
 - Children are cautioned to use low concentrations
 - But these do not last as long as higher concentrations
 - Concern has been risk of seizures



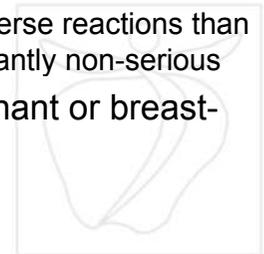
What Do We Know About DEET risks?

- Based on registry data
 - Sponsored by manufacturers – so we must be wary of results, but is among our best data
 - DEET registry – supposedly covers 5×10^9 uses from 1995-2001.
 - 100 adverse events in children reported, mostly under age 13.
 - Of these, 13 judged “probably related” to DEET, 65 “possibly related”
 - 59 of these were seizures, 14 (23%) in children under 3
 - » No evidence for DEET causation



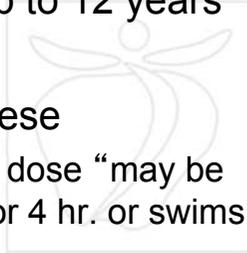
What Do We Know About DEET risks?

- Review by Dr. Koren from Toronto
 - Canadian Medical Assoc. Journal Aug 5/2003
 - Evidence of harm to young children reviewed
 - No data supports harm
 - Young children have more adverse reactions than adults, but these are predominantly non-serious
 - No evidence of harm to pregnant or breast-feeding women



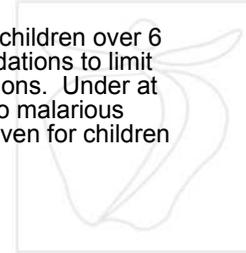
Current Recommendations

- No DEET under 6 months
- 6 months – 2 years – 1 application daily
- 2-12 years – 3 applications daily
- 10% is maximum strength up to 12 years
- Little evidence supporting these
 - Koren recommends a second dose “may be warranted” if child outdoors for 4 hr. or swims



It is unlikely that DEET poses any risk to children.

DEET can probably be used safely in children over 6 months, though there are recommendations to limit concentration and number of applications. Under at least some circumstances (travel to malarious countries) benefits likely exceed risk, even for children under six months.



“Children of the 90s Study” – Bristol, England

- 40% of homes used fresheners/cleaners regularly
 - Mothers and children in these homes more likely to report frequent sickness
 - Risk of ecological fallacy, but suggests possibility of association
 - **Are air fresheners safe for children?**



Ionizers and air fresheners

- Major 2006 California study by Nazaroff et al looked at 21 of cleaners & fresheners
 - When used as directed, all produced significant air levels of potentially harmful chemicals – but generally below limits
 - Many had chemicals which were reactive with ozone – primarily “terpenes” (lemon oil, pine oil)
 - Common outdoor air pollutant, and produced by some ionizers
 - Combination of ozone and fresheners/cleaners -> formaldehyde and other quite toxic substances



Household Risks in Home Simulations

- Simulated 15 minute bathroom cleaning
 - Could exceed inhalation risks because of small space, intense use, poor ventilation
- Risk may be highest for professional house cleaners - daily use
- Use of fresheners + ionizers in bedrooms
 - Could cause excess exposure to formaldehyde for children
 - Should be avoided
 - Also avoid use of terpene air fresheners in children's rooms when there is high outdoor air ozone

Incense and candles and indoor air

- Even when electric lights are so readily available, many people like candles for romantic “atmosphere”
- Incense is widely used in many homes and public areas – not only in Asia
- **Do candles and incense significantly affect the air that we and our children breathe?**

Unfortunately for romance, the answer is “Yes”

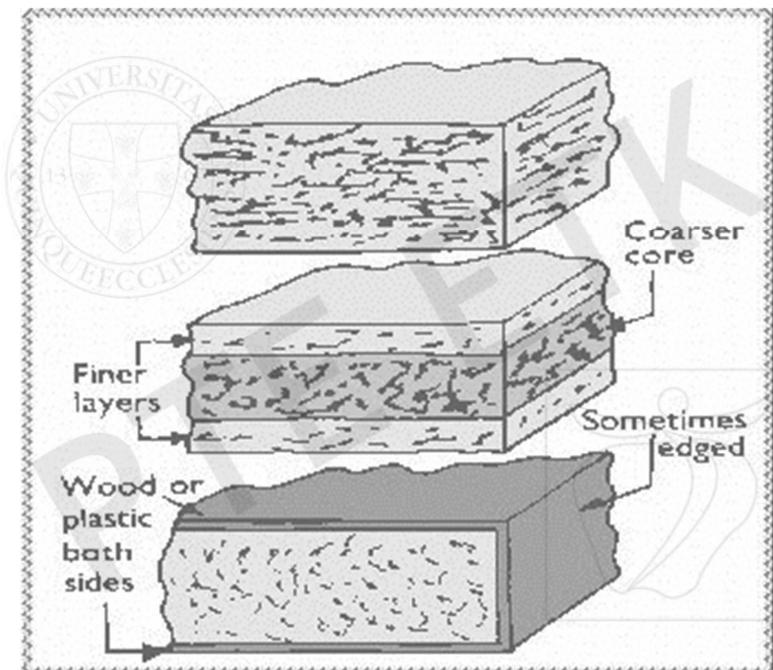
- Candles and incense both *do* produce particulate emission in indoor air
- But some kinds of candles emit lead into the atmosphere when they burn – a surprise!
 - Candles with metal wire in their wicks may release lead when they burn
 - Some wicks are made of zinc rather than lead, but may have lead contamination
 - Less dangerous, but add to household dust lead
 - Do not use metal wick candles around children or in poorly ventilated rooms
 - Most of these candles are designed to burn for long times – often for religious purposes

Candle and Incense Smoke

- Candles produce “soot” – probably PM-25
 - Soot contains benzene and sometimes phthalates
 - Risks unclear, but nothing good about these
- Incense also produces soot
 - Quantity is variable, but much greater (5X) particulate production than cigarettes
 - Though less nitrogen oxides and carbon monoxide
 - Incense also produces benzene and polycyclic aromatic hydrocarbons
 - Incense smoke is mutagenic by Ames bacterial test
 - Suggests that it may be a cancer risk – like 2nd hand cigarette smoke

Might Candles and Incense be Good for Children

May help us make children. Unlikely to help us keep them healthy. Avoid frequent use around kids.



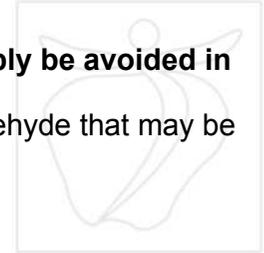
Chipboard furniture – what is it? Can it harm children?

- Chipboard is made from wood dust by combining it with glues to produce boards from which inexpensive children's furniture is often made.
 - several furniture is made from chipboard around us
 - the tables for example



Chipboard furniture – what is it? Can it harm children?

- Chipboard furniture releases formaldehyde into the room air
 - Releases seem to be greater in the summer months
 - Formaldehyde is a strong respiratory irritant as those of you who have taken gross anatomy know
 - Formaldehyde levels above 60 ppb (levels not unusual in children's bedrooms) are associated with asthma and other respiratory symptoms
 - It is probably also carcinogenic
- **Chipboard furniture should probably be avoided in houses with young children**
- Remember other sources of formaldehyde that may be asthma triggers:
 - New latex paint
 - Unvented gas heater



Thank you for your attention

