Bisphenol A

Introduction

- For my fact sheet topic I chose to research Bisphenol A. I started the project without a clue as to what Bisphenol A was, but once I started my research it became very clear. It seems that once Bisphenol A was brought to market there were a lot of concerns about the effects it had on people's health. Since Bisphenol A is found in so many products worldwide, if it did affect our health in a negative way, the issue of removing it from these products would be a very serious one. But through extensive research the Food and Drug Administration has concluded that the low levels of Bisphenol A that we are exposed to, in fact, do not put us at risk for any health problems.

  Although many government Web sites suggest that Bisphenol A will not risk our health in any way, I am skeptical. There are new studies being done all the time and many of them prove that a number of different materials can put us at risk, so why would Bisphenol A be any different?

Section 1: Background and Problem Statement

- **Web site #1 Name:** Healthy People 2010
- **Web address:** http://www.cdc.gov/exposurereport/data_tables/BisphenolA_ChemicalInformation.html
- **Background Information:**
  - Bisphenol A is a phenolic chemical used in the manufacture of polycarbonate plastics and epoxy resins, in thermal paper production, and as a polymerization inhibitor in the formation of some polyvinyl chloride plastics.(Par 1) Products containing Bisphenol A are anything from

canned food linings, baby bottles, and toys to some floorings and even dental composites. (Par 1) Bisphenol A is controversial because the long term health effects are unknown. Through research done in animals, some findings did suggest that there may be negative effects to living organisms that experienced high doses of Bisphenol A. Another study that only tested animals with low doses found that there can be some negative effects and these include: altered development of the fetal prostate and mammary gland, inhibition of postnatal testosterone production, and changes in neurodevelopment. (Par 3)

- **Web site #2 Name:** Bisphenol A
- **Web address:** http://www.bisphenol-a.org/about/faq.html?gclid=CJnKsffsgaECFQuB5Qodqn0RzA#a
- **Background Information:**
  - Bisphenol A is one of the most extensively tested materials in use today. It has been safely used in many products and researched for over forty years. (Par 5) Scientific evidence strongly suggests that the use of Bisphenol A is safe and there is no basis for human health concerns from exposure to Bisphenol A. (Par 5)

    Many safety assessments conclude that the potential human exposure to Bisphenol A from polycarbonate plastics and epoxy resins is more than 400 times lower than the safe level of BPA set by the U.S. Environmental Protection Agency. This very low level of exposure poses no risk to human health. (Par 6)

- **Web site #3 Name:** Since You Asked – Bisphenol A (BPA)
- **Web address:** http://www.niehs.nih.gov/news/media/questions/sya-bpa.cfm

- **Background Information:**
  - Through a study conducted by the National Toxicology Program (NTP), the following conclusions were found on the possible effects of current exposures to Bisphenol A on human development and reproduction. (Par 1) There are five levels of concern ranging from negligible concern, minimal concern, some concern, concern, and to serious concern. There is negligible concern regarding exposure of pregnant women to Bisphenol A and the effects it will have on fetal or neonatal mortality, birth defects, or reduced birth weight and growth in their offspring. (Par 4) There is minimal concern for effects on the mammary gland and an earlier age for puberty for females in fetuses, infants, and children at current human exposures to bisphenol A. (Par 3). There is also minimal concern for workers exposed to higher levels in occupational settings. (Par 5) There is some concern for effects on the brain, behavior, and prostate gland in fetuses, infants, and children at current human exposures to bisphenol A. (Par 2)

Section 2: Research

- **Web site #1 Name:** Perinatal Exposure to Bisphenol A and the Development of Metabolic Syndrome in CD-1 Mice.
- **Web address:** http://www.ncbi.nlm.nih.gov/pubmed/20351315
- **Summary of the research:**
  - It has been suggested that exposure to BPA, even low doses of exposure, during development may be associated with increased susceptibility to diabetes and obesity later in life. Because of the growing cause for concern, The Endocrine Society, the National Institute of Environmental

Health Sciences, and others conducted further research. They tested mice by exposing them to BPA and comParing them to other mice that were not exposed to BPA. They found that the mice that were not exposed to BPA were smaller during gestation and lactation and even shorter comPared to the mice exposed to BPA but these findings did not hold true once the mice reached adulthood. (Par 1)

In turn their research concluded that BPA does not directly correlate with increased susceptibility to diabetes and obesity later in life. Instead these institutions concluded that this larger size for age represents a faster rate of growth early in development, rather than an obese, diabetic phenotype in adulthood. (Par 1)

- **Web site #2 Name:** Bisphenol A: Toxic Plastics Chemical in Canned Food
- **Web address:** http://www.ewg.org/reports/bisphenola
- **Summary of the research:**
  - Since there are no government safety standards limiting the amount of Bisphenol A in canned foods a number of independent laboratories tested 97 cans of name brand fruit, vegetables, soda and other commonly eaten canned foods. (Par 1) This study was led by the Environmental Working Group and targeted the chemical Bisphenol A.

    The study concluded that of all foods tested, chicken soup, infant formula, and ravioli had BPA with levels of highest concern. Just one to three servings of foods with these concentrations could expose a woman or child to BPA at levels that caused serious adverse effects in animal tests. (Par 2)

For 1 in 10 cans of all food tested, and 1 in 3 cans of infant formula, a single serving contained enough BPA to expose a woman or infant to BPA levels more than 200 times the government's traditional safe level of exposure for industrial chemicals. The government typically mandates a 1,000- to 3,000-fold margin of safety between human exposures and levels found to harm lab animals, but these servings contained levels of BPA less than 5 times lower than doses that harmed lab animals. (Par 3)

- **Web site #3 Name:** Lexology- Study Claims BPA Exposure May Cause Permanent Fertility Defects
- **Web address:** http://www.lexology.com/library/detail.aspx?g=fad245d5-6a37-47c3-8637-ef8ee6a60667
- **Summary of the research:**
    - According to a Yale University press release, it has been found that BPA exposure permanently affects sensitivity to estrogen. In order for them to come to this conclusion, researchers used two groups of mice, one exposed to BPA during pregnancy and the other exposed to a placebo. (Par 1)

      The results of the study concluded that the mice exposed to BPA as a fetus had an ex**a**ggerated response to estrogens as adults, long after the exposure to BPA, and that the genes were permanently programmed to respond excessively to estrogen.

Section 3: Statistics

- **Web site #1 Name:** Chemical Encyclopedia- Bisphenol A
- **Web address:** http://healthychild.org/issues/chemical-pop/bisphenol_a/
- **Summary of the statistics:**
    - Many studies have found that Bisphenol A affects a number of hormones in the body. New studies are constantly coming out with new information

about the risks of exposure to Bisphenol A. With this in mind Bisphenol is still being produced at an alarming rate.

Bisphenol-A is one of the top 50 chemicals produced in the U.S. Over 1.6 billion pounds of this hormone disruptor were produced in 1995. (Par 8)

- **Web site #2 Name:** Since You Asked- Bisphenol A
- **Web address:** http://www.niehs.nih.gov/news/media/questions/sya-bpa.cfm
- **Summary of the statistics:**
  - Since human exposure to BPA is so widespread there is a reason to be concerned. Bisphenol A is found in so many products used today and if it is putting us in danger, not only should it be known, actions should be done to reduce the exposure greatly.
  - To get an idea of just how widespread exposure to BPA is the 2003-2004 National Health and Nutrition Examination Survey (NHANES III) conducted by the Centers for Disease Control and Prevention (CDC) found detectable levels of BPA in 93% of 2517 urine samples from people six years and older.

- **Web site #3:** Chemical Encyclopedia- Bisphenol A
- **Web address:** http://healthychild.org/issues/chemical-pop/bisphenol_a/
- **Summary of the statistics:**
  - There continues to be a growing concern about just how much Bisphenol A is safe to ingest. Some studies suggest different amounts while others suggest that no amount on Bisphenol A is safe. Due to the concern there have been many efforts to see just how much Bisphenol A people ingest from different sources.

According to the Chemical Encyclopedia, on average, humans ingest approximately 6.3 micrograms per day of bisphenol-A from the linings of food cans.

Section 4: Consumer Information

- **Web site #1 Name:** Bisphenol A Facts
- **Web address:** http://med.stanford.edu/mcr/2008/bpa-facts-0430.html
- **Summary of the information:**
  - There are many things that can be done in order to reduce exposure to Bisphenol A. It is important to steer clear of hard containers or those that are labeled with the recycling number 1, 2, 4, 5, or 7. Avoid microwaving any plastic containers, also it is important to avoid washing these hard plastic containers in the dishwasher, the heat and alkali detergent can increase the likelihood of leaching. Instead of plastic containers use glass, porcelain or stainless steel. Another important thing to remember is to limit the consumption of canned goods. Lastly to reduce exposure, look for products with that are labeled Bisphenol A or BPA free.

- **Web site #2 Name:** The Washington Post
- **Web address:** http://www.washingtonpost.com/wp-dyn/content/article/2008/09/16/AR2008091601132.html
- **Summary of the information:**
  - The National Toxicology Program of the DePartment of Health and Human Services has come up with a list of things to do in order to avoid Bisphenol A. Do not microwave polycarbonate plastic food containers; they contain BPA, especially ones with a number 7 on the bottom. Reduce the use of canned foods, especially highly acidic ones, like tomatoes. When buying items that are usually canned, opt for ones packages in cardboard boxes

lined with aluminum. Lastly, it is very important to use baby bottles that are BPA free. Most major manufacturers now make baby bottles that are BPA free.

- **Web site #3 Name:** Tox Town- Bisphenol A
- **Web address:** http://www.toxtown.nlm.nih.gov/text_version/chemicals.php?id=69
- **Summary of the information:**
  - Exposure to Bisphenol A is almost impossible to avoid but by taking certain precautions the chances of over exposure can be greatly reduced. Plastic water bottles can be a source of Bisphenol A, try to use alternatives like aluminum bottles now being sold. Plastic dinnerware can also contain Bisphenol A. Another product that can contain BPA is reusable plastic cups. Try to avoid using these products to reduce intake of BPA. Another place BPA is found is in dental sealants, ask if there is alternative to these and if the ones that are in use are safe.

Section 5: Solutions to the Issue

- **Web site #1 Name:** FDA U.S. Food and Drug Administration
- **Web address:** http://www.fda.gov/NewsEvents/PublicHealthFocus/ucm197739.htm#current
- **Summary of the information:**
  - At this interim stage, FDA shares the perspective of the National Toxicology Program that recent studies provide reason for some concern about the potential effects of BPA on the brain, behavior, and prostate gland of fetuses, infants and children. (Par 15) The FDA also recognizes uncertainty in these studies and their potential implications for human health effects of BPA exposure. Due to these issues becoming a great

concern, the FDA is beginning to take steps in figuring out how to deal with Bisphenol A exposure.

FDA is pursuing additional studies to address the uncertainties dealing with exposure to Bisphenol A. They are deciding whether a shift to a more robust regulatory framework for oversight of BPA is suitable in order to be able to respond quickly, if necessary, to protect the public. (Par 16)

In addition, FDA is supporting reasonable steps to reduce human exposure to BPA, including actions by industry and recommendations to consumers on food preParation. At this time, FDA is not recommending that families change the use of infant formula or foods, as the benefit of a stable source of good nutrition outweighs the potential risk of BPA exposure. (Par 17)

- **Web site #2 Name:** Environmental Health Perspectives
- **Web address:** http://ehsehplp03.niehs.nih.gov/article/info:doi%2F10.1289%2Fehp.117-a541
- **Summary of the information:**
  - With $14 million in stimulus funds from the American Recovery and Reinvestment Act, the NIEHS is bolstering a coordinated effort to produce data on bisphenol A (BPA) that will help refine our understanding of whether the general population's current exposures to the chemical pose a health risk. (Par 1)

    The NIEHS is using the stimulus money to conduct two 10-year studies on the contribution of low doses of BPA in humans to problems, such as obesity, diabetes, reproductive disorders, asthma, sexually dimorphic

behaviors, cardiovascular diseases, and prostate, breast, and uterine cancer. (Par 2)

Since many studies have found negative effects in animals due to BPA exposure, it is now crucial to see if these findings directly correlate to humans.

- **Web site #3 Name:** EPA to Scrutinize Environmental Impact of Bisphenol A
- **Web address:** http://yosemite.epa.gov/opa/admpress.nsf/d0cf6618525a9efb85257359003fb69d/78110048d7f696d1852576f50054241a!OpenDocument
- **Summary of the information:**
  - On March 29, 2010, the Environmental Protection Agency announced a number of actions to address the potential effects of Bisphenol A. The EPA plans to look at the environmental impacts of BPA, and will look to add Bisphenol A to the list of chemicals or concern and require testing relating to environmental effects.

    Releases of Bisphenol A into the environment exceed one millions pounds per year. BPA has caused reproductive and developmental effects in animal studies and may also affect the endocrine system. In order to address this issue fully the EPA is taking these necessary steps:

    · Adding BPA to the chemical concern list on the basis of potential environmental effects. (Par 4)

    · Requiring information on concentrations of BPA in surface water, ground water, and drinking water to determine if BPA may be present at levels of potential concern. (Par 4)

    · Requiring manufacturers to provide test data to assist the agency in evaluating its possible impacts, including long-term effects on growth,

reproduction, and development in aquatic organisms and wildlife. (Par 4)

· Using EPA's Design for the Environment (DfE) program to look for ways to reduce unnecessary exposures, including assessing substitutes, while additional studies continue. (Par 4)

· And, continuing to evaluate the potential disproportionate impact on children and other sub-populations through exposure from non-food packaging uses. (Par 4)

Conclusions:

Although I started this project with no knowledge about what Bisphenol A was or what effect it had on me, I have already learned so much about it and plan to take action when it comes to my health and protecting myself from the harmful affects of BPA. Not only can BPA cause problems with hormones in people's bodies but also it can be found in products that are almost impossible to avoid. Before my research I never knew that plastic water bottles could possibly harm me, but I also learned that there are safe alternatives to them. I hope that once I share the facts about Bisphenol A, people will become concerned and alter their lifestyles for their benefit. It should be known that Bisphenol A is found in baby bottles and in plastic products with the number 7 on the bottom. I plan to look into all of these issues and make my environment as safe as possible and once I can spread the word I hope others will want to as well.

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