PBDE FLAME RETARDANTS AND HUMAN HEALTH

The Issue

Polybrominated diphenyl ether flame retardants (PBDEs) are man-made chemicals added to a wide variety of consumer products to make them less likely to catch fire. Recently, there has been media attention on PBDEs because levels in the environment and in humans in North America, while low, are on the rise and are higher than in Europe, where some PBDEs have been banned.

Background

PBDE flame retardants are added to some plastics, electrical and electronic equipment, upholstered furniture, non-clothing textiles and foam products. Because PBDEs are added to the products rather than chemically bound into them, they can be slowly and continuously released from the products during their manufacture, while in use, or after their disposal.

PBDEs have been found both in the environment and in humans, including in human breast milk in Canada, the United States and Europe. While the levels in humans are very low, they have been increasing with time, and are higher in North Americans than in Europeans.

Commercial PBDEs come in one of three mixtures:

- PentaBDE
- OctaBDE
- DecaBDE

A number of countries and US states have moved to ban PentaBDE and OctaBDE which they consider to be of greatest concern. The major North American manufacturer of these two PBDEs ceased their production in 2004. Because of environmental concerns, many companies have stopped using PBDEs in their products, and it is anticipated that more will follow. In Sweden, the levels of PBDEs in breast milk decreased soon after measures to reduce their use and environmental release were introduced.

Sources of Exposure to PBDEs

PBDEs are found at low levels throughout the environment - in air, water, soil, sediments, indoor dust and food. Although data on levels of PBDEs in the environment are somewhat limited, available information shows that the main sources of PBDE exposure for humans are likely to be indoor air, indoor dust and food, including human milk. In food, PBDEs are generally found in higher concentrations in fatty foods of animal origin, such as some fish, meats and dairy products.

Health Effects Of PBDEs

In the few studies of humans exposed to PBDEs, there is no clear evidence of any adverse effects or of increased disease.

In animals, effects on behavioural development, nervous system development, as well as on the liver and thyroid have been seen in studies on rats and mice exposed to PBDEs. However, the experimental animals were exposed at much higher levels than those to which humans are exposed in Canada.

There is some very limited evidence that PBDEs may cause cancer in laboratory animals. In one study, rats exposed to extremely high doses of DecaBDE over their entire lifetime had an increase in the number of liver tumours. However, this happened only

at doses many times greater than those that caused the behavioural, liver and thyroid problems noted above.

Minimizing Your Risk

If you are concerned about PBDE exposure for you or your family, consider taking the following steps.

- Several electronics and furniture manufacturers now produce computers, sound systems, upholstered furniture, carpet padding, mattresses and futons that are free of PBDEs. Some fibres such as wool are naturally flame-retardant. Ask the retailer about PBDEs before you make a new purchase.
- Since PDBEs are stored in fatty tissue, limit your consumption of fatty foods. Follow the advice in Canada's Food Guide to Healthy Eating and enjoy a variety of low-fat foods. Vegetables, fruit and whole grains contain lower amounts of PBDEs than meat, dairy products and fish.
- As PBDEs (along with other contaminants) can accumulate in house dust, clean your house often, especially if you have young children who may have increased contact with house dust when playing on the floor or furniture.
- Cover or replace any exposed carpet padding or foam pads on upholstered furniture and car seats.

Government of Canada's Role

Environment Canada and Health Canada have recently prepared screening assessments on several PBDEs. The environmental screening assessment done by Environment Canada found that PBDEs were considered to pose a risk to some wildlife and invertebrates. Health Canada's screening assessment found that the estimated current exposure to PBDEs for humans was well below the levels that caused health effects in animals.

Because the recent Canadian assessment of PBDEs concluded that these substances do have a harmful effect on the environment, Environment Canada and Health Canada have proposed that use and/or release to the environment of these PBDEs be strictly controlled.

Under the Food Program, Health Canada has also determined that the levels of PBDEs in human milk, fish and various commercial foods are low, and not considered to pose a risk to human health. Health Canada will continue to monitor and conduct research on environmental contaminants, including PBDEs, as part of the Department's ongoing commitment to the safety of Canada's food supply. Ongoing food monitoring programs, such as the Total Diet Study and other surveys, provide critical information on levels of contaminants in food, which is used in the assessment of risks.

Need More Info?

For more information about the health effects of PBDEs, or Health Canada's screening assessment program in general, contact:

Existing Substances Division
Health Canada
269 Laurier Avenue W.
Ottawa, ON, K1A 0K9
E-mail: ExSD@hc-sc.gc.ca

Or visit:
Health Canada's Existing Substances Division Web site at:
http://www.hc-sc.gc.ca/ewh-semt/contaminants/existsub/index_e.html

Health Canada's Food and Nutrition Web site at:
http://www.hc-sc.gc.ca/fn-an/index_e.html

Also, see the following publications:

It's Your Health - Human Health and the Canadian Environmental Protection Act (CEPA): An Overview at:
http://www.hc-sc.gc.ca/iyh-vsv/environ/cepa-lcpe_e.html

Screening Health Assessment of Existing Substances under the Canadian Environmental Protection Act, 1999 at:
http://www.hc-sc.gc.ca/ewh-semt/contaminants/existsub/screen-eval_e.html

Health Canada Fact Sheets on Polybrominated Diphenyl Ethers at:
http://www.hc-sc.gc.ca/fn-an/securit/chem-chim/pbde-edpb/index_e.html

Health Canada Surveillance Information:
http://www.hc-sc.gc.ca/fn-an/surveill/other-autre/index_e.html

For more on Canada's Food Guide for Healthy Eating, go to:
http://www.hc-sc.gc.ca/fn-an/food-guide-aliment/index_e.html

For additional articles on health and safety issues go to the
It's Your Health Web site at:
www.healthcanada.gc.ca/iyh
You can also call toll free at
1-866-225-0709
or TTY at 1-800-267-1245*

Catalogue #
ISBN #

Original: September 2006

© Her Majesty the Queen in Right of Canada, represented by the Minister of Health, 2006

Canada