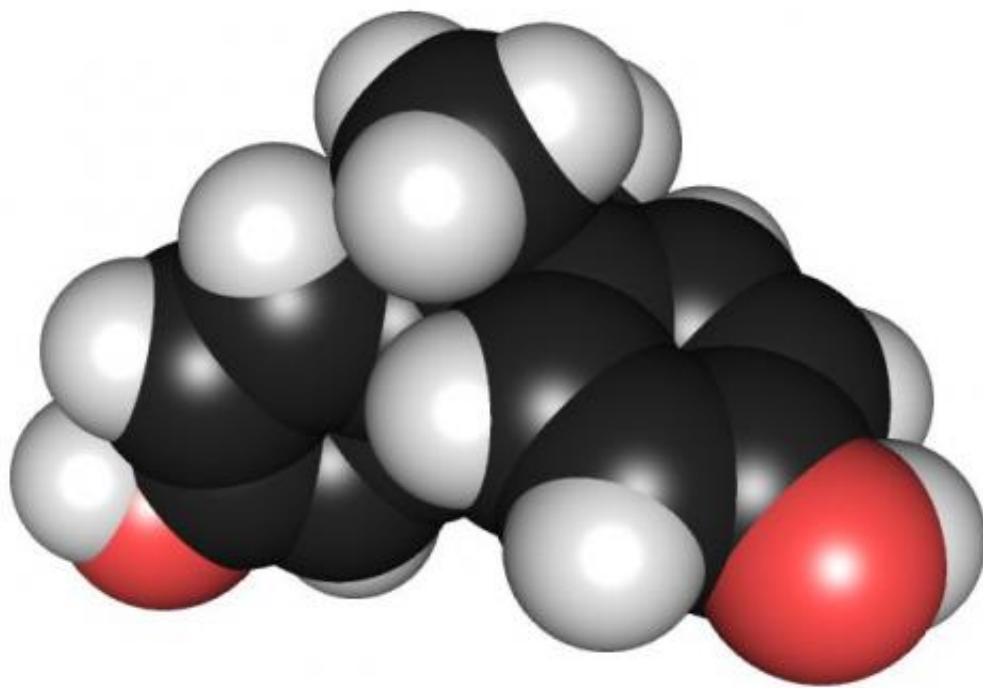


# Bisphenol A in low doses can affect the reproductive system and behaviour

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3D chemical structure of bisphenol A. Credit: Wikipedia.

If rats are exposed to bisphenol A in low doses during early development it can lead to reduced sperm count, obesity and changes to breast development and behaviour. These are some of the findings of a new study from the National Food Institute, Technical University of Denmark. The results support previous animal studies, which have

shown that low doses of bisphenol A can affect development of the metabolism as well as the reproductive and nervous systems.

The chemical [bisphenol](#) A, which is e.g. used in some can linings and certain plastics as well as thermal paper in receipts, is suspected of causing adverse health effects in humans.

The National Food Institute has performed a large animal study to examine the effects of bisphenol A in rats that were exposed to the endocrine disrupting chemical in foetal life and during lactation. The researchers examined the effects on the growth, the developing brain and the reproductive system of the rats, including mammary gland development.

The doses studied ranged from low doses – equivalent to what people may be exposed to – up to higher doses.

## **Effects especially at low doses**

The results show that particularly low doses of bisphenol A affect the development of the animals. The female rats that were exposed to the lowest dose weighed more as adults, and their behaviour had changed in a direction that resembled male behaviour. This could indicate masculinization of the females' brains. Male rats that were exposed to the lowest dose had increased growth of [mammary gland](#) tissue, and decreased [sperm count](#) as adults.

These effects were not observed at the higher bisphenol A doses.

Mammary gland changes that could be indicative of an early stage of breast cancer were observed in aging rats exposed to the second lowest dose of bisphenol A.

The results support previous studies, which show that particularly low doses of bisphenol A can affect the animals' development, while higher doses have different effects.

"Our study shows that exposure to low doses of bisphenol A during development can have harmful effects on male sperm count, affect female behaviour and contribute to obesity as well as cause effects on breast [development](#) in both male and female offspring of [rats](#)," Professor Ulla Hass from the National Food Institute explains.

## Lower limit for bisphenol A recommended

Other animal studies have previously shown similar effects at equivalent doses. According to the National Food Institute's calculations the tolerable daily intake (TDI) should be 0.7 micrograms per kilogram of body weight per day or lower to be sufficiently protective with regards to endocrine disrupting effects of bisphenol A in humans. In February 2015, the European Food Safety Authority, EFSA, set the TDI for bisphenol A to 4 micrograms per kilogram body weight per day. The National Food Institute evaluates that this TDI does not sufficiently protect against endocrine disrupting effects of bisphenol A.

"The health risks of bisphenol A are especially of concern for highly exposed consumers. This applies in particular to pregnant or nursing women and children, who are especially sensitive to the adverse effects of bisphenol A that may occur at low exposure levels," Ulla Hass adds.

**More information:** U. Hass et al. Low-dose effect of developmental bisphenol A exposure on sperm count and behaviour in rats, *Andrology* (2016). [DOI: 10.1111/andr.12176](https://doi.org/10.1111/andr.12176)

K. Mandrup et al. Low-dose effects of bisphenol A on mammary gland development in rats, *Andrology* (2016). [DOI: 10.1111/andr.12193](https://doi.org/10.1111/andr.12193)

Provided by Technical University of Denmark

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