

Do chemicals in the environment affect fertility?

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Our day-to-day exposure to chemicals is on the increase. From food packaging to the air we breathe, every day contact with potentially-toxic substances could be affecting our health — and our fertility.

Researchers at The University of Nottingham are set to take part in one of the first studies of the effect of environmental chemicals on female mammals. Part of the Reproductive Effects of Environmental Chemicals in Females Consortium (REEF), Dr Richard Lea of the School of Veterinary Medicine and Science and Dr Kevin Sinclair of the School of Biosciences will receive a £500,000 grant for their work researching how these chemicals impact on mammalian fertility. REEF will receive a total of £2.4m in funding from the EU.

Dr Lea and Dr Sinclair will study the impact of low levels of environmental chemicals on sheep foetuses in the womb. The specific chemicals to be studied are found in human sewage sludge which is frequently spread on fields where sheep graze prior to entering the human food chain.

The amount of chemicals absorbed is thought to be so minute that they would be difficult to discern through testing. However, through a process known as bioaccumulation, chemicals can become concentrated in individuals over a number of years, stored mostly in fat tissue. Though these chemicals may not be directly harmful to these individuals, if they are passed on — for example, through gestation in the womb or through the food chain — they might have consequences for human health.

“One of the concerns of bioaccumulation is that when the fat is broken down and passed on — for example during the breast feeding process — the offspring are exposed to a concentration of chemicals that the mother has built up over the years,” said Dr Sinclair.

Colleagues in Aberdeen have provided precise measurements of specific chemicals in the environment and in animal tissues. These often take the form of chemicals which mimic hormones.

“These chemicals come from a variety of sources including plastics, pesticides and industrial waste and many of these persist in the environment for a long time — albeit at very low levels,” said Dr Lea. “The problem is even low levels can still have an effect.”

The three-year study will look at how chemicals are passed on from mother to foetus, and how this impacts on the foetus. It is thought that, although this generation of animals may have no problems getting pregnant, the next and future generations could have fertility problems stemming from exposure to environmental chemicals in the womb.

Dr Lea said: “Though male fertility has been the subject of studies in recent years, this will be the first time that female fertility has been examined. Currently, less is known about the effects of hormone-like chemicals on the developing female foetus, so the consequences for reproductive development in females may be greater than in males.”

“We’re not talking about obvious congenital defects here, but tiny changes caused by exposure to chemicals that have an impact on reproductive function — changes over generations rather than immediate effect,” added Dr Sinclair.

Source: University of Nottingham

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