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REPORT LINKS COMMERCIAL DOG FOOD TO DECLINING FERTILITY

ENDOCRINE disrupting (ED) chemicals found in some commercially available dog foods may be a factor in declining fertility.

The findings come from a report based on data taken from a 26-year study and published by the University of Nottingham in *Scientific Reports*. The report also found male pups fathered by dogs with declining semen quality were more prone to cryptorchidism and the number of males born relative to females had declined.

The findings that "environmental influences" such as ED chemicals have an adverse effect on canine sperm function are seen as being a "useful sentinel" for the study of environmental

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influences on human male fertility. Specific ED chemicals identified include polychlorinated bisphenol 153 (PCB153) and diethylhexyl phthalate (DEHP). ED chemicals were found in wet, dry and "puppy" food.

Richard Lea, reader in reproductive biology at the university's School of Veterinary Medicine and Science, and his team examined a unique dataset

based on semen collected from a controlled population of stud dogs – mainly Labrador retrievers, golden retrievers and German shepherds – from 1988 to 2014.

The number of dogs in the programme each year varied between 42 and 97 throughout the study.

Sperm analysis methods

Importantly, all data was generated using sperm analysis methods that have remained consistent throughout the 26 years of the study, with uniform input from three experienced technical staff and one of the senior authors. As such, the data is regarded as robust.

Results demonstrated sperm motility declined by 2.5 per cent per year between 1988 and 1998 and, following a short period when stud dogs of compromised fertility were retired from the study, sperm motility continued to decline at a rate of 1.2 per cent per year from 2002 to 2014.

Data suggesting a similar decline in human semen quality have been questioned on the basis of changes in laboratory methods, training of laboratory personnel and improved quality assurance over the last 53 years.

The University of Nottingham report states: "ED chemicals PCB153 and DEHP are detectable in canine testes collected from dogs from the same location as the temporal study.

"Furthermore, the same chemicals were detected in a range of commercially available dog foods. Since testicular concentrations of these chemicals directly perturbed sperm motility and viability, this may be a mechanism by which environmental chemicals directly affect male fertility."

Further research needed

It concludes: "This study demonstrates that, in a population of stud dogs, sperm motility has declined over a 26-year period. Although the mech-

anism remains to be determined, we have shown chemicals present in testis and ejaculate directly affect sperm function and viability.

"Since the increased incidence of cryptorchidism coupled with declining sperm quality in males is indicative of canine 'testicular dysgenesis syndrome', the domestic dog may be a useful sentinel for the study of environmental influences on human male fertility."

Dr Lea said: "This is the first time such a decline in male fertility has been reported in the dog and we believe this is due to environmental contaminants, some of which we have detected in dog food and in the sperm and testes of the animals themselves.

"While further research is needed to conclusively demonstrate a link, the dog may indeed be a sentinel for humans – it shares the same environment, exhibits the same range of diseases, many with the same frequency, and responds in a similar way to therapies."

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Richard Lea, University of Nottingham