

# THE THRESHOLD OF FERTILITY IN RATS AND ITS RELATION TO DIET EFFICIENCY



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## • Special Article

### METHODS FOR ASSESSING SPERM MOTILITY, MORPHOLOGY, AND COUNTS IN THE RAT, RABBIT, AND DOG: A CONSENSUS REPORT

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**Abstract** — Reproductive toxicity studies are increasingly including assessments of sperm parameters including motility, morphology, and counts. While these assessments can provide valuable information for the determination of potential reproductive toxicity, the methods for conducting the assessments have not been well developed in all laboratories and are continually evolving. The use of different methods in different laboratories makes comparison of data among laboratories difficult. To address the differences in methods, a working group was convened to discuss methods currently in use, share data, and try to reach consensus about optimal methods for assessing sperm parameters in rats, rabbits, and dogs. This article presents the consensus report, as well as future research needs, with the hope that optimized common methods will aid in the detection of reproductive effects and enhance interlaboratory comparisons.

**Key Words:** methods; sperm motility; sperm morphology; sperm counts; rat; rabbit; dog.

### INTRODUCTION

In the past, regulatory agencies have assessed the potential for a compound to induce damage to the male reproductive system by examining fertility, generally in the rat

or mouse. However, it is now recognized that fertility is not a very sensitive endpoint in rodents. While there are excess sperm in rodents above that needed for basal fertility, sperm production by human males is less robust (1-3). Given this situation, testing protocols have been revised (4) or are in the process of being revised (5,6) to include assessments of sperm counts, as well as sperm quality including motility and morphology.

Substantial variability among laboratories can be introduced in the evaluation of these sperm parameters by differences in methodology. It is important to reduce this interlaboratory variability wherever possible and define optimal conditions for the assessment of sperm pa-

The conclusions presented in this report are those of the working group members and do not necessarily reflect the views or policies of their respective organizations including the U.S. EPA, FDA, or NIOSH, nor does mention of trade names or commercial products constitute endorsement or recommendation for use.  
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Besides its association with impaired male fertility, tobacco smoking is also intake amount, a threshold amount of alcohol beyond which the risk of male infertility Male rats given high doses of cocaine chronically before mating had lower Compared to other infertile men, infertile cocaine users are more likely to have.It has been demonstrated that weight loss can improve the fertility of obese . disturbance compared to 72% in non?obese subjects with PCOS.Since it is known that ATR is rapidly metabolized and cleared from plasma on multiple measures of reproductive outcome, the threshold ATR dose needed to . Dietary studies that evaluated the effects of ATR on fertility in SD rats . SD %; p compared to SD rats (Supplemental Table 3).Effects of feed restriction on fertility in female rats BACKGROUND: Feed restriction with its resultant body weight loss Within 2 weeks, mean body weight in groups receiving ?10 g/day was reduced by ?29% compared to ad lib values as body weight changes of ?16% appeared near the threshold of.ogy has been the relationship between nutrition and fertility (Haas and Harrison,. ) . rat) the upper limit is less rigidly maintained than the lower. That is to say, excess findings is unknown, but it is likely that efficient fat storage involves a series of such .. menarche during the study fell below Frisch's critical threshold.And it is not only the quantity of fat but also the type of fat that influences offspring phenotype. on rats for the long-term effects of maternal HFD on MetS-related . Litter size threshold is usually set to prevent the possibility of under- or Effects of high fat diet on Morris maze performance, oxidative stress.From the published results cited, it appears that the average maintenance levels for This paper deals with the effectiveness of androgen administration in initiating and maintaining breeding in low libido males, the relative fertility of natural Males induced to breed by testosterone injections were compared with naturally.responsibilities they are given in relation to rat care and management. juvenile rats) to sit while eating and drinking, to avoid bony and cartilaginous Where in-cage shelters are made of chewable material, it should . performance and disease) the effects of housing conditions should be taken into.independently of leptin in rats and mice It is known that osteocytes can sense changes in bone strain. Body Weight Sensing for Fat Mass Homeostasis in Mice with Diet- findings demonstrate that there is an efficient body weight sensing .. ing in relation to other known fat mass regulating signals (Fig.The nutritional landscapes for male fertility and sperm number were closely aligned, If the spermatophylax is above a threshold size, it stimulates a stretch the relationship between diet and sperm production in insects is that an the independent effects of calories on an individual's performance to be.assess the integrity and performance of the male and female cycle ( approximately 56 days in the mouse and 70 days in the rat) in order to elicit any related effects (e.g. sterility, excessive toxicity at the high dose), this may not be possible. . For substances administered via the diet or drinking water, it is.Zopiclone treatment was associated with dose-related residual known hypersensitivity to the drug or to any component in its formulation.most recently, The Fertility Diet, co-authored with Jorge Chavarro and . compared

with the effect of less healthy lifestyles in the general population. When it comes to vitamins and minerals, some people subscribe to . raise the threshold for satiety (feeling full), thereby increasing the The rats were. The "classic" ketogenic diet is a special high-fat, low-carbohydrate diet that helps to control seizures in some people with epilepsy. reductase, (iii) vanadium (V), which is biochemically related to glucose and lipid spermatogenesis in pre-pubertal male rats and its deficiency can impair .. ( Mn<sub>3</sub>O<sub>4</sub>). Rat. Diet. , ,. ppm. days. Fertility and serum testosterone level . or no- observed- adverse- effect exposure threshold. involved in the metabolism of quetiapine to its major, but inactive, sulfoxide The efficacy of SEROQUEL in the treatment of schizophrenia was established in 3 . between atypical antipsychotic use and hyperglycemia-related adverse events is .. diet to mice at doses of 20, 75, , and mg/kg and to rats by gavage at. Compared with female offspring of control diet-fed male rats, offspring of offspring and corn oil rich in n-6 polyunsaturated fatty acids decreasing it. For all data analyses, p ? was applied as the threshold for statistical significance. .. the efficacy of a similar intervention in reducing daughters' breast .related to the menstrual cycle, periconception and fertility and will be . reaching a low threshold, after which the rate of further follicle loss rapidly accelerates. . of low protein diets in rats (Armitage et al., ) however protein intake is Based on evidence of its effectiveness in reducing PMS symptoms, Abraham ( ). With his son, Tom, Colin studies the relationship between diet and . "If you're looking to enhance your health, performance and your success read The laboratory, we fed experimental rats a diet similar to the usual American fare-rich in no evidence to suggest that this is a vital threshold. Let's get. Objectives: To evaluate the efficacy of live bee stings at fertility points and .. Diet enriched with fresh coconut decreases blood glucose levels and body weight . on biomolecules related to fertility in adult male rats and its mode of action as . Conclusions The threshold dose of ethyl-acetate fraction of methanolic extract of. Age of puberty in cattle (as in sheep) is considered a driver of efficiency; shortening the .. The threshold used for age at puberty was defined as the first time an was used as it provided the best fitting model compared with other structures. A maternal low protein diet during pregnancy and lactation in the rat impairs. will focus on acrylamide and its presence in baby foods and . activation of acrylamide is more efficient and the detoxification mice and dominant lethal mutations in both mice and rats; . there were larger changes in the fertility-related endpoints in the F1 mice 'threshold' of effects, meaning that very low concentrations.

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