

Sucralose: lack of effects on sperm glycolysis and reproduction in the rat.

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Magazine: **Food Chem Toxicol. 2000; 38 Suppl 2: S19-29**

Certain chlorine-substituted sugars with chemical similarities to sucralose have been demonstrated previously to diminish or inhibit sperm glycolysis and fertility in the rat ([Ford]). In order to investigate this potential for sucralose, epididymal spermatozoa were recovered from rats exposed in vivo to oral doses of one of three of these substituted sugars: 6-chloroglucose (6-CG, 24mg/kg/day, positive control), sucralose (500mg/kg/day, over 300 times the expected human daily intake), or a 6'-substituted isomer of sucralose, trichloro deoxy sucrose (TCDS, 100mg/kg/day, a potential trace impurity in commercial sucralose); distilled water served as the negative control.

After incubation of the spermatozoa with D-[U-(14)C] glucose, measurements of (14)CO(2) and of ATP content showed no impairment of the glycolytic ability of spermatozoa in any of the groups except for a marked inhibition for those exposed to 6-CG, the positive control.

In order to determine whether other parameters of reproduction and fertility could be affected, reproductive endpoints were examined following oral exposure of male and female rats to sucralose. Sucralose was fed in the diet at concentrations of 0, 0.3, 1.0 and 3.0% (approx. 100, 365 and 1150 times the EDI) to groups of 30 male and 30 female rats for 10 weeks prior to mating, and continued through two subsequent generations until weaning of the F(2) pups. Two litters were produced per generation.

Food consumption and weight gain in the F(0) and F(1) generations were depressed in all sucralose groups before mating and in all four litters prior to weaning. The decrease in initial average weight for newborn pups probably reflects the increased litter sizes noted for sucralose-treated groups and the reduced food consumption of the dams during gestation and lactation. The latter is a result primarily of the unpalatability of sucralose to rats ([McNeil,]). Caecal enlargement (a common animal response to large doses of indigestible material) occurred in both the F(0) and F(1) parents. Increased kidney weights, possibly associated with increased water intake, were observed primarily among animals receiving 3% sucralose (no

renal histopathology has been detected). Decreased thymus weights occurred in F(1) males and in both F(1) and F(2) females at the 3% level. Subsequent studies specifically designed to investigate the potential for adverse immune system effects of sucralose ([McNeil,]) showed no adverse effects

. These findings are consistent with investigations by others showing that decreases in thymus weights occur in young rats in response to stressful conditions associated with reductions in weight gain. All reproductive indices (oestrous cycles, mating behaviour, fertility, gestation, maternal and foetal viability, foetal development, parturition, pup maturation and lactation) were comparable between the control and sucralose-treated groups. We conclude from these results that sucralose has no effect on sperm glycolysis or on male or female reproductive performance in the rat.