

52. PHYTOESTROGEN EXPOSURE REDUCES FERTILITY OF MALE RATS

Amy Glover, Helen Nicholson and Stephen Assinder

Department of Anatomy and Structural Biology, University of Otago, New Zealand

Phytoestrogens are plant-derived compounds able to bind to and activate oestrogen receptors α (ER α) and β (ER β). Exposure to phytoestrogens, in particular soy, through diet is very common. ER α and ER β are present throughout the male reproductive tract, but the exact role of oestrogen in male reproductive biology is unclear. Male and female Wistar rats used for this study were offspring of female rats maintained on a low soy diet (containing 112 $\mu\text{g/g}$ isoflavanoid) prior to conception through to weaning. After weaning, the juvenile rats were fed the same low soy diet into adulthood. Six adult male rats were transferred to a high soy diet (containing 465 $\mu\text{g/g}$ isoflavanoid) ($n = 6$); the remaining male rats were continued on the low soy control diet ($n = 8$). On days 3, 6, 12 and 25 following the commencement of the high soy diet, the male rats were housed overnight with pro-oestrus female rats (1:1). The female rats were housed separately until parturition. The size and sex ratio of the litters were recorded. After the final mating, the male rats were killed and the epididymides were removed. Sperm counts were performed on the initial segment, caput, corpus and cauda of one epididymis from each rat. Sperm counts showed fewer sperm in the initial segment ($P < 0.05$), corpus ($P < 0.05$) and cauda ($P < 0.01$) epididymides of high soy rats, as compared to the low soy rats. The litter sizes for the treatment groups showed an exposure-dependent response. The litter sizes of the day 3 ($P < 0.01$) and day 6 ($P < 0.05$) high soy groups was significantly lower than the low soy group, while litter sizes of the day 12 and 25 groups were not significantly different to low soy fed animals. The sex ratios of the litters from both groups were not significantly different. In conclusion, short-term exposure to high phytoestrogen levels reduces male fertility. The mechanisms involved in these changes are being investigated.