Repeated dose 28-day oral toxicity study in Wistar rats with a mixture of five pesticides often found as residues in food: alphacypermethrin, bromopropylate, carbendazim, chlorpyrifos and mancozeb

Six dose groups of 8 male and female rats respectively received a daily dose equivalent to 0, 0.15, 0.006, 0.03, 0.15 or 0.3 mg/kg b.w./day chlorpyrifos (groups 1-6) and the last four dose groups (groups 3-6) received in addition daily doses equivalent to 18 mg/kg b.w./day alphacypermethrin, 30 mg/kg b.w./day bromopropylate, 45 mg/kg b.w./day carbendazim and 12.5 mg/kg b.w./day mancozeb for 28 days. Plasma acetylcholinesterase was significantly decreased in the groups 2, 5 and 6 males. Total white blood cell count was significantly lower in females of group 6. Total red blood cell count, haematocrite and haemoglobin concentration was significantly reduced in both male and female rats of groups 5 and 6. Relative liver weight was significantly increased in groups 3-6 male and female rats. Absolute thyroid gland weight was significantly increased in groups 3, 5 and 6 male rats and of groups 3-6 female rats, and relative thyroid gland weight was significantly increased in groups 2-6 male rats and of groups 3-6 female rats. Absolute thymus weight of groups 3-6 male and female rats and relative thymus weight of groups 3-6 male rats and groups 3 and 4 female rats was significantly decreased. A mild degree of centrilobular cell hypertrophy of the liver was seen in all male rats and of three female rats of group 6. In the thyroid gland follicular cell hypertrophy was present in one female in the control group and in six females and seven males of group 6. It was concluded that inhibition of acetylcholinesterase activity in plasma and brain by chlorpyrifos was not enhanced by coadministration of the other four pesticides. Effects were seen in liver, thyroid, thymus and blood in the combination groups. However, identification of the pesticide(s) responsible for these changes would require further studies of the individually pesticides as well as various combinations of the pesticides.