Deficits in response inhibition in male rats prenatally exposed to vapor condensates made from gasoline containing ethanol at 0% and 15%, but not 85%. WM Oshiro, SA Martin, TE Beasley, PA Evansky, PJ Bushnell Toxicity Assessment Division, National Health Effects and Environmental Research Laboratory, Office of Research and Development, US EPA, Research Triangle Park, NC 27711

The impact of developmental exposure to inhaled ethanol-gasoline fuel blends is a potential public health concern. We previously reported that rats whose mothers inhaled ethanol (21,000 ppm) during pregnancy had increased levels of anticipatory responding on a choice reaction time (CRT) task. Thus, we used this task to investigate effects in the adult offspring of dams exposed to vapor condensates made from fuels blended with a range of ethanol concentrations, including gasoline alone (E0) and gasoline with 15% and 85% ethanol (E15 and E85, respectively). Each blend was investigated in separate cohorts. Within each cohort, dams were exposed for 6.5 h daily from gestational day 9 through 20 to concentrations of 0, 3,000, 6,000, or 9,000 ppm (n=8 per concentration). Male offspring were assessed during acquisition of both cued and uncued versions of the CRT and during asymptotic performance of the uncued task. During acquisition, increased anticipatory responding (elevated hold failures during a preparatory hold period) was observed in rats exposed to E0 (9,000 ppm) and E15 (6,000 and 9,000 ppm) indicating deficits in response inhibition. E15 offspring also had reduced accuracy (6,000 and 9,000 ppm) during acquisition of the cued CRT, suggesting additional deficits in processing visual information, and reduced decision times (6,000 ppm), indicating possible facilitation in this measure due to elevated hold failures. No effects were observed on any performance measure after exposure to E85, or, during asymptotic performances of the uncued CRT for any fuel blend. These data, combined with data from rats exposed to vapors of neat ethanol, indicate that prenatal exposure to ethanol and gasoline can cause deficits in response inhibition. However, 15% ethanol in gasoline appears to increase these effects, whereas 85% ethanol appears to diminish them. This abstract does not represent EPA policy.