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Effects of Gestational Exposure to Benomyl on the Reproductive and Mammary Gland Development of Female Offspring Rats

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The objective of this study is to investigate whether exposure to benomyl (BN), a systemic fungicide, during late gestation alters the reproductive- and mammary development in female offspring rats. Timed pregnant Sprague Dawley rats received 5 daily treatments of 0, 50, 250, or 500 mg benomyl/kg/day by gavage on gestation days 15. Anogenital distance (AGD), developmental parameters (sex ratio, viability etc.), and pubertal parameters (the onset of vaginal opening and estrous cyclicity) were measured in female offspring rats. Reproductive organ weights were measured on postnatal days (PND) 22, 31, 41, and 61, and MGs from female pups were removed and prepared as whole mounts on PND 22 and 31. In our results, BN increased the AGD of female at PND 4 and 10 in a dose-dependent manner, but the pubertal parameters (VO and estrocyclicity) were not affected. BN decreased the uterus weights from PND 31, and delayed the development of MG on PND 22 and 31. In cDNA microarray, BN increased the expression of β-casein gene in PND 41 MG. In western blot result, the expressions of estrogen receptor (ER-α) and progesterone receptor (PR) in PND 41 and 61 MGs were decreased. Our results provide the exposure to chemical such as endocrine disruptors during a critical period of organ development altered the weights of reproductive organs and the development of mammary gland.

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