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High-fat diet during pregnancy compromises offspring's lung health

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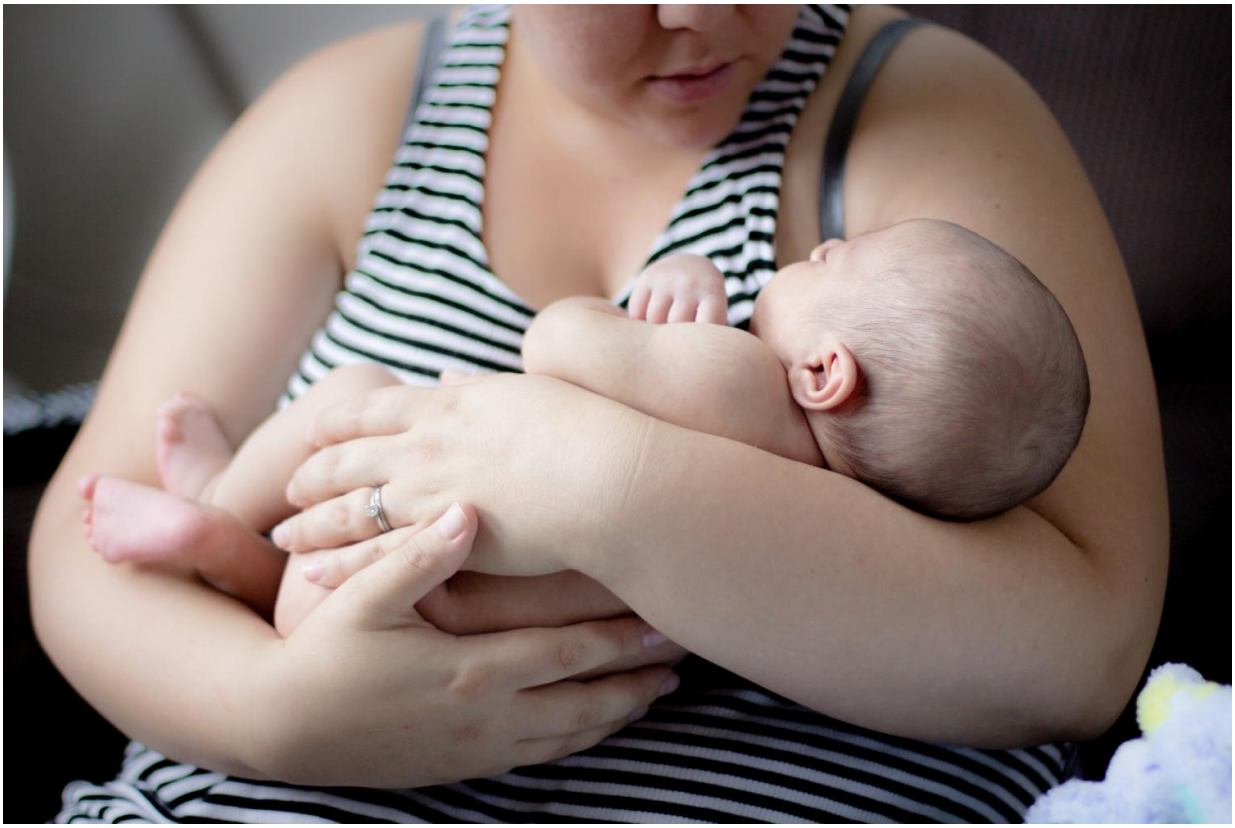

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Women who follow a high-fat diet during pregnancy may increase their children's risk for asthma. A mouse study by Oregon Health and Science University researchers suggests that consistent consumption of fat-laden

foods may change the immune response of the offsprings' respiratory system. The article is published in *Physiological Reports*.

Researchers studied four groups of mice pups: Two groups were born to mothers who were fed a high-fat diet ("high-fat maternal") and then either continued a high-fat diet or switched to a normal-fat diet at weaning. The other two groups were born to mothers that followed a normal-fat diet ("normal maternal") during pregnancy and lactation. After weaning, those pups were fed either a high-fat diet or a normal diet.

The research team examined lung structure from both groups, as well as several markers of inflammation and allergy response, including:

- airway resistance (how easily air flows through the respiratory tract), a hallmark feature of asthma;
- the amount and composition of the cells in the airways; and
- the concentration of inflammatory chemicals in the lungs.

All of the pups whose moms consumed a high-fat diet had increased airway resistance, even those who weaned to a normal-fat diet. Higher airway resistance is commonly seen in asthma attacks when the airways constrict. This observation suggests maternal diet alone can affect airway reactivity in the offspring.

The lungs of all mice whose mothers were fed a high-fat diet had an increased concentration of inflammation-causing chemicals, higher cell counts (a marker of inflammation) and more white blood cells (cells that fight infection). The pups that began a normal diet after weaning did not show as much inflammation as those that were exposed to the high-fat diet.

"Our results demonstrate that maternal [high-fat diet] programs

increased [airway resistance] in the offspring," the researchers wrote. These findings suggest that exposure to a high-fat diet during pregnancy and nursing creates immune cell variances that increase the risk of asthma and allergies. Reducing fat in the offspring's diet may help offset the health risks associated with the mother's lifestyle, but some of the damage may already be done.

More information: Kelvin D. MacDonald et al. Maternal high-fat diet in mice leads to innate airway hyperresponsiveness in the adult offspring, *Physiological Reports* (2017). DOI: 10.14814/phy2.13082

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