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Objectives: Cannabis use is rising among reproductive-aged women, and cannabinoids have been detected in milk of breastfeeding women who use cannabis. Scant research exists on whether maternal cannabis use affects the nutrient composition of human milk. This study explores the acute effect of maternal cannabis use on total lipid, fatty acids, protein, and lactose content in human milk.

Methods: Breastfeeding women who used cannabis (cases, n = 20) were matched with breastfeeding women who did not use cannabis (controls, n = 19; one excluded for testing positive for cannabis) based on body mass index and time postpartum. After ≥12h abstention, cases collected a baseline sample via full breast expression, then used cannabis as desired. Additional samples were collected at 30-40 min, 1-2h, 2-3h, 4-5h, and 8-12h after initial cannabis use. Controls collected samples at the same times of the day as their matched cases. Delta-9-tetrahydrocannabinol (Δ^9- THC) and total lipid concentrations were measured in all samples (n = 229); fatty acids, lactose, and protein concentrations were quantified at baseline, 1-2h and 8-12h after initial use (n = 114).

Results: No differences in milk macronutrient concentrations were identified between cases and controls at baseline (t-test $p > 0.05$). Linear mixed effect models showed that, over the 12h after cannabis use, concentrations of lipid, protein, lactose, and fatty acids in milk from cases remained similar to those in milk from controls. However, Δ^9-THC was positively correlated with total lipid content ($\rho = 0.55$; $p < 0.001$) and negatively correlated with lactose ($\rho = -0.39$; $p = 0.024$) in milk from women who used cannabis. No correlation was observed between THC and protein concentrations.

Conclusions: Concentration of THC in human milk is positively correlated with milk lipid content and negatively correlated with milk lactose content. There was no effect of cannabis use on macronutrients concentrations in human milk collected from cases during the 12h after use compared to controls. These findings highlight the need for further research on maternal cannabis use during breastfeeding and its impact on infant health.

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OR02-03-25 Human Milk Lead Levels in a Cohort of Midwestern Infants: Preliminary Results From the MOM2CHild Study

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Objectives: Child blood lead (Pb) levels have dropped dramatically since banning Pb additives in paint and gasoline in the United States (US). However, women of child-bearing age today often experienced higher Pb exposure during childhood, particularly if they resided in low socio-economic environment (SEE) neighborhoods. Approximately 90% of Pb body burden is stored in bone, so lifetime maternal Pb exposures may transfer to infants *via* human milk due to increased bone resorption during lactation. However, the concentration and dose of Pb received through human milk in US infants is understudied. We compared Pb concentration ([μg/dL]) and daily dose (dPb) received *via* human milk feeding at two weeks of age by neighborhood SEE in a cohort of infants participating in the ongoing MOM2CHild study (Cincinnati, OH).

Methods: Human milk from 2 weeks post-partum was assessed using inductively-coupled plasma mass spectrometry. Daily human milk intake was estimated based on the child's age and weight, adjusted by the maternally-reported proportion of human milk feeds. SEE was assessed using the Area Deprivation Index score of the mother's neighborhood. The geometric mean (GM) Pb concentration, dPb (μg/kg infant body weight) and proportion consuming Pb above the dietary reference range (RR, dPb ≥ 0.26 μg/kg) were calculated and compared by SEE quartile using linear regression and Fisher's exact test, respectively.

Results: Analysis was completed in 71 milk samples from mothers who were 30.4 +/- 5.0 years old and 47% (n=34) primiparous; all samples had detectable Pb (GM [0.10 μg/dL], max [0.49 μg/dL]). The GM dPb was 0.10 μg/kg, with 11% (n=8) exceeding the RR (max dPb 0.55 μg/kg). Compared to those residing in the highest SEE neighborhoods, children in the lowest SEE neighborhoods had increased dPb (β 0.11 μg/kg, 95% CI 0.04, 0.19), and a higher proportion above RR (11% *vs* 50%, p=0.009).

Conclusions: All participants had detectable levels of Pb in their milk at 2-weeks post-partum and over 10% of infants consumed more than the RR of Pb *via* human milk, with the highest dose double the recommended limit. Prenatal maternal testing and nutritional supplementation to reduce bone resorption in pregnant and lactating mothers may reduce transgenerational Pb transfer, especially in low SEE neighborhoods.

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OR02-05-25 Origins of Health Outcomes: Linking the Gut Microbiome and Early Life Events to Predict Childhood Obesity Risk

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Objectives: While numerous studies have explored the impact of feeding mode (e.g., breastfeeding, formula feeding, or mixed feeding) on microbiome composition, many are limited by cross-sectional designs, small sample sizes, or low-resolution sequencing techniques. This study leverages full-length 16S rRNA sequencing and a longitudinal approach to comprehensively examine how feeding mode influences gut microbiome composition during the first year of life, offering potential predictors of future health outcomes.