

### A Mediterranean Meal Plan Modulates Fatty Acid Content of Human Milk in Women With Obesity

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**Objectives:** Human milk (HM) fatty acid content is, influenced by both maternal adiposity and diet. The objective of this study was to determine the impact of a Mediterranean meal plan on HM fatty acid content in women with obesity.

**Methods:** In this pilot study, thirteen women with obesity (body mass index (BMI)  $\geq 30$  kg/m<sup>2</sup>) enrolled at five months post-partum and were provided a Mediterranean meal plan for four weeks. Nutrition Data System for Research was used to assess participants' diet during the study. HM was collected at baseline and after the 4-week intervention. Cytokines were measured using multi-spot assays and the fatty acid composition of triglycerides determined using a UHPLC electrospray ionization mass spectrometry. Triglycerides containing a particular fatty acid species were normalized to the total abundance of all triglyceride species detected in each sample. Wilcoxon signed-rank tests were used to assess changes in participant diet and HM composition,

and repeated measures correlations were used to test associations of paired measures. Summary statistics are presented as mean  $\pm$  standard deviation.

**Results:** During the intervention, the ratio of the maternal intake of  $\omega 6$  and  $\omega 3$  fatty acids ( $\omega 6$ :  $\omega 3$ ) significantly decreased ( $8.86 \pm 1.60$  vs.  $4.63 \pm 1.25$ ,  $P < 0.001$ ) and was positively correlated with HM levels of leptin and tumor necrosis factor- $\alpha$  ( $r = 0.64$ ,  $p = 0.024$  and  $r = 0.67$ ,  $p = 0.017$ , respectively). Levels of human milk 20:3 ( $0.588 \pm 0.085\%$  vs.  $0.483 \pm 0.080\%$ ,  $P < 0.001$ ) and 22:4 ( $0.057 \pm 0.012\%$  vs.  $0.050 \pm 0.011\%$ ,  $p = 0.01$ ) fatty acids were significantly decreased following the intervention. Maternal intake of  $\omega 6$ :  $\omega 3$  positively correlated with HM 20:3 and 22:4 fatty acid concentrations ( $r = 0.78$ ,  $p = 0.001$  and  $r = 0.71$ ,  $p = 0.005$ , respectively).

**Conclusions:** A 4-week Mediterranean meal plan modulated the fatty acid content in HM from women with obesity. There was an association between maternal  $\omega 6$ :  $\omega 3$  intake and HM fatty acid content, supporting a role for maternal diet in modulating HM composition. Future studies are needed to investigate the effect of the intervention on specific fatty acids and whether the observed changes in HM impact infant growth or development.

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