

Taste Preference Between Ruminant and Industrial Trans Fat in C57BL/6 Mice Measured With the Automated IntelliCage System

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Objectives: The objective is to evaluate the taste preference between water, lecithin, R-TFA and I-TFA (TFAs in lecithin at a ratio of 14:86 (w/w)) nanovesicles measured with the automated IntelliCage system in C57BL/6 mice. We hypothesized that the preference for industrially originated trans-fatty acids (elaïdic acid (EA trans 18: 1n-9)) and ruminant trans fatty acids (trans-palmitoleic acid (TPA t16:1 n-7)) -is higher than lecithin (control) and/or water. The objective is to evaluate the taste preference between water, lecithin, R-TFA and I-TFA (TFAs in lecithin at a ratio of 14:86 (w/w)) nanovesicles measured with the automated IntelliCage system in C57BL/6 mice.

Methods: Twenty-four female C57BL/6 mice were divided into 2 groups in two separate IntelliCages where had ad libitum access to food (Teklad global 18% protein extruded (18% fat)). On week 1, both groups had access to only water (control). On week 2, in cage 1 mice received lecithin and EA and in cage 2 mice received lecithin and TPA. In week 3

mice had access to only water. On weeks 4 and 5, mice had access to EA and TPA where the positions of trans fatty acids were interchanged for week 5 compared to week 4. Water also was added to the cages on week 5. Mice weights were measured for each week. Corner preference was recorded by 1- the number of the times a mouse enters a corner (corners visits), 2- crossing a hole to reach the bottles (nose pokes); and 3-the number of licking the bottles (licks). Differences between total number of licks was assessed by t-test.

Results: During week 2, mice preferred either EA (7.6 times) in cage 1 or TPA (7.9 times) in cage 2 over lecithin ($P < 0.05$). During week 4 in cage 1, the mice drank more EA (3.14 times) compared to TPA ($P < 0.05$). Oppositely during week 4, in cage 2, mice drank more TPA compared to EA (1,2 times, $P < 0.05$). After corners were switched for fat solutions in week 5, mice drank TPA 2.66 times more than EA ($P < 0.05$) and 3.5 times more than water ($P < 0.05$) in cage 1. Equally in cage 2, mice drank EA 1.44 and 4.4 times more than TPA and water ($P < 0.05$) in week 5.

Conclusions: Results showed mice preferred dietary trans fat, either EA and TPA in equal matter over control and drinking water. Further, mice changed their fat preference (EA to TPA and TPA to EA) when the positions of trans fatty acids in corners were switched; therefore, more analysis needs to be done.

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