Effects of the Type and Emulsification of Oil on Postprandial Appetite Responses in Healthy Young Adults

Yuanhang Yao, Hongyi Manfred Goh, and Jung Eun Kim

National University of Singapore

Objectives: Previous studies revealed that consuming different types of oil or the same type of oil but whether being emulsified could result in a different subsequent food intake. While these results suggest that different types of oils or emulsification could affect appetite control, very limited data exist. Therefore, this study aimed to investigate the impact of type and emulsification of oil on postprandial appetite responses.

Methods: This is a randomized, controlled, double-blinded crossover study and 16 healthy males and females aged between 21 and 29 participated in the study. All participants consumed a high-fat isocaloric breakfast meal containing 29 g of one of the following four oil: i) olive oil-water non-emulsified; ii) olive oil-water emulsified; (iv) coconut oil-water non-emulsified, v) coconut oil-water emulsified. Five hours after the test breakfast meal, subjects received a standard low-fat lunch. Six appetites components including hunger, desire to eat, prospective consumption, fullness, nausea and bloating were evaluated over a 10-hour postprandial duration by using visual analogue scales (VAS). The net incremental area under the curve (iAUC) of appetite VAS was calculated by the trapezoidal method.

Results: The iAUC value (mean ± SE) of hunger VAS was higher with the oil emulsified group (-512.2 ± 137.4) than the oil non-emulsified group (-785.4 ± 132.9) over a 5-hour postprandial period ($P < 0.05$), but the difference became insignificant over a 10-hour postprandial period. On the other hand, the coconut oil group resulted in higher fullness VAS than the olive oil group ($P < 0.05$), for both $iAUC_{0\text{-}5\ hour}$ (coconut oil: 813.3 ± 146.0; olive oil: 575.4 ± 139.8) and $iAUC_{0\text{-}10\ hour}$ values (coconut oil: 1,785.9 ± 311.3; olive oil: 1,368.5 ± 306.3). There is no interaction effect of the emulsification and the type of oil on all the six subjective appetites VAS during the postprandial state.

Conclusions: The type and emulsification of oil in a high-fat meal could cause differential appetite responses over a certain postprandial duration. Physiological measures, such as appetite-regulating hormones, energy expenditure and substrate oxidation rates, are necessary to elucidate the differences in subjective appetite responses in future studies.

Funding Sources: National University of Singapore and Agency for Science, Technology and Research, Industry Alignment.