TACSM Abstract

Assessing the Differences Between Chewing and Swallowing Arugula Extract Capsules on the Concentrations of Nitric Oxide Metabolites in Metabolically Healthy Males

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ABSTRACT

Previous literature has examined the benefits of consuming nitrate (NO3)-rich crops (e.g., beetroot, spinach, watercress, arugula) on endothelial function due to their positive influence on nitric oxide (NO) production from the utilization of nitrate-reducing bacteria in the oral microbiome. However, there has yet to be a study addressing how the method of consumption may influence the role the oral microbiome plays in the degradation of NO3 to NO from consuming an encapsulated NO3-rich crop. **PURPOSE**: To determine the differences in NO metabolite concentrations following two different methods (e.g., chewing, swallowing) of consuming the encapsulated arugula extract. **METHODS**: Eight, metabolically healthy males (age = 23 ± 3.2 yrs, wt. = 75.7 ± 13.7 kg, %BF = 16.1 ± 4.7) were recruited for this study. Participants were determined to be metabolically healthy through several blood screen panels (e.g., metabolic, lipid, complete blood cell count) following an overnight fast. All participants were randomized and counterbalanced for two conditions (e.g., chewing, swallowing), with both being separated by a 72-HR washout period. Following an overnight fast, participants had a venous catheter inserted into the most prominent vein in the antecubital space. Participants were asked to either swallow the arugula extract capsules (2; 100mg NO3) or chew the arugula extract capsules (2; 100mg NO3) until the contents were dispersed into their mouth (15 seconds) and then swallowed. Blood samples were then taken at 4 time points for each condition (e.g., baseline, 1-HR, 2-HR, and 3-HR proceeding ingestion). Data were analyzed using a 2 x 4 repeated measures ANOVA to assess differences in NO metabolite concentrations [(total NO, NO3, and nitrite (NO2)]. **RESULTS**: Total NO and NO3 concentrations significantly increased from baseline to 1-HR when chewing (NO: $p = .008$; NO3: $p = .011$) but not for swallowing. Correspondingly, chewing demonstrated a significantly larger increase 1-HR after ingestion compared to swallowing ($F = 13.799$, $p = .008$). However, 2-HRs after swallowing, both total NO and NO3 significantly rose (NO: $p = .005$; NO3: $p < .001$) to a similar level as chewing ($F = .759$, $p = .413$). **CONCLUSION**: Regardless of chewing or swallowing the arugula extract capsule, both showed similar increases 2-HR after consumption. However, chewing displayed a significantly larger increase in total NO metabolites after 1-HR. Future research should aim to assess a more prolonged period to further examine differences in consumption modality.