

Oral application of L-menthol in the heat: from pleasure to performance

Russ Best^{3,4}, Martin Barwood¹, Jason Gillis², Owen Jeffries⁵

1. Department for Sport, Health and Nutrition, Leeds Trinity University, Horsforth, United Kingdom
2. Human Performance Laboratory, Department of Sport & Movement Science, Salem State University, Salem, MA, USA.
3. School of Health & Social Care, Teesside University, Middlesbrough, United Kingdom
4. Centre for Sport Science & Human Performance, WINTEC, Hamilton, New Zealand
5. School of Biomedical Sciences, Faculty of Medical Sciences, Newcastle University, Newcastle upon Tyne, United Kingdom.

When menthol is applied to the oral cavity it presents with a familiar refreshing sensation and cooling mint flavour. This may be deemed hedonic in some individuals, but may cause irritation in others. This variation in response is likely dependent upon trigeminal sensitivity toward cold stimuli, suggesting a need for a menthol solution that can be easily personalised. Menthol's characteristics can also be enhanced by matching colour to qualitative outcomes; a factor which can easily be manipulated by practitioners working in athletic or occupational settings to potentially enhance intervention efficacy.

This presentation will outline the efficacy of oral menthol application for improving time trial performance to date, either via swilling or via co-ingestion with other cooling strategies, with an emphasis upon how menthol can be applied in ecologically valid scenarios. Situations in which performance is not expected to be enhanced will also be discussed. An updated model by which menthol may prove hedonic, satiate thirst and affect ventilation will also be presented, with the potential performance implications of these findings discussed and modelled. Qualitative reflections from athletes that have implemented menthol mouth swilling in competition, training and maximal exercise will also be included.