

## Abstract Template

**Abstract title: The Effect of Swilling Carbohydrate, Menthol or a Combination on 40km Cycling Time Trial in the Heat.**

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Please list all (including the presenter first in **bold**) co-authors (surname and initial – ie. Smith, E.) in correct order and with a number preceding their name for the institution (ie. <sup>1</sup>Smith, E; <sup>2</sup>Ahuriri, A; etc.)

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Abstract:

**Introduction:** Both carbohydrate and menthol mouth swills have shown ergogenic effects under a variety of settings. The aim of the current study was to compare the effect of the aforementioned mouth swill solutions on 40 km time trial (TT) performance in the heat (32°C, 40% humidity, 300kw radiant load) and investigate associated subjective measures (thermal comfort, thermal sensation, thirst, and RPE) every 5km. **Methods:** Six (6) recreationally trained male cyclists (31.8 ± 5.9 years, 178.2 ± 6.0 cm, 75.7 ± 10.0 kg) completed 3 trials, swilling either menthol (MEN), carbohydrate (CHO), or a combination (BOTH) at 10km intervals (5, 15, 25, 35km). **Results:** There was no statistically significant difference in 40km TT performance between mouth swills (P = 1.00), with MEN producing slightly quicker times on average (MEN 65:43 ± 4:48, CHO 66:09 ± 4:13, BOTH 65:57 ± 3:58 min:sec). Subjective measures were not significantly different, however MEN showed small (0.2-0.6) and moderate (0.6-1.2) effect size increases on thermal comfort compared to CHO and BOTH 5km post swill. **Discussion:** The ability to activate receptors in the oral cavity may be responsible for improved athletic performance due to potential central activation. The ability to perceptually cool and or fuel an athlete while exercising, especially in the heat, may allow for improved levels of thermal comfort and subsequently enhanced performance **Take Home Message:** Results, however, indicate that while MEN showed a beneficial effect on making participants feel more comfortable while exercising in the heat compared to CHO or BOTH, 40km TT was not significantly difference between solutions.

References:

- Stevens, C.J. and Best, R., 2017. Menthol: a fresh ergogenic aid for athletic performance. *Sports Medicine*, 47(6), pp.1035-1042.
- Jeffries, O. and Waldron, M., 2018. The effects of menthol on exercise performance and thermal sensation: a meta-analysis. *Journal of science and medicine in sport*.

Barwood, M.J., Kupusarevic, J. and Goodall, S., 2019. Enhancement of Exercise Capacity in the Heat With Repeated Menthol-Spray Application. *International journal of sports physiology and performance*, 14(5), pp.644-649.

Pottier, A., Bouckaert, J., Gilis, W., Roels, T. and Derave, W., 2010. Mouth rinse but not ingestion of a carbohydrate solution improves 1-h cycle time trial performance. *Scandinavian journal of medicine & science in sports*, 20(1), pp.105-111.

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