

COMPARABLE RATES OF EXOGENOUS CHO OXIDATION & TRIVIAL GI DISCOMFORT WHEN **INGESTING 120 G/H** FROM A DRINK, GEL, JELLY CHEW OR CO-INGESTION APPROACH

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INTRODUCTION

Ingesting multiple transportable CHO's (in a ratio close to unity) at a rate of > 90 g.h⁻¹ allows for high rates of oxidation during exercise. In order to meet these fuelling requirements during exercise, endurance athletes commonly utilise a variety of CHO forms including liquids, semi-solids and solids.

Despite the popular use of jelly chews amongst endurance athletes, it is currently unknown whether this delivery form achieves similar rates of oxidation to fluid and semi-solid forms.

METHODS

In a repeated measures design, nine endurance trained males (VO₂max, 64.9 ± 6.9 ml.kg⁻¹.min⁻¹; PPO, 438 ± 79 W) cycled for 180 min at 95% lactate threshold (215 ± 35 W). During exercise, subjects ingested 120 g.h⁻¹ CHO from glucose (maltodextrin) and fructose in a 1:08 ratio from fluid (drink), semi-solid (gel), solid (jelly chew) or a co-ingestion approach.

During manufacture, U13-C glucose and U13-C fructose were equivalently incorporated into drink, gel and jelly chew forms.

RESULTS

OBJECTIVES

To quantify rates of exogenous CHO oxidation from the ingestion of drink, gel and jelly chew forms as well as a combination of all three forms

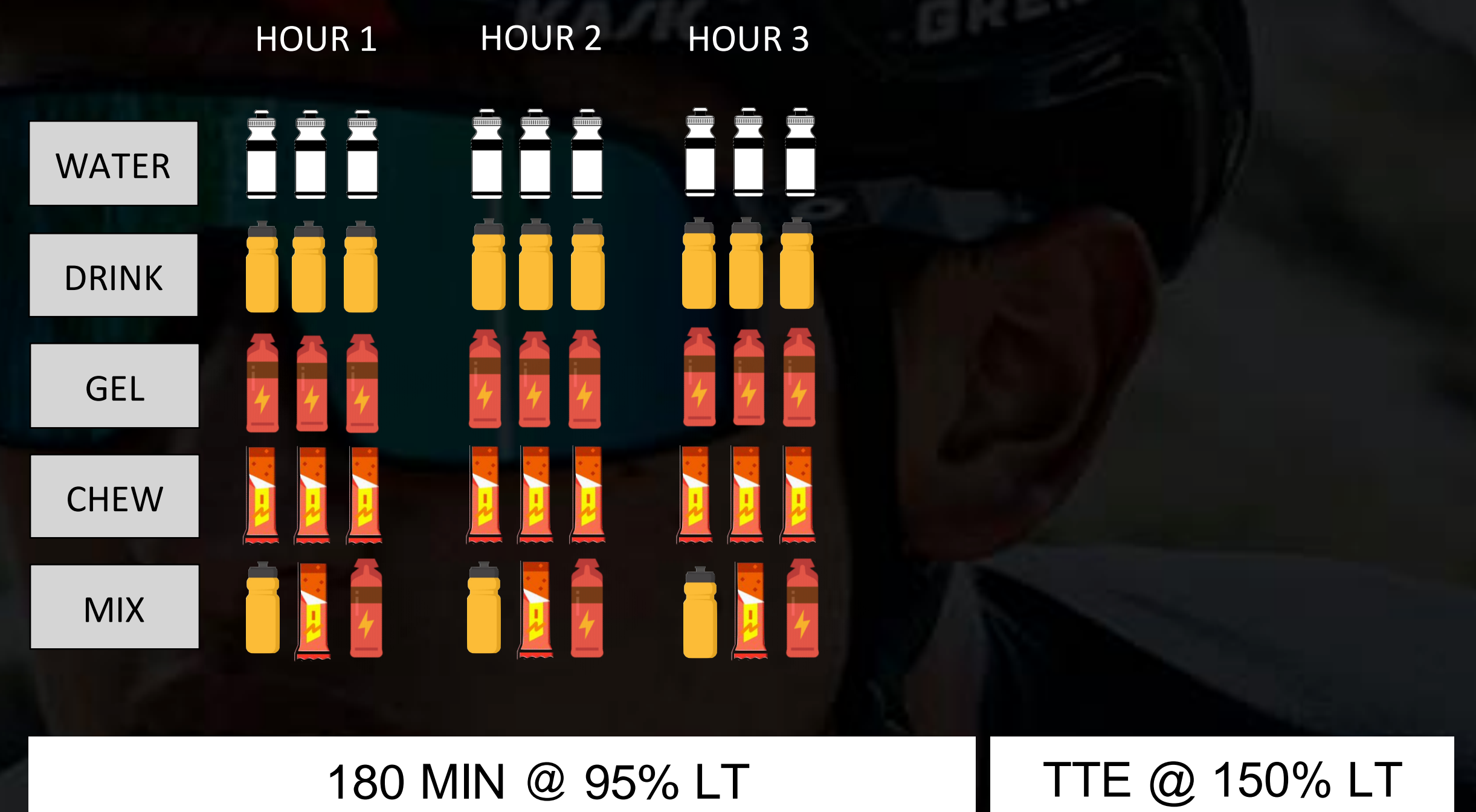


Figure 1. Schematic overview of the experimental protocol employed in each trial. LT, lactate threshold; TTE, time to exhaustion

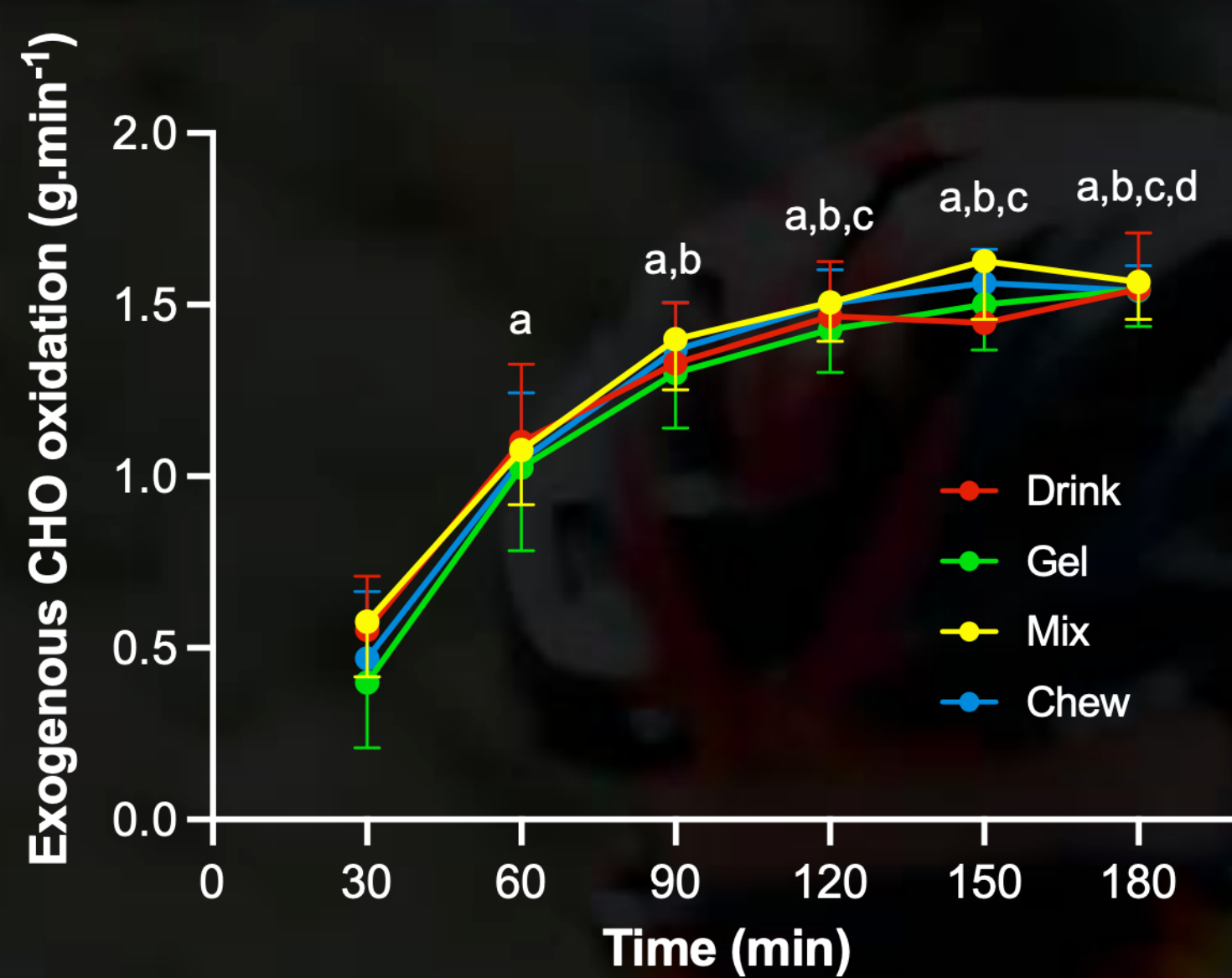


Figure 2. Exogenous CHO oxidation during 180 minutes of exercise. ^aSignificantly different to 30 min, ^bSignificantly different to 60 min, ^cSignificantly different to 90 min, ^dSignificantly different to 120 min (P < 0.05)

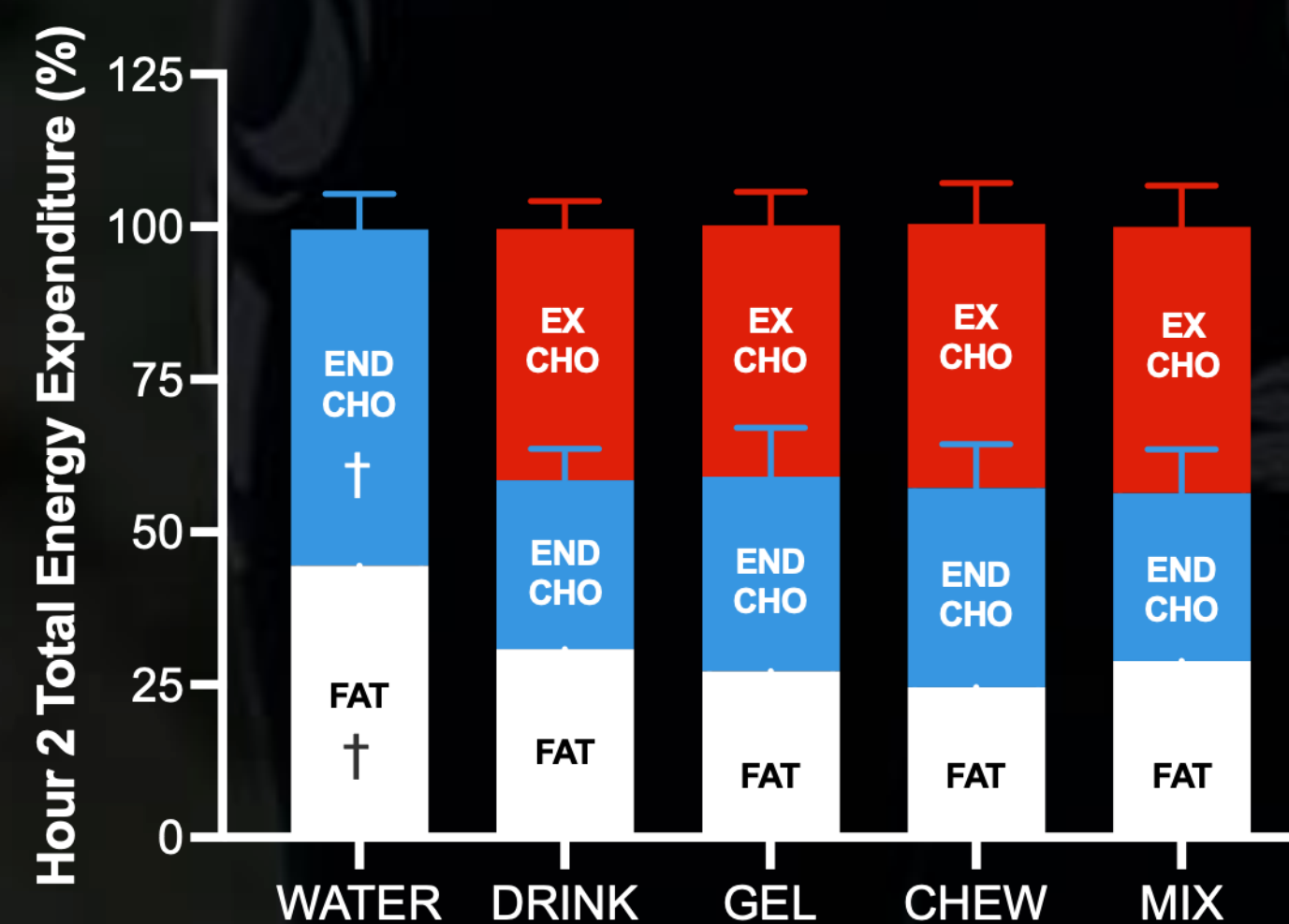


Figure 3. Substrate contributions to total energy expenditure during the second hour of exercise. †Significant difference between water and all other feeding trials (P < 0.05)

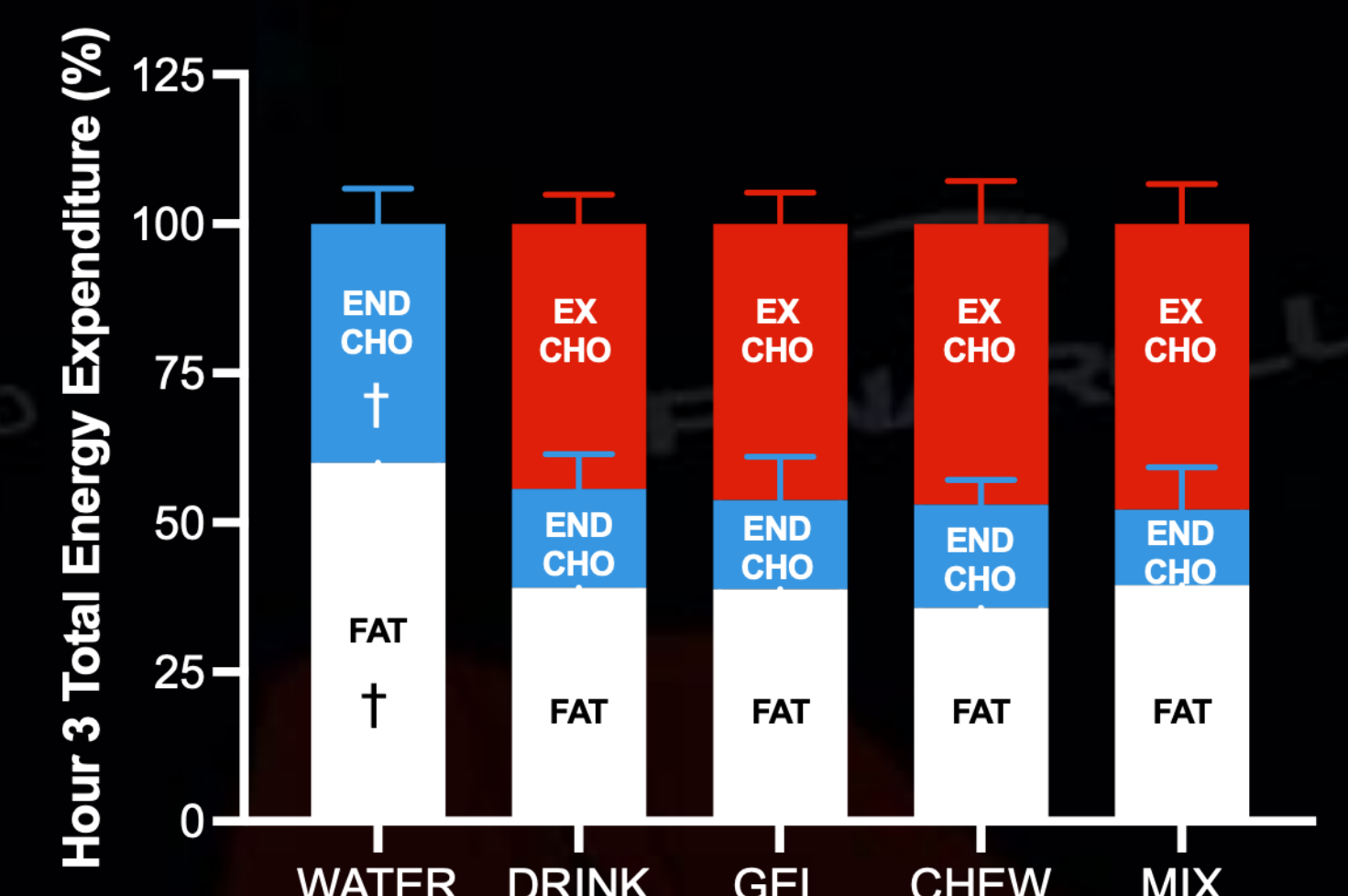


Figure 4. Substrate contributions to total energy expenditure during the third hour of exercise. †Significant difference between water and all other feeding trials (P < 0.05)

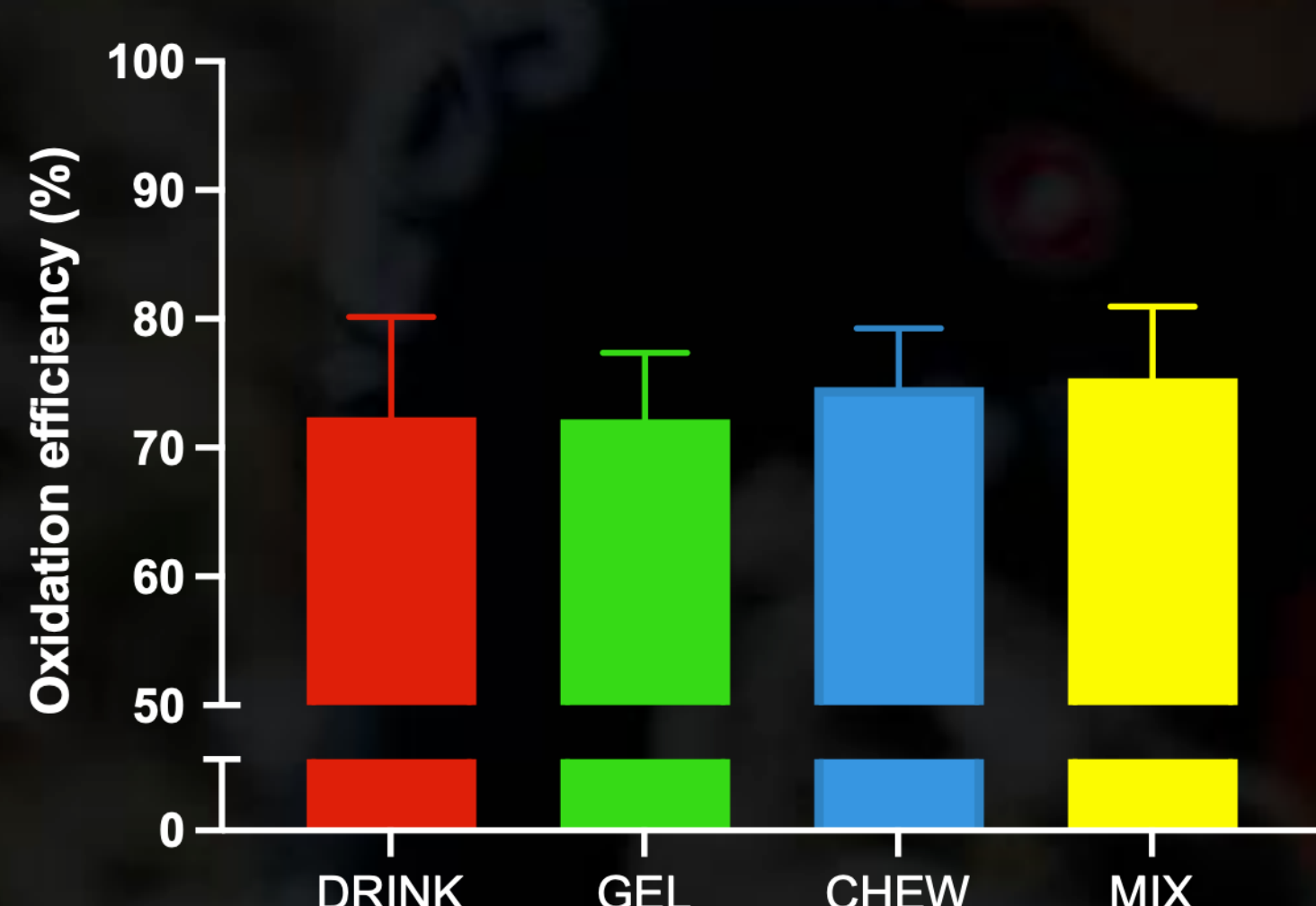


Figure 5. Exogenous CHO oxidation efficiency

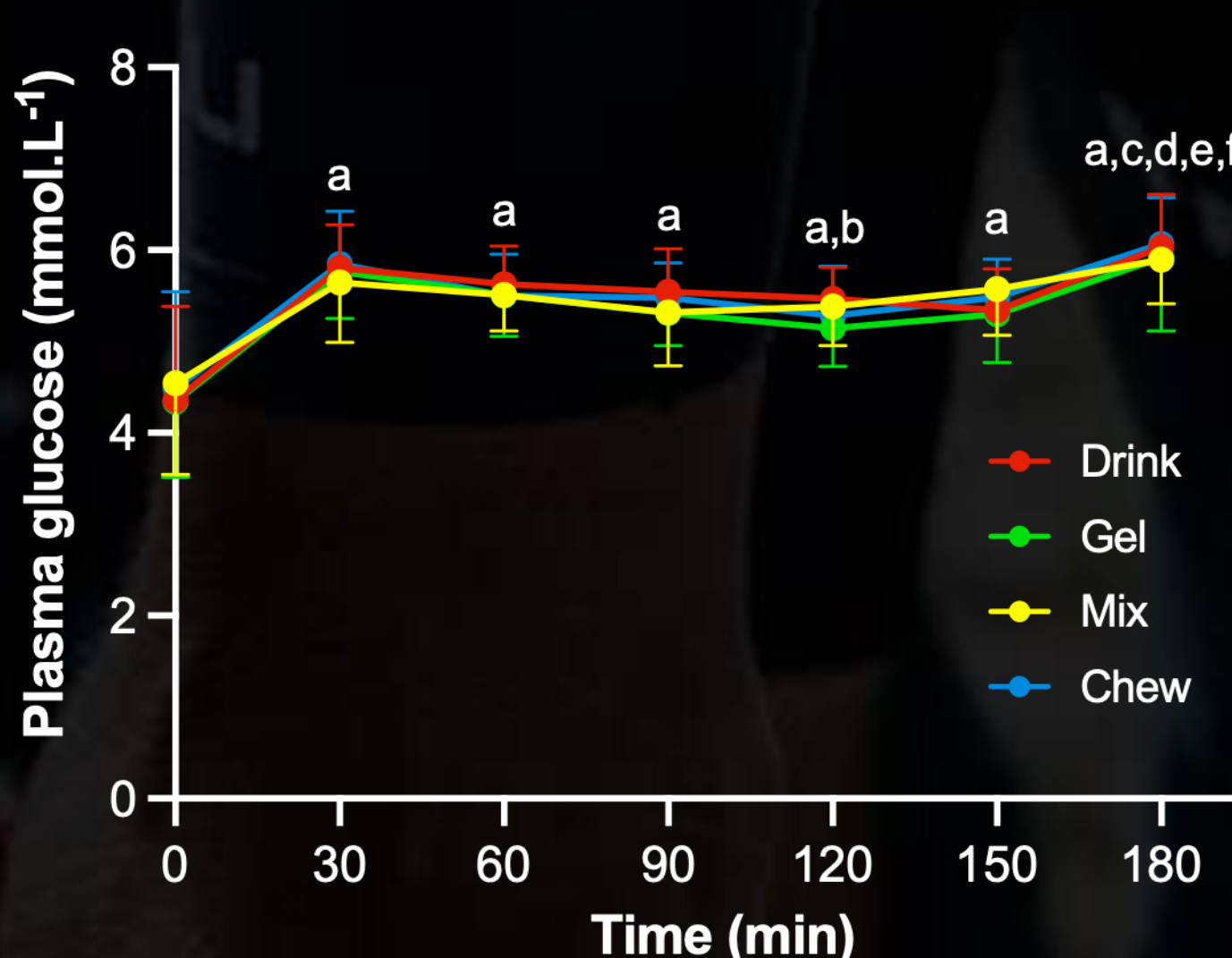


Figure 6. Plasma glucose responses. ^aSignificantly different to rest, ^bSignificantly different to 30 min, ^cSignificantly different to 60 min, ^dSignificantly different to 90 min, ^eSignificantly different to 120 min, ^fSignificantly different to 150 min (P < 0.05)

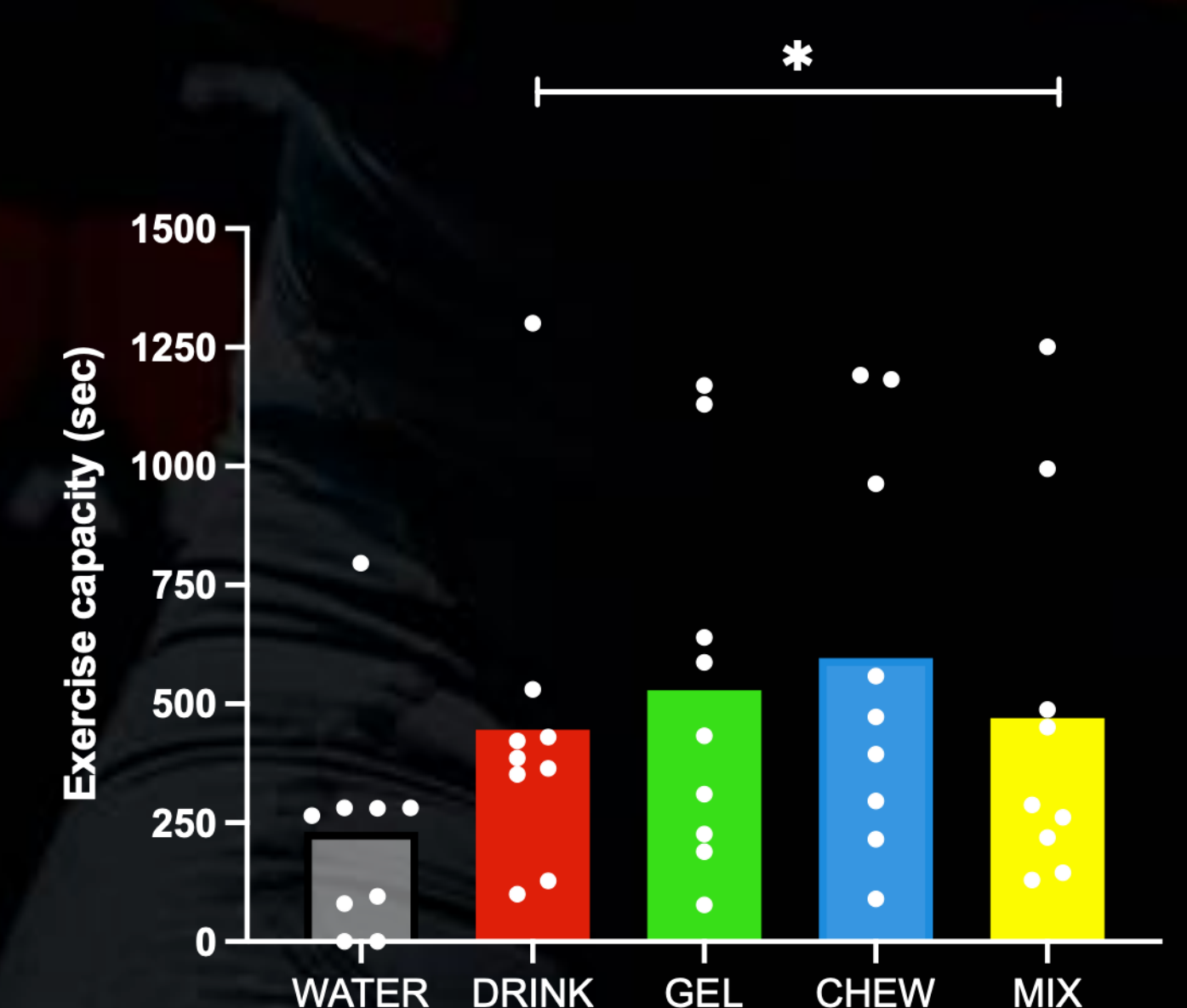


Figure 7. Exercise capacity time (time to exhaustion). *Significantly different from WATER (P < 0.05). Bars represent group means and circles represent individual data points

CONCLUSION

When considering the high absolute rates of exogenous CHO oxidation, the maintenance of whole body CHO oxidation and the lack of GI symptoms observed, data suggest that the consumption of 120 g.h⁻¹ is a practically feasible and well tolerated strategy to promote high CHO availability during exercise. Such intakes can be achieved through solid, semi-solid or solid forms or a co-ingestion approach depending on the athletes preferences.