



Peter Hespel

ORAL KETONE ESTER INTAKE TO IMPROVE PERFORMANCE IN CYCLING

Science & Cycling, Brussels 2019

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TDF induces a catabolic state

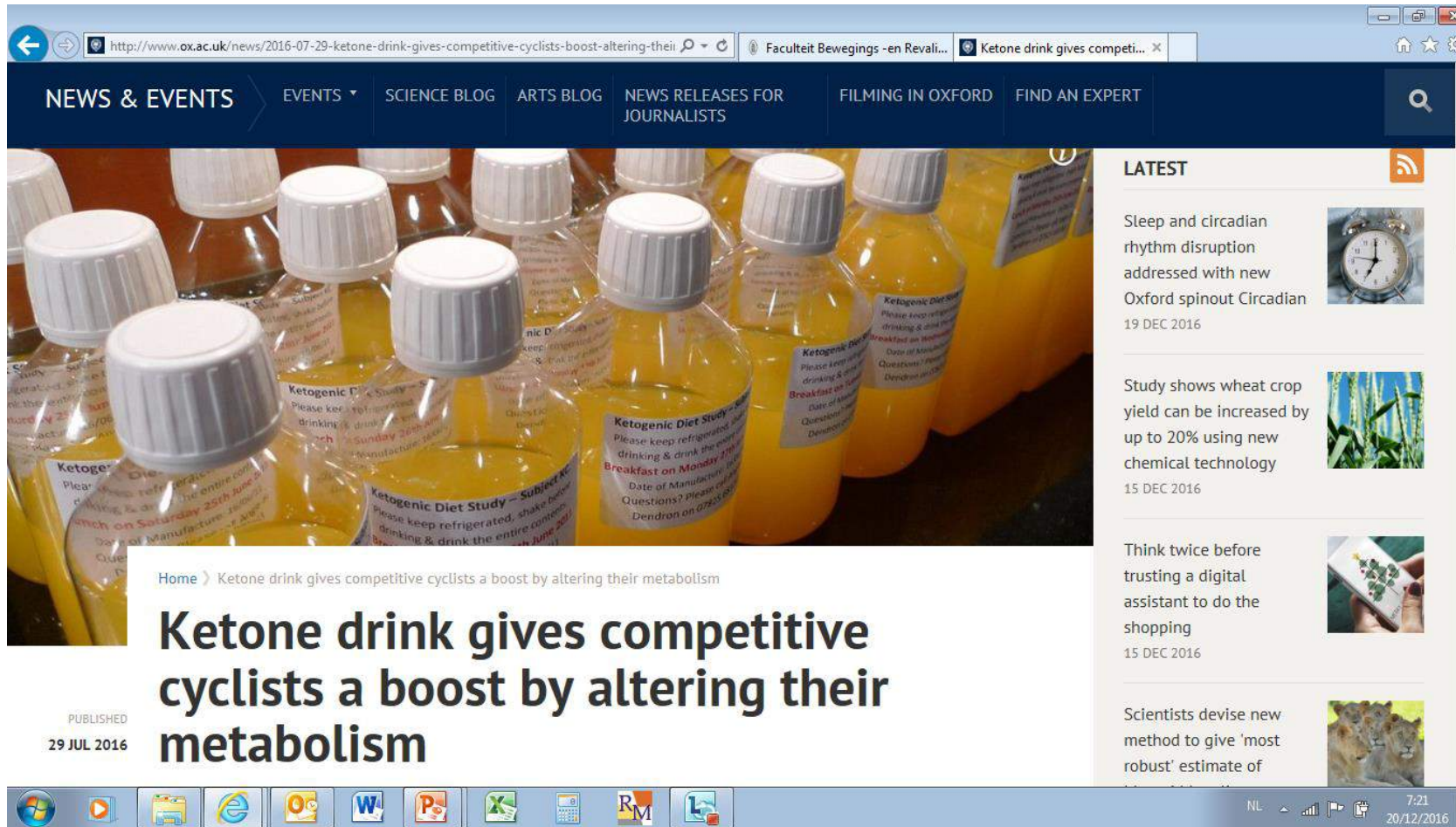


*“When mud and dust have been rinsed off,
we look like skeletons.*

*“Every Tour I loose 6 of my 10 toenails,
they slowly die
from stage to stage.*

But, they recover by the next year .”

Oral ketone ester intake



The screenshot shows a web browser window with the URL <http://www.ox.ac.uk/news/2016-07-29-ketone-drink-gives-competitive-cyclists-boost-altering-their-metabolism>. The browser's address bar also shows the text "Faculteit Bewegings -en Revali..." and "Ketone drink gives competi...". The website's navigation menu includes "NEWS & EVENTS", "EVENTS", "SCIENCE BLOG", "ARTS BLOG", "NEWS RELEASES FOR JOURNALISTS", "FILMING IN OXFORD", and "FIND AN EXPERT".

The main content area features a large image of several clear plastic bottles with white caps, each containing a yellow liquid. The bottles are labeled "Ketogenic Diet Study" and include instructions such as "Please keep refrigerated, shake before drinking & drink the entire contents" and "Breakfast on Monday 27th June".

Below the image, the article title is "Ketone drink gives competitive cyclists a boost by altering their metabolism", published on 29 JUL 2016. A breadcrumb trail shows "Home > Ketone drink gives competitive cyclists a boost by altering their metabolism".

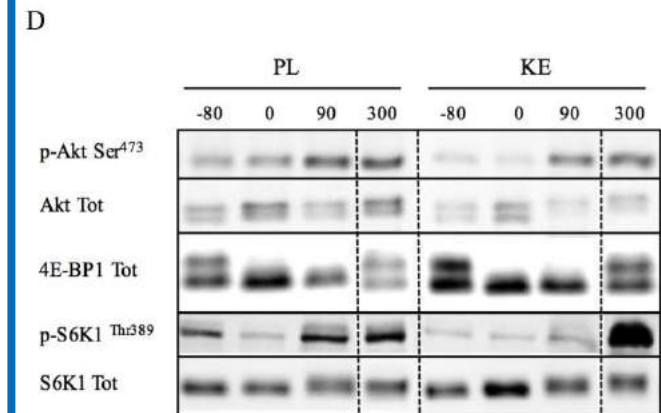
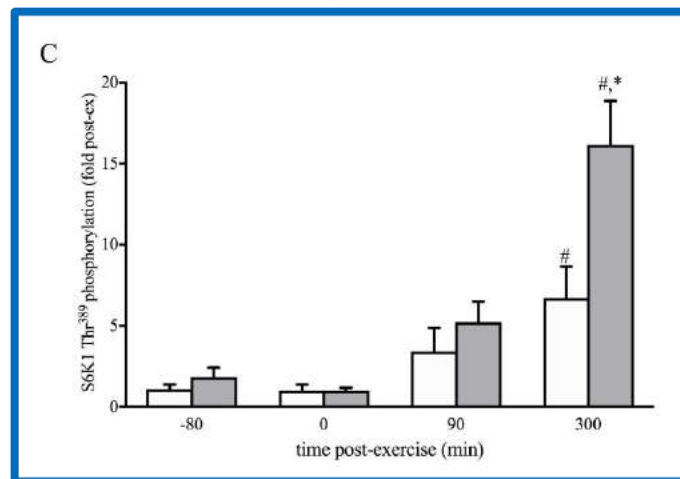
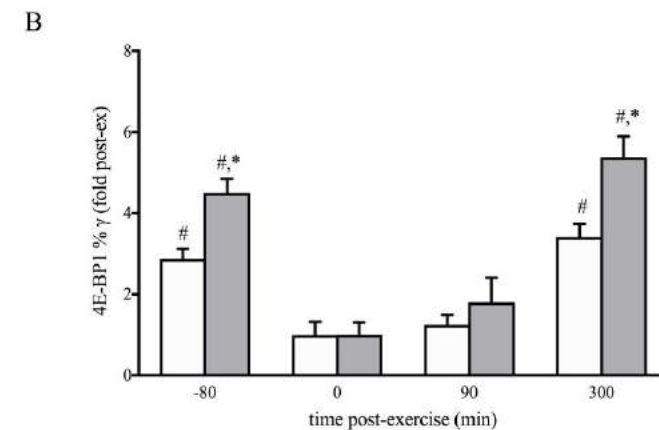
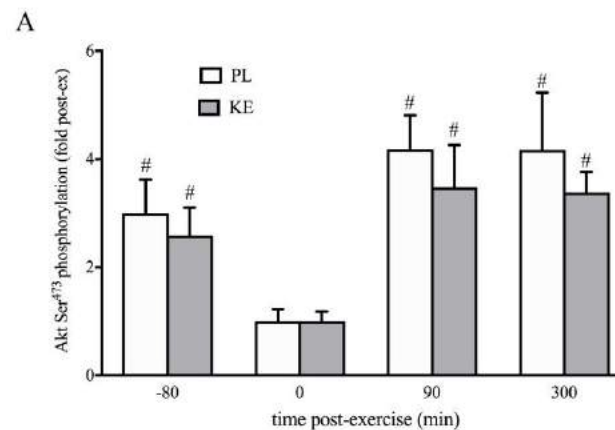
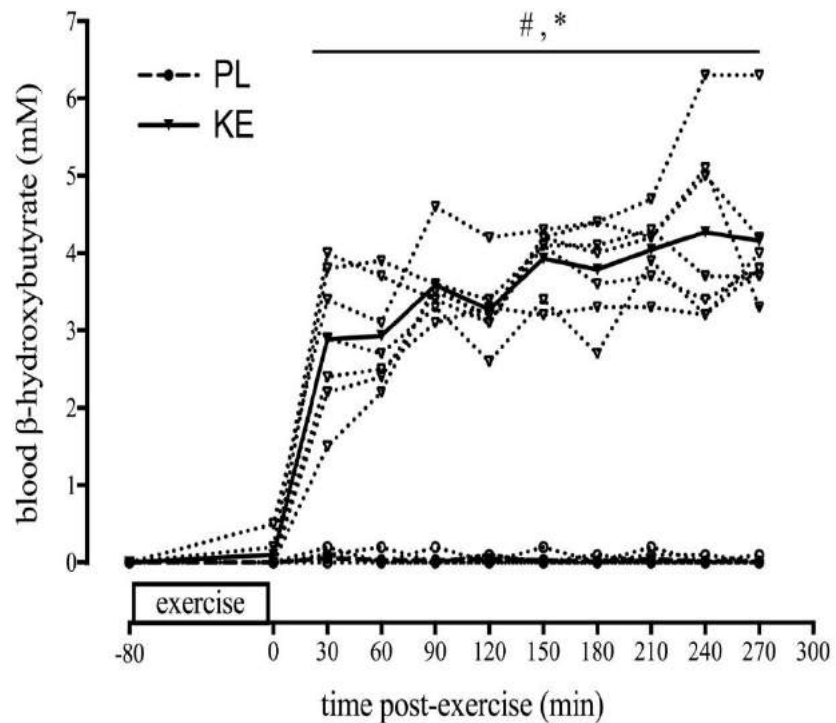
On the right side of the page, there is a "LATEST" section with three article teasers:

- "Sleep and circadian rhythm disruption addressed with new Oxford spinout Circadian" (19 DEC 2016) with a clock icon.
- "Study shows wheat crop yield can be increased by up to 20% using new chemical technology" (15 DEC 2016) with a wheat field icon.
- "Think twice before trusting a digital assistant to do the shopping" (15 DEC 2016) with a hand holding a smartphone icon.

The Windows taskbar at the bottom shows the system tray with the date 20/12/2016 and time 7:21.

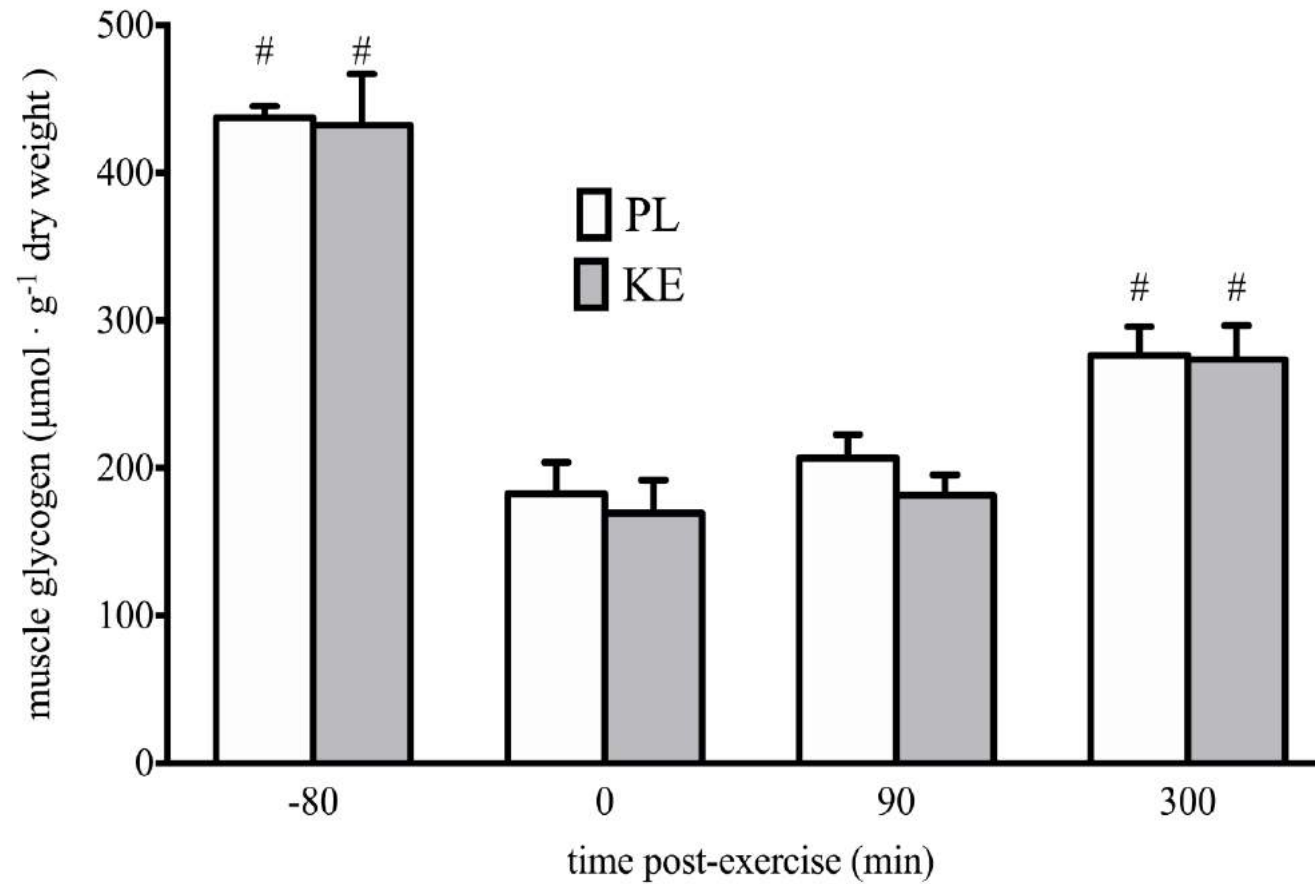


Can oral ketone ester intake stimulate recovery?



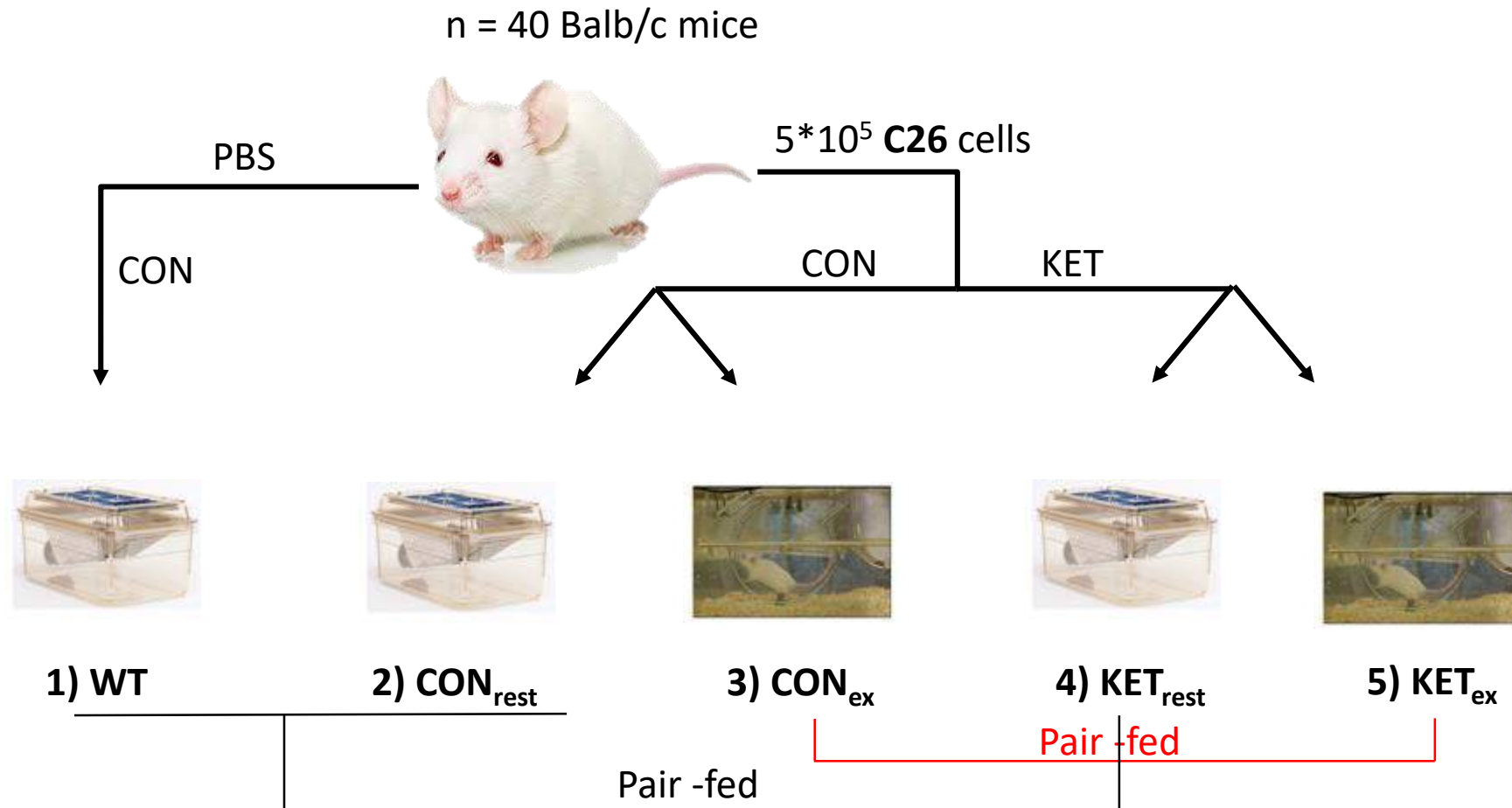


No effect on muscle glycogen resynthesis



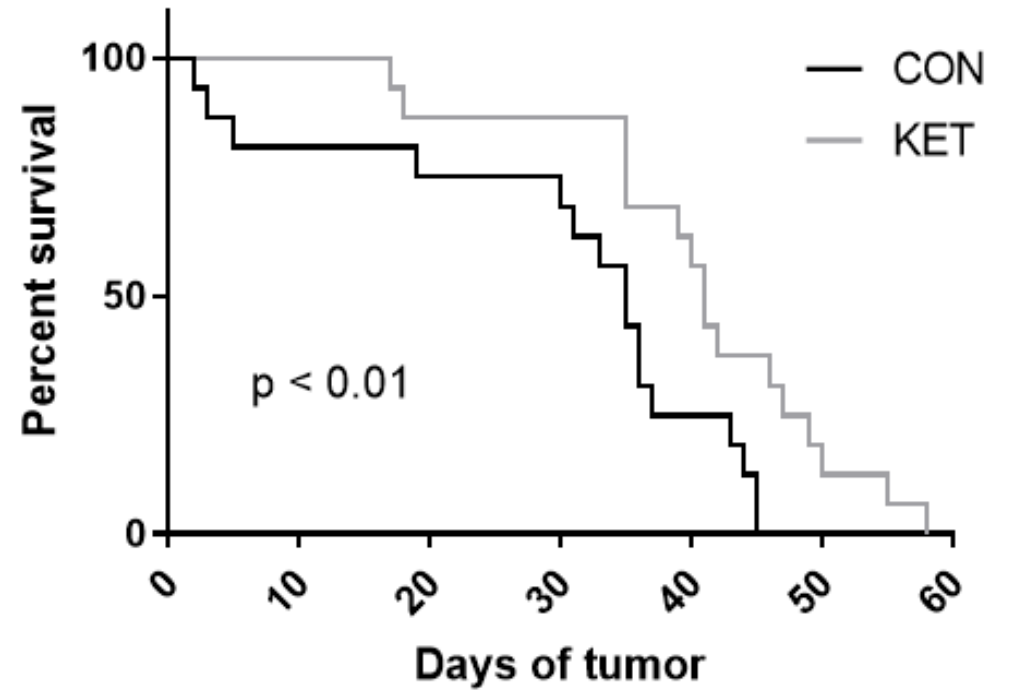
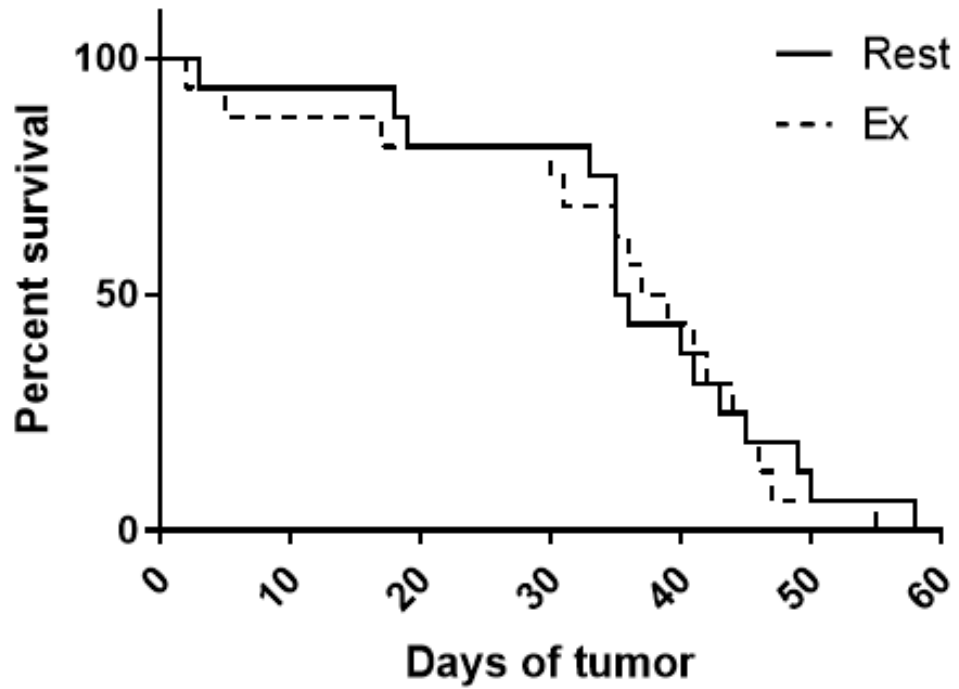


Ketones as an 'anti-catabolic' agent in cancer cachexia



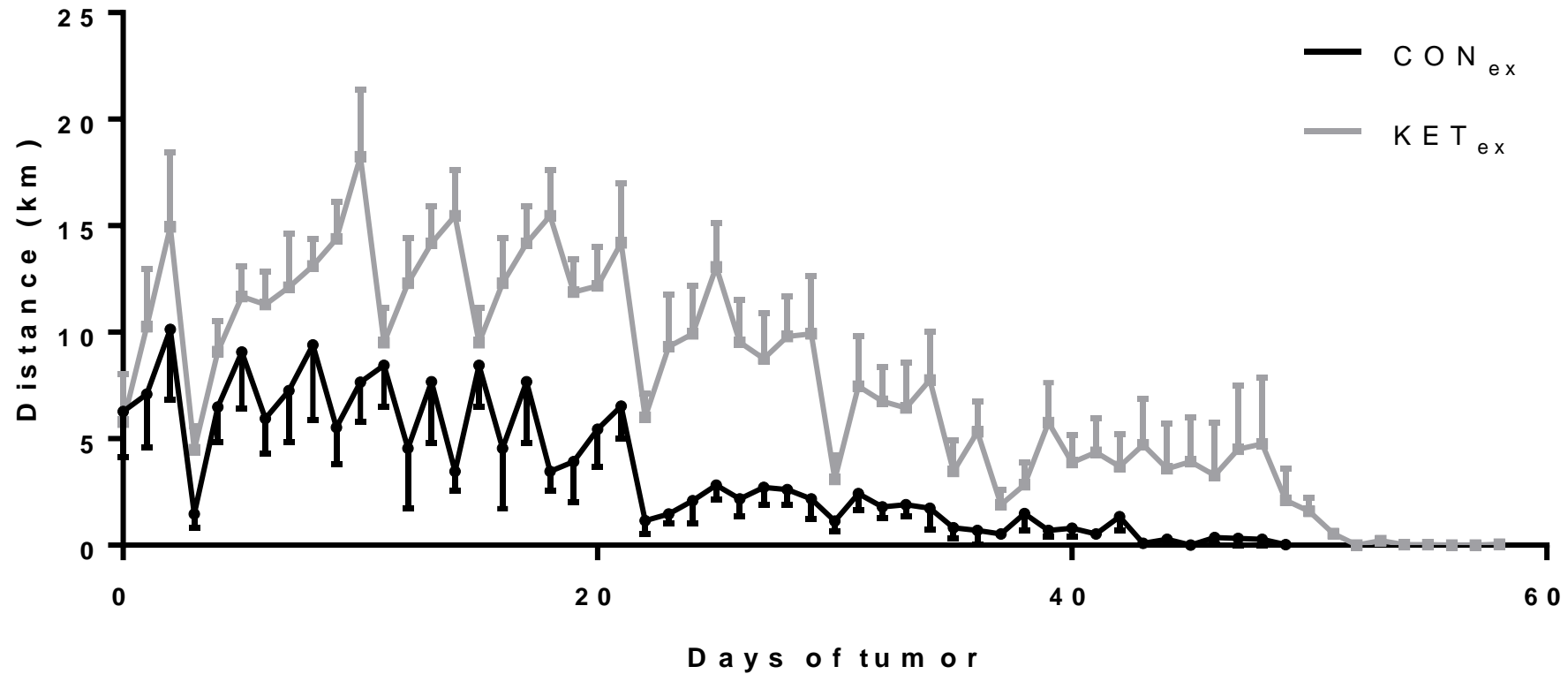


Survival in cancer cachexia



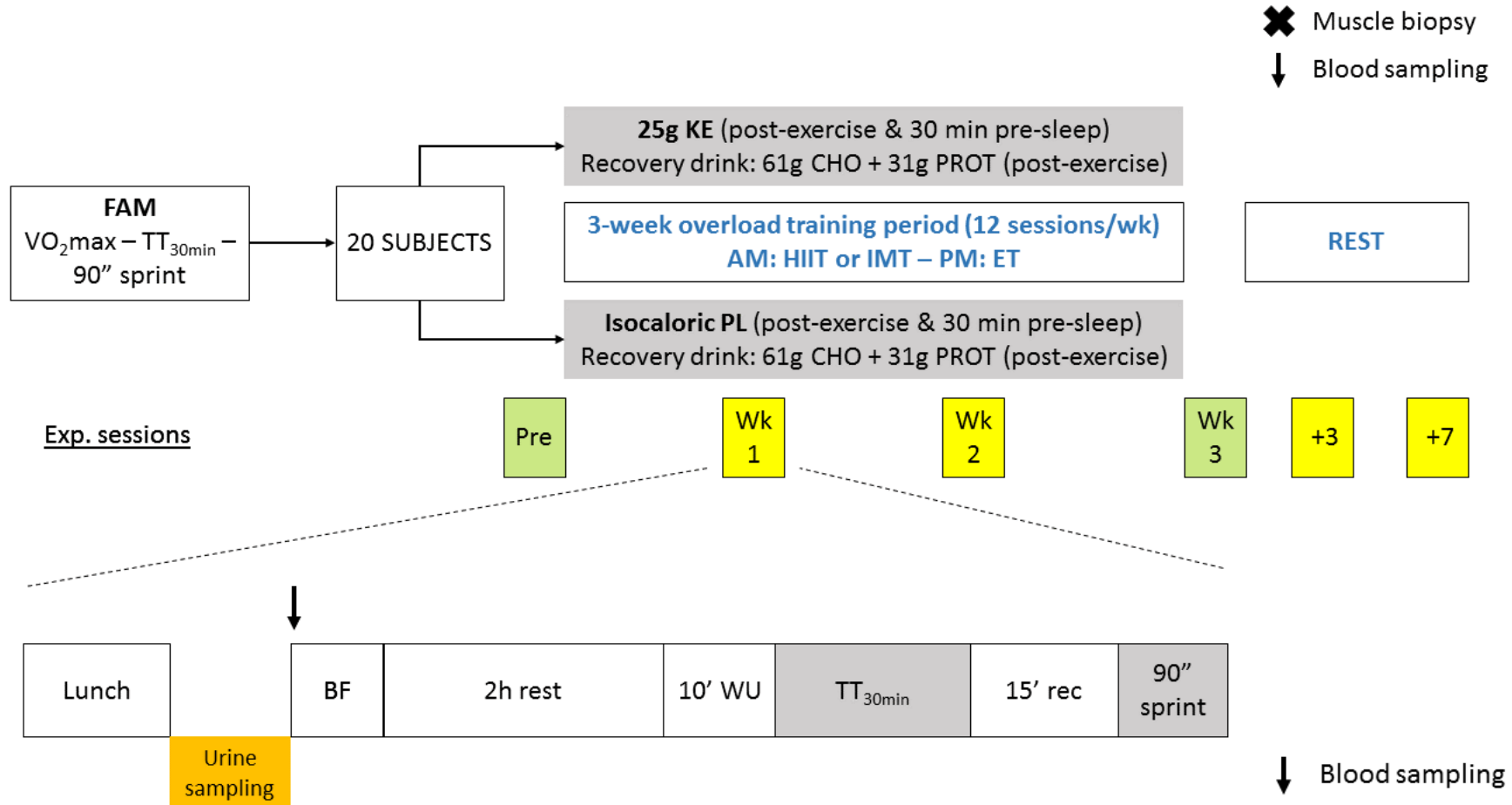


Exercise capacity in cancer cachexia





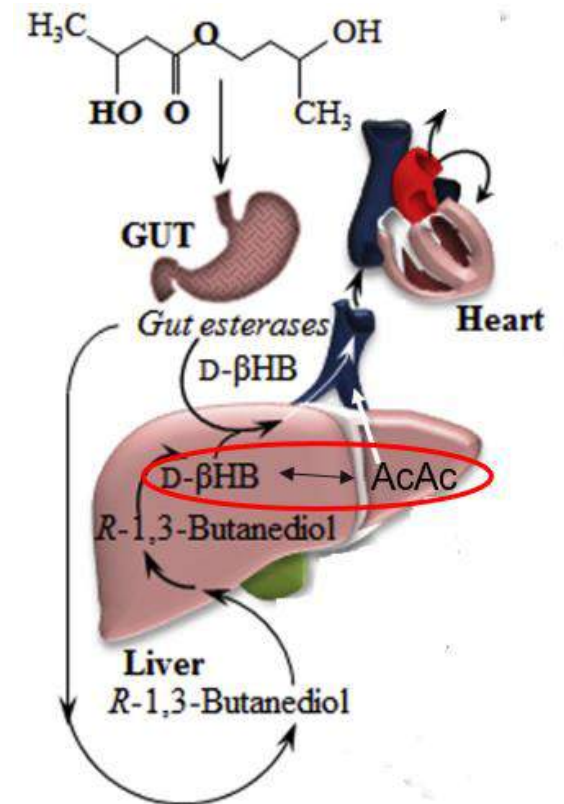
Can KE intake suppress overreaching?





Simulated 'Tour de France'

		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Week 1	AM	70 min IMT 100/55%	Rest	30 min HIIT	70 min IMT 100/55%	30 min HIIT	70 min IMT 100/55%	Test Wk1
	PM	Rest	Rest	60 min ET 70%	60 min ET 70%	60 min ET 70%	60 min ET 70%	60 min ET 77.5%
Week 2	AM	70 min IMT 100/65%	Rest	30 min HIIT	70 min IMT 105/65%	30 min HIIT	70 min IMT 110/80%	Test Wk2
	PM	Rest	Rest	90 min ET 77.5%	60 min ET 85%	90 min ET 80%	60 min ET 90%	90 min ET 85%
Week 3	AM	120 min HIIT & ET 85%	Rest	70 min IMT 110/80%	120 min ET-TT_{30min} 85% - 30' all-out	70 min IMT 110/80%	70 min IMT 110/85%	Posttest Test Wk3
	PM	Rest	Rest	90 min ET 90%	Rest	120 min ET 95%	150 min HIIT & ET 92.5%	Rest

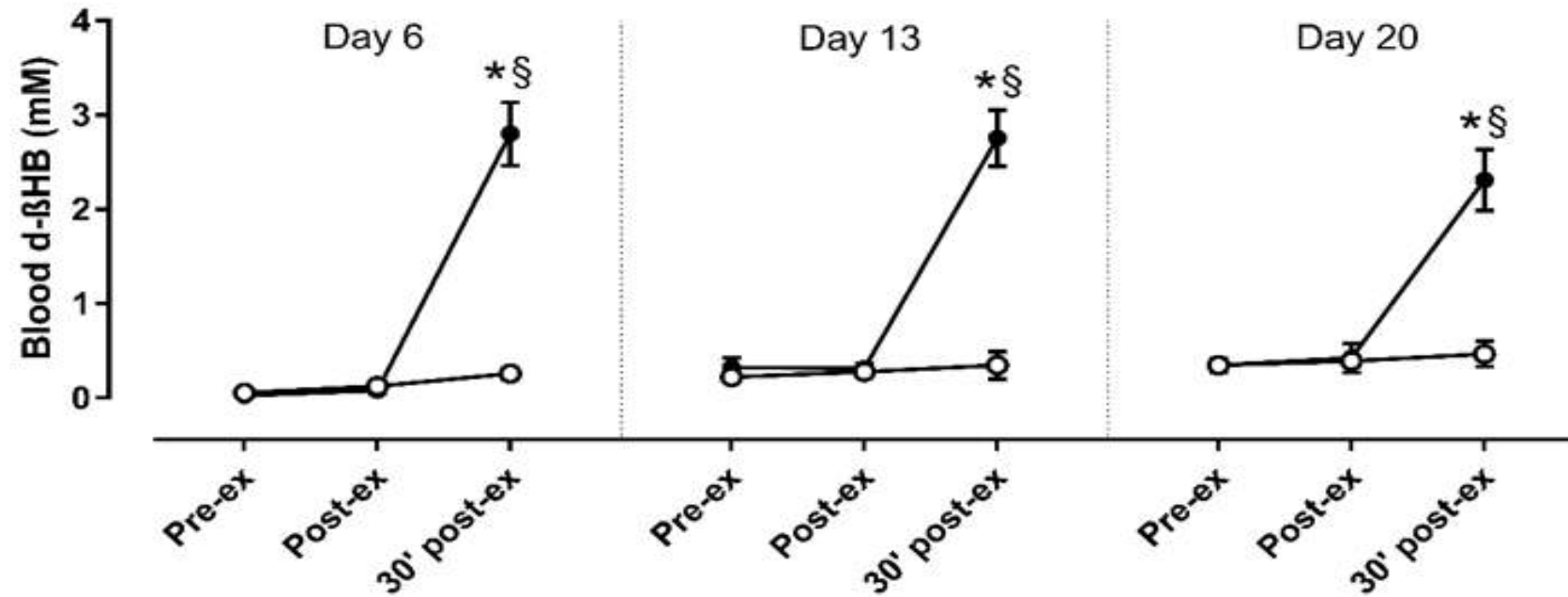




Blood d-β-hydroxybutyrate levels

25g KE doses

3 * daily

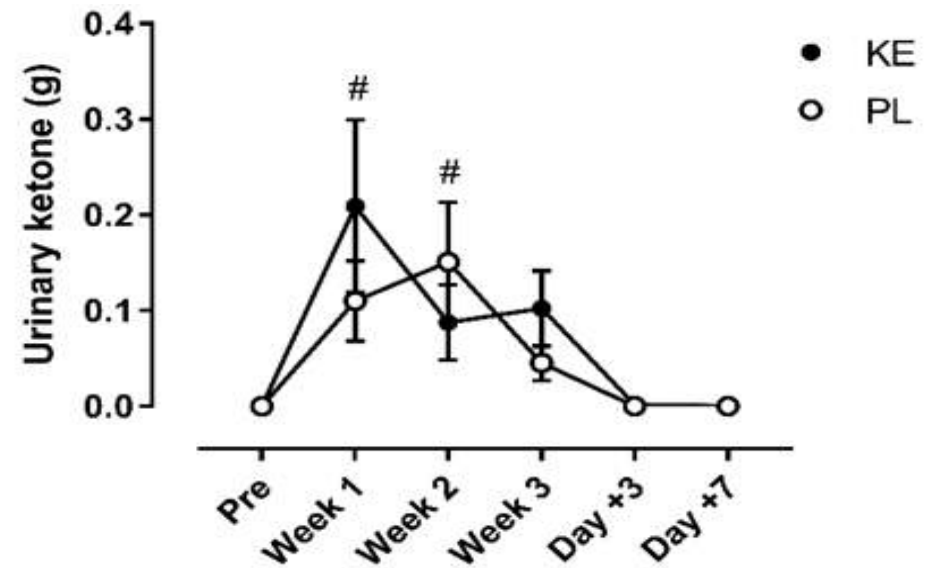
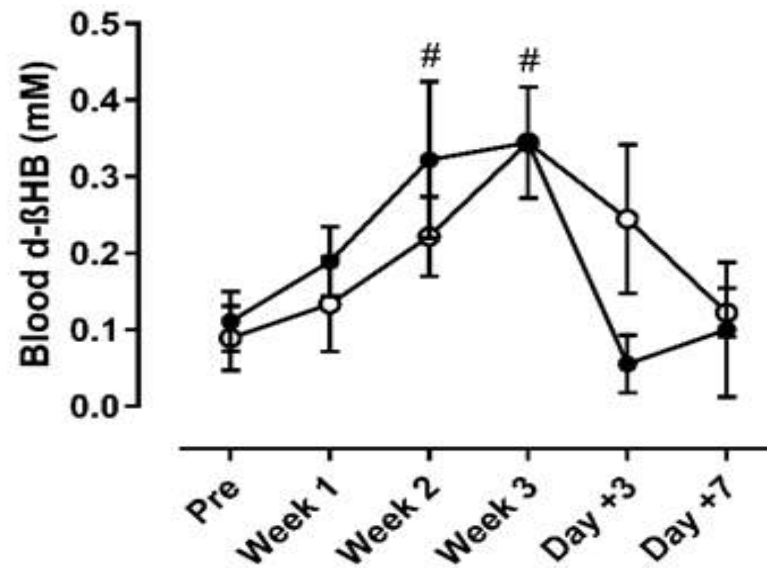




Blood d-β-hydroxybutyrate levels

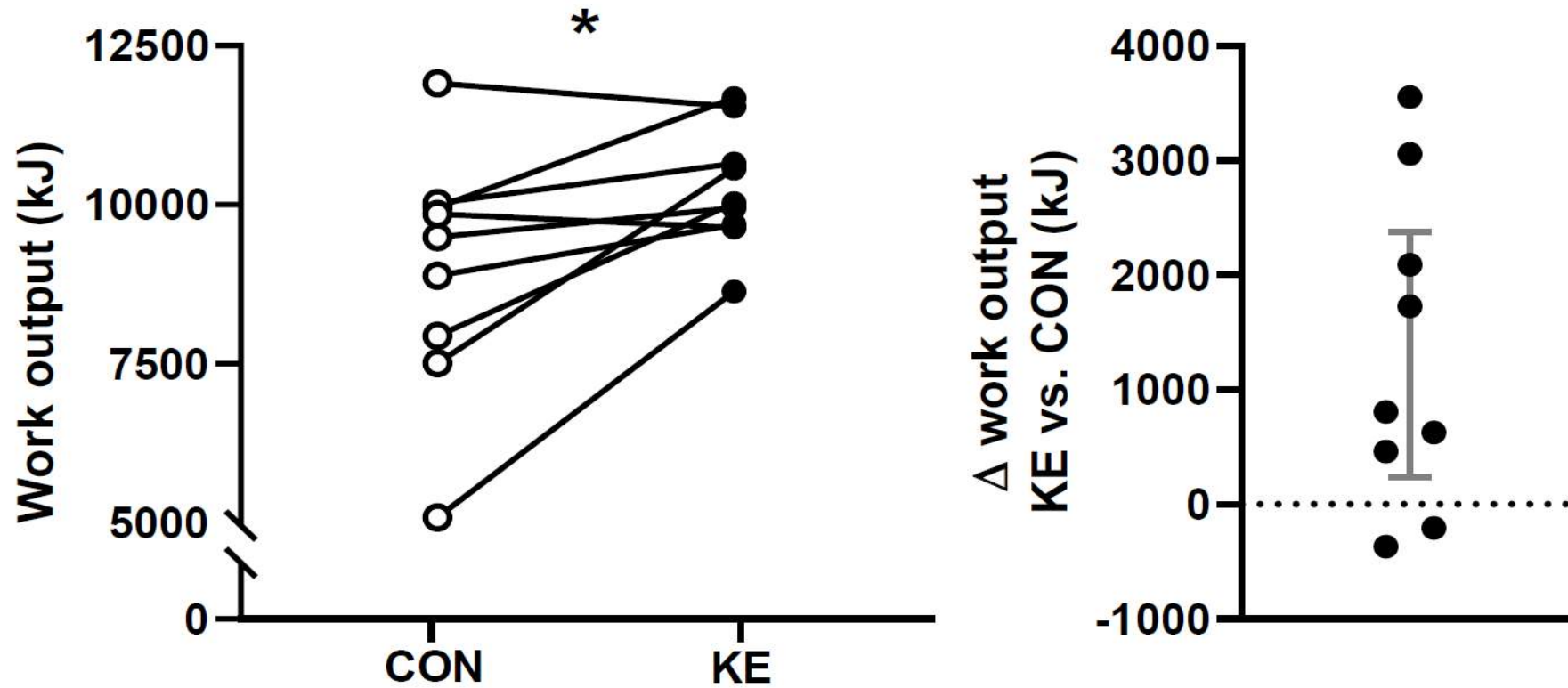
25g KE doses

3 * daily





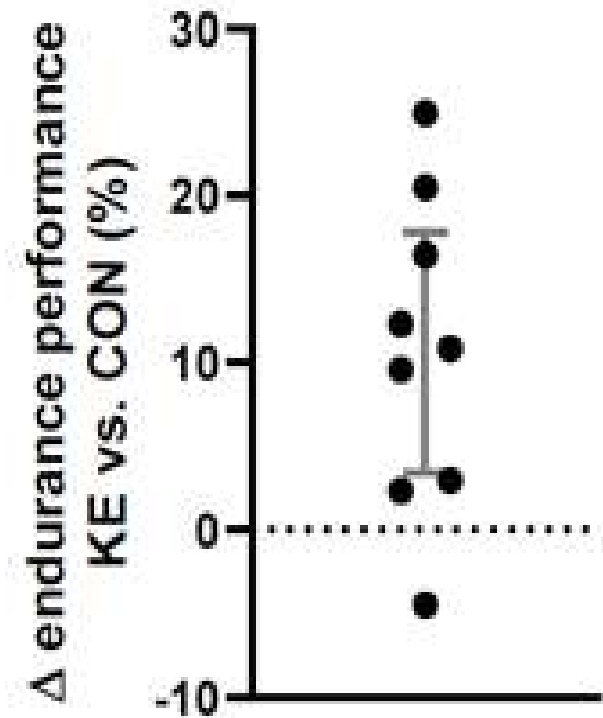
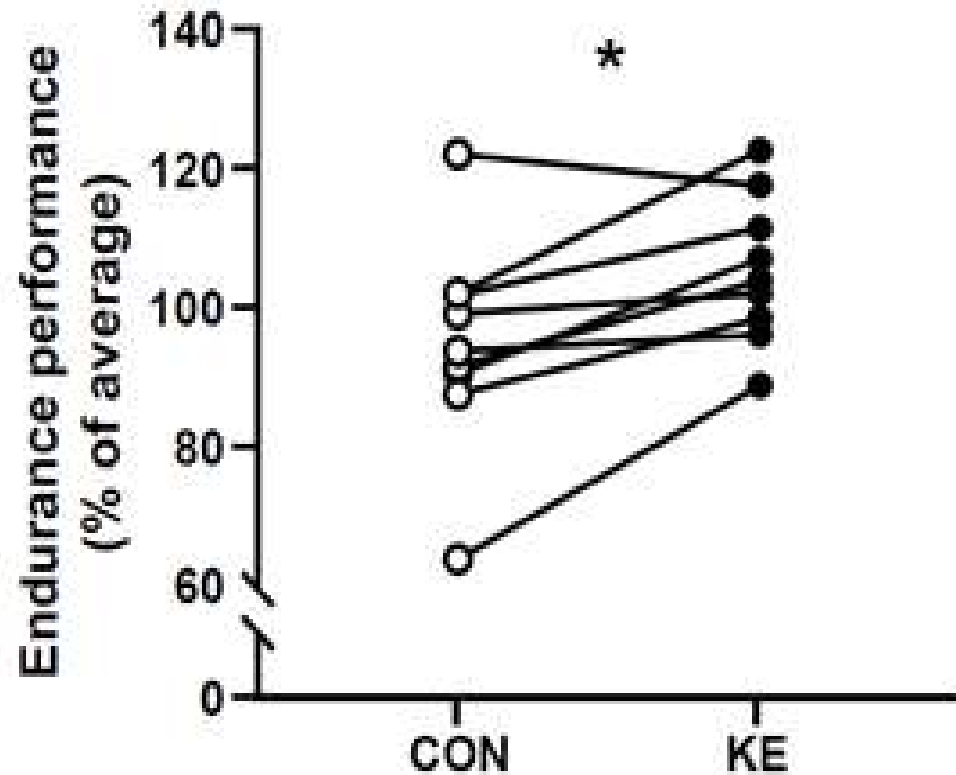
KE increased training load in week 3





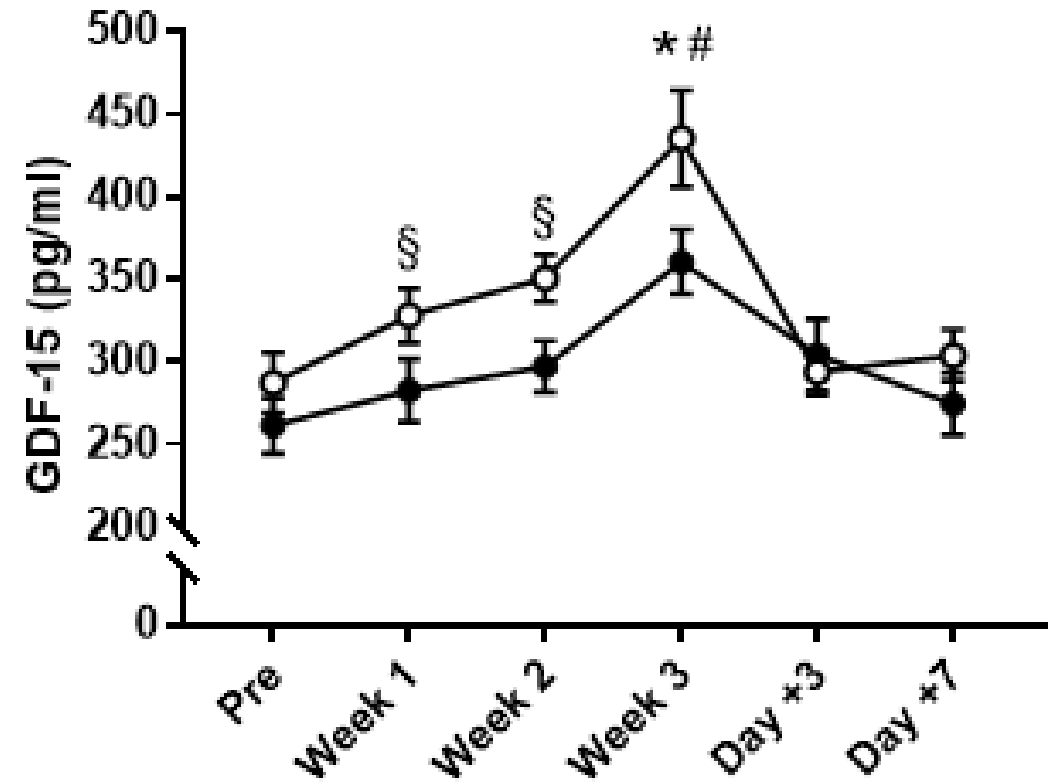
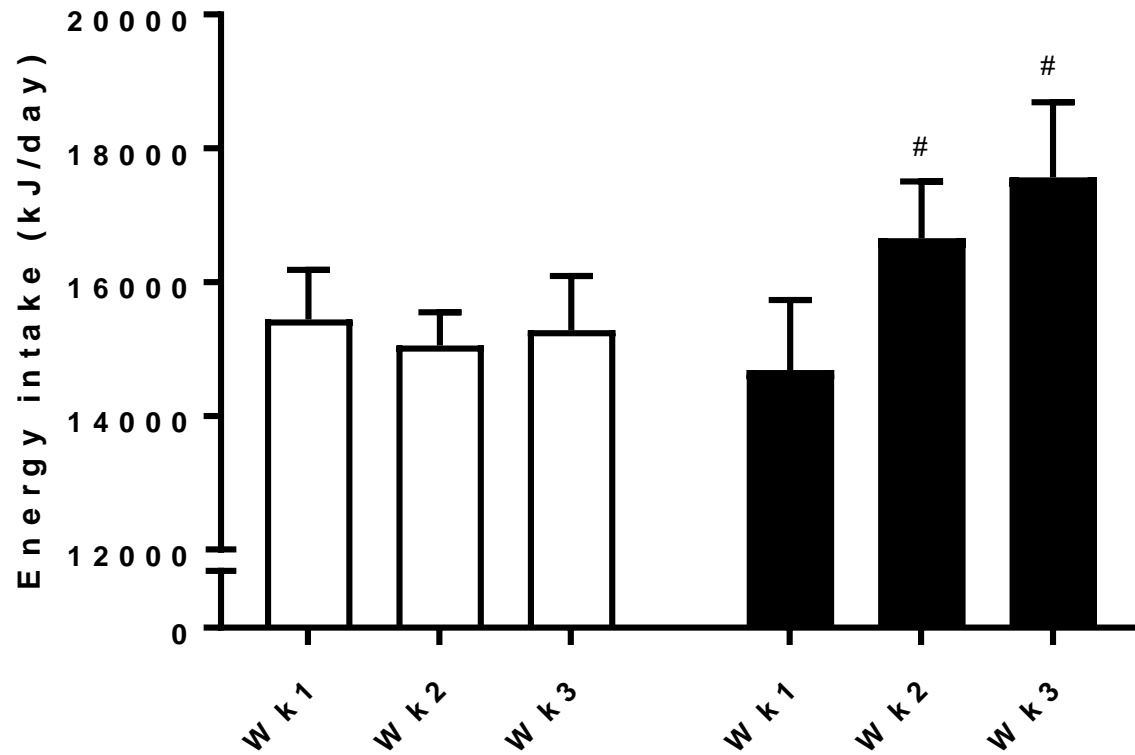
KE enhanced endurance performance

- Training workload
- 30-min time trial
- 120 min training + 30-min time trial



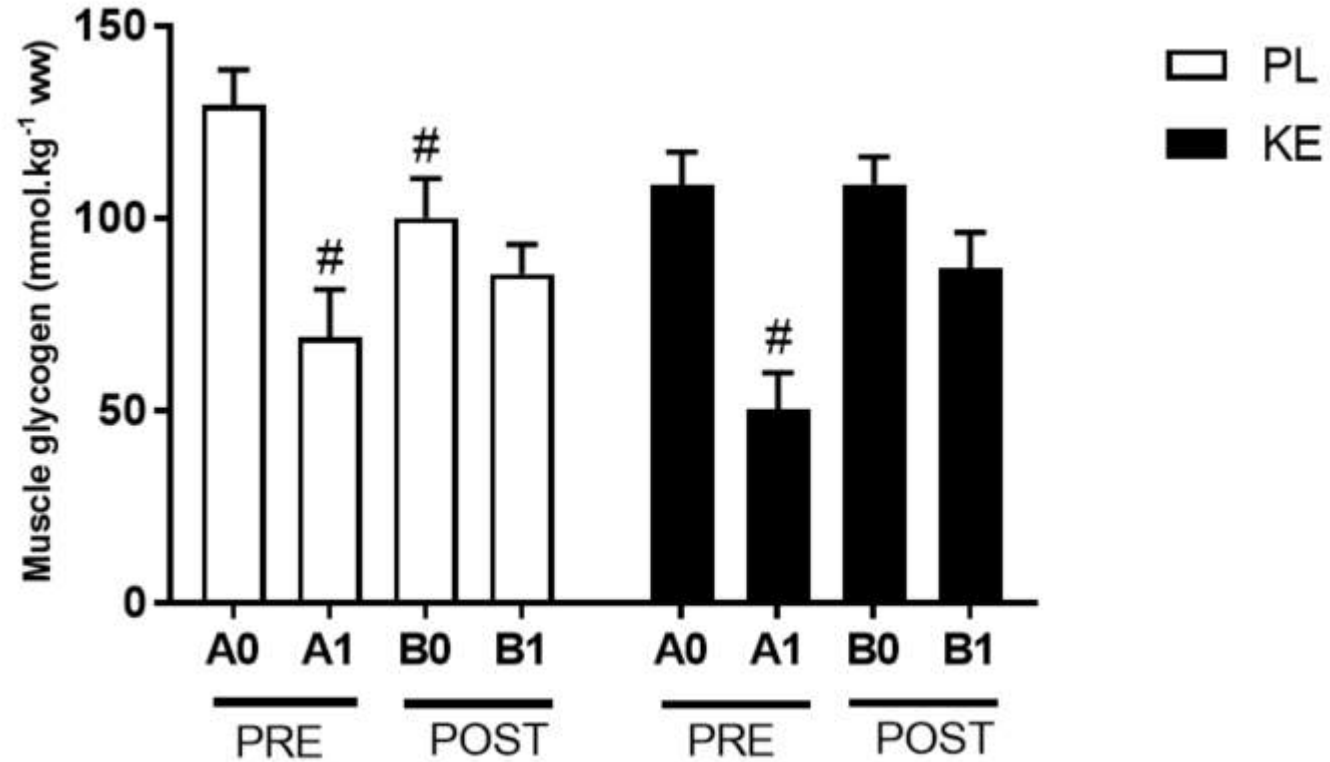


KE intake stimulates energy intake



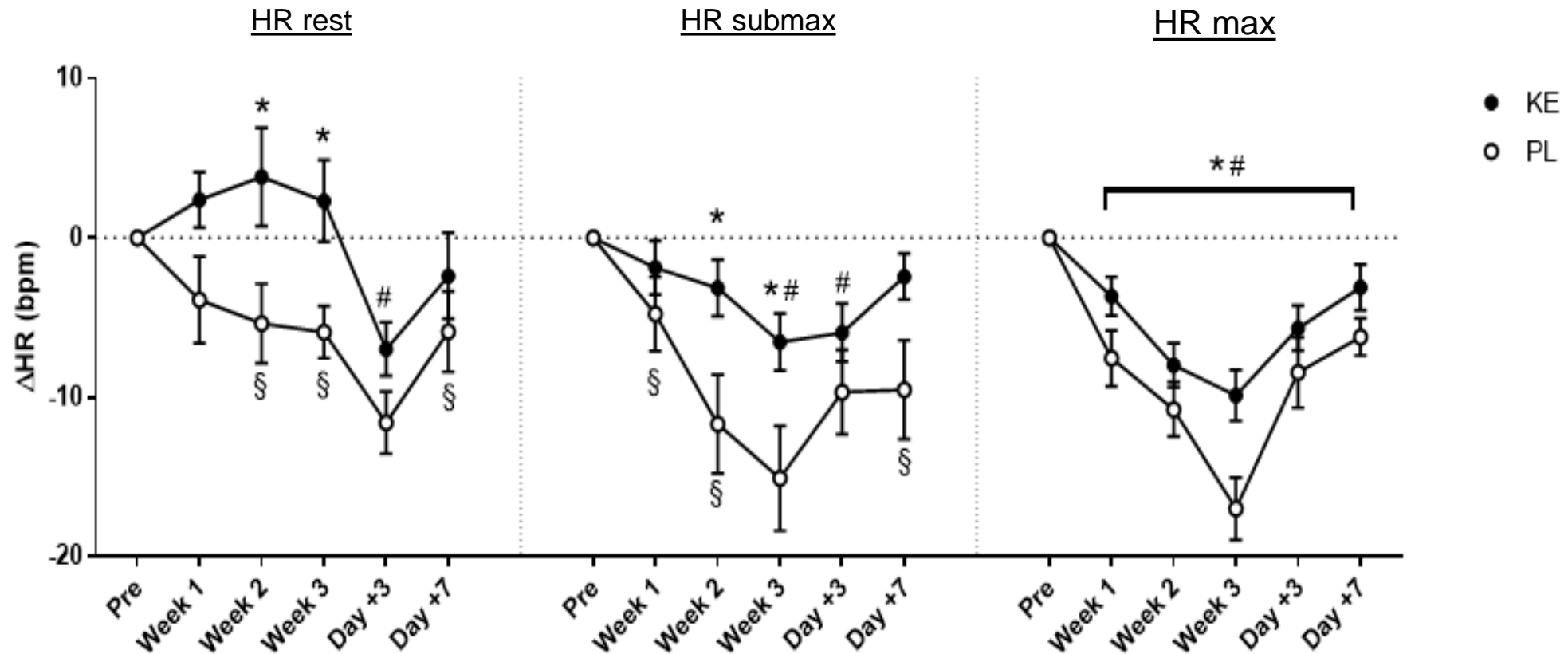


Muscle glycogen content in 30-min TT



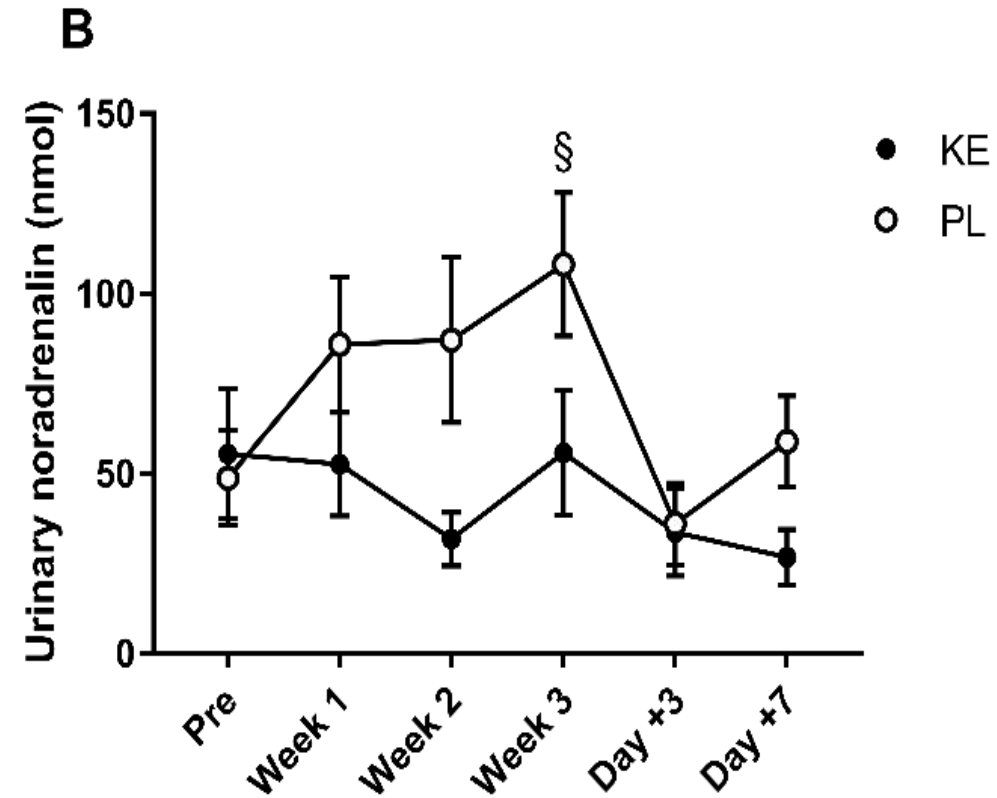
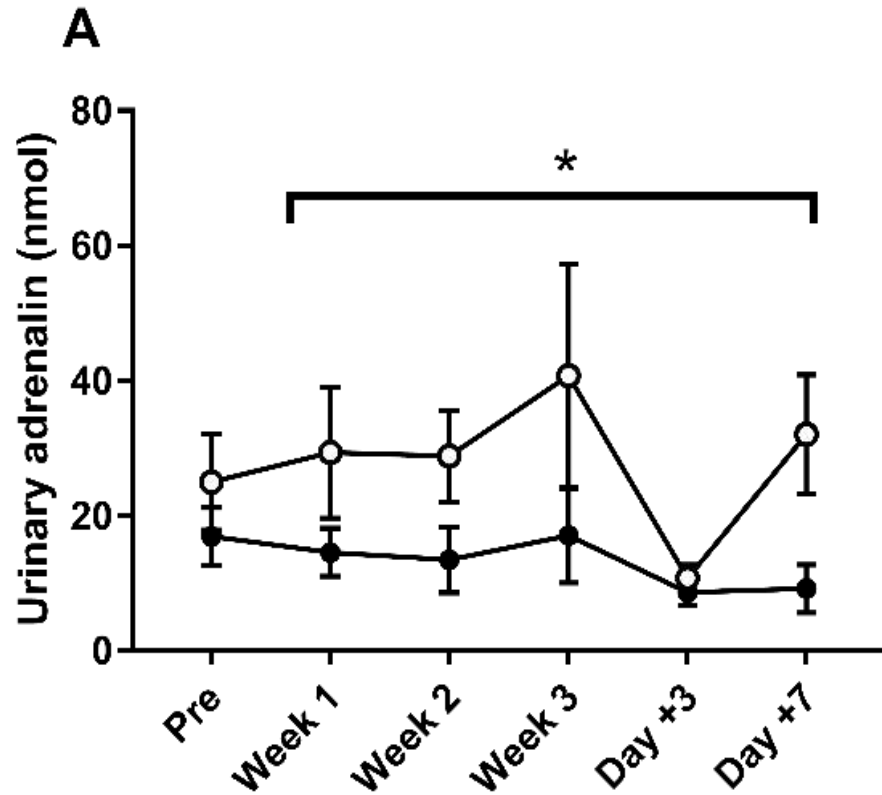


KE suppressed heart rate drop





KE suppressed overnight adrenergic tone





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