METHODS:
Endurance-trained adults (10 males, 7 females) ingested 600 mg/kg body mass of a ketone monoester supplement 30 min before a 30-min cycling bout performed at individual ventilatory threshold intensity. Blood samples were obtained before and after exercise via both fingerprick and venipuncture, and appropriately treated to yield four different types of samples for analyses. Capillary and whole blood was immediately analyzed using a POC analyzer (beta-ketone strip, Freestyle Precision Neo; Abbott Laboratories, IL, USA). Plasma and serum were also analyzed using POC immediately after preparation, and subsequently stored at -80°C for colorimetric analysis occurred within 25 d (Abnova, cat no KA1630; Fisher Scientific, Ontario, Canada), which occurred within 25 d.
RESULTS:
[BHB] determined in plasma and serum samples via POC analyzer were similar ($p>0.99$), but higher than all other [BHB] measures ($p<0.0001$), which were not different from one other ($p>0.61$). [BHB] obtained via colorimetric assay in plasma and serum samples from the same blood draw were not different from each other ($p>0.99$) and averaged to create a single value. Using Bland-Altman plots, the mean difference [95% CI] between BHB via colorimetric assay and capillary, whole blood, and plasma BHB via POC analyzer was 0.0 [-2.0-2.1], 0.2 [-1.3-1.8], and 1.3 [0.2-2.7] mM respectively. Log(BHB), averaged from plasma and serum via colorimetric assay, was linearly regressed to capillary ($p=0.01$, $R2=0.20$, $p=0.01$; $y=4.3x + 1.4$), whole blood ($p<0.0001$, $R2=0.43$, $p<0.0001$; $y=5.6x + 0.82$), and plasma [BHB] via POC analyzer ($p<0.0001$, $R2=0.42$, $p=0.0001$; $y=3.9x + 2.9$).
CONCLUSION:
Mean [BHB] determined via POC analyzer and colorimetric assay were similar, but there was considerable variability between methods for a given sample.

THE TIME-TO-PEAK BLOOD BICARBONATE, PH, AND STRONG ION DIFFERENCE FOLLOWING THE INGESTION OF SODIUM BICARBONATE IN HIGHLY-TRAINED ADOLESCENT SWIMMERS.

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INTRODUCTION:
Contemporary research has sought to optimise sodium bicarbonate ($NaHCO_3$) supplementation by personalising dosing protocols based upon an individual time-to-peak alkalosis. However, it is difficult to ascertain when this time-point occurs since numerous physiological determinants have been previously used to measure acid-base balance. Therefore, the purpose of this study was to investigate the time-to-peak of three different acid-base variables following $NaHCO_3$ supplementation.
METHODS:
Twelve highly-trained, adolescent swimmers (age: 15.9 ± 1.0 years, height: 1.73 ± 0.6 m, body mass: 65.3 ± 9.6 kg) volunteered for this study. Participants mimicked their typical pre-competition nutrition before ingesting 0.3 g·kg BM-1 $NaHCO_3$ in gelatine capsules. Capillary blood samples were then taken during quiet, seated rest on nine occasions (0, 60, 75, 90, 105, 120, 135, 150, and 165 mins post-ingestion) for the assessment of blood pH, bicarbonate ions ($HCO_3–$), and the strong ion difference (SID).
RESULTS:
On a group mean level, no differences were found in the time-to-peak of either approach (pH = 120 ± 38 mins, $HCO_3–$ = 130 ± 35 mins, SID = 96 ± 35 mins; $p = 0.06$). There was, however, a large effect size ($g = 0.91$) between $HCO_3–$ and the SID suggesting a difference in practical application.
CONCLUSION:
This earlier peak in the SID presents an interesting avenue for further research, as this may elucidate a more optimal dosing strategy based upon the current theory towards exercise fatigue. Thus, future investigations should aim to identify whether either of these personalised strategies is more ergogenic with regards to performance enhancement.

SUPPLEMENTATION WITH A MANGO LEAF EXTRACT (ZYNAMITE®) IN COMBINATION WITH QUERCETIN ATTENUATES MUSCLE DAMAGE AND PAIN AND ACCELERATES RECOVERY AFTER STRENUOUS DAMAGING EXERCISE

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INTRODUCTION:
Vigorous and unaccustomed exercise involving eccentric muscle contractions may cause muscle damage. This concurs with increased local inflammation and muscle soreness, reducing force production and compromising recovery. The ergogenic effect of antioxidants administration to reduce exercise-induced muscle damage (EIMD) remains under debate, although recent studies have reported positive effects using large daily doses (1000mg) during at least 3 days, which may compromise exercise-induced hormesis. Zynamite®, a mango leaf extract rich in the natural polyphenol mangiferin, has antioxidant and anti-inflammatory properties, which may prevent EIMD and ease recovery. Thus, we aim to determine if Zynamite® administered in combination with quercetin accelerates recovery after repeated damaging exercise.
METHODS:
Twenty-four women and 33 men were randomly assigned to two treatment groups matched by sex and 5-km running performance, and run a 10-km race followed by 100 drop jumps to elicit EIMD. One hour prior to competition, and every 8h after for 24h, they ingested placebo or 140 mg of Zynamite®+ 140 mg of quercetin with a double-blind design. Fasting blood samples were obtained before the 10-km race and 24h after. Biomarkers of muscle damage were assessed in serum: myoglobin, high-sensitivity C-reactive protein (hs-CRP), creatine kinase (CK) and alanine aminotransferase (ALT). Race performance, muscle pain (analogic scale) and countermovement vertical jump performance (force plate, Kistler) were assessed before and after competition.
RESULTS:
Performance time in the competition were unaffected by the treatment, while polyphenols attenuated the muscle pain after the competition (6.8±1.5 and 5.7±2.2a.u., $p=0.035$) and the loss of jumping performance (9.4±11.5 and 3.9±5.2%, $p=0.036$; $p=0.034$) and mechanical impulse ($p=0.038$) 24h later. In men, polyphenols attenuated the increase of serum myoglobin (24.4±21.2 to 48.3±42.9 ng/mL, $p<0.001$; time by treatment by sex interaction; $p=0.045$) and alanine aminotransferase (from 19.3±14.3 to 24.8±15.7 and from 23.3±13.6 to 24.7±16.1 U/L, placebo and polyphenol treatment, respectively, $p < 0.001$; time by treatment interaction, $p = 0.01$). The concentration of hs-CRP and CK were increased 24h post-race without a significant effect of polyphenols ($p=0.53$ and $p=0.95$, respectively).