Reviewer’s report

Title: Fermented milk improves glucose metabolism in exercise-induced muscle damage in young healthy men

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Reviewer: Thomas Love

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Method

Study Design
The authors use a repeated-measures design to determine the effects of fermented milk on muscle damage and acknowledge the existence of a repeated bout effect. Whilst trials were administered in a random order please could they clarify if this was 1) a counter-balanced design, 2) report trial order effects for responses (soreness, CK) and 3) further explain the reason for using a 6 week intervening period given the data presented by Nosaka et al (1991) which suggests a protective effect might still be evident.

Examination Beverage
It is unclear what the authors mean by “adjusted contents of protein...”. It would perhaps be more informative to report protein, fat, carbohydrate and pH values of both drinks to allow comparison with other guidelines such as the effects of carbohydrate and/or protein on muscle damage to be determined.

Experimental Schedule
Diet – The authors state that food and fluid intake was recorded for the day before the trial, but there is not data/attempt to standardise the diet on day 1 of each trial. Consequently the ability to infer that the alteration in CK at 24hr and indices of oxidation were due to the drinks that were consumed is not possible.

Diet – The lack of dietary control on day 1 has implications for the metabolic data collected on day 2. Recently Stevenson and colleagues have reported the influence of the GI index of an evening meal on subsequent responses to a high GI meal the following morning. Whilst this did not appear to influence carbohydrate or fat oxidation it did have a significant effect on blood glucose and insulin responses. Can the authors report what dietary standardisation was performed on day 1 of each trial?

Urine Collection – Urine collections and blood samples (analysed for CRP, TNF#, carbonyl protein) were obtained only on the morning of day 2. Given the 6 week intervening period between trials, could these values represent a day-day change rather than attributable to the intervention?

Visual Analogue Scale – It is currently unclear what a muscle soreness value of
4.8 means. Please can the authors provide further evidence of the scale used. A total soreness value has been reported by simply adding the soreness values from the 3 muscle groups together. If whole body muscle soreness was a variable of interest this would have been best determined by a specific question rather than later inferred from data. The absence of muscle soreness data from the Control trial is disappointing as this would have been informative and enabled a more guided assessment of the efficacy of drinks to have been made. Was this data collected and if so, why was it not included?

Statistical Analysis – The data gathered, (3 trials using the same participants) would suggest that a repeated-measures ANOVA would be the most appropriate statistical test (if data was normally distributed) rather than a one-way ANOVA that has been used.

Statistical Analysis – For some variables (eg. lactate, glucose) the authors report 2-3 collection points per trial. This data should therefore be analysed by a two-way repeated measures ANOVA rather than a one-way ANOVA. Please can the authors clarify the reasons for the statistical tests run.

Discussion
It is surprising that the recent work by Cockburn et al (2012) and other studies from the growing literature on milk and exercise was not included in the study. This data indicate that just 500ml of milk will confer a benefit on muscle damage. This volume of milk is similar to that used in the current study (400ml). If indeed an improvement was found with fermented milk, then the authors might find it beneficial and indeed a strength of the study to report this due to the comparison of fermented milk to a PLA (milk) which is already considered to be beneficial.

Conclusion
The authors conclude “we found that fermented milk prevents glucose metabolic impairment and muscle damage induced....”. But, from the data that was presented, there was no difference in muscle damage between trials.

Impaired Glucose Metabolism – The data presented indicates no differences in blood glucose responses to a glucose load and in the absence of insulin concentrations, I believe the statement “These observations suggest that dietary fermented milk reduces impairment of glucose metabolism....” is difficult to justify.

Athletes – This study used “healthy young males who were not habituated to a regular exercise regimen. It is therefore difficult to justify the comment suggesting athletes may benefit.

Quality of written English: Needs some language corrections before being published

Statistical review: No, the manuscript does not need to be seen by a statistician.
Declaration of competing interests:

I declare that I have no competing interests