Reviewer’s report

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

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Reviewer: Koichi Nakazato

Reviewer’s report:

The authors investigated the effect of fermented milk supplementation on muscle damage after one bout of strength exercise. They observed significant changes in muscle soreness and RQ in the fermented milk group compared to the placebo group. The authors concluded that intake of fermented milk supplementation improves glucose metabolism and alleviates muscle damage.

The reviewer thinks that the aim of this study is clear, but there are several concerns especially in the Methods and Discussion sections. Since the experimental setup seemed unsuitable for the purpose of the study, the obtained results were rather weak to support their hypothesis.

Background

The authors previously reported that Lactobacillus helveticus-fermented milk prevents exercise-induced muscle damage in animal models. They also showed that insulin-dependent glucose uptake was affected in damaged muscle, and such impairment was rescued by fermented milk supplementation in animals. In this report, they raised the question of whether this favorable effect of fermented milk supplementation is also effective in humans.

The reviewer thinks that the question is original and clearly defined. It is also obvious that prevention of muscle damage is important, for example, for weekend athletes.

Method

1 Repeat bout effect

The authors classified 3 groups as control, placebo, and fermented milk groups, and all subjects participated in all 3 trials in a random order. It is well known that the repeat-bout effect exists in exercise-induced injury. The reviewer recommends that the authors explain why they thought that 6 weeks was enough to diminish the repeat-bout effects.

2 Exercise protocol

The reviewer is not sure why the authors selected the “usual” exercise protocol. In their animal model, they employed eccentric contraction exercise, which induces muscle damage. In this human trial, eccentric exercise is suitable for replicating the author’s previous animal studies.

The reviewer also wonders why the strength of the exercise was as broad as
70–100%. The strength and volume is critical for inducing muscle damage. Please provide details for the exercise protocol employed.

3 RQ
It is obvious that indirect metabolic performance is affected by the experimental setup. Please clarify how you measured the respiratory parameters. The cited manuscript is inappropriate, because it refers to an animal-model study.

4 Experimental schedules
It is easier for readers to understand schematic illustrations of the experimental schedule rather than text. Please consider making this change.

VAS and blood-profiling parameters change over time. The reviewer thinks that only 1 time point is insufficient for precise evaluation. Why did the authors select the next day of exercise as the only measuring time point?

5 VAS
Why did the authors evaluate muscle pain during butterfly and squat movements? It is easier to evaluate the degree of pain by palpation and specify the muscle group involved. If the authors have referenced previous studies, please indicate so.

Results and Discussion
1 Effect of fermented milk for muscle damage
The significant differences between the fermented milk and the placebo were only seen in muscle soreness and respiratory parameters. Further, evaluation of muscle soreness was conducted at only 1 time point, and significance was observed only in the pectoralis major muscle. The pain during butterfly motion is suspected to have radiated from other muscle groups. With regard to RQ, the difference of averaged values was rather small (0.88 and 0.84).

Although the reviewer agrees that fermented milk might have beneficial effects, the experimental setup and obtained data were too weak to support their hypothesis.

2 Serum glucose, lipid profile, inflammatory factors, and oxidant stress markers
The tendency of averaged values seemed to support the author’s hypothesis, but there was no significance. The reviewer thinks that the strength of the selected exercise protocol might be weak for this experiment.

Quality of written English: Acceptable

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.