Does post-exercise milk consumption reduce exercise-induced systemic inflammation? A research proposal
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**Background:** Following a single session of exercise there is a transient increase in inflammation, with increases in both systemic cytokines and leukocyte counts. This inflammatory response contributes to exercise-induced muscle damage. Consuming milk post-exercise has been shown to improve subsequent performance, preserve muscle strength, and reduce muscle soreness and creatine kinase levels. Further, long-term intervention studies have demonstrated that dairy consumption reduces systemic concentrations of pro-inflammatory cytokines. However, no study has comprehensively examined the effect of post-exercise milk consumption on systemic inflammation. The present study will characterize and compare the inflammatory response following post-exercise milk consumption versus an isoenergetic carbohydrate drink.

**Methods:** Up to fifteen young, healthy females naïve to resistance exercise will be recruited. Participants will complete the milk and carbohydrate trials in a randomized order, separated by four weeks. After an overnight fast, participants will report to the lab for a baseline blood draw and perform an acute bout of resistance and plyometric exercise. Immediately following exercise, participants will consume the corresponding trial drink, either 500mL skim milk (MILK), or an isoenergetic and isovolumetric maltodextrin and water drink (CHO), and undergo a 5min post-exercise blood draw. A second drink will be provided at 1hr post-exercise, and a 1hr post-exercise blood draw will be taken. Subsequent blood draws will be performed at 24 and 48hr post-exercise. At each blood draw, participants will perform a jump test and rate their muscle soreness. Three-day food records encompassing the day of the trial will be recorded, and participants will be asked to keep their diet consistent during both the MILK and CHO trials. Blood will be analyzed for systemic cytokine levels (TNF-α, IL-6, IL-10, IL-1β), leukocyte analysis will be done on fresh cells, using Flow Cytometry, to determine changes within leukocyte populations and the source of cytokine production.

**Hypothesis and Expected Results:** We hypothesize that post-exercise milk consumption will attenuate the pro-inflammatory while enhancing the anti-inflammatory response to acute exercise, versus carbohydrate consumption.