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ABSTRACT

New Zealand Blackcurrant (NZBC) has a high anthocyanin content and intake has been shown to increase fat oxidation during 30-min exercise, with magnitude of change correlated to body composition in males and females. No investigation has compared males and females fat oxidation responses to NZBC intake during longer duration exercise within the same study. **PURPOSE:** To examine the effect of body composition and NZBC extract on metabolic responses during 60-minutes treadmill running in males and females. **METHODS:** Twenty-two (11 male and females, mean±SD, age: 29±8 years, height: 171±10 cm, mass: 69±11 kg, body fat: 18±6 %, $\dot{V}O_{2max}$: 44±9 mL·kg⁻¹·min⁻¹) participants underwent a double-blind, randomised cross-over and placebo-controlled study. Participants consumed NZBC extract (600 mg·day⁻¹ containing 210 mg anthocyanin) or placebo (PLA) for 7-days (washout 14-days). Participants performed 60-minutes of treadmill running at 50% $\dot{V}O_{2max}$ with measurement of expired gases (Cortex Metalyzer 3B, Leipzig, Germany). Bioelectrical impedance measured body composition (Bodystat 1500, Douglas Isle of Man). **RESULTS:** There was no difference in relative intensity for NZBC and placebo for males (NZBC: 51.7±6.1, PLA: 49.5±6.9) and females (NZBC: 52.1±6.9, PLA: 52.9±9.2 % $\dot{V}O_{2max}$) (P=0.109). Average fat oxidation was different between the conditions (NZBC: 0.27±0.11, PLA: 0.21±0.12 g·min⁻¹, P<0.001), but the responses between males (NZBC: 0.27±0.11, PLA: 0.19±0.11 g·min⁻¹) and females was not different (NZBC: 0.26±0.12, PLA: 0.22±0.14 g·min⁻¹, P=0.078). When combined, there was no relationship (P>0.05) between body fat percentage, fat-free-mass, and fat-mass for change in fat oxidation (Δ FATOX) (r=-0.079, r=0.141, r=-0.012, respectively). For males there was no relationship (P>0.05) between body fat percentage, fat-free-mass, and fat-mass for Δ FATOX (r=-0.069, r=0.039, r=0.029, respectively). However, for females there was a relationship between body fat percentage and Δ FATOX (r=0.691, p=0.019) but no relationship (P>0.05) between fat-free-mass and fat-mass for Δ FATOX (r=-0.429, r=0.538, respectively). **CONCLUSION:** A 7-day intake of New Zealand blackcurrant extract increases fat oxidation during 60-min moderate-intensity exercise, with the change related to body composition in females.

INTRODUCTION

New Zealand blackcurrant (NZBC) extract contains anthocyanins. Seven days of 600 mg·day⁻¹ New Zealand blackcurrant extract (containing 210 mg anthocyanins) has been shown to increase fat oxidation during walking with the magnitude of change correlated to body fat percentage in males [1] and females [2]. A comparison of responses to NZBC extract in males and females has never been undertaken.

AIM

To examine the effect of NZBC extract and body composition on metabolic responses in males and females during 60-min of moderate intensity treadmill exercise.

METHODS

The study used a double-blind, placebo-controlled, cross-over design. Twenty-two (11 males and 11 females) (age: 29±8 years, height: 171±10 cm, mass: 69±11 kg, body fat: 18±6 %, $\dot{V}O_{2max}$: 44±9 mL·kg⁻¹·min⁻¹) consumed 210 mg anthocyanins from NZBC extract (CurraNZ) or placebo (PLA) for 7-days with a 14-day washout between conditions. Participants performed 60-minutes of treadmill exercise at 50% $\dot{V}O_{2max}$ with measurement of expired gases (Cortex Metalyzer 3B, Leipzig, Germany) and had their body composition measured by bioelectrical impedance (Bodystat 1500, Douglas Isle of Man). The absolute change in fat and carbohydrate oxidation from the PLA with NZBC was calculated (i.e. Δ Fat/ Δ Cho).

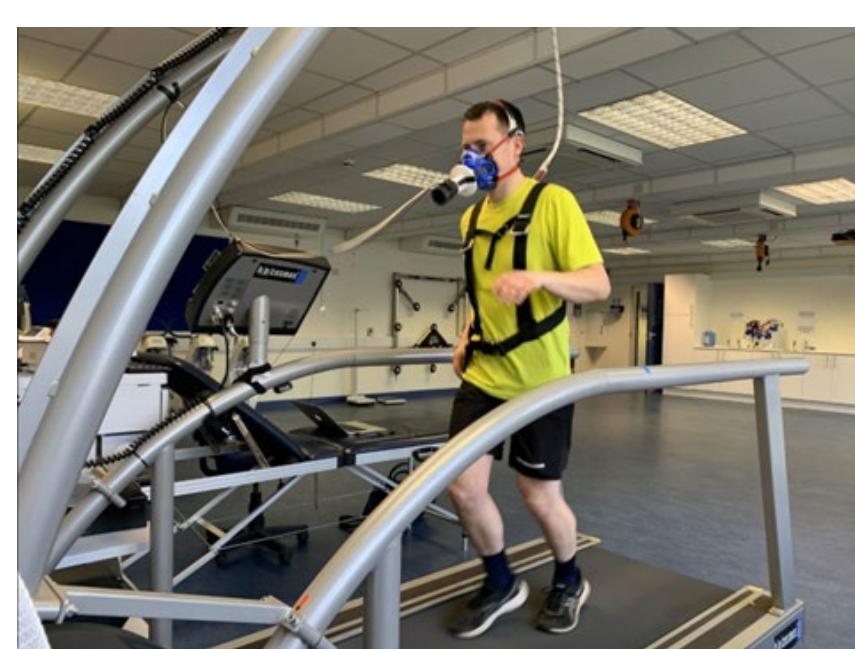


Figure 1



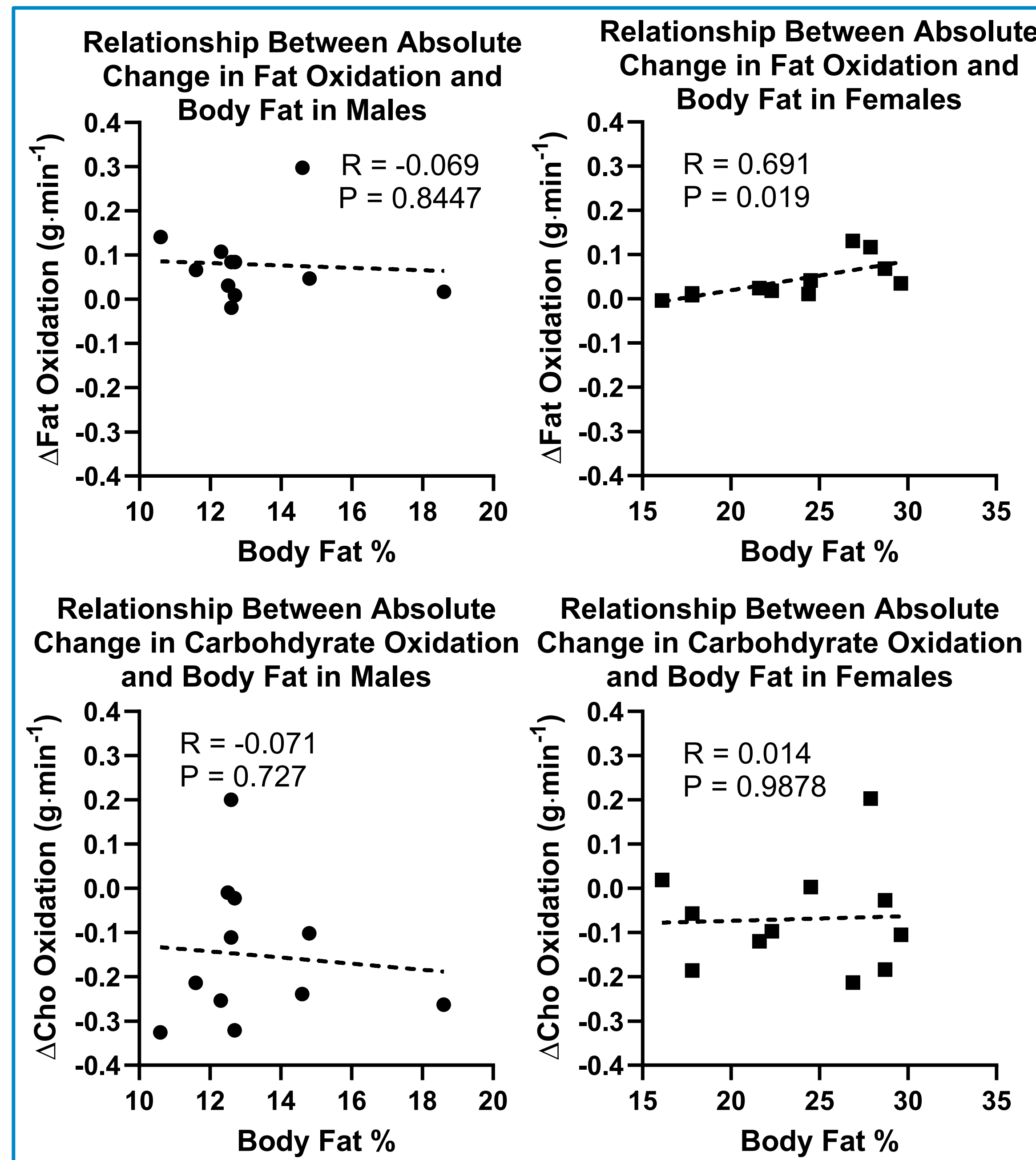
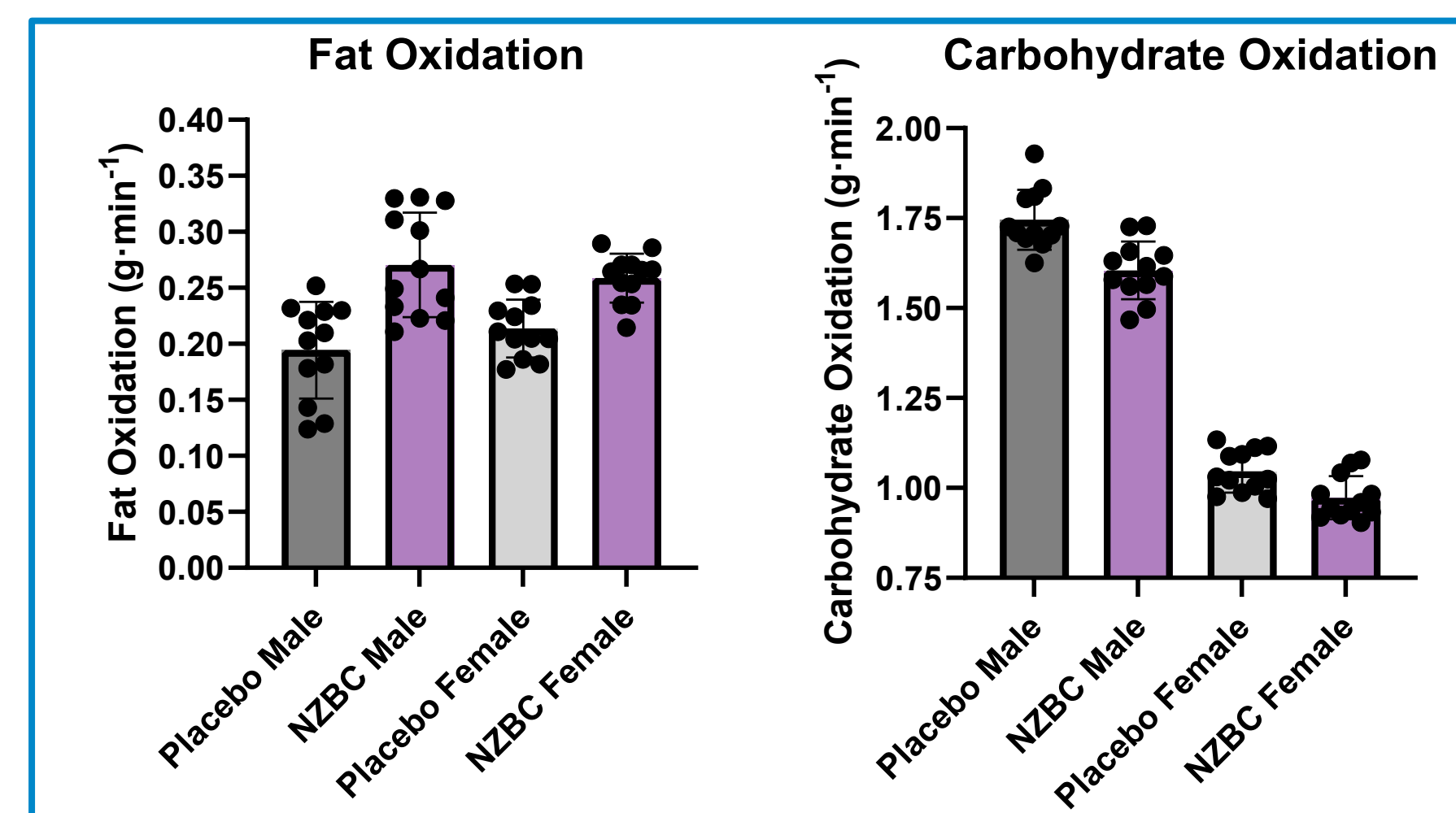
Figure 2



Figure 3

RESULTS

Intensity with NZBC extract and placebo for males (NZBC: 51.7±6.1, PLA: 49.5±6.9 % $\dot{V}O_{2max}$) and females (NZBC: 52.1±6.9, PLA: 52.9±9.2 % $\dot{V}O_{2max}$) was not different (P=0.109). Average fat oxidation combined for males and females was different between the conditions (NZBC: 0.27±0.11, PLA: 0.21±0.12 g·min⁻¹, P<0.001), with carbohydrate oxidation also different (NZBC: 1.32±0.44, PLA: 1.43±0.49 g·min⁻¹, P=0.002).



NZBC extract increased fat oxidation and decreased carbohydrate oxidation during moderate intensity treadmill exercise, and there was a relationship (R=0.691) between the change in fat oxidation and body fat in females.

CONCLUSION

A seven-day intake of New Zealand blackcurrant extract increased fat oxidation and decreased carbohydrate oxidation during 60-minutes treadmill exercise at 50% $\dot{V}O_{2max}$ in males and females. The magnitude of change in fat oxidation from New Zealand blackcurrant is correlated to body fat percentage in females and not males.

APPLICATION

Increased fat oxidation from New Zealand blackcurrant extract intake may enhance endurance performance or health. These findings may have applications for recommendations for supplementation and help inform who could be high or low responders to New Zealand blackcurrant extract.

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