



## INTRODUCTION

Gastrointestinal (GI) distress symptoms are a common running-induced experience for athletes training and competing in hot environmental conditions [1]. GI distress symptoms may compromise exercise performance as well as carbohydrate digestion and absorption. Food components may affect the presence and severity of GI distress symptoms during running in hot environmental conditions.

## AIM

We examined the effect of anthocyanin-rich New Zealand blackcurrant (NZBC) extract on the GI distress symptoms during running in hot environmental conditions.

## METHODS

Recreationally active males (n=12, age: 28±6 yr, BMI: 24.5±1.8 kg·m<sup>-2</sup>,  $\dot{V}O_{2max}$ : 56±6 mL·kg<sup>-1</sup>·min<sup>-1</sup>) volunteered. The study had a placebo-controlled, double blind, randomized, cross-over design. In thermoneutral conditions (18°C and 40% relative humidity), participants completed an incremental exercise test to exhaustion to standardize running intensity (visit 1) and a familiarization (visit 2).



Participants dosed with 7-days of NZBC extract (210 mg anthocyanins per day) or placebo. Euhydration was confirmed before the experimental visits of treadmill running for 1 hr at 65% $\dot{V}O_{2max}$  in an environmental chamber (TISS Services UK, Medtead, Hampshire, UK, 34.1±0.1 °C, 40.8±0.2% relative humidity). At 0, 30 and 60 min during the running and at 60 min following recovery in thermoneutral conditions, GI distress symptoms (i.e. upper, lower and other) were scored as below with a modified visual analogue scale [2]. Water was available *ad libitum*.

Very mild symptoms	Severe symptoms	Extremely severe symptoms
0	1 2 3 4	5 6 7 8 9 10

## RESULTS

Ps	placebo	NZBC extract
1	2	0
2	0	0
3	7	6
4	1	0
5	1	1
6	1	1
7	2	0
8	4	6
9	1	0
10	2	0
11	0	0
12	0	0
total	21	14

Upper gastrointestinal distress symptoms: belching, heart burn, stomach bloating, stomach pain, urge to vomit, vomit

Upper GI distress symptoms were reduced from 75% (placebo) to 25% (NZBC extract) of participants (Ps)

Ps	placebo	NZBC extract
1	0	0
2	0	0
3	0	0
4	0	0
5	0	1
6	0	0
7	0	0
8	0	1
9	2	0
10	2	0
11	0	0
12	1	0
total	5	2

Lower gastrointestinal distress symptoms: flatulence, urge to defecate, lower abdominal pain

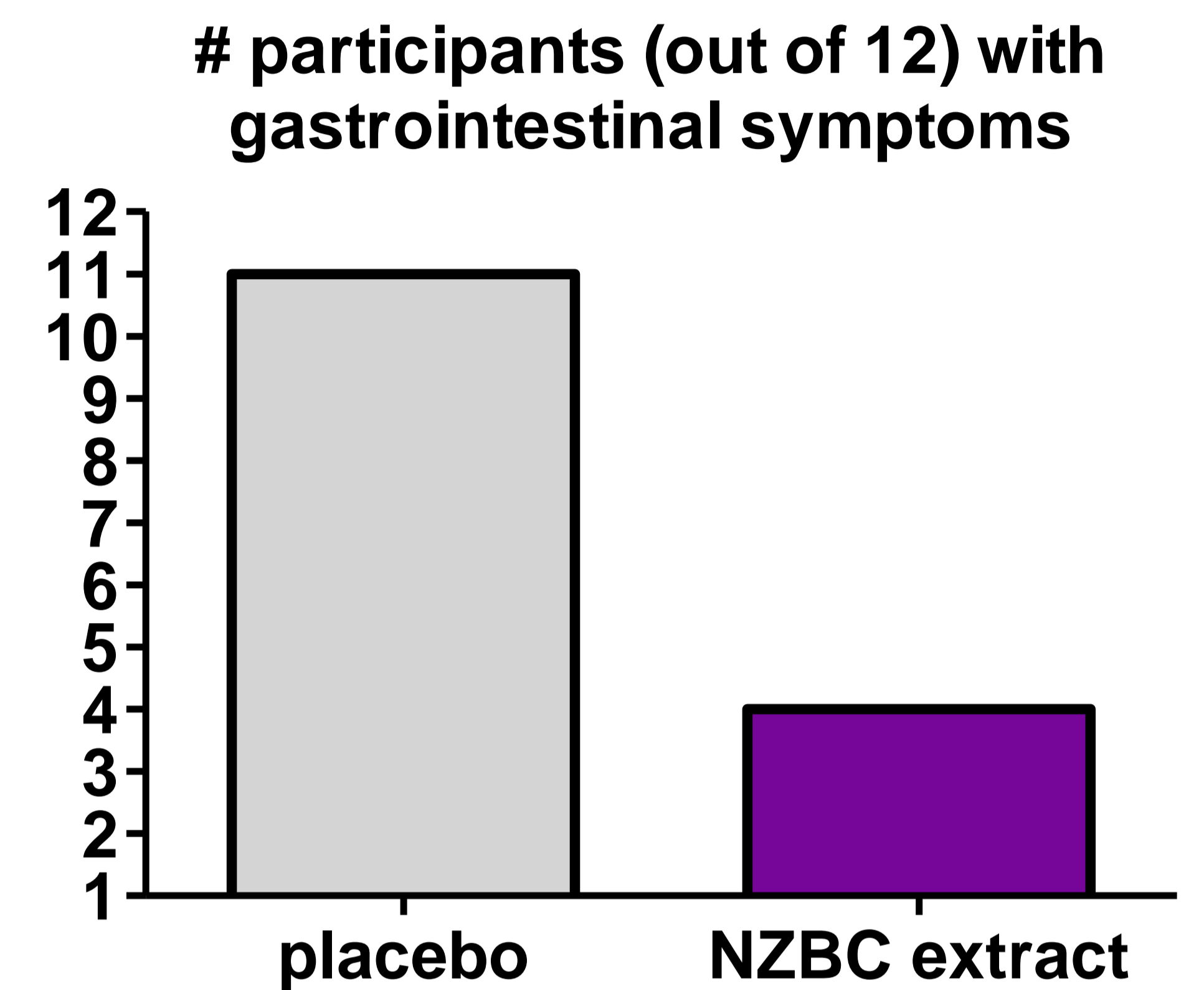
Lower GI distress symptoms were reduced from 25% (placebo) to 17% (NZBC extract) of participants (Ps)

Ps	placebo	NZBC extract
1	0	0
2	1	0
3	8	2
4	0	0
5	4	0
6	1	1
7	0	0
8	2	3
9	0	0
10	2	0
11	0	0
12	0	0
total	18	6

Other gastrointestinal distress symptoms: nausea, dizziness, stitch

Other GI distress symptoms were reduced from 50% (placebo) to 25% (NZBC extract) of participants (Ps)

## RESULTS CONT'D



With NZBC extract, the number of participants experiencing total gastrointestinal symptoms was reduced from 11 participants (92%) to 4 participants (25%).

## CONCLUSION

7-day intake of New Zealand blackcurrant extract reduces gastrointestinal symptom during 1 hour of treadmill running in the heat.

## APPLICATION

New Zealand blackcurrant extract may be useful for activities in hot environments that are prone to the development of gastrointestinal symptoms.

## REFERENCES

- [1] Karhu et al. Exercise and gastrointestinal symptoms: running-induced changes in intestinal permeability and markers of gastrointestinal function in asymptomatic and symptomatic runners. *European Journal of Applied Physiology*, 117(12), 2519-2526, 2017.
- [2] Gaskell et al. Test-retest reliability of a modified visual analog scale assessment tool for determining incidence and severity of gastrointestinal symptoms in response to exercise stress. *International Journal of Sport Nutrition and Exercise Metabolism*, 29(4), 411-419, 2019.

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