

Novel quinoa-enriched biscuits improve CVD risk markers in older adults: a randomised crossover trial with a novel food product

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Introduction

- Quinoa (*Chenopodium quinoa Willd.*) is a traditional Andean seed crop:
 - ✓ favourable phytochemical composition
 - ✓ high quality fatty acid profile^(1,2)
- The anti-inflammatory, antioxidant and lipid-lowering potential of such bioactive components are well established⁽³⁾
- The potential of quinoa specifically to exert such beneficial effects on CVD risk markers *in vivo* has not yet been fully elucidated in controlled human trials

Aim

To investigate the effect of consuming quinoa-enriched biscuits on markers of CVD risk over 4-weeks in free-living older adults

Methods

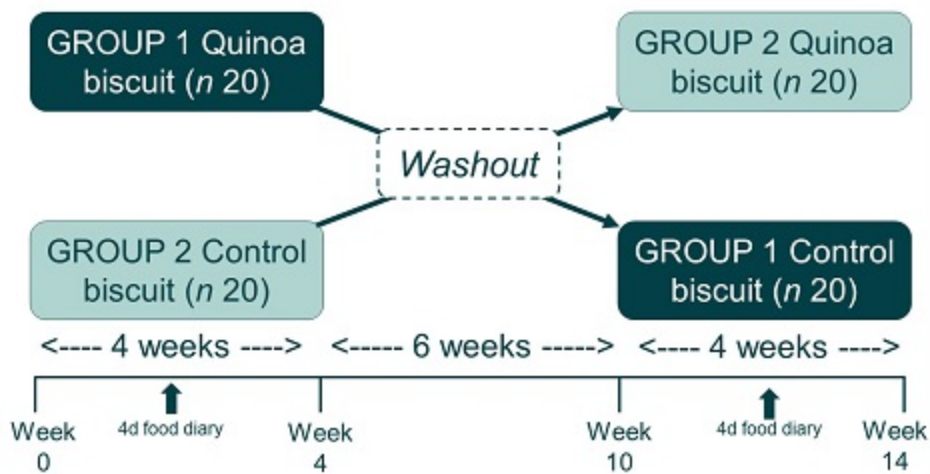


Study Design

- Randomised double-blind crossover trial (n 40)*

Inclusion: apparently healthy; low fish consumers (<2 servings/week); aged 50-75 years; non-smokers

Exclusion: pregnant/lactating; coeliac disease; wheat intolerance; current fish oil supplement use; regular use of plant stanols; chronic medical condition; prescribed cholesterol or BP lowering medications



Biscuits

- Participants consumed 2x15g biscuits/day
- Quinoa-enriched (60g quinoa flour/100g), or control (iso-energetic made using wheat flour)



Methods

- Fasting blood sample & anthropometric measurements (weeks 0, 4, 10 & 14)
- Validated physical activity questionnaire (weeks 4 & 14)⁽⁴⁾
- Lipid profiles: iLab 650 Clinical Chemistry auto-analyser
- Total polyunsaturated fatty acid (PUFA): GM-MS⁽⁵⁾

*Ethical approval: Ulster University (REC/16/0106) / Registered: clinicaltrials.gov (NCT03291548)

Results

99% compliance

At baseline, mean (SD):

- 12M / 28F; aged 57.7 (6.2) years; BMI 26.2 (4.0) kg/m²
- Total cholesterol concentrations 6.02 (1.22) mmol/L (range 3.7-9.2mmol/L); n 33 (82.5%) had ↑ cholesterol (>5mmol/L)

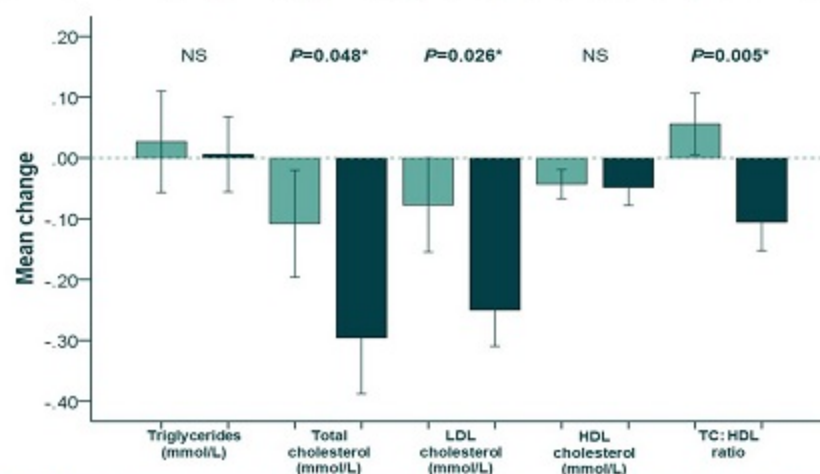


Figure 1. Mean (±SEM) change in circulating lipid profiles after consuming control (light green bars) compared to quinoa biscuits (dark green bars). *Response to treatment (after – before) was significantly different between groups, P<0.05 (1-tailed paired t-test).

Table 1. Effect of quinoa consumption on outcome variables

Measures	Change after control (n 40)		Change after quinoa (n 40)		p*
	Mean	SD	Mean	SD	
Weight (kg)	-0.09	1.17	-0.61	0.89	0.015
BMI (kg/m ²)	-0.03	0.44	-0.22	0.34	0.011
Total PUFA (mg/ml)	-0.02	0.13	-0.03	0.10	0.072

*Response to treatment (after – before) was significantly different between groups, P<0.05 (1-tailed paired t-test).

- No participants were lost to follow-up
- There were no changes in habitual dietary intakes or levels of physical activity between weeks 0-4 and weeks 10-14

Conclusions

- Consumption of novel quinoa-enriched biscuits produced favourable changes in body weight, BMI and circulating cholesterol concentrations
- Results indicate that regular consumption of quinoa may contribute to lowered CVD risk in free-living older adults
- Changes in PUFA status alone cannot explain these findings
- Future research is required to elucidate quinoa's potential cardio-protective effects

Acknowledgments

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