

Citrus Fruits FOR HEART HEALTH

Heart health is still the most pressing health concern in Australia.



Heart disease is the **#1** cause of death in Australia¹.

- One death every 18 minutes and one hospitalisation every 80 seconds.
- Diet a widely established modifiable risk factor for heart disease.

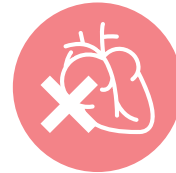
COMMON HEART HEALTH MEASURES IN SCIENTIFIC STUDIES:



Markers of cardiovascular disease (CVD) risk:

Biomarkers that increase CVD risk such as high blood pressure (BP) and lipids.

Measured over:



Cardiovascular disease:

Diseases of the heart and blood vessels that includes coronary heart disease (CHD) and stroke.

Measured over:



CVD mortality:

Death with CVD as the underlying cause.

Measured over:



THE EVIDENCE: Citrus fruits benefit heart health outcomes

CVD MARKERS

In meta-analysis of randomised controlled trials, citrus fruits and citrus juices improve markers of CVD^{2,3}.

2.1% FMD

Improvement in flow-mediated dilation (FMD) in a meta-analysis of 35 randomised control trials (RCTs) for **fruit juices (including citrus)** vs. control.

-3.1 mmHg SBP

Reduction in systolic blood pressure (SBP) in a meta-analysis of 35 RCTs for **fruit juices (including citrus)** vs. control.

-2.4 mmHg SBP

Reduction in SBP in a meta-analysis of 3 RCTs for **grapefruit** vs control.

CVD

In large prospective cohorts of US health professionals, higher intake of citrus fruits and their juices was associated with reduced CVD risk⁴.

19% RR

Reduced risk (RR) of ischaemic stroke for **citrus fruits and their juices**.

25% RR

Reduced risk of ischaemic stroke for **citrus juices alone**.

CVD MORTALITY

In a large prospective cohort study of US women⁵:

15% RR

Reduced risk of CHD mortality with **grapefruit** consumption.

Prospective cohort study = an observational study that is considered to provide the greatest level of evidence relative to the other observational study designs.

Randomised controlled trial = an experimental study considered to provide the most reliable evidence on the effectiveness of interventions.



In the Nurses' Health Study and the Health Professionals' Follow-Up Study, citrus fruits (including juice) had one of the strongest protective associations for ischaemic stroke **of all fruit and vegetable types**⁴.



Citrus fruits are a unique, whole food package



All citrus fruits contain: **Flavonoids, essential micronutrients and fibre.**
It is this unique, whole food package that is thought to benefit heart health.

FLAVONOIDS



- ✓ A major class of polyphenols⁶.
- ✓ Citrus fruits are one of the richest sources of flavonoids. Some flavonoids, such as hesperidin and naringenin, are specific to citrus fruits⁶.
- ✓ High intake associated with reduced risk of CVD in a systematic review and meta-analysis⁷.

MICRONUTRIENTS



- ✓ Citrus fruits can provide up to 173% of the Recommended Daily Intake of vitamin C and 270 mg potassium^{8,9}.
- ✓ High dietary vitamin C intake associated with reduced CHD risk in a meta-analysis of prospective cohort studies¹⁰.
- ✓ High potassium intake reduces BP in people with hypertension and associated with lower risk of stroke in a systematic review and meta-analysis of RCTs¹¹.

FIBRE



- ✓ Citrus fruits can provide up to 3.2 grams of fibre and have a balance of soluble, insoluble, including prebiotic fibres¹².
- ✓ Soluble fibre lowers total and LDL cholesterol¹³ and total fibre intake was associated with large risk reductions in CVD and CHD¹⁴.

How can citrus fruits improve heart health?

Citrus fruits are likely to improve heart health through many mechanisms of action¹⁵⁻¹⁷, including:

ANTI-HYPERTENSIVE

Potassium and vitamin C lower blood pressure, which improves the health of arteries and reduce cardiac workload.

ANTI-INFLAMMATORY

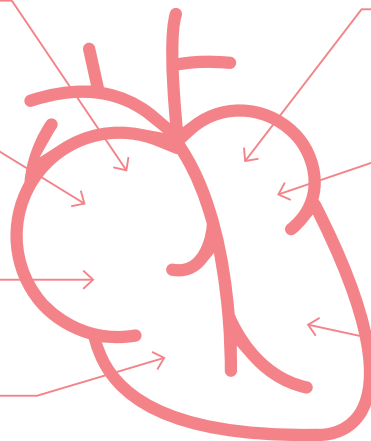
Citrus flavonoids, vitamin C and fibre have anti-inflammatory effects, protecting the heart and arteries from damage.

ANTIOXIDANT

Citrus flavonoids and vitamin C have antioxidant effects, reducing oxidative stress.

ANTIPLATELET

Citrus flavonoids act as antiplatelet agents.



LIPID-LOWERING

Citrus flavonoids such as naringin and **soluble fibre** have lipid-lowering effects.

PREBIOTIC

Fibre and citrus flavonoids modulate the gut bacteria, leading to the production of short chain fatty acids, which can improve lipid metabolism.

VASODILATOR

Potassium, vitamin C and citrus flavonoids contribute to vasodilation, decreasing blood pressure.

Take home messages:

- 1** Citrus fruits support a healthy heart in many ways.
- 2** All parts of the fruit (whole, peel, and juice) can help to support a healthy heart.
- 3** Citrus fruits are an evidenced-based recommendation that fits within minimally processed, plant-based, DASH (Dietary Approaches to Stop Hypertension) and Mediterranean-style diets.

1 SERVE CITRUS = ~ 150 GRAMS =



1 orange



2 mandarins



1 lemon



2 limes



½ grapefruit



½ cup 100% citrus juice

References:

- Heart Foundation <https://www.heartfoundation.org.au/bundles/for-professionals/australia-heart-disease-statistics>.
- D'Elia (2021) <https://doi.org/10.1007/s00394-020-02426-7>.
- Onakpoya (2017) <https://doi.org/10.1080/10408398.2014.901292>.
- Joshiyura (1999) <https://doi.org/10.1001/jama.282.13.1233>.
- Mink (2007) <https://doi.org/10.1093/ajcn/85.3.895>.
- Soni (2022) <https://doi.org/10.3390/antiox11020239>.
- Wang (2014) <https://doi.org/10.1017/s000711451300278x>.
- Eat for Health 2017, <https://www.eatforhealth.gov.au/nutrient-reference-values>.
- Ye (2008) <https://doi.org/10.1097/HJR.0b013e3282f1f95>.
- Aburto (2013) <https://doi.org/10.1136/bmj.f1378>.
- Slavin & Lloyd, 2012 <https://doi.org/10.3945/ajcn.112.002154>.
- Brown (1999) <https://doi.org/10.1093/ajcn/69.1.30>.
- Threapleton (2013) <https://doi.org/10.1136/bmj.f6879>.
- Evans (2020) <https://doi.org/10.1017/s0029665119000673>.
- Mahmoud (2019) <https://doi.org/10.1155/2019/5484138>.
- Morelli (2020) <https://doi.org/10.3390/antiox9121227>.

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