

Long-term hydrogen-rich water and gut flora

A clear summary of a two-month study in young female soccer players

The short answer: Blood tests showed favourable differences, but the gut findings were not conclusive. After eight weeks, the hydrogen-water group had better readings on several oxidative-stress and inflammatory markers. Gut-microbiome richness and diversity moved in a favourable direction, but those differences were not statistically significant.

How was the study organised?

38 participants Healthy juvenile female soccer players at one sports school in Suzhou, China	Two unequal groups Hydrogen-rich water: 28 Regular water: 10
Eight weeks Participants kept their usual training, diet, rest and drinking amounts	What was tested Blood at baseline, 4 and 8 weeks; stool microbiome by 16S rDNA sequencing

The paper says participants were randomly divided. The hydrogen group replaced its usual water with hydrogen-rich water; the control group continued standard water. The paper did not report the hydrogen concentration, preparation method or a fixed daily dose.

What did the study find?

Outcome	Reported result	Plain-English meaning
Oxidative stress	MDA was lower, while SOD and total antioxidant capacity were higher in the hydrogen group across time (reported $P < 0.001$, $P = 0.027$ and $P = 0.004$).	Several laboratory markers shifted in a direction consistent with less oxidative stress or greater antioxidant activity.
Inflammation	IL-1, IL-6 and TNF-alpha were lower in the hydrogen group after eight weeks; the reported group differences were significant ($P = 0.002$, $P < 0.001$ and $P < 0.001$).	The hydrogen group showed lower levels of three measured inflammatory signalling proteins.
Other blood markers	Haemoglobin showed a significant difference ($P = 0.032$). BUN ($P = 0.887$) and CK ($P = 0.061$) did not.	The study did not show clear differences in the two measured recovery/load markers, BUN and CK.
Gut richness and diversity	Sobs, ACE, Chao and Shannon indices became numerically higher in the hydrogen group, but all P values were non-significant: 0.479, 0.710, 0.369 and 0.369.	The trend was interesting, but this study did not prove that hydrogen water increased gut-microbiome richness or diversity.
Types of gut bacteria	No significant between-group changes in bacterial composition were found after two months.	The study did not demonstrate a reliable shift in specific bacterial groups.

Encouraging blood markers; uncertain gut effect

Why the findings matter

This was an eight-week human study rather than a single-dose experiment. It followed athletes during normal training and measured both blood biomarkers and stool microbiota.

The antioxidant and inflammatory measurements provide a reason for larger, better-balanced trials. However, biomarkers are not the same as feeling better, recovering faster or performing better.

The microbiome result

Before the trial, the control group already had greater gut richness and diversity. By weeks 4 and 8, the numerical pattern favoured hydrogen water. Because the final comparisons were not statistically significant, the safest wording is 'a possible trend'—not a proven improvement in gut health.

Important limitations

- Small study from one school, with only 38 young female athletes.
- Groups were very unequal (28 versus 10).
- Large baseline differences: the control group was older, taller, heavier and had trained longer.
- No placebo-matched or blinded water was described.
- Hydrogen concentration, preparation, actual daily intake and adherence were not reported.
- Usual diets were continued rather than tightly controlled; diet strongly affects the microbiome.
- The statistical method and many comparisons increase uncertainty; effect sizes and confidence intervals were not reported.
- No gastrointestinal symptoms, health outcomes or sports performance outcomes were tested.

Best interpretation

Two months of hydrogen-rich water was associated with favourable changes in several blood biomarkers in this specific group. The study offers only preliminary, non-significant evidence for a change in gut-microbiome richness or diversity and no clear evidence of changed bacterial composition.

Quick glossary

MDA	Malondialdehyde: a marker associated with oxidative damage to fats
SOD / T-AOC	Measures related to antioxidant defence and total antioxidant capacity
IL-1, IL-6, TNF-alpha	Signalling proteins involved in inflammation
Richness / diversity	How many microbial types are detected, and how evenly they are represented; more is not automatically healthier

Original study

Sha J-B, Zhang S-S, Lu Y-M, et al. Effects of the long-term consumption of hydrogen-rich water on the antioxidant activity and the gut flora in female juvenile soccer players from Suzhou, China. Medical Gas Research. 2018;8(4):135-143. Published online 2019. [Read the full original study](#) | DOI: [10.4103/2045-9912.248263](#)

Educational summary only. Molecular hydrogen is still being researched and should not be presented as a treatment, cure or substitute for medical care. This summary explains one study's findings and does not constitute medical advice.