

Curry spice boosts exercise performance in mice with heart failure

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New research suggests that curcumin, a main ingredient in curry, may improve exercise intolerance related to heart failure. The study is published ahead of print in the *Journal of Applied Physiology*.

Curcumin, a chemical that comes from the turmeric plant, has been used as a traditional Asian medicine for centuries, primarily to treat gastrointestinal ailments and skin wounds. Studies increasingly suggest that the compound may prevent or limit muscle wasting associated with a number of health conditions, including heart [failure](#).

Heart failure affects more than 6 million people living in the U.S. People with heart failure have a reduced function of the left ventricle—the chamber of the heart that pumps blood out to the rest of the body—called reduced [ejection fraction](#). A decreased ability to exercise (exercise intolerance) is another significant characteristic of heart failure. Previous research has found that higher than normal levels of oxidative stress—an imbalance of two different kinds of molecules that can result in cell damage—contribute to exercise intolerance in people with heart failure. Heart failure is also associated with lower than normal expression of antioxidant enzymes in the muscles, but the reason for this is unclear. Antioxidant enzymes both prevent and repair damage from oxidative stress. Boosting enzyme levels may improve exercise performance in people in heart failure.

Researchers from the University of Nebraska Medical Center theorized that a reduction in the normal signaling of Nrf2, a protein that regulates

the expression of antioxidant enzymes, may play a role in the impaired expression of antioxidant enzymes. They examined the effects of curcumin, which is known to promote activation of Nrf2, on a mouse model of heart failure with reduced ejection fraction. One group of mice with heart failure received daily doses of curcumin for 12 weeks, and another group did not receive treatment. The heart failure groups were compared to a control group of healthy mice that received curcumin and an untreated control group.

The [research team](#) measured the exercise capacity of all the mice before and after curcumin treatment. The researchers also examined muscle fiber samples to assess [enzyme](#) expression levels. They found that expression of Nrf2 increased and levels of antioxidant enzymes improved in the animals with heart failure that were given curcumin. In addition, both groups that received curcumin—even the animals without heart failure—had improved exercise capacity when compared with the untreated groups, suggesting the effects of [curcumin](#) on skeletal muscle is not exclusive to [heart](#) failure.

"These data suggest that activation of Nrf2 in [skeletal muscle](#) may represent a novel therapeutic strategy to improve ... quality of life" in people with [heart failure](#) with reduced ejection fraction, the researchers wrote.

More information: Ahmed M. Wafi et al, Curcumin Improves Exercise Performance of Mice with Coronary Artery Ligation Induced HFrEF: Nrf2 and Antioxidant Mechanisms in Skeletal Muscle, *Journal of Applied Physiology* (2018). [DOI: 10.1152/jappphysiol.00654.2018](https://doi.org/10.1152/jappphysiol.00654.2018)

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