



Feature

Value with Air

Making Exercise a Good Habit Using the Power of Air

Why is it important?

Insufficient Physical Activity Has Become a Worldwide Social Issue Today

The insufficient physical activity of people today has become a social issue amid enhancements in transportation and telecommunication infrastructure and the increase in intellect-based jobs. This has raised the risk of non-communicable diseases such as cancer and diabetes, while estimates put the economic impact of medical costs at around 54 billion US dollars worldwide.

The World Health Organization (WHO) has established a goal to reduce the number of people with insufficient physical activity by 15% by 2030. It recommends that adults get 30 minutes of moderate to high intensity exercise at least five days a week, such as brisk walking, and do weight training at least twice a week. The WHO also urges people to avoid sitting continuously for long periods of time.

Following such a regimen, however, is no easy task, as more than one in four adults are believed to be insufficiently active. Why is it that people find it difficult to exercise? In Japan, the Sports Agency conducted a survey that found reasons include being too busy due to work or family obligations, or various other distractions. This necessitates measures to reduce these reasons, prevent NCDs and improve well-being.

Percentage of Adults with Insufficient Physical Activity



Note: Prepared by Daikin based on *Worldwide trends in insufficient physical activity from 2001 to 2016* by The Lancet Global Health.

Daikin's Approach

Developed a Hypoxic System Even for Offices from the Standpoints of Location and Air Environment

Today, office workers are susceptible to insufficient physical activity because they spend long hours performing desk work. Daikin, which supplies air conditioners to a large number of office buildings, is looking to support the health of the people that work in these buildings by using the power of air. In April 2022, we commercialized a hypoxic system* that can be installed in offices as a solution for people who are too busy and cannot get to a gym or who cannot commit continuously to exercise, even if they know they are not active enough.

A challenge in development was how to come up with a solution that enables someone to continue exercising without spending too much time during their busy daily life. One perspective behind the solution was location. Creating a place to exercise inside an office will reduce the amount of time spent traveling to a gym. Employee health is an important issue for companies and creating opportunities for exercise at work will lead to the health and productivity management practiced today.

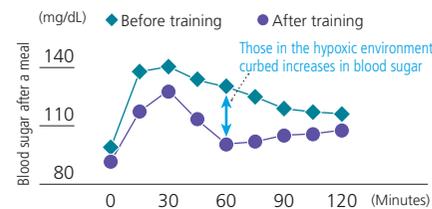
Another perspective was the air environment when exercising. To increase the effectiveness of exercise, we decided to tackle the challenge of hypoxic spaces, gaining a hint from athletes who train at high elevations. Harnessing our oxygen concentration control technologies cultivated from the development of medical-use oxygen concentrators, we created a hypoxic system that can be installed in offices.

The system offers simple installation work and can control the indoor oxygen concentration level within a range of elevations between 1,200 and 3,900 meters. Recent research has found that exercising under hypoxic conditions similar to a high elevation results in better health compared to exercise in normal oxygen levels, including making it difficult for blood sugar to spike, promoting release of growth hormone, and expanding the size of blood vessels.

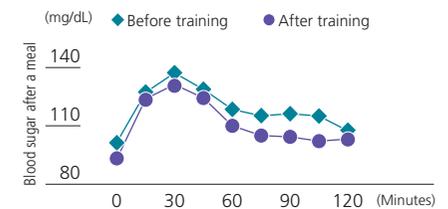
*This product is not a medical device.

Trend in Change in Blood Sugar After Eating Before/After 4-Week Training Period

Persons working out in a hypoxic environment



Persons working out in a normal oxygen environment



Note: Prepared by Daikin based on *Whole body, regional fat accumulation, and appetite-related hormonal response after hypoxic training* authored by Takuma Morishima, Toshiyuki Kurihara, Takafumi Hamaoka, and Kazushige Goto.

Daikin's Performance

Proposing Environments that Make Continuous Exercise Accessible and More Effective

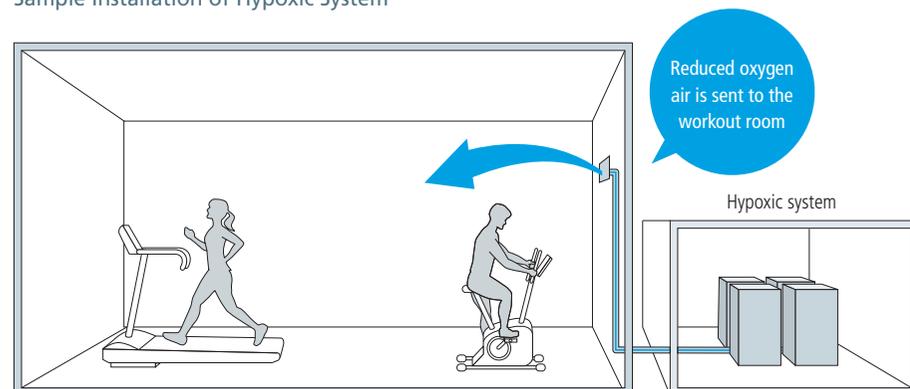
Behind the commercialization of the hypoxic system for offices is Daikin's unique technological capabilities and know-how.

Hypoxic systems have also been introduced in gyms, but these are noisy and large, making them difficult to install in offices and other places with limited available space. Daikin has overcome these problems by applying the technology of in-home medical equipment requiring compact design and quiet operation. In particular, we have achieved a level of sound so low that it would not interfere with sleep.

Furthermore, our system also offers the same quality and reliability as medical devices. Multiple hypoxic units based on oxygen concentrators can be connected to achieve the desired performance. This also offers redundancy where if one unit fails, the system can be supplemented by other units to provide a stable hypoxic space. It is also possible to propose the optimal system according to customer needs based on the space and the intensity of exercise.

Daikin has set up a hypoxic room in point 0 marunouchi, a members-only co-working space in which Daikin participates, and since April 2022, we have been using this space to conduct real life testing. Subjects who exercised for 30 minutes one or more times per week showed a decrease in body fat, visceral fat, and blood pressure. In addition, in a questionnaire conducted in July 2022, 86% of the subjects responded that the hypoxic room made them more motivated to exercise.

Sample Installation of Hypoxic System



Next Challenge

Bringing Well-being to More and More People

Daikin's hypoxic system can be installed in various places in a building, from small rooms to large spaces, as long as a certain degree of airtightness is ensured. Going forward, we plan to expand our proposals to include not only company offices, but also schools and local governments.

Maintaining health and reducing the risk of disease will also lead to lower medical costs, an issue faced by many local governments. To help solve this problem through hypoxic spaces, Daikin plans to evaluate the effectiveness of the system in parallel with its ongoing real life testing. In addition to medical verification on the effect of improved sleep quality and lowering blood sugar levels by improving glucose metabolism, we intend to obtain evidence on health benefits such as increased muscle strength and anti-aging in collaboration with various universities.

In the future, we will also work to improve people's living habits by linking users' vital sign data with sleep and eating habits to provide optimal exercise regimens.

Daikin will help people to stay healthy and active both physically and mentally, including improving intellectual productivity by utilizing oxygen concentration control technology.

Daikin will continue to pursue the possibilities of air for the well-being of all people.

Focus on the Power of Air and How it Benefits People's Health

Kazushige Goto

Professor
Faculty of Sport and Health Science, Ritsumeikan University



Many studies have proven that exercise is an effective way to improve health; yet, making exercise a habit can be difficult given today's busy lives. I have high expectations for the social implementation of Daikin's groundbreaking concept of using the power of air to improve health.

For example, if we can make exercise in a hypoxic environment commonplace, such as by making office spaces a hypoxic environment timed for when blood sugar levels spike after lunch, we should be able to reduce these spikes and improve blood vessel function. Additionally, exercise in a hypoxic environment has the potential over the long term to reduce the risk of diabetes and high blood pressure, and help to improve worker health and productivity. I am really impressed with Daikin's initiative to create an innovative, new tomorrow using advanced technologies.