# SCIENTIFIC FOUNDATIONS OF AIR HYGIENE AND THE ORGANIZATION OF SPORTS EXERCISES

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## Abstract

Air hygiene is a crucial environmental factor that significantly affects human health and physical performance during sports activities. The effectiveness of sports exercises largely depends on air quality, especially during intense physical exertion. This article analyzes the scientific role of air hygiene, its physiological impact on the human body, and hygienic requirements for organizing sports exercises in indoor and outdoor environments.

**Keywords:** air hygiene, physical activity, sports training, ventilation, environmental health.

## Introduction

Physical education and sports are essential components of a healthy lifestyle and play an important role in strengthening the body and preventing disease. However, the benefits of physical exercise depend not only on training methods but also on environmental conditions. During physical activity, oxygen consumption

increases, and the respiratory system becomes more active. Under these conditions, exposure to polluted or poorly ventilated air can negatively affect health and reduce athletic performance. Therefore, air hygiene is an important aspect of the scientific organization of sports exercises.

**Concept and Significance of Air Hygiene**

Air hygiene refers to the study and regulation of air quality parameters such as purity, chemical composition, temperature, humidity, air movement, and microbial contamination. During exercise, pulmonary ventilation may increase up to ten times compared to rest. Poor air quality containing dust, toxic substances, or pathogens can lead to respiratory irritation, fatigue, reduced endurance, and long-term health complications. Maintaining clean and oxygen-rich air is essential for optimal physical performance and athlete safety.

**Physiological Effects of Air Quality on the Human Body**

Air quality has a direct influence on thermoregulation, cardiovascular function, and metabolism. The optimal air temperature for sports activities is generally between 18–20 °C, while relative humidity should be maintained at 40–60%. Elevated temperature and humidity impair heat dissipation and increase the risk of dehydration and heat stress. Adequate ventilation supports effective oxygen delivery to muscles and stabilizes physiological responses during exercise.

**Organization of Outdoor Sports Exercises**

Outdoor sports exercises are considered the most hygienically favorable due to natural air circulation and higher oxygen concentration. Training sessions conducted in parks, stadiums, and green zones away from industrial areas and traffic pollution enhance respiratory efficiency and overall health. Morning hours are especially

recommended, as air pollution levels are typically lower and climatic conditions are more comfortable.

**Air Hygiene in Indoor Sports Facilities**

In indoor sports facilities, air hygiene requires special attention. Gymnasiums and sports halls must be equipped with effective ventilation and air-conditioning systems to ensure continuous air exchange. Increased carbon dioxide levels, excessive heat, and humidity can reduce concentration and physical capacity. To maintain hygienic standards, the number of participants should be regulated, and regular ventilation should be carried out before, during, and after training sessions.

**Organizational and Hygienic Measures**

The scientific organization of sports exercises includes several hygienic measures:

- systematic ventilation of training facilities;
- regular cleaning and disinfection of sports equipment;
- control of temperature and humidity levels;
- enforcement of personal hygiene rules among athletes;
- scheduled rest breaks to allow air renewal.

Educating coaches and athletes about air hygiene principles further improves the safety and effectiveness of sports training.

**Conclusion**

Air hygiene is a fundamental element in the organization of sports exercises from a scientific perspective. Clean, well-ventilated, and properly regulated air conditions enhance physical performance, protect respiratory health, and increase

the overall benefits of physical activity. Adhering to air hygiene standards is essential for ensuring safe and effective sports training environments.

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