

# Why do we always care about the welfare of laboratory animals?



## Seasoned experts from the Daegu-Gyeongbuk Medical Innovation Foundation (K-MEDI hub) in South Korea share their research perspectives on the welfare of laboratory animals, including the issue of veterinary care

Awareness of animal ethics is changing and rising worldwide, and the concept of animal welfare importance is spreading rapidly. Generally, animal welfare involves not hurting, harassing or recklessly killing animals. In addition, animal welfare involves inducing positive changes in humans and animals, both physically and emotionally. Based on the research and discussion of Ruth Harrison's claim in 1965, Britain began establishing various animal welfare measures. Subsequently, public opinion on animal welfare has spread widely across Europe.

## **Movement forwards to improve laboratory animal welfare**

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The Korean Ministry of Agriculture, the Korea Food and Drug Administration (KFDA), and the Ministry of Food and Drug Safety have announced a 5-year plan to address animal welfare. Although the application of animal welfare was initially limited to companion or exhibition animals, the need for animal welfare is emerging for all animals, including those raised in a limited space, such as laboratory animals. Animal experiments must be performed in the non-clinical evaluation process before entering the clinical trial phase. Unfortunately, during this process, laboratory animals inevitably experience pain and stress. Therefore, it is necessary to devise and implement a plan to alleviate this.

In Korea, there has been a recent mandate for the inclusion of attending veterinarians in laboratory animal research facility, reflecting efforts towards enhancing the welfare of research animals.

Animal testing has a 3R principle (replacement, reduction, and refinement). The first part of this principle, “replacement”, refers to replacing animal experiments with a possible alternative method to achieve the research purpose without conducting experiments involving animals. Secondly, “reduction” involves using a minimum number of animals with scientific, statistical significance to obtain useful comparable information. Lastly, “refinement” is the concept of improving animals’ happiness levels by reducing their pain and stress and eliminating the occurrence of inhumane treatment when animal experiments are unavoidable. The idea of refinement can be retained when improving animal welfare.

To address animal welfare in a laboratory environment, it is vital to consider animals as living creatures and have some consideration and respect for their natural way of life. To support this, providing appropriate environmental enrichment for these animals is crucial. This will prevent boredom because of receiving a limited food and living in a limited space. Additionally, environmental enrichment may also prevent mental abnormalities due to experimental stress, which can positively affect the stability and reproducibility of research. However, although it is recognized that providing enrichment can improve animal welfare, scientific evaluation to determine what kind of enrichment can reduce animal stress is yet to be conducted.

Stress Level	←—————→					
	Less Stressful					More Stressful
Body weight (g)	1st	2nd	3rd	4th	5th	6th
	IVC cage Group E.E*	IVC cage Single E.E*	IVC cage Single	IVC cage Group	ISO cage Group	ISO cage Single
Stress Level	←—————→					
	Less Stressful					More Stressful
Corticosterone concentration one serum (pg/mL)	6th	5th	4th	3rd	2nd	1st
	IVC cage Group E.E*	IVC cage Group	IVC cage Single E.E*	IVC cage Single	ISO cage Single	ISO cage Group
Corticosterone concentration/ body weight	6th	5th	4th	3rd	2nd	1st
	IVC cage Group E.E*	IVC cage Group	ISO cage Single	IVC cage Single E.E*	ISO cage Single	ISO cage Group

\*E.E: environmental enrichment

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## Efforts for animal welfare at the K-MEDI hub

K-MEDI hub Preclinical Research Center (PRC) received full accreditation from the Association for Assessment and Accreditation of Laboratory Animal Care International (AAALAC-I), and was certified for laboratory animal welfare at an international level and approved as a Korean excellent laboratory animal facility by the Korea Food and Drug Administration.

To find the least stressful breeding environment, PRC scientifically evaluated the degree of stress caused by the breeding environment of mice and the research results were published (Animals, 2023 Jan 10;13(2):249 / Animals 2023 Mar 19;13(6):1095). The results confirmed that providing a well-ventilated environment and environmental enrichment reduces animal stress. Mice from individually ventilated cages (more ventilated than isolated ventilated cages) and mice from group cages with environmental enrichment had the lowest levels of the stress marker corticosterone. In addition, appropriate companions and environmental enrichment can reduce stress levels in dogs.

In addition, PRC is currently studying environmental care that reduces stress for large laboratory animals, including dogs and pigs. For example, in 2021, K-MEDI hub established a playground intending to improve the welfare of beagle dogs. Regular exercise and gathering in the playground will significantly positively affect the psychological and physical well-being of beagle dogs raised in limited areas like cages. Basic comprehensive animal health checkups for dogs, pigs, and monkeys are conducted twice a year to promote animal welfare through individual veterinary care management.

According to the guidelines in South Korea, the functions of the Institutional Animal Care and Use Committee (IACUC) with post-approval monitoring (PAM) were strengthened with the mandatory continuation of education to enhance the expertise of IACUC members. It is recommended that PAM activities occur at least twice a year, which is followed at PRC, where activities are conducted by an attending veterinarian in conjunction with IACUC. At K-MEDI hub, PAM activities have enhanced the welfare of laboratory animals and the communication between researchers and IACUC members.

Some researchers think of PAM activities as the bothersome task, but the fundamental purpose of PAM is to work in partnership with researchers to conduct successful and ethical animal experiments while paying attention to the welfare of laboratory animals. PRC is trying to find ways to cooperate by strengthening the role of “collaborator” in improving animal welfare.

## **Why is the welfare of laboratory animals necessary?**

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We believe that animal welfare is necessary for two reasons. First, “happy animals make good science” in terms of improving the reproducibility and reliability of experiments. Stress unexpectedly affects several physiological factors, causing substantial variation in the experimental results due to artifact lesions. Improving animal welfare produces reliable experimental results. Second, the suffering of laboratory animals can be a psychological burden and, therefore, influence researchers’ professional quality of life. These reasons are why we always care about the welfare of laboratory animals in the field of preclinical research. K-MEDI hub PRC will continue its efforts towards improving animal welfare. We hope this article provides the necessary information to expand global interest in the importance of laboratory animal welfare.

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