

ственного бюджета: – Чехия – 4,5 %, Мексика – 2%, Чили – 2,9 от ВВП, но цель была достигнута.

4. Обеспечение социальной стабильности в обществе проводилось всеми странами через адресную социальную поддержку бедных слоев населения.

**Заключение.** Меры антикризисного регулирования в странах мира, основанные на использовании инструментов денежно-кредитного, бюджетно-налогового и социального регулирования экономики, являются очень важным опытом для разработки и проведения антикризисной политики в Республике Беларусь. Особенно важно использование «кризисного» опыта в условиях неопределенности и ограниченного времени для принятия решений.

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## **THE USE OF LABORATORY ANIMALS**

**Introduction.** Experimental animals are used to develop and test medicines and vaccines for humans, to study how animal's and human's bodies function, to assess the possible effects of chemicals on human health. Experimental research with animals is conducted in universities, medical colleges, pharmaceutical companies, etc. Most experimental animals are purpose-bred. The common laboratory animals are rats, mice, guinea pigs, rabbits, frogs and hamsters. Cats, dogs, monkeys, pigeons and other animals may be used.

**Material and research methods.** The aim of the research is to study the bioethical problem of animal testing. The tasks are to study living conditions of laboratory animals in Vitebsk vivaria and to analyze the viewpoints of veterinary students concerning the use of animals in research and educational process. Qualitative and quantitative research methods were used. Methods of data collection included observation and interview. Materials of the research are living conditions of laboratory animals in Vitebsk vivaria.

**The results of the research.** The history of animal experimentation goes back to the 4th and 3rd centuries BC. There were some physicians who explored anatomy by dissection and vivisection of animals. It helped people to perform surgical operations on humans. Many medical advances were made in the 20th century. Organ transplant techniques, the heart-lung machine are the striking examples. Some dramatic human diseases could be prevented (e.g. vaccine against rabies) or treated (e.g. antibiotics like penicillin) owing to animal experimentation. Animal testing for veterinary studies accounts for around five percent of research using animals. Nowadays despite that fact that animal experiments pose ethical challenges, the use of animals in research, testing and education is widely practiced in the world. Animal use in science gives an opportunity to investigate different fields of activities. Animals are used in basic and biomedical research, behavioral research, military research, agricultural research, veterinary research, and drug development and testing. After research household products and cosmetics can be used safely.

The 3R Principle is the basis for the ethical approach to animal experimentation in the world. The 3R Principle was formulated by two English biologists, William Russel and Rex Burch. In their book published in 1959 (*The Principles of Humane Experimental Technique*), the two scientists described this principle for the first time. It includes three statements: Reduction, Replacement, and Refinement of animal studies. The objective of reduction is to decrease the number of animals used

for research purposes. In order to replace animal models, it is sometimes possible to work on cells or tissues (in vitro methods) or on digital models (in silico). Refinement means reducing, eliminating or relieving their pain or distress. The issue of animal welfare should be paid due attention. Abnormal behavior is an indicator of poor welfare. The emotional state of animals is an important component of behavioral research. Non-invasive procedures, adequate care before, during and after the operation, anesthesia/pain relief, reduction in the duration of certain studies (particularly toxicological studies), and appropriate euthanasia procedures should be obligatory.

Laboratory animals are kept in special quarters – vivaria. Vivaria regulations are strict. There must be no possibility of outbreaks and spread of diseases among the laboratory animals. Animals' ration should contain all essential vitamins, minerals and a proper balance of proteins, carbohydrates and fats. Cages or enclosures must be of the size that animal needs. All painful procedures must be carried out with the use of anaesthesia (local or general). Most animals are euthanized after being used in an experiment. It must be a humane act.

In this work we shall consider the situation with experimental animals in two vivaria in Vitebsk. They are the structural units of the Vitebsk State Medical University and the Vitebsk State Academy of Veterinary Medicine. The vivaria are intended for the maintenance of laboratory animals used for performing scientific experiments and the educational process of the universities as well as for testing biological and medicinal products. Both are situated in specially designed buildings which ensure safety and comfort of the species. The vivarium of the Vitebsk State Medical University contains the following types of laboratory animals: dogs, mice, rats, hamsters, guinea pigs, rabbits, frogs. Experimental animals are brought from specialized nurseries of the Russian Academy of Medical Sciences. A veterinary certificate of infectious well-being is obtained for each batch of animals. All animals entering the vivarium are quarantined. At present various new drugs are undergoing preclinical research in VSMU using laboratory animals. The norms of humane treatment of laboratory animals during the experiments are observed. When used in tests animals are anesthetized to ensure that they do not feel pain.

The Vitebsk State Academy of Veterinary Medicine is a center of research in the Republic of Belarus. The academic and research activities in veterinary medicine, zooengineering, biology and agricultural production are performed in the Central Research Laboratory, in 24 research laboratories attached to the departments. The vivarium is the main source of laboratory animals for the Academy. It provides premises for different species of animals. Mice, rats, guinea pigs, hamsters, rabbits are kept in cages of different sizes. Poultry, geese, sheep inhabit special boxes. The kennels for dogs can be found in the vivarium yard. The manager of the vivarium is an experienced veterinarian. All members of the staff observe the international regulations of bioethics in laboratory animal husbandry. They are helped by students on duty. Fresh water is in full supply. The animals are given plenty of exercise. The vivarium carries out breeding of laboratory animals for research and academic purposes. More than 2500 animals of different species are used during practical classes at the departments of the Academy annually.

94 students of the VSAVM have been interviewed about their attitude to the use of laboratory animals for testing. The results have proved that the problem is of great interest for future veterinarians. 58% of students think that animal testing is necessary, useful and justified. 33% of students consider animal testing possible provided that animals are treated in a proper way (no pain and suffering). 9% of students are against, for humans have no rights to exploit animals. It's cruel and unethical.

**Conclusions.** There are opposite opinions on the problem of animal testing. However, in our opinion the use of experimental animals is a vital necessity at present. As alternatives to animal testing are being developed, someday it will no longer be needed. We are sure that people who use animals in research, teaching, or testing assume responsibility for their well-being.

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