

NJSC AL-FARABI KAZAKH NATIONAL UNIVERSITY

FACULTY OF BIOLOGY AND BIOTECHNOLOGY

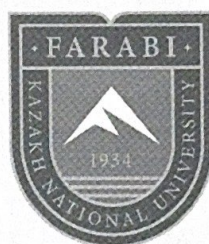
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Member of the Board – Vice-Rector for
scientific and innovative activities
NJSC «Al-Farabi KazNU»



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University policy on sustainable food cultivation on campus

Almaty 2024

University policy on sustainable food cultivation on campus

Goal

This policy is aimed at promoting sustainable agriculture, improving food security and supporting environmentally friendly methods of growing food on the university grounds. The University is committed to minimizing the impact on the environment and promoting education in the field of sustainable development.

Scope of application

The policy applies to all areas used for growing agricultural products, including university gardens, greenhouses, and educational farms.

Main provisions

1. Sustainable cultivation methods:

- Используются **Organic cultivation methods are used**, excluding the use of synthetic pesticides and fertilizers.
- Внедряются **Crop rotation**, composting, and natural pest control practices are being implemented.
- Focus on **preserving and improving soil fertility** through organic additives and practices that prevent erosion.

2. Saving resources:

- Применяются технологии **Water-saving technologies are used**, such as drip irrigation and rainwater harvesting.
- Measures are being promoted to reduce the use of energy and water resources, minimizing the carbon footprint of food production.
- All waste from cultivated areas is processed into compost and used to fertilize the soil.

3. Support for local and adapted cultures:

- Preference is given to growing **local and sustainable varieties of plants** that are better adapted to the climate and require fewer resources for cultivation.
- Experimental plots can be used to study resistant varieties and crops that are resistant to climate change.

4. Educational initiatives:

- There are courses, seminars and workshops on sustainable agriculture for students, staff and interested communities.
- Students are given the opportunity to participate in the processes of growing, collecting and distributing food in order to gain practical experience.

5. Support for public initiatives and food security:

- Some of the products are sent to university canteens and food banks to support food security.
- The University supports student and community initiatives aimed at improving food security and awareness of the importance of sustainable agriculture.

6. Evaluation and reporting:

- The University annually evaluates the effectiveness of the sustainable cultivation program and publishes a report on the results achieved on its website.
- The environmental impact of the activity is analyzed and the policy is adjusted for continuous improvement.

Conclusion This policy aims to create a sustainable food system on campus, support environmental education, and contribute to food security.

GREENHOUSE

There is a greenhouse on the campus of Al-Farabi Kazakh National University, where fruit and vegetable crops and ornamental plants are grown using innovative technologies.





The main goal of the university greenhouse is to create conditions for conducting scientific research in the greenhouse complex in combination with the practice of theoretical knowledge of students in the specialty "Biology". In the greenhouse complex, various types and varieties of plants are grown and studied throughout the year. Also, the greenhouse complex is the most convenient place for conducting scientific research and experiments necessary for writing theses and master's theses. In the complex, teachers can conduct field and practical seminars and workshops, helping to increase students' interest in growing vegetable crops. In addition, you can grow seedlings of ornamental plants necessary for landscaping the territory of our university. You can also grow various vegetable crops and use them in the university cafeteria.

AGROBIOCENTER

The Faculty of Biology and Biotechnology oversees the activities of the Agrobiocenter – the only center of our university that conducts agricultural scientific, technical and research work with industrial practice. The agrobiocenter was built in the Ili district of Almaty region.





The agrobiocenter is primarily intended for conducting field practices in biological disciplines and methods of teaching biology. The main purpose of creating the agrobiocenter was to improve the quality of practical training of future biologists and biotechnologists. Of course, it is impossible to imagine a full-fledged training of future specialists in the field of biological and environmental education without field training in botany, zoology, soil science and soil ecology, genetics, biotechnology, and biology training methods conducted on the basis of the agrobiocenter. During these practices, the natural environment and natural objects in their natural environment are comprehensively used for educational and research purposes. Also, on the basis of the agrobiostation, agricultural crops of plants are grown annually: potatoes, cabbage, beets, pumpkins, corn, apples, which are then sold at the fair for students, as well as various flowers are bred to decorate the university territory.

WINTER GARDEN

A place belonging to the Al-Farabi Kazakh National University, Faculty of Biology and Biotechnology-winter garden. This garden is located on the fourth floor of the Omirbek Zholdasbekov Palace of Students. In the winter garden, research works of undergraduates and doctoral students are grown, festive events of students are held, as well as tropical ornamental plants are grown. Citrus fruits and tropical plants for introduction (avocados) are also grown. Along with common plants, tropical plants have an important role in the winter garden. The presence in the winter garden of such exotic 50 species of plants as dracaena, scheffler, ficus, monstera, avocado.

Scheffleria is an ornamental deciduous plant. Its main external feature is finger-shaped leaves, there may be 7 or more such "fingers".

Dracaena - woody plants, less often shrubs. The tree-like form of representatives of the genus is due to the secondary growth of the stem. Some species have been used as a source of so-called "dragon blood" since ancient times. Some members of the genus are popular greenhouse and houseplants.

Ficus belongs to the evergreen decorative leafy plant species of the Mulberry family. Indoor ficus species are used as decorative plants for landscaping rooms. The leaves are alternate, less often opposite, toothed and lobed.

Monstera is an evergreen liana with large - up to 45 cm-carved leaves. Monsters are unpretentious and even at home can grow up to several meters in length.

The leaves are pinnately dissected and perforated. *Monstera alba* is a large, brightly colored tropical flowering plant.

Avocado is a fast-growing tree, reaching a height of 20 m. The trunk is usually straight and strongly branched. The leaves are elliptical, up to 35 cm long, and fall off all year round. The flowers are nondescript, small, greenish, located in the axils of the leaves.





AQUARIUM LAB

The aquarium laboratory of the Department of Biodiversity and Bioresources has been operating at the Faculty of Biology and Biotechnology of Al-Farabi Kazakh National University since 1979, that is, for more than 40 years. During this time, a lot of experience has been accumulated in the maintenance and breeding of many species of aquarium fish, but work on the maintenance of local species has begun relatively recently. The aquarium complex is equipped with systems of small aquariums that allow conducting research with objects of warm-water and cold-water fish farming, as well as other objects of aquaculture in the following areas: assessment of the physiological state of organisms (growth rate, development characteristics, nutrition, behavioral reactions, resistance to adverse environmental factors, susceptibility to infectious agents, immunity indicators, etc.) assessment of growing conditions and development of optimal technologies for specific types of aquaculture. A special feature and problem of keeping native species in aquariums is their insistence on temperature and water purity.



Currently, the laboratory is working out methods for keeping 4 Балхашского endangered fish species endemic to the Balkhash basin in captivity: Balkhash marinka *Schizothorax argentatus*, Semirechensk minnow *Phoxinus brachyurus* and Severtsov's char *Triplophysa sewerzowi*.

Балхашская маринка Until the mid-1970s of the last century, the Balkhash marinka was one of the most important objects of fishing – up to three thousand tons of this fish were produced per year. The average weight of fish in catches was about 1.5-2 kg, and the maximum – about 10 kg. Dried marinka meat (balyk) was valued on a par with sturgeon. However, the irrational organization of fishing and the introduction of alien fish species led to a rapid decline in the number and range of this species. In recent years, the Balkhash marinka is increasingly rare in the vicinity of the city of Almaty, where not only amateur fishermen, but also poachers are trying to get these fish. In the aquarium laboratory of the Department of Biodiversity and Bioresources, a small herd of this species has existed for more than 5 years.

Semirechensk minnow is a small fish no more than 8 cm long, usually much smaller. This species was first described in 1912 by the great Soviet scientist Lev Semenovich Berg from several specimens caught in springs near the village of Chilik. In the past, the Semirechensk minnow was widespread in the Balkhash basin, where it inhabited springs, small rivers and lakes. This species performs a very important ecosystem service by eating large numbers of mosquito larvae. However,

other information on its biology is extremely scarce. We managed to get offspring of this species in captivity, but it is too early to talk about sustainable reproduction.

	S c h i z o t h
	P h o x i n
	Голец Severtsov's char (<i>Triplophysa sewerzowi</i>)

Голец Severtsov -'s char is one of the smallest fish in Central Asia. The length of adult fish rarely reaches 5 cm. The species was discovered and described by the outstanding Soviet ichthyologist Georgy Vasilyevich Nikolsky in 1937 from the Ili River basin. The biology of this species has not been studied at all. Due to the fact that Severtsov's char has become extremely rare in the natural environment, the aquarium laboratory contains only a few specimens. Observations in the aquarium should help to understand the biological characteristics of this species in order to develop recommendations for the effective conservation of its natural habitat.

The work on keeping native fish species in aquariums is not only of great practical and scientific importance, but also allows students to engage in independent scientific work and instill in them a careful attitude to their native nature.

BIOBASE

The Educational and Scientific Biological Base (NBB) was created as a special service. Division of the Faculty of Biology based on the Letter of the Kaz State University (No. 27-740 dated 30.09.77) and the Order of the Ministry of ViSSO of the Kazakh SSR (no. 5/1-21-536 dated 12.07.78).

Educational and scientific biological base-is an educational, auxiliary and scientific division of the Faculty of Biology and Biotechnology Kazof the Al-Farabi Kazakh National University.

The tasks of the NBB are determined by the curricula of departments and scientific laboratories of the faculty, according to the submitted applications and approved by the dean's office for the required number and types of laboratory animals for the academic year.

NBB employees are engaged in the maintenance, feeding and breeding of laboratory experimental animals, which is carried out in accordance with Sanitary norms and Rules approved by the Ministry of Health of the Republic of Kazakhstan and the University Administration. The main objectives of the biobase are aimed at strengthening the position of the University as a leading scientific and educational complex in the country that meets international standards for scientific research based on the latest achievements in biology.

The main functions of the biobase include:

1-Providing biomaterials for scientific research of fundamental and applied nature in various areas of biomedicine.

2-Material and technical support of educational and scientific processes.

3-Equipping the NBB with modern laboratory equipment, breeding laboratory breeds of animals and using all resources for educational and research purposes.