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INFLUENCE OF SCIENTISTS-HIPOLOGISTS OF THE INSTITUTE OF LIVESTOCK OF NAAS ON THE HORSE BREEDING OF UKRAINE: A REVIEW (to the 95th anniversary of the Livestock farming institute of NAAS and the 90th anniversary of the Department of horse breeding)

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The article is devoted to the review of the formation and activities of the scientific structural unit on horse breeding of the Livestock farming institute of the NAAS, as a scientific center on horse breeding, which carries out scientific support of the industry, starting from 1944 and until now. In particular, the scientific influence of the employees of the scientific unit on horse breeding in Ukraine is analyzed. The personalities of scientists who worked in the department (laboratory) of horse breeding of the institute at different periods, their personal contribution to the horse breeding industry are considered.

The achievements of the scientists-hipologists of the institute in breeding and technological research, the creation of new breeds, types, lines of horses, the improvement of the horse feeding system, elements of horse training, the study of the features of local horse populations in different regions of Ukraine are highlighted.

The directions of scientific work, the created breeds, types and lines of horses, breeding, technological developments, research on genetics, feeding, biotechnology, economics in horse breeding are considered.

In the article, the authors partially used archival research by Victoria Vyacheslavivna Kunets, in particular, information from her historical and bibliographic publication "Scientific achievements of scientists in the development of domestic horse breeding and horse breeding", for which they express their sincere gratitude to her.

Keywords: Livestock farming institute of the NAAS, horse breeding, scientists-hypologists, scientific support, breeds, lines, types

ВПЛИВ НАУКОВЦІВ-ІПОЛОГІВ ІНСТИТУТУ ТВАРИННИЦТВА НААН НА КОНЯРСТВО УКРАЇНИ: ОГЛЯД (до 95-річчя Інституту тваринництва НААН та 90-річчя відділу конярства)

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Стаття присвячена огляду формування і діяльності наукового структурного підрозділу з конярства Інституту тваринництва НААН, як наукового центру з конярства, що здійснює науковий супровід галузі, починаючи з 1944 року і понині. Зокрема проаналізовано науковий вплив співробітників

наукового підрозділу на конярство України. Розглянуто особистості науковців, які у різні періоди працювали у відділі (лабораторії) конярства інституту, їх особистий внесок у конярську галузь.

Висвітлено досягнення науковців-іпологів інституту у селекційних і технологічних дослідженнях, створенні нових порід, типів, ліній коней, удосконаленні системи годівлі коней, елементів тренінгу коней, вивченню особливостей локальних популяцій коней у різних регіонах України.

Розглянуті напрями наукової роботи, створені породи, типи і лінії коней, селекційні, технологічні розробки, дослідження з генетики, годівлі, біотехнології, економіки у конярстві.

У статті автори частково використали архівні дослідження Вікторії В'ячеславівні Кунець, зокрема – відомості з її історико-бібліографічного видання «Науковий доробок учених у розвиток вітчизняного конярства та кіннозаводства» за що висловлюють їй щиру вдячність.

Ключові слова: *Інститут тваринництва НААН, конярство, кіннозаводство, науковці-іпологи, науковий супровід, породи, лінії, типи*

In 2024, the Institute of Livestock of the National Academy of Agrarian Sciences of Ukraine will celebrate its 95th anniversary and the 90th anniversary of the creation of its scientific unit - the Department of Horse Breeding - a modern leading breeding center for horse breeding. The purpose of this article is to highlight the main areas of scientific research of the Department of Horse Breeding and its achievements.

Research methods. The article highlights the authors' own scientific achievements, memories of the formation of the team and scientific topics, the main results of research from the laboratory's scientific reports during its period of activity, while using historical, bibliographical methods and systematization of materials.

The prerequisite for the establishment in 1944 of the Department of Horse Breeding at the Ukrainian Research Livestock farming institute (UNDIT, then - the Scientific Research Institute of Forest-Steppe and Polissya of the Ukrainian SSR (NIILIP), now - the Institute of Livestock of the NAAS) after the liberation of the Kharkiv region from German occupation was the need for a rapid and qualitative improvement of the horse population, which at that time had an important function in agriculture and the army. The first part-time head of the Department of Horse Breeding was Candidate of Agricultural Sciences Yurii Yuriyovych Podoba, who in 1945 headed the Department of Small Animal Husbandry (Kunets, 2014). The Horse Breeding Department was initially staffed by scientists whose field of work had not previously been related to horse breeding. The main tasks of the Horse Breeding Sector, according to the Regulations on the UNDIT, were:

- methodological guidance of selection and breeding work in the field of horse breeding in state breeding nurseries and state stables for individual types of horses (trotters, draft horses, riding horses);
- study and implementation of methods of selection and breeding of horses in order to improve their quality and accelerate reproduction;
- study of issues of crossbreeding of horses in order to establish the direction of selection and breeding work with crossbreed animals, improve and compare breeds and justify their zoning;
- development and implementation of methods and techniques for feeding, caring for and keeping horses in production;
- study and implementation of methods of using horses for work in production;

- development of individual issues in the field of horse breeding on the instructions of the management.

The first scientific report on the research work of the Horse Breeding Department was compiled for 1945 by Yevhen Yosypovych Senkovsky (a research associate of the Horse Breeding Department since January 15, 1945) on the topic: "Study of horse breeding resources in the main regions of the Ukrainian SSR." The materials of this report were partially published in the journal "Equestrianism" (Senkovsky, 1946). At that time, E.Y. Senkovsky was an experienced specialist in horse breeding, having worked as the manager of the "Narodna Ferma" stud farms, a zootechnician in various farms, and an inspector of horse breeding in the Kharkiv region. Since September 1941, he was authorized to evacuate animals from the Kharkiv region, in particular, he organized the evacuation of horses from Derkul stud farm No. 63 in 1941-1942. (Kunets et al., 2009)

The fastest possible restoration and further development of horse livestock and breeding was one of the main requirements for livestock breeders in the first post-war years. In connection with the significant arrival of horses from Germany and Hungary in 1945 as reparations and the beginning of the creation of a Ukrainian horse breed, the horse breeding department was expanded, the management Since March 1, 1946, it has been carried out by the front-line soldier Professor Vasyl Kuzmich Klyuchnikov, in the past - a teacher and head of the Kharkiv Dairy and Zootechnical Institute (Kharkiv State Zoo-Veterinary Academy) and the Kharkiv Agricultural Institute (Kharkiv National Agrarian University named after V.V. Dokuchaev). Since June 26, 1946, Ivan Dmitrievich Manakov and technician Sergei Servych Shevchenko were enrolled in the department.. Professor S. V. Afanasyev (author of the "Album of Horse Breeds", 1953) also worked in the department for a short time. In 1947, the department of horse breeding was fully staffed. Mikhail Ivanovich Novikov was hired as a senior research fellow, and the technician was Fedir Kuzmich Musienko, an experienced zootechnician, formerly the head of the equestrian unit of the Yagilnytsky stud farm No. 19 (Kuners, 2014).

The scientists of the department of horse breeding widely promoted the industry, provided practical assistance to stud farms, stud farms, collective farms, state farms and other farms, gave lectures, held talks for all categories of specialists, and distributed literature. The achievements of the industry by the scientists of the department were exhibited at exhibitions.

In 1947, the department employee E. Y. Senkovsky published the monograph “Feeding and Care of Horses” (Senkovsky, 1947) and the first dissertation in the department was defended by Ivan Dmitrievich Manakov on the topic “Foreign draft horses as the basis for creating a draft type of working horses” (Manakov, 1947).

In 1947, scientists from the horse breeding department conducted a survey of horse populations in the western regions of Ukraine. In this expedition, significant attention was paid to horses of the Hutsul and Polissya breeds (Manakov, 1948).

In 1948, senior researcher Mykhailo Ivanovych Novikov joined the department, and in 1948, his position was taken by Viktor Oleksiyovych Solovyov, previously the head of the horse breeding department of the Kyiv Research Station of Animal Husbandry (Kunets, 2014).

In 1948, the department conducted two scientific topics; “Study of breed resources in the Ukrainian SSR” (head V. K. Klyuchnikov) and “Improvement of breed and breeding qualities of horses of the Krasnogradsk, Pyriatyn and Romensk Autonomous Okrugs of the Ukrainian SSR” (head I. D. Manakov). In the same year, the first postgraduate student in the specialty “Equestrianism” was accepted at the institute - Fedor Kuzmich Musienko, under the scientific supervision of V. Klyuchnikov (Kunets, 2014). A significant event in the further work of the Department of Horse Breeding was the

enrollment in postgraduate studies in 1950 of Dmitry Andriyovych Volkov - the future founder of his own scientific school of scientists and horse breeders (Ionov, 2014; Pomitun & Tkachova, 2019). This year Dmitry Andriyovych would have turned 105 years old. His enormous contribution to science and the field of horse breeding will be discussed in more detail below. In the same year, V.K. Klyuchnikov was recalled to the position of Deputy Minister of Agriculture of the Ukrainian SSR and the horse breeding department was headed by I. D. Manakov (Kunets, 2014). Thus, the responsible executors of the scientific topic were the head of Manakov I.D. and graduate student Volkov D.A., the scientific topic concerned mainly the improvement of draft horses. In just 5 years, scientists formed more than 20 valuable mother families in a new draft type. Special attention was paid to the technology of growing, feeding, training and testing draft young stock, which became the basis of D.A. Volkov's PhD thesis (Volkov, 1953).

In 1953, the head of the horse breeding department and at the same time the deputy director for scientific work of the institute was appointed an experienced specialist-hipologist Mykola Mikhailovich Burlakov, who had worked in production for many years, including being the director of the State Stud Farm No. 49, the director of the Alma-Ata All-Union Trust of Stud Farms of the USSR National Committee for the Study of Stud Farms and the Ukrainian Trust of Stud Farms of the USSR National Committee for the Study of Stud Farms. In 1954, M.M. Burlakov was recalled to the Ministry of Agriculture of the USSR and Dmitry Andriyovich Volkov became the head of the department (Kunets, 2014; Pomitun & Tkachova, 2019). In 1956, the horse breeding department was joined by an experienced specialist in horse breeding and organizer of stud farms – Pavel Pavlovich Volkov and Anna Stepanivna Filimonova – previously a lecturer in animal husbandry at the school for training heads of collective farms and technicians of the Institute of Experimental Veterinary Medicine. The work of the Horse Breeding Department in 1958 was aimed at checking the state of breeding and selection, conditions for keeping breeding stock and raising breeding young stock in stud farms (D. A. Volkov, P. P. Volkov), as a result of which priority measures were developed and implemented for the systematic conduct of work on the qualitative improvement of the horse population of the republic (Volkov D. & Volkov P., 1958).

Since 1960, the Horse Breeding Department has been managing breeding work to improve the Oryol and Russian trotters, purebred horse breeds, the creation of the Ukrainian horse breed group and the Novooleksandrivskyy heavy-duty type of horses. During this work, new lines and mother families in breeds were created, and horse keeping and training systems were developed.

In 1967, the chief judge (and later the director of the Kharkiv State Hippodrome) Mykola Mykolayovych Ponomarenko entered the postgraduate program of the Institute of Horse Research and Training, who conducted important experimental studies on the influence of training intensity and liveliness of mares on their reproductive ability and the quality of their offspring, which were covered in his candidate dissertation (Ponomarenko, 1971). In 1972, significant personnel changes took place at the institute, and the horse breeding department also underwent changes. D.A. Volkov was appointed deputy director for scientific work of the institute, and only G. S. Filimonov remained in the department (Kunets, 2014). But already at the end of 1973, a promising young specialist, Alexander Aleksandrovich Novikov, was enrolled in the department. The subject of the department's work at that time concerned the development and implementation of methods for improving the breeding and sporting qualities of factory-bred horses. Volume I of the Ukrainian Horse Breeding Code was compiled and materials for its approval were prepared. During these years, the Horse Breeding Department was

reorganized into a laboratory attached to the Small Animal Breeding and Horse Breeding Department under the leadership of V. V. Myros (Kunets, 2014).

The equine laboratory continued to be replenished with experienced personnel who entered postgraduate studies under the leadership of Dmitry Andriyovych Volkov, forming his scientific school (Ionov, 2014; Pomitun & Tkachova, 2019). In 1953, the equine laboratory was replenished with a practicing horseman from the Strelka Stud Farm, Oleksandr Mykhailovych Latka, later a recognized expert on the Ukrainian horse breed. In 1981, Tamara Ivanivna Volkova was enrolled in the laboratory staff, in the future a specialist in horse feeding. In 1985, Violetta Stanislavivna Slizh, a former trotter rider at the Kharkiv State Hippodrome, who received the second prize in the All-Union Student Essay Competition named after S.M. Budyonny, entered the postgraduate study. She became one of the first scientists at the institute to start working with computer technology and software, and created the first database of Ukrainian horse breeds. In 1987, an experienced zootechnician, Olga Mykhailivna Sobol, entered graduate school, studying and implementing genetic indicators of trotting horse agility – later a lecturer at Kherson State Agrarian University. In 1978, the head of the production department (later director) of the Kharkiv State Hippodrome, Vasyl Oleksiyovych Lebedev, entered the institute's graduate school, who substantiated and implemented individual elements of the trotting horse testing system at the hippodromes, which increased their agility (Lebedev, 1989)

With the acquisition of independence by Ukraine, reforms took place in all sectors of the economy, including agriculture. In particular, horse breeding was very difficult during this period, the number of horses began to decline rapidly, stud farms, racetracks, and equestrian complexes were in a difficult state. In the conditions of the reduction of the horse breeding industry and economic decline, scientists of the horse breeding laboratory received a responsible task - to preserve the gene pool of horses in Ukraine. The first scientific project on horse breeding in independent Ukraine was the research project "To improve the gene pool of breeds and develop a highly efficient technology for breeding horses for agricultural production and equestrian sports" (D. A. Volkov, O. O. Novikov, V. S. Slizh, O. M. Latka). Scientists studied the current technologies in stud farms and identified the weakest elements, which were refined and introduced into the new technology. The most effective elements of horse training technology were studied. An assessment of the quality of movements at different gaits was developed (V. S. Slizh, D. A. Volkov), research was conducted on the experimental substantiation of the technology of growing, training and testing young Ukrainian horse breeds in stud farms (D. A. Volkov, V. S. Slizh, O. M. Sobol). In 1993, an experienced horseman-practitioner Serhiy Vyacheslavovich Lyutykh entered graduate school. His research was aimed at developing breeding directions with draft horses, he studied milk and working productivity, and is currently working on the problems of sports horse breeding.

A new important transformation of the equine sector of the institute took place in 2000 - the equine laboratory again acquired a separate status due to the expansion of demand for scientific support for equine breeding of all areas of productivity in new market conditions (order No. 243/k dated October 23, 2000). Oleksandr Oleksandrovich Novikov was appointed head of the laboratory.

Taking into account the contribution of the Livestock farming institute of the NAAS to the practice of domestic horse breeding, the order of the Ministry of Agrarian Policy of Ukraine No. 165/54 dated June 9, 2003 approved the institute as a scientific breeding center for equine breeding.

According to the plan of scientific research and contractual topics, a redistribution of scientific workloads was carried out among the laboratory staff, to which scientists,

laboratory assistants and technicians from other departments of the institute were transferred; Anatoly Andriyevich Bondar, Iryna Volodymyrivna Tkachova, Valentyna Andriyivna Tverdokhlib, Valentyna Viktorivna Yatsutsenko, Victoria Alekseevna Kuraksyna, Kateryna Volodymyrivna Gdanska, Valentyna Fedorivna KovalKoval. At the same time, the laboratory was replenished with talented graduate students: N. V. Volgina, O. V. Bondarenko, T. O. Kovaleva, N. O. Laryna, O. A. Chorna, O. O. Kornienko, A. V. Andriychuk, I. V. Bilous. Most of them defended their dissertations on time and joined the ranks of scientists-hipologists and specialists in horse breeding. Over the entire period of the scientific division of horse breeding, its employees defended 13 candidate and 4 doctoral dissertations. With the expansion of scientific topics in horse breeding, other scientific departments of the institute were connected to the work: the biotechnology center (O. B. Sushko, O. V. Tkachev), the genetics laboratory (V. I. Rossokha, G. M. Tur, T. L. Voroshina, N. V. Shkavro, T. V. Kovaleva, L. T. Dobrodeeva, O. O. Aleshchenko, O. V. Boyko, O. A. Zaderikhina, O. V. Brovko, O. L. Grebenyuk), the feeding laboratory (V. M. Kandyba), the economics laboratory (O. L. Kukla), the analytical laboratory (L. M. Fedotova, T. O. Bredykhina, S. S. Varchuk). The Livestock farming institute of the NAAS was the coordinator of the scientific program "Equestrianism", in which the following took part: the Institute of Animal Breeding and Genetics, Ternopil and Mykolaiv Institutes of Animal Husbandry, Transcarpathian State Veterinary Service and Ivano-Frankivsk State Veterinary Service.

In 2007, the head of the laboratory O.O. Novikov passed away prematurely and the laboratory of horse breeding was headed by Iryna Volodymyrivna Tkachova (in the future - the director of the institute). Further work of the laboratory was aimed at preserving the gene pool and biological diversity of horses, developing effective breeding and technological methods that contribute to the realization of the genetic potential of horses in various areas of economic use. Currently, the unit carries out scientific topics in the coordination network of the Institute of Animal Breeding and Genetics named after M.V. Zubets of the NAAS for the research project "Genetic Conservation".

In 2018, the institute underwent staff optimization and changes in the structure of the institute, as a result of which the horse breeding laboratory entered the newly created Department of Breeding and Technological Research in Small Animal Husbandry and Horse Breeding as a scientific sector and breeding center for horse breeding.

And today, in extremely difficult war conditions, equine scientists continue to work for the preservation and improvement of Ukrainian horse breeding.

Breeding research, creation of new types and breeds of horses.

The limited and heterogeneous horse resources that remained after the occupation of Ukraine required significant efforts of specialists to successfully solve the problem of creating a new breed of horses and qualified assistance from scientific institutions. Employees of the Horse Breeding Department - Head V. K. Klyuchnikov, Candidate of Agricultural Sciences I. D. Manakov and Senior Researcher E. I. Senkovsky during 1946 conducted a survey of pedigree horses that survived the war in Poltava, Kharkiv, Sumy, Kirovohrad regions. The expedition survey covered 4076 horses, including the breeding stock of the Krasnograd, Kirovohrad, Pyriatyn and Pryluky stud farms. It was established (Senkovsky, 1946) that in most areas, pedigree horses are very scattered (2-3 heads each) on collective farms. Only in some breeding farms were they gathered in more or less significant groups (20-50 heads). In the Novoukrainsk district of the Kirovograd region, which was saturated with pedigree horses before the war, single individuals remained. The organization of farms in this area was initially carried out at the expense of a small number of local horses and imported mares of the Karabair breed, which, according to scientists, did not meet the task of breeding a new breed. Based on the data from the

survey and assessment of the population, a meeting of specialists was held at the Livestock farming institute and urgent measures were outlined to restore pedigree horse breeding. It was decided to import thoroughbred and high-blooded stallions into the network of state stud farms to reduce the heterogeneity of the horse massif and improve the breed, caliber and exterior indicators. On the recommendations of scientists, a significant number of riding horses of domestic origin and Western European breeds, which arrived from military units and as reparations, were gradually collected in stud farms and horse farms. The need to breed a large agricultural horse of the riding-sled type (universal working productivity) was determined instead of a highly specialized thoroughbred riding breed (Volkov D., Volkov P., 1958).

On April 16, 1953, Mykola Mikhailovich Burlakov was appointed head of the horse breeding department, who had previously headed the Kharkiv Regional Department of Agriculture, and even earlier - in 1945-1951 he was the director of the Ukrainian Trust of Horse Breeding Plants of the People's Commissariat of Land of the USSR. The time of his leadership of the department coincided with the rapid disbandment of the cavalry and the direction of horse breeding for sports (Kunets, 2014).

In connection with the transfer of M. M. Burlakov, on June 2, 1954, a front-line veteran, Candidate of Agricultural Sciences Dmitry Andriyovych Volkov was appointed as Deputy Director for the Scientific Part of the Institute, Head of the Horse Breeding Department. He was entrusted with the methodological and scientific management of breeding work to create the Ukrainian riding breed group of horses. He developed long-term breeding plans for 1961-1965 and 1966-1970, which gradually reduced the number of stallions of the original breeds and increasingly used stallions of the desired genealogical complex of domestic selection. In accordance with the long-term plans, stud farms carried out measures to improve horses of the Ukrainian riding breed group by means of targeted selection and selection, organization of sports training, evaluation of stud stallions by the quality of offspring, selection of progenitors and establishment of genealogical lines, maternal families.

Based on the materials of the survey of the livestock of the newly created breed group in 1970, D.A. Volkov and the department staff developed a long-term plan for breeding work with horses of the Ukrainian riding breed group for 1970-1980. The main task of the breeding work was to create a new breed of riding-sled horses suitable for use in equestrian sports (in particular, in its classical types: show jumping, dressage, eventing, style-chasing), as well as for use in agriculture and the improvement of local horses. The certificate of the Scientific Research Livestock farming institute of the Forest-Steppe and Polissya of the Ukrainian SSR dated May 7, 1971 on the mass survey of the horse population indicated that 95% of the dams met the requirements of the breed group type. By origin, these were crosses of three and four breeds, obtained as a result of crossing the Hungarian, Trakehner, Hanoverian breeds with purebred horse breeds and were largely fixed by further mating of crosses of the desired type with each other. In 1974, the employees of the Horse Breeding Department compiled the first volume of the State Stud Book of the Ukrainian Horse Breed Group. In 1978-1979, the employees of the Institute, as part of the State Commission, conducted a control survey of the horse population, took measures to organize breeding work on breeding horse farms and developed long-term work plans for each stud farm. In 1986, the employees of the Horse Breeding Department were pared in accordance with the then current regulations materials for the approbation of the Ukrainian horse breed and submitted for consideration to the State Agricultural Industry of the Ukrainian SSR and the State Agricultural Industry of the USSR.

Further selection work was carried out guided by a single plan of breeding work, developed by specialists of the horse breeding department, which made it possible to

combine the positive qualities of the original breeds and obtain horses that surpass them in a set of selection characteristics. Of great importance in this work was the creation of an initiative Breeding Council for the breed and the opening of an international auction in Kyiv for the sale of horses of the new breed. In September 1990, a group of experts, which included prominent scientists of the time - Professor Yu. N. Barmintsev, Professor O. A. Balakshin and others, conducted a survey of the basic farms - the originators of the creation of the new breed. Based on the results of the survey, specialists from the horse breeding department prepared materials for the approval of the breeding achievement, approved by the State Commission of the Council of the USSR Ministry of Food and Procurement. The new breed was given the name "Ukrainian riding horse".

The process of creating and improving horses of the domestic sports breed would have been impossible without the authors and main executors of the breeding programs – scientists of the institute and horse breeders: D. A. Volkov, O. A. Kalantary, P. A. Deineka, V. O. Peresady, M. B. Ignatieva, A. S. Filimonova, V. I. Kulikov, V. V. Stashevsky, P. Ya. Belan, N. T. Bobkova, V. P. Shimshyrt, P. M. Krymtsov, B. I. Moskalenko, I. G. Kravchenko, I. E. Gotlib. Later, scientific support for the work with the Ukrainian horse breed was carried out by Slizh V. S., Novikov O. O., Latka O. M., Bondarenko O. V., Tkachova I. V.

Currently, the Ukrainian horse breed, the main purpose of which is to be used in classical equestrian sports, ranks first among other breeds of Ukraine in terms of the number of breeding stock. The leading farms for its breeding are LLC "Kharkiv Horse Breeding Plant", branches of the State Enterprise "Equestrianism of Ukraine": Lozov Horse Breeding Plant No. 124, Oleksandrijsk Horse Breeding Plant No. 74, Dnipropetrovsk Horse Breeding Plant No. 60.

At the same time as the breeding of the Ukrainian horse breed, scientists of the horse breeding department were engaged in the improvement of heavy draft horses, the need for which was very significant in the post-war period. The prerequisite for working with draft horses was the importation of draft horses of Western European origin, mainly Belgian Ardennes, to the Dibrivsky Stud Farm in 1868. For a long time, breeders of local and improved mares crossed them with Belgian mountain Ardennes, and to a lesser extent with Brabancons and Percherons. By 1920, several breed types had formed in the Russian Ardennes breed, the smallest of which and the most uniform in proportional build were the Dibrivsky Ardennes. In 1923, draft horses of the Dibrivsky type were transferred to the Novooleksandrivsky Stud Farm, and in 1929, the stock of draft horses from the Mariupol People's Farm was transferred to this plant.

Until 1941, the main goal of working with heavy draft horses at the Novooleksandrivsky Stud Farm was to breed larger horses with correct exterior and high working productivity.

In the post-war years, heavy draft horses were sent to Ukrainian stud farms for reparations and were carefully studied. According to the recommendations of scientists from the horse breeding department, further work with heavy draft horses was based on crosses of lines with the simultaneous use of inbreeding. As a result, a type of horse was obtained, which was characterized by small stature, a wide barrel-shaped body, on low, dry, correctly set legs, with a light head, a short wide neck, a long, bifurcated, wide, slightly drooping croup.

Under the methodological guidance of D. A. Volkov, in 1948 the creation of the Novooleksandrivsky (Ukrainian) type of heavy draft horse began, officially approved on December 31, 1970. (Order No. 437 of the USSR Ministry of Agriculture). Even before the approval of the new type of heavy draft horses, starting from the selection plans

approved in 1960, its transformation into a new breed began (Volkov D. A., Kemarska M. S., Kalantar A. A.).

Further intensive use of the complexes obtained at the Dibrivsky and Novooleksandrivsky stud farms, the creation of genealogical lines and maternal families, as well as appropriate training and testing of the working qualities of horses made it possible to carry out complex work on creating a new heavy draft breed based on the heavy draft type. The decisive factors in this work were the organization and conduct of expert assessment of the breeding nucleus, the selection and intensive use of the best stallions-breeders, selection for improving the type of body structure, assessment of the quality of the offspring, testing them for working productivity. A certain role in the selection work was played by a comparative two-stage assessment of line continuations and breeding stallions by offspring and the quality of daughters used in the reproductive composition. The selection was aimed at the maximum development of the main genealogical lines and branches through the best stallions (Pavlovskii & Tkachova, 2019). The Novooleksandrivskaya heavy-duty breed was approved as a selection achievement in 1997 (Author's Certificate No. 1262 dated 28.11.1997 r.). The team of authors included D. A. Volkov (scientific supervisor), M. S. Kemarska, O. A. Kalantar, I. P. Goroshko and other highly qualified breeders. Under the leadership of Professor D. A. Volkov, scientific and methodological support of breeding work with the Novooleksandrivky Draft breed was carried out by A. S. Filimonova, S. V. Lyutikh, I. V. Tkachova, N. V. Volgina, O. O. Kornienko, S. S. Pavlovsky.

Modern horses of the Novooleksandrivky breed differ significantly from analogues of the Russian heavy draft breed, in particular its Ural type. They are more massive, have a strong constitution, are well adapted to the conditions of maintenance and use in different regions of Ukraine, are characterized by high working capacity, early maturity, fertility and milk yield (up to 4000 liters of milk). More than 20 representatives of the Novooleksandrivky heavy-duty breed were awarded the titles of champions and record holders in express cargo delivery and draft endurance.

With the participation of scientists from the horse breeding laboratory at the institute, research was conducted to study the quality of mares' milk, its nutritional value and the necessary technological conditions for the production of high-quality koumiss (S.V. Lyutykh, L.M. Rosso). State standards were developed for the requirements for the quality of mares' milk and koumiss.

Considerable attention in the scientific research of the institute was paid to the improvement of the purebred riding horse breed, which has been bred in Ukraine for more than two centuries. At different periods of time, breeding work on the improvement of horses of this breed was carried out according to selection programs developed under the methodological guidance of scientists from the horse breeding department (laboratory): D. A. Volkov, O. O. Novikov, I. V. Tkachova, T. O. Kovaleva. Every year, scientists evaluated purebred young horses at Ukrainian racetracks, made suggestions for selection plans, and developed long-term breeding plans for stud farms.

Oleksandr Oleksandrovich Novikov, head of the horse breeding laboratory in 1998-2007, was particularly interested in purebred horse breeding. As part of research on purebred horse breeding, changes in the parameters of horse selection by breed and by stud farm and lineal affiliation of the generation were studied in terms of racing class and liveliness. In stallions and dams used over the past 20 years, age variability and heredity indicators were studied, and based on these data, a new method of selecting dams for stallions by liveliness classes and a breeding program for working with purebred horses in Ukraine were proposed. The results of the research became the basis of the scientist's PhD thesis (Novikov, 2002).

Scientists of the Institute's Horse Breeding Department have conducted many years of research on the assessment of lines of purebred horse breeds by liveliness, distance, and the number of victories in races of various levels according to the international classification. As a result, the modern direction of selection is the specialization of lines in the breed depending on the presence of certain qualities of stayers, sprinters, and distancers. For this purpose, a methodology has been developed for assessing the reproductive composition of the breed by liveliness indicators with its division into classes; high, medium, and quiet, which makes it possible to take into account the performance index of horses when selecting breeding young stock and compiling selections (D. A. Volkov, O. O. Novikov).

At different stages of work with the breed, studies were conducted aimed at assessing the intensity of selection, features of variability, heredity, and repeatability of liveliness indicators in generations in terms of lines and individual stud farms. In order to determine the constant influence of individual stud stallions and the nature of their compatibility in various genealogical complexes, the horse breeding laboratory annually evaluates stallions by the quality of their offspring. The main indicator is the stallion's "success index", the number of victories and prize places in traditional prizes received by the offspring, and the total amount of winnings by the offspring.

Extensive research work has been carried out to improve the Oryol breed of horses. Resources have been studied and plans for breeding work on the breed to improve and create new lines have been developed, breeding traits have been studied and standards have been developed for individual stud farms (D. A. Volkov, P. P. Volkov, V. V. Galas, M. M. Ponomarenko, O. M. Sobol, I. V. Tkachova, O. O. Kornienko).

In recent years, active work has been carried out to create and test the domestic genealogical line of the Zapad Orlov trotting breed (Tkachova & Frolova, 2020).

An urgent task of breeding work with trotting breeds is to further increase the agility of horses both over short and long distances. In this regard, the question arises about the directions of breeding work with trotting horse breeds in the future. The basis of further work is purebred breeding of horses of each breed separately with the maximum use in breeding work of agile stallions-sprouts, who also have a clearly expressed body type of their breed. It is certain that in this case it will be necessary to obtain high-class stallions and dams and ensure their effective use in breeding work.

For a long time, in Ukraine, with the scientific and methodological support of scientists from the Livestock farming institute of the NAAS, work has been underway to improve the domestic prize trotter (D.A. Volkov, P.P. Volkov, V.V. Galas, M.M. Ponomarenko, O.M. Sobol, N.V. Volgina, I.V. Tkachova, O.O. Kornienko). The idea of creating a domestic trotting breed belongs to the luminaries of equine science at the institute - D.A. Volkov and O.O. Novikov, but it was their students and followers who had to implement it. In 2014, the first program for breeding horses of the Ukrainian trotting breed group was developed, and in 2016, materials on its testing were submitted for consideration (I.V. Tkachova, O.O. Kornienko). Given the proven genetic uniqueness of the newly created breeding achievement, it was decided to carry out work on transforming it into a new breed - the Ukrainian Trotting Horse (Tkachova & Yusyuk-Omelnytska, 2023). It is currently being tested and there is a gratifying hope that the 95th anniversary of the Livestock farming institute of the NAAS and the 90th anniversary of the Horse Breeding Department will be marked by the approval of a new breeding achievement - the Ukrainian Trotting Horse.

Studies of local horse populations.

In addition to pedigree horses, considerable attention was paid to local horses from different regions of Ukraine, as well as horses of local breeds imported from other

countries, which had excellent adaptive qualities, were unpretentious, strong and adapted to agricultural work. Thus, in 1946, scientists from the Department of Horse Breeding conducted a survey of Mongolian horses imported to the Kharkiv region in 1944 (Kunets, 2014).

In 1948-1951, scientists from the Department of Horse Breeding conducted research on the horse population in the regions of Polissya of the Ukrainian SSR, which made it possible to identify horses of the Polissya breed, and conducted experiments on improving local Polissya horses as heavy draft horses in Sumy and Chernihiv regions. The results obtained were included in the candidate's dissertation of graduate student F. K. Musienko "The Horse of Polissya of Ukraine and Methods of Its Improvement" (Musienko, 1951).

In the conditions of the mountainous region of Crimea, in 2009-2013, experiments were conducted to study herd horse breeding as a separate ecosystem. The analysis of the horse composition of the largest equestrian tourist bases of the mountainous Crimea determined the main parameters of horse selection, important for equestrian tourism: morphological and physiological features, ethology and temperament, exterior and interior indicators, breed and pedigree, as a unifying factor of the complex of selection parameters. The organizational and technological parameters of equestrian tourism and the morphometric characteristics of the mass of horses employed in equestrian tourism were studied, and a methodology for selecting horses for equestrian tourism based on these characteristics was developed (I. V. Tkachova, I. V. Bilous) (Tkachova et all., 2009). The adaptive, physiological, morphological and hematological indicators of Crimean-type horses of different sex and age groups were assessed at altitudes (from 300 to 700 m above sea level) in conditions of distance runs of 18 and 32 km (Andriichuk et all., 2015).

In 2015, within the framework of the implementation of the international cross-border program IPBU.03.01.00-18-751/11-00 “Utworzenie Polsko-Ukrainskiego Centrum Hodowli i Promocji Konia Huculskiego” (“Creation of a Polish-Ukrainian Center for Breeding and Promotion of the Hutsul Horse”), an inventory of 614 horses was conducted in the Transcarpathian region in order to identify horses of the Hutsul breed and the most typical of them, a photo archive and database were formed (I. V. Tkachova).

In the western regions of Ukraine, the Torian breed of draft horses is widespread, whose representatives were not registered in the state breeding register and were bred chaotically in small farms. During 2017-2019, at the initiative of the Horse Breeding Center of the Livestock farming institute of the NAAS (I. V. Tkachova), meetings were held with the leadership of the Tory Horse Breeding Association (Estonia), an expeditionary survey of the Tory horse population of Ukraine and an expert assessment of the horses. As a result of the work carried out, it was established that the Tory horses of Ukrainian selection meet the breed standard, and the Livestock farming institute of the NAAS received permission to organize its own pedigree register of Tory horses of Ukrainian selection, the first volume of which was published in 2021 in English (Tkachova et al., 2021).

Horse breeding paid significant attention to horse breeding technology. This direction was developed back in 1949 with the approval of the scientific topic of the horse breeding department “Development of a system for raising, training and testing pedigree horses in the State Stud Farms of the Ukrainian SSR” (head I. D. Manakov). The development of foals, selection of young animals, research groups were formed, and the results of training draft horses were studied (Kunets, 2014).

Based on the study of the technology of raising horses in stud farms and their assessment of sporting qualities depending on bloodline, lineage, selection methods and

body structure, the parameters of the desired (standard types) horses were established, as well as an experimentally substantiated and developed system of early sports training of young horses of the Ukrainian horse breed for dressage and show jumping, which ensures the development of motor skills and the ability to overcome obstacles 120-150 cm high (D. A. Volkov, V. S. Slizh).

Elements of the technology of systematic education of foals of the purebred horse breed were developed (T. O. Kovaleva), which contribute to improving work with young horses during handling, training and, accordingly, increase performance during hippodrome tests.

Separate elements of the technology of testing trotting horses were developed (V. A. Lebedev).

The relationship between physiological and biochemical indicators with the functional state of horses of sports breeds, changes in the content of oxidative stress markers and the activity of antioxidant defense enzymes in the dynamics of physical exertion was studied. A patent for a utility model (Pat. 146831 Ukraine, MPK (2021.01) A61V 5/00) "Method for determining the level of fitness of sports horses by hematological, biochemical parameters and markers of oxidative stress" (I.V. Tkachova, A.V. Andriychuk) and a monograph "Antioxidant mechanisms of adaptation of horses in the process of physical training" (jointly with Polish colleagues) were obtained.

Regulatory documentation has been prepared that regulates the technology of horse breeding based on the initial requirements for technological, organizational-economic, zoohygienic and ethological standards for breeding, keeping, training and testing horses, developed using previous developments, developed standards and recommendations (I. V. Tkachova).

Improvement of the horse feeding system

Given the great importance of the level of horse feeding for the manifestation of their genetic potential, the horse breeding department (laboratory) conducted scientific research on the organization of the feed base, studying the nutritional value of rations for different sex and age groups of horses, creating original feed premixes, protein-vitamin-mineral supplements and compound feeds.

Even at the beginning of the operation of the institute, the horse breeding department paid much attention to the organization of the feed base in the conditions of various farms. Thus, in 1949, in the conditions of the Pyriatyn and Krasnograd state breeding nurseries of the Kharkiv region (a total of 74 breeding farms), scientists of the horse breeding department developed plans for the organization of the feed base, adjusted crop rotation schemes, the structure of crops for uninterrupted supply of feed. Since 1950, D.A. Volkov has been engaged in issues of feeding heavy draft young animals, improved rations, and organized early feeding of foals. Guided by the need of horses for basic nutrients and biologically active substances, in 1993-1997, premix recipes for different sex and age groups were developed and experimentally substantiated. The effectiveness of the developed recipes was tested in the diets of breeding dams and foals from weaning to 2 years of age in scientific and production experiments at leading stud farms. A patent of Ukraine was obtained for the developed premixes (№ 20409 A dated 15.07.97). In 1996, a "sports" version of the experimental premix was developed, which was tested on sports horses of the dressage and competition groups of the Mykolaiv Equestrian Base "Kolos", as well as horses of the Ukrainian national equestrian team.

In 1997-1998, a scientific and production experiment was conducted at the Lozivsky Stud and the Olimpiysky Stud Farm in Mykolaiv to study the effect of a protein-vitamin-mineral supplement (PVMD) on the development of foals of the Ukrainian horse breed. The studies established that the inclusion of PVMD in the diet has a positive effect

on the development of foals after weaning (V. M. Kandyba, T. I. Volkova, O. O. Novikov).

In 2001-2005 in Lymarivsky and Stryletsky Stud, the positive effect of the developed compound feed with the inclusion of premixes on the reproductive ability of stallions-breeders and dams was studied. In the Stryletsky stud farm, the effectiveness of compound feed with the inclusion of a vitamin-mineral premix for suckling foals and young horses in training was also studied. Feeding the developed compound feed to suckling foals of purebred riding breeds as part of the diet has a beneficial effect on growth and development, provides a significant improvement in the performance of horses and keeps them in good prize-winning order (V. M. Kandyba, T. I. Volkova, O. O. Novikov).

A feed additive for horses during periods of intensive physical exertion has been developed. It based on oat bran-based feed with the addition of bee honey (mass fraction – 15.0%), vegetable oil enriched with vitamin D, feed chalk. The biologically active substance in the feed additive is bee honey. The energy and nutritional value of the feed additive was calculated (I. V. Tkachova)

In co-authorship with the Department of Animal Husbandry of the NAAS, a monograph for a wide range of horse breeding specialists “Physiology of Nutrition and Standardization of Horse Feeding” was published.

The development and implementation of a computerized system of breeding accounting in breeding, prize, sports and draft horse breeding (V.S. Slizh, I.V. Tkachova) ensured an increase in the rate of accumulation of informative material on horse breeding and the quality of statistical data processing. Unified forms of breeding accounting in horse breeding have been developed, databases have been created for each breed, which accumulate information on the origin, development, working capacity and breeding use of horses, registers, catalogs, state books of breeding horses are maintained, and the reproductive composition is assessed by the quality of offspring. The Livestock farming institute of the NAAS currently stores and constantly updates the most informative database of horse breeding in Ukraine.

Only in the last decade, the institute's hippologists have developed:

- The program for breeding horses of the Ukrainian riding breed until 2020;
- The program for breeding horses of the Novooleksandrivky Draft breed until 2020;
- The program for breeding horses of the Ukrainian trotting breed group until 2020;
- The program for preserving the gene pool of horses in Ukraine until 2025.
- Methodological recommendations have been developed and implemented:
- Selection and genetic parameters of horses in the genetic passporting system";
- Standardized feeding of horses of different areas of use;
- Evaluation of physiological indicators of sports and prize horses by the volume and intensity of physiological loads;
- Effective formation and use of mother families in the Ukrainian riding breed;
- Regulations on testing horses of the sports direction of work capacity.

The Horse Breeding Center actively cooperates with the State Enterprise "Equestrianism of Ukraine", the State Enterprise "Agency for Identification and Registration of Animals", the Public Organization "Association of Horse Breeders of Ukraine", the Public Organization "Association of Subjects of Stud Business in Horse Breeding", engaged in breeding horses of the Ukrainian riding breed", the Public Organization "Association of Horse Racing and Racing", the Public Organization "Association of the Draught Horse", the employees of the center are members of the

working group on horse breeding and expert commissions of the Ministry of Agrarian Policy and Food of Ukraine.

Since 2010, the employees of the horse breeding sector have supported international cooperation with the Institute of Biology and Earth Sciences of the Pomeranian University in Slupsk (Republic of Poland) on conducting joint research and implementing a research project on the study of adaptation mechanisms of sport horses, as well as with the Tory Horse Breeding Association (Estonia), which coordinates the Ukrainian-Estonian commission for assessing the breeding value of Tory horses.

The employees of the horse breeding sector carry out advisory activities, provide practical assistance (conducting boning, expert assessment of horses, description of signs, rationing of rations, clarification of pedigrees, assistance in identifying and registering horses, adjusting training elements, etc.) and provide consultations to farms on issues of breeding, keeping, feeding horses.

The diverse requirements for horses necessitate the study of methods for obtaining the most desirable types and groups of horses that meet certain requirements, the development of methods, programs and business projects that will ensure the maintenance of the competitiveness of breeds in Ukraine, taking into account social and economic conditions. The priority in scientific research is given to the main direction of horse breeding - stud horse breeding, which is able to meet the needs for horses of different breeds in a multi-structured market economy. At the same time, the task is set in the near future to reach the world level on the basis of breeding and technological developments to increase the competitiveness of horses of domestic breeding. This is expected to be achieved both through the intensification of the breeding process in breeds and the development and implementation of progressive scientifically based energy-saving technologies for breeding, training, testing of pedigree horses, immunogenetic and cytogenetic diagnostics, promising methods for assessing work capacity, feed production and feeding technology, optimal ration structure, and the economics of horse breeding production at the level of the latest world achievements.

An important issue also remains the preservation and further development of horse breeds with a limited gene pool. Competition between foreign-bred horses and domestic ones, well-adapted to the economic and climatic conditions of different regions of Ukraine, as well as socio-economic restructuring, changes in ownership forms, and the economic crisis, have made the problem of preserving valuable, small-numbered breeds of domestic breeding particularly important. The fate of horse breeds that have traditionally been bred on the territory of Ukraine for many years depends on the solution to this issue: Orel and Russian trotters of the established domestic type, purebred riding, Tory, Arabian, and especially breeds created in Ukraine, which are our national heritage: Hutsul, Ukrainian Trotter, Novooleksandrivky Draft, newly created Ukrainian Scientists-hypologists of the Livestock farming institute of the NAAS are working on these issues.

References

Andriichuk A., Tkachenko H., Tkachova I. 2015. Hematological alterations and osmotic resistance of erythrocytes in endurance horses during 32 km races. *Słupskie Prace Biologiczne, 2: 5-20.*

Volkov, D. A. (1953). The experience of training tribal heavy trucks foals of the desired type with early training and early feeding conditions of the Romensky state breeding nursery: thes, dis…PhD 06.02.04, Kharkiv: 18

Volkov, D. A., Volkov, P. P. (1958). Breeding work in State nurseries horses of Ukraine. Kharkiv: 76

Volkov, D. A., Tkachova, I. V., Kornienko, O. O., Kuraksina V. O. (2014). Laboratory of horse breeding of the Institute of animal sciences of NAAS - scientific center of hippology in Ukraine (to the 70th anniversary of the foundation). *Scientific and technical bulletin of Institute of animal sciences of NAAS*, 111: 6-13

Ionov, I. A. (2014). Volkov Dmytro Andriiovych – the luminary of National Horse breeding. *Scientific and technical bulletin of Institute of animal sciences of NAAS*, 111: 3-5

Kunets, V. V., Tkachova, I. V., Goncharenko, L. V., Ochkovska, T. M. (2009). The contribution of scientists of the Institute of Animal Sciences of the National Academy of Agrarian Sciences of Ukraine to the development of horse breeding in Ukraine: bibliography. Show of science pr. in history, the period of the institution's existence (1914-2009) (to the 80th anniversary of the institution's founding) / UAAN, Institute of Animal Sciences; [science ed. E. V. Rudenko], Kharkiv: 79

Kunets, V. V. (2014). Scientific output of scientists in the development of domestic horse breeding and horse breeding / NAAS. In-t of Anim. Sci.; Kunets Victoria Vyacheslavivna; science ed. I. A. Ionov. Kharkiv: 168. (Series «Institute of Animal Sciences of the National Academy of Agrarian Sciences of Ukraine in bibliography, archival and literary sources». Book 5).

Lebedev, V. A. (1989). Justification of individual elements of the system trials of trotting horses: dis... PhD: 06.02.04; Kharkiv: 182

Manakov, I. D. (1947). Draft horses of foreign origin as the basis for creating a weight-carrying type of working horses: dis. PhD, Kharkiv: 225

Manakov, I. D. (1948). Polesie horse of Ukraine and ways to improve. *Horse breeding*, 4: 27-29

Musienko, F. K. (1951). The horse of Polesie of Ukraine and its methods improvements: dis…PhD. (not protected)

Novikov, O. O. (2002). Assessment of work capacity and level of intensity selection of thoroughbred breed: dis…PhD 06.02.01, Kharkiv: 166

Pavlovskii, S. S., Tkachova, I. V. (2019). Genealogical structure of the New Alexandria weight-carrying breed. *Scientific and technical bulletin of Institute of animal sciences of NAAS*, 122: 130-138. doi:10.32900/2312-8402-2019-122-130-138

Ponomarenko, N. N. (1971). Study of the influence of training intensity and frivolity of mares on their reproductive ability and quality offspring: dis... PhD: 06.550, Kharkov: 160

Pomitun, I. A., Tkachova, I. V. To the 100th anniversary of Dmytro Andriiovych Volkov - the luminary of National horse breeding. *Scientific and technical bulletin of Institute of animal sciences of NAAS*, 121: 5-10

Senkovsky, E. Y. (1946). Breed horse breeding of the Ukrainian. *Horse breeding*, 8-9: 33-38.

Senkovsky, E. Y. (1947). Horse feeding and care. K.: Agricultural Publishing House. Ukrainian: 36

Tkachova, I. V., Bilous, I. V., Grigorenko, A. M., Stepanenko, V. M., Melnichenko, S.M. (2009). Technological aspects of herd horse breeding and the organization of equestrian tourism in the conditions of mountainous Crimea. *Scientific and technical bulletin of Institute of animal sciences of NAAS*, 101: 19-23

Tkachova, I. V., Frolova, H. O. (2020) Genealogical lines in the Oryol spotted breed of the Ukrainian part of the population. *Scientific and technical bulletin of Institute of animal sciences of NAAS*, 123: 184-193. doi:10.32900/2312-8402-2020-123-184-193

Tkachova I. V., Marushchak V. D., Frolova G. A. (2021). Stut book of horses of the Torian breed of UKR aine: Vol. I. Institute of animal science of the National Academy of Agrarian Sciences of Ukraine; PA «Society of the Torian horse»; GA «Association for horse racing and running»; edited by I. V. Tkachova, Kharkiv-Lviv: Institute of animal science of the National Academy of Sciences: 140

Tkachova I., Yusyuk-Omelnytska T. (2023). Population characteristics and the concept of gene pool conservation for the of horses of the newly created Ukrainian trotting breed group. *The Scientific and Technical Bulletin of Livestock farming institute of NAAS*, Is. 130: 216-230. doi:10.32900/2312-8402-2023-130-216-230