

State of scientific studies in branch of veterinary medicine, carried out on the basis of dissertational, research and development and design projects

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The purpose. To determine and analyze productivity of scientific studies and their financing in the field of veterinary medicine. **Methods.** Method of empirical probe is used. As materials for probes they used database of dissertations for 2000 – 2013 made in the field of «Veterinary sciences», and block of carried out research and development and design projects for 2013-2015. **Results.** Solution of questions of provision stable epizootic situation in Ukraine is the basis for strategic priority «Technological renewal and development of agribusiness industry» which includes 8 intermediate term priority directions of innovative activity. The most probed priority is «Development and implementation of technologies of production of preparations for diagnostics of diseases of animals and means of their protection» (20% of prepared theses). The most probed directions are: veterinary microbiology, epizootology, communicable diseases and immunology (27,3% of protected theses), and the least probed are: veterinary pharmacology and toxicology (7,8%). **Conclusions.** Analysis of protected for 2000 – 2013 theses in the field of «Veterinary sciences» testifies to the following: studies were carried out not in all directions. Of 10 ciphers of certain specialities probes were carried out only in 7, and in 3 ciphers (parasitology, entomology and veterinary-sanitary expertise) probes were not carried out. For financing research works in veterinary medicine state budget and own means were used. The highest financing due to budgetary funds made 71% of total sum in 2014, and the greatest sum of own means was used in 2013 (almost 80%). Analysis of the carried out 88 researches in veterinary questions for 2013 – 2015 testifies to low level of productivity as any technology was not registered in the base of Technologies.

Key words: *veterinary medicine, monitoring of theses, scientific probes, financing of studies.*

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The problem of ensuring food security of the population and preventing infectious diseases, especially common to people and animals, to obtain safe and high-quality livestock products, is relevant to all countries in the world. Solving this problem is one of the most important internal functions of the government. For this purpose, significant funds are needed for veterinary and prophylactic measures, the development of the biological industry, the production of chemotherapeutic drugs and the organization of scientific research [1, 2].

The stability of the epizootic situation in Ukraine to a large extent depends on the provision of ant epizootic measures by diagnostic, prophylactic and curative and immunobiological drugs. Therefore, the economic evaluation of the work of the veterinary medicine service, the introduction of scientific research into production - is a part of the work [2].

According to the EIB (International Epizootic Bureau), the global epizootic situation in the world remains extremely unfavorable. This is confirmed by the spread of known and new infectious processes, including catarrhal sheep fever (bluetongue), African wine fever, spongiform encephalopathy, and others [2, 3].

Analysis of recent research and publications. In recent years, due to the development of scientific institutes of the Department of Veterinary Medicine of the National Academy of Sciences of Ukraine and other scientific and scientific-pedagogical institutions of Ukraine, there has been established a stable production of vaccines and diagnostic umsofanthrax, leptospirosis, rabies, necrobacteriosis, classical swine fever, Aujeszky's disease, Teschen, Gamboro, Newcastle disease, myxomatosis and hemorrhagic disease of rabbits tuberculosis, paratuberculosis, brucellosis, diseases of birds, pneumocentrics of cattle. In addition, modern therapeutic and prophylactic and antiparasitic preparations have been developed and produced [4-13].

The financial and technological components of the innovation potential are elucidated on the basis of the results of the two above-mentioned monitoring of years 2012-2014 on the implementation of the priority directions of innovation activity. The Ukrainian Institute of Scientific, Technical and Economic Information (UkrINTEI) developed methods for conducting these monitoring, the first of which was approved by the order of the Ministry of Education and Science, Youth and Sport of Ukraine dated January 11, 2012, No. 10, registered by the Ministry of Justice of Ukraine on January 30, 2012 under No. 146 / 20459, the second one - posted on the website of the Ministry of Health of Ukraine [14, 15].

In accordance to these methods, budget funds managers provide information on the main results of the implementation of medium-term priority areas of innovation activity - the volume of budget financing of innovation priorities, the number of created for these funds and the number of transferred technologies, including enterprises.

Distribution of research and development was carried out according to the nomenclature of scientific and technical information DK 022: 2008, in which veterinary medicine (68.41) is presented in 24 sections. Technologies were taken from the automated database "Technologies of Ukraine", created on the basis of the Order of the Ministry of Education and Science of 11.11.2015 № 1156.

The purpose of the research is to determine and analyze the effectiveness of scientific research in the field of veterinary medicine, the state of financing research and development work in the areas of scientific research, years and thematic headings.

Research results. The solution of the issues of ensuring a stable epizootic situation in Ukraine is provided by the strategic priority "Technological renewal and development of the agro-industrial complex" (Law of Ukraine dated 09/08/2011 № 3715 "On priority directions of innovation activity in Ukraine"). According to the strategic priority direction, according to the Resolution of the Cabinet of Ministers of Ukraine from March 12, 2012, No. 294, eight medium-term priority directions of innovation activity on the national level for 2012-2016 are identified. A total of 2831 dissertations were defended for the strategic priority "Technological renewal and development of the agro-industrial complex" in 2000-2013. The most studied mid-term priority is "Development and introduction of technologies for the production of diagnostic kits of animal diseases and the means of protection," where 564 dissertations were defended or about 20% of the total number according to the strategy apriority. Distribution of these for the direction "Veterinary sciences" and the scientific degree was as follows: 87.4% candidate and 12.6% doctoral. For the direction "Veterinary Sciences" the most researched specialty is 16.00.03 (veterinary microbiology, epizootology, infectious diseases and immunology). During the above-mentioned period, 27.3% of these

were defended, and by specialty 16.00.04 (veterinary pharmacology and toxicology) - only 7.8%. This trend continues throughout the next 2013-2017 years (Fig. 1, 2, 3).

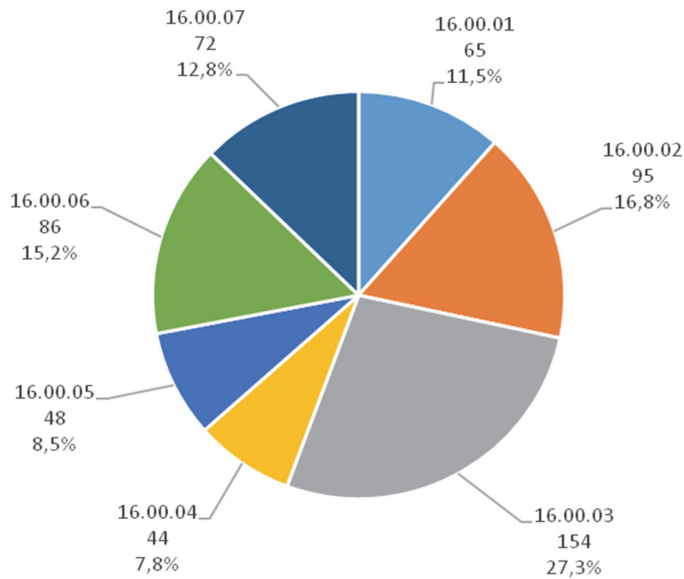


Fig.1 Distribution of dissertations by code of specialties

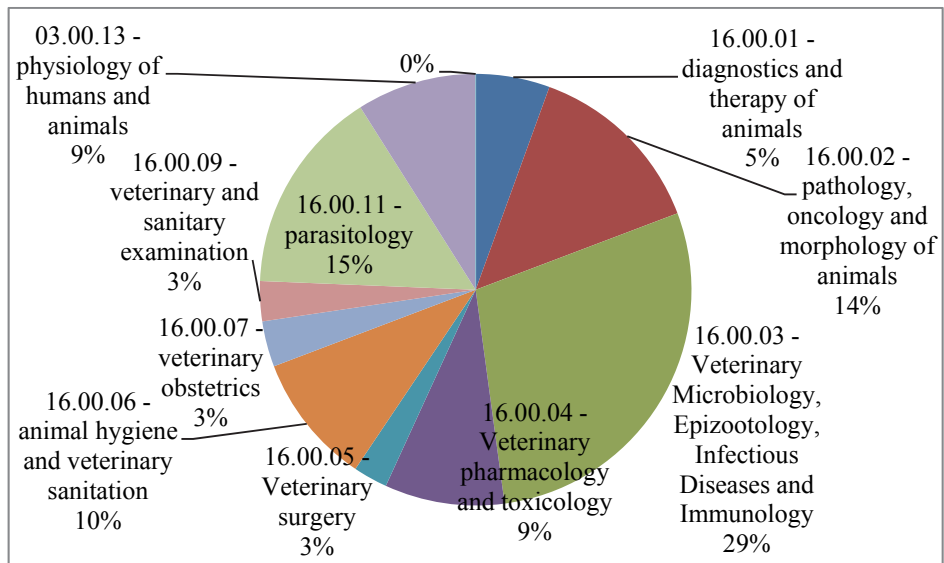


Fig.2 Defended Ph.D. theses in 2013-2017 years by specialties

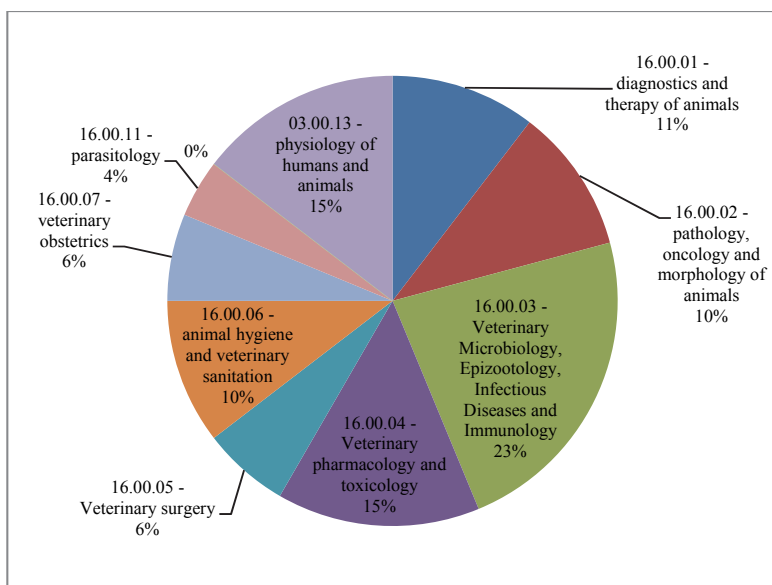


Fig.3 Defended doctoral theses in 2013-2017 by specialties

The largest number of dissertations was defended in 2011, 2013 (63 and 64 units), and the smallest - in 2000-2001 (24 units) (Table 1).

Table 1. Distribution of theses in specialties (2000 - 2013)

Years	Specialty							Total
	16.00.01	16.00.02	16.00.03	16.00.04	16.00.05	16.00.06	16.00.07	
2000	4	6	5	-	2	2	5	24
2001	1	5	1	1	1	10	5	24
2002	5	4	8	1	3	6	5	32
2003	4	1	6	4	5	-	6	26
2004	3	11	14	2	4	3	7	44
2005	5	2	8	6	3	6	3	33
2006	8	8	10	4	5	3	1	39
2007	1	4	15	4	10	6	6	46
2008	6	6	14	2	3	4	7	42
2009	6	7	14	5	3	6	5	46
2010	4	7	7	1	4	7	3	33
2011	7	10	21	3	2	8	12	63
2012	5	11	13	4	2	13	-	48
2013	6	13	18	7	1	12	7	64
	65	95	154	44	48	86	72	564

In specialties they were distributed as follows: most of all dissertations are defended in specialties 16.00.03. (veterinary microbiology, epizootology, infectious diseases and immunology - 39 units), 16.00.02. (pathology and oncology - 23) and 16.00.07 (veterinary obstetrics - 19).

At the sometimes it should be noted that in such specialties as veterinary -sanitary examination (16.00.09), entomology (16.00.10) and parasitology (16.00.11), the dissertations were not defended and

only in the last 2013-2017 years the seson parasitology and veterinary and sanitary examination began to be defended.

In addition to studying the scientific (human) potential, we have researched the quality and effectiveness of research in the medium-term priority direction of innovation activity at the national level.

We analyzed the performed R&D of 2013-2015 according to the following indicators: their annual number, the number of directions (thematic headings), sources of financing, the amount of financing of the most popular headings, from which R & D performed.

For 2013-2015 on veterinary medicine (heading 68.41), 88 R&D were performed in 17 thematic sections.

The distribution by years was as follows (%): 14.7; 52.3 and 32.9. The greatest attention was paid to diagnostics, veterinary sanitation and therapy, infectious diseases.

It should be noted that the heading "Veterinary science" according to the category of scientific and technical information is presented in 24 sections, but studies were carried out only in 17, and 7 categories were not covered by scientific researches, namely veterinary equipment, zoo, hippocampus, breast cancer, leukozolia, etc. The Largest Number of R&D were performed under the heading "Veterinary Medicine" and general issues (31 scientific developments). However, these data are doubtful. Researchers often do not distribute works in separate sections according to research topics, but refer them to the general heading.

However, during the implementation of 88 R&D of 2013-2015, no technology has been registered.

The analysis of R&D on veterinary medicine and its distribution by headings is given in Table 2.

Table 2. Distribution of R&D on veterinary medicine by thematic headings

Rubric code	The maticheading	Years			Total
		2013	2014	2015	
		Number of R&D	Number of R&D	Number of R&D	
68.41	Veterinary medicine		11	4	15
68.41.01	General issues		10	6	16
68.41.05	Methods of research in veterinary medicine		1	1	2
68.41.31	Veterinary sanitation	1	1	4	6
68.41.32	Veterinary virology	1	4		5
68.41.34	Veterinary pharmacy	1	1	1	3
68.41.35	Veterinary microbiology		2		2
68.41.37	Veterinary pharmacology	1	4		5
68.41.41	Veterinary diagnosis	2	3	2	7
68.41.43	Veterinary therapy	2	2	2	6
68.41.45	Internalnon-contagiousdiseases			1	1
68.41.47	Veterinary surgery	1		1	2
68.41.49	Veterinary obstetrics and gynecology		1	1	2
68.41.51	Veterinary radiology	2		1	3

68.41.53	Infectious diseases of animals		5	5	10
68.41.55	Invasive diseases	2			2
68.41.63	Veterinary immunology		1		1
Total		13	46	29	88

In the analysis of the R&D funding system (88 units) on veterinary medicine (heading 68.41) of 2013-2015, it was established that the work was financed with two sources (budget and own funds). The largest amount of funds from the state budget was allocated in 2014 (24302, 47 thousand UAH or about 66.6% of the total funding for three years). The volume of financing at its own expense is the largest in 2013 (8535 thousand UAH or 23.3% of the total financing over three years). It should be noted that for three years, 10 R&D were performed on a royalty-free basis without attracting additional funds. These works were probably done at their own expense. The leaders are the State Scientific-Research Control Institute for Veterinary Medicinal Products and Feed Additives (4 R&D) and the Odessa State Agrarian University (5 R&D) (Table 3).

Table 3 Number of R&D performed and their funding over the years

Year	Number of R&D	Number of the main headings	Funding sources, thousand UAH			
			Budget funds	Own budget	Free of charge	Total
2013	13	9	740	8535	1	9775
2014	46	18	24302,47	326	4	24628,47
2015	29	10	824,67	1771,5	5	2596,17
Total	88	37	25867,14	10632,5	10	36499,64

Conclusions

1. Resolving the issues of ensuring a stable epizootic situation in Ukraine is the basis of the strategic priority "Technological renewal and development of the agro-industrial complex" (Law of Ukraine from 09/08/2011 № 3715 "On priority directions of innovation activity in Ukraine"), according to which of 2012-2016 By the Resolution of the Cabinet of Ministers of Ukraine from March 12, 2012 №294, eight medium-term priorities of innovation activity at the national level were approved. One of the most researched medium-term priorities is "Development and implementation of technologies for diagnostic diseases of animals and their means of protection", which owns 20% of the total number (2831 dissertations) of a strategic priority.

2. The most studied areas are veterinary microbiology, epizootiology, infectious diseases and immunology (27.3% of defended dissertations), and the least studied are veterinary pharmacology and toxicology (7.8% of defended dissertations).

3. The financing of scientific and research work on veterinary medicine used budgetary and own funds. Funding from budget funds accounted for 71% of the total.

4. The analysis of 88 scientific research papers on veterinary medicine of 2013-2015 shows that no technology was registered in the technology base, which testifies to the low level of R&D performance.

5. The choice of subjects of the dissertation work in the field of veterinary medicine is spontaneous.

References

1. Mandyhra M.S., Boiko P.K., Boiko O.P. (2014). Metodichni pidkhody do konstruiuvannia bakterialnykh vaktsyn na prykladi inaktyvovanoi vaktsyny proty emfizematoznoho karbunkulu [Methodical approaches to constructing bacterial vaccines on an example of an inactivated vaccine against emphysematous carbuncle]. *Veterynarna medytsyna*. V. 101. P. 211–215. [In Ukrainian].
2. Busol V.O., Kovalenko L.V. (2014). Typ ta stratehiia parazytyzmu virusu leukozu velykoi rohatoi khudoby [Type and strategy of parasitism of leukemia virus in cattle]. *Veterynarna medytsyna*. V. 101. P. 110–113. [In Ukrainian].
3. Stehnii B.T., Herilovych A.P., Mandyhra M.S., Doletskyi S.P. (2013). Problemy biolohichnoi bezpeky ta biolohichnoho zakhystu u veterynarnii medytsyni ta biotekhnolohii [Problems of biological safety and biological protection in veterinary medicine and biotechnology]. Kharkiv: NTMT. P. 414. [In Ukrainian].
4. Nychyk S.A., Muzykina L.M., Kovalenko H.V. et al. (2017). Vychennia faktoriv rozpovsiudzhennia AChS v Ukraini [Studying the distribution factors of AHS in Ukraine]. CBEP Regional One Health Research Symposium and Peer Review Session. Kyiv, 84 p. [In Ukrainian].
5. Tsvilikhovskiy M.I., Dukhnytskyi V.B., Kostyuk V.K. (2013). Struktura y metodolohichni zasady pidhotovky fakhivtsiv veterynarnoi medytsyny v Ukraini na suchasnomu etapi [Structure and methodological principles of training of specialists in veterinary medicine in Ukraine at the present stage]. *Veterynarna medytsyna Ukrainy*. № 8 (210). P. 36–41. [In Ukrainian].
6. Pridibaylo N. (2008). Perspektivy ispol'zovaniya nanotekhnolohiy v ptitsevodstve [Prospects for the use of nanotechnology in the poultry industry]. *Ptitsevodstvo*. № 7. P. 32–33. [In Russian].
7. Kotsiumbas I.Ia., Kotsiumbas H.I., Velychenko O.B. (2007). Mikotoksykozy tvaryn: metod. rekom. [Mycotoxicosis of animals: methodical recommendations]. Lviv, 16 p. [In Ukrainian].
8. Berezovskiy A.V., Fotina A.A. (2012). Printsipy sozdaniya kompleksnykh i kombinirovannykh antibakterial'nykh preparatov [Principles for the creation of complex and combined antibacterial Drugs]. *Materialy KhVII Mezhdunarodnoy konferentsii VNAP: Innovatsionnye razrabotki i ikh osvoenie v promyshlennom ptitsevodstve*. Sergiev Posad. P. 512–516. [In Russian].
9. Stehnii B.T. (2013). Naukovyi suprovit u haluzi veterynarnoi medytsyny [Scientific support in the field of veterinary medicine]. *Visnyk ahrarynoi nauky*. № 9. P. 19–24. [In Ukrainian].
10. Zadorozhnyaya G.P., Paladchenko O.F., Novitskaya G.V. (2015). Rol' informatsionnykh tekhnolohiy v reshenii aktual'nykh voprosov nauchnogo obespecheniya ekonomiki Ukrainy. Razvitie informatsii i gosudarstvennoy sistemy nauchno-prakticheskoy informatsii (RINITI-2015) [The role of information technology in addressing topical issues of scientific support for the economy of Ukraine. Development of information and the state system of scientific and practical information]. *Doklady KhIV Mezhdunarodnoy konferentsii, Minsk, 19 noyabrya 2015 g.* Minsk: OIPI NAN Belorusi. P. 114–118. [In Russian].
11. Zadorozhnia H.P., Paladchenko O.F., Novitska H.V. (2015). Naukove zabezpechennia silskoho hospodarstva v Ukraini [Scientific provision of agriculture in Ukraine]. *Visnyk ahrarynoi nauky. [Bulletin of Agricultural Science]*. № 2. P. 74–77. [In Ukrainian].