

RENCANA STRATEGIS

FAKULTAS KEDOKTERAN HEWAN
IPB UNIVERSITY
2021 - 2026

RENCANA
STRATEGIS FKH - IPB UNIVERSITY



RENCANA
STRATEGIS FKH - IPB UNIVERSITY

IPB UNIVERSITY
2021

KATA PENGANTAR

KETUA SENAT FAKULTAS KEDOKTERAN HEWAN

Segala puji dan syukur kita panjatkan ke hadirat Allah, Tuhan yang Maha Kuasa karena atas izin dan perkenan-Nya jualah, Renstra Fakultas Kedokteran Hewan ini dapat dipersembahkan sebagai dokumen penting dalam rangka mewujudkan gagasan dan rencana pengembangan FKH IPB.

Konsep kesehatan semesta (*One Health*) dan kondisi pandemi Covid-19 saat ini telah menyadarkan masyarakat dunia tentang pentingnya profesi kedokteran hewan dalam sistem kesehatan global. Melalui pendidikan program sarjana, profesi kedokteran hewan, pascasarjana dan keterlibatan staf pengajar FKH IPB dalam bidang kedokteran dan kesehatan manusia, mengokohkan peran FKH IPB. Di sisi lain, penguatan peran profesi kedokteran hewan memerlukan dukungan kapasitas tenaga biomedis yang kuat. Dengan demikian guna memberikan dukungan akademik, perluasan lapangan kerja baru dan tata pamong yang lebih sesuai dengan kebutuhan. Rencana strategis 2021-2026 disusun sebagai landasan transformasi dari Fakultas Kedokteran Hewan menjadi Sekolah Kedokteran Hewan dan Biomedis.

Senat FKH IPB menyampaikan terima kasih dan penghargaan kepada Pimpinan FKH IPB, Tim Penyusun Renstra, Panitia Adhoc Transformasi Fakultas Kedokteran Hewan menjadi Sekolah Kedokteran Hewan dan Biomedis, para anggota Senat FKH IPB serta sivitas akademika dan mitra kerja FKH IPB atas kerja keras dan kontribusinya bagi penyusunan Renstra ini. Semoga Allah, Tuhan Yang Maha Kuasa senantiasa memberikan bimbingan dan barokah-Nya. Aamiin ya Robbal aalamiin.

Ketua Senat
Fakultas Kedokteran Hewan
Institut Pertanian Bogor



Prof Drh Bambang Purwantara, MSc, PhD

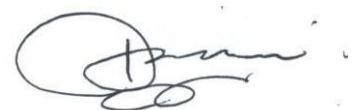
PREFACE

DEAN OF THE SCHOOL OF VETERINARY MEDICINE AND BIOMEDICAL SCIENCES

Praise be to the presence of Allah SWT, God Almighty, for all the blessings, gifts, and facilities given to us so that we can all carry out the tasks entrusted to us. The field of veterinary medicine has developed quickly because of advances in science and technology and the public's need for healthy environmental conditions. The veterinary profession is becoming increasingly important not only because of its medical capabilities and authority but also because of its need to be part of the universal health work unit (One Health), given the complexity of the problems in realizing a healthy world (Global Health). The School of Veterinary Medicine and Biomedical Sciences (SVMBS) of IPB University, which started its educational activities a century ago, has a strong enough foundation to develop itself to face challenges and opportunities. Among the aspects that are important to adapt to various changes are aspects of governance and scientific development. Governance based on quality assurance and efficiency is the top choice, and scientific development is based on specific fields of knowledge towards multi and transdisciplinary collaboration.

The strategic plan for SVMBS IPB University is 5 years, namely 2021-2026. This period is adjusted to the term of the Dean's leadership. The main objective of this strategic plan is to bring SVMBS IPB University and its graduates to take part at the international level. The program of activities emphasizes strengthening the learning process, international accreditation processes, preparation, and transformation of SVMBS IPB University into a School of Veterinary Medicine and Biomedical Sciences. With this, it is hoped that SVMBS IPB University can achieve its vision of becoming a faculty of veterinary medicine with an international standard and improve people's welfare through the excellence of international quality graduates, quality research, and innovation with products that can be commercialized and implementable.

This Strategic Plan was developed and adapted to the dynamics and essential issues that will be faced in the world related to the availability of food (of animal origin), the era of disruption, the 4.0 era, environmental problems, and globalization. The Strategic Plan was prepared by taking into account the various internal dynamics at the institutional level, including the plan to change the organizational structure and governance to become SKHB. The strategic program was prepared by considering the strengths, weaknesses, opportunities and threats faced by SVMBS IPB University and grouped into each aspect of the three pillars of higher education, education, research and community service. A guide in the direction and development of SVMBS IPB University in welcoming 2026.



Dean
Prof Drh Deni Noviana, PhD, DAiCVIM

EXECUTIVE SUMMARY

The Faculty of Veterinary Medicine, IPB, is the first and oldest faculty of veterinary medicine in Indonesia and often becomes a trend setter for veterinary education programmes nationally. Veterinary or veterinary medicine is a field of science that is almost as old as human medicine. Veterinary is a profession related to animals, animal products and animal diseases. Veterinarians are a medical profession and play an essential role in handling animal health problems that directly or indirectly affect human health and the environment. In essence, the management of this health problem cannot be handled singly by the medical or veterinary fields because it requires a collaborative approach from various disciplines. The world has realized that climate change broadly affects the environment, including influences on food production and availability, food quality and safety, feed quality, and animal and human health. This condition shows the importance of a multidisciplinary approach in addressing global health issues.

Since the last few decades, various concepts in efforts to improve health have no longer dichotomized human health with animal health. Various terminologies were rolled out, one of which is the concept of One Health. Even though the concept of One Health was developed to improve human and animal health quality, it cannot be denied that veterinary medicine plays a significant proportion compared to other disciplines. This condition is evidenced by the distribution of publications about One Health in various journals, most of which were published by authors with a background in veterinary medicine. Apart from that, the field of veterinary medicine has always been very attached to concepts similar to One Health and was introduced earlier, such as One Medicine and One World One Medicine. In the future, the field of veterinary medicine is not only needed in the clinical realm. Furthermore, it has become the leading actor in promoting human, animal and environmental health, with the One Health concept projected to become a trend.

Currently, One Health's ideas and terminology are increasingly being used to facilitate collaboration between departments in government agencies in formulating policies in various countries, including handling the current pandemic conditions in Indonesia and around the world. In the rapid development of the One Health concept in the last decade, SVMBS IPB University has actively participated in efforts to implement One Health both nationally and internationally. Scientific publications by FKH-IPB staff have also developed into the realm of science, which is no longer limited to animal aspects and includes biomedical sciences.

The rapid development of science and technology in today's world also influences developments in the world of health. The health sciences expand along with technological developments and the increasing demand for innovation to meet the needs of various medical procedures. Fields such as biotechnology, pharmaceuticals, information technology, medical devices and equipment development, and many more have significantly contributed to improving human health worldwide. Responding to the rapid and dynamic development of science and technology, the Bogor Agricultural University has a strategic plan to establish a vision of becoming a research-based University and at the forefront of innovation for national independence towards a techno-socio entrepreneurial University that excels at the global level in the fields of agriculture, marine

and tropical biosciences. The three scientific fields are strategic areas mandated by IPB, including related sciences that support agriculture broadly, including health sciences.

In its journey, the development of health sciences at IPB since its inception is generally carried out by the Faculty of Veterinary Medicine with a concentration in the field of animal health in a broad sense, including public health and the environment. With a long record of SVMBS IPB University's contribution to the world of health, SVMBS has a strong enough foundation to develop itself to face changes, needs, challenges and opportunities in the increasingly widespread world of health. One of the lessons learned in dealing with the current pandemic situation is the demand for the veterinary education system to utilize the latest technology and teaching and learning methods which are predicted to continue to transform rapidly, not only to support the handling of national health problems but also to prepare resources for prospective veterinarians who are ready for various challenges of the profession in the future or future-ready veterinarians.

Various aspects are deemed necessary to adapt to the development of science and technology in the world of health and, at the same time, support IPB University's strategic plan in the health sector. One of the aspects in question is the aspect of governance and scientific development. As stated in the Statutes of IPB University (PP Number 66 of 2013), the format for the management of literary elements from one science cluster is in the form of a school. This condition is also following Law Number 12 of 2012 concerning Higher Education. The implementation of one cluster of veterinary science will be more appropriate and efficient if it is carried out in the form of a School, not a Faculty. This form will strengthen the role of the field of science (division) in supporting the adaptation needed to face challenges and opportunities because it provides space for enriching Tri Dharma activities. Changing the management format to a school will enable SVMBS IPB University to expand the field of study, not only animal health but also new study programmes according to the challenges and demands that exist, for example, biomedical science, medical biotechnology, and specialist veterinarians. These things strengthened the basis for changing the IPB Faculty of Veterinary Medicine into the IPB School of Veterinary Medicine and Biomedical Medicine.

The 2021-2026 SVMBS IPB University Strategic Plan contains various SVMBS IPB University development plans, which are a crystallization of the thoughts of the entire SVMBS IPB University academic community by taking into account input from stakeholders. The Strategic Plan is prepared measurably and systematically in laying the foundations for development into a School of Veterinary Medicine and Biomedical Medicine.

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RENCANA STRATEGIS - FKH IPB

PENDAHULUAN

BAGIAN I



FAKULTAS KEDOKTERAN HEWAN - IPB UNIVERSITY

2021-2026

CHAPTER I INTRODUCTION

Get to know Veterinary Medicine

Veterinary medicine is a field of science that is almost as old as human medicine. Initially, veterinary medicine was the development of medical science that required comparative medicine and experimental animals to find cures for human diseases. In English, veterinary medicine is called Veterinary Medicine. The word "Veterinary" comes from ancient Greece, namely the word *veterinarius* means a person who has expertise in caring for animals or from the word *veterinary*, namely those who have special competence in caring for sacred animals. This profession is now known as the *Veterinarian* or the veterinary profession. In many countries in the world, veterinary medicine is often positioned together in the Agricultural Sciences group because animals that are important for human life are mainly animals related to agriculture, namely livestock (as food producers of animal origin in the form of meat, milk and eggs) and other livestock production. as a trade/economic commodity. In structuring affairs in one country, veterinary empowerment is entrusted with the Ministry of Agriculture, including Indonesia, because it adheres to a government system inherited from the Netherlands, namely the continental system. This system places veterinary as one of the fields managed by the ministry of agriculture. However, the veterinary profession's characteristics require confirmation by special veterinary law rules because many of their work competencies cannot be transferred to ordinary people/non-medical or non-medical people. Veterinary aspects have been regulated by Law Number 18 of 2009 concerning Animal Husbandry and Health.

Since the founding of modern medical schools in the West, the graduates have been referred to as "The Healing Profession, " those who graduate from medical schools and perform medical procedures according to the standard principles of medical science. These principles also include Veterinary Science which develops from Human Medicine. The definition of veterinary can be seen in the Indonesian dictionary as the field/profession of veterinary medicine. Veterinary in Law Number 18/2009 Chapter I Article 1 point 26 *junto* Law Number 41/2014 is defined as all matters relating to animals, animal products and animal diseases. Veterinarian professionalism must be measured through several criteria to assess their performance as a particular medical profession, with the object of their profession being various categories of animals

A veterinary professional is required to combine three competency displays, namely (1) mastery of the latest knowledge, (2) high skills (skills), and (3) professional, ethical behaviour (attitude) required by the profession. The first two competency displays will show veterinary medical performance (veterinary medical performance). In contrast, the third competency will show a noble and dignified attitude in its responsibility to treat animals as patients,

humans as clients, and the safety of society, nation and state from animal health threats (ethical performances).

In Law Number 18 of 2009 concerning Animal Husbandry and Animal Health, article 71, paragraph 4 mandates the obligation of veterinarians to comply with the Oath and Code of Ethics. This law shows the demand for the veterinary profession to carry out professional work competently and professionally, being responsible to the community and the nation because it involves the role of protecting humans, animals and the environment from threats of disease or health problems from animals and extinction of the nation's animal resources. If veterinarians do not carry out their functions and work consistently following their competence and professional guidelines, the sustainability and health of the ecosystem (humans, animals and the environment) can be disastrous.

Veterinary Education Program in Indonesia

The journey of veterinary education in Indonesia or the Veterinary Education Program consists of two stages of education, namely the undergraduate and professional education programmes. The two educational programmes are a unified process in producing veterinarians, or more strictly speaking, the terminal of education at the faculty of veterinary medicine is to produce veterinarians.

Since the issuance of PP No. 60 of 1999 concerning Higher Education, a meeting has been held between all Faculties of Veterinary Medicine in Indonesia and the Executive Board of the Indonesian Veterinary Medical Association (IVMA, *Pengurus Besar Perhimpunan Dokter Hewan Indonesia/PB PDHI*) to discuss and agree on the veterinary competencies that need to be produced by the Indonesian Higher Veterinary Medicine Education (PTKHI). According to the demands and expectations of PB PDHI in facing global challenges.

The harmonization meeting between PTKHI and PB PDHI has been held regularly every year since the signing of the cooperation agreement in the direction of veterinary education on June 7, 2000, at the Faculty of Veterinary Medicine (FKH) Universitas Airlangga until now. The meeting also involved teaching staff from various FKH and veterinary science fields to obtain a nationally standardized curriculum equalised and competency equality for FKH graduates.

Facing the ASEAN Framework Agreement on Services (AFAS), namely the opening of labour competition with foreign workers in Indonesia, all educational programmes and the legal status of their graduates must be accountable based on clear legal rules and can be the basis. An effort is needed to revitalize the veterinary education program, which involves all related components, namely the Faculties/Programmes of Veterinary Studies throughout Indonesia, which are members of the Association of Indonesian

Veterinary Medicine Faculties (AFKHI) together with professional organizations (Indonesian Veterinary Association) with input and enlightenment contributions from various sources. The expected outputs from this revitalization activity include the preparation of learning outcomes, curriculum improvements, and recommendations for external quality assurance instruments.

Characteristics of the Veterinary Study Program

The Veterinary Study Program consists of veterinary academic and professional programmes dedicated to 1) mastering, utilizing, disseminating, transforming and developing science, technology and art (science and technology) in the field of Veterinary Medicine; 2) studying, clarifying and preserving culture related to the field of study of Veterinary Medicine; 3) improve the quality of people's lives concerning the field of veterinary medicine. Therefore the Bachelor of Veterinary Science Programme and the Veterinary Professional Education Programme (two programmes that produce qualified veterinarians) carries out the functions of the three pillars of Higher Education. These study programmes must be able to self-regulate to improve and guarantee quality sustainably concerning input, process and output of academic and professional programmes and services provided to the community in harmony with the field of study they manage.

The veterinary study programmes must actively develop an internal quality assurance system to realize public accountability. An external quality assurance agency must accredit the veterinary study programmes. With a good and correct quality assurance system, study programmes can improve quality, develop themselves as providers of academic and professional education that they manage, and sustainably improve community welfare.

Based on the applicable laws and regulations and the various considerations mentioned above, Indonesian Accreditation Agency for Higher Education in Health (IAAHEH or *Perkumpulan Lembaga Akreditasi Mandiri Pendidikan Tinggi Kesehatan Indonesia/LAM-PTKes*) accredits all veterinary study programmes throughout Indonesia. Accreditation of the veterinary study program is a comprehensive evaluation and assessment of the program's commitment to the quality and capacity of implementing the three pillars of Higher Education to determine the study programme's feasibility. The criteria for evaluating and assessing this commitment are spelt out in several veterinary study program accreditation standards and their parameters.

Veterinary Study Program Qualification

Improving people's welfare through the motto *Manusya Mriga Satwa*

Sewaka (serving humanity for human welfare through the world of animals) is the primary goal of veterinary education in Indonesia. According to the Indonesian Veterinary Education Standards, the veterinary study program is an education organized to produce veterinarians who have competence according to standards.

Indonesian Veterinary Education Standards are set concerning the Indonesian Veterinary Qualification Framework based on Presidential Regulation 08 of 2012 concerning the Indonesian National Qualifications Framework, which includes the basis of personality, mastery of knowledge and skills, ability to work, and attitudes and behaviour to work.

Study Completion Period

The veterinary education curriculum consists of academic and professional education curricula. The academic education curriculum (undergraduate) is implemented within 8 semesters with a minimum total of 144 credits. After completing academic education, graduates are awarded the Bachelor of Veterinary Science (SKH) degree. To obtain the title of Veterinarian (Drh), academic education graduates continue to professional education, which is carried out for 18 months with a total of 37 credits. The learning curriculum is implemented using a competency-based approach using various methods, including student-centred learning.

The veterinary education curriculum consists of content compiled based on competency standards for Indonesian veterinarians (consisting of the general compulsory curriculum and the compulsory science curriculum) and institutional content. The institutional curriculum is developed following the implementing institution's vision, mission and conditions, which can become mandatory and/or elective material. Elective materials provide opportunities for students to develop special interests.

Legal Foundation

The development of veterinary education refers to the following:

1. Law Number 12 of 2012 concerning Higher Education (Articles 26, 28, 29, 42, 43, 44, 55).
2. Law Number 14 of 2005 concerning Teachers and Lecturers (Article 47).
3. Law Number 18 of 2009 concerning Animal Husbandry and Health.
4. Law Number 41 of 2014 concerning Amendments to Law Number 18 of 2009 concerning Animal Husbandry and Health
5. Law Number 2 of 1989 concerning the National Education System (Article 16 Paragraph 5)
6. Government Regulation Number 19 of 2005 concerning National Education Standards (Articles 86, 87 and 88).
7. Government Regulation Number 17 of 2010 concerning Management and

Implementation of Education (Articles 84 and 85).

8. Government Regulation Number 66 of 2013 concerning Statutes of IPB (Article 65 Paragraph 2).
9. Decree of the Minister of National Education Number 178/U/2001 concerning Higher Education Degrees and Graduates.
10. Regulation of the Minister of National Education Number 28 of 2005 concerning the National Accreditation Board for Higher Education.
11. Regulation of the Minister of Agriculture Number 02/Permentan/OT.140/1/2010 concerning Guidelines for Veterinary Medical Services.
12. Chancellor's Circular Letter Number 4707/IT3/OT.01/2018 regarding the Proposal to Change the Faculty of Veterinary Medicine to become the IPB School of Veterinary Medicine.

Philosophical and Sociological Foundations

Philosophically, veterinary science is in the realm of health/medical science.

1. In general, veterinary medicine is in the realm of medical science.
2. Several physical facilities (diagnostic laboratories, educational laboratories), human resources (doctors, paramedics, networks, lecturers and support staff), applications for handling zoonotic diseases, health and biomedical research and educational processes taught to students, in general, have similarities between veterinary science and human medical science.
3. The synergy between the fields of human medicine and veterinary medicine will provide scientific integrity and its applications.

Several primary scientific fields and human resources that can be synergized between Veterinary Medicine and Human Medicine include Physiology, Pharmacology, Histology, Biochemistry, Microbiology (Bacteriology, Virology, Mycology), Immunology, Parasitology, Embryology, Clinical Pathology, Surgery, Reproduction, Veterinary Public Health, Epidemiology, Pharmacy. Laboratory facilities that can be used collectively include Chemistry, Biochemistry, Microbiology, Immunology, Parasitology, Embryology, Histology, Histopathology, Pharmacology, Pharmacy, Physiology, and Anatomy.

As a professional education, the veterinary study program produces a veterinarian who can continue to a higher/advanced level through academic education (masters and doctors) or a type of professional education (specialists and subspecialists).

The profession of a veterinarian is a particular skill that demands professionalism through medical actions and decisions, obtains compensation and must be trusted, which is guaranteed by an oath, code of ethics and licensing in its services (UU No. 18 of 2009 and Regulation of the Minister of Agriculture No. 02/Permentan /OT. 140/ 1/2010).

Veterinary science handles matters concerning animals, animal products and diseases (veterinary function) related to security guarantees. These risks can interfere with health (safety) from animals to animals and from animals to humans to ensure human health, public health and environmental health (assurance) concerning international guidelines and information, as well as pay attention to animal welfare aspects. Veterinary science also includes the application of medical science (promotive, preventive, curative and rehabilitative) and guidelines for the veterinary profession (veterinarians' code of ethics and oath).

Sociologically, although the number of veterinarians in Indonesia is currently around 17,000 in various fields of work, the distribution is not evenly distributed. This amount is still insufficient and is concentrated on the island of Java. Seeing this fact, problems related to animal diseases, including zoonotic diseases, animal health, food safety of animal origin and other matters related to the protection and interests of the public who require veterinary staff are challenges the veterinary sector must respond to the issues. Furthermore, the need for veterinarians capable of supporting the implementation of veterinary functions in Indonesia is urgent, especially with the outbreak of disease outbreaks categorized as zoonoses, diseases transmitted from animals to humans and vice versa. To meet the time target according to the GATT/WTO agreement (free competition), acceleration in producing veterinarians in Indonesia is necessary.

Various efforts have been made to increase the number of veterinary graduates from veterinary study programmes, including by increasing graduates' capacity, quality of education, and competence.

RENCANA STRATEGIS - FKH IPB

GAMBARAN UMUM FKH IPB UNIVERSITY

BAGIAN II



FAKULTAS KEDOKTERAN HEWAN - IPB UNIVERSITY
2021-2026

CHAPTER II

GENERAL DESCRIPTION OF THE FACULTY OF VETERINARY MEDICINE, IPB University

History of Veterinary Medicine IPB

The history of the profession and veterinary education in Indonesia can be divided into 3 periods: the Dutch East Indies Period (1861-1942), the Japanese Colonial Period (1942-1945), and the Indonesian Independence Period (1945-present). The veterinary profession in Indonesia began in the mid-19th century. At that time, disease in livestock was one of the main concentrations of the Dutch East Indies government. Several outbreaks of livestock diseases occurred, including rinderpest (1875), anthrax (1884), trypanosomiasis (1886), and foot and mouth disease (1887). Since then, there has been a shortage of experts to treat livestock diseases, so veterinarians from the Netherlands were sent to Indonesia. The first veterinarian from Indonesian civilians was Dr R. A. Coppieters in 1820. From 1820 to 1843, Dutch veterinarians visited Indonesia periodically. Research on livestock diseases was driven by Dr J.K.F. De Does. He investigated several livestock diseases in Indonesia between 1897 and 1970 at Arsten Laboratory (Laboratory of Human Health). In 1907, de Does persuade the colonial government to establish a veterinary research laboratory in Bogor. This laboratory was under the authority of the Department of Animal Health, Ministry of Agriculture, Industry and Trade, which had just been formed and became an essential player in veterinary education. The Veterinary Campus is still operating today as the Faculty of Veterinary Medicine, Bogor Agricultural University. Bogor is designated as a centre for veterinary education and research.

Table 1 History of Veterinary Education in Indonesia

Year	Changes
Dutch East Indies period (1861-1942)	
1861 – 1875	Government veterinarian J. van der Helde was assigned to build and lead a veterinary school in Surabaya
1908	The first veterinary school for natives (Indische Veeartsen School, IVS) was founded under Prof. dr. L. de Blicck. He also oversees the veterinary laboratory which Dr J.K has started. F. de Does. The school and laboratory were then merged into one.
1910	The first IVS graduate was Dr J.A. Kaligis. He became the first indigenous veterinarian in Indonesia
1914	IVS's name changed to Nederlandsch-Indische Veeartsenschool (NIVS), with a 4-year curriculum

1915	One of the graduates from NIVS who was graduated was Dr M Soeparwi, and he later became the first rector of Gadjah Mada University in Yogyakarta
Japanese Occupation Period (1942-1945)	
March 1942 – August 1945	NIVS in Bogor is continued with the name Bogor Jyuui Gakko, which operates a one-period system of 4 years of study. the students consists of ex-NIVS and high schools (MULO, Meer Uitgebreid Lager Onderwijs)
Indonesian Independence Period (1945-now)	
1945 – 1946	<i>Bogor Jyuui Gakko</i> kemudian berubah kembali menjadi NIVS
1946	NIVS kemudian berganti nama menjadi <i>Bogor Veterinary School</i> (BVS)
21 January 1946	<i>Nood-Universiteit</i> didirikan, terdiri dari 5 fakultas yang sudah ada sejak 1941, yaitu: 1) <i>Geneeskundige Faculteit</i> , 2) <i>Juridische Faculteit</i> , 3) <i>Faculteit der Letteren en Wijsbegeerte</i> , 4) <i>Landbouwkundige Faculteit</i> , dan 5) <i>Technische Faculteit</i> .
March 1946	The Ministry of Prosperity of the Republic of Indonesia has formed a committee to establish a veterinary medical campus. Based on the proposal from this committee, BVS status was increased to College of Veterinary Medicine (Diergeneeskundige Faculteit)/College of Veterinary Medicine (PTKH) based on the Decree of the Minister of Welfare No. 1280 a/Per. September 20, 1946, led by Dr Moehede
November 1946	Vice President Moh. Hatta officially opened PTKH. This date is marked as the birthday of the Faculty of Veterinary Medicine in Indonesia
12 March 1947	<i>Nood-Universiteit</i> was later changed to <i>Universiteit van Indonesie</i> with the campus statutes (Hooger-onderwijs ordonnantie 1946) issued by the Deputy Governor General of the Dutch East Indies. Article 4 of the 1946 campus statutes precisely <i>Universiteit van Indonesie</i> consists of 5 faculties in 3 locations
1947	<i>Universiteit van Indonesie</i> established 4 new faculties. The new faculty was the reason for revising the campus statutes of 1946 article 4 by Decree No. 4 dated 22 September 1948. The Statute determines explicitly that <i>Universiteit van Indonesie</i> consists of 9 faculties
Juli 1947	PTKH stopped operating due to a military conflict between the Indonesian and Dutch governments
1947	A campus branch was then opened in Klaten, Central Java
December 1948	The campus was later closed again due to the second military conflict
November 1 1949	The campus branch then reopened in Yogyakarta

19 December 1949	All universities in Yogyakarta joined to become Gajah Mada University, and PTKH-RI transformed into the UGM Faculty of Veterinary Medicine
1949	After lengthy discussions at the Round Table Conference in the Netherlands, Indonesia gained sovereignty. All Dutch assets (except in Irian Jaya) were officially transferred, including Universiteit van Indonesie
1960	The faculty of Veterinary Medicine changed to the Faculty of Veterinary Medicine and Animal Science
1963	Three years passed, and the farm split into its faculty until today
September 1 1963	The University of Indonesia (formerly Universiteit van Indonesie) in Bogor was transformed into a new University, the Bogor Agricultural Institute (IPB). Based on the Decree of the Minister of Higher Education and Science (PTIP) Number 91 of 1963, IPB consists of 5 departments, namely: Agriculture, Veterinary Medicine, Forestry, Animal Husbandry, and Fisheries
1965	The President of the Republic of Indonesia replaced the Decree of the Minister of PTIP No. 91 of 1963 with Presidential Decree No. 279 of 1965. This decision stipulates that IPB consists of 6 faculties, namely: Agriculture, Veterinary Medicine, Fisheries, Animal Husbandry, Forestry, and Agricultural Technology

The Vision of SVMBS IPB University

Realizing excellent veterinary and biomedical study programmes based on innovative research in the development of human resources and science and technology to produce graduates who are highly competitive at the global level in 2035.

The Missions of SVMBS IPB University

- a. Organizing innovative competency-based and student-centred veterinary and biomedical education at the undergraduate, postgraduate, professional and veterinary specialist levels to produce graduates who are alert to technological developments (changing technology) and challenges of the future-ready
- b. Promoting lifelong learning and facilitating acquiring new knowledge and skills through continuing professional development (CPD)
- c. Build a professional culture that can adapt, inspire innovation, and build an entrepreneurial mindset (techno-socio entrepreneurship) to support the implementation of sustainable national development through quality

- research and community service activities.
- d. Expanding its influence as an educational institution that is trusted and valued by all stakeholders and plays a role in improving the standard of living of the community through the fields of animal health, animal husbandry and biomedical through harmonization of the relationship between animals, humans and the environment (one health).
 - e. Providing various structured Continuing Professional Development (CPD) activities independently or in collaboration with professional organizations and other related partners.
 - f. Develop various innovative basic, applied and strategic research in the field of veterinary medicine and biomedical with an entrepreneurial spirit to support sustainable national development.
 - g. Implementing inventions in animal health, livestock and biomedical fields for human and animal welfare and environmental sustainability.

Targets

The educational goals of the veterinary and biomedical study programmes are to produce bachelors, masters, doctors, veterinarians and skilled veterinary specialists who have integrity and are competent in carrying out tasks related to the inherent authority in the field of (1) animal health management and systems, (2) control of the safety and quality of products of animal origin, (3) as well as biomedical.

Organizational Structure

Referring to the regulations in force at IPB University, the governance system at the School of Veterinary Medicine and Biomedical Sciences, IPB University (SVMBS IPB University) consists of the Faculty Senate as a normative institution, Faculty Leaders (Deans and Deputy Deans), Heads of Departments, Heads of Administration, Heads of Divisions/ Laboratories, and Commissions (Figure 1). SVMBS IPB University academic administration is carried out by the Academic and Student Affairs Administration Section, the Personnel Section carries out human resource management, and facility and property management are carried out by the General, Facilities and Property Section.

In practice, all sections coordinate with the relevant Directorates and/or Offices at the IPB level (Directorate of Education Administration and New Student Admissions, Directorate of Student Affairs and Career Development, Directorate of Human Resources, Directorate of Infrastructure, Facilities and Environmental Security, Directorate of Information Systems and Digital Transformation, as well as the Directorate of Finance and Accounting.

A more detailed description of the Tata Pamong system at SVMBS IPB University is as follows:

1. The Faculty Senate is a normative organ tasked with giving advice on policies and directions to be carried out by the Faculty leadership. The Faculty Senate has a Chair and Secretary and consists of SVMBS IPB University Professors, Deans and Deputy Deans, and representatives from each Department.
2. The Dean and Deputy Dean are Faculty Leaders. The Dean of SVMBS IPB University is a quality guarantor (QA) for implementing education at SVMBS IPB University and is responsible to the Chancellor. The Deputy Dean is the coordinator of quality control (QC) for implementing education and is responsible to the Dean. Until 2014 the Dean was only accompanied by a Deputy Dean. Therefore the Dean appointed the Secretary of the Faculty by Decree of the Dean Number 19/IT3.2/KP/2013 to assist the leadership in coordinating the quality assurance of academic services and implementing the implementation of the ISO Quality Management System, as well as the areas of campus governance, cooperation and promotion. In its implementation, it is assisted by five commissions, namely (1) Academic Commission (BVS and VPE Study Programmes), (2) Student Affairs Commission, (3) PPM Commission (Research and Community Service), (4) Cooperation Commission, and (5) Community Development Commission. Until 2014 SVMBS IPB University had one deputy dean. Following the Statutes of IPB, starting in 2015, there were two deputy deans, namely the Deputy Dean for Academic and Student Affairs and the Deputy Dean for Resources, Cooperation and Development.
3. The Head of the Department is responsible to the Dean and supervises the Head of the Division/Laboratory in developing scientific mandates. The departments within the SVMBS IPB University are the Department of Anatomy, Physiology and Pharmacology (AFF), the Department of Animal Infectious Diseases and Veterinary Public Health (IPHK), and the Department of Clinical, Reproductive and Pathology (KRP). The AFF Department has 3 divisions: the Division of Anatomy, Histology and Embryology, the Division of Physiology and the Division of Pharmacology and Toxicology. The IPHK Department has 3 divisions: the Division of Health Parasitology and Entomology, the Division of Medical Microbiology, and the Division of Veterinary Public Health and Epidemiology. The KRP Department has 4 divisions: Internal Medicine Division, Surgery and Radiology Division, Reproductive and Obstetrics Division, Pathology Division, and Veterinary Pharmacy Division.
4. The Head of Administration (KTU) coordinates the administration of the fields of Personnel, Academic and Student Affairs, Facilities and Property. KTU is responsible to the Faculty Leadership.

1. SVMBS IPB University Academic Support Units consist of laboratories, a library, SVMBS IPB University Veterinary Teaching Hospital, Reproductive Rehabilitation Unit (URR), Laboratory Animal Management Unit (UPHL), Residential Pest Control Study Unit (UKPHP), Poultry Slaughterhouse (RPU), as well as the Integrated Research Laboratory.

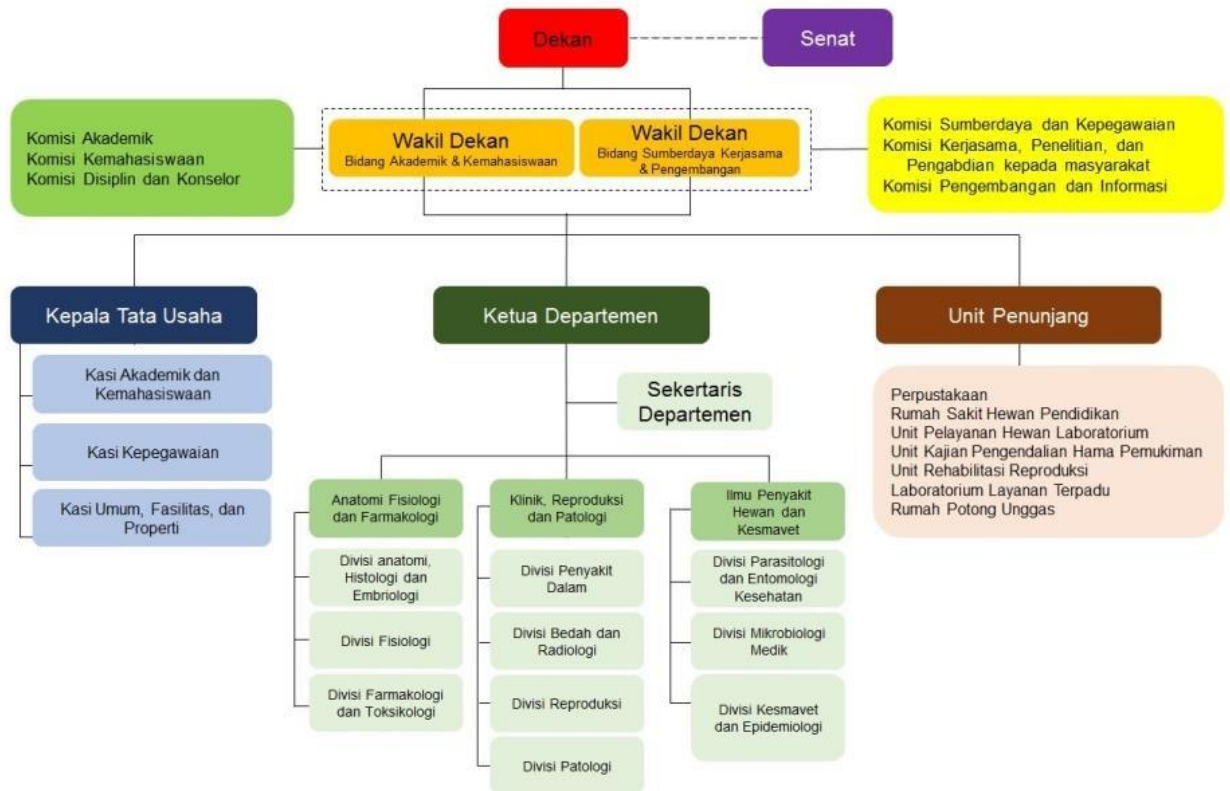


Figure 1 IPB University School of Veterinary Medicine and Biomedical Sciences Organizational Structure

Education System

Competence and profile of the Indonesian Bachelor of Veterinary Science and Veterinary Professional Education, as well as educational standards and formulation of the Indonesian veterinary education curriculum, have been determined nationally by the Executive Board of the Indonesian Veterinary Medical Association (IVMA or *Pengurus Besar Perhimpunan Dokter Hewan Indonesia/PB PDHI*) together with the Association of Indonesian Faculty of Veterinary Medicine (AFKHI) and documented in a Standard document Competence of Indonesian Veterinarians (TAP. No. 18/16th Congress/PDHI/2010), and in the document Revitalization of Indonesian Veterinary Professional Education (2013). This decree is a reference for all Faculties of Veterinary Medicine in Indonesia in organizing and developing their education. Besides that, in determining the competence of its graduates, SVMBS IPB University also refers to the document The OIE Recommendations on the Competencies of graduating veterinarians ('Day 1 graduates') to assure

National Veterinary Services of quality (2012). Efforts to improve the quality of learning are carried out through evaluating and strengthening the learning outcome (LO)-based curriculum and the Indonesian National Qualifications Framework (KKNI), improving the input quality of prospective students and international students, exchange programmes, setting intramural and extramural learning standards for the Veterinary Professional Education Program (PPDH)) as well as a scientific publication incentive program and publication of the scientific journal *Acta Veterinaria Indonesiana*. The learning outcomes and education level schemes in SVMBS IPB University can be seen in Table 2 and Figure 2.

All educational processes are provided in a coordinated manner by lecturers/teachers from various disciplines. Since 2005, all faculties/schools at IPB University, including SVMBS, have implemented department-based education, namely study programmes carried out by departments related to the science of the study program. For the Faculty of Veterinary Medicine, due to the nature of its medical education, the study program is not managed by one department. Still, its management is carried out under the coordination of the faculty and supported by all divisions in the 3 departments of SVMBS IPB University, which include preclinical, paraclinical and clinical sciences (AFF, IPHK, and KRP). On the other hand, to meet the department's requirements to administer the study program, the department at SVMBS also manages postgraduate programmes (S-2/Masters and S-3/Ph.D.).

Table 2. Educational learning outcomes at SVMBS IPB University

No.	Learning Outcomes	Courses (Credit)	Level
Bachelor of Veterinary Science			
1.	Graduates can apply biomedical science and technology, categorize healthy and unhealthy animals based on anatomical and physiological characteristics, clinical symptoms, pathological changes, accurate laboratory diagnostic techniques, and appropriate	Veterinary Anatomy II (3), Veterinary Histology I (2), Veterinary Histology II (2), Embryology and Developmental Genetics (3), Physiology I (3), Physiology II (3). (Total Credits = 16)	Praclinic
		Chemistry (3), Basic Biology (3), Physics (3), Veterinary Anatomy I (3), General Biochemistry (3). (Total Credits = 15)	Foundation Year
		Topographic Anatomy	Paraclinic

		<p>(3), Reproductive Technology (3), Pharmacology I (2), Veterinary Immunology (2), Ectoparasites (2), Introduction to Nutrition (3), Rations Formulation Techniques and Feed Information Systems (3), Endoparasites (3), Medical Biochemistry (2), Veterinary Mycology and Bacteriology (3), Veterinary Virology (2), Statistical Methods (3).</p> <p>(Total Credits = 31)</p>	
		<p>Veterinary Clinic Diagnostics (3), General Pathology (3)</p> <p>(Total Credits = 6)</p>	Clinic
2.	<p>Graduates can explain the prevention, control, eradication, and treatment of animal diseases, including zoonotic diseases, and promotive actions regarding animal health and welfare</p>	<p>Pharmacology II (3), Midwifery and Empowerment (3), Public Health (1), Mycotic and Bacterial Diseases (2), Viral Diseases (2), Food Hygiene of Animal Origin (3), Animal Health and Environmental Management (2), Zoonoses (2), Animal Welfare (2), Veterinary Epidemiology and Economics (3), Veterinary Toxicology (2), Elective Course I (2): Animal Behavior Science, Elective Course II (2):</p>	Praclinic

		<p>Laboratory Animal Health Management, Biomedical Instrumentation, Aquatic Animal Health Management, Wildlife Health Management, Poultry Health Management.</p> <p>(Total Credits = 29)</p>	
		<p>Systemic Pathology I (2), Poultry Pathology (2), General Veterinary Surgery (3), Internal Medicine I (2), Radiology (2), Special Veterinary Surgery I (2), Internal Medicine II (2), Clinical Pathology (2), Clinical Demonstration (1), Clinical Dietetics (2), General Therapy and Pharmaceutical Preparations (2), Special Veterinary Surgery II (2), Systemic Pathology II (3).</p> <p>(Total Credits = 27)</p>	Clinic
3.	<p>Graduates can demonstrate leadership and entrepreneurial spirit, apply good communication, work independently and in groups, and have responsibility, perseverance and commitment.</p>	<p>Scientific Methodology (2), Seminar (1), Thesis (5), Veterinary Ethics and Legislation (2).</p> <p>(Total Credits = 10)</p>	Praclinic
		<p>Religion (3), Basic Ideology and Citizenship (2), Indonesian (2), English (3), Sports and Arts (1), Introduction to Agriculture (2), Foundations of Mathematics (3), Introduction to</p>	Foundational Year

		Entrepreneurship (1), Understanding of the Veterinary Profession (1), General Economics (3), General Sociology (3). (Total Credits = 24)	
Veterinary Professional Education Programme			
4.	Graduates can determine disease diagnoses and perform medical procedures.	Diagnostic Laboratory (4), Pathology Diagnostic (4). (Total Credits = 8)	Clinic
5.	Graduates can solve problems and implement prevention, control, eradication and treatment of animal diseases, including zoonotic diseases.	Drug Receptors and Applications (3), Internal Medicine and Clinical Pathology (4), Veterinary Surgery and Radiology (4), Reproduction (4), Veterinary Public Health and Epidemiology (2). (Total Credits = 17)	Clinic
6.	Graduates can demonstrate leadership and entrepreneurial spirit, apply good communication, work independently and in groups, comply with the oath and code of ethics for veterinarians and have responsibility, perseverance and commitment.	Compulsory Field Work Practices (9): Cattle Health Field Practice (2), Hospital Profession Field Practice (2), Poultry Profession Field Practice (2), RPH/RPU and Official Field Practice (2), Animal Welfare Field Practice (1), Optional Field Work Practice (2): Horse Health Field Practice (2), Preferred Profession Field Practice (2), Quarantine Field Practice (2), Veterinary Products Industry Field	Clinic

		<p>Practice (2), Wildlife Health Field Practice (2), Aquatic Animal Health Field Practice (2), Laboratory Animal Health Field Practice (2).</p> <p>Veterinary Studies Final Exam (1) (Total Credits = 12)</p>	
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Figure 2 Schematic of the stages of education carried out at SVMBS IPB University.

Quality Assurance

The quality assurance process at SVMBS IPB University is carried out about IPB University's quality assurance system as outlined in IPB University's Chancellor's Decree Number 169/K13/2004 concerning the Education Quality Assurance System and IPB's Chancellor's Decree Number 006/13/OT/2008 concerning IPB's Quality Assurance System 2008-2012. At the institutional level, system development and quality assurance processes are coordinated by the Quality Management Office (KMM) of IPB University. Faculties are units that implement quality assurance processes, while departments are education delivery units that carry out quality control processes. The Dean of the Faculty/School is responsible for ensuring the quality of the educational process. The quality control process is carried out by monitoring the academic implementation and the level of achievement of quality objectives.

In connection with the differences in the implementation of educational programmes in SVMBS IPB University with other faculties and departments in IPB University, the undergraduate (Bachelor of Veterinary Science Study Programme) and Veterinary Professional Education Study Programme are supported at the faculty level so that SVMBS IPB University modifies the quality assurance organizational structure that IPB University has developed. This modification is intended so that the organizational structure of the quality assurance system becomes more in line with the existing processes at SVMBS IPB University, and the quality assurance system established by IPB University can be implemented. The S1 Education Quality Assurance Organization at SVMBS IPB University is carried out under the responsibility of the Deputy Dean by appointing an Academic Commission as an implementing officer who is assisted by a team consisting of Departmental Secretaries within the SVMBS IPB University. The organizational framework and diagram of the quality assurance organizational structure at SVMBS IPB University can be seen in Table 3 and Figure 3.

Tabel 3 Kerangka organisasi penjaminan mutu di SVMBS IPB University

Programme	Level	Executor Name	Executive Officer	Team	Responsible Person
<ul style="list-style-type: none"> Bachelor of Veterinary Science Programme, Veterinary Professional Education Programme, Master Programme, Doctoral Programme 	Faculty/ School	Quality Assurance Group (GPM)	Deputy Dean	Head of Department	Dean
<ul style="list-style-type: none"> Bachelor Programme 	Faculty/ School	Quality Assurance Group (GPM)	Deputy Dean	Academic Commission of Bachelor Programme and Secretary of Department	Dean
<ul style="list-style-type: none"> Veterinary Professional Education Programme 	Faculty/ School	Quality Control Group (GKM)	Deputy Dean	Academic Commission of Veterinary Professional Education Programme	Dean
<ul style="list-style-type: none"> Master's and PhD Degree Programme 	Department	Quality Control Group (GKM)	Secretary of Department	Determined by the Head of the Department	Department

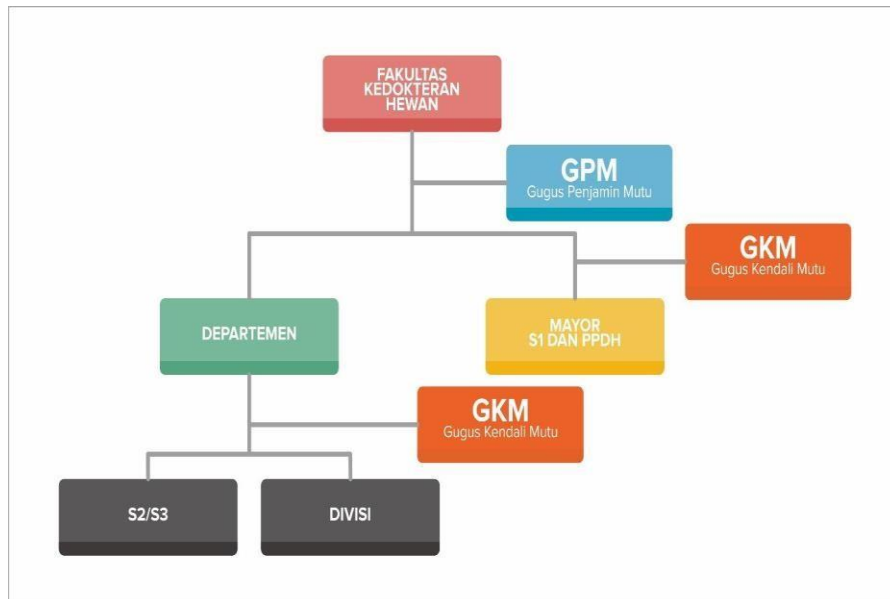


Figure 3 Quality assurance organizational structure at SVMBS IPB University

Financial Management

Financial management at SVMBS IPB University follows the rules and regulations that apply to IPB University. Financial management is carried out centrally in the Directorate of Finance. The faculties/Schools' needs and units in the faculties were submitted to IPB University through the Deputy Dean for Resources, Cooperation and Development. In financial management at the faculty level, the Deputy Dean for Resources, Cooperation and Development is assisted by the Head of Administration (KTU) and the Unit Cash Holder (PKU).

Funds obtained by SVMBS IPB University came from IPB University, the Ministry of Education, Culture, Research, and Technology, and other sources. Of the total funds obtained by SVMBS IPB University, the types of funds with the highest percentage were DIPA/Salary, community funds (DM), research funds, and external cooperation (Figure 4).

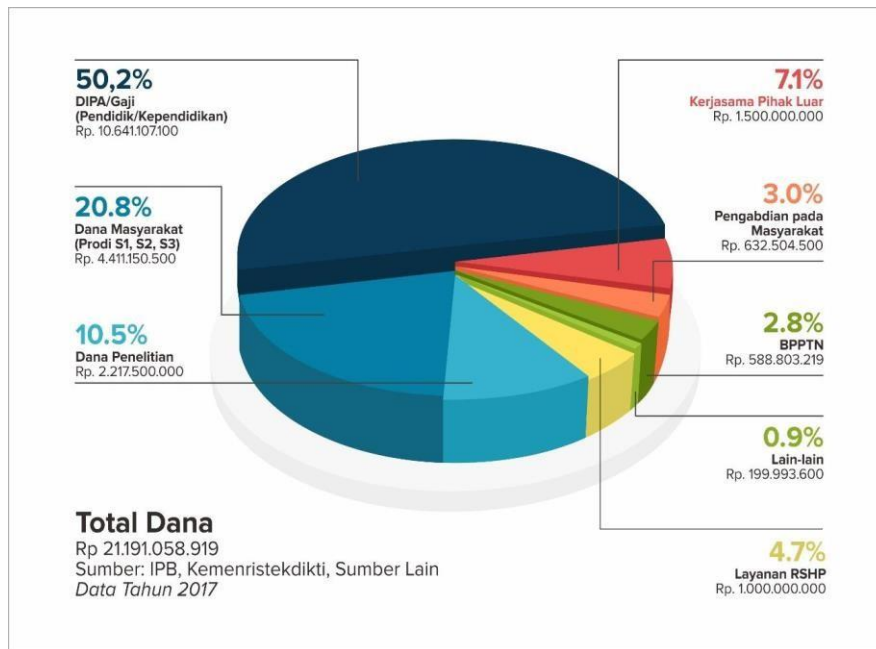


Figure 4 Funds of SVMBS IPB University came from IPB University, the Ministry of Education, Culture, Research, and Technology, and other sources. Funds that have the highest percentage are DIPA/Salary (Teaching & Supporting Staff).

Facilities and Infrastructure

Learning conducted at the School of Veterinary Medicine and Biomedical Sciences IPB University is supported by various learning facilities and infrastructure, such as:

1. Classrooms and supporting facilities for classrooms
2. Laboratories and laboratory-supporting facilities
3. Libraries that are connected to the central library of IPB University
4. Animal Teaching Hospital (RSHP)
5. Reproductive Rehabilitation Unit (URR)
6. Laboratory Animal Management Unit (UPHL)
7. Residential Pest Control Study Unit (UKPHP)
8. Integrated Research Laboratory
9. Poultry Slaughterhouse (RPU)
10. Field learning facilities: implemented in collaboration with academic partners, including learning facilities in poultry companies, the biomedical industry, private animal clinics, the Baharkam Wildlife Police Directorate, animal husbandry services, dairy cooperatives, quarantine centres, and Parongpong Horse Cavalry Detachment (Denkavkud).



Figure 5 The educational process at SVMBS IPB University is supported by adequate facilities and infrastructure such as classrooms, laboratories, libraries, Educational Animal Hospital, Laboratory Animal Management Unit, and Reproductive Rehabilitation Unit.

Teaching and Supporting Staff

Teaching Staff

Currently, SVMBS IPB University has 102 educators/lecturers consisting of 20 people with the academic position of Professor, 27 people with the academic position of Associate Professor, 29 people with the academic position of Assistant Professor, and 15 people with the academic position of Instructor, and 11 are assistant instructors (Figure 6). Based on their latest education, the teaching staff/lecturers consist of 78 PhD and 24 Masters graduates (Figure 6).

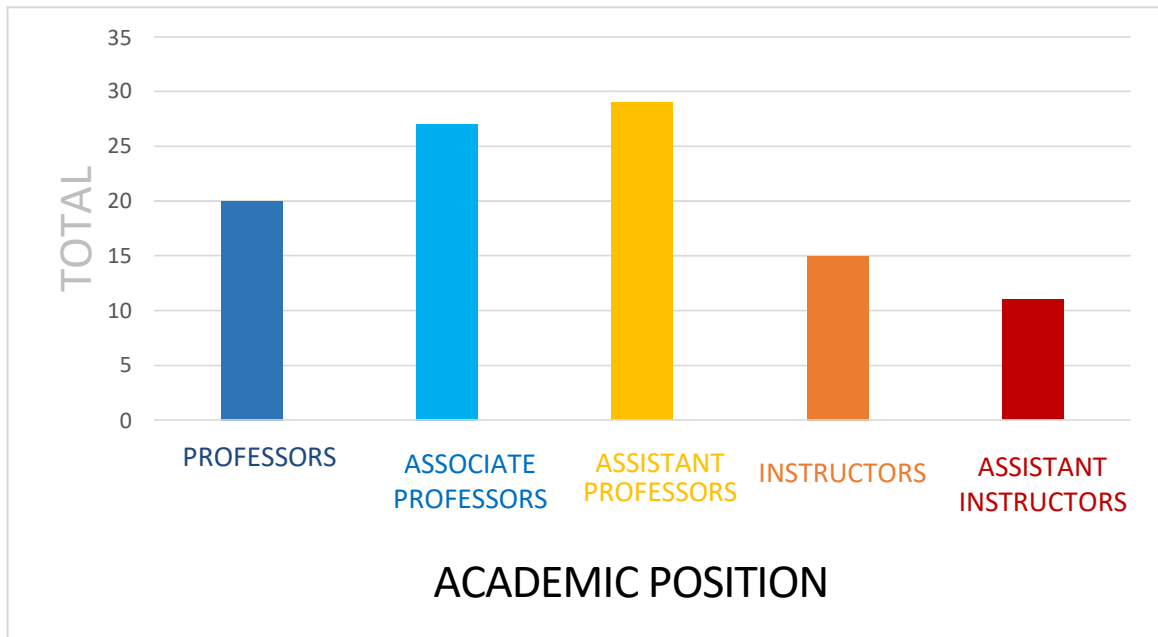


Figure 6 Number of teaching staff based on academic positions in 2020.

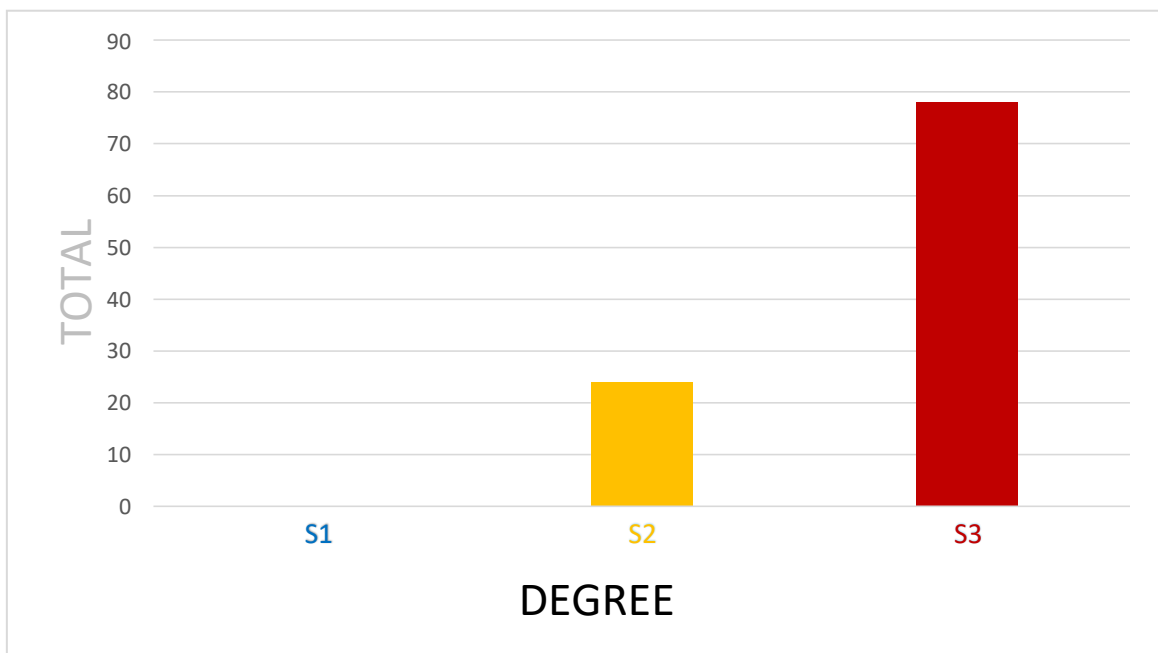


Figure 7 Number of educators based on last education in 2020.

Supporting Staff

SVMBS IPB University has a supporting staff of 118 people consisting of 66 civil servants (ASN) employees, 46 non-ASN/contract employees, and 6 casual daily workers (THL) (Figure 8).

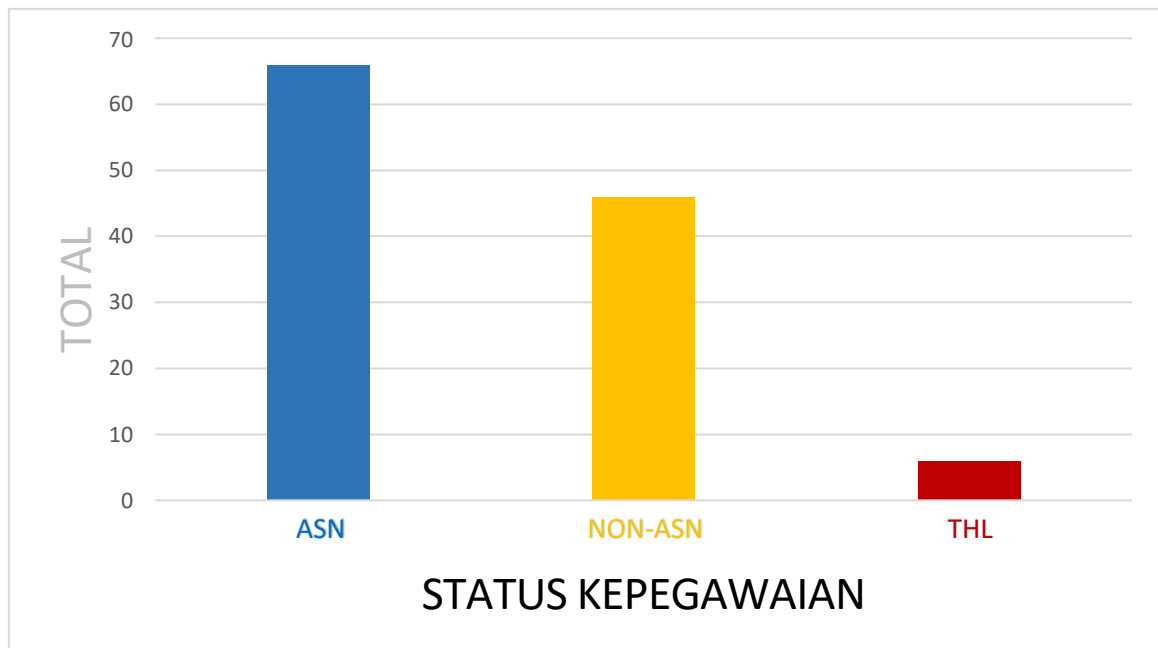


Figure 8 Number of supporting staff based on employment status in 2020.

Laboratory and Community Services

Laboratory Services

Apart from being used as educational facilities, the laboratories located in each division, as well as supporting units (URR, RSHP, UPHL, UKPHP), also provide testing services and as research facilities covering the fields of physiology, anatomy, microbiology, pathology, parasitology, pharmacology, diagnostics, clinical pathology, internal medicine, surgery and radiology and veterinary public health. In addition, SVMBS IPB University has an integrated laboratory: a teaching lab which serves the activities of the three pillars of Higher Education.

Community Services

The School of Veterinary Medicine and Biomedical Sciences carries out routine and incidental community service activities (PkM) by always involving students. This activity is also a means of learning and practice for students. In these various community service activities, students are fully involved in responsibilities starting from preparing proposals, seeking funds, and organizing to implementing and preparing reports/evaluation of activities.

One form of PkM activity that is routine (annual) is the health examination of sacrificial animals carried out by SVMBS IPB University in collaboration with local governments in the Greater Jakarta area. In this activity, students are involved as inspectors for animal health and qurban (sacrificial) meat and are given the responsibility for managing and processing inspection data. Several incidental community service activities assist regional government programmes in guaranteeing animal health, such as vaccination and food safety from safe, healthy, intact, and halal (ASUH) in

the form of outreach.

Another community service activity involving students is a mobile animal clinic or ambulatory. The ambulatory routinely visits several locations, namely livestock centres around Bogor, horse stables, and the Directorate of Wildlife Police, Kelapa Dua, Depok. The services provided include clinical examinations, midwifery, maternity, and udder health examinations and counselling. One of the community service activities that was thoroughly planned and carried out by SVMBS IPB University students was Nusantara Students have regularly held this activity every year, every year by students, and it has been going on since 2010.

Continuing Education

One of the veterinary education standards is implementing routine continuing education for alumni. SVMBS IPB University carries out various forms of continuing education activities as a form of service and community service. Continuing education aims to improve the soft skills and skills of graduates/alumni and other community users so that SVMBS plays an active role in improving the quality of human resources for veterinarians and other biomedical personnel related to the veterinary field.

Currently, continuing education at SVMBS IPB University is carried out through the activities of divisions and the Veterinary Teaching Hospital of SVMBS IPB University. Continuing education participants held at SVMBS IPB University are not only from SVMBS or IPB University institutions but are also widely open to institutions outside IPB University. This phenomenon is a form of SVMBS IPB University's contribution to improving Indonesian human resources. Participants are not only limited to the veterinary profession, but also come from other related professions, such as general practitioners, medical specialists, biologists, biomedicine, breeders, and the general public who need applied veterinary-related knowledge. Increasingly in demand is from surgeons, as well as embryologists from general practitioners, biologists and obstetricians who wish to study the specialized fields of radiology, surgery, reproduction, entomology and embryology. To improve the quality of this continuing education, experts can come from within the Faculty of Medicine of IPB and outside IPB, both domestic and foreign, who are considered competent in their fields.

From 2017 to 2020, SVMBS IPB University, through the Veterinary Teaching Hospital in collaboration with various companies and associations of the veterinary profession, has held 76 activities related to continuing education (Table 4). Speakers at these activities have different backgrounds. Speakers from lecturers have the most significant percentage, namely 41% from practitioners, 35.5%, and 23.5% from experts and the private sector. Most participants who participated in the activity came from the practitioner category with a percentage of 48.4%, 38.5% from students, and 13.1% from

lecturers, the government, and the general public (Figure 9).

Table 4 Continuing education carried out by SVMBS IPB University through RSHP in collaboration with various companies and professional associations

Continuing professional development	2020	2019	2018	2017	Average
• Companion animals	7	13	6	7	8.25
• Equine	1	0	0	0	0.25
• Production Animals	0	1	0	0	0.25
• Pest Control	6	5	5	5	5.25
• Others	4	7	5	4	5
• Total	18	16	16	16	19

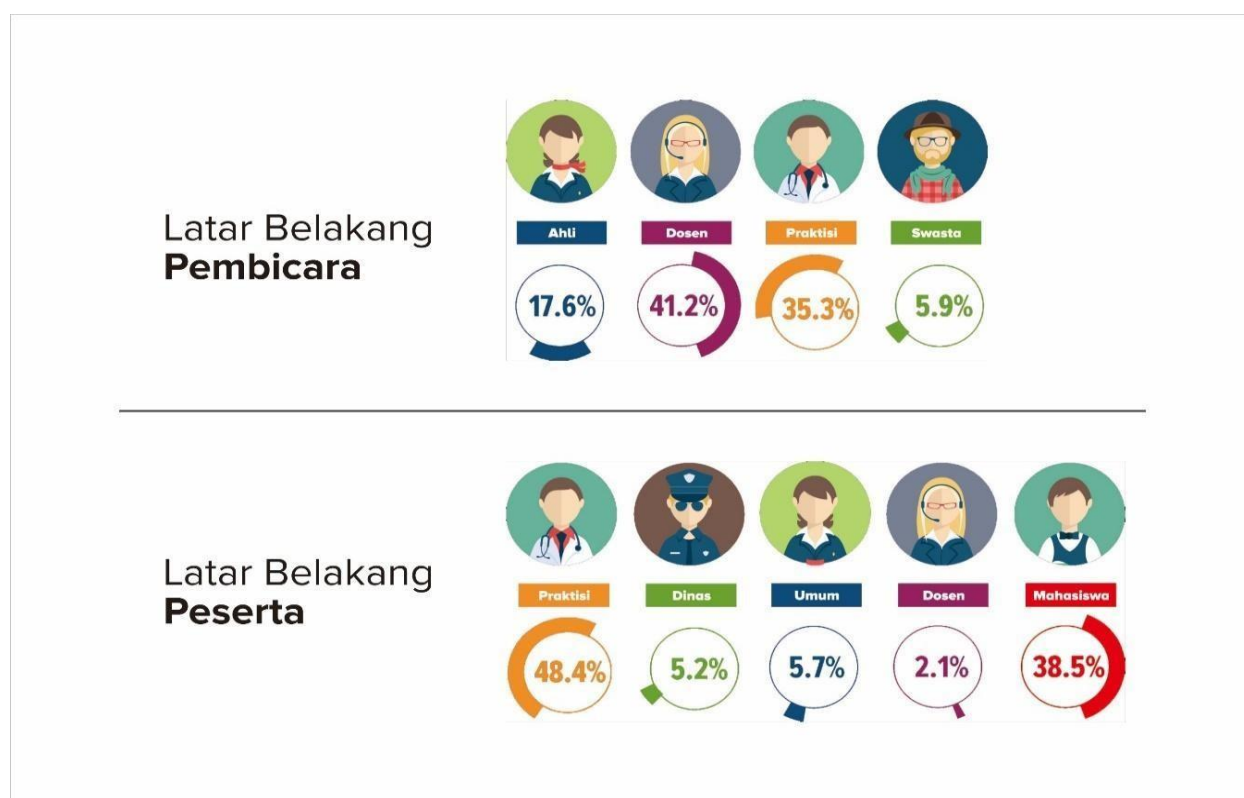


Figure 9 Speakers and participants participating in continuing education in 2017-2020 come from various backgrounds.

Research and Collaboration

Currently, the School of Veterinary Medicine and Biomedical Sciences of IPB University actively participates in various educational and research activities and collaborations in the field of veterinary medicine at the national and international levels, for example, in the Association of Indonesian Veterinary Medicine Faculties (AFKHI), Indonesia One Health University Network (INDOHUN) at the national level and South East Asia One Health University Network (SEAOHUN) at the international level for the One Health concept development network, as a member of the South East Asian Association of Veterinary Schools (SEAVSA) and the Asian Association of Veterinary Schools (AAVS). IPB's Faculty of Veterinary Medicine also carries out educational and research collaboration programmes with foreign institutions (Malaysia: Universiti Putra Malaysia UPM, Universiti Malaysia Kelantan UMK, Universiti Teknologi Malaysia UTM; Thailand: Kasetsart University, Khon Khaen University, Chulalongkorn University; Australia: the University of Sydney, University of Queensland, Murdoch University; Japan: the University of Miyazaki, Hokkaido University, Nagoya University, Gifu University; Netherlands: Utrecht University; Germany: Goettingen University; Switzerland: University of Zurich; USA: the University of Colorado, University of Minnesota, Tuft University, University of California (UC) Davis), as well as with international institutions such as the OIE for the development of veterinary education and profession and with World Animal Protection in the development and implementation of animal welfare aspects in education and research.

Through this research collaboration, SVMBS IPB University benefits, including increased mobility of lecturers and students abroad, various training on the latest research methods, increased publications in international journals, laboratory equipment and the construction of the BSL-3 Research Laboratory.

International Class

Since the 1970s, SVMBS IPB University has accepted international students, especially those from Malaysia. On average, the number of Malaysian students studying at SVMBS IPB University is between 5-10 people per year. Veterinarians from Malaysia who graduated from SVMBS IPB University returned, worked in their home country, and showed excellent work performance. Along with implementing the internationalization program from the Ministry of Education, Culture, Research, and Technology of leading universities in Indonesia, IPB University has established the implementation of international classes at the School of Veterinary Medicine and Biomedical Sciences of IPB University since 2015. The School of Veterinary Medicine of IPB University accepts 20-25 international students through this program annually.

Achievements

International Publications

Until now, SVMBS IPB University continues to experience periodic improvements in national and international publications. In the 2015-2020 period, SVMBS IPB University lecturers produced more than 200 international publications, with an average of more than 40 international publications per year. The publication status of SVMBS IPB University lecturers in international-level scientific publications can be seen in databases such as Scopus or Web of Science. International publications in the veterinary field by SVMBS IPB University are ranked the highest among the 5 best Faculties/Schools of Veterinary Medicine in Indonesia (IPB University, Gadjah Mada University, Airlangga University, Udayana University, and Syiah Kuala University) (Figure 10). Publications by SVMBS IPB University lecturers have developed and expanded into the biomedical field. The development of IPB University's international publications in the biomedical field compared to the best universities in Indonesia and other universities with an SVMBS IPB University is presented in Figure 11.

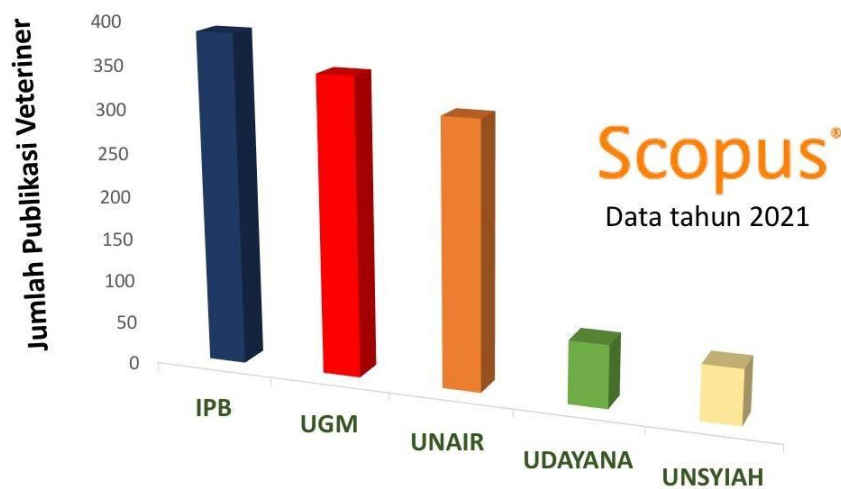


Figure 10 International publications of SVMBS IPB University in the veterinary field are classified as the highest among Indonesia's 5 Faculties/Schools of Veterinary Medicine.

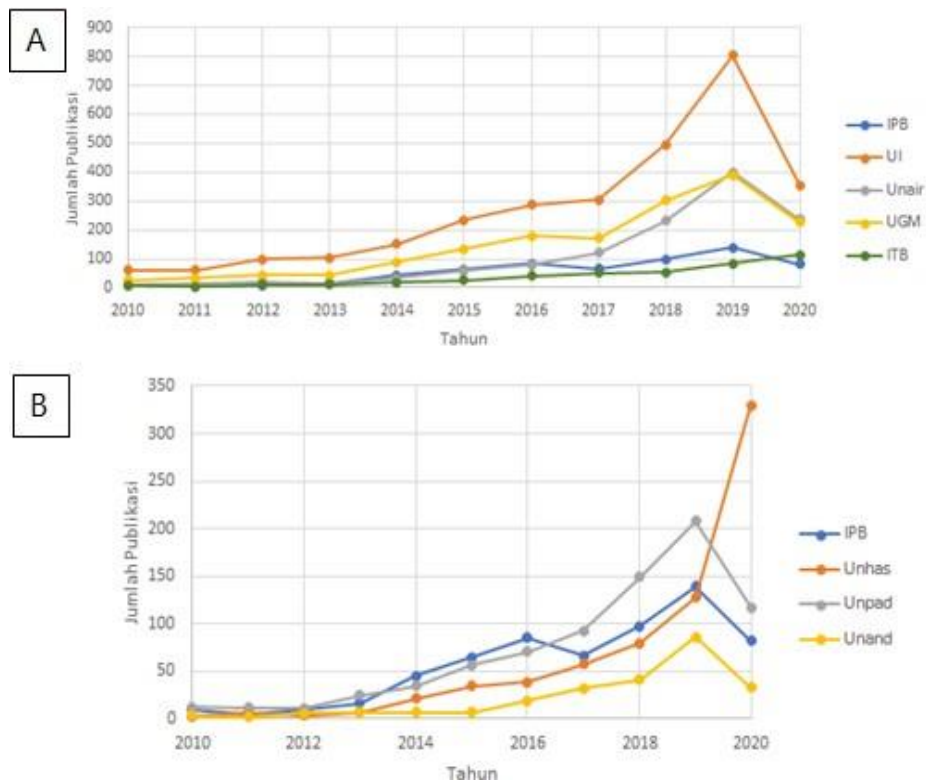


Figure 11 Development of IPB University's international biomedical publications for the 2010-2020 period: (A) Comparison of IPB University's biomedical publications to UI, UGM, UNAIR and ITB; and (B) comparison with other universities that have medical faculties (besides the top five best universities in Indonesia), namely Hasanuddin University, Padjadjaran University and Andalas University.

Academic and Non-Academic Achievements

In student affairs, SVMBS IPB University has students who excel at national and international levels.

Graduates

IPB University's School of Veterinary Medicine and Biomedical Sciences has graduated 6,475 veterinarians. SVMBS IPB University graduates have an average waiting period of fewer than 3 months. Veterinarian graduates' waiting period is considered a fast category compared to other faculties/schools at IPB University. There are various fields of work occupied by graduates, including on-farm agriculture, professional services, education, government, quarantine, and other services. General distribution is 50% poultry industry and other related industries, small animal practitioners 10%, large animal practitioners 5%, wildlife, aquatic and exotic practitioners 5%, government agencies 10%, research institutions and academic institutions

10%, services another 10%. IPB SVMBS IPB University graduates have an average first salary of Rp. 3,000,000 – Rp. 4,000,000 per month.

Accreditation and Certification

To improve the quality of governance and the education system, SVMBS IPB University has received certification and accreditation at the national and regional levels. Several achievements in the field of accreditation and certification obtained by the SVMBS IPB University include:

1. In 2016, SVMBS IPB University obtained "A" (Excellent) accreditation from BAN-PT (SK No. 0057/SK.BAN-PT/Akred/PSPKH/I/2016) for Undergraduate Veterinary Medicine and Doctor Profession Study Programmes Animal.
2. In 2016, FKH received an Education System Quality Certification from the ASEAN University Network-Quality Assurance (AUN-QA) (Certificate Number: AP154IPBMAY16).
1. 3. Since 2013, SVMBS IPB University has implemented a Quality Management System based on ISO 9001:2015 for Academic Administration (Certificate Number: QSC 01147).

RENCANA STRATEGIS - FKH IPB

TANTANGAN MASA DEPAN DAN ARAH PERUBAHAN

BAGIAN III

Kedokteran Hewan Institut Pertanian Bogor Motto: To h

FAKULTAS KEDOKTERAN HEWAN
INSTITUT PERTANIAN BOGOR

PART III

FUTURE CHALLENGES AND DIRECTIONS OF CHANGE

Overview of Future Challenges

Humans and animals are the principal inhabitants of the planet earth. Understanding ecosystems and climate change is fundamental because it directly impacts human, pet, livestock, and wildlife health. In 2007, the Intergovernmental Panel on Climate Change, a scientific organization under the auspices of the United Nations (UN), stated that increasing temperatures, rainfall changes, and humidity significantly impact wildlife and domestic animals, human health, and the spread of disease. Climate change can also increase water demand, accelerate habitat destruction, and increase opportunities for disease transmission between animals and humans. In addition, the emergence of invasive species, urbanization, environmental pollution, land conversion to buildings, wars, and natural disasters will impact the balance of populations and ecosystems.

The rapid development of transportation systems and equipment and various cutting-edge technologies have positively impacted human life. However, this can also quickly facilitate the spread of contaminants or diseases from one region to another. This condition is undoubtedly a threat and a severe problem for human health and the environment. Currently, infectious diseases that attack humans quickly spread. Seventy per cent of existing infectious diseases are diseases that can be transmitted from humans to animals or vice versa (zoonoses).

Seeing the complexity of the problems that cause disease outbreaks, efforts to prevent and deal with them cannot be solved by just one area of

expertise. All countries, world health organizations (World Health Organization/ WHO), world animal health organizations, Office International des Epizooties (OIE/World Organisation for Animal Health/WOAH), environmental organizations, and other scientific disciplines are developing One Health. One Health is an approach to dealing with health problems carried out collaboratively by multidisciplinary disciplines: medical doctors, veterinarians, public health scholars, biomedical scholars, environmental health experts, other scientists, and even other fields of science such as economics, society, and culture. One Health illustrates that humans are part of a larger ecosystem, and disease problems can be handled more effectively through increased communication and collaboration. Although the concept of One Health was developed to improve human and animal health quality, it cannot be denied that veterinary medicine plays a role in the most significant proportion compared to other disciplines. This condition is evidenced by the distribution of publications about One Health in various journals, most of which were published by authors with a background in veterinary medicine. One Health terminology in 2008, as many as 61% of publications about One Health were articles with a scientific background in veterinary medicine.

Within One Health, veterinarians are at the connecting point as they interact with human health, livestock, wildlife, the environment, and international public health regulatory bodies. There is an increasing need for veterinarians to be able to work across disciplines. One example of a real challenge in the health problems that are currently being faced is the COVID-19 pandemic which is a complex issue and requires expertise from across scientific fields to handle it. The role of veterinary medicine is evident in the various research and testing steps related to COVID-19. The field of veterinary medicine has always been very attached to concepts similar to One Health and was introduced earlier, such as One Medicine and One World One Medicine. Articles from the field of veterinary medicine also dominate publications

related to these two concepts. Thus, the future of veterinary medicine is not only needed in the clinical realm. Veterinary medicine has become the leading actor in promoting human, animal, and environmental health, with One Health as a future trend. Currently, the idea and terminology of One Health are increasingly being used to facilitate inter-departmental collaboration in government agencies in the formulation of health policies in various countries.

Speedy population growth is also a challenge in the world of veterinary medicine. An increase in the human population will lead to an increase in the need for food. By 2050, the world will need to double food production to meet an estimated 9.1 billion global population. Various sectors must ensure a continuous supply of safe and healthy food, which is the responsibility of veterinarians. Veterinarians must ensure and guarantee food safety, especially food of animal origin.

Significant changes in veterinary education requirements have occurred over the years to meet the needs of society in the 21st century. The impact of these changes has been a significant advance in veterinary science and technology; increasing public confidence in the quality and efficacy of veterinary services; increasing funding for follow-up research; increasing the need for veterinarians to ensure food of healthy animal origin; prevent bioterrorism and new diseases affecting human health; and desire to protect ecosystem balance and environmental health.

Veterinarians have many job opportunities based on their education and unique skills. Veterinarians can work in various fields, such as private practice/joint practice, government apparatus, wildlife health, meat, and poultry supervisors, disease control personnel, state military/police personnel, teaching or research in faculties, pharmaceutical, biotechnology, diagnostic, agrochemical, or other field companies. The development of engineering science and technology has led to the development of various medical equipment and industries, including robotics, nanotechnology, and systems for

the mass production of products of animal origin. The rapid change towards digitalization of technology has also changed the trend of society and consumers, particularly towards services-based platforms, which is a challenge for the veterinary profession. The development of new sciences, such as telehealth and its derivatives, such as telemedicine, is an unavoidable demand. This science development is also an aspect that needs to be incorporated into veterinary education to ensure proper implementation of veterinary science, answering the needs of society while remaining within the corridors of proper professional ethics.

Advances in development and living systems have made a trend toward increasing the relationship between animals and humans. Many people currently keep pets and visit animal conservation areas such as zoos, captive centres, etc. On the other hand, various research in veterinary medicine and biomedical have reached a high level, and many use animals as models and laboratory animals. This condition has raised issues related to animal welfare, so animal welfare has become something that all students and graduates of veterinary medicine must understand. In modern life, people expect qualified and specific veterinary services. Many people have been able to pay for quite expensive services as long as they can provide satisfaction from the accuracy of the diagnosis and treatment. This condition has also triggered the development of veterinary education in Indonesia towards specialist veterinary education.

Efforts to Improve the Quality of IPB Veterinary Education

To improve the quality of veterinary education, the Indonesian Veterinary Medical Association (IVMA/PDHI), together with the Faculties of Veterinary Medicine throughout Indonesia, have built a strategic partnership and alliance and have produced various agreements as mentioned below:

1. Workshop on National Curriculum for Higher Veterinary Medical Education throughout Indonesia March 3-5, 2000, and June 6-7, 2000, in Surabaya.
2. The signing of the cooperation agreement between PDHI and the Faculty of Veterinary Medicine (FVM) of IPB University, FVM Airlangga University, FVM Gadjah Mada University, FVM Udayana University, and FVM Syiah Kuala University regarding the Implementation of Veterinary Professional Education on June 7, 2000, in Surabaya.
3. National Workshop on Veterinary Professional Education on August 13, 2002, at FKH UGM, Yogyakarta.
4. National Meeting on Professional Veterinary Education October 2002, concurrent with the 14th PDHI Congress at Lombok Raya Hotel, Mataram NTB
5. Indonesian Veterinary Education Workshop on February 4, 2005, at FVM IPB University, Bogor.
6. Indonesian Veterinary Education National Meeting in conjunction with the 15th Congress of PDHI June 6-8, 2006, at the Millenium Hotel, Jakarta
7. Decree of the XV Congress of the Indonesian Veterinary Association of 2006 Number 08/Congress XV/PDHI/2006 concerning Competency Standards and Continuing Education.
8. Joint Agreement between PDHI and the Faculty of Veterinary Medicine, Bogor Agricultural Institute, Airlangga University, Gadjah Mada University, Udayana University, and Syiah Kuala University on December 20, 2006, in Surabaya regarding:
 - a. Veterinary Professional Education Council Veterinary
 - b. Competency
 - c. Standards Veterinary Paraprofessional Competency Standards Continuing
 - d. Education
 - e. Declaration Dean of the Faculties of Veterinary Medicine from IPB University,

Airlangga University, Gadjah Mada University, Udayana University, and Syiah Kuala University on December 20, 2006, in Surabaya regarding Indonesian Veterinary Association (PDHI) as the only Veterinary Professional Organization in Indonesia.

1. Workshop on Indonesian Veterinary Medicine 18-19 July 2007 at the Faculty of Veterinary Medicine, Udayana University, Bali.
2. Establishment of the Association of Indonesian Veterinary Medicine Faculties (AFKHI), the establishment of the Indonesian Veterinary Competency National Examination (Ujinas KDHI) and the establishment of the Association of Indonesian Veterinary Hospitals (ARSHI) on February 18, 2010, in Surabaya.
3. Decree of the 2010 XVI PDHI Congress in Semarang, Number 16/Congress XVI/PDHI/2010 concerning Competency Standards for Indonesian Veterinarians.

The establishment of Veterinary Education Standards in Indonesia was carried out by AFKHI, PDHI, and the Ministry of Research and Higher Education in 2013. Since 2013, SVMBS IPB University has referred to the recommended documents provided by WOAHA on the Competencies of Graduating Veterinarians (Day 1 Graduate Competencies) to ensure national veterinary services of quality (2012).

The World Organization of Animal Health (WOAH; previously OIE) issued the Day 1 Graduate Competencies as a standard for curriculum development covering basic veterinary sciences and became the basis for determining the competence of FKH-FKH graduates around the world. FKH-IPB has referred to and implemented these recommendations to respond to international challenges that demand standardization of veterinarians' competencies at *entry-level* or *fresh graduates* globally to support public health and provide an adequate scientific basis for continuing education which will be pursued further.

To produce future-ready standards and recommendations from the OIE as the world body that regulates animal health will continue to be FKH-IPB's reference in determining essential competencies in the field of veterinary medicine. In addition, efforts to develop veterinary education at IPB require an approach in line with matters agreed upon in the mission and strategy of the veterinary profession worldwide. Through *the Federation of Asian Veterinary Associations (FAVA)* and *World Veterinary Associations (WVA)*, a veterinary professional development strategy has been formulated for 2020-2025. Four priority areas are being highlighted by the world veterinary association (WVA). They will need to focus on developing veterinary education programmes at IPB, namely *Animal Welfare, Pharmaceutical Stewardship, Veterinary Education, and One Health*. Highlighting the strategy for veterinarians in Asia through FAVA, the Food Security and Food Safety field is another challenge that needs to be prioritized in education in Indonesia. In facing rapid developments in the field of science and technology, WVA also frequently publishes *position statements* as a global reference for the veterinary profession in acting and behaving; an example is the *WVA Position Statement on Telemedicine* which was published in April 2021 as a response to the very rapid development of *telehealth* in the pandemic era. The development of veterinary education at IPB through the School of Veterinary Medicine and Biomedical Sciences will continue to refer to developments in OIE recommendations as well as FAVA and WVA missions in the future to ensure the suitability of educational and teaching science development with what is the challenge of the veterinary profession in the world of work/professional and supported by the latest science and technology. This condition will also help IPB University form a synergistic collaboration strategy with other Schools or Faculties of Veterinary Medicine in Indonesia, Asia and the world.

Strategy in Anticipating Reskilling Momentum 2030 2030

a. Technology transforming medical education, promoting inquiry and innovation, mastery

Veterinary medicine will experience new demands and expectations as the veterinarian's role evolves from traditional primary care and referral practice to a technology-based speciality. Examples include epidemiology, basic and applied research, information management, biomedical engineering, accessing resources, publications management, and communication and coordination across geographic boundaries and specialities. Veterinary medicine must increase diversity in all its dimensions across the profession to benefit from new approaches to research, education, product development, and clinical practice to meet these challenges. A central element for meeting future demands will be a constant focus on connectivity involving animals, humans and the environment. These linkages include the human-animal bond, protein-based food security, protection against zoonotic diseases, the development of innovative products and animal health solutions, and the increasing need to apply global solutions and resources to meet universal challenges.

Education at all levels is on the verge of transformation. The veterinary professional education system must utilize the latest teaching and learning technology and methodologies. Professional medical education is shifting from a knowledge-based curriculum to a competency-based curriculum. New approaches are needed in the teaching process that emphasises data access and application skills, problem-solving, innovation, and creativity. In the future, instructors must become organizers and facilitators who can digitally, mobile, and consistently analyze student data.

The development of veterinary education needs to anticipate the following challenges:

1. Veterinary schools that will be developed will increasingly focus on *lifelong learning* to keep pace with an exponentially changing world by providing CPD activities independently or in collaboration with other practitioners and partners who are related.

2. Veterinary schools will collaborate in various ways, such as sharing "*Big Data*" with similar institutions and using *Augmented Intelligence* to improve learning outcomes, help develop market-relevant graduates, and share educational content.

3. Competency-based education will encourage curriculum development and allow for more focused assessment and certification.

4. Learners will become more involved with lifelong professional development (*lifelong learning*) by having greater access to various learning environments and increased responsibility for their career development.

5. An innovative teaching method that emphasizes the process of personal discovery by students (students), in which students are encouraged to develop their thinking skills and construct new knowledge through appropriate, more independent and proactive questioning techniques.

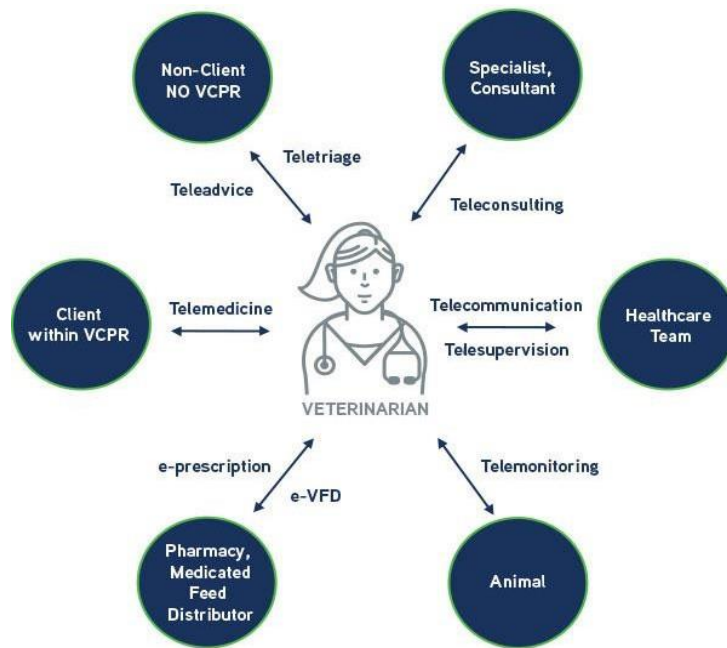
6. Veterinary school graduates must have comprehensive knowledge or skills in a subject or achievement.

b. Technology Supporting Healthcare, Changes in Practice Patterns, Changing Role of the Doctor and Team Approach to Care

As new technologies develop, almost every aspect of veterinary care will be affected. Technology applied to health monitoring will increase the availability and accuracy of diagnostic tools, thereby changing the way care is provided. The quality and coverage of veterinary health services will also develop by utilizing *virtual*, *augmented*, and *extended reality*. Technology will provide better access to remote inspection, diagnosis and monitoring.

Increased speed of communication tools will evolve to allow veterinarians to connect remotely with specialist colleagues, clients, and patients, enabling clinical services to be delivered competently regardless of the doctor's and patient's location. This development allows veterinarians to increase efficiency and reduce costs while restructuring and enhancing the practice service paradigm. However, this will be a challenge because the expectations of consumers or users of veterinary services and services will continue to switch to the platform, even though the medical profession will not easily accommodate this approach. After all, it requires wise, ethical judgments and is guided by signs in the form of clear rules.

In anticipating the existing challenges, changes are needed in the provision of veterinary science, so that prospective veterinarians understand the challenges of digitalization and are ready to transform by anticipating growing trends. The development of digital technology as *a platform* for providing *Telehealth* services or health services at a distance and relying on telecommunication technology will continue to be an opportunity and a challenge for veterinarians in providing excellent service and



According to community needs (Figure 13). An understanding of procedures for carrying out and limitations of services is required in each branch of *Telehealth* consisting of *Teleadvice* (general advice regarding

animals), *Teletriage* assessment of animal conditions *urgent* to determine the need for immediate treatment by a veterinarian), *Telemedicine* (practice support devices in the form of communication services between doctors and their clients to continue observing and discussing follow-up handling), *Teleconsulting* (vets consult with specialists at different locations) and *Telemonitoring* (monitoring the condition of animals at other locations). The right approach for each form of digital service will need to be scrutinized and strategically implemented. In addition, there are also challenges to *e-prescription* or services related to digital receptors. The rise of herbal research in Indonesia will create opportunities and challenges in developing *e-prescriptions* that utilize herbal and animal medicines based on natural ingredients that have been clinically proven and licensed.

Figure 12 *Telehealth* and its service category branches. (Source: AVMA)

The millennial generation has become today's premier pet owner group, and the next generation of pet owners will surely demand high-tech solutions for much of their pet care. This trend will support a more technologically advanced veterinary practice in line with the animal owner's preferences. The

future of animal health care systems will move from collecting data to connecting, understanding, and translating data. This condition will require digital enhancements and secure sharing capabilities of veterinary practice information management systems.

The following are some of the challenges in veterinary care in the future that need to be anticipated with the development of veterinary science and biomedical sciences:

1. Advances in technology will fundamentally change the delivery of health care and will have an impact on the veterinary-client-patient relationship.
2. Veterinary care in the future will give pet owners and producers more control over healthcare management.
3. *Telemedicine* will expand the reach and ability of veterinarians to provide care wherever patients and clients are.
4. Remote monitoring systems make it possible to improve the quality of care while reducing or eliminating unnecessary hospitalizations.
5. New technologies will enable earlier and more reliable detection, diagnosis, treatment, and real-time monitoring.
6. Patient medical records digitally and more efficiently.
7. Artificial intelligence (AI) will be utilized extensively to help veterinary healthcare agencies meet patient, client, and practice goals more effectively.
8. Future technological advances will increase individual productivity and potentially reduce provider "burnout".
9. Professional education, continuing education, and career advancement will change with innovative technological advances.
10. A new financial model will be developed to reduce the financial burden of providing high-quality pet care.
11. Meeting patient needs and preferences encourages all healthcare teams to work fully with their certified expertise and experience.

c. *Medicine, Science and Innovation; Community service and service learning; and promoting inquiry and innovation*

(1) Veterinary research will continue to be influenced by academics and other research organizations or institutions. Veterinary training and education will be aligned with (1) trends towards demand-driven research; (2) disease detection, treatment, management and prevention; (3) maintenance of health across all species; (4) environmental health; (5) the presence of animals in human life; (6) pedagogy, and (7) the evolution of the veterinary profession itself. *One Health*, which represents the meeting point between animal, human and environmental health, will become an area of increasing focus and importance. Animals in human life will also be a more general focus of research. Increasing population pressure will push demand for increasingly sophisticated research on the economics of food animal production.

Research in veterinary medicine will continue to span the spectrum from fundamental discovery to commercialization. Innovation and application will continue to be the foundation for successful research results. The application of preliminary research results will involve veterinarians, animal health scientists, and academics. What is expected to change is how the wider society recognizes this approach, the extent to which applied research is based on efforts by multinational research teams, and the extent to which such a global approach is being embraced by society globally.

Traditional research laboratories will become scarcer, replaced by laboratories with standard controlled maintenance and experimental practices appropriate to risk assessment and use of alternative models, and require open and collaborative research approaches. The veterinary profession will increasingly rely on computer science and digital engineering. In particular, advances in data compilation, management, and application will emerge to investigate and assess new information from a veterinary perspective. To continue to be considered a significant source of research expertise, traditional

perceptions of what veterinarians do must be broadened, and veterinary schools must emphasize the importance of veterinary research careers. Likely, the source of funding will also change. Support from traditional entities, such as government funding agencies and pharmaceutical companies, will gradually decrease as a percentage of the research portfolio. At the same time, the emphasis on venture capital and testing of ideas without upfront investment in infrastructure will increase.

The following is the direction of the development of veterinary and biomedical sciences according to the challenges of future innovation:

1. Economic realities and research trends will pressure universities to move from an "independent researcher" model to consortiums or large teams of many researchers.
2. Existing preclinical and clinical trial procedures will be enhanced and possibly even replaced by newer technology-based procedures, which are more ethical and lead to more rapid and effective identification.

Artificial intelligence (AI) will be the engine that drives research with effective results and improves or enhances animal health care.

d. Emphasizing values, values-driven action and Community service and service learning

Every veterinarian must recognize the inevitability of rapid change in the veterinary profession, embrace the need to adapt to the evolving landscape we operate, and contribute to a profession that can and will develop in the future. Professional leadership must keep pace with changes affecting veterinary medicine, both external and internal forces. Individual members of the medical profession can and should contribute to this dynamic process by continuously engaging in information gathering, regularly participating in professional forums, expressing their expectations to leaders, and maintaining a commitment to professional growth and lifelong learning.

The guidelines chosen and adhered to by FKH for graduates must be based on a system of values/principles (*values*). In any condition, action based on value systems requires awareness of personal values and the intention to commit to these values. Value-based action will foster awareness, optimism, flexibility, regulation, networking and partnerships.

Future graduates of veterinary and biomedical schools must be able to meet the community's needs and overcome environmental problems. A teaching and learning system is needed to integrate relevant service activities and focus on community needs into a subject to achieve those. In the future, students of veterinary and biomedical schools are expected to be able to link the knowledge or theory acquired into actual practice in the form of community service in a structured learning environment or learning process known as *service learning*.

Direction and Purpose of Change

Direction of Change

Since the establishment of IPB in 1963, SVMBS IPB University has undergone several changes in the learning system. The 6-year veterinary education program was changed to 4 years plus 6 months education program (in the form of 4 undergraduate years and 6 months co-assistant) in the 1980s. Then in 2000, all the Faculties of Veterinary Medicine in Indonesia agreed on a nationally applicable curriculum referring to the semester credit system (SKS), namely an undergraduate education program of 144 credits followed by a veterinary education program to complete 37 credits. Then in 2013, all Faculties/Schools of Veterinary Medicine in Indonesia and PDHI set veterinary education standards in Indonesia, emphasising the availability of facilities and infrastructure to support clinical learning. For example, faculties must provide veterinary clinics or animal hospitals, animal pens and field studies related to

poultry and large ruminants.

The nature of learning in veterinary education is learning based on health sciences (medical sciences); a student will learn in stages and stages starting from essential learning related to body systems, animal behaviour, basic biochemistry and physiology, genetics, and developmental genetics. This period in the medical education system is called the preclinical stage (primary medicine). Then, students will study the para-clinical stage, learn about the mechanism of disease occurrence, types of microorganisms and disease-causing factors (traits and life cycles), knowledge of drugs and drug action, as well as various supporting knowledge such as knowledge of legislation, economics, and sociology. At the clinical stage, students will learn to master clinical skills, such as making diagnoses, recognizing diseases, performing therapeutic actions, performing surgeries, and the ability to perform post-mortem diagnostics, including various cases and diseases related to animal reproduction and other supporting knowledge such as prescription writing, laws and regulations, laws/legislation, ethics, and animal welfare.

All of the above learning processes are provided in a coordinated manner by lecturers/teachers from various disciplines. Since 2005, all faculties at IPB have implemented department-based education, where study programmes are carried out by departments related to the science of the study program. For the Faculty of Veterinary Medicine, the study program is not managed in one department because of the nature of its medical education. Still, its management is carried out under the coordination of the faculty and supported by all divisions in the 3 departments of SVMBS IPB University (AFF, IPHK and KRP). On the other hand, to meet the department's requirements to administer the study program, the SVMBS IPB University only manages postgraduate programmes (Masters/S2 and PhD/S3).

Based on SWOT and the implementation system of one science clump of education (veterinary medicine) held by SVMBS IPB University to date, there

are several administrative obstacles, including:

1. Implementation is inefficient because faculties carry out study programmes at the bachelor level (S1), and departments also carry out study programmes at the postgraduate level (S2, S3)).
2. The existing financial management system at IPB University has not accommodated the tremendous demand for implementing education at SVMBS IPB University.
3. The quality assurance system at SVMBS IPB University had to be modified because the administration system and academic management at SVMBS IPB University differed from other faculties at IPB University.

According to the statute (Regulation of the Government of the Republic of Indonesia Number 66 of 2013 concerning the Statutes of the Bogor Agricultural Institute in Article 65 paragraph 2), IPB can form schools as executors of academic elements from one science cluster. With the uniqueness of implementing education in one family of veterinary sciences, which SVMBS IPB University has carried out, then per the Statutes of the IPB University, this implementation would be more suitable if it was carried out in the form of a school. With the change from Faculty to School, there are several benefits, including:

1. Implementing one veterinary science cluster will be more efficient if it is carried out in a School instead of a faculty/school. There is efficiency due to implementation only at the faculty level and the ease of various divisions to coordinate to support the learning process.
2. The form of a school will enable a financial management process that is more based on the immediate needs of the learning process and operations.
3. Make it easy to meet the requirements for the number of lecturers in

4. the Ministry of Education and Culture's higher education database (PDPT).
5. The implementation of the three pillars of Higher Education (education, research, and service) can be carried out in a more integrated manner between divisions under school coordination so that it is expected to have a tangible impact on the community as well as efficiency in involving funds, facilities and infrastructure.
6. The development of science and research in each division becomes more open to transdisciplinary.
7. Easy to adapt to improve the quality of learning with a more advanced education system.

The change from the Faculty of Veterinary Medicine to the School of Veterinary Medicine and Biomedical Sciences will open opportunities for the formation of other study programmes related to health (*medical sciences*), such as biomedical science, medical biotechnology, pharmacy, and so on. In the continents of Asia, America, Australia and Europe, around 44 universities are offering educational programmes related to veterinary medicine under the name "School", while 6 universities are offering veterinary education programmes using unit names (Department/Faculty/School)) accompanied by biomedical science. A list of University names can be seen in Table 5 and Table 6.

Table 5 List of names of educational units offering veterinary majors under the name "school"

No.	Country	Institution	Unit
1.	Australia	Charles Sturt University	School of Animal and Veterinary Sciences
		Murdoch University	School of Veterinary and Life Sciences
2.	Japan	Obihiro University of Agriculture and Veterinary Medicine	School of Veterinary Medicine
		Rakuno Gakuen University	School of Veterinary Medicine
		Tokyo University of Agriculture and Technology	United Graduate School of Veterinary Sciences
		Tottori University	School of Veterinary Medicine
3.	Taiwan	National Taiwan University	School of Veterinary Medicine
4.	India	Desh Bhagat University	Desh Bhagat School of Veterinary Sciences, Mandi Gobindgarh, Punjab
5.	Philippines	Isabela State University, Luzon	School of Veterinary Medicine
		Aklan State University, Visayas	School of Veterinary Medicine
6.	Iran	Islamic Azad University	Babol Branch School of Veterinary Medicine
			Garmsar Branch School of Veterinary Medicine
			Shabestar Branch School of Veterinary Medicine
			Tabriz Branch School of Veterinary Medicine
		Lorestan University	School of Veterinary Medicine
		University of Shiraz	School of Veterinary Science
7.	Israel	The Hebrew University of Jerusalem Koret	School of Veterinary Medicine
8.	Costa Rica	National University of Costa Rica	School of Veterinary Medicine
9.	Saint Kitts and Nevis	Ross University	School of Veterinary Medicine
10.	Brazil	Federal University of Goiás	Veterinary and Husbandry School
		Pontifical Catholic University of Paraná	School of Agriculture and Veterinary Medicine
11.	Grenada	St. George's University	School of Veterinary Medicine
12.	Mexico	University of the Valley of Mexico	Coyoacán School of Veterinary Medicine and Zootechnics
13.	France	National Veterinary School of Alfort	

No.	Country	Institution	Unit
		National Veterinary School of Toulouse	
		National Veterinary School of Lyon	
14.	Portugal	University of Trás-os-Montes and Alto Douro	School of Agrarian and Veterinary
15.	The United Kingdom	St. Matthew's University	School of Veterinary Medicine
		University of Bristol	School of Veterinary Science
		University of Cambridge	Veterinary School
		University of Nottingham	School of Veterinary Medicine and Science
		University of Surrey	School of Veterinary Medicine
		University of Edinburgh	Royal (Dick) School of Veterinary Studies
		University of Glasgow	School of Veterinary Medicine
16.	Denmark	UCPH	School of Veterinary Medicine and Animal Science (2012–)
17.	United States of America	Louisiana State University	School of Veterinary Medicine
		Tufts University Cummings	School of Veterinary Medicine
		Tuskegee University	School of Veterinary Medicine
		University of California	Davis School of Veterinary Medicine
		University of Wisconsin at Madison	School of Veterinary Medicine
		University of Pennsylvania	School of Veterinary Medicine

Table 6 Names of units that offer majors in veterinary medicine plus biomedical sciences

No.	Country	Institution	Unit
1.	Bangladesh	Sylhet Agricultural University	Faculty of Veterinary, Animal and Biomedical Sciences
2.	Mexico	Autonomous University of Juárez City	Institute of Biomedical Sciences
3.	Philippines	Cavite State University	College of Veterinary Medicine and Biomedical Sciences
4.	United States of America	Colorado State University	College of Veterinary Medicine and Biomedical Sciences
		Texas A&M University	College of Veterinary Medicine & Biomedical Sciences
5.	Portugal	University of Porto	Abel Salazar Biomedical Sciences Institute

Purpose of Change

The quality of veterinary education at IPB was improved by changing the organizational structure from the Faculty of Veterinary Medicine to the School of Veterinary Medicine and Biomedical Medicine. The objectives of these changes include:

1. Responding to changes and the need for scientific development at IPB University.
2. Responding to changes and needs in the field of veterinary medicine and biomedicine.
3. Adjustments to the IPB University statutes, namely, the school as a forum for implementing multilevel programmes in one family of veterinary sciences.
4. Efficiency in the implementation and governance of the educational process of study programmes and the implementation of the three pillars of Higher Education.
5. Strengthening the role of fields of science/divisions in supporting veterinary medicine and biomedical sciences education.

RENCANA STRATEGIS - FKH IPB

ANALISIS SWOT, RENCANA STRATEGIS DAN ROAD MAP PENELITIAN DAN PENGABDIAN PADA MASYARAKAT FKH IPB

BAGIAN IV



Analysis of Strength, Weakness, Opportunity, and Threat (SWOT)

To realize the vision and mission of the study program management unit and study program, SVMBS IPB University needs to develop the right strategy by determining priority programmes by the target achievements of each stage. Determining the strategy for achieving the vision and mission can be done by analyzing the strengths and weaknesses and the opportunities and threats that will be faced to achieve the mission and vision. A SWOT analysis needs to be carried out, which begins with identifying the weaknesses and threats most urgent to address in all components of the self-evaluation. Next, identify the strengths and opportunities that are suitable for efforts to overcome the weaknesses and threats that have been identified previously. The results of this SWOT analysis are used to develop strategic programmes and prepare implementation programmes.

1. Analysis of Performance Achievements

In general, all study program performance indicators have been achieved, and some indicators even exceed IPB University and national standards. FKH's vision and mission are in line with IPB's vision and mission, namely to become a leading institution at the global level. The internationalization process is carried out through efforts to gain international recognition through the accreditation of study programmes (PS) by the European Association of Establishments for Veterinary Education (EAEVE) and through the Accreditierungsagentur für Studiengänge der Ingenieurwissenschaften, der Informatik, der Naturwissenschaften und der Mathematik (ASIIN). Overall, the achievement of the vision and mission of SVMBS IPB University has been outstanding, especially in terms of *inputs* and processes. However, the accreditation process by EAEVE was not achieved in 2020 due to the Covid-19 pandemic, which has caused the *consultative visit* to be postponed until 2022. In 2021-2023, the accreditation process for EAEVE and ASIIN will run in parallel.

The achievement of the vision and mission of SVMBS IPB University is supported by good governance and governance of SVMBS IPB University. Administrative arrangements at SVMBS IPB University are simple so that instructions and coordination run efficiently in a short flow. However, with the academic management of study programmes at the faculty level, the workload of the Leaders (Dean and Deputy Dean) of SVMBS IPB University becomes heavier. This condition requires additional commissions to support routine administration tasks in the academic, student affairs, staffing, finance, facilities and infrastructure fields. Considering that the roles and functions of the faculties in SVMBS are different from other faculties/schools in IPB University, such as undergraduate and professional study program administration, strategies for achieving cross-departmental competencies, financial management, and management of facilities and infrastructure centralized in the faculty, the future development of SVMBS IPB University will be transformed into the School of Veterinary Medicine and Biomedical Sciences (SKHB/SVMBS).

To guarantee the quality and quantity of prospective students, SVMBS IPB University has carried out a student selection process through several new student admission system schemes (SNMPTN, SBMPTN, UTM IPB, Regional Representative Scholarships, Achievements, and international routes). The ratio of stringency of student applicants accepted at SVMBS IPB University is already high (1:12) but still needs to be improved to reach the standard set by IPB University, which is 1:13. Several factors influenced the number of potential applicants, including the adoption of the national SNMPTN system, the increase in veterinary study programmes and the improvement in the quality of veterinary study programmes at other tertiary institutions. The achievements of SVMBS IPB University students have not reached the targets set by IPB. The number of credits that are dense and the quality of coaching students lacking in participating in competitions influence the achievements of SVMBS IPB University students. This condition underlies the need for coaching and dissemination of information

related to student competitions or competitions that are participated in by SVMBS IPB University students.

The number of permanent lecturers for the Bachelor of Veterinary Science and Veterinary Professional Education SVMBS IPB University programmes in terms of qualifications, competencies, available positions, and the percentage who have educator certificates has exceeded the targets of SVMBS IPB University, IPB University, and national standards. Even though this number has exceeded the standard, the recruitment program and accelerated promotion also need to be improved so that the regeneration process runs well and the proportion of professors and associate professors increases so that the percentage does not decrease when some professors and associate professors reach retirement age. What needs to be improved is the process of planning, recruiting and developing lecturers in the future, considering that the proportion of SVMBS IPB University with ages over 55 years is relatively high. Good planning related to lecturer regeneration needs to be done to reduce lecturer vacancies in the future. The number of academic staff is still sufficient to provide good service for implementing the three pillars of Higher Education. Still, the age composition of educational staff is less than ideal. Most teaching staff are entering retirement age, but no recruits exist. Recruitment of educational staff, in general, follows the government's program in the form of Indonesian civil servants (CPNS) acceptance. Therefore, a planned recruitment program is needed outside of civil servant formation.

SVMBS IPB University has adequate facilities and infrastructure to support the implementation of lectures, practicum, research, extracurricular activities, health facilities, and interaction between lecturers and students. In addition to the existing facilities and infrastructure in SVMBS, there is also a *sharing* of integrated infrastructure facilities at the level that is very helpful in supporting academic implementation. The implementation of three pillars of higher education activities at SVMBS IPB University is supported by an adequate information system and

centrally coordinated internet services at IPB University, including the Academic Information System (SIMAK), Employee Information System (SIMPEG), Credit and Scientific Work Scoring System (SIPAKARIL), System Student Affairs (SIMAWA), IPB mobile (students, lecturers, and supporting staff), and online services. The information system has been used optimally in online study plan form (KRS), *uploading* grades, teaching materials, scheduling lectures, and practical classes. Continuous improvement of facilities and infrastructure continues to be carried out by SVMBS IPB University to improve the quality of learning through internal funding from SVMBS and IPB University and by submitting a revitalization proposal to revitalize veterinary education to the Belmawa of the Ministry of Education and Culture.

The current curriculum at SVMBS IPB University is a competency-based curriculum that complies with the IQF, adopts the national veterinary curriculum, and refers to regional and international competencies set by the OIE (2012). To achieve international accreditation, SVMBS IPB University adjusted to veterinary education standards with veterinary standards in Europe. From the results of analyzes in 2019 and 2020 conducted on veterinary learning data based on animal commodities for EAEVE accreditation applications, it was found that the number of uses and practical learning in pigs, horses, large ruminants, and exotic animals is still low.

The achievement of the leading and additional performance indicators in research and community services of SVMBS IPB University exceeds the standards set nationally and is following the roadmap of research and community services. Research and community service results have been used to enrich teaching materials and disseminate them. Research activities have also produced scientific works in textbooks, technology, and products, some of which have been registered to protect intellectual property rights. The implementation of the research also involved students in the implementation of the final project. Research outputs as key performance indicators have also been achieved in

various forms, such as scientific journals published nationally and internationally, patents, intellectual property rights, books and materials disseminated in scientific forums. Even so, the achievements of research activities, outputs, and PkM have not been evenly distributed among SVMBS IPB University lecturers.

The study program's educational outcomes have been excellent regarding average graduation on time, average GPA, and waiting period for work. SVMBS IPB University graduates occupy many strategic positions in the government and private sectors. Continuous efforts to improve the quality of education and graduates must still be carried out through improving the learning process and other efforts, such as through the piloting of the *OIE education twinning* with Yamaguchi University.

To continuously improve the programmes that have been achieved and programmes that have not been achieved, a SWOT analysis is then carried out to determine the strategy for achieving the UPPS Performance indicators. The SWOT analysis that was carried out and the strategy determined also took into account changes in the KPI imposed by IPB and the Ministry of Education and Culture.

1. SWOT Analysis SWOT

Components are identified based on each criterion's strengths, weaknesses, opportunities and challenges (criteria 1-9). The various identified SWOT components can be grouped as internal factors and external factors as follows:

1. Internal factors

A. Strength

1. The vision, mission and primary objective of SVMBS IPB University are clear and aligned with them
2. *World University ranking program in IPB institution*
3. *Recognition from other countries to alumni of SVMBS IPB University*
4. SVMBS IPB University have an "A or excellent" accreditation status of BAN-PT

5. Implementation of a quality assurance system and internal audit within IPB University
6. SVMBS IPB University implements a quality management system (SMM) ISO 9001:2015
7. Trust as a new faculty of veterinary medicine as a coach
8. Has an extensive network of cooperation
9. Has an excellent student recruitment system, and the tightness of student recruitment is above IPB University standards
10. Has international class
11. Has lecturers with excellent qualifications, competencies, and adequacy ratio between lecturers and students
12. Has good academic facilities and infrastructure
13. Acquisition of research funding is relatively high
14. Has an excellent quantity and quality of research and community services
15. Good lecturer productivity resulting in international publications, patents, and innovation
16. The excellent output of graduates in terms of graduating on time, GPA, and waiting period
17. Good cooperation with Alumni Association IPB (HA IPB, IKA SVMBS IPB University)

B. *Weaknesses*

1. The organizational structure and functions, as well as the management of academic and financial management at SVMBS IPB University, are different from other faculties at IPB University
2. The number of inbound and outbound students is still limited

3. The rate of retirement of lecturers and education staff is not balanced with the speed of recruitment and depends on formation from the government
4. A limited number of qualified laboratory staff
5. Laboratory services and units in FKH have not been integrated
6. Not all scope of laboratory services is accredited
7. Dependence on off-campus educational vehicles
8. High credit load
9. Research activities and community services have not been evenly distributed
10. Scientific publications, patents, and lecturer innovations are not evenly distributed

2. External Factors

a. Opportunity

1. Membership as an associate member of EAEVE and ASIIN
2. KPI achievement incentives
3. Ministry of Education and Culture Program (training, research, innovation, link and match through KEDAIREKA, organizing seminars, sabbatical leave, visiting professor)
4. The revitalization program for the faculty of veterinary medicine from the Ministry of Education and Culture
5. Independent campus learning program
6. The need for national veterinarians is high
7. Increased world attention on zoonotic diseases and new-emerging diseases

8. Free trade in animals and food products of animal origin requires the role of veterinarians
9. Increased offers of cooperation at home and abroad
10. The interest of prospective regional and international students is relatively high
11. The development of digital technology 4.0
12. OIE's offer for twinning programmes
13. University to University's collaboration with various Japanese universities through the AJIVE scheme
14. High opportunity to obtain funding for collaboration in academic and research fields under the one health framework
15. many scholarship offers are available for both national and international for lecturers to continue their higher education (LPDP, DAAD, MEXT, Government of Thailand, Malaysia and other countries)
16. Availability of veterinary education standards both nationally and internationally

Threats

1. The opening of opportunities for foreign veterinarians to work in Indonesia as a consequence of AFTA and MEA
2. The establishment of the new faculties of veterinary medicine has tightened competitiveness in getting new students, graduates, and off-campus educational vehicles.
3. Increasing the academic quality of other faculties of veterinary medicine in Indonesia
4. There are restrictions on the recruitment/ acceptance of lecturers and

education staff

5. There is a limit to the number of educator certifications from the government
6. Public demands for accreditation/ certification of laboratory examination services
7. The student recruitment system by invitation is adopted nationally
8. The covid-19 pandemic has affected Tri Dharma activities

Analisis SWOT

S-O	S-T	W-O	W-T
<p><i>Optimizing existing strengths and opportunities to obtain national and international accreditation.</i></p>	<p>Restructuring the curriculum according to international accreditation standards EAEVE and ASIIN, as well as strengthening <i>life-based learning</i> in producing veterinarians who are superior, agile, adaptive to change, and globally competitive.</p>	<p><i>Develop a staffing development plan, and increase the qualifications and competencies of existing human resources through training to ensure the availability of adequate quality and quantity of human resources.</i></p>	<p><i>Developing services to become a certified Academy Business Unit (SUA).</i></p>
<p><i>Integration of the tutoring system, academic management, and revitalization of academic support based on continuous improvement in realizing the independence of educational facilities.</i></p>	<p>Guidance and research facilitation to support the careers of lecturers and education staff at various levels of rank, which simultaneously produce publications, Intellectual Property Rights, and innovations that benefit the wider community.</p>	<p><i>Develop a strategic plan for community service as a reference for PkM implementation for lecturers and students</i></p>	
<p><i>Make optimal use of the collaborative network of SVMBS IPB University with stakeholders and alumni networks to increase research and community service activities in the framework of developing SVMBS IPB University human resources to</i></p>		<p><i>Encouraging the SVMBS IPB University community to take part in various activities related to the Tri Dharma at the national and international levels</i></p>	

S-O

S-T

W-O

W-T

Face the challenges of the digital age.

Development of community service activities to improve services and the role of SVMBS IPB University in maintaining the health of the veterinary community.

3. Strategic Plan

Based on the analysis of all SWOT components, namely the analysis of various internal and external factors (SO, ST, WO and WT analysis) as shown in the SWOT analysis, the strategy for problem-solving, improvement and development of SVMBS IPB University is as follows the following:

1. Optimizing existing strengths and opportunities to obtain national and international accreditation.
2. Integration of the tutoring system, academic management & revitalization of academic support based on continuous improvement in realizing the independence of educational facilities.

3. Restructuring the curriculum according to international accreditation standards (EAEVE and ASIIN) and strengthening life-based learning in producing veterinarians who are superior, agile, adaptive to change, and globally competitive veterinarians.
4. Make optimal use of the collaboration network of SVMBS IPB University with stakeholders and alumni networks to increase research activities and community service in the context of developing SVMBS IPB University human resources to face the challenges of the digital era.
5. Develop a staffing development plan and improve the qualifications and competence of existing human resources through training to ensure the availability of adequate quality and quantity of human resources.
6. Develop research coaching and facilitation programmes to support the careers of lecturers and education staff at various levels of rank, which simultaneously produce publications, Intellectual Property Rights and innovations that benefit the wider community.
7. Develop a program to develop community service activities to improve services and the role of SVMBS IPB University in maintaining the health of the veterinary community.
8. Encouraging the SVMBS IPB University community to participate in various activities related to Tri Dharma at the national and international levels

4. Strategic Programmes

1. Optimizing existing strengths and opportunities to obtain national and international accreditation
 - National and international accreditation (LAMPT-Kes, EAEVE and ASIIN)

accreditation)

2. Integration of governance systems, academic management, and revitalization of academic support based on continuous improvement in realizing the independence of educational facilities.
 - Implementation of the transformation of the Faculty of Veterinary Medicine IPB University into the School of Veterinary Medicine and Biomedical Sciences
 - Arrangement of postgraduate study programmes for Masters/S3: Veterinary Biomedical Sciences with specializations
3. Restructuring the curriculum according to international accreditation standards EAEVE and ASIIN, as well as strengthening life-based learning in producing veterinarians who are superior, agile, adaptive to change, and globally competitive
 - Formation of a Curriculum Committee and strengthening of the curriculum/academic organizational structure and system (EAEVE and ASIIN requirements)
 - Curriculum workshops and development of learning models
4. Make optimal use of the collaborative network of SVMBS IPB University with stakeholders and alumni networks to improve education, research and community service activities, as well as develop SVMBS IPB University's human resources to face the challenges of the digital era.
 - Development of Twinning Program for Vet Education (Yamaguchi University in the OIE scheme)
 - Development of UToU collaboration with universities in Japan through the AJIVE
 - program summer course with Arizona State University, Yamaguchi University

- Development of Animal Telemedicine Station (ATS) as an implementation of the industrial era 4.0 through collaboration with Eka Farma, Satwagia
 - Collaborating with strategic partners
 - increasing the number of publications per lecturer (International, National)
 - Establishment of Poultry Research Farm (JAPFA Comfeed Ind Tbk Cooperation)
5. Developing a staffing development plan and improving the qualifications and competence of existing HR through training to ensure the availability of quality and quantity of Adequate human resources
 - Routine evaluation of manpower planning that has been made until 2030
 - Arrangement to recruit permanent lecturers and education staff for IPB University through Civil Servants (PNS) and Non-PNS channels.
 6. Develop research coaching and facilitation programmes to support the careers of lecturers and education staff at various levels of rank, which simultaneously produce publications, intellectual property rights, and innovations that benefit the wider community.
 - In-house training coordinated by the Directorate of the directorate under the coordination of the Deputy Chancellors (publication camp, incentives for writing international publications and HAKI, assistance for document drafting, IPR, training on proposal writing)
 - Making the most of the programmes offered by the Ministry of Education and Culture and Research and Technology
 7. Developing programmes for developing community service activities the community to improve services and the role of SVMBS IPB University in maintaining the health of the veterinary community.

- Develop community service strategic plans which serve as a reference for community service activities for lecturers and students.
 - Develop regular and non-regular community service agendas.
 - Development of preclinical test services for biomedical products
 - Development of Continuing Professional Development
8. Encouraging the SVMBS IPB University community to participate in various activities related to the Tri Dharma at the national and international levels.
- Increasing inbound and outbound students and lecturers.
 - ◇ Organizing international conferences (AJIVE Seminars, INAHEX, and others)
 - ◇ Summer Course 2021
 - ◇ *International activity program assistance for lecturers (sabbatical leave, visiting professor, international seminar assistance)*
 - Increasing student achievement
 - ◇ Guidance for the preparation of the Student Creativity proposal
 - ◇ Development of outstanding students
 - ◇ Coaching students for various competition activities

Strategic Plans, Strategic Programmes, Supporting Factors, and Indicators

Strategic Plan(s)	Strategic Program(s)	Execution Time(s)					Supporting Factor(s)	Indicator(s)
		1	2	3	4	5		
1. optimizing existing strengths and opportunities to obtain national and international accreditation.	National Accreditation (Indonesian Accreditation Agency for Higher Education in Health (IAAHEH))	✓	✓	✓	✓		Funding for the national accreditation program through KMMAI IPB University	Nationally Accredited (Excellent) by LAMPT-Kes
	International Accreditations (EAEVE dan ASIIN)	✓	✓	✓			Funding for the World University program IPB University Ranking	Internationally accredited by EAEVE and ASIIN
3. Restructuring the curriculum according to international accreditation standards (EAEVE and ASIIN) and strengthening life-based learning in producing veterinarians who are superior, agile, adaptive to change, and globally competitive veterinarians.	Curriculum workshops and development of learning module	✓	✓	✓	✓	✓	Community Fund (DM) of SVMBS IPB University	Courses have textbooks (100%)
4. Make optimal use of the SVMBS IPB University collaboration network with stakeholders and alumni	Development of the Twining Program for Vet Education (Yamaguchi University in the OIE scheme)		✓	✓	✓		World Organisation for Animal Health (WOAH) and Indonesian State Budget (in Indonesian: <i>Anggaran Pendapatan dan Belanja</i>)	Collaboration is established (1 activity per year)

Strategic Plan(s)	Strategic Program(s)	Execution Time(s)					Supporting Factor(s)	Indicator(s)
		1	2	3	4	5		
networks to increase research and community service activities in the context of developing SVMBS IPB University human resources to face the challenges of the digital era.	Development of Animal Telemedicine Station (ATS)		✓	✓	✓	✓	<i>Negara</i> , or APBN) Private Sector	Has a Telemedicine Station at RSHP
	Collaboration with strategic partners	✓	✓	✓	✓	✓	Private Sector	There is a collaboration program 1 activity per year
	Increase the Number of Publications per lecturer (International, National)	✓	✓	✓	✓	✓	Grand Funding (domestic and foreign)	Lecturer publication 1 person per year
	Establishment of a Poultry Research Farm (Cooperation with JAPFA Comfeed Ind Tbk)	✓	✓	✓	✓	✓	Private Sector, IPB University	Has a poultry research farm
	Development of specialist programmes at the national and Asian	✓	✓	✓	✓	✓	Foreign Cooperation	Delivery specialist program (1 person per year)
	Development of cooperation with Government agencies	✓	✓	✓	✓	✓	Regional government cooperation	Follow up on the extension of existing collaborations and add one collaboration with government agencies
	Development of cooperation with private institutions	✓	✓	✓	✓	✓	Private sector	Collaboration with private institutions, as many as 3 cooperation agreements
	Development of Start-Up School collaboration to facilitate student and alumni	✓	✓	✓	✓	✓	In the private sector, IPB University	Development of student and alumni entrepreneurial cooperation through the general

Strategic Plan(s)	Strategic Program(s)	Execution Time(s)					Supporting Factor(s)	Indicator(s)
		1	2	3	4	5		
	entrepreneurship							alumni stadium twice a year
	Development of pages and various social media platforms of SVMBS IPB University professionally and sustainably as an effective communication medium in the 4.0 era	✓	✓	✓	✓	✓	The private sector, Community Fund (DM) of SVMBS IPB University	Update SVMBS IPB University's social media platform pages at least once a month
	Increasing network strength WiFi in SVMBS IPB University so that access related to education, research, and community service can run optimally	✓	✓	✓	✓	✓	IPB University	Update and add WIFI facilities once a year

Strategic Plan(s)	Strategic Program(s)	Execution Time(s)					Supporting Factor(s)	Indicator(s)
		1	2	3	4	5		
5. Develop a plan for staffing development and improve the qualifications and competencies of existing HR through training to ensure the availability of adequate quality and quantity of human resources	Routine evaluation of manpower planning has been made until 2030	✓	✓	✓	✓	✓	Community Fund (DM) of SVMBS IPB University	There is a quota of one team member per year
	Arrangement for the recruitment of lecturers and permanent education staff of IPB through the PNS and NonPNS channels	✓	✓	✓	✓	✓	Community Fund (DM) of SVMBS IPB University	There is a quota of one team member per year
1. Develop research coaching and facilitation programmes to support the careers of lecturers and education staff at various levels of rank, which simultaneously produce publications, Intellectual Property Rights and innovations that benefit the wider community	In-house training coordinated by the Directorate of Human Resources IPB University	✓	✓	✓	✓	✓	The Directorate is under the coordination of the Deputy Chancellor of IPB University and the Ministry of Education, Culture, Research, and Technology	Twice a year
	Publication writing training (publication camp)	✓	✓	✓	✓	✓		Twice a year
	Writing incentives, textbooks, international publications, and Intellectual Property Rights Assistance for drafting	✓	✓	✓	✓	✓		Twice a year
	Intellectual Property Rights Research proposal writing training	✓	✓	✓	✓	✓		Twice a year
2. Develop a program to develop community service	Develop a Community Service Strategic Plan	✓	✓	✓	✓	✓	Community Fund (DM) of SVMBS IPB University	
	Develop regular and non-	✓	✓	✓	✓	✓	Community Fund (DM) of	Once a year

Strategic Plan(s)	Strategic Program(s)	Execution Time(s)					Supporting Factor(s)	Indicator(s)
		1	2	3	4	5		
activities to improve services and the role of SVMBS IPB University in maintaining the health of the veterinary community	regular community service agendas						SVMBS IPB University	
	Development of Preclinical Test Services for biomedical products	✓	✓	✓	✓	✓	National Research and Innovation Agency	Twice a year
	Continuing Professional Development Programmes	✓	✓	✓	✓	✓	Collaboration with the Indonesian Veterinary Medical Association	Twice a year
	Regular participation in exhibitions in the field of animal husbandry and animal health at national and international levels	✓	✓	✓	✓	✓	Collaboration with the private sector and Community Fund (DM) of SVMBS IPB University	Participation in national events (2 times) and international events (1 time)
	Routine inspection of animals and (Qurban) sacrificial meat	✓	✓	✓	✓	✓	Collaboration with local governments and IPB University	Five different cities/districts for (Qurban) animal examination
	Zoonotic diseases control, such as vaccination and counselling	✓	✓	✓	✓	✓	Collaboration with local governments and private institutions	Counselling and/or vaccination program (twice a year)
	Feral cat population control	✓	✓	✓	✓	✓	Collaboration with the Indonesian Veterinary Medical Association and private sector	Feral cat population control is held once a year
	Mobile large animal health service	✓	✓	✓	✓	✓	Community Fund (DM) of SVMBS IPB University	Large animal health services around 12 times a year
	Community service around Indonesia through the Abdi Nusantara (<i>Nation Service</i>) program and Integrated Real Work Lectures (KKN-T)	✓	✓	✓	✓	✓	Provincial Government Institution(s) and Community Fund (DM) of SVMBS IPB University	Community service around Indonesia through the ABDI Nusantara and/or KKNT programmes is carried out once a year
Community animal health care program around the campus, which is carried out by each	✓	✓	✓	✓	✓	Community Fund (DM) of SVMBS IPB University	The community animal health care programmes around the campus which is carried out by	

Strategic Plan(s)	Strategic Program(s)	Execution Time(s)					Supporting Factor(s)	Indicator(s)
		1	2	3	4	5		
	SVMBS IPB University professional (interest) association							each SVMBS IPB University professional interest association (held 4 times a year)
	Sharing of veterinary knowledge to the public through school visits	✓	✓	✓	✓	✓	Collaboration with local government(s) and Community Fund (DM) of SVMBS IPB University	Sharing knowledge of veterinary medicine to the public through school visits (carried out 4 times a year)
3. Encouraging the SVMBS IPB University community to take part in various activities related to the three pillars of higher education at the national and international levels	Increasing the in-out bond between students and lecturers							
	• Increasing academic cooperation in the forums AFKHI, ARSHI, SEAVSA, AAVS, SEAOHUN, AJIVE, AiCVIM	✓	✓	✓	✓	✓	IPB University, Ministry of Education, Culture, Research, and Technology, international funding, private sector	Holding scientific activities involving the organization in two national and/or international events
	• INAHEX	✓	✓	✓	✓	✓	Collaboration with private industry, IPB University	One event a year: INAHEX
	• Summer Course	✓	✓	✓	✓	✓	Collaboration with international institutions, IPB University, Ministry of Education, Culture, Research, and Technology	One event a year: summer course
	• International activity program for lecturers (sabbatical leave, visiting professor, international seminar assistance)	✓	✓	✓	✓	✓	IPB University, Ministry of Education, Culture, Research, and Technology	One event a year
	Increasing student achievement							
	• Guidance for the preparation of Student Creativity Program (PKM) proposals	✓	✓	✓	✓	✓	Community Fund (DM) of SVMBS IPB University	Two events a year
	• Development of outstanding	✓	✓	✓	✓	✓	Community Fund (DM) of	Two events a year

Strategic Plan(s)	Strategic Program(s)	Execution Time(s)					Supporting Factor(s)	Indicator(s)
		1	2	3	4	5		
	students • Coaching students for various competition activities	✓	✓	✓	✓	✓	SVMBS IPB University Community Fund (DM) of SVMBS IPB University	Two events a year

ROADMAP OF RESEARCH AND COMMUNITY SERVICE OF THE SCHOOL OF VETERINARY MEDICINE AND BIOMEDICAL SCIENCES IPB University REFERRING TO THE RESEARCH AND COMMUNITY SERVICE MASTER PLAN (RIPPM) OF IPB 2015-2026 PERIOD

PREFACE

The Roadmap for Research and Community Service of the School of Veterinary Medicine and Biomedical Sciences of IPB University (SVMBS IPB University) for the 2015-2026 period was prepared in the framework of an effort to realize the three pillars of higher education, which is synergistic and sustainable from time to time. As an institution in society, the School of Veterinary Medicine and Biomedical Sciences of IPB University is obliged to provide scientific contributions developed through research to be applied in society. As a form of efficiency in implementing the three pillars of higher education, it is excellent if there is a continuous pattern between research and community service. This plan was prepared as a reference, and an overview of the core activities in research and community service carried out by the academic community of SVMBS IPB University. This reference must be compiled to give direction to research and community service, so synergy, relevance, and continuity are formed from time to time so that the results achieved remain in the same corridor.

It is hoped that preparing the Roadmap for Research and Community Service will motivate the academic community of SVMBS IPB University to develop superior research in each scientific discipline. Furthermore, this Roadmap for Research and Community Service is expected to be a reference and benchmark for developing the following Roadmap for Research and Community Service.

INTRODUCTION

The School of Veterinary Medicine and Biomedical Sciences (SVMBS) of IPB University, as part of the large IPB institution, has a vision that supports the realization of the institutional vision. By carrying out the vision of realizing veterinary and biomedical study programmes based on innovative research in the development of human resources and science and technology to produce highly competitive graduates in 2035.

Efforts to realize the vision of SVMBS IPB University in developing the field of science and technology in veterinary medicine and biomedicine are carried out by developing research in various fields related to this matter. From 2005 to 2019, 32 innovation works by the SVMBS IPB University academic community were successfully patented. All these patents are within the scope of science and technology in veterinary science and biomedicine. In line with the dynamics of research activities in SVMBS IPB University, SVMBS IPB University research and community service activities are also actively carried out. SVMBS IPB University research and community service activities are unstructured and have SVMBS uniqueness. SVMBS IPB University has implemented efficiency in implementing three pillars of higher education since the beginning. Most of the community service activities carried out by SVMBS IPB University also serve as a vehicle for education in the Veterinary Professional Education Program (VPE). The scopes of services to the community that is carried out are

1. Veterinary hospital and ambulatory services
2. Quality and safety testing services for biological products from various industries
3. Pathological-anatomical and histopathological diagnostic services
4. Animal laboratory diagnostic services
5. Pregnancy Examination and Artificial Insemination Services and Training
6. Health Consultation and Health Management carried out by institutions or individuals
7. Examination and testing services for parasites and microbiology
8. Examination of Sacrificial Animals
9. Training services, courses, and continuing education

Community service also provided input by lecturers as experts in their fields, both in government and non-government agencies. The SVMBS IPB University Research and Community Service Roadmap is a guide for developing research and community service and a reference for policy direction and decision-making in research and community service management.

The SVMBS IPB University Research and Community Service Roadmap was prepared by considering the strengths, weaknesses, opportunities and threats faced by SVMBS IPB University and grouped into each aspect of three pillars of higher education, namely education, research, and community service. Furthermore, it is hoped that the Research and Community Service Roadmap of SVMBS IPB University will guide the direction and development of the Faculty of Veterinary Medicine for the next period.

AIMS

The SVMBS IPB University Research and Community Service Roadmap for the 2015-2025 period aims to realize IPB University as a world-class research-based University by increasing the quality and quantity of research as the basis for implementing the tri dharma of higher education. The roadmap is expected to provide direction for both individual and institutional research that involves interdisciplinary disciplines and synergizes research activities so that they are relevant and sustainable from time to time. A research roadmap was also developed to motivate research activities that have superior value as a basis for forming and developing prospective research umbrellas (grand research) from each field of science and study program in developing and anticipating the needs of stakeholders.

In detail, the purposes of preparing the Research and Community Service Roadmap are:

1. Supporting IPB University towards a world-class research-based University
2. Establish and develop a superior research umbrella (grand research).
3. Exploring and improving the efficiency of the use of research funds
4. Increase the focus of research to achieve IPB University as a world-class research-based University in producing pious, independent, and intellectual-human resources in harmony with the development of science and technology.
5. Improving the quality and productivity of research in the form of publications in national and international scientific forums, publications in accredited national journals and reputable international journals, teaching materials, appropriate technology, and IPR.
6. Increase the relevance of using research results within the three pillars of higher education.
7. Increasing the role of SVMBS IPB University in accelerating regional and national development towards a prosperous Indonesian society.

The objectives of developing the Roadmap of Research and Community Service include:

1. The formation of leading research directions for researchers
2. Compilation of academic staff expertise map
3. Compilation of research roadmap components and their mandate as a reference for study programmes, departments, faculties and universities in research planning and implementation
4. The implementation of targeted research activities, quality and sustainability for the development of science, technology, arts, and/or sports, which prospers individuals and society, support regional and national development and contributes to solving global problems
5. The realization of a research culture as the basis for a research-based University
6. The realization of an increase in technological findings or other products in various fields of science that are prospective, applicable, and effective for development and society.
7. Realization of increasing national and international publications, patents/intellectual property rights/copyrights.

SCOPE

Philosophically, veterinary science is in the realm of health/medical science. This philosophy is reflected because the basic knowledge taught, developed, and taught is medical/medical science, so it is closely related to the field of human medicine. Several primary scientific fields that can be synergized between Veterinary Medicine and Human Medicine include Physiology, Pharmacology, Histology, Biochemistry, Microbiology (Bacteriology, Virology, Mycology), Immunology, Parasitology, Embryology, Clinical Pathology, Surgery, Reproduction, Public Health Veterinary, Epidemiology, and Pharmacy. Laboratory facilities that can be used collectively include Chemistry, Biochemistry, Microbiology, Immunology, Parasitology, Embryology, Histology, Histopathology, Pharmacology, Pharmacy, Physiology, and Anatomy.

Veterinary science handles matters regarding animals and their diseases (veterinary function) related to security guarantees and risks that can interfere with health (safety) from animal to animal and from animal to human. Veterinary medicine aims to guarantee human health, public health, and environmental health (assurance) regarding international guidelines and information, as well as paying attention to animal welfare aspects. Veterinary science also includes the application of medical science (promotive, preventive, curative and rehabilitative). This discipline also includes guidelines for the veterinary

profession (veterinarians' code of ethics and oath).

Based on the scope presented above, the field of veterinary medicine has a place in the National Research Master Plan (RIRN), namely focusing on food agriculture and Health-medicine (Table 1).

Table 1 National Research Master Plan in Veterinary Medicine

Research Themes	Research Topics	Related Institutions	Targets
Post-harvest technology	Diversification and down streaming of agricultural, plantation, livestock and fishery products	Ministry of Agriculture, Ministry of Forestry and Environment, Ministry of Maritime Affairs and Fisheries, National Research and Innovation Agency, Universities	Beef preservation technology
The technology of Food Security and Food Self-sufficiency	Food self-sufficiency of ruminant commodity	Ministry of Agriculture, National Research and Innovation Agency, the National Agency of Drug and Food Control (NA-DFC), Universities	Cattle flushing technology, large and small ruminant superior seed technology, superior animal feed and feed additives technology
Biopharmaceutical Product Technology	Mastery of primary vaccine production (hepatitis, dengue)	Ministry of Health, Ministry of Industry, National Research and Innovation Agency, the National Agency	Seed Vaccine of Hepatitis B and Dengue

Research Themes	Research Topics	Related Institutions	Targets
		of Drug and Food Control, Universities	
	Mastery of stem cells	Ministry of Health, Ministry of Industry, National Research and Innovation Agency, the National Agency of Drug and Food Control, Universities	Applied stem cell
	Mastery of biosimilar products and blood products	Ministry of Health, Ministry of Industry, National Research and Innovation Agency, the National Agency of Drug and Food Control, Universities	EPO (Human Recombinant Erythropoietin), Insulin
The technology of Medical and Diagnostic Devices	Development of in vivo diagnostics	Ministry of Health, Ministry of Industry, National Research and Innovation Agency	Diagnostic kits for dengue and HIV
	Development of in vivo diagnostics (IVD) for the detection of degenerative diseases	Ministry of Health, Ministry of Industry, National Research and Innovation	Diagnostic kit prototypes for degenerative diseases

Research Themes	Research Topics	Related Institutions	Targets
		Agency	
	Development of electromedical tools	Ministry of Health, Ministry of Industry, National Research and Innovation Agency	Haemodialysis tools, semilunar flushing, the valve device
Independence Technology of Medicinal Raw Material	The development of phytopharmaca based on local resources	Ministry of Health, Ministry of Industry, National Research and Innovation Agency, the National Agency of Drug and Food Control	Utilization of biodiversity as phytopharmaca
	Chemical raw materials	Ministry of Health, Ministry of Industry, National Research and Innovation Agency, the National Agency of Drug and Food Control	Vitamin A based on pigment, cephalosporin and other antibiotics, dextrose monohydrate
	Research of <i>Jamu</i> and herbal, natural pigment production technology	Ministry of Health, Ministry of Environment and Forestry, Ministry of Industry, National Research and Innovation Agency, the	A medicinal plant extract raw material, standardized herbal medicine

Research Themes	Research Topics	Related Institutions	Targets
		National Agency of Drug and Food Control	

In line with the national research theme compiled by the ministry of research and higher education, research activities at SVMBS IPB University focus on basic, applied and development research that accommodates the fields of animal and livestock health studies and comparative medicine (comparative medicine). These studies were developed per existing scientific disciplines at SVMBS IPB University and are divided into three major scientific clusters, namely Anatomy, Physiology and Pharmacology (AFF); Clinic, Reproduction and Pathology (KRP); Animal Infectious Diseases and Veterinary Public Health (IPHK). The AFF science family includes anatomy, physiology, and pharmacology. Understanding body systems' structure, development, function, mechanism and response and their engineering. The KRP science family includes Veterinary Clinic, Reproduction, Obstetrics & Gynaecology, Pathology, Pharmacy, Animal Health Management, Diagnostics and Therapy. The IPHK science cluster is divided into 3, namely, (1) Division of Veterinary Public Health, (2) Division of Medical Microbiology, and (3) Division of Parasitology and Medical Entomology. The scope of veterinary public health is to guarantee the safety and quality of food of animal origin, environmental sanitation and control of diseases originating from animals that can be transmitted to humans or vice versa. Veterinary public health also includes investigating causes, planning and monitoring control programmes, and economic analysis of disease in populations. Medical Microbiology has the scope of bioecology, pathogenesis, microbial control, and immune response. Bioecology, pathogenesis, microbial control, and immune response are all aspects of medical microbiology. The Division of Parasitology and Medical Entomology studies bioecology, pathogenesis, and control of parasitic worms, protozoa, insects, and roots, as well as their role as disease vectors in animals and humans.

The research focus of SVMBS IPB University develops and moves dynamically according to world developments. Increasing world attention on the outbreak of new diseases (new-emerging diseases) and other zoonotic diseases in Indonesia and other tropical countries, as well as the globalization of trade in animals and their products, requires the role of veterinarians in maintaining the health of humans, animals and the environment. Therefore, SVMBS IPB University equips itself with developing facilities and study units covering this matter. Increasing academic and research collaboration within the

framework of One Health. Research development at SVMBS IPB University focuses on current issues, namely zoonoses and herbal medicine.

SWOT Analysis of Research, Community Service, and Collaboration

Table 2 SWOT Analysis of Research, Community Service, and Cooperation in the Study Programmes of the School of Veterinary Medicine and Biomedical Sciences, IPB University

STRENGTHS (S)	WEAKNESSES
<ol style="list-style-type: none"> 1. High academic ability of lecturers, lecturers with doctoral and master's degrees of more than 95% 2. The number of research activities, community service, and collaboration is high, and several SVMBS IPB University lecturers consistently receive competitive grants 3. The number of international publications (based on Scopus) for SVMBS IPB University lecturers ranks 1st in the scope of IPB University, and IPB ranks 4th in Indonesia 4. Up-to-date laboratory equipment to support research activities, community service and cooperation 5. The scientific competence of lecturers is relatively high, and they have good networks both at home and abroad 6. Research activities, community service and collaboration, have involved the majority (65%) of students 7. Several lecturers' research results have succeeded in obtaining patents 8. Has a research umbrella at the institutional level 	<ol style="list-style-type: none"> 1. Allocation of institutional research funds for coaching young lecturers is still minimal 2. Research and community service activities are not evenly distributed among all lecturers 3. Lecturers' international scientific publications are not evenly distributed (still dominated by several lecturers) 4. There are no accredited/certified laboratories within the Faculty 5. Commercial application and utilization of research results are still low

OPPORTUNITIES (O)	THREATS (T)
<ol style="list-style-type: none"> 1. Opportunities for collaboration in the field of research with foreign universities 2. Opportunities for cooperation in the form of services or analysis needed by parties outside the University or the private sector 3. There are still many sources of funds that have not been utilized 4. There are laws and regulations regarding intellectual property rights and a reward system for scientific publications 5. The obligation to cooperate with other institutions or universities in the implementation of several types of competitive grants 	<ol style="list-style-type: none"> 1. Competition (competitiveness) within and between universities to obtain research funding and community service is getting higher and more challenging, both within and outside the country 2. The country's economy is not yet stable, affecting the amount of regular funding for research and international publications 3. The demand for laboratory accreditation is getting higher for the validation of research results as well as collaboration and services 4. Companies in Indonesia have not yet supported the commercialization of higher education research results

Research Development Strategy, Community Service, and Cooperation

The strategies of SVMBS IPB University in developing research, community service and collaboration are through:

1. Increasing cooperation in the field of research with universities abroad
2. Increasing cooperation in the form of services or analysis needed by parties outside the University or the private sector
3. Utilizing many sources of funds that have not been utilized to improve facilities and service quality
4. Encouraging lecturers to obtain patents and publications under laws and regulations regarding intellectual property rights and a reward system for scientific publications
5. SVMBS IPB University collaborates with other institutions or universities in implementing several types of competitive grants
6. SVMBS IPB University always supports government activities in increasing livestock population, increasing livestock product production, veterinary public health and animal health through community service at both regional and national levels
7. Development of research at SVMBS IPB University that focuses on current issues, namely zoonoses and herbal medicines
8. Strengthening the functions of the Animal Hospital of SVMBS IPB University, Laboratory Animal Management Unit (UPHL), Rehabilitation and Reproduction Unit (URR), and Residential Pest Control Study Unit (UKPHP) as a means of multi-level veterinary education and continuing education

POLICY FRAMEWORK AND RESEARCH AND COMMUNITY SERVICE ROADMAP

3.1 Policy Framework – National Policies

The formulation of the 2015-2025 Research and Community Service of the School of Veterinary Medicine and Biomedical Sciences (SVMBS) IPB University policy framework was prepared within the framework of realizing IPB University's vision, missions, and objectives (Strategic Planning) by considering several policies at the national level such as the National Long-Term Development Plan (RPJPN) 2005-2025, the Master Plan and the 2025 Indonesia Innovation Vision, the master plan for the Acceleration and Expansion of Indonesia's Economic Development (MP3EI) 2011-2025, the National Medium Term Development Plan 2015-2019, the Ministry of Technology Research and Higher Education Strategic Plan 2015-2019, the National Strategic Policy on Science and Technology (Jakstranas Iptek) 2015-2019, and the 2015-2019 National Research Agenda (ARN) and the Ministry of Research and Technology's 2017-2045 National Research Master Plan.

The vision for Indonesia contained in the RPJPN 2005-2025 is an Indonesia that is independent, advanced, just and prosperous. The description of the vision is as follows:

1. Independent: Realizing a parallel and equal life with other nations by relying on one's abilities and strengths
2. Advanced: Quality and prosperous Indonesian human resources accompanied by a solid political and legal system and institutions
3. Fair: There are no restrictions/discrimination of any kind, whether between individuals, gender, or region
4. Prosperous: All their needs are met so that they can give meaning and importance to other nations.

The Master Plan for the Acceleration and Expansion of Indonesia's Economic Development (MP3EI) 2011-2025 is one of the efforts to accelerate and expand economic development through the development of 8 (eight) main programmes consisting of 22 (twenty-two) main economic activities. The MP3EI implementation strategy is carried out by integrating 3 (three) main elements, namely: (1) developing regional economic potential in 6 (six) Indonesian Economic Corridors, namely: Sumatra Economic Corridor, Java Economic Corridor, Kalimantan

Economic Corridor, Sulawesi Economic Corridor, Economic Corridor Bali–Nusa Tenggara, and the Papua–Maluku Archipelago Economic Corridor; (2) strengthening national connectivity that is locally integrated and globally connected; (3) strengthening the capacity of national human resources and science and technology to support main development program in each economic corridor. An overview of economic corridors and leading economic activities is presented in Figure 1



Figure 1 Overview of economic corridors and leading economic activities

ROADMAP, TARGETS, STRATEGIC PROGRAMMES AND PERFORMANCE INDICATORS IN RESEARCH AND COMMUNITY SERVICE

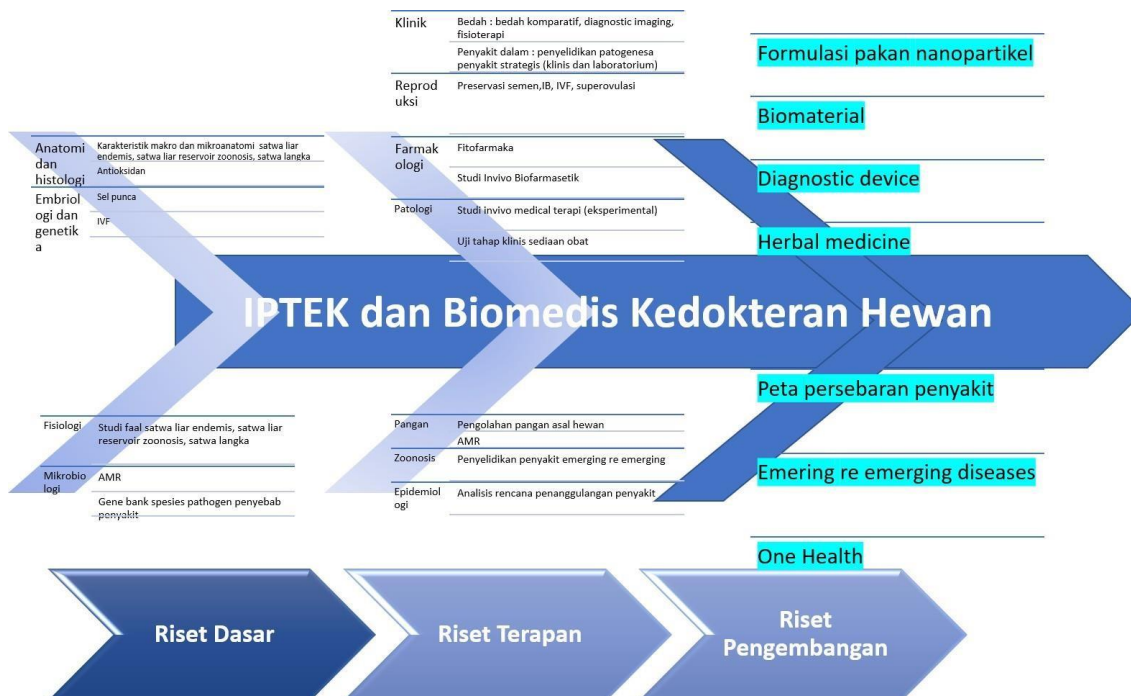


Figure 2 Roadmap for Research and Community Service of SVMBS IPB University

Research activities at SVMBS IPB University include basic, applied and development research. This research was conducted following the disciplines of SVMBS IPB University. Basic sciences include anatomy and histology, physiology, pharmacology, embryology, and genetics. The scope of the anatomy and histology section deals with the macro and microanatomical characteristics of animals. Especially endemic wildlife, zoonotic reservoir wildlife, rare animals, and histological characteristics of active cellular components, especially antioxidants, hormones, and enzymes. Research in this field aims to develop knowledge related to the structure and function of animal body anatomy, biological processes, and engineering at the molecular, cellular, tissue and organ levels. The scope of the physiology section is centred on the study of physiology, particularly on endemic wildlife, reservoir wildlife and endangered species. This research aims to develop knowledge about physiology and biology and their

application in supporting science and participating in addressing global health problems. The scope of pharmacology and toxicology includes the study of pharmacology and in vivo biopharmaceuticals. The toxicity of drug product preparations is also part of the pharmacology and toxicology scope. This research focuses on exploring the efficacy of drugs for various disorders of the body's organs, producing drug products for animals and humans. The focuses include pharmacological activity, proven safety levels, and developing pharmacotherapies. The science of embryology and genetics scope includes stem cell development and in vitro fertilization (IVF). Research in this field is centred on the manufacture and development of stem cells (production, function and application) as a therapeutic option, embryonic gene expression and application, as well as evaluating the success rate of IVF.

The clinic, reproduction and pathology science family include clinical animal science (internal medicine, surgery and radiology), reproduction, obstetrics & gynaecology, pathology, pharmacy, animal health management, diagnostics and therapy. The scope of the veterinary clinical science section functions to investigate the pathogenesis of strategic diseases (clinical and laboratory), the biochemical characteristics of body metabolites in animals (especially Indonesian races and endangered species) and the development of disease management therapies. The scope of the surgical science section includes comparative surgery, diagnostic imaging, physiotherapy, and the application and evaluation of biomaterials. This study aims to obtain findings and updates on surgical methods, surgical case management, biomaterial applications, physiotherapy as a postoperative therapy option and biomaterial applications. The reproductive sciences include semen preservation, artificial insemination (AI), IVF and superovulation. This research aims to achieve maximum reproduction results and technology development to increase success. The scope of the pathology science section includes studies of the characteristics of pathological organs, tissues and cells, in vivo medical (experimental) therapy and clinical stage trials of drug preparations. The scope of the pharmaceutical sciences section includes characterization, effectiveness testing and manufacture of pharmaceutical preparations.

The science in the scope of Animal Infectious Diseases and Veterinary Public Health includes the Division of Veterinary Public Health and Epidemiology, the Division of Medical Microbiology and the Division of Medical Parasitology and Entomology. The research scope for the Division of Veterinary Public Health and Epidemiology includes the guarantee of the safety and quality of food of animal origin, environmental sanitation and

control of diseases originating from animals that can be transmitted to humans or vice versa. Investigation of the causes of disease occurrence, planning and monitoring of control programmes and economic analysis of diseases in populations are also part of the Division of Veterinary Public Health and Epidemiology. The scope of research in the Division of Medical Microbiology includes bioecology, pathogenesis, safety and quality assurance of medical products, and the development of biotechnology in evaluating antibiotic resistance. The Division of Medical Parasitology and Entomology performs research regarding bioecology, pathogenesis, and control of parasites and arthropods. This division also studies the role of parasites and arthropods as vectors of human and animal diseases. Lastly, the role of pesticides against residential pests (efficacy, biosafety, and resistance management) and the role of ectoparasites as a vector are also studied in the division.

The Target of the Research and Community Service Program is to make SVMBS IPB University a reference in the development of science and technology in the area of Veterinary Medicine and Biomedical Sciences (Vision)

The research and community service programmes of SVMBS IPB University are expected to benefit the community, students, researchers and the nation's progress. PPM program objectives include:

1. Availability of primary data as a reference for researchers in research-based related science clusters
2. Use of safe and standardized medical products in animals and humans
3. Realization of findings and development of therapies in animal diseases
4. Realization of the development and updating of knowledge in a sustainable manner
5. Realizing findings and development of medical technologies and products in each science family that are prospective, applicable and effective in animal health and health.
6. Realizing individual and community welfare and supporting and contributing to solving animal health problems nationally and globally.
7. Realization of an increase in scientific publications and IPR.
8. Improving the community's standard of living through animal health and animal husbandry by harmonizing the relationship between humans, animals and their environment (one health).

The Output(s) of Each Topic of Research and Community Service of SVMBS IPB University

The research provides outputs in the form of scientific publications, books, inventions of new methods and intellectual property rights (IPR) in the form of patents or copyrights. The output of this PPM is one of the steps to achieve the vision and mission of the three pillars of Indonesian universities in general and the vision and mission of IPB University and SVMBS IPB University in particular. Research and community service activities at the SVMBS IPB University level always provide output as a track record of research. The research and community service that has been carried out and dedicated to the world of research and education make SVMBS IPB University a reference in developing science and technology in health, animal health, and biomedical sciences. Research results are presented objectively (based on actual research results), systematically, logically and neutrally (without giving importance to other parties). Scientific publications are carried out to disseminate research results on discoveries, updates or developments on previous research. The output in the form of a book can be in the form of a book or a textbook. Making a book on research results can be used as a guide for related researchers and textbooks for the development of knowledge in the world of education. The discovery or development of the method obtained is a form of contribution to the world of research. Intellectual property rights in the form of exclusive rights of researchers on the discovery of a product or helpful process for humans can be in the form of copyrights or patents. The outputs of research and community service activities in the SVMBS IPB University environment are presented in Table 3.

Table 3 Outcome of the topic of the Research and Community Service program in the SVMBS IPB University

Topic	Output				intellectual property rights (IPR)
	Journal Article	Book	New Method	Patent	
Anatomy	√	√	√	√	-
Histology	√	√	√	√	-
Physiology	√	√	√	√	-
Embryology and Genetics	√	√	√	√	-
Pharmacology	√	√	√	√	-
Clinics (Internal Medicine dan Surgery)	√	√	√	√	-
Reproduction	√	√	√	√	-
Pathology	√	√	√	√	-
Pharmacy					-
Microbiology	√	√	√	√	-
Food Sciences	√	√	√	√	-
Zoonosis	√	√	√	√	-
Epidemiology	√	√	√	√	-
Parasitology	√	√	√	√	-
Medical Entomology	√	√	√	√	-

Strategic Programmes are Prepared based on Strategic Issues

Strategic research programmes are prepared and proposed based on strategic and current issues, especially those that require solving problems related to animal and human health and the level of human welfare. Compilation of research programmes within the SVMBS IPB University environment through each or collaboration between disciplines. Each study has a target that is evaluated with work indicators. Work indicators as parameters of research continuity and scientific research results. The preparation of strategic programmes in each science cluster has targets according to their roles (Table 4).

Table 4 Strategic Research and Community Service Programmes in the SVMBS IPB University environment

Science Cluster/Topic	Target	Work Indicator							
		A	B	C	D	E	F	G	H
Anatomy <ul style="list-style-type: none"> • Understanding of the structure and function of the anatomy of the animal body, • Development of an analysis method for the anatomical structure of the animal body • Characteristics of animal morphophysiology 		√	√						
Histology <ul style="list-style-type: none"> • Cellular and micromolecular microstructural characteristics • Cellular effectiveness of testing herbal preparations in experimental animals and animal models (histology and immunohistochemistry) 		√	√						
Physiology <ul style="list-style-type: none"> • Study of physiology of body systems in wild 		√	√						

Science Cluster/Topic	Target	Work Indicator							
		A	B	C	D	E	F	G	H
animals <ul style="list-style-type: none"> • Study of the body's physiological functions against the administration of medicinal preparations 									
Embryology and Genetics <ul style="list-style-type: none"> • Research and development of stem cell production, function and application • Research on the expression of gene markers in embryos in animal models • • Application and evaluation of in vitro fertilization (IVF) success rates 		√	√						
Pharmacology <ul style="list-style-type: none"> • Toxicity test of drug preparations 		√	√						
Surgery and Radiology <ul style="list-style-type: none"> • Development of surgical methods in animal models as replicas of human disease • Design, development and testing (in vitro and in vivo) of biomaterials as therapeutic agents • Application of diagnostic imaging in the evaluation of organ and tissue characteristics • Evaluation of the administration of anaesthetic preparations for various cases of the disease in animals 		√	√						
Internal Medicine <ul style="list-style-type: none"> • Study of lesions and pathogenesis in treated animals 		√	√						

Science Cluster/Topic	Target	Work Indicator							
		A	B	C	D	E	F	G	H
<ul style="list-style-type: none"> • Treatment of internal medicine cases • Evaluation of biochemical characteristics of body metabolites, especially in Indonesian rare and endangered animal species 									
Reproduction <ul style="list-style-type: none"> • Treatment of reproductive disorders • Application of technology in supporting the development of an increasing population • Molecular analysis of semen, especially in wild and endangered animals • Evaluation of cement quality to improve • successful population increase 		√	√						
Pathology <ul style="list-style-type: none"> • Evaluation of the characteristics of tumour cells and their treatment • Study of the morpho-pathology of microorganisms in infected animals • Pathogenesis studies of microorganisms in infected animals 		√	√						
Pharmacy <ul style="list-style-type: none"> • Characterization of nanoemulgels • Test the effectiveness of medicinal preparations/extracts/herbs in various cases in animals and humans • Manufacture of pharmaceutical preparations for animals 		√	√						
Microbiology <ul style="list-style-type: none"> • Guarantee of safety and quality of 		√	√						

Science Cluster/Topic	Target	Work Indicator							
		A	B	C	D	E	F	G	H
biomedical products with supporting technology <ul style="list-style-type: none"> • Molecular characteristics of bacteria, fungi and viruses • Characterization of antigen virulence • Development of biomedical technology in the evaluation of antibiotic resistance • Antibody production 									
Food Sciences <ul style="list-style-type: none"> • Guarantee of safety and quality of food of animal origin 		√	√						
Zoonoses <ul style="list-style-type: none"> • Emerging and re-emerging disease • Environment sanitation • Control of diseases originated from animals that spread from animals to humans and vice versa 		√	√						
Epidemiology <ul style="list-style-type: none"> • Penyidikan penyebab kejadian penyakit dan penyebarannya • Perencanaan dan monitoring program pengendalian penyakit • Analisis ekonomi penyakit pada populasi 		√	√						
Parasitology <ul style="list-style-type: none"> • Bioecology, pathogenesis and parasite control • The role of parasites as disease vectors in animals and humans. 		√	√						

Science Cluster/Topic	Target	Work Indicator							
		A	B	C	D	E	F	G	H
Medical Entomology <ul style="list-style-type: none"> • Ecological research and the role of insects and arachnids as conventional and molecular vectors • The role of pesticides against residential pests (study of efficacy, biosafety and resistance management) • Comprehensive-integrated vector control 		√	√						

Note: (A) scientific publications (in the form of international and national journals, proceedings, books), (B) participation in scientific meetings, (C) inbound and outbound, (D) Intellectual Property Rights, (E) appropriate technology packages, (F) models/prototypes/designs/social engineering, (G) PPM funds, (H) cooperation partners.

CLOSING

The Research and Community Service Roadmap is a strategic formulation in determining the direction and policy of Research and Community Service to increase the role of research to support the SVMBS IPB University vision policy. The formulation and implementation of the SVMBS IPB University Research and Community Service Roadmap while simultaneously supporting IPB's slogan as a technopreneurship University based on world-class research that contributes to the development of society both locally, globally, regionally and internationally. The success of these goals will depend heavily on consistency in implementing the plans that have been set. Therefore, it is hoped that this SVMBS IPB University Research and Community Service Roadmap is a planning document used as a reference for Research and Community Service within the scope of SVMBS IPB University.

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