

THESIS

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The History of Veterinary Education with a Comparison View on different Universities

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ABSTRACT

English Abstract

This work studies how the veterinary medicine has changed looking at the history of the profession and education. Considering how the domestication of animals brought up the need for professionals being able to care for their health and how the relationship of animals with humans has changed over the past centuries. The foundation of the first veterinary school and its dissemination. With it the educational training of students in the past until the present day. In addition, presenting two universities and their points of differences. The research was carried out to determine whether it would be useful or not to make a change in the veterinary education training. By that a real survey study is tackled in this project, consisting of sixteen questions, which were answered by practicing veterinarians, students from different universities and semesters. Focusing on getting the results, from students if an early specification in their studies regarding species or other fields of veterinary science could contribute to cope with the constantly rising knowledge of the profession.

The importance of understanding and evaluating this problem is crucial, since a more denominated veterinary medicine study program could be the future. As the trend in practicing veterinarians goes more in specializing in one field of the profession and working in large clinics with specialized veterinarians.

Hungarian Abstract

Szakdolgozatomban azt vizsgáltam, hogy az állatorvoslás szakmai és oktatási szempontból miként változott a történelem során az első állatorvosképző hely megalapításától az oktatás terjedésével napjainkig, figyelembe véve, hogy a háziiasítás, valamint az állattartói kultúra változása miként keltette fel az egyes állatfajok egészségügyi ellátására képes szakemberek iránti igényt. Ezen felül két egyetemet és azok közti különbségeket mutattam be.

A kutatást azon kérdés eldöntésének érdekében végeztem, hogy érdemes lenne-e változtatni az állatorvos oktatási képzésen, vélnék e a hallgatók előnyöket a korai specifikációban (akár fajra, akár szakterületre vonatkozólag).

A vizsgálatom egy 15 kérdéses kérdőívből állt, amit praktizáló állatorvosok mellett a két egyetem különböző évfolyamokon tanuló hallgatói töltöttek ki.

Ezen probléma jelentőségének megértése és értékelése rendkívül fontos, mert egy specializáltabb állatorvos oktatási program lehet a jövő. Annál is inkább, mivel megfigyelhető az a trend, hogy a praktizáló állatorvosok egyre nagyobb része specializálódott egy adott szakterületre, különösen nagyobb klinikák dolgoznak specializált állatorvosokkal.

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CHAPTER I. INTRODUCTION

This work was done in the framework preparation of the diploma program in veterinary medicine at the “University of Veterinary Medicine of Budapest”. This document presents the historical and educational development that took place in the veterinary profession. It includes a survey which investigates whether it would be beneficial to differentiate the study structures according to the working fields of a veterinarian earlier in the training. In order to cope with the rising knowledge that needs to be covered by the universities and help with preparation for the upcoming work life.

The project starts with an overview of the literature for veterinary medicine, covering the definition, history of veterinary science, education, and its dissemination. Continuing with the changing role of animals in our society and how it effects and changes the work of veterinarians. In addition to that it describes the veterinary education today and possible challenges that comes with increasing knowledge in the field.

Where the third chapter is devoted to present two Universities and their educational training, providing basic knowledge in all areas of veterinary medicine and enables problem solving capacity through practice-oriented teaching skills. The Veterinarian Universities of Vienna and Budapest are introduced by describing their study program including courses, exams and tasks that need to be achieved to become a veterinarian. In the end of this chapter the most significant differences between the two universities are emphasized by a comparison.

In chapter four the survey questions are posed and evaluated. The survey was carried out on students belonging to any Universities of Veterinary Science. Since the question whether it is reasonable to specialize earlier in a field is a matter to all students.

As a conclusion for this project a summery is pointed out, along with the results which was determent by the survey.

CHAPTER II. LITERATURE REVIEW

2.1. BRIEF HISTORY OF THE VETERINARIAN SCIENCE

The English word 'veterinarian' comes from the Latin verb *veheri* meaning “to draw” (as in “pull”) defining one who provides medical care to animals, was first applied to those who cared for cattle or horses in ancient Rome (Guthrie, 1). The connection of the term “veterinary medicine” with Rome has encouraged a tendency to begin any discussion of the history of the practice either with the Roman physician Galen (l. 129-216 CE), the earlier Greek “Father of Medicine” Hippocrates (l. c. 460 - c. 379 BCE) or the writer Vegetius (l. late 4th or 5th century CE) when, in fact, the practice was already well-established by the time they lived. When or where veterinary medicine began is as impossible to say as it is to definitively claim when or where animals first have been domesticated. Some form of veterinary medicine most likely followed quickly upon the earliest domestication of animals which, is usually dated to 12,000-10,000 BCE, especially concerning the dog, this event date much earlier. (Mark, 2020)

In the middle east the first known veterinary practice came into being in 9,000 BC. To treat their animal’s sheep herders used basic medical skills, which included the guardian dogs of their herds. In Egypt between 4,000 and 3,000 BC, thousands of years later the medical treatment of animals became more common but was still largely undeveloped.

The first written accounts of veterinary medicine were captured approximately 1,900 BC in four sacred Hindu texts, where two distinct writings outlined the fields of human and animal medicine. In 1850, a millennia later, archaeologists discovered fragments of an ancient veterinary medical textbook made of papyrus. As horses were economically important for transportation, agriculture, and trade, the primary focus of ancient medical care was based on them. (OVRs staff, 2019)

However, it is possible to chart a rough evolution of veterinary practice in ancient civilizations such as China, Mesopotamia, Egypt and India long before it came to Greece and Rome from where it would later be developed throughout Europe. In 476 CE the Western Roman Empire fall and prior knowledge of veterinary science was lost, due to the rise of Christianity. The reason for that was the believe of the medieval Church claiming that animals had no immortal soul, hence weren’t worthy of medical treatment. It took until the late 12th and early 13th centuries CE that Europeans began to pay attention to the health of animals again, as it affected the human wellbeing. (Mark, 2020)

The animal’s health for its own sake became a focus much later in history. Veterinary Medicine would not regard again until the Age of Enlightenment with any serious interest. The ones who wrote on the subject had no knowledge of the achievements of the Chinese,

Sumerians, Indians, Egyptians, or others and were convinced that the works of the Greeks and Romans to be the earliest in the field. (Mark, 2020)

In the relationship with animals the veterinary profession has many roles and responsibilities. For centuries, the role of animals in European society was well defined. They served the utilitarian needs providing food, clothing, utensils, and transportation. The veterinarian's role was to ensure the optimum function of animals used in the daily life. With the focus on animals with financial or utilitarian value. (Fogle, 1999)

2.2. DEVELOPMENT OF VETERINARY EDUCATION

Many plaques among the domestic animals appeared in the 18th century. Such as rinderpest, anthrax, blackleg, sheep pox, scabies, glanders, contagious pleuro-pneumonia, strangles, tetanus and wound infections. Which caused enormous economic losses and brought a clear need of a college of Veterinary Medicine to the public eye.

Above all, the epidemic of rinderpest caused a terrible devastation from 1714 in the kingdom of France. Herds of cattle were dying and with them the source of milk, income and especially precious manures which fertilized the land disappeared. The sheep were also poorly maintained, modest in size, producing little wool, which led to losses in exporting such products. With the disease not disappearing and instead reappearing from decade to decade, lead to destroy the cattle and agriculture industry each time. As a result of this King Louis XV made the agricultural question a major problem. In terms of the threats of horses due to infectious diseases, such as glanders, being unbearable to troops, for works, transportation and in the fine art of horsemanship, incited the King to respond favorable to the proposal from Lyon, Claude Bourgelat (1712-1779), to create a veterinary school in the city. (Degueurce, 2012)

2.2.1. The First Veterinary School

Bourgelat was born March 27, 1712, as a son of a noble family in Lyon. Receiving a classical education and in the studies of law he received a lawyer from the University of Toulouse. Being a passionate of horses he immersed himself in the writings of that era's masters of horsemanship.

In 1740, when he was 28 years old, Bourgelat became director of the Lyon Academy of Horsemanship. During this time, according to Barber-Lomax: "Bourgelat's study of veterinary classics made him realize the deficiencies in his knowledge and under the direction of two surgeons of Lyon he studied the anatomy, physiology, and pathology of animals."

According to the book "Lyon: berceau des sciences vétérinaires" (Lyon: cradle of veterinary science) by Jack Bost, where Bourgelat was described as a rationalist, who

wanted to base medicine on known observation and experimentation. This was proven 1750 in Bourgelat's published book "Elements of the principles of veterinary art or, new knowledge about medicine and horses". Which led to his election as a member of the Academy of Sciences, founded 1666 by King Louis XIV. It was the forefront of scientific developments in Europe in the 17th and 18th centuries. Moreover, Bourgelat demonstrated in his book that he already thought of the idea of veterinary teaching standards. In the foreword of "Elements", he wrote: "Those who intend to acquire skills in veterinary art will not be able to acquire a sufficient degree of education ... (since) we do not have schools for teaching."

Coincidentally for Bourgelat, in 1761, the government of King Louis XV wished to prevent cattle diseases, protect grazing land, and train farmers. And it was proposed that a veterinary school should be founded in Lyon and that the director should be him. On August 4, 1761 he obtained a grant from the King and 6 month later, in February 1762, the first students were admitted.

2.2.2. The First Teaching Methods

Throughout the year students arrived to take theoretical courses, which were divided into three classes: The first was devoted to the study of external parts, osteology and mycology, the second to "materia medica", splanchnology and bandaging, the third to physiology, medicine, pharmacology and the appropriate use of medications.

Bourgelat wrote out all the information he required the students to learn and the students copied it word by word. Which was done to standardize classes in the beginning of the school. Later his books would become the basis of the theoretical teaching. Students were required to recite the content without error. Teaching also consisted practical training sessions of dissections and botany. Students made an herbarium and worked the forge, because Bourgelat figured veterinarians should know how to shoe and forge the utensils they use.

Till 1764 the financial future of the school was in doubt since Bourgelat was not willed to fund it with his own wealth and the King had given it only a short-term grant. Bourgelat taught his best students everything they needed to know in less than a year to send as many as possible to tackle the cattle disease, rinderpest. Through the assistance provided to agriculture by the veterinary science and art, soon the health of the stock was restored. Which led the king to command in 1764 that Lyon be given the title Royal Veterinary School meant that it would be fully supported by the state. In the same year Bourgelat was ordered to open another school in Alfort, outside of Paris. He established the standards of the two veterinary schools in 1777 and would continue to teach until he died Jan. 3, 1779, at age 67. Bourgelat helped create the veterinary profession as it is known today, by setting up the world's first veterinary training institution. (Larkin 2010)



Figure 1 Claude Bourgelat

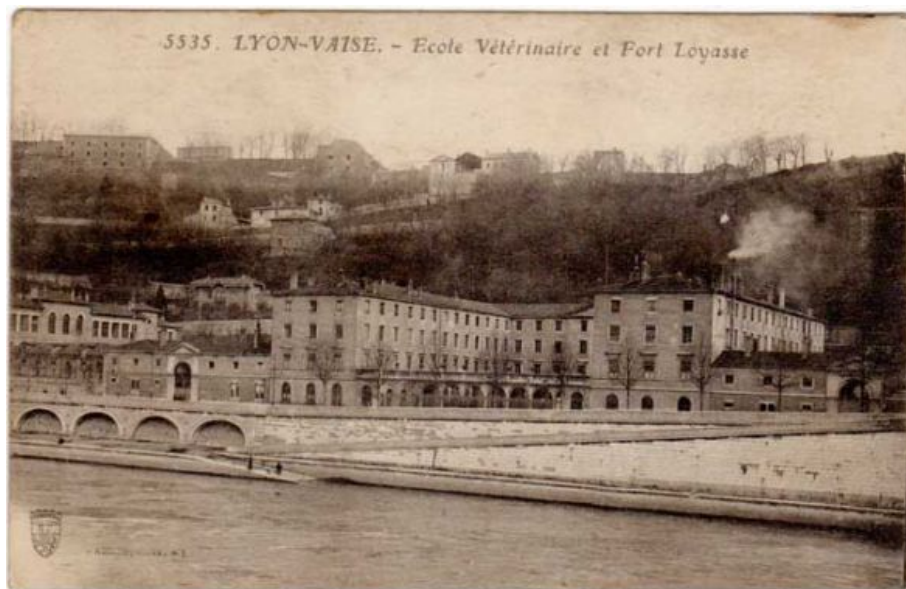


Figure 2 Former Veterinary School in Lyon

2.2.3. The Dissemination of the Veterinary Education

Several approaches would lead to the dissemination of this new version of veterinary medicine. Neighboring European governments sent students very quickly to follow the French training. Some came to Lyon, like Pieter Abildaard, who founded the Copenhagen school in 1771. Others to Alfort, for example the Italian Brugnone who created the first school of Turin in 1769. Some in both schools, like the ones who created the schools of Milan and Istanbul.

It should not be forgotten that either of these French schools were very new and little versed in species other than the horse. So many students went through the workshop of the famous hippiatrist (Bourgelat). Likewise, it is that not all schools were founded on the base of a multi-species version, like the school created in Vienna 1767 after two students came to train in Lyon. Which first was a school of hippiatry before its final version in 1777. The one in Madrid was founded in 1793 and was aimed at the military and carried on the horse. Other faculties were created in a completely opportunistic way by former French students. The most famous ones are probably Charles Vial de Saint Bel, a former student of Lyon's and Alfort's school, founder of the Royal Veterinary College of London in 1792.

In a few decades most European states were endowed with establishments of veterinary education and these new institutions were themselves participating in creating new establishments. One example is the Royal Veterinary College of London which was to lead the creation of the schools of Edinburgh in 1823, Toronto in 1862 and Montreal in 1866. (Degueurce, 2012)

2.3. CHANGING ROLE OF VETERINARIANS

2.3.1. Key Data in the Veterinary Profession

There are approximately 309,144 veterinarians in Europe and on average there are 0.38 veterinarians per 1000 people. A general trend towards the feminization of the profession can be seen: 58% of veterinarians are women and 42% are men and the proportion of female veterinarians owning a practice has also increase in most countries. 81% of veterinarians are in full-time employment, while 15% have part-time jobs, overall, there has been a decrease in the percentage of unemployment veterinarians. The private sector is the most common sector for veterinarians. 58% in Europe work within the private sector, whether as practice owners with 27% or employees with 31%.

Predominant in Europe are small veterinary business, 43% are composed of one or two staff members. Overall, 70% of the practices have five workers or less. Practices of 11 to

30 staff make up 10% and finally, the least common businesses are those with over 31 workers. Veterinary practices are made up of 25% veterinary practices owners, 30% of veterinarian's non-owners, another 25% of veterinary nurses, 2% of non-veterinary practice owners and 18% of other staff. Veterinarians earn on average 39,803 Euros per year, looking at individual countries, many differences can be observed. In Switzerland and Netherland are the highest income, with earnings more than 70,000 Euro per year. Whereas, Macedonia and Bulgaria have the lowest earnings, both under 20,000 Euro per year. Earnings of veterinarians rises as age do, those above 60 earn the most (upwards of 65,000), while veterinarians up to 39 years old, earn relatively less (up to 46,000). Male veterinarians are better payed than female ones (44,057 vs. 38,874). There are 290 million companion animals, including dogs, cats, small mammals, exotics, birds, ornamental fish and reptiles, 107 million cattle, 88 million sheep and 153 million pigs in Europe. Additionally, it is estimated that there are more than 6 million horses, 23 million goats and 397 million poultry.

European veterinarians rated their satisfaction with how their education prepared them for the job market, working for less than 10 years, as 5. With a scale from 0 to 10, where 10 means "complete satisfaction" and 0 "complete dissatisfaction". (Federation of Veterinarians of Europe, 2018)

2.3.2. The Changing Roles of Pets in the Society

To understand the changing role of veterinarians throughout the decades it is important to have a view on how the pet ownership and agriculture has evolved. Animals have played a key role in human life throughout the history. People have come to depend on animals for food, transportation, and clothing, in many cultures around the world they were also focus of religious worship, or still are.

In the last several hundred years, there has been a massive increase in the number of animals kept purely for companionship and pleasure, rather than being used for hunting, guarding, and herding. The affectionate relationship towards animals were considered immoral and against the natural order of life, which was most likely the reason for the negative attitudes towards companion animals. Generally, pet keeping wasn't accepted in Europe until the end of the 17th century, and it wasn't common among the middle classes until the late 18th century. Pet keeping in its present form is an invention of the Victorian times of the 19th century. Which reflected also social attitudes of the time, pets were not considered appropriate for the "lower class", as it was thought to encourage the neglect of other social duties. The most common reason for owning pets in Western societies today is companionship. With the growing awareness of the positive effects this relationship can have on human health and psychological well-being and the recognition of the therapeutic value of companion animals. But not to forget several functional roles, such as guide dogs

for blind people, hearing dogs for deaf, police and military dogs. Cats still play a role as they did back in the days as rodent hunters on farms.

2.3.3. Changes in the Small Animal Practice

With the shift how the public sees pets, paying more attention to the human animal bond and animal welfare a higher level of investigative diagnostic work will be done. This has created a culture that is willing to pay more for small animal veterinary services than before. With an average increase in disposable income and the widespread uptake of pet insurances has helped to fund these higher costs. Technology transformed diagnostic work, these days, many veterinary clinics have advanced laboratory equipment and digital processing of x-ray images have mostly replaced the dark room. Including other types of new technology, such as ultrasound machines, electronic pumps for giving intravenous fluids, computerised monitors to make anaesthesia safer, fibre-optic endoscopes to investigate hard-to-reach parts of the body, and high-tech stethoscopes that create digital recordings of the heart beats. Even MRI and CT are available in some veterinary centres.

The net result of the growth in this so called “companion animal sector” is that there are more jobs in small animal practice. Many veterinarians now set out to make this a career from the start, whereas many years ago most of the graduates sought out mixed practices as their starting point; they specialised only later in their chosen field of work. It is far more common for new graduates to move straight to companion animal work, and it’s clear from the start that they don’t want to do any farm animal or equine work. These days, it becomes common for veterinarians to do basic extra qualifications and their chosen career path is to become an independent specialist, working in referral centre. Referral clinics have grown exponentially over the past years, reflecting both the demand for a high-level care for pets and the desire of veterinarians to work in their own specific niche. There is a general trend towards the feminization of the veterinary profession in Europe. 58% of veterinarians in Europe are woman and 42% are men. (Federation of Veterinarians of Europe,2018)

The average size of veterinary practices appears to undergo a period of change. Most veterinary practices (70%) are small, with fewer than five staff. There is a trend towards increasing corporatization and the creation of larger practice groups. By 2030 the veterinarians working alone will be a minority and a slight decrease in veterinary ownership can also be seen. With more veterinarians working as employees in 2018 than in 2015, which corresponds to the trend noted above. (Federation of Veterinarians of Europe, 2018)

2.3.4. Changes in the Large Animal Sector

Looking back over the past 20 year, 1994 represented the peak of a shift to intensive farming that began in the Second World War. The demand for inexpensive food led to

animal welfare issues related to the widespread adoption of confinement selection, genetic selection for growth rate and yield, and live animal exports to Europe. With no recognition of their capacity for sentience farm animals were considered in law to be 'goods' and little protection of their welfare was done.

In the following twenty years, significant changes in the number of animals farmed and the structure of the industry was found. With growth in the aquaculture and chicken meat sector, a decline in the red meat sector, unification across all sectors took place. The livestock holdings have decreased since 1994, the average herd and flock size has particularly increased. Three quarters of dairy cow herds are now kept in groups of 100 or more, compared with less than half 20 years ago; 70% of poultry are now kept in flocks 100,000 or more, up from 50% in 1994; 80% of fattening pigs are now kept in herd of 1,000 or more, up from 60% in 1994. This change in increasing group sizes may present both challenges and opportunities for animal welfare.

With some significant changes in farming systems and husbandry conditions over the past 20 years. Such as moving away from the most intensive confinement systems such as battery cages and sow stalls. However, breeding for increased growth rate and yield has continued, with associated health and welfare issues remaining mostly unaddressed. The numbers of animals reared in systems with higher welfare potential, including outdoor and enriched indoor systems. Farm security schemes, animal welfare NGOs and scientists, retailers, legislation, consumer and farmers have all contributed their part in pushing these changes. (O'Brien,2013)

2.3.5. Changes in the Large Animal Practice

A shift has been gradually taking place in the veterinary profession. The numbers of small animal practitioners continue to rise while large animal veterinarians continue to decline comparatively. As described in the previous paragraph, many farms have formed conglomerates over the years. Large-scale dairy corporations with 5,000 heads employ one or two veterinarians to work only on their farm where in the past, these numbers were spread out on numerous small farms, requiring more veterinary personnel. But also, large swine producers, poultry corporations and the feedlot cattle industry face such changes. (O'Brien,2013)

Many discussions have revolved around the connection between the increased number of women in the profession and the shortage of large-animal veterinarians. Often a rural practice is a mixed practice or, if it is a large-animal practice, service small farms. The new large-animal veterinarian is a consultant for one or more large livestock producers. The biggest concerns about a shortage of large-animal veterinarians seem to come from rural veterinarians who fear about whether anyone will want to buy their practices. And if one

asks them about weather, they need new associate veterinarians, the answer is likely to be 'yes.

From a strictly economic point of view, economic benefit should follow a high demand for these services. A big obstacle to getting veterinarians to work in rural areas is the low pay in proportion to the hours worked. In order to be able to serve a rural area, to be available at all hours needed, but at the same time serving a small total population, results in a low income per working hour. The assumption that attracting men from rural backgrounds will fill the need for rural veterinarians must be avoided. (Smith, 2006)

Despite the interest of many veterinary students to work in rural or mixed practice, they often end up working in urban or suburban small-animal practices. Reasons for that are home and lifestyle factors in addition to economic factors, which not only affects women. So, it is not to blame or to assume that woman do not like large animal practice. Female physicians report that their decision to work in a rural area depends on lifestyle factors such a flexible scheduling and availability of childcare. Which make it almost impossible for them to work the same number of hours as did the previous generation of men. Rural practitioners might be more successful recruiting for two part-time positions than looking for one person who will work those long hours. (Smith, 2006)

2.3.6. The Changing Role of Exotic Animal Keeping

To describe many different things in society the work exotic is used as an adjective. This term indicates something unique, dangerous, or exciting. The definition of exotic includes: 1. introduced from another country: not native to the place where found, 2. foreign, alien, and 3. strikingly, excitingly, or mysteriously different or unusual. Other adjectives, however, are commonly used to describe exotic animals, like nontraditional or nondomestic. (Mitchell, 2009)

The obsession of people to keep exotic animals started early. Throughout history keeping birds in captivity for food has been common, records show that people in Egypt were keeping birds for more than just food in 4000 BC. During the Song Dynasty (960-1279) in China went a step further and were the first to breed fish selectively for decoration. Exotic pets further grew in popularity in the 20th century. Today, exotic pets are a big business and are a main driver of the trade of live animals. The following is a review of how some exotic animals gained in popularity.

One of the oldest groups of exotic pets are represented by the ornamental fish. As mentioned above it was the Chinese who actively keep and breed fish for their aesthetics. The first fish to be actively maintained for this reason was the goldfish. These ornamentals made their way to the Western world (Europe) not until the 17th century. The hobby grew and fish would be moved globally by ship, railroad, or plane. It finally became affordable

after the 1940s. Significant advances have been made over the past 2 to 3 decades, in filtration techniques, water quality standards, and fish nutrition.

Reptiles have only become popular recently, from the 1940s to the 1970s, primarily native species were sold in the United States. Such as the red-eared slider turtle and green anole. In the 1950s and 1960, turtle farming became popular. Turtle farmers began to export the turtles, after the U.S. Food and Drug Administration instituted the 1975 regulation restricting the interstate and intrastate sales of chelonians under 10.2 cm. In the latter half of the 20th century, reptiles were imported from Asia, South and Central America, Africa, and Australia. However, it was not until the 1980s and 1990s that a real explosion in the pet reptile trade occurred. 1997 alone, more than 566,000 green iguanas, 94,000 ball pythons, and 29,000 boa constrictors were imported.

In human civilization ferrets have a long and documented history. Brought into captivity originally around 350 BC, these animals have held roles in captivity such as: hunting partner, vermin control, and companion animal. Ferrets have been introduced into the United States during the 1700s and would have been introduced to the New World during the great migration. Today they are no longer to be considered as working animals, rather than being companion animals. Except for example as in the United Kingdom, where ferrets remain active working animals, assisting hunters with the capture of rabbits.

Domestic rabbits have been associated with humans for over 1000 years. *Oryctolagus cuniculus* was originally found on the Iberian Peninsula at the end of the Pleistocene era. However, it was a group of French monks that were credited with the domestication and selective breeding of rabbits that are consistent with the animals known today. Rabbits are popular for meat and fur production, as research animals, and as companion pets.

Chinchillas, like ferrets, have served many different roles since being acknowledged by humans. Including providing fur and meat, research models for auditory research, and serving as companion pets. They originally served as a prey species, providing meat and fur to indigenous peoples of the Andes mountains. In 1500s an international trade for chinchilla fur was founded, but by the late 1800s native populations had been declined. Even though they are still raised for fur production, they are now popular as pets. (Mitchell, 2009)

To keep exotic pets is no longer limited to the elite, the hobbyist or collector, but the wider population who desire a diverse range of animal species. They are often chosen as many do not take up too much space, do not need to be walked, as alternatives for people with allergies and due to the 'exotic' factor. It is believed that an estimate of 1,000 species to be in trade. (De Briynea, Iatridoua, 2016)

2.3.7. Changes in the Exotic Animal Medicine

The demand and keeping of 'exotic pets' increased, in the last decade. Most seen in veterinary practice are Chelonia followed by large parrots and exotic birds. Reasons for consultations are mainly nutritional or digestive disorders, respiratory diseases, skin diseases, accidents, advice in keeping and feeding, for preventive reasons, for identification or certification. With treating exotic animals, the main challenges are difficulties in diagnosis, lack of available treatment options, lack of owner knowledge, unwillingness of the owners to spend money treating their animals and the difficulties in handling the examining animals. It is common to referral exotic animals to specialists.

Specific training and knowledge on exotic species are not always included in the undergraduate veterinary education yet. Veterinarians that graduated recently had significantly received more training undergraduate than longer graduated ones. The health problems that have been most reported in relation to the keeping of exotics were, psittacosis, bites or attacks, mycosis, scabies and salmonellae.

This increasing trend poses new challenges for the veterinarian. Veterinary professionals are expected to have the ability to diagnose, treat and care for a huge variety of animal species; each with their own inherent welfare needs and presenting a multitude of a new conditions and diseases. Many issues are similar with traditional companion animals, while the keeping and treatment of exotic animals imply some additional challenges. Like the limited treatment options with very few veterinary medicines authorized for exotic animals. So often veterinarians need to resort using non-authorized veterinary medicines, which has not been tested on the species concerned, which lays in their own responsibility. Since the investment needed to develop a product would exceed any profit to be made with the product, there is no interest in researching and authorizing medicines for the animal health industry. Therefore, using non-authorized medicines will stay essential to be able to ensure the health and welfare of exotic animals.

The aim of veterinary medical studies is to be inclusive, all-encompassing all species, making veterinarians who graduate omni-competent and able to work in all areas of the veterinary medicine. Due to rapidly growing knowledge over the years, the study load for veterinary students have increased massively. With it the demand for veterinarians who have specialized expertise in one of the numerous new fields of veterinary sciences. However undergraduate teaching in specific fields such as exotic animal medicine is limited, recognizing that exotic animals are remarkably diverse and only basic knowledge and abilities can be taught. Post-graduate training in exotics has increased significantly and veterinarians who want to work with these animals, should follow continuous professional development course to get a deeper inside knowledge. (De Briynea, Iatridoua, 2016)

2.4. VETERINARY EDUCATION TODAY

2.4.1. Background

The 41 national veterinary organization across 36 countries, Turkey included are represented by the Federation of Veterinarians of Europe (FVE). In 1975 the FVE was founded and is the professional umbrella organization for the national member organizations of veterinarians and for four specialized veterinary groups. The European Union of Veterinary Practitioners (UEVP), the European Union of Veterinary Hygienists (UEVH), the European Association of State Veterinary Officers (EASVO), and the European Association for Veterinarians of Education, Research and Industry (EVERI). To support veterinarians so that they can deliver their responsibilities for the health and welfare of animals and people is the mission of the FVE. They actively strive the continued strengthening of pre- and postgraduate veterinary education.

2.4.2. The Current Structure of Veterinary Education in Europe

The European Commission based the structure of veterinary education on three directives which exist for almost 30 years now. Directives 78/1026/EEC, 78/1027/EEC, and 78/1028/EEC mediate a listing of subjects that need to be thought within the veterinary curriculum. But provide little guidance as to the minimum standards necessary. Member countries are independent to define how each subject should be executed in their curricula, whilst a final attainment level is stated by the directives. Furthermore, they require a mutual recognition of veterinary degrees among EU countries which facilitated the migration of veterinarians between countries. The result is a growing number of graduates leaving their own country to work elsewhere.

2.4.3. Veterinary Undergraduate Education in Training

The EAEVE is the central association for the approximately 100 veterinary teaching establishments. Whose mission it is to promote and develop veterinary education. As their primary task is to facilitate the exchange of information on teaching and research among European veterinary school. In order to improve and harmonize veterinary education among the members, by promoting the exchange of teaching staff and the mobility of students between institutions. To complete veterinary schools in Europe it usually requires a degree program of five to six years. (Jorna, 2006)

The training should include at least five categories with the following subjects:

1. Basic subjects: Physics, chemistry, animal biology, plant biology, biomathematics.
2. Pre-clinical sciences: Anatomy (histology and embryology included), physiology, genetics, pharmacy, microbiology, epidemiology, professional ethics, biochemistry, pharmacology, toxicology, immunology, parasitology.
3. Clinical sciences: Pathology (with pathophysiology), clinical medicine and surgery, infectious diseases and preventive medicine, diagnostic imaging, reproductive medicine, veterinary state medicine and veterinary legislation, forensic medicine.
4. Animal production: Animal breeding, animal nutrition, animal husbandry, animal hygiene and economics.
5. Food hygiene: Veterinary public health, food safety and quality, inspection, and control of foodstuff of animal origin, food hygiene and food technology.

For a recognized professional veterinary qualification, the initial training is the most important area. Post-graduate academic studies such as PhD or residency programs might follow the diploma for further three or four years. (Leibetseder, 2004)

With a growing need for enhanced practical training and the intensifying of the curricula, the time for completion tends to be longer now. With the expeditiously increase of the available techniques and knowledge in the veterinary field, many schools are considering or have adopted tracking (differentiation) in their veterinary degree program. It provides students to concentrate on certain areas of veterinary medicine while compromising others. Overall, the number of graduates is rising, as well as the student uptake, and some new schools, especially in the south of Europe, have been established. In some countries the possible saturation of the professional market in some countries has led to increased competition. Which is not necessarily a negative effect, as it encouraged the diversification and specialization of the profession. (Jorna, 2006)

CHAPTER III. COMPARISON BETWEEN UNIVERSITIES OF VETERINARY MEDICINE

3.1. VIENNA VETERINARY MEDICINE UNIVERSITY

3.1.1. General Information

The duration of the diploma programme in veterinary medicine is twelve semesters, which equals the collection of 360 ECTS-Points. For international recognition, the scope of the study program and individual study achievements are expressed in the European Credit Transfer System-Points. 60 ECTS-Points are given per year, which corresponds to a workload of 1500 hours. ECTS-Points are only granted for positively assessed study achievements. A performance is positively assessed if it awarded a mark or, a grade point average of at least “sufficient” (4) or as “passed” or “with success participated” is evaluated.

3.1.2. Composition of the Study

Teaching modules: Up to the ninth semester the curriculum is structured according to teaching modules that represent organ or function groups. The teaching modules are also organized across semesters, with exception for modules 1-4 of the first semester.

Table 1 Teaching Modules

Nr. teaching module	Name teaching module
1	From the organism to the tissue
2	From the tissue to the cell
3	From the cell to the molecule
4	From the genome to the population
5	Regulation and mechanism
6	Infection and immunity
7	Animal husbandry/animal welfare/animal hygiene
8	Propaedeutic/clinic
9	Respiration/blood/circulation

10	Skin and appendices
11	Digestion/metabolism/liver/kidney/urinary tract
12	Endocrinology/reproduction/genetics
13	Neurology/sensory organs
14	Food science/public veterinary services/epidemiology/animal diseases
15	Locomotor system
16	Economy/communication/reflection/personal and scientific training

Advanced modules: In the tenth and eleventh semester, the in-depth training takes place, which are structured according to animals' species or thematic priorities.

Diploma thesis: Students are required to complete a thesis to the extent of 20 ECTS-Points. The task is to be chosen so that the work can be completed within one semester.

Educational Working groups (EWGs): An Educational Working Group is responsible for the content, organisational planning, implementation of the evaluation and improvement measures of the teaching module. The EWGs are responsible for: Definition of the learning outcomes, development of a course – constructive alignment, teaching methods during contact hours, assessment of the courses included in the examination, continuous adaptation process based on evaluation results, reports to the curriculum commission.

Elective courses: Elective courses need to be chosen to reach a minimum of 7.5 ECTS-Points and must be taken from the following subject areas:

- Lifelong learning 2.0 ECTS-Points
- Development of scientific competences 2.5 ECTS-Points
- Development of personal competences 3.0 ECTS-Points

Depending on the learning objective and the content of the course, the following distinguished forms of teaching are offered.

A. Courses without immanent examination character

- **Lectures (L)** serve to provide basic concepts, the basic systematics of a field, the identification of the scientific background, the explanation of complicated facts and the creation of cross connections as well as the demonstration of clinical relevance.

B. Courses with immanent examination character

- **Conservatories (CV)** are courses that are offered through discussions and requests to the teachers of the relevant subject in extension of already existing knowledge and to train the ability to solve problems.
- **Seminars (SE)** serve the scientific discussion in small groups. In seminars the active cooperation of the students is required, whereby the ability to use acquired knowledge for the analysis and solution of scientific or clinical questions is to be learned.
- **Exercises (E)** help on the one hand to deepen the understanding of scientific phenomena and on the other hand the adoption of basic skills for the later career.
- **Clinical demonstrations (CV)** are used to develop clinical teaching content based on cases and the processing of clinical problems in the sense of vertical and horizontal integration. It promotes the networked clinical thinking.
- **Outpatient clinic (OC)** integrates students into the daily clinical work and branches including night and weekend services. They contribute to the admission, diagnostics, therapy, and general care of patients. In a degree appropriate to their knowledge and skills. Which is examined in the second diploma examination.
- **Clinical rotations (CR)** give the students the opportunity, under supervision, to practice and deepen their abilities and skills directly on patients. In doing so great importance is given to the discussion of specific cases and the elaboration of case-specific backgrounds. The participation in the clinic rounds while teaching and the completion of night services are an essential part of the clinical rotations.
- **Special trainings (ST)** introduce students to special examination procedures of the respective specialisation.
- **Patient presentations/case analyses (PC):** According to the requirements (single animal versus live stock) students present on the basis of patients possible examination and treatment methods and discuss these particularly with regards to its significance for diagnosis, therapy, prognosis and prophylaxis.

Examinations: The examinations in the diploma degree course in veterinary medicine have the aim of improving the acquirement of knowledge, skills, attitudes. These are evaluated based on objectifiable evaluations according to the criteria of reliability, validity, and feasibility. Examinations are carried out as summative or formative examinations.

A. Formative examination: Formative exams are designed to support the learning process of students. They can be offered in every course and are strongly recommended for the preparation of summative examinations.

B. Summative examination:

B.1. Courses with immanent examinations: In principle, all courses in the diploma degree course in veterinary medicine are, except of lectures, with immanent examination character. At the beginning of each semester (according to §76 (2) UG 2002) the examination plan and the regulations for missed teaching units are published.

B.2. Teaching module examination: Is the performance review for the courses of the modules 1-4 and 5 (first semester) and takes place in several modules that are spread over the semester of the individual teaching modules. The teaching module examination has as a performance review of the associated course immanent examination character.

B.3. Diploma examination: The diploma examination can consist of several parts (diploma part examinations), which are described in examination regulations of the individual study sections.

3.1.3. Structure of the Study Program

Start of study

The curriculum is designed in such way that the compulsory courses within the framework of the teaching and specialisation modules are completed in the winter semester at the beginning of the programme, while their sequence are coordinated in terms of content.

Duration and structure of the study programme

The diploma study course in veterinary medicine lasts 12 semester and is divided into 3 study section.

Course types

All courses listed in the curriculum are compulsory courses with mandatory attendance. The course instructor can spare the attendance obligation in the corresponding course but must provide literature and learning information for the self-study.

Table 2 Overview Diploma Studies Veterinary Medicine

Semester	ECTS-Points (Obligatory)	ECTS-Points (Elective)	ECTS-Points (Practical)	ECTS-Points (Diploma work)	ECTS-Points total
1. (1 – 4)	112,5	3,5	4		120
2. (5 – 9)	136,0		14		150
3. (10 – 12)	45,0	4,0	21	20	90
Total	293,5	7,5	39	20	360

The 1st stage of study

Semester 1-4: The attendance of compulsory and optional courses and the passing of the corresponding examinations with 120 ECTS-Points is planned.

Table 3 Courses of the 1st Semester

Module	Course	CV	E	L	Total	ECTS-Points
1	Morphology fundamentals	0,13		0,37	0,50	0,5
1	Scientific law&application of basic diagnostic procedures	0,47		1,40	1,87	2,0
1	Zoology			0,40	0,40	0,5
2	From the tissue to the cell	0,67	0,93	2,27	3,87	4,5
3	From the cell to the molecule	4,00			4,00	4,0
4	Pet lore			1,50	1,50	1,5
4	Evolutionary ecology &population genetics			1,47	1,47	1,5
5	Basics of the regulatory systems&mechanisms			2,50	2,50	2,5
7	Behaviour of pets			1,00	1,00	1,0

8	Handling of animals&animal care	0,13		0,53	0,66	3,0
15	Structure of the locomotor system I	1,70		1,11	2,81	3,0
2	Laboratory diagnostics I		0,33		0,33	0,5
16	Applied ethics I	0,50			0,50	0,5
16	Science in vet. med I		0,67	1,00	1,67	2,5
16	Lifelong learning		0,70		0,70	1,0
Internship	1 week I					1,5
Total		7,67	2,63	13,55	23,78	30,0

Table 4 Courses of the 2nd Semester

Module	Course	CV	E	L	Total	ECTS-Points
9	Structure&function of resp. tract, heart,circulation&lymph. organs	1,07	1,47	4,30	6,84	7,5
10	Structure&function of the skin	0,20	0,34	1,40	1,94	2,5
11	Structure&function of urinary&digestive tract I	1,13	2,00	5,00	8,13	10,0
13	Neurology/sensory organs I	1,27		1,53	2,80	3,0
9, 11	Laboratory diagnostics II		1,67		1,67	2,5
15	Basics of movement	0,27		0,70	0,97	1,0
16	Applied ethics II	0,50			0,50	0,5
16	Science in vet. med II		0,50	0,14	0,64	1,0
16	Economy/communication/ reflection/ personal&scientific training (elective)					0,5

Internship	1 week II					0,5
Total		4,44	5,98	13,07	23,49	30,0

Table 5 Courses of the 3rd Semester

Modules	Courses	CV	E	L	Total	ECTS-Points
5	Origin of diseases			3,87	3,87	4,5
5	Modulation of regulation processes		0,27	1,07	1,34	1,5
6	Infection&immunity			4,00	4,00	4,0
8	Propaedeutic I&II		0,73	1,00	1,73	2,0
8	Clinical demonstration I	1,00			1,00	1,0
11	Structure&function of the urinary&digestive organs II		1,66	1,00	2,66	3,5
12	Reproduction&endocrinology	1,2		2,20	3,40	3,5
13	Neurology&sensory organs II	1,00	0,40	1,13	2,53	3,0
14	Animal epidemic			0,50	0,50	0,5
9, 10, 11, 12	Laboratory diagnostics III		2,33		2,33	3,5
16	Applied ethics III	0,50			0,50	0,5
16	Science in vet. med III			0,14	0,14	0,5
16	The conversation with the animal owners		0,66	0,14	0,80	1,0
Internship						1,0
Total		3,70	5,72	15,05	24,80	30,0

Table 6 Courses of the 4th Semester

Module	Course	CV	E	L	Total	ECTS-Points
7	Animal husbandry	1,00	0,33	2,0	3,33	3,0
8	Propaedeutic II		1,07		1,07	2,0
8	Clinical demonstration II	1,00			1,00	1,0
9	Morphology&function of respiratory, organs,heart,circulation&lymphatic organs (case studies)	1,06	1,40	0,87	3,33	4,5
10	Skin diseases			3,00	3,00	3,0
11	Morphology&function of the urinary&dig. organs (case studies)	2,00			2,00	2,0
11	Animal nutrition and feed science		1,00	1,00	2,00	2,5
14	Statistic&epidemiology fundamentals	2,00			2,00	2,0
15	Structure of the musculoskeletal system II	0,40	2,53	1,30	4,23	5,5
9, 10, 11	Laboratory diagnostic IV	0,33			0,33	0,5
16	Applied ethics IV	0,50			0,50	0,5
16	Science in vet. med IV			0,14	0,14	0,5
16	Economy/communication/ reflection/personal&scientific education (elective)					3,0
Total		7,29	6,33	8,31	22,93	30,0

Examination regulations of the 1st study section (1st diploma examination)

The teaching module examination according to B.2 is taken regularly in written questions in the form of computer-aided testing. Multiple-choice (MC) question format (MCQ type A (single choice question), MCQ pick-n (multiple choice question), cloze question drop-down) and other written question formats (free text question type Short Answer-Question (SAQ), image diagnosis question, image assignment question, grouping question) is used to construct exams.

The positive completion of the teaching module (1-5) examination of the first semester is requirement for the participation in the courses of the following semesters excluding the courses of the teaching module 16. Only if also the following two partial examination are succeeded, the first diploma examination is positive:

- Partial examination of the morphology and clinical basics in writing
- Partial examination of the morphology and clinical basics in oral-practical

The grade for the first diploma examination is made up of the results of course examinations (40%) and the grades of the two partial examinations together (30%, 30%)

The 2nd stage of study

The Semester 5-9: The attendance of compulsory and optional courses and the passing of the examinations corresponding 150 ECTS-Points is planned. In the 9th semester the general clinical training is completed.

Table 7 Courses of the 5th Semester

Module	Course	CV	SE	E	L	Total	ECTS-Points
7	Animal welfare	0,40	0,47		0,40	1,27	1,5
8	Special propaedeutic I			1,93	1,54	3,47	4,0
8	Clinical demonstrations III	1,00				1,00	1,0
9	Diseases of the resp. organs, heart, circulation & lymph organs	1,93			0,57	2,50	2,5
11	Diseases of urinary&dig. organs&met. diseases I	5,00			3,00	8,00	8,0

14	Animal epidemic & disease control				5,0	5,0	5,0
9, 10, 11	Lab. Diagnostics V			4,00		4,00	6,0
16	Science in vet. med				0,50	0,50	1,0
Internship							1,0
Total		8,33	0,47	5,93	11,01	25,74	30

Table 8 Courses of the 6th Semester

Module	Course	CV	SE	E	L	Total	ECTS-Points
5	Special pharmacology	1,00			3,27	4,27	4,5
8	Special propaedeutic II			2,87	2,20	5,07	5,5
8	Clinical demonstration IV	1,00				1,00	1,0
9	Diagnosis, therapy of resp. tract, heart, circulation & lymph organ diseases			0,33		0,33	0,5
10	Diseases of skin: Finding survey				0,67	0,67	1,5
11	Diseases of urinary & dig. tract & metabolic diseases II			0,67		0,67	1,0
12	Neonatology I				1,00	1,00	1,0
12	Applied endocrinology & obstetrics		1,47	0,67	1,73	3,87	5,0
13	Diagnosis & therapy of neurology & sensory organs I				1,73	1,73	1,5
13	Aetiology/pathology/diagnostic/ neurology/ sensory organs			0,27	1,20	1,47	2,0

13	Structure,function&aetiology of diseases of neurology&sensory organs	3,00				3,00	3,0
16	Science in vet. med		0,50			0,50	1,5
16	The conversation with the animal owners or stakeholders – similtations		0,70			0,70	1,0
IP							1,0
Total		5,00	1,47	6,01	11,80	24,28	30,0

Table 9 Courses of the 7th Semester

Module	Course	CV	SE	E	L	Total	ECTS-Points
8	Outpatient clinic I						2,5
8	Clinical demonstration V	1,00				1,00	1,0
9	Diagnosis, therapy of the respiratory tract, heart, circulation&lymph organ diseases II	4,10			0,13	4,23	4,5
10	Diseases of skin: Diagnosis&therapy	1,53		1,33	4,53	7,39	9,0
11	Diseases of urinary&digestive tract&metabolic diseases: Diagnosis&therapy	3,00			2,00	5,00	5,0
13	Diagnosis&therapy of neurology&sensory organs II				1,27	1,27	1,0
14	Basics of the production of raw material of animal&food production I			1,00		1,00	1,5

15	Orthopaedic diseases	0,53				0,53	0,5
9, 11	Laboratory diagnostic VII			0,67		0,67	1,0
9, 11	Pathologic diagnostic			1,33		1,33	2
16	Science in vet. med III		0,30			0,30	1,0
IP							1,0
Total		10,16	0,30	4,33	7,93	22,72	30,0

Table 10 Courses of the 8th Semester

Module	Course	CV	SE	E	L	Total	ECTS-Points
8	Outpatient clinic II						3,0
8	Clinical demonstration VI	1,00				1,00	1,0
12	Applied animal breeding			0,67	2,27	2,94	3,5
12	Neonatology II	0,73				0,73	1,0
12	In-depth endocrinology & reproductive medicine	1,20		0,20	1,50	2,90	3,0
13	Emergency block neurology/ sensory organs	0,50				0,50	0,5
14	Structural challenges in veterinary practice in Austria		0,47		1,00	1,47	1,5
14	Biosafety&prophylaxis	1,50				1,50	2,5
14	Basics of the production of raw material of animal&food production II			2,30		2,30	3,5
14	Basics of food hygiene				3,50	3,50	3,5

14	Principles of quality assurance in food hygiene	1,00				1,00	1,5
14	Right to dispense			1,00		1,00	1,5
15	Orthopaedic disease&emergency block locomotor system	0,67			2,33	3,00	3,0
16	Science in vet. med IV						0,5
IP							1,0
Total		6,60	0,47	4,17	10,6	21,84	30,0

Table 11 Courses of the 9th Semester

Module	Course	CR	Total	ECTS-Points
8	Clinical rotation I	20,0	20,0	20,0
Internship				10,0
Total		20,0	20,0	30,0

Clinical courses of the 2nd diploma examination

Outpatient clinic: see above

Clinical rotation I: In the 9th semester, only clinical rotation I is offered. The successful completion of the clinical rotation I also includes the fulfilment of night and weekend services in a total of seven services. During the completion of clinical rotation I, the participation in other courses is not permitted. The aim is that students should be able to take part in the corresponding examination (partial examination- farm animals or companion animals) immediately after completing a block.

Table 12 Structure of the Clinical Rotation

Clinical rotation I	Weeks
Small animal clinic	5
Surgery; Internal medicine including intensive & emergency care; Obstetrics; Ornamental birds/reptiles; Anaesthesia; Medical imaging	
Horse clinic	4
Surgery; Internal medicine; Anaesthesia; Medical imaging; Insemination and embryo transfer; Reproduction	
Ruminant clinic	2
Internal medicine; Herd health monitoring; Reproduction	
Swine clinic	1
Poultry and fish clinic	1
Poultry and fish medicine	
Pathology	1
Total	14

Examination regulation of the 2nd study section (2nd diploma examination)

After positive completion of all the courses belonging to the second diploma examination courses (40%) and after passing the following four partial examinations, the second diploma examination is positive:

- Partial examination of diseases (10%): written comprehensive examination at the end of the 7th semester on the theoretical aspects of the diseases of all species. Including procedural knowledge
- Partial examination of food science, public health, and the right to dispense (10%): written comprehensive examination at the end of the 8th semester.

- Partial clinical examination farm animals (20%): oral-practical comprehensive examination.
- Partial clinical examination small animals (20%): oral-practical comprehensive examination.

The 3rd stage of study

The semester 10-12: Includes the attendance of compulsory and optional courses and taking of the corresponding examinations to the extent of 90 ECTS-Points are planned. In the third study section the focus is on the in-depth clinical training. The diploma thesis is to be submitted latest in this stage of the study.

When choosing the specialisation (advanced) module, students must choose from the modules listed in the following table.

Table 13 Advanced Modules Options

Module	Clinical/Non - clinical
Small animal medicine	
Ruminant medicine	Clinical module
Poultry-/Swine medicine	
Food science, public veterinary, and health services	
Laboratory Animal Medicine	Non - clinical module
Conversational medicine	
Reproductive biotechnology	

Each of the specialisation modules (advanced module AM1 and advanced module AM2) is credited with 9 ECTS-Points and a total of 30 ECTS-Points need to be collected. The first 14 weeks of the 10th semester is reserved for the AM1, the following 6 weeks for the AM2. The first 7 weeks of the 11th semester is for compulsory courses of the AM1, the following 3 weeks for compulsory courses of the AM2. Afterwards, in the 11th semester, a block of at least 3 weeks need to be kept free for the remaining compulsory courses of the 3rd study section.

Selection of the in-depth modules

In step 1 (voting) the AM1 is selected: the eight available modules with a priority of 1-8 is assigned, where 1 is the highest and 8 the lowest priority. The dispensation is made according to the calculated rate in descending order. The highest prioritized module will be assigned which still have places available.

After the result of the 1st voting, in a 2nd step (2nd voting) the advanced module 2 (AM2) is chosen, where students with a non- clinical AM1 must select a clinical AM2. These students are only the clinical modules offered which they can assign with a priority of 1-4 where 1 is the highest and 4 the lowest.

In contrast students with a clinical AM1 can choose from all modules, except the own AM1, i.e. they assign the priority from 1-7, where 1 is the highest and 7 is the lowest priority. For all students with non-clinical AM1, places for the clinical AM2 must be reserved. The remaining places are distributed to the highest ranked students with clinical AM1. The clinical contingent that is available to students with clinical AM1, is therefore calculated from the difference between the available clinical AM2 and the number of the allocated non-clinical AM1.

If there are not enough available places in a specialisation module for students who valued it with 1, the student will be assigned to the module with a value of 2. If there is still no space available, the student will be assigned to the in-depth module which is listed with a value of 3.

Courses of the 3rd stage of study: medical biometry and epidemiology, legal veterinary medicine and veterinary science, economics in veterinary medicine-own practice, advanced science in veterinary medicine and the electives from the teaching module economy/communication/reflection/personal and scientific training is compulsory for all students. Courses need to add up to 10 ECTS-Points. The in-depth training modules end up with 39 ECTS-Points.

Table 14 Compulsory Courses of 10th-12th Semester

Module	Course	CV	SE	Total	ECTS-Points
AM 1					30
AM 2					9
14	Medical biometrics & epidemiology	2		2	2
14	State veterinary medicine & forensic veterinary medicine	2		2	2

16	Economics in veterinary medicine – private practice		0,7	0,7	1
16	Science in vet. med - advanced		0,7	0,7	1
16	Elective subjects from the module economy/communication /reflection/personal & scientific training				4
Internship	10 weeks advanced module from AM 1 and 4 weeks at a slaughterhouse				21
Diploma thesis					20
Total		4,0	1,4	5,4	90

Examination regulations of the 3rd study section (3rd diploma examination)

Requirement for the participation in the courses of the 3rd study section is:

- the positive completion of the courses belonging to the 2nd diploma examination with the exception of the courses of the teaching module 16

- partial examination of diseases

- partial examination of fundamentals of food science and public health, veterinary health care and the law of dispensation

- partial clinical examination – farm animals

- partial clinical examination – companion animals

After the successful completion of all courses belonging to the 3rd diploma examination (40%) and after passing the following two partial examinations, the 3rd diploma examination is positive:

- partial examination of the advanced module: oral-practical comprehensive examination from the advanced module 1 in a structured oral exam format (55%)

- partial examination of veterinary and forensic veterinary medicine: overall written examination from veterinary science and forensic veterinary medicine (5%)

The diploma thesis – 12th semester

Students are required to complete a thesis to the extent of 20 ECTS-Points. The topic for the diploma thesis must be chosen together with a, according to the regulations of the statutes entitled, supervisor. And must be chosen so that for a student the work is feasible within one semester. The student can propose the topic or select the topic from a number

of proposals from the available supervisor. The joint work on a topic by several students is permitted if the performance of individual students can be assessed separately.

The internship

Internship of a time period of 26 weeks need to be completed by the students of the diploma course in veterinary medicine. This corresponds to 39 ECTS-Points. The aim of the internship is to amplify the vocational and/or academic training in a meaningful way. It serves the testing and practice-oriented application of acquired knowledge and skills as well as preparation for later professional practice. No courses may be attended while completing the internships.

Completion of diploma studies

After completion of the compulsory courses amounting to 340ECTS-Points and the positive assessment of the diploma thesis (20ECTS-Points) the program is completed. It entitles the graduate to the academic degree “certified veterinary surgeon”, in latin “magistra medicinae veterinariae” or “magister medicinae veterinariae” (mag.med.vet).

3.2. BUDAPEST UNIVERSITY OF VETERINARIAN SCIENCE

3.2.1. General Information

The veterinary diploma study program has a duration of eleven semesters, where a semester is equivalent to one term. The academic year consists of two terms, 1st and 2nd or winter- and spring-term and begins in September. Each term is being concluded by a 6-week examination period. 300 ECTS-points are collected during the study, a minimum 30 ECTS-points with elective courses needs to be collected and 20 ECTS-points are given for the completed diploma thesis work, to successfully complete the program. From the semesters 1-10 27 ECTS-points are given each term or 54 ECTS-points per year. ECTS-points are only given for positively assessed study achievements. Which means a grade point average of at least “passing” (2) or a “signature” for a completed course is given.

It is obligatory to attend classes and the department of the given subject set the number of missing classes and their way of making them up, at the beginning of the semester. The subjects are taught in lectures and in practical classes in smaller groups.

Table 15 ECTS-Points

Semester	ECTS-Points (Obligatory)	ECTS-Points (Elective)	ECTS-Points (Diploma work)	ECTS-Points total
1. (1 – 4)	108	-	-	108
2. (5 – 10)	162	-	10	172
3. (11)	30	-	10	40
Total	300	30	20	350

3.2.2. Exam Regulations

To sit an exam the acceptance of the semester certified by the “signature” of the authorized lecturer of the subject is required. The department can organize mid-term tests on the condition that they are announced at the beginning of the semester. Just if all parts of the thought subject are passed with a minimum “passing” (2) grade and the numbers of missing classes is not exceeded the signature can be given to the student.

Multiple exam-dates are offered by the departments via the neptun system and must be agreed with the departments before the end of the semester. Without being registered for the exam it is not allowed to participate.

The grading in oral exams follows usually the principles below:

1. Fail: the knowledge of the student about the given topic(s) is not sufficient, after major mistakes/ignorance the student cannot answer substantive questions of the examiner;
2. Passing: the knowledge of the student about her/his topic(s) is very brief, but the student can answer substantive questions of the examiner;
3. Fair: the knowledge of the student about her/his topic(s) is acceptable, or the student has stabile knowledge about the majority of topics, but one of the topics is barely acceptable;
4. Good: the knowledge of the student about her/his topic(s) is good, but the student cannot answer other questions of the examiner;
5. Excellent: the knowledge of the student about her/his topic(s) is very good, her/his answers do not leave any questions to the examiner or the student can confidently answer other questions of the examiner.” (student guide page 6)

According to the following grade scale written exams are usually graded: 90 – 100% = 5, excellent; 80 – 89% = 4, good; 70 – 79% = 3, fair; 60 – 69% = 2, passing; up to 59% = 1, fail. However, this is for general orientation only. Different grading scale for each and every exam, even of the same subject, without being a proportionate one can be used by the departments.⁴

EXAM REGULATIONS FOR SEMESTERS 1 - 10

Each exam can be taken five times:

- three times in the actual exam period, i.e. following the curricular time of the (part of the) subject (end of December – beginning of February or end of May – end of June, respectively). Opportunities missed cannot be transferred to a later period, they are lost!
- altogether two further, postponed occasions are available for the exam within any of the following periods:
 - 1st December – beginning of February;
 - 2nd May – end of June (for subjects of the 4th semester: within the two weeks around the start of the academic year). Getting registered for the curricular semester 5 is only possible if all exams of the semesters 1 – 4 are passed.

To be entitled to start the 11th (practical) semester, students must have passed all the compulsory exams of semesters 5 – 10, collected at least 30 ECTS-credits from elective courses and produce the thesis progress report.

“Furthermore, the following subject prerequisites must be regarded: Chemistry exam for Vet- & Food Chemistry exam, Vet- & Food Chemistry exam for Biochemistry final; Anatomy I exam for participation at Anatomy III classes; Anatomy II exam for participation at Topo-classes; Pathophysiology- and Laboratory Diagnostics exam for Clinical Diagnostics exam; Clinical Diagnostics exam for participation at practical’s of Internal Medicine I and for Pathology exam; Pathology A exam for participation at Pathology C exam; Pathology C exam for participation at Pathology D exam; Pharmacology final for Toxicology exam, Animal Breeding final for Animal Nutrition final and the sequence of exams in the subjects Vet. Virology – Vet. Bacteriology – Vet. Immunology –Epidemiology has to be taken into consideration.” (student guide page 8)

A year must be taken off from regular studies and the student become inactive if he / she fails to meet the requirement within the 3+2 options available for an exam. An alternative a request to re-visit the subject (for an additional fee) can be submitted by mid-September or mid-February, the number of chances for visiting a (part of a) subject is limited to a total of two.

For a special tuition fee, part-time students are visiting some courses, if the request for re-visiting a subject has been submitted latest by mid-September or mid-February. The previous results of the subject (mid-terms, signature etc.) are not valid anymore and same regulations and rules (compulsory attendance, exam dates etc.) are valid as for regular students. For all further subjects, the dates and rules of inactive students apply.

3.2.3. Diploma Thesis and State Exams

Under the supervision of any department or clinic a thesis must be written, and the supervisor and topic must be indicated at the registration for the 9th semester. Till early December of the 11th semester on hard copy of the thesis have to be submitted to the department, one bounded hard copy has to be delivered by the student to the state exam committee and has to be uploaded online as well.

The thesis-defense, reporting about the 11th semester and a conversation about professional plans of the graduating student consists the state exam.

Based on the result of the academic exams during the studies and thesis the degree or diploma is graded as follows: “rite - cum laude - summa cum laude” for “fair – good – excellent”, respectively.

3.2.4. Curriculum

Table 16 Courses of the 1st Semester (1st year, Winter-term)

Subject	Lectures	Workshops	ECTS-Points
Chemistry	30	30	5
Anatomy I.	30	45	5
Histology I.	30	30	5
Biology	30	0	3
Biophysics	30	0	3
Informatics	15	30	3
Zoology	30	0	3
Total	195	135	27

Table 17 Courses of the 2nd Semester (1st year, Spring-term)

Subject	Lectures	Workshops	ECTS-Points
Veterinary+Food chemistry	45	30	6
Anatomy II.	30	45	5
Botany	30	45	5
Histology II.	30	45	5
Animal Protection	30	15	3
Biomaths	15	30	3
Total	180	210	27

Table 18 Courses of the 3rd Semester (2nd year, Winter-term)

Subject	Lectures	Workshops	ECTS-Points
Anatomy III.	30	45	7
Veterinary Physiology I.	45	15	6
Veterinary Profession	15	0	1
Veterinary Biochem. I.	45	15	5
Agraeconomics	30	0	3
Veterinary Genetics	30	30	5
Total	195	105	27

Table 19 Courses of the 4th Semester (2nd year, Spring-term)

Subject	Lectures	Workshops	ECTS-Points
Topographic & Applied anatomy	15	30	4
Veterinary Physiology II.	60	15	7
Veterinary Biochem. II.	45	15	6
Veterinary Virology	30	15	4
Animal breeding	45	30	6
Total	195	105	27

Extramural practical: Animal Breeding, 2 weeks

Table 20 Courses of the 5th (3rd year, Winter-term)

Subject	Lectures	Workshop	ECTS-Points
General Pathology	60	30	6
Veterinary Pharmacology I.	45	30	6
Veterinary Pathophysiology	45	0	4
Veterinary Bacteriology	30	30	4
Laboratory Animal Science & Bioethics	15	8	3
Applied Ethology	15	30	3

Veterinary Laboratory Diagnostics	0	30	1
Total	210	158	27

Table 21 Courses of the 6th Semester (3rd year, Spring-term)

Subject	Lectures	Workshops	ECTS-Points
Veterinary Pharmacology II.	30	30	6
Small Animal Medicine I.	60	45	5
Veterinary Immunology	30	30	4
Parasitology I.	45	30	4
Animal Nutrition + Dietetics I.	30	15	3
Equine Medicine and Surgery I.	30	45	3
Pathology I.	15	30	2
Total	240	225	27

Extramural practical: Animal Nutrition, 2 weeks

+ obligatory clinical practice (day and night shifts) with small and large animals

+ mobile clinic

Table 22 Courses of the 7th Semester (4th year, Winter-term)

Subject	Lectures	Workshops	ECTS-Points
Parasitology II.	30	30	7
Pathology C	15	45	3
Surgery II.	45	30	4

Vet. Medicine I.	45	30	4
Obstetrics + Reproduction I.	45	45	6
Toxicology	30	0	3
Total	210	180	27

+ *obligatory clinical practice (day and night shifts) with small and large animals*
+ *mobile clinic*

Table 23 Courses of the 8th Semester (4th year, Spring-term)

Subject	Lectures	Workshops	ECTS-Points
Pathology D	30	60	6
Surgery III.	45	45	6
Veterinary Medicine II.	60	45	3
Obstetrics + Reproduction II.	45	45	3
Animals Hygiene + Herd Health I.	30	0*	1
Avian & Exotic Animal Medicine	24	0	2
Bee Hygiene and Health	12	0	2
Fish Hygiene and Diseases	30	0	2
Lab. Animal Sci & Bioethics	15	8	2
Total	291	203	27

+ *obligatory clinical practice (day and night shifts) with small and large animals*
+ *mobile clinic; *farm visit*

Extramural practical: Polyclinical pract., 4 weeks

Table 24 Courses of the 9th Semester (5th Year, Winter-term)

Subject	Lectures	Workshops	ECTS-Points
Vet. Ophthalmology	12	9	3
Vet. Medicine III.	36	0	6
Obstetrics + Reproduction III.	30	30	6
Animal Hygiene + Herd Health II.	45	0*	4
Food Hygiene I.	60	30	4
State Vet. Medicine I.	30	0	1
Epidemiology & Inf. Diseases I.	75	15	3
Total	288	84	27

+ *obligatory clinical practice (day and night shifts) with small and large animals*

+ *mobile clinic; *farm visits*

Table 25 Courses of the 10th Semester (5th Year, Spring-term)

Subject	Lectures	Workshops	ECTS-Points
Animal Health econ. Management	30	0	2
Forensic Veterinary Medicine	35	0	3
State Vet. Medicine II.	30	0	2
Food Hygiene II.	60	30	5
Epidemiology & Inf. Diseases II.	60	20	5
THESIS WORK			10
Total	215	50	27

+obligatory clinical practice (day and night shift) with small and large animals

+ mobile clinic

One unit of instruction is a 45-minutes period.

Table 26 Courses of the 11th Semester

Subject	Lectures	Workshops	ECTS-Points
Lab.Diag. practice	0	80	3
Food Hygiene practice	0	80	3
State Vet. Medicine practice	0	80	2
Clinical blocks (12 week altogether)	0	480	12
THESIS DEFENCE	0	0	10
Total		480	30

3.3. COMPARISION

As mentioned in the point 1.4 the examples of the Universities of Vienna and Budapest shows how the education institutes differs in the execution of the study aim. Both fulfill the recognition of veterinary degrees among the EU countries by the application of the European Credit Transfer System-Points.

While the study program of the Budapest university last for eleven semesters with the obligatory collection of 300 ECTS-points, takes the study of the University in Vienna 12 semesters with the collection of 360 ECTS-points. Another significant difference between those two is the grading system, whereas the grade 5 is the highest reachable grade “excellent”, means this grade in Vienna “fail”. Which means that the descending order of the grades are defined conversely. Both universities require the completion of a diploma thesis work, which is awarded with 20 ECTS-points in both study programs. Next to the obligatory courses both expect the fulfillment of elective courses to collect min. 7.5 ECTS-points (Vienna) or min 30 ECTS-points (Budapest). Where it is free to choose the courses in their content in Budapest, Vienna regulates the elective course choice by subject areas seen on page 20, which are: Lifelong learning with 2.0 ECTS-Points, development of scientific competences with 2.5 ECTS-Points, development of personal competences with 3.0 ECTS-Points.

The most significant distinction between those two universities lays in the composition of the higher clinical education. Where Vienna make the students choose their advanced modules in the third study stage beginning with the 10th semester. The advanced modules are listed in the Table 27 Advanced Modules Options and are composed of a clinical and non-clinical module. One of each must be chosen. The clinical rotation takes place in the 9th semester other than the practical semester in Budapest is contributed to the 11th semester.

CHAPTER IV. SURVEY

4.1. SURVEY QUESTIONS

This survey was created with google forms and participants were taking part during the time of the 24th of October and the 13th of November. A total of 108 responses has been gathered in this time. The answers of the survey are shown in diagrams to visual the results and discussed in their significance. At the end, the conclusion is made based on the gathered information's.

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4.1.1. Question One

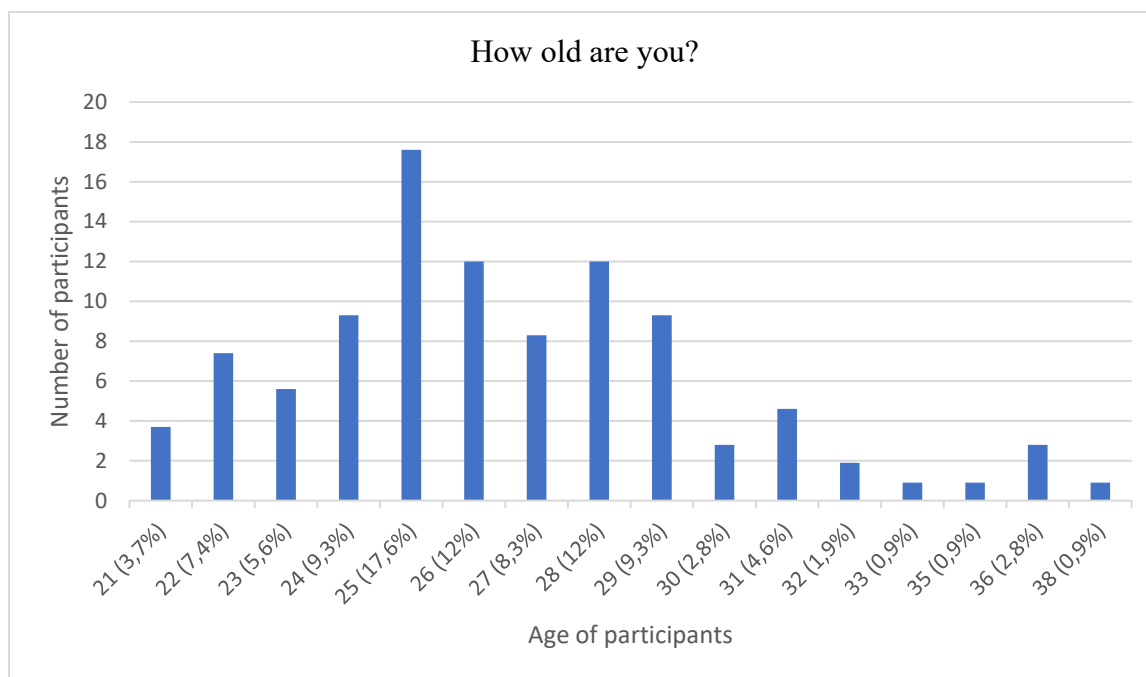


Figure 3 Age of participants with respect to their number

With veterinary students and practicing veterinarians participating in this survey the age range was between 21 and 38. Most responses were gathered from ages 25, 26 and 28 as shown in figure 3.

4.1.2. Question Two

As seen in figure 4, 88 of the 108 responses states to be female (81,5%), 19 to be male (17,6%) and one chose the answer “prefer not to say” (0,9%). Which correlates with the general trend towards the feminization of the profession.

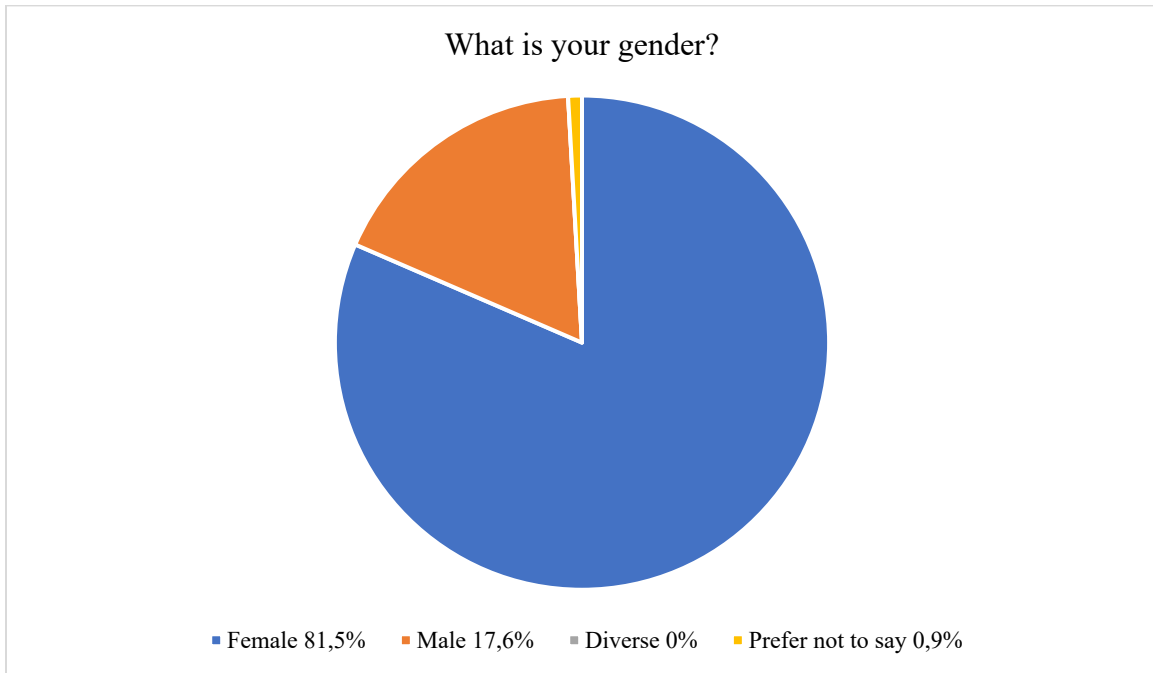


Figure 4 Gender variation of participants

4.1.3. Question Three

With being the 11th semester most present in this survey is lead back to the fact that this work was done in the framework of the diploma thesis of the 11th semester on the University of Veterinary Science of Budapest. And students from the own semester were the most reachable.

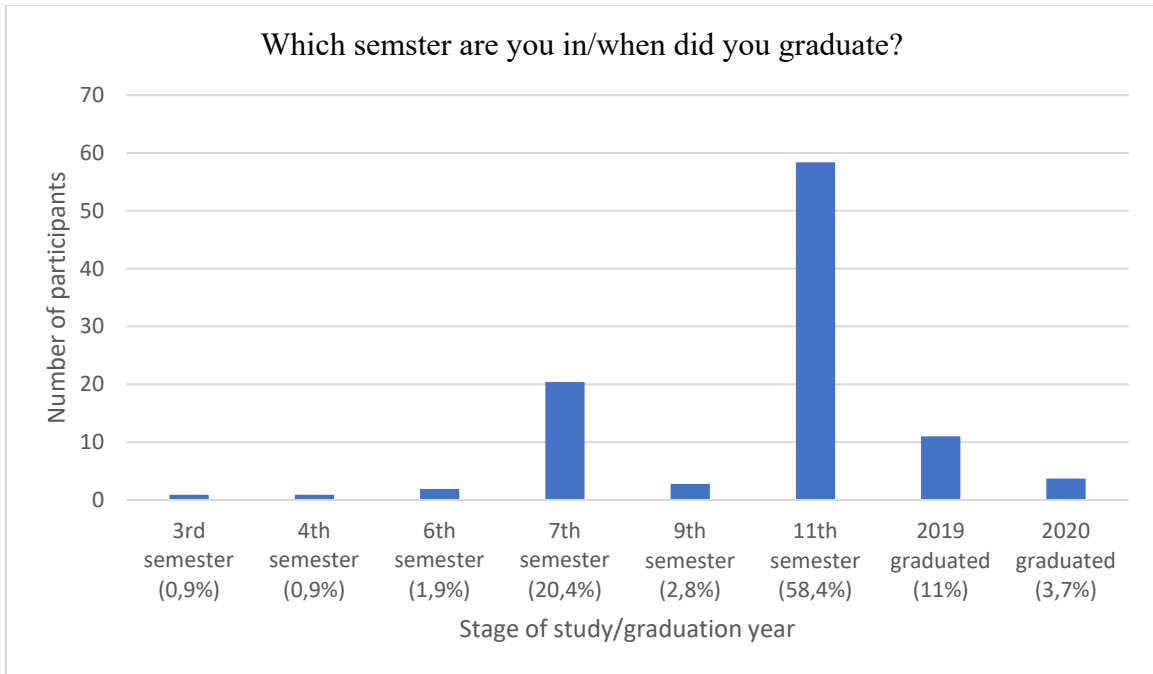


Figure 5 Stage of study/graduation year of participants

4.1.4. Question Four

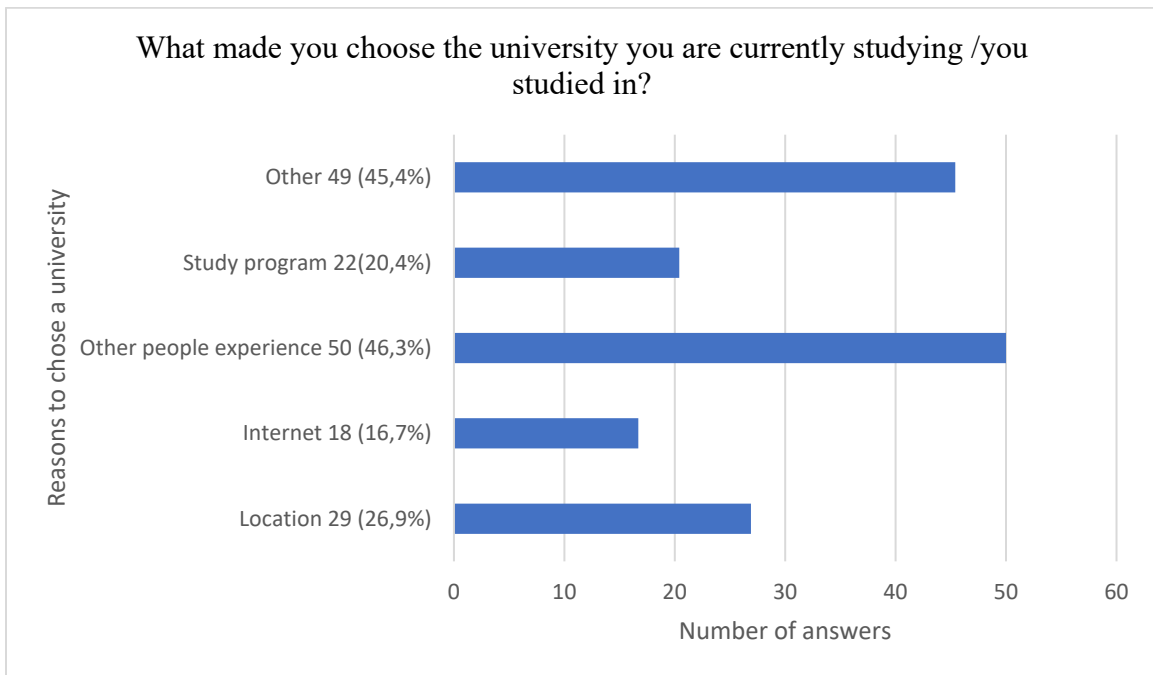


Figure 6 Reasons to choose a university

This question was asked as a multiple-choice question, which is the reason for having more answers than participants in this survey. With having the focus in this work on the study programs of universities, interestingly the intention of choosing a university to study

veterinarian medicine was not mainly driven by the program of the chosen university. Since the number of veterinarian universities in Europe is quite limited compared to other study programs, the location doesn't seem to make such a big impact. Rather than being based on 'Other people experience' with being the highest chosen answer. Where the acknowledgment on the possibility of studying abroad is taken based on other people who have made this experience.

4.1.5. Questions Five

This question shows that clearly most of the participants want to work with multiple species in their upcoming work life and only 1,9% are interested in working in a non - clinical field of the profession. The other majority with 38,9% is interested in working only with one species. Having a minority left with 5,6% not knowing in what fields of veterinarian medicine they want to work with.

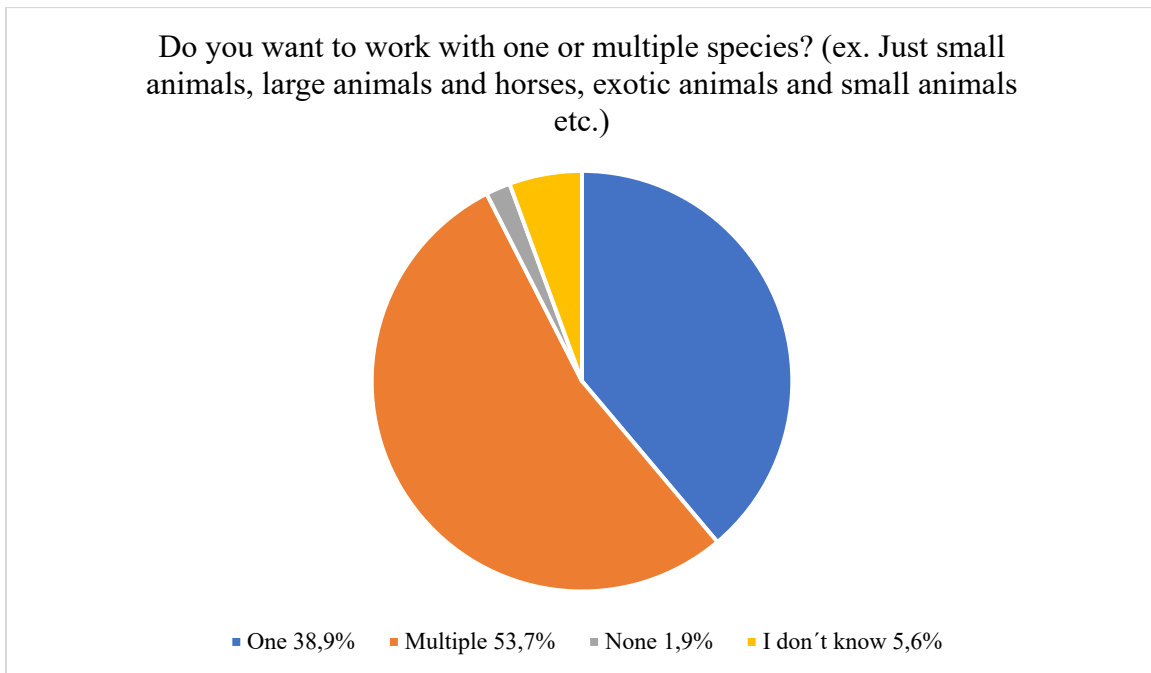


Figure 7 Field of working preferences

4.1.6. Question Six

Putting the numbers of students together who knew with which species or field of veterinarian medicine they want to work with before the end of their study adds up with 78,8%. Most of these decisions were made before the end of the study and even more remarkable is the fact that 50% were already sure before the study has even begun.

When did you know with which species you want to work with/in which field you want to work?

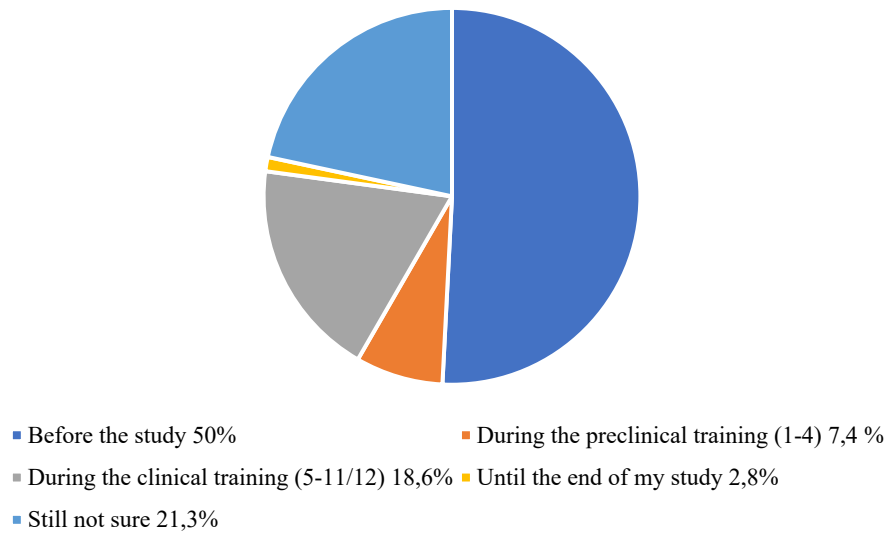


Figure 8 Time of choosing the specialization

4.1.7. Question Seven

Did that change during your further studies?

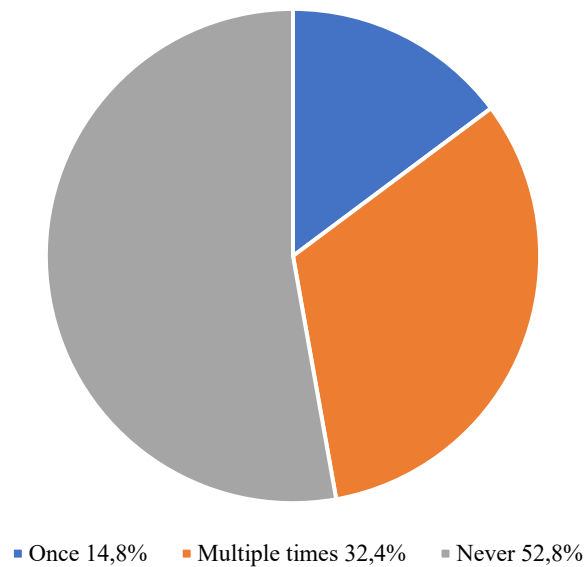


Figure 9 Changing chosen specialization

The answers to this question highly correlate with the answer to the previous question in figure 8. Were 50% state that they have known their specialisation in terms of species or field of veterinarian science beforehand. And the 'never' have been chosen by 52,8%. The

number of students where this decision has been changed multiple times with 32,4% is more than double as high as the number in students where it only changed once with 14,8%.

4.1.8. Question Eight

If you would have the choice to choose species and other fields of veterinarian medicine to focus on in your study which one would it be? (1. large animal, small animal, horse medicine, exotic animal medicine; 2. laboratory animal medicine, food hygiene, state veterinary medicine, research) (choose two of each list)

There has been an error for this question. 43 of 108 participants answered this question in a wrong way, where either more than the asked answers were chosen or less. That is why this question will not be considered in the conclusion of this work.

4.1.9. Question Nine

A high percentage, 79,6%, of participants answered this question with yes and 14,8% stated that this only implies for them sometimes. While only 5,6% stated that they have no trouble to give each course the attention that it deserves.

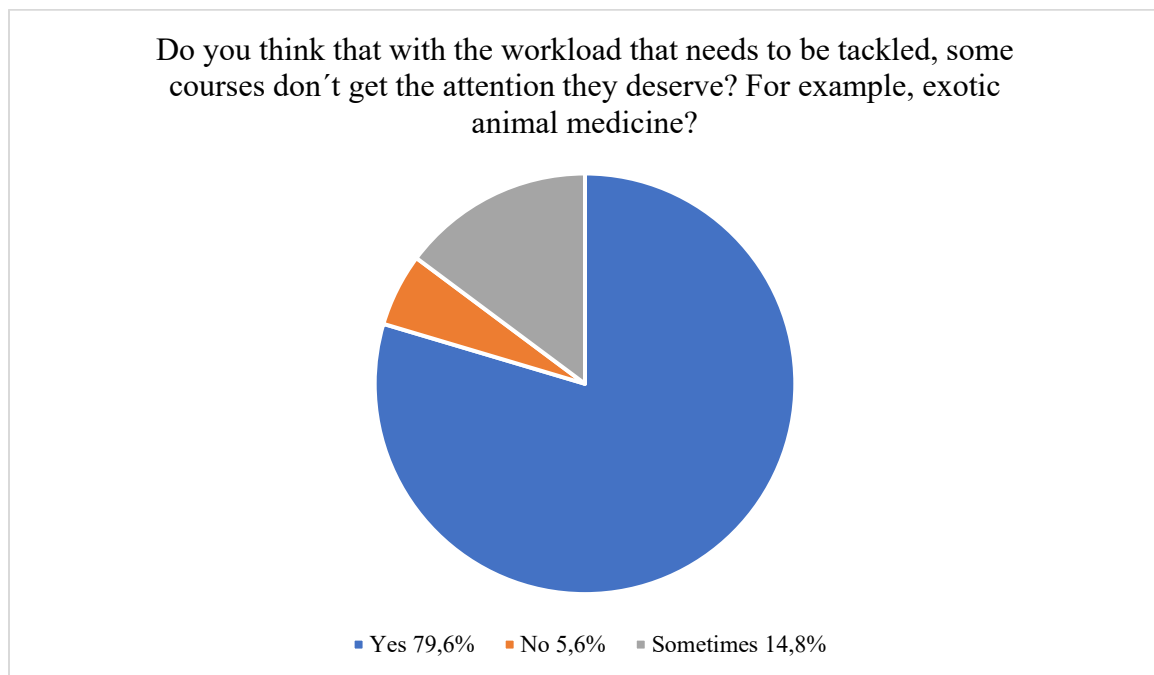


Figure 10 Selection of courses according to a high workload

4.1.10. Question Ten

For most of the people taking part in this survey it is a problem to remember detailed information that they have learned during their studies and 60,2% answered this question with yes. Whereas others stated with 34,3 % that is only sometimes a problem. The same percentage of people indicated that is no problem for them as the percentage of the question in figure 11, which was also 5,6%.

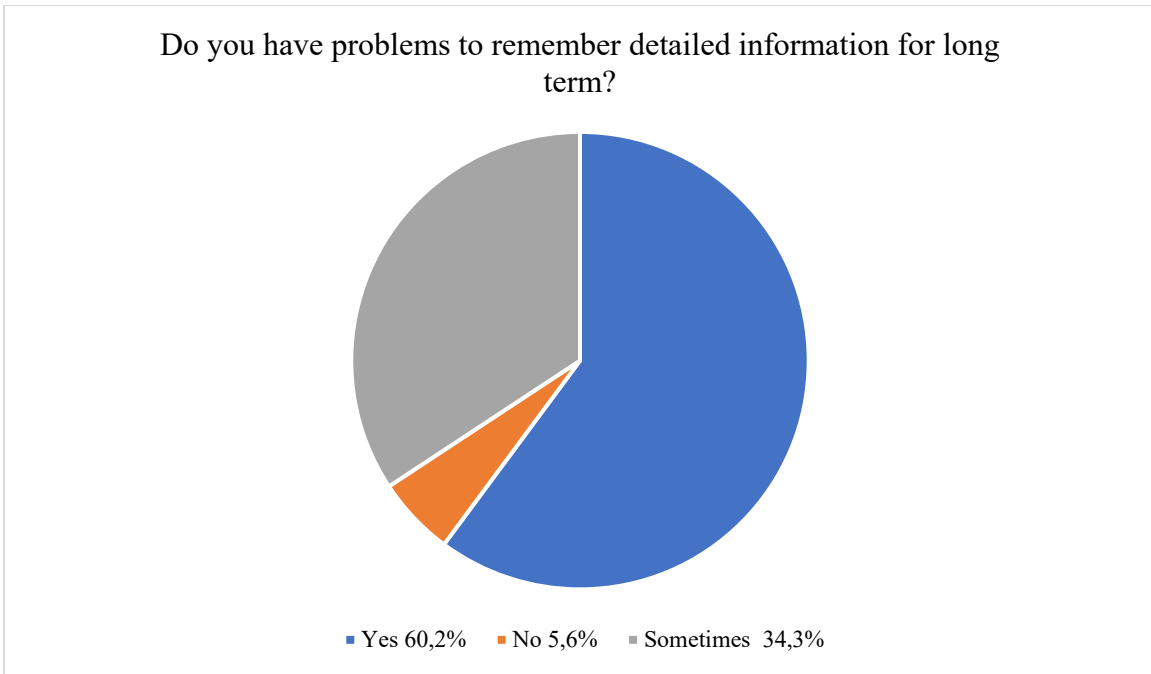


Figure 11 Information remembering difficulties

4.1.11. Question Eleven

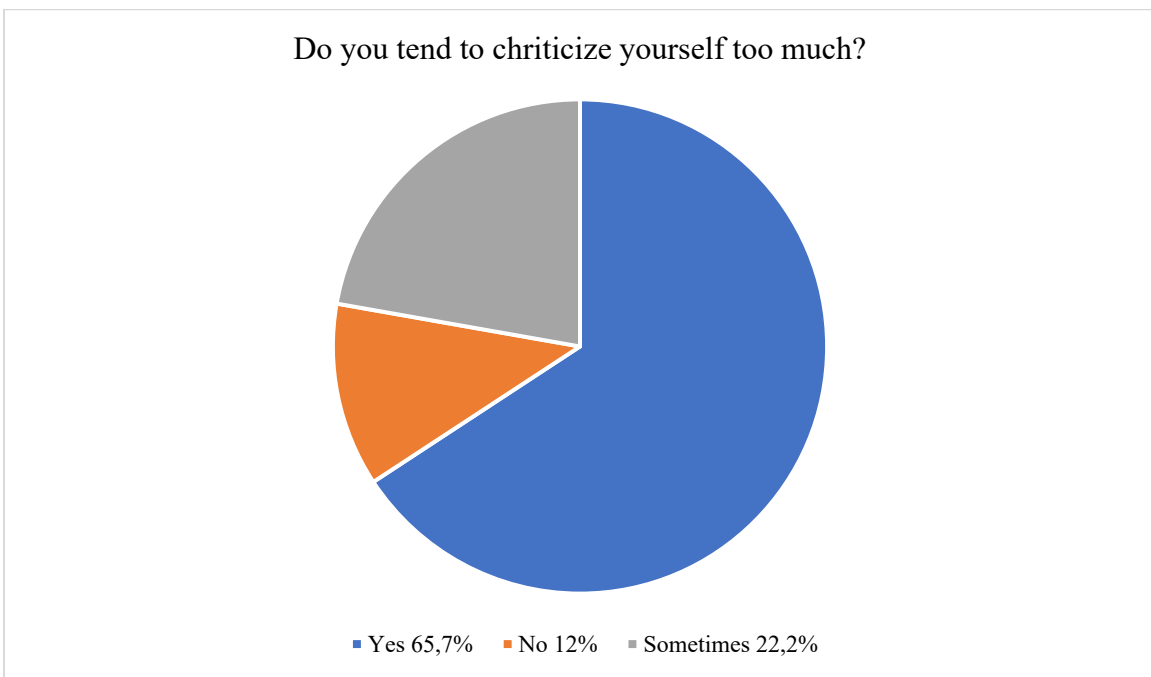


Figure 12 Criticizing diagram

This question was asked for own interest and does not contribute for the conclusion of this work. Since it has a rather psychological approach with has not been researched enough in this project.

4.1.12. Question Twelve

Over 50% said that they don't feel well prepared for their upcoming work life, while 37% do feel so in some fields. Again, the same percentage that answered the questions in 4.1.10 and 4.1.9 with no, do feel well prepared.

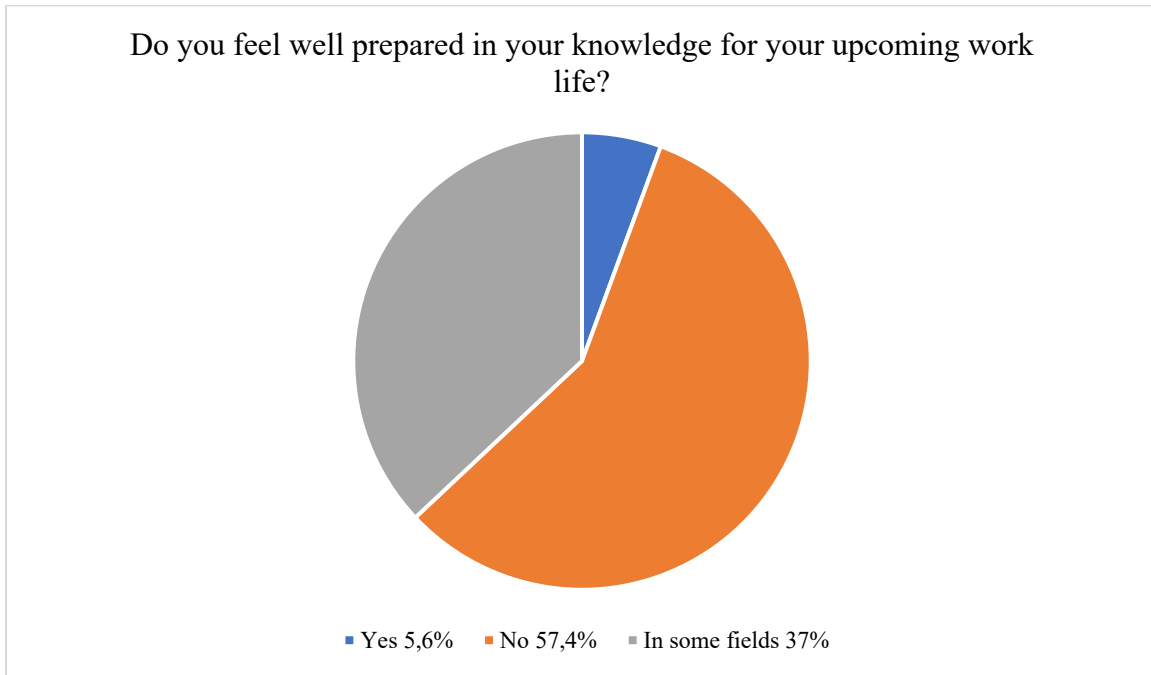
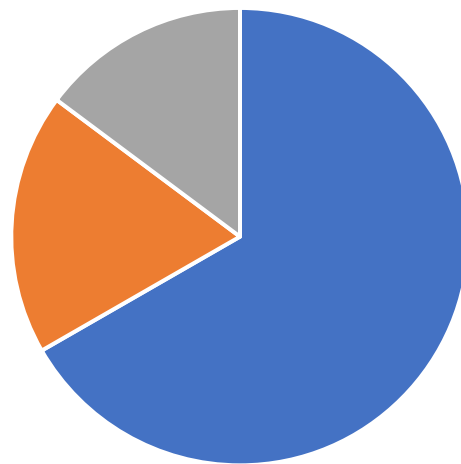


Figure 13 Confidence of knowledge

4.1.13. Question Thirteen

Many thinks with 66,7% that a specialisation earlier in their studies would have helped to feel better prepared for the upcoming work life, 14,8% are not sure if that would be the case. And 18,5% clearly think that it wouldn't help in being better prepared.

If not, do you think it would have helped you to specify your study earlier in terms of the species/fields you want to work with?

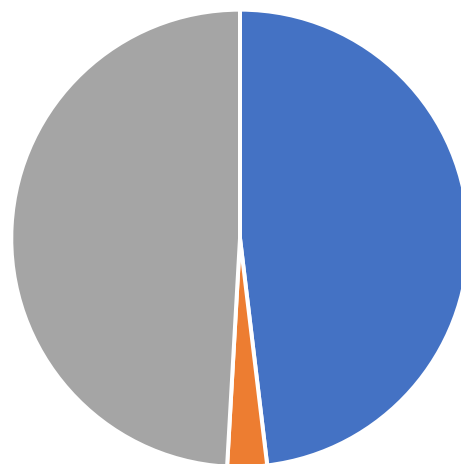


■ Yes 66,7% ■ No 18,5% ■ I don't know 14,8%

Figure 14 Relation of knowledge and early specialization

4.1.14. Question Fourteen

Do you wish that there would be a change in the veterinary medicine training?



■ Yes 48,1% ■ No 2,8% ■ In some parts 49,1%

Figure 15 Desire to change the veterinary medicine training

A total of 97,2% wish that there would be change in the veterinary medicine training or at least in some parts of it. With 2,8% a quite low number don't want a change in their training in becoming a veterinarian.

4.1.15. Question Fifteen

Following question 14, What parts would that be? (space)

With having a lot similar answers to this question, the most prominent are going to be pointed out and rephrased in the following paragraph.

102 answers were gathered, and six participants left the space blank or stated it with "none". There was some interesting answers such as: "To focus more on economic and surgical training."; "Focus on communication/business parts, which I think is coming for the future."; "Cursus separated by subjects (neurology, cardiology, airway tract, diagnostic imaging etc.) instead in species (small, large, exotic, etc.)"; "More contact with clients during the education. A Bigger focus on animal welfare, including the actual enforcement of the curative practice (ex. It is not enough to know that brachycephalic animals are agony breeds, it needs a clear guidance on how to deal with such situations to create a nationwide understanding. It was not thought how for example to tell an owner that his/her animal is overweight, many are not able to do so."

Where a high number of responses were asking for a more practice orientated training. Where the once standing out the most are as follow: "Real clinical practice under a supervising veterinarian to get practice in doing clinical examinations and basic procedures. More hands-on clinical experience, like how to set up an x-ray, prepare anaesthesia combinations, setting up lists of differential diagnosis, treatment plans, getting to practice spaying/neutering, practicing c-sections and pregnancy diagnosis."; "learning to look at cases more holistically."; "More practical work, more structure, better communication between the different fields as well as the 'real world'."; "More focus on practical skills and a restructuring to put clinical courses towards the end of the study, so we leave with a fresh clinical knowledge."

The other majority wished an earlier specialisation of the study according to their interests. In which the most prominent once are: "Learning the important facts and practical skills about every animal but focus more on one species you want to work with in the future."; "More species interested focus after 3rd year and more clinical based training in 5th year. Choose field of interest in 11th semester and train in that specific field for month instead of jumping between blocks."; "Focused clinical studies during 5th year (large, equine, small) if one chooses so, and if you don't know you could choose mixed (as the course is now). A lot more case study teaching."

On the other hand, two participants stated: "More practical work in the areas where you want to work in. There are too many areas in which you can work as a veterinarian later on and it is important to get to know all of them but this inevitably lead to the fact that you do not learn important things in the areas you want to work in later on or learn them not well enough."; "I like it's not species specific at the end, I didn't realise how much I enjoyed working with farm animals until the end even if this is not my main focus. I didn't think I was well prepared until I started the 11th semester placement and realised how much I actually was."

CHAPTER V. CONCLUSION

After considering and evaluating the results that were obtained from the survey and the research, which took place in this project, the following conclusion can be drawn. Question six (figure 8) supported the hypothesis by showing that 78,8% of all participants knew with what species/field they want to work with before the end of the study, while a percentage of 57,4% before the start of the clinical training. Showing that half of the participants already knew it before the study has even begun. Which means that most of the students would be able to choose their field of interest during the study. This approach is underlined by the question seven (figure 9) where the question was if this decision changed in their further studies and more than half, 52,8% stated that this has never changed during their studies. Adding to this the 14,8% of people where it only changed once, where a total of 57,6% is consolidated in their decision. Question nine (figure 10) points out the amount that needs to be tackled in the veterinary medicine training, some courses might not get enough attention from students in order to fulfil them with a good mark and to acquire lasting knowledge for the future. Knowing that this question has been significantly answered with 'yes' by the participants with 79,6%, while 14,8% are saying that this is 'sometimes' the case, adding up to a total of 94,4%. But not only giving courses the attention that they deserve is a problem for students, also remembering the studied information's for long term and hence applying them in the future in their work. This is visualised by the 10th question (figure 11), where 60,2% do have problems to remember studied information and 34,3% do sometimes. However, 5,6% stated that they neither have troubles to give all the courses the attention they deserve nor remembering detailed information for long term. Which is a minority of the answers gathered in this matter. With this being said it is almost predictable that the answers to the question twelve (figure 13) if the participants feel well prepared for their upcoming working life is 'no' with 57,4% and 37% feel well prepared only in some fields. Question 13 (figure 14) underlines the hypothesis if an early specialisation in their studies could contribute to a better knowledge for graduating students. Where 66,7% stated that it would have helped to acquire a better knowledge for their upcoming work life if they would have been able to focus earlier on their field of interest during the study. Furthermore, question 14 (figure 15) discusses whether students wish that there would be a change in the veterinary medicine training. Remarkably 97,2% of participants do wish a change, while 48,1% answered this question with a yes and 49,1% just in some parts and only 2,8% do not wish any changes in the education of veterinary medicine. Question 15 gave participants the chance who answered the previous question with 'yes' or 'in some parts' to express their ideas of how the training of veterinarians could be improved or changed. Contributing to the idea of this work, a high number of participants expressed the desire to be able to choose their field/fields of interest earlier in their studies.

On the other hand, this approach could be the solution to overworked and stressed students, who don't feel well prepared for their upcoming working life is far from reality. Considering the latest it would be for example leaving the 24,1% in figure 8 behind that are not sure in what field they want to work with until the end of their study or even

afterwards. This is underlined by the fact that a high percentage of participants with 32,4% stated in figure 9 that this changed multiple times and most likely could change again at any moment in their studies or working life. This is based on real life events, where for example somebody worked as a farm animal veterinarian and after the work has been too exhausting and unbearable anymore that person needed to switch to work with small animals. Or when the decision was made to work for example in the veterinarian state office with more predictable and family friendly working hours. Such decisions won't take place, if the foundation to be able to work in these fields wouldn't have been made during the study of veterinarian medicine. It is true that the majority as seen in figure 11 have troubles to remember detailed information for long term. The aim of the university is to give students a good amount of basic knowledge and the ability to extent and understand this knowledge in the future. Putting a specification in the study would also not be beneficial for the people who don't think it would have helped to acquire a better knowledge with 18,5% and the ones who are not sure about that and answered the question in figure 14 with 'I don't know' (14,8%). Which adds up to a total of 23,3%, which is still a reasonable percentage that needs to be considered. Therefore, the approach that shows it wouldn't be beneficial of choosing fields of interest during the studies is underlined by the participants stating in question 15 that he/she wouldn't like a specialisation as he/she didn't know how much joy it would be working in a field that wasn't his/her main focus. This person also wrote that he/she was surprised of how much the university prepared him/her for the 11th clinical semester. And the statement of the person that emphasized the variety of fields to work in with the veterinarian medicine education alone. And how important it is to get an overview of all of them in order to find out fields of interested which haven't been there before.

As a final result, it can be said that the approach of specialising earlier in the study of the veterinary medicine training could be beneficial and might be an approach for the future as the trend in the veterinarian medicine goes to being a specialist in your field of work. This being the wish of many participants in the survey. However, the reasons to not realise this are overweighting those in their significance. The university gives us the legal permission to work as veterinarians with the degree and teaches us to gather and understand information to apply them in our daily work. To become a competent veterinarian the basis is a constantly lifelong learning and practicing in the field one chooses.

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- Figure 1:
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- Figure 2:
<https://www.google.de/imgres?imgurl=https%3A%2F%2Fhistoryofveterinarymedicine.files.wordpress.com%2F2015%2F11%2Flyon.jpg%3Fw%3D640&imgrefurl=https%3A%2F%2Fhistoryofveterinarymedicine.wordpress.com%2F2015%2F11%2F11%2Fthe-birth-of-modern-veterinary-medicine-a-cattle-plague-story%2F&tbnid=oXNNZyLSPMjzDM&vet=12ahUKEwjSxpWhpbLsAhWbgaQKHbvTCxAQMygCegQIARBM..i&docid=YIWTwsyEmBykDM&w=591&h=380&q=first%20veterinary%20school%20lyon%20france&ved=2ahUKEwjSxpWhpbLsAhWbgaQKHbvTCxAQMygCegQIARBM>

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