Texty pro studenty předmětu V1AJ

Ústav cizích jazyků
VFU BRNO

HISTORY OF UVPS BRNO

The University of Veterinary and Pharmaceutical Sciences Brno was founded on December 12, 1918 by Act no. 76/1918 Coll. on Creation of the Czechoslovak State Veterinary University in Brno. It was the first university to be established after the formation of the Republic of Czechoslovakia. It was founded within the premises of what used to be cavalry barracks and a provincial reform school. The university's founder and its first rector was Professor Eduard Babák. Classes began on November 17, 1919. From its start, the university developed as a single-faculty university aimed at veterinary medicine (veterinary sciences). In 1975, two fields of study were introduced: the General Veterinary Medicine and Veterinary Medicine – Foodstuff Hygiene. In 1990, two faculties were created – the Faculty of Veterinary Medicine, focused on veterinary medicine, and the Faculty of Veterinary Hygiene and Ecology aimed at veterinary hygiene. In 1991, a third faculty was added – the Faculty of Pharmacy, geared towards human and veterinary pharmaceutical sciences. Since 1994, the university has been officially called the University of Veterinary and Pharmaceutical Sciences Brno (UVPS Brno).

LOCATION AND UNIVERSITY CAMPUS

UVPS Brno is the only university in the Czech Republic specializing in veterinary medicine, veterinary hygiene and ecology, and one of two universities that teaches pharmaceutical sciences. The school campus is found on unique premises with a special atmosphere formed by the building's enclosed spatial layout combining the character of 19th century structures with modern buildings from just the past fifteen years. The park with its mature trees adds to the campus atmosphere. The campus also features a greenhouse, botanical gardens and certain rare or interesting tree species.

UNIVERSITY ORGANIZATION

The rector is the head of the UVPS Brno. Subordinate to the rector are three vice-rectors – vice-rector for education, vice-rector for science, research and foreign relations, and the vice-rector for development and construction of UVPS Brno, contact with job training and university agricultural farm. The registrar handles economic and administrative issues. Autonomy of the university is provided by the University Academic Senate. A university body is the University Board of Supervisors. The issue of education and scientific activity is taken up in the University Scientific Board. The university is divided into the Rector's Office, including other working locations, and three faculties, the Faculty of Veterinary Medicine (FVM), Faculty of Veterinary Hygiene and Ecology (FVHE), and the Faculty of Pharmacy (FP).

FACULTY OF VETERINARY MEDICINE

The Faculty of Veterinary Medicine provides university education, research and specialized activities focused mainly on clinical veterinary medicine. In terms of organization, the faculty is divided into the Dean's Office, sections with individual clinics and departments, and specific faculty facilities. The FVM organizational structure is as follows:

- Section of Morphology and Physiology (Department of Anatomy, Histology and Embryology, Department of Physiology)

- Pathobiology Section (Department of Pathological Morphology, Department of Parasitology, Department of Microbiology and Immunology, Department of Animal Genetics, Department of Infectious Diseases and Epizootology)
- Section of Small Animals Diseases (Dog and Cat Clinic, Avian and Exotic Animal Clinic, Department of Pharmacology)
- Section of Large Animals Diseases (Equine Clinic, Ruminant Clinic, Swine Clinic)
- Specific faculty facilities (Central Clinical Laboratory)

At the FVM, education is realized within the framework of the Master's degree programme of Veterinary Medicine in the languages of Czech and English. The form of study is daily and its standard length is 6 years. Studies include subjects from the group of basic fields, mainly biology and chemistry, group of animal breeding fields, mainly animal nutrition, livestock breeding and animal hygiene, animal welfare and protection, group of pre-clinical fields, mainly anatomy, histology and embryology, physiology, pathological anatomy, pathological physiology, microbiology, immunology, parasitology, genetics, pharmacology, toxicology and epizootology, group of clinical fields, mainly diseases of dogs, cats, horses, cattle and small ruminants, swine, poultry, fish, bees and exotic animals, infectious diseases, legal and veterinary public health, as well as a group of subjects of food hygiene and professional education subjects. Studies include a wide spectrum of veterinary medicine, but they are strongly oriented towards diagnostics, therapy and prevention of diseases of various types of animals. Studies are completed by an advanced state exam which is comprised of component tests from several clinical subjects based on the student's choice, and possibly a thesis defence, and also component tests from infections of animals and legislation, and komponent tests from food hygiene. Graduates are bestowed the title of *Doctor of Veterinary Medicine* (lat. *medicinae veterinariae doctor* abbreviated to MVDr. preceding the graduate's name). The FVM graduates have traditionally asserted themselves mainly in the private veterinary practice sector. In the Czech Republic, private veterinary practice is a business regulated by specific directives and decrees; therefore the number of places in this practice is not limited by employment capacity in enterprise or state administration, but by the demand of citizens and enterprise for veterinary diagnostic, treatment and preventative activity which is substantial especially in small animal veterinary practice. At the Faculty of Veterinary Medicine, a doctoral post-graduate study programme is also offered in 16 selected fields of veterinary medicine in the Czech study programme, and in 5 fields in the English study programme. Entrance exams include an interview with the applicant in which mainly the person's prospects for scientific work are verified. The standard length of study is 3 years. Studies end with a State doctoral exam and a Doctoral thesis defence. Graduates are bestowed the academic title of *Doctor* (abbreviated to Ph.D. introduced after the graduate's name). Lifelong Learning is realized within the framework of the so called University of the Third Age with its degree study programme in the area of Man and Animal. The standard study programme lasts 2 years. Lifelong Learning is also further implemented as a part of educational and training courses mainly for veterinary practitioners.

STUDYING AT THE UNIVERSITY

Applicants for a Bachelor's degree study programme, a sucessive and/or standard Master's degree study programme must submit their applications by the end of February. Bachelor's and Master's degree study programmes entrance exams are scheduled in the month of June, and the entrance requirements include a State leaving exam diploma and successful passing of a test from the subjects of biology, chemistry and physics. Post-graduate degree study programme entrance e xams are scheduled in the month of July. Applicants are ceremonially accepted into the academic community during the act of matriculation when

they take the oath of university students. Education at the university is based on a credit system principle (ECTS – European Credit Transfer System). It is carried out in the form of lectures, seminars, practical exercises, laboratory training, in the form of education at clinics, and in meat, fish and dairy workstations, in the faculty pharmacy, and in specialized laboratories. It is also provided in the form of practice training at the agricultural school farm, in companies and job training in the form of internships at university institutions and clinics, and in the form of internships in private veterinary practices, at veterinary organizations, and in pharmacies or other institutions. Such approach to teaching and education enables students to gain practical experience in their respective fields of study. Emphasis is placed on practical training, leading to students attaining professional skills applicable in their future veterinary profession. Nevertheless, more traditional teaching procedures are also used in education. Teaching is supported by multimedia mainly during lectures and seminar training. During practical training, however, preservation of traditional approaches is essencial in specific laboratory work, in dealing with biological material, handling of animals, performing autopsies, in work in examination rooms, in veterinary activity in veterinary practice as well as in pharmacological activity in pharmacies. The studies are terminated by a graduation ceremony. The university holds traditional academic graduation ceremonies which are considered to be the most impressive in the school's history. The event takes place in the University Hall, and is attended by academic officials of both the university and the faculties. During the graduation ceremony, graduates take a ceremonial oath, and they are presented diplomas for the degrees that they have earned, as well as their academic titles and a bilingual diploma supplement certifying the course of study to facilitate graduates' placement abroad.

UNIVERSITY SCHOLARSHIP PROGRAM

A student support programme has been developed at the UVPS Brno. A part of such activities is the scholarship programme which includes merit scholarships awarded on the basis of academic performance without regard for financial need and given for student scientific efforts, for excellent scientific research, development and/or other creative results, accommodation scholarships and financial ned scholarships, and special scholarships in cases worthy of special consideration. One such example are athletic scholarships for exceptional results during sports representation of the university. Doctoral scholarships are granted to students of post-graduate study programmes. The same applies to scholarships supporting students sent abroad.

NATIONAL ACCREDITATION, INTERNATIONAL EVALUATION AND RECOGNITION OF STUDIES BY THE EUROPEAN UNION

National assessment of the university education quality at the faculty level is performed by the Accreditation Commission of the Ministry of Education, Youth and Sports of the Czech Republic. The last assessment of all three faculties was affirmative and all its requirements and criteria were met. The quality of education at the university is verified at the international and national level. Both the FVM and the FVHE are mentioned on a prestigious list of affirmatively assessed veterinary faculties and universities, as compiled by the European Association for Establishments of Veterinary Education (EAEVE). Both faculties attained this prestigious placement on the basis of foreign expert international evaluation. The final assessment report presented to the university at a meeting in Brussels stated that both faculties meet requirements for veterinary education established by EU legal regulations and additional EAEVE requirements and that their education quality standards are high. This ranked the University of Veterinary and Pharmaceutical Sciences Brno among the top veterinary universities in Europe. After the meeting of the international commission, the Faculty of Pharmacy was ranked amongst the pharmaceutical faculties that meet the EU pharmaceutical education requirements. Education at all UVPS Brno faculties is

recognized within the EU framework by Directive no. 2005/36/EC, on recognition of professional qualifications. This directive lays out conditions for attaining education for performance of an occupation for which providing a determined level of education is required (so-called regulated profession amongst which veterinary and pharmaceutical professions belong).

FOREIGN STAYS OF STUDENTS AND TEACHERS AND UNIVERSITY INTERNATIONAL ACTIVITIES

The university appreciates acquiring international experience, and thus it supports student and teaching staff exchanges within the framework of the international Erasmus programme and Lifelong Learning scheme, or on self-evaluation report and evaluation report within the scope of international evaluation of veterinary faculties, or on the basis of bilateral agreements, or in the form of so-called free movers. Students and professors alike attend both short-term and long-term stays at univerities in Europe, and lately, in the United States of America as well. The mobility programme supports active membership of the university in dominant European organizations influencing veterinary and pharmaceutical education in Europe, such as the European University Association (EUA), the European Universities Continuing Education Network (EUCEN), the European Association for Establishments of Veterinary Education (EAEVE), the Veterinary Network of European Student and Staff Transfer, (VETNEST), the Federation of Veterinarians of Europe (FVE), the Europe Union of Veterinary Hygienists (EUVH), and the European Association of Faculties of Pharmacy (EAFP).

SCIENTIFIC AND RESEARCH ACTIVITY

Scientific, research and creative activities form an integral part of the UVPS Brno and they are carried out at the faculties. They are funded from external sources upon competition with other applicants. The most important source of financing are government grants, internal university grant agencies, contractual research with companies and other possible issuers, as well as shares in resolving international projects. The number of projects is rather high. Another part of the university research activity is work on two research projects and participation in two national research programmes. UVPS Brno is also involved in an extensive, seven-year project aimed at the area of veterinary aspects of food safety and foodstuff quality.

PUBLICATION ACTIVITY

The results of the university research activities are introduced in the form of publications which are documented and subsequently presented in an annual overview – List of Publications of UVPS Brno. High quality papers are publishedin Impact factor journals included in the international database of scientific literary sources. Recently, the university has been publishing over 200 Impact scientific papers in scientific journals each year. Academic staff also takes part in a beneficial exchange of scientific experience at numerous conferences. When assessing scientific and research activity based on a rough coefficient given by the number of publications in scientific journals with an Impact factor per 100 students or per the number of academicians, UVPS Brno is one of the best-published public universities in the Czech Republic. The university also issues its own scientific journal, Acta veterinaria Brno, an impact journal focusing on veterinary medicine, with a tradition reaching back to 1922.

CONFERENCE

The university holds scientific as well as specialized meetings both for students and for scientific gields specialists. A number of these events have a rather long tradition, such as the Lenfeld and Hökl Days – a conference on food hygiene and technology (since 1967), the Conference on Animal Welfare and Protection (since 1994), the Kábrt Dietetic Days (since 1995), and the Lukeš Days (since 1995).

VETERINARY CLINICAL ACTIVITY

The university clinics have become a centre of veterinary care for clients from all over the county and even abroad. Their clinical facilities, such as the Small Animals Clinic, Equine Clinic, or the Swine Clinic provide a 24/7 veterinary care including emergency care, hospitalization and intensive unit care. With their modern equipment and professionally handled surgical operations the clinics provide the highest level veterinary care. The number of examined or hospitalized patients or those located in intensive care units and the sheer number of patiens examined directly in herds of livestock is exceptionally high. The clinics academic staff, veterinary surgeons providing veterinary care and students engage in activities of the clinics which host a number of research projects. The clinics thus satisfy not just the role of surgical veterinary facilities for diagnostics, therapy and prevention of diseases of livestock and pets, but also the role of modern education and training centres.

AGRICULTURAL SCHOOL FARM

The UVPS Brno also operates ad agricultural school farm in Nový Jičín (3,170 ha), and in Nové Dvory and Jinačovice near Brno (179 ha). Vegetable crops focus on wheat, barley, corn, sugar beets, poppy, peas, clover, grasses and perennial fodder crops. Livestock production includes cattle, pigs of all categories and horse breeding. The farm features a game park with breeds of fallow deer, a pheasantry for rearing pheasants and other game birds, and deer hunt. Annualy, the end of the ridinf season in autumn sees a celebration called the Hubert's Ride. The school farm is an important part of educating students in the area of livestock veterinary care.

UNIQUE FEATURES OF THE UNIVERSITY

Among the special university features are the Museum of Anatomy, the Museum of Pathological Morphology, the Museum of History of Veterinary Medicine and Pharmacy, and the archive treasuringdocuments on veterinary medicine, such as unique documents from the entire history of the university since 1918. The Club of History of Veterinary Medicine and Pharmacy is a place where emeritus university professors and field enthusiasts meet and hold an entire series of events commemorating historic moments in veterinary medicine and pharmacy. For more than 40 years, the university bestows its so-called Golden Diplomas upon its own graduates 50 years after their graduation. Other events held yearly are the annual university balls. The university holds a unique collection of medals and medallions, representing one of the largest vocational collections in Europe. It is proud of its picture gallery of its rectors depicting each and every university representative. The university grounds are also the place where graduates hold their graduating class reunions.

FORMAL LETTER WRITING – CURRICULUM VITAE AND COVER LETTER

Curriculum Vitae

Curriculum vitae provides key information about a person's life, skills, experience, education and qualifications. The term *curriculum vitae*, abbreviated to CV, is of Latin origin and can be loosely translated as "a course of life". Thus, shortened form *vita* is sometimes used.

The main purpose of a CV is to provide future employer with data about us necessary for gaining some position. *Curriculum vitae* is commonly used in Europe, the Middle East, Africa or Asia when seeking a job, whereas in the United States and Canada CV is primarily used when applying for academic, education, scientific or research positions. CV in the "European" sense is in these countries called **résumé**. Generally, a CV tends to be longer and more detailed mainly on education, usually including an extensive list of professional history, previous employment, work experience, publications, etc. Sometimes, the information included in a CV or résumé has to be adapted to different types of positions. Similarly as a résumé, *curriculum vitae* should include personal information as the full name, contact address, phone number, email address or fax of the applicant. Certain attempts to create a model of a standardized CV were made in the European Union. This universal CV was included among other documents - Language Passport, Europass Mobility, Certificate supplement and Diploma supplement - **uniformly called Europass**, which should help clearly understand person's skills and qualifications throughout Europe.

How to write a good CV

Structure your CV in a logic and well-arranged way. At the top you should type in bold your **personal and contact information** (name, address, phone number or possibly e-mail). Further **academic background information** on postgraduate, graduate or undergraduate work, degrees or honours follow. Other information could deal with work or other related experience, **professional development** (conferences or workshops attended), **research activities** (journal articles, authorship, conference proceedings, etc.). If it is connected to the position you apply for, you can also mention **affiliations or memberships** in concrete societies, volunteer work or consulting. Usually some **foreign language abilities** or skills are necessary to mention. If possible it is useful to give **information on references**. Ideally give the details of two referees: one academic and one employer. Imply their names, position, address, phone numbers and email addresses. They should be always asked for their permission and possibly informed of your career aspirations and achievements to date. Information such as your date of birth, age, gender, religion or marital status, whether you have a driving license or your photograph are in accordance with anti-discrimination laws in most cases considered optional data.

What to avoid

When writing the CV, you should avoid certain issues which would negatively influence your chances of getting the job. Do not use any subjective (mainly pejorative) evaluation of your previous colleagues, bosses or teachers. **Never lie**: implying skills or knowledge you do not posses will be revealed if not during the interview then definitely after you have been recruited. Be careful about possible grammatical mistakes in your CV - it would throw bad light upon you. Also being too wordy in order to impress the potential employer will discourage them from even reading it. The CV should be **written concisely** and to the point as the others will not spend a long time extracting and seeking for the relevant information.

The language of a CV

The language of a CV and in fact of all similar documents has its own specifications which combine **characteristics of formal and written language**. One of the main rules is to **avoid abbreviations and contracted forms of words**. Mixing of tenses is also one of the common mistakes people make as they describe previous and current work experience. It does not matter if you use the past or the

present tense but choose one and stick to it! You should **avoid writing in the first person** as much as you can – using action verbs to start with sentences is a good way to overcome this. It immediately emphasizes the skill used and focuses the reader's attention. If you combine this style with using **bullet points**, it will make your CV scannable so that the main information can be identified quickly.

CV layout

The visual aspect of your CV plays an important role, too. Use only good quality, white A4 paper with black print, remember to use spacing, highlight different sections as it helps better orientation, and consider the font use. Arial, Times New Roman or Calibri seem to be much more acceptable than e.g. Courier or Comic Sans. **The style and format of your CV should remain uniform throughout.**

Cover letter

Another document very often attached to *curriculum vitae* is the cover letter. Cover letter, or covering letter, also referred to as motivational letter or letter of motivation, is a letter sent to a future employer when applying for a job. It is a way of **introduction of the applicant** and **explaining suitability for the desired post**. Basically, cover letters are one page at most in length, divided into a header, introduction, body, and closing. The employer's address is listed below your contact information.

Header

Header embodies the **sender's contact information** (name, address, phone number, cell phone number, email address) and the **recipient's contact information**. Do not forget the date sent after either the sender's or the recipient's address. The final part of the header is a **salutation** followed by a comma, a space, and then follows the first paragraph of the letter (introduction). If you address the concrete person, you use salutation as e.g. *Dear Mr. Smith* or *Dear Dr. White*. In case you do not know the name of the contact person, you should use general salutations as *Dear Hiring Manager*, *Dear Sir or Madam* or *To whom it may concern*.

Introduction

The next part of the letter is introduction in which the candidate briefly states the specific position desired. Although this section should be very short (approx. 1-2 sentences), it is very essential as it **should catch the employer's immediate interest**.

Body

The body emphasizes the material in the CV and explains **why the job seeker is interested in the job** and would be of value to the potential employer. Typical matters considered typically include the applicant's skills, qualifications, and past experience. Other special things to note such as availability date can be included as well.

Closing

The closing **summarizes the letter**, and implies how the applicant will follow up. It may indicate that the applicant intends to contact the employer; however, many prefer the more indirect approach of simply saying that the applicant will **look forward to hearing from or speaking with the employer**. After the closing there comes a **valediction**, and then a **signature line**. Examples of some suitable valedictions are following: *Sincerely*, *Sincerely Yours*, *Regards*, *Best Regards*, *Kind regards*, *Yours Truly*, *Respectfully* or *Thank you for your consideration*. These phrases are, similarly as the salutation, followed by a comma and space. After it comes a signature. Optionally, the abbreviation ENCL may be used to indicate that there are enclosures as a CV or copies of other official documents.

ACTIVITIES

1. Questioning an applicant
Write questions you would ask an applicant to find out the following information

first name _____
surname _____
date of birth _____
place of birth _____
country of origin _____
present address _____
permanent address _____
marital status _____
skills _____
driving license _____
interests _____
health status _____
accreditation _____
education _____
work experience _____

2. Reading comprehension
Scan through the texts again. Answer these questions.

What is the difference between a CV and a résumé?
_____
_____
Why do you usually need a CV?
_____
What are any common mistakes made in writing a CV?
_____
_____
What is the language of official documents in general?
_____
What does the term Europass stand for?
_____
What is the main function of a cover letter?
_____
What are the main parts of a cover letter?
_____

4. Lexis
Match the particular expressions to the parts of CV in the table below (sometimes there may be more possibilities)

Address, Administrator of the course, Artistic pursuits, Boss's Name, Details of final project, Driving Licence, Email, Employer's name, Grants, Hobbies, IT Skills, Job title, Language knowledge, Applicant's Name, Title of doctoral thesis, Candidate's Phone number, Postgraduate work, Professional exam (grade), Referee's Name, Work Responsibilities, Skills gained at work, Sports, Supervisor's name, Training course, Tutor's name, University name, Work address

Personal information	Education & Qualifications	Work experience	Skills	Professional Training	Interests & Activities	References

5. Gap fill
Read the cover letter (enclosed to an internship application) and fill in the gaps with appropriate expressions or phrases

Application Form, a definite asset, a great deal of, a match for, conducted a study, consideration, contact, Dear, experience with, applying for, In addition, look forward to, performed experiments, provide me with, reliable, to schedule an interview, willing to

Martin Uhlíř
Havlenova 4
639 00 Brno
Czech Republic
uhlir@email.cz

Dr. John Sheep
The College of Veterinary Medicine
Royal College Avenue
AL9 47T London
United Kingdom

February 13, 2010

_____ Dr. Sheep,
I am _____ the scientific research 1-term internship that was listed through The University of Veterinary Studies Career Services Office.
I have had _____ laboratory experience in biochemistry, and microbiology, both indoors and in the field. I have _____ testing new drugs for cattle. In field studies, I have _____ on quality of milk from cows using these drugs.
_____ to my lab work, I have _____ recording, calculating, analyzing data, as well as preparing reports. I have no problems to work as a team member, I am very _____ and organized, and _____ learn.
I hope I would be _____ your team. This internship would _____ the ideal opportunity to further expand my skills and knowledge in the research.

I will _____ you the next week to see if you consider my qualifications _____ for the position. If so, I hope _____ at a mutually convenient time. I_____ meeting you.

Thank you for your _____,

Sincerely Yours,
Martin Uhlíř

Enclosure:
Curriculum Vitae
_____
Letters of Reference

VOCABULARY LIST

affiliation (n)	/əˌfɪliˈeɪʃ(ə)n/	členství
achievement (n)	/əˈtʃiːvmənt/	úspěch, výkon
apply for (v)	/əˈplaɪ fə/	žádat o, ucházet se o
artistic pursuit	/ɑːˈtɪstɪk pəˈsjuːt/	umělecká práce, činnost
aspiration (n)	/ˌæspɪˈreɪʃ(ə)n/	cíl, snaha, úsilí
attend (v)	/əˈtend/	navštěvovat, účastnit se
authorship (n)	/ˈɔːθə(r)ʃɪp/	autorství
briefly (adv)	/ˈbriːfli/	krátce, stručně
bullet point (n)	/ˈbʊlɪt pɔɪnt/	odrážka
cell phone (n)	/sel fəʊn/	mobilní telefon
complimantary close (n)	/ˌkɒmplɪˈment(ə)ri ˈkləʊz/	zdvořilostní zakončení dopisu
concisely (adv)	/kənˈsaɪsli/	výstižně, stručně
consulting (n)	/kənˈsʌltɪŋ/	poradenství
contracted form	/kənˈtræktid fɔːm/	stažený tvar
convenient time	/kənˈviːniənt taɪm/	vhodný, příhodný čas
country of origin	/ˈkʌntri əv ˈɒrɪdʒɪn/	země původu
course (n)	/kɔːs/	průběh, chod
cover letter (n)	/ˈkʌvə ˈletə/	krycí dopis
cunduct a study	/kənˈdʌkt ə ˈstʌdi/	provádět studii
deal of	/diːl əv/	část
definite asset	/ˈdef(ə)nət ˈæset/	určitá, jistá výhoda
degree (n)	/dɪˈgriː/	akademický titul
driving licence (n)	/ˈdraɪvɪŋ ˈlaɪs(ə)ns/	řidičský průkaz
embody (v)	/ɪmˈbɒdi/	zahrnovat, obsahovat
enclosure (n)	/ɪnˈkləʊʒə/	příloha dopisu
experience (n)	/ɪkˈspɪəriəns/	zkušenost
extensive list	/ɪkˈstensɪv lɪst/	rozsáhlý seznam
follow up (v)	/ˈfɒləʊ ʌp/	pokračovat
header (n)	/ˈhedə/	záhlaví
headline (n)	/ˈhedˌlaɪn/	nadpis, titulek
honour (n)	/ˈɒnə/	hodnost, vyznamenání
in accordance with (phr)	/ɪn əˈkɔː(r)d(ə)ns wɪð/	v souladu s, ve shodě s
in bold (phr)	/ɪn bəʊld/	tučným písmem
intend (v)	/ɪnˈtend/	zamýšlet, mínit
key information	/ˈkiː ˌɪnfəˈmeɪʃ(ə)n/	klíčové informace
loosely (adv)	/ˈluːsli/	volně
mutually (adv)	/ˈmjuːtʃuəli/	vzájemně, navzájem
obtain (v)	/əbˈteɪn/	získat, dostat; dosáhnout něčeho
organized (adj)	/ˈɔːgənaɪzd/	pečlivý, důkladný, svědomitý
overcome (v)	/ˌəʊvəˈkʌm/	překonat, přemoci

pejorative (adj)	/pɪˈdʒɒrətɪv/	hanlivý
position (n)	/pəˈzɪʃ(ə)n/	místo (zaměstnání)
professional assets	/prəˈfeʃ(ə)nəl ˈæsets/	profesionální aktivity
professional training	/prəˈfeʃ(ə)nəl ˈtreɪnɪŋ/	profesionální školení, kurz
provide with (v)	/prəˈvaɪd wɪð/	opatřit (čím)
recruit (v)	/rɪˈkruːt/	hledat nové zaměstnance
reliable (adj)	/rɪˈlaɪəb(ə)l/	spolehlivý, bezpečný
résumé (n)	/ˈrezjuːmeɪ/	životopis; shrnutí
salutation (n)	/ˌsæljʊˈteɪʃ(ə)n/	oslovení; pozdrav
seek (v)	/siːk/	hledat
schedule an interview	/ˈʃedjuːl ən ˈɪntəˌvjuː/	naplánovat pohovor
skill (n)	/skɪl/	dovednost
stick to st. (v)	/stɪk tə/	držet se něčeho
suitability (v)	/ˌsuːtəˈbɪləti/	přiměřenost, vhodnost
supervision (n)	/ˌsuːpə(r)ˈvɪʒ(ə)n/	dozor, dohled; řízení; inspekce
supplement (n)	/ˈsʌplɪmənt/	příloha
term of employement	/tɜːm əv ɪmˈplɔɪmənt/	doba zaměstnání, délka zaměstnání
throughout Europe	/θruːˈaʊt ˈjʊərəp/	v celé Evropě
to the point	/tə ðə ˈpɔɪnt/	k věci, věcně
touch-typing	/tʌtʃ ˈtaɪpɪŋ/	psaní na stroji
valediction (n)	/ˌvælɪˈdɪkʃ(ə)n/	slovo na rozloučenou
volunteer work	/ˌvɒlənˈtɪə wɜːk/	práce dobrovolníka
well-arrange (v)	/wel əˈreɪndʒ/	přehledně uspořádat
willing to (adj)	/ˈwɪlɪŋ tə/	ochotný
wordy (adj)	/ˈwɜːdi/	rozvláčný, mnohomluvný

Source: BUCHALOVÁ, K., SCHÜLLEROVÁ, S.: *Angličtina pro posluchače bakalářského studijního programu FVHE VFU Brno.* Brno 2010.

SIGNIFICANT CONTRIBUTIONS TO THE FIELD OF MEDICINE

Throughout the long history of medicine, the most important and truly revolutionary discoveries and advancements leading to great progresses in diagnosis and treatment of diseases have been made since the 19thcentury. Medicine, like other sciences, was significantly influenced by various fields of study. The development of such branches as bacteriology and microbiology helped in combating infectious diseases in the sense of creating vaccination or antibiotics. German pathologist Rudolf Virchow initiated development of another important branch of medicine – pathology, when he proclaimed that all diseases are caused by disorders in cells. The germ theory of disease introduced by Louis Pasteur gradually lead to widespread usage of antiseptics which, together with improved standards in sanitation and hygiene, have markedly improved quality of human life in the last century. Moreover, introduction of rather simple to more complicated diagnostic tools connected with such physical phenomena as X-rays or ultrasound helped to evolve many diagnostic and therapeutic methods. In 1819 stethoscope, an essential tool for detecting sounds in the body such as heart beat, was invented by French physician René-Théophile-Hyacinthe Laënnec (1781-1826).

Advancements in the field of histology, embryology, and pharmacology that were important for creation of modern understanding of the eye and vision, brain and heart function, mammalian reproduction, and the composition of cells were partly realized owing to the investigations of Czech experimental physiologist **Jan Evangelista Purkinje** (1787-1869). His work led to the discovery of the phenomenon referred to as Purkinje effect describing changes in light intensity in relation to the colour. The best known Purkinje's discovery is considered to be the description of large nerve cells in the cortex of the cerebellum of the brain, called after him the Purkinje cells.

Similarly, as Charles Darwin with his evolutionary theory raised interest in the science of comparative anatomy and physiology, an Augustinian priest and scientist **Johann Gregor Mendel** (1822-1884) with his experiments in plant breeding stimulated enthusiasm for human genetics. Mendel proved that the inheritance of certain traits in pea plants is controlled by particular laws which were later named after him. All his important experiments were carried out in the garden of the Augustinian monastery in Old Brno. His investigations brought him posthumous fame and the later re-discovery of his laws established the basis of modern science of genetics.

A few years later, in 1895, the X-ray was accidentally discovered by a German physics professor **Wilhelm Conrad Roentgen** (1845-1923). Although effects of these rays had already been observed by other scientists as Ivan Pulyui, William Crookes, Johann Wilhelm Hittorf, or Nicola Tesla, Roentgen was the first who did so systematically and discovered its medical usage. The picture of the hand of Roentgen's wife was the first X-ray photograph of a part of a human body in the history. Roentgen called the rays "X" to indicate it was an unknown type of radiation, although they are still occasionally referred to as Roentgen rays in German-speaking countries. Low-intensity beans X-ray can be used for diagnosis, high-intensity X-rays enable to destroy especially vulnerable cancerous cells and thus help in treatment of tumours.

One of the milestones in medical history appeared in the 1870s when French chemist Louis Pasteur and German physician Robert Koch independently established the germ theory of disease. At the beginning of this theory figured the work of the American physician and author Oliver Wendell Holmes and Hungarian obstetrician **Ignaz Phillip Semmelweis** (1818-1865), who showed that the high maternal mortality rate was a result of infectious agents spread from unwashed hands. The incidence of puerperal fever was rapidly cut and thus Semmelweis was soon proclaimed emblematic figure of the physicians of the 19th century.

A French chemist and microbiologist **Louis Pasteur** (1822-1895) developed experiments that proved rightness and correctness of the germ theory. During his experiments he also discovered that the

growth of microorganism caused spoiling liquids, such as wine, milk or beer. Pasteur found out that process of heating the beverage up to a certain temperature kills most bacteria and moulds present in it and so prevents the drinks from quick spoiling. This process was called after him pasteurization. He applied this knowledge on the relationship between microorganism infecting animal or human being and a disease and developed antiseptic methods in surgery to prevent the entry of the microorganism into the human body. Similarly as Ignaz Semmelweis, Pasteur's discoveries reduced mortality from puerperal fever. Pasteur also did a great deal in the field of immunology and vaccination. Starting with studies of infectious diseases as chicken cholera and anthrax, in 1885 Pasteur saved many lives by inventing the way to prevent rabies by using vaccine. Soon after the germ theory was broadly accepted, the people infected by such highly contagious and dangerous diseases as anthrax, diphtheria, typhus, pneumonia or plague, started to be isolated.

The work of Louis Pasteur was further developed by the German scientist **Robert Koch** (1843-1910). While Pasteur was never able to proof that one microbe was directly linked with a disease, Koch was successful in doing this. Unlike Pasteur he - as a doctor - had detailed and deep knowledge of a human body and was also skilled in experiments as he invented new methods for purification of the bacillus from blood samples and growing pure cultures. The first disease Koch started to study was anthrax seriously affecting herds of farm animals at that time. He spent three years investigating every fact about this feared disease, including its life cycle. He found that anthrax microbes built spores capable of surviving outside a host for a long time after the animal had died. After this success he aimed his interest on germs that particularly affected people. He was able to isolate the *Tuberculosis bacillus* and the *Vibrio cholerae*, investigations of the first one brought him the Nobel Prize in Physiology or Medicine in 1905. Koch is also famous for defining the criteria that an organism must fulfil to be the cause of a disease, known as Koch's postulates. These principles are:

> *"Step 1. ASSOCIATION: The suspected pathogen must be consistently associated with the diseased plant (or animal).*
> *Step 2. ISOLATION: The pathogen must be isolated and grown in pure culture and its characteristics described.*
> *Step 3. INOCULATION: The pathogen from pure culture is inoculated into a healthy plant of the same species or variety and it must produce the same symptoms and signs.*
> *Step 4. RE-ISOLATION: The pathogen is re-isolated from the inoculated plant and its characteristics must be the same as the organism initially isolated in step 2."* (KOCH'S POSTULATE DEMONSTRATING THE PATHOGENICITY OF A MICROORGANISM)

Koch's work was inspirational for other major scientists as Paul Ehrlich and Gerhard Domagk. **Gerhard Johannes Paul Domagk** (1895-1964) was a German pathologist who is well known for discovering sulphonamides, the first antimicrobial drugs, which helped in further development of other antibiotics. In 1947 was awarded Nobel Prize in Medicine for his discoveries. Although sulphonamide became a revolutionary drug, it was later substituted by other breakthrough drug - penicillin that had better effects and lesser side effects. With the discovery of one of the most powerful antibiotics, a Scottish Professor **Alexander Fleming** (1881-1955) entered the history of medicine. Paradoxically, one of the most significant advances in medicine began by accident. As Fleming was cleaning his laboratory and going through many glass plates previously coated with staphylococcus bacteria he found out that there is mould on one of the plates. Further research on the mould confirmed his idea that the bacteria on the plate were destroyed by some substance coming from the mould. The mould was called *Penicillium notatum*. It turned out that this mould is able to kill also other types of bacteria and after ten years Howard Florey and Ernst Chain isolated the effective substance found in the mould and called it penicillin.

ACTIVITIES

1. Lexis
Complete the table with proper word forms

Noun	Adjective
laboratory	
effect	
substance	
hygiene	
therapy	
fever	
infection	
prevent	
success	
life	

2. Lexis
Make word combinations using words from each column. There are sometimes more possibilities.

blood	discovery	_____
pure	disease	_____
contagious	theory	_____
improved	sample	_____
revolutionary	breeding	_____
diagnostic	standards	_____
plant	tool	_____
germ	culture	_____

3. Lexis
Read the definitions and fill in the missing words

g_____	a form of bacteria that spreads disease among people or animals
c_____	cows and bulls kept by farmers for their milk or meat
r_____	a line of energy in the form of heat or light
p_____	an idea that is an important part of a theory, argument, or explanation
e_____	a scientific test to find out what happens to someone or something in particular conditions
r_____	a detailed study of something in order to discover new facts

4. Reading comprehension
Answer these questions in full sentences

Who further developed the work of Pasteur?
_____

What can high-intensity X-rays be used for?
_____
_____

When was stethoscope invented?
_____

What nationality was Ignaz Phillip Semmelweis?

_____

Who was dealing with anthrax?

_____

What drug proceeded penicillin and who discovered it?

_____

_____

5. Essay writing
Write an essay (max. 100 words) discussing the differences in the fields mentioned below in the 18th century and nowadays

water, hospital, personal hygiene, drugs availability, life span, maternal mortality

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

6. Translation
Translate these sentences into English

Mikrobi vytvářejí spory, které mohou přežít vně tělo mrtvého zvířete.

_____

Biologové a fyzikové většinou rozvíjeli práci svých předchůdců.

_____

Velké objevy vznikly na poli lidské genetiky a anatomie.

_____

Stetoskop slouží pro rozlišení a poslech srdečního rytmu.

_____

Mnoho vědců se stalo slavnými až po jejich smrti.

_____

Velké množství pokusů probíhalo na zvířatech.

_____

Objev a rozšíření očkování zachránilo mnoho lidských životů.

_____

7. Text-related activity

Match the discoveries, inventions or theories with particular people and fill their nationalities

Pasteur	germ theory and vaccination against rabies	_____
Darwin	nerve cells	_____
Koch	sulphonamides	_____
Purkinje	laws of heredity	_____
Domagk	penicillin	_____
Mendel	evolutionary theory	_____
Fleming	isolation of the tuberculosis bacillus	_____

VOCABULARY LIST

advancement (n)	/ədˈvɑːnsmənt/	pokrok
anthrax (n)	/ˈænθræks/	antrax
antimicrobial drug (n)	/ˌæntɪmaɪˈkrəʊbɪəl drʌg/	antimikrobiální léčivo
association (n)	/əˌsəʊsiˈeɪʃ(ə)n/	spojení, asociace
bacillus (n)	/bəˈsɪləs/	bakterie, mikrob
beverage (n)	/ˈbev(ə)rɪdʒ/	nápoj
cancerous (adj)	/ˈkænsərəs/	rakovinný, kancerózní
capable of (adj)	/ˈkeɪpəb(ə)l əv/	schopný čeho
carry out (v)	/ˈkæri aʊt/	provádět, vykonávat
cerebellum (n)	/ˌserəˈbeləm/	mozeček
confirm (v)	/kənˈfɜːm/	potvrdit
contagious (adj)	/kənˈteɪdʒəs/	nakažlivý, infekční
cortex (n)	/ˈkɔːteks/	kůra mozková
cut (n)	/kʌt/	snížení
develop (v)	/dɪˈveləp/	rozvíjet
diptheria (n)	/dɪfˈθɪəriə/	záškrt
disorder (n)	/dɪsˈɔːdə/	zmatek, nepořádek
emblematic (adj)	/ˌembləˈmætɪk/	symbolický, obrazný
enable (v)	/ɪnˈeɪb(ə)l/	umožnit
essential (adj)	/ɪˈsenʃ(ə)l/	základní
establish (v)	/ɪˈstæblɪʃ/	ustanovit, založit, zavést
evolve (v)	/ɪˈvɒlv/	vyvíjet se, rozvíjet se
fulfil (v)	/fʊlˈfɪl/	splnit, vykonat
germ (n)	/dʒɜːm/	zárodek
go through (v)	gəʊ θruː/	prohlížet
herd (n)	/hɜːd/	stádo
host (n)	/həʊst/	hostitel
hygiene (n)	/ˈhaɪdʒiːn/	hygiena
cholera (n)	/ˈkɒlərə/	cholera
indicate (v)	/ˈɪndɪkeɪt/	ukazovat, naznačit
initially (adv)	/ɪˈnɪʃ(ə)li/	zpočátku, na začátku, nejprve
inoculation (n)	/ɪˌnɒkjʊˈleɪʃ(ə)n/	očkování, inokulace
investigate (v)	/ɪnˈvestɪgeɪt/	zkoumat, vyšetřovat
investigation (n)	/ɪnˌvestɪˈgeɪʃ(ə)n/	pátrání, zkoumání, bádání
lesser (adj)	/ˈlesə/	menší, malý
liquid (n)	/ˈlɪkwɪd/	tekutina
mammalian (adj)	/məˈmeɪliən/	savčí
maternal (adj)	/məˈtɜːn(ə)l/	mateřský
monastery (n)	/ˈmɒnəst(ə)ri/	klášter
mortality rate (phr)	/mɔːˈtæləti reɪt/	stupeň, míra úmrtnosti
mould (n)	/məʊld/	plíseň
obstetrician (n)	/ˌɒbstəˈtrɪʃ(ə)n/	porodník
owing to (prep)	/ˈəʊɪŋ tə/	kvůli, vzhledem k
pathology (n)	/pəˈθɒlədʒi/	patologie

physiologist (n)	/ˌfɪziˈɒlədʒist/	fyzik, přírodovědec
plague (n)	/pleɪg/	mor
pneumonia (n)	/njuːˈməʊniə/	zápal plic
postulate (n)	/ˈpɒstjʊleɪt/	předpoklad, postulát
priest (n)	/priːst/	kněz
proclaim (v)	/prəˈkleɪm/	prohlásit, prohlašovat
progress (n)	/ˈprəʊgres/	pokrok
puerperal fever (n)	/pjʊːˈəpərəl ˈfiːvə/	horečka omladnic
purification (n)	/ˌpjʊərɪfɪˈkeɪʃ(ə)n/	čištění, purifikace
radiation (n)	/ˌreɪdiˈeɪʃ(ə)n/	záření
skilled (adj)	/skɪld/	zkušený, zručný
spore (n)	/spɔː/	výtrus, spora
staphylococcus bacteria (n)	/ˌstæfələʊˈ kɒkəs bækˈtɪəriə/	bakterie stafylokoka
stethoscope (n)	/ˈsteθəˌskəʊp/	stetoskop
sulphonamide (n)	/sʌlˈfɒnəˌmaɪd/	sulfonamid
turn out (v)	/tɜː(r)n aʊt/	ukázat se (jakým, čím)
typhus (n)	/ˈtaɪfəs/	tyfus
vulnerable (adj)	/ˈvʌln(ə)rəb(ə)l/	napadnutelný, náchylný

Source: BUCHALOVÁ, K., SCHÜLLEROVÁ, S.: *Angličtina pro posluchače bakalářského studijního programu FVHE VFU Brno.* Brno 2010.

LABORATORY AND ITS EQUIPMENT / MICROSCOPE

A laboratory, or a lab, in general is a facility which offers suitable conditions for conducting measurements, tests, experiments and research-oriented activities. Laboratories vary in sizes and purposes for which they are intended and used. Research work in different scientific fields poses different requirements on the facilities where the laboratories are located, on their work and safety equipment and spatial layout, as well as specific safety rules minimizing individual's risk and protecting lab users. Despite the considerable differences among laboratories, there exist common features, without which no laboratory could work properly.

A laboratory is not usually a single-room facility. There should be a changing room with showers, bathroom sinks and toilets, where lab workers change from their street clothes, which they place into lockers, into laboratory clothing or laboratory work wear consisting of white trousers, a white long sleeve coat and laboratory shoes. Laboratory work wear protects against accidental spills and splashes of chemicals. White coats, however, did not use to be universal in all laboratories at all times. Until about the 1930s, black laboratory coats were commonly worn in microbiology labs and biomedical labs because any dust, often contagious, was clearly visible. Also, students performing autopsies on cadavers would dress in black laboratory coats in order to show their respect for the dead. Apart from the lab work wear mentioned above, there are other protective means worn by laboratory users – rubber gloves, safety glasses, face masks and face shields.

Other rooms supporting laboratory work can be preparation rooms where reagents of different concentrations are prepared, and stockrooms where not only chemicals, but also laboratory glassware are stored: beakers, burettes, dropping and separatory funnels, syringes, graduated cylinders, Petri dishes, watch glasses, flasks, test tubes or pipettes. Amongst other utilities frequently used for laboratory testing and experimenting are wash bottles, burners, crucibles, stirrers, mortars with pestles, thermometers, tubes, clamps, tongs, wire gauzes, grinders or pumps. As far as larger laboratory equipment is concerned, fume hoods minimize the risk of inhaling toxic vapours when working with hazardous chemicals, centrifuges separating solid particles from liquids using the sedimentation principle, distillation units, aspirators using the Venturi effect, mixers, shakers, ovens and furnaces, refrigerators and freezers, balances, or spectrophotometers which measure light absorption.

All laboratories are equipped with workbenches, sinks with running water for hand washing, eye wash stations and overhead showers useful when a chemical comes into contact with one's eyes or skin. Fire extinguishers are used to put out or control small fires, while fire blankets, usually made of wool, should be wrapped around a person whose coat catches fire.

Safety rules to be observed in a laboratory can be divided into general rules, rules for personal protection, hygienic rules, emergencies and storage and disposal rules. General safety rules include:

Do NOT work with hazardous substances without a second person being present.
Do NOT eat, drink or smoke in the laboratory under any circumstances.
ALWAYS keep your working area clean and tidy and free of clutter.
ALWAYS label containers with the common known name of the substance and the appropriate hazard warning sign.
ALWAYS secure the tops of reagent bottles immediately after use.
ALWAYS clear up spillages immediately.
Do NOT leave equipment using water, gas or electricity on overnight.

Rules of personal protection of individuals working in a laboratory are as follows:

ALWAYS wear a lab coat and appropriate eye protection, e.g. safety glasses or face shield.
Lab coats should ALWAYS be buttoned up.

ALWAYS use the appropriate gloves whenever handling chemicals or hazardous substances, and ALWAYS check their integrity before use, ensuring they will give you protection against the substance being used.

ALWAYS wear proper footwear, do NOT wear open toed footwear.

Essential hygienic rules, emergencies and storage and disposal rules include the following:

Do NOT pipette by mouth.

ALWAYS wash hands after using any substances hazardous to health, on leaving the laboratory and before visiting the toilet.

Do NOT touch surfaces (phones, doors, handles etc.) with contaminated gloves if they may be touched by others.

ALWAYS know where the nearest fire extinguisher and first aid kit are.

ALWAYS know the emergency escape route and assembly point.

ALWAYS keep broken glassware and sharps separate from other waste and ALWAYS dispose of in the appropriate containers.

ALWAYS return stock bottles, jars etc. of highly flammable liquids or acids to their correct store cupboard after work has finished.

Do NOT have more than 500 ml of a flammable solvent in use at any one time on the bench.

Microscope

A microscope is a laboratory device which enables observing objects too small to be viewed by the naked eye. The timeline of microscope technology is rather long, dating back almost one millennium when a so called reading stone was invented, a glass sphere used for magnifying reading materials when laid on top of them. The inventor of this device is unknown. The next important milestone for microscopy in general was the invention of glass lenses followed by devising the first wearable spectacles at the end of the 13th century by an Italian, Salvino D'Armate. More than 300 years later, in 1590, experiments with eye glasses were performed by two Dutch glassmakers, the Janssens. They created a device which can be called the forerunner of the telescope and microscope, its magnification being about 10x. Improvements to both the telescope and the microscope were done in the 17th century by a man called the “father of science”, the Italian Galileo Galilei. In the same century there were more contributions to the field of microscopy. Robert Hooke, an Englishman, constructed the first British operational compound microscope, and Antonie van Leeuwenhoek, considered “the father of microbiology” built a simple one-lens microscope and made observations of sperm, blood cells, and microscopic single-celled organisms. Van Leeuwenhoek’s hand-ground lenses had magnifying power of up to 275x. Some of van Leeuwenhoek’s original microscopes exist till present. Major improvements were made no sooner than in the 19th century when foundations of the Zeiss laboratories were laid, their compound microscopes distributed to most of the world. Today, there are many companies producing a great variety of many kinds of microscopes, such as electron microscopes (invented by Ernst Ruska in the 1930s), optical and light microscopes, scanning electron microscopes, atomic force microscopes etc.

(Pict. 6)

There are several **basic parts of a microscope**. The body and support of the device form the heavy microscope base and the arm on which other parts are mounted: a body tube with the eyepiece, or ocular, a revolving nosepiece, or a turret, with objectives of different magnifying power, a stage, or a slide platform, with clips on which the slide with specimen ready for microscopy is placed. The object condenser under the stage is composed of a diaphragm and a lens. The former is used to control the amount of light entering the body tube from a light source located on the base. Coarse and fine adjustment knobs, or coarse and fine focus knobs, are used for sharpening the observed image

ACTIVITIES

1. Comprehension check
Microscope. Answer these questions.

How long is the history of the microscope?
What was the reading stone?
What did Salvino D'Armate construct?
Who built the first telescope and microscope?
What was Robert Hooke's contribution to microscopy?
Why is van Leeuwenhoek called "the father of microbiology"?
Who and when invented the electron microscope?

2. Lexis
Translate the following lab equipment into Czech.

fire extinguisher _____
crucible _____
graduated cylinder _____
laboratory balances _____
mortar and pestle _____
sink and running water _____
test tubes _____
dropping funnel _____
wire gauze and burner _____
oven and furnace _____

3. Matching
Match the beginnings of the sentences on the left with proper endings on the right to form meaningful laboratory safety rules.

Always keep your working	a. on overnight.
Lab coats should	b. with contaminated gloves.
Do not wear open	c. area free of clutter.
Do not touch surfaces (handles, doors, etc.)	d. on a bench at one time.
Eating, drinking and smoking in labs are	e. toed footwear
Do not leave equipment using electricity, water or gas	f. where the first aid kit is.
Make sure you know	g. always be buttoned up.
There should never be more	h. forbidden under all circumstances.

4. Gap filling
Read the following text and fill in the gaps with appropriate words from the box.

features - safety - scientific - spatial - suitable - users - vary

A laboratory is a facility with conditions _____ for conducting measurements, tests, experiments and research activities. Laboratories can _____ in sizes and purposes for which they are intended. Research work in different _____fields poses different requirements on the facilities where the laboratories are located, on their work and safety equipment and _____ layout, as well as specific _____ rules minimizing individual's risk and protecting lab_____. Despite the considerable differences among laboratories, there exist common _____, without which no laboratory could work properly.

5. Lexis

Translate the following expressions into English. The first letters of words have been given.

činidla různých koncentrací	r_____ of	d_____	c_____	
clona mikroskopu	m_____	d_____		
pozorovat pouhým okem	v_____ by	the	n_____	e_____
úniková cesta z laboratoře	e_____	e_____	f_____ a l_____	
sestrojit zařízení	c_____ a	d_____		
zacházet s chemikáliemi	h_____	c_____		
provádět pitvy	p_____	a_____		
ochranné prostředky	p_____	m_____		
oddělit pevné části	s_____	s_____	p_____	
vybavit laboratorním sklem	e_____	w_____	l_____	g_____

6. Microscope

Label the indicated microscope parts in the picture below.

(Pict. 7)

7. Pronunciation

Which words from the texts above have been transcribed below? Write the words in English and translate them into Czech.

/əb'dʒektɪv/	_____	_____
/ə'rɪdʒ(ə)nəl/	_____	_____
/wɒʃ 'bɒt(ə)l/	_____	_____
/sɪ'kjʊə(r)/	_____	_____
/ˌdɪstɪ'leɪʃ(ə)n//'juːnɪt/	_____	_____
/ə'dʒʌst/	_____	_____
/'sɜː(r)kəmstəns/	_____	_____
/'fəʊkəs/	_____	_____
/gɔːz/	_____	_____
/rɪ'vɒlvɪŋ nəʊzpiːs/	_____	_____
/'stɜːrə(r)/	_____	_____
/ræp ə'raʊnd/	_____	_____
/dɪ'spəʊz/	_____	_____
/ɪ'kwɪpt/	_____	_____

8. Lexis
Form the designated forms of words in the table below.

VERB	NOUN	NOUN	VERB	NOUN	ADJECTIVE
devise		vapour		hazard	
measure		experiment		chemical	
warn		absorption		health	
protect		improvement		magnification	
invent		foundation		contagion	
shake		stirrer		protection	
compose		requirement		equipment	
store		difference		vision	
perform		intention		difference	
exist		contribution		importance	
dispose		reaction		toe	

9. Translation
Translate the following sentences into English.

Mikroskopovaný objekt zaostřujeme pomocí makro- a mikro šroubů.

_____
_____

Digestoře minimalizují riziko, že při práci s nebezpečnými chemikáliemi vdechneme jejich jedovaté výpary.

_____
_____

Vybavení a velikost laboratoří se různí dle jejich zaměření.

_____
_____

Pokožku musíme chránit před kontaktem s infekčními látkami.

_____
_____

Štítky nádob s vysoce hořlavými látkami musí obsahovat tuto výstražnou značku.

_____
_____

VOCABULARY LIST

10x	/ten taɪmz/	desetkrát
accidental	/ˌæksɪˈdent(ə)l/	náhodný, neúmyslný
acid	/ˈæsɪd/	kyselina
adjust	/əˈdʒʌst/	nastavit, regulovat
adjustment knob	/əˈdʒʌs(t)mənt nɒb/	otočný regulátor
aspirator	/ˈespəˌreɪtə(r)/	odsávač, vývěva
assembly point	/əˈsembli pɔɪnt/	shromaždiště
atomic force microscope	/əˈtɒmɪk fɔː(r)s ˈmaɪkrəˌskəʊp/	mikroskop atomárních sil
balances	/ˈbæləns ɪz/	váhy
base	/beɪs/	základna
bathroom sink	/ˈbɑːθˌruːm sɪŋk/	umyvadlo
beaker	/ˈbiːkə(r)/	kádinka
blood cell	/blʌd sel/	krvinka
body tube	/ˈbɒdi tjuːb/	tubus
burette	/bjuəˈret/	byreta
burner	/ˈbɜː(r)nə(r)/	hořák
button up	/ˈbʌt(ə)n ʌp/	zapnout (na knoflíky)
centrifuge	/ˈsentrɪˌfjuːdʒ/	odstředivka
circumstance	/ˈsɜː(r)kəmstəns/	podmínka
clamp	/klæmp/	svorka
clear up spillages	/klɪə(r) ʌp ˈspɪlɪdʒɪz/	uklidit rozlité látky
coarse adjustment knob	/kɔː(r)s/	makrošroub
come into contact with	/kʌm ˈɪntə ˈkɒntækt wɪθ/	přijít do kontaktu s
common feature	/ˈkɒmən ˈfiːtʃə(r)/	společný rys, prvek
conduct measurements	/kənˈdʌkt ˈmeʒə(r)mənts/	provádět měření
consider	/kənˈsɪdə(r)/	zvážit
considerable difference	/kənˈsɪd(ə)rəb(ə)l ˈdɪfrəns/	značný rodíl
contagious	/kənˈteɪdʒəs/	infekční, nkažlivý
contribution	/ˌkɒntrɪˈbjuːʃ(ə)n/	přínos
crucible	/ˈkruːsəb(ə)l/	tavicí kelímek
devise	/dɪˈvaɪz/	vynalézt, sestrojit
diaphragm	/ˈdaɪəfræm/	clona
disposal rules	/dɪˈspəʊz(ə)l ruːlz/	dispenzační pravidla
dispose of	/dɪˈspəʊz/	zbavit se něčeho
distillation unit	/ˌdɪstɪˈleɪʃ(ə)n ˈjuːnɪt/	destilační jednotka
dropping funnel	/drɒpɪŋ ˈfʌn(ə)l/	kapací nálevka
dust (n)	/dʌst/	prach
Dutch (adj)	/dʌst/	holandský
electron microscope	/ˈmaɪkrəˌskəʊp/	elektronový mikroskop
emergency escape route	/ɪˈmɜː(r)dʒ(ə)nsi ɪˈskeɪp ruːt/	úniková cesta
equipped	/ɪˈkwɪpt/	vybavený
etc.	/et ˈset(ə)rə/	atd.
experiment (n)	/ɪkˈsperɪmənt/	pokus
eyepiece	/ˈaɪˌpiːs/	okulár

face shield	/feɪs ʃiːld/	obličejový štít
facility	/fəˈsɪləti/	prostora
fine adjustment knob	/faɪn/	mikrošroub
fire blanket	/ˈfaɪə(r) ˈblæŋkɪt/	hasicí rouška
fire extinguisher	/ˈfaɪə(r) ɪkˈstɪŋgwɪʃə(r)/	hasicí přístroj
first aid kit	/fɜː(r)st eɪd kɪt/	lékárnička
flammable solvent	/ˈflæməb(ə)l ˈsɒlv(ə)nt/	hořlavé rozpouštědlo
flask	/flɑːsk/	baňka
focus	/ˈfəʊkəs/	soustředit se na, fokus
forerunner	/ˈfɔːˌrʌnə(r)/	předchůdce
free of clutter	/ˈklʌtə(r)/	uklizený
frequently	/ˈfriːkwəntli/	často
fume hood	/fjuːm hʊd/	digestoř, odsávač par
furnace	/ˈfɜː(r)nɪs/	pec
gauze	/gɔːz/	drátěná gáza, kovové sítko
glass lens	/glɑːs lenz/	skleněná čočka
glassmaker	/glɑːsmeɪkə(r)/	sklář
graduated cylinder	/ˈgrædʒuˌeɪtɪd ˈsɪlɪndə(r)/	odměrný válec
grinder	/ˈgraɪndə(r)/	mlýnek, drtič
hand-ground lens	/hænd graʊnd lenz/	ručně broušená čočka
handle chemicals	/ˈhænd(ə)l ˈkemɪk(ə)lz/	zacházet s chemikáliemi
highly flammable liquid	/ˈhaɪli ˈflæməb(ə)l ˈlɪkwɪd/	vysoce hořlavá kapalina
changing room	/ˈtʃeɪndʒɪŋ ˌruːm/	šatna
image	/ˈɪmɪdʒ/	obraz
immediately	/ɪˈmiːdiətli/	okamžitě
improvement	/ɪmˈpruːvmənt/	vylepšení
in general	/ˈdʒen(ə)rəl/	všeobecně
in order to	/ˈɔː(r)də(r)/	aby
inhale toxic vapours	/ɪnˈheɪl ˈtɒksɪk ˈveɪpə(r)z/	vdechovat toxické páry/výpary
invent	/ɪnˈvent/	vynalézt, sestrojit
kind (n)	/kaɪnd/	druh
knob	/nɒb/	regulátor (otočný)
label a container	/ˈleɪb(ə)l//kənˈteɪnə(r)/	opatřit nádobu štítkem
laboratory	/ləˈbɒrət(ə)ri/	laboratoř
laboratory device	/ləˈbɒrət(ə)ri dɪˈvaɪs/	laboratoní zařízení
laboratory glassware	/ləˈbɒrət(ə)ri ˈglɑːsˌweə(r)/	laboratorní sklo
lay foundations of	/leɪ faʊnˈdeɪʃ(ə)nz/	položit základy čemu
leave on	/liːv/	nechat zapnuté
lens	/lenz/	čočka
light microscope	/laɪt ˈmaɪkrəˌskəʊp/	světelný mikroskop
locker	/ˈlɒkə(r)/	šatní skříňka
long sleeve coat	/lɒŋ sliːv kəʊt/	plášť s dlouhým rukávem
magnify	/ˈmægnɪfaɪ/	zvětšovat
magnifying power	/ˈmægnɪfaɪɪŋ ˈpaʊə(r)/	zvětšovací síla
microscope	/ˈmaɪkrəˌskəʊp/	mikrokop
minimize	/ˈmɪnɪmaɪz/	minimalizovat

mortar with pestle	/ˈmɔː(r)tə(r) wɪθ ˈpes(ə)l/	hmoždíř s paličkou
mount	/maʊnt/	připevnit
object condenser	/ˈɒbdʒekt kənˈdensə(r)/	kondenzátor
objective (n)	/əbˈdʒektɪv/	objektiv
observe objects	/əbˈzɜː(r)v ˈɒbdʒekts/	pozorovat předměty
ocular	/ˈɒkjʊlə(r)/	okulár
open toed footwear	/ˈəʊpən təʊd ˈfʊtˌweə(r)/	obuv s otevřenou špičkou
optical microscope	/ˈɒptɪk(ə)l ˈmaɪkrəˌskəʊp/	optický mikroskop
original (adj)	/əˈrɪdʒ(ə)nəl/	původní
oven	/ˈʌv(ə)n/	pec
perform autopsy on cadavers	/pə(r)ˈfɔː(r)m ˈɔːtɒpsi//kəˈdævə(r)z/	provádět pitvu na kadaverech
Petri dish	/ˈpiːtri ˌdɪʃ/	Petriho miska
pipette	/pɪˈpet/	pipeta
pose requirements on	/pəʊz rɪˈkwaɪə(r)mənts/	klást požadavky
preparation room	/ˌprepəˈreɪʃ(ə)n/	přípravna
proper footwear	/ˈprɒpə(r) ˈfʊtˌweə(r)/	vhodná obuv
protect against	/prəˈtekt əˈgenst/	chránit před
protective means	/prəˈtektɪv miːnz/	ochranné prostředky
pump (n)	/pʌmp/	pumpa
put out fire	/pʊt aʊt ˈfaɪə(r)/	uhasit oheň
reagent	/riˈeɪdʒ(ə)nt/	činidlo
research activity	/rɪˈsɜː(r)tʃ ækˈtɪvəti/	výzkumná činnost
revolving nosepiece	/rɪˈvɒlvɪŋ nəʊzpiːs/	otočná hlavice
rubber gloves	/ˈrʌbə(r) glʌvz/	gumové rukavice
running water	/ˈrʌnɪŋ ˈwɔːtə(r)/	tekoucí voda
safety equipment	/ˈseɪfti ɪˈkwɪpmənt/	bezpečnostní zařízení, vybavení
safety rules	/ˈseɪfti ruːlz/	pravidla bezpečnosti
secure a top	/sɪˈkjʊə(r)/	upevnit uzávěr
separatory funnel	/seˈpərət(ə)ri ˈfʌn(ə)l/	dělicí nálevka
sharp	/ʃɑː(r)p/	ostrý
sharps	/ʃɑː(r)ps/	střepy
show respect to the dead	/rɪˈspekt//ded/	prokázat úctu mrtvým
single-celled organism	/ˈsɪŋg(ə)lseld ˈɔː(r)gəˌnɪz(ə)m/	jednobuněčný organizmus
slide with a specimen	/slaɪd//wɪθ//ˈspesəmɪn/	sklíčko s preparátem
so called	/ˈsəʊ kɔːld/	tzv.
spatial layout	/ˈspeɪʃ(ə)l ˈleɪaʊt/	prostorové rozvržení
spectacles	/ˈspektək(ə)lz/	brýle
spectrophotometer	/speˈktrɒfəʊtəʊmɪtə(r)/	spektrální fotometr
sperm	/spɜː(r)m/	sperma, spermie
sphere	/sfɪə(r)/	koule
spill (n)	/spɪl/	louže
splash (n)	/splæʃ/	kapka, kalužinka
stage	/steɪdʒ/	stolek
stirrer	/ˈstɜːrə(r)/	mísidlo
stock bottle	/stɒk ˈbɒt(ə)l/	skladová nádoba
stockroom	/ˈstɒkˌruːm/	sklad

suitable conditions	/ˈsuːtəb(ə)l kənˈdɪʃ(ə)nz/	vhodné podmínky
support (n)	/səˈpɔː(r)t/	podpora
surface (n)	/ˈsɜː(r)fɪs/	povrch
syringe (n)	/sɪˈrɪndʒ/	injekční stříkačka
test tube	/test tjuːb/	zkumavka
thermometer	/θə(r)ˈmɒmɪtə(r)/	teploměr
tongs	/tɒŋz/	kleště, nůžky
tidy (adj)	/ˈtaɪdi/	poklizený
timeline	/ˈtaɪmˌlaɪn/	časová osa
tube	/tjuːb/	trubice
turret	/ˈtʌrɪt/	otočná hlavice
utility	/juːˈtɪləti/	pomůcka
variety	/vəˈraɪəti/	pestrost, rozmanitost
vary (v)	/ˈveəri/	různit se, lišit se
viewed by the naked eye	/vjuːd baɪ//ˈneɪkɪd aɪ/	viditelný pouhým okem
warning sign	/ˈwɔː(r)nɪŋ saɪn/	varovný nápis
wash bottle	/wɒʃ ˈbɒt(ə)l/	stříčka, promývací baňka
waste	/weɪst/	odpad
watch glass	/wɒtʃ glɑːs/	hodinové sklíčko
wool	/wʊl/	vlna, příze
work properly	/wɜː(r)k ˈprɒpə(r)li/	správně fungovat
work wear	/wɜː(r)k weə(r)/	pracovní oděv
workbench	/ˈwɜː(r)kˌbentʃ/	pracovní stůl
wrap around	/ræp əˈraʊnd/	omotat kolem

Source: BUCHALOVÁ, K., SCHÜLLEROVÁ, S.: *Angličtina pro posluchače bakalářského studijního programu FVHE VFU Brno.* Brno 2010.

PHARMACOLOGY

Pharmacology is an experimental science dealing with properties of drugs and their effects on living systems. If the substances have medical properties, they are considered **pharmaceuticals**. Drugs may be used to improve health and quality of life, to treat and prevent diseases, or as a research tool to further explore body functions. Pharmacology also includes the study of sources of drugs (pharmacognosy) or the use of drugs in treatment of disease (toxicology). The word drug is derived from the Old French *drogue*, which meant herb.

Pharmacology is both an **experimental** (testing the drug action on animals), and **clinical** (testing the drug action on human volunteers or target animals for veterinary drugs) science that deals with all types of drugs: medicinal and recreational, legal and illegal, synthetic and naturally occurring, therapeutically beneficial medicines and potentially toxic substances. Clinical pharmacology represents a foundation for the application of pharmacologic principles in the development of drug therapy for animal patients. Controlled evaluation of the drug therapy safety and efficacy in animal patients is a major concern of **veterinary clinical pharmacology**. Veterinary pharmacology is not an easy subject to master due to the species multiplicity and abundance of drugs on the market. Veterinarians are asked to care for the health of the entire animal kingdom with the only exception – the humans. Different animal species respond to drugs differently, and the veterinarians must bear in mind that a large number of the animals they treat enter the human food supply chain and thus must evaluate the use of drugs accordingly.

Development of a drug is a vital concern to medicine, but also has strong economic and political implications. To protect the consumer and prevent abuse, many governments regulate the manufacture, sale, and administration of medication.

The study of medicinal chemicals requires intimate knowledge of the biological system affected, because chemicals have, from the pharmacological point of view, various properties.

Pharmacodynamics (*pharmakon*= drug, *dynamis*= power) is the study of the biochemical and physiological effects of drugs and the mechanisms of their actions, including the correlation of their actions and effects with their chemical structure (desired effects or toxic side-effects, etc.);

Pharmacogenetics (*pharmacon+genesis*= origin) is the study of the effect of the genetic factors belonging to a group or to an individual on the response of the group or the individual to certain drugs.

Pharmacokinetics (*pharmakon+kinesis*= motion) is the study of the action of drugs within the body, which can, in many respects, be envisioned more accurately as the actions of the body on an administered drug. It includes studies of the mechanisms of drug absorption, distribution, metabolism, and excretion; onset of action; duration of effect; biotransformation; and effects and routes of excretion of the metabolites of the drug (ADME).

- **Absorption** How is the medication absorbed (through the skin, the intestines, or the oral mucosa)?
- **Distribution** How does it spread through the organism?
- **Metabolism** Is the medication converted chemically inside the body, and into which substances?

- **Excretion** How is the medication eliminated (through the bile, urine, breath, or skin)?

The term **bioavailability** is used to describe the fraction of an administered dose of medication that reaches the systemic circulation, one of the principal pharmacokinetic properties of drugs. When a medication is administered intravenously, its bioavailability is 100%. However, when a medication is administered via other routes (such as by mouth), its bioavailability decreases (due to incomplete absorption and first-pass[1] metabolism). Bioavailability is one of the essential tools in pharmacokinetics, as bioavailability must be considered when calculating dosages for non-intravenous routes of administration. It is expressed as the letter *F.*

ROUTES OF DRUG ADMINISTRATION IN ANIMALS

- **I.M. (intramuscularly)** - administering a drug deep in the muscle for proper absorption. The diameter or gauge (g) should be as small as possible to prevent the drug from running up the needle track and down the side of the animal. This route of administration allows the second fastest rate of absorption. The site of injection is important, particularly in food producing animals, when it is possible to use the muscles on the neck. Injection site abscesses can develop.
- **I.V. (intravenous)** – provides the fastest route of absorption of drugs. In large animals, the jugular vein in the neck is the most frequently used. Drugs should be administered at body temperature and at a slow pace. This route of administration is used a) if a rapid drug effect is required; b) for continuous administration (infusion); c) for large drug dosage volumes; and d) for drugs that cause local tissue damage if given by other routes.
- **I.D. (intradermal)** – drugs are injected into the skin, the absorption rate is very slow, used e.g. for Tuberculosis skin tests
- **I.P. (intraperitoneal)** – drugs are injected directly into the peritoneal cavity, often used in combination with I.V. injections to prolong the availability of the medication to the animal. The drug absorption rate is slow.
- **I.R. (intrarumenal)** – administration similar to that of I.P., but into the rumen (the first part of the compound stomach in ruminants). Can only be accomplished on the left side of the animal. When needle inserted properly, stomach gas will flow out.
- **I.M.F. (intramammary infusion)** – drugs are administered (injected) into the teat canal using a plastic teat infusion cannula; used in the treatment of mastitis.
- I.N. (intranasal) – drugs are administered by squirting up the nostril; a suitable way for administration of some vaccines (e.g. Nasogen for IBR vaccination). Currently, many pharmaceutical companies are developing vaccines and other drugs that can be administered via this route to avoid injection site problems and to satisfy animal rights activists.
- **I.U. (intrauterine infusion)** – drug is infused into the uterus by passing a pipette through the cervix; often used to treat metritis (uterine infection).
- **Topical** – drugs are applied to the skin or surface of the body (e.g. Salves, ointments, pour-on wormers, dusts, etc.).

- **Oral (drench)** – drugs are administered through the mouth in the form of a bolus (pill) or a liquid. Liquids or pastes can be placed in the mouth and animals are allowed to swallow them. Also a stomach tube can be used to administer the drug directly in the digestive tract.

Drug metabolism is the process by which the body breaks down and converts medication into active chemical substances; it is the transformation of a drug by the body tissues, primarily those of the liver, into a more water-soluble metabolite that can be eliminated. This process inactivates many drugs, but some drugs have metabolites that are also biologically active and others are administered as pro-drugs that must undergo drug metabolism to become biologically active.

Drug effect is the ability of a drug or treatment to produce a specific result, regardless of dosage. Knowing the general actions of drugs, both beneficial and harmful, is essential for their proper use in therapy. It is necessary to pay attention to common and potentially serious **side-effects, toxic effects (toxicity), adverse effects, and contraindications.** Various warnings, adverse and side effects are listed in the package inserts accompanying drugs.

- **Side-effects** are secondary to the main therapeutic effects. They are not necessarily harmful and might be prevented by decreasing the dosage of a drug. They have a tendency to disappear when a patient gets used to the medication. They include a loss of appetite, weight loss or weight gain, nausea, rash, vomiting, etc.
- **Toxic effects (toxicity)** are poisonous and potentially harmful effects caused by certain drugs. They are much more severe than the side or adverse effects. They very often develop if the patient´s dosage greatly exceeds the usual doses of a drug.
- **Adverse effects** are a harmful and undesired effect caused by an incorrect dosage (side-effect), wrong procedure or other medical intervention (surgery). Using a treatment which is contraindicated may increase the risk of adverse effects as well as not knowing other drugs simultaneously taken by a patient (interactions). Allergic reactions are considered to be the most serious (e.g. *anaphylaxis*, an immediate severe allergic response evoked by an exposure to an antibiotic, a bee sting or various foods). Adverse effects of medical procedures include: haemorrhage, inflammation, gangrene, etc. They can be reversible or irreversible.
- **Contraindications** refer to the factors in a patient´s condition that make use of particular drugs or medical procedures (surgery) life-threatening.

DRUG ACTIONS AND INTERACTIONS

Every physiologically active drug has the potential to cause undesirable reactions. In certain cases they may be responsible for illness. A condition which is caused by drug treatment is called **iatrogenic**. Besides the effects mentioned earlier, patients may experience:

- **Cumulative effects** – if excessive doses of drugs are taken they can accumulate in the body and cause problems with drug elimination. Thus, drug concentrations may reach toxic levels.
- **Tolerance (resistance) and dependence**: Habitual use of some drugs may create a tolerance (reduction in effectiveness of body response after repeated exposure).

Moreover, a physical dependence (development of signs and symptoms of illness when the drug is withdrawn) can also appear.

Various drugs can also interact with one another. When used in combination they may produce effects that are greater than either drug would bring about individually. In such a case we talk about **potentiation**. Lower or eliminated effects are called **antagonism**.

MAXIMUM RESIDUE LIMITS (MRLs) AND THE SAFETY OF FOOD FROM ANIMALS

In food-producing animals, veterinary surgeons and farmers must be aware of residues of licensed veterinary medicinal products. They are defined by the EU as pharmacologically active substances (whether active principles, excipients or degradation products) and their metabolites which remain in foodstuffs obtained from animals to which the veterinary medicinal product in question has been administered. An MRL is the maximum concentration of residue following administration of a veterinary medicine which is legally permitted or acceptable in food under the laws of the EU. Use of animal medicines is strictly controlled by European law, and requires observance of the withdrawal period. This is the time which passes between the last dose given to the animal and the time when the level of residues in the tissues (muscle, liver, kidney, skin/fat) or products (milk, eggs, honey) is lower or equal to the MRL. Until the withdrawal period has elapsed, the animal or its products must not be used for human consumption.

1 The first-pass effect (or first-pass metabolism) is a phenomenon of drug metabolism. After a drug is swallowed, it is absorbed by the digestive system and enters circulation. The absorbed drug is carried through the Portal vein into the liver. Some drugs are so extensively metabolized by the liver that only a small amount of unchanged drug may enter the systemic circulation, so the bioavailability of the drug is reduced.

Sources:

HAVLÍČKOVÁ, DOSTÁLOVÁ, KATEROVÁ: *English for Pharmacy and Medical Bioanalytics.* The Karolinum Press, 2008. s. 175-181

ADAMS, R. H.: *Veterinary Pharmacology and Therapeutics.* Accessed at <http://www.google.com/books?id=2CUbc0RXvb8C&lpg=PR7&ots=jM7KB7zvoP&dq=veterinary%20pharmacology%20articles&lr=&hl=cs&pg=PA12#v=onepage&q=veterinary%20pharmacology%20articles&f=false>

The Free Dictionary accessed at <http://medical-dictionary.thefreedictionary.com>

Routes of Drug Administration accessed at <http://www.powershow.com/view/4adcf-NzM0M/Routes_of_Drug_Administration>

Maximum Residue Limits (MRLs) and the Safety of Food from Animals accessed at <http://www.noah.co.uk/issues/briefingdoc/09-mrls.htm>

affinity to (v)	/ə'fɪnəti/	vztah k, chápání čeho
amid (prep)	/ə'mɪd/	uprostřed, mezi
antagonism (n)	/æn'tægə,nɪz(ə)m/	nepřátelství; opačné působení
antipathogenic (adj)	/,ænti,pæθə'dʒenɪk/	antipatogenický
bile (n)	/'baɪl/	žluč
bioavailability (n)	/baɪəʊ ə,veɪlə'bɪləti/	biologická dostupnost, využitelnost
bolus (n)	/bɒ'ləs/	pilulka
cannula (n)	/'kænjʊlə/	kanyla
correlation (n)	/,kɒrə'leɪʃ(ə)n/	korelace, vzájemný vztah
digitalis (n)	/,dɪdʒɪ'teɪlɪs/	digitalis, náprstník
disintegration (n)	/dɪs,ɪntɪ'greɪʃ(ə)n/	rozpad, rozklad
dispersal (n)	/dɪ'spɜ:(r)s(ə)l/	rozptýlení, disperze
dissolution (n)	/,dɪsə'lu:ʃ(ə)n	rozpuštění, rozložení
drench (v)	/drentʃ/	nasáknout, namočit
efficacy in (n)	/'efɪkəsi/	účinnost, působivost
elapse (v)	/ɪ'læps/	uplynout, projít, vypršet
encompass (v)	/ɪn'kʌmpəs/	obklopit, zahrnout
envision (v)	/ɪn'vɪʒ(ə)n/	představovat si, předvídat
excipient (n)	/ek'sipɪənt/	mastťový základ
excretion (n)	/ɪk'skri:ʃ(ə)n/	výměšek, vylučování
exert (v)	/ɪg'zɜ:(r)t/	vynaložit úsilí, činit se, projevovat se
exogenous (adj)	/ig'zɒdʒɪnəs/	vnější, působící zvnějšku
foundation for (n)	/faʊn'deɪʃ(ə)n.../	důvod pro
gangrene (n)	/'gæŋgri:n/	sněť
gauge (n)	/'geɪdʒ/	míra, šablona, měřidlo
genomic (adj)	/dʒɪ'nɒmɪk/	genomový
give rise to (phrv)	/...'raɪz.../	dát vzniknout čemu
hemorrhage (n)	/'heməɪdʒ/	hemoragie, krvácení
iatrogenic (adj)	/jætrɒtrə'dʒenɪk/	iatrogenní
implication (n)	/,ɪmplɪ'keɪʃ(ə)n/	důsledek, souvislost, následek
in recognition of (phr)	/,rekəg'nɪʃ(ə)n/	jako projev uznání za co
in vivo (adv)	/'...vi:vəʊ/	v živém organizmu, zaživa
intramammary (adj)	/ɪntrə'mæmərɪ/	intramamární

intravenously (adv)	/,ɪntrə'vi:nəslɪ/	nitrožilně
liberation (n)	/,lɪbə'reɪʃ(ə)n/	zrovnoprávnění, osvobození
margin (n)	/'mɑ:(r)dʒɪn/	kraj, okraj, hranice
mastitis (n)	/mæ'staɪtɪs/	mastitida
mediate (v)	/'mi:dɪeɪt/	zprostředkovat, sjednat, zakročit
medicinal (adj)	/mə'dɪs(ə)nəl/	léčivý, působící jako lék
metabolite (n)	/mə'tæbəlɪt/	metabolit
metritis (n)	/mɪ'traɪtɪs/	metritida
morphine (n)	/'mɔ:(r)fi:n/	morfium, morfin
mucosa (n)	/mjʊ:'kəʊsə/	mukóza, sliznice
nausea (n)	/'nɔ:ziə/	nauzea
novel (adj)	/'nɒv(ə)l/	nový, neobvyklý
onset of (n)	/'ɒn,set.../	začátek, příchod; záchvat (choroby)
outcome (n)	/'aʊt,kʌm/	výsledek, závěr, konec
pathway (n)	/'pɑ:θ,weɪ/	stezka, cestička (vyšlapaná)
peritoneal (adj)	/perɪtə'ni:əl/	peritoneální
pharmacognosy (n)	/,fɑ:(r)mə'kɒgnɒsi/	farmakognosie
portal vein	/'pɔ:(r)t(ə)l 'veɪn/	vena portalis
posology (n)	/pə'sɒlədʒi/	studium dávkování léků
quinine (n)	/'kwaɪnaɪn/	chinin
residue (n)	/'rezɪdju:/	reziduum
resurgence of (n)	/rɪ'sɜ:(r)dʒ(ə)ns/	obnovení, obnova
rumen (n)	/'rʊ:mən/	bachor
salve (n)	/'sælv/	mast
teat (n)	/'ti:t/	struk
therapeutic (adj)	/,θerə'pju:tɪk/	léčebný, terapeutický
uterus (n)	/'ju:t(ə)rəs/	děloha, uterus
vaguely (adv)	/'veɪgli/	nejasně, vyhýbavě

DRUG DOSAGE FORMS IN VETERINARY MEDICINE

The dose is the amount of drug taken at any one time. It can be expressed as *the weight of drug* (e.g. 250 mg), *volume of drug solution* (e.g. 10 mL, 2 drops), *the number of dosage forms* (e.g. 1 capsule, 1 suppository) or some *other quantity* (e.g. 2 puffs).

The dosage regimen is the frequency at which the drug doses are given. Examples include 2.5 mL twice a day, one tablet three times a day, one injection every four weeks.

The total daily dose is calculated from the dose and the number of times per day the dose is taken.

The dosage form is the physical form of a dose of drug. **Common dosage forms** include tablets, capsules, creams, ointments, aerosols, and patches. Each dosage form may also have a number of specialized forms such as extended-release, buccal, dispersible, and chewable tablets. **The strength** is the amount of drug in the dosage form or a unit of the dosage form (e.g. 500 mg capsule, 250 mg/5 mL suspension).

The route of administration is the way the dosage form is given. Common routes of administration include oral, rectal, inhalation, nasal and topical.

The optimal dosage is the dosage that gives the desired effect with minimum side effects.

There are many factors taken into consideration when deciding a dose of drug - including animal species, age, health state, etc. Other medicines may also affect the drug dose.

Dosage instructions are written on the vet's prescription and on the pharmacy label of a prescribed medicine. Dosage instructions are also found on the packaging and **inserts** of over-the-counter medicines.

Please note that **animal welfare regulations prohibit the use of expired drugs on research animals**, except if the animal is anesthetized for a terminal study. The anaesthesia drugs may not be expired under any circumstances.

Species Code:
Can = canine
Fel = feline
Bov = bovine
Ov = ovine
Cap = caprine
Por = porcine
Rod = rodents (individual species listed by name)
Rab = rabbit
NHP = nonhuman primate
Av = avian
Rep = reptiles (species listed by name)
Am = amphibians (species listed by name)
Fish (species listed by name)

ORAL DRUG DOSAGE FORMS

Oral dosage forms comprise liquids (solutions, suspensions, and emulsions), semi-solids (pastes), and solids (tablets, capsules, powders, granules, premixes, and medicated blocks).

A **solution** is a mixture of 2 or more components that form a single phase that is homogeneous down to the

molecular level. Solutions offer several advantages over other dosage forms. Compared with solid dosage forms, solutions are absorbed faster and generally cause less irritation of the GI mucosa. The disadvantages of solutions include susceptibility to microbial contamination and the hydrolysis in aqueous solution of susceptible active ingredients. In addition, the taste of some drugs is more unpleasant when in solution Oral solutions provide a convenient means of drug administration to neonates and young animals.

A **suspension** is a coarse dispersion of insoluble drug particles, generally with a diameter exceeding 1 μm, in a liquid (usually aqueous) medium. Suspensions are useful for administering insoluble or poorly soluble drugs or in situations when the presence of a finely divided form of the material in the GI tract is required.

An **emulsion** is a system consisting of 2 immiscible liquid phases, one of which is dispersed throughout the other in the form of fine droplets; droplet diameter generally ranges from 0.1-100 μm. Creaming, as occurs with milk, also occurs with pharmaceutical emulsions. However, it is not a serious problem because a uniform dispersion returns upon shaking.

A **paste** is a 2-component semi-solid in which drug is dispersed as a powder in an aqueous or fatty base. The particle size of the active ingredient in pastes can be as large as 100 μm. The vehicle containing the drug may be water. Pastes are a popular dosage form for treating cats and horses, and can be easily and safely administered by owners.

A **tablet** consists of one or more active ingredients and numerous excipients and may be a conventional tablet that is swallowed whole, a chewable tablet, or a modified-release tablet (more commonly referred to as a modified-release bolus due to its large unit size). Conventional and chewable tablets are used to administer drugs to dogs and cats, whereas modified-release boluses are administered to cattle, sheep, and goats.

A **capsule** is an oral dosage form usually made from gelatin and filled with an active ingredient and excipients. Two common capsule types are available: hard gelatin capsules for solid-fill formulations, and soft gelatin capsules for liquid-fill or semi-solid-fill formulations.

A **powder** is a formulation in which a drug powder is mixed with other powdered excipients to produce a final product for oral administration.

A **granule** is a dosage form consisting of powder particles that have been aggregated to form a larger mass, usually 2-4 mm in diameter.

A **premix** is a solid dosage form in which an active ingredient, such as a coccidiostat, production enhancer, or nutritional supplement, is formulated with excipients. They are administered to poultry, pigs, and ruminants.

A **medicated block** is a compressed feed material that contains an active ingredient, such as a drug, anthelmintic, surfactant (for bloat prevention), or a nutritional supplement, and is commonly packaged in a cardboard box. Ruminants typically have free access to the medicated block over several days, and variable consumption may be problematic

PARENTERAL DOSAGE FORMS

Parenteral dosage forms and delivery systems include injectables (ie, solutions, suspensions, emulsions, and dry powders for reconstitution), intra-mammary infusions, intra-vaginal delivery systems, and implants.

A **solution** for injection is a mixture of 2 or more components that form a single phase that is homogeneous down to the molecular level. “Water for injection” is the most widely used solvent for parenteral formulations.

A **suspension** for injection consists of insoluble solid particles dispersed in a liquid medium, with the solid particles accounting for 0.5-30% of the suspension. The vehicle may be aqueous, oil, or both. Injectable suspensions are commonly used.

An **emulsion** for injection is a heterogeneous dispersion of one immiscible liquid in another; it relies on an emulsifying agent for stability. Parenteral emulsions are rare because it is seldom necessary to achieve an emulsion for drug administration.

A **dry powder** for parenteral administration is reconstituted as a solution or as a suspension immediately prior to injection. The principal advantage of this dosage form is that it overcomes the problem of instability in solution.

Mastitis **intra-mammary infusion products** are available for lactating and non-lactating (dry) cows. Lactating cow intra-mammary infusions should demonstrate fast and even distribution of the drug and a low degree of binding to udder tissue. These properties result in lower concentrations of drug residues in the milk.

Intra-vaginal delivery systems include controlled internal drug release (CIDR) devices, progesterone-releasing intra-vaginal devices (PRID), and vaginal sponges. These systems are used for oestrus synchronization in sheep, goats, and cattle.

The majority of **implants** used in veterinary medicine are compressed tablets or dispersed matrix systems in which the drug is uniformly dispersed within a non-degradable polymer.

TOPICAL DOSAGE FORMS

The topical dosage forms available for treating animals include solids (dusting powders), semisolids (creams, ointments, and pastes), and liquids (solutions, suspension concentrates, suspoemulsions, and emulsifiable concentrates). Of special interest are transdermal delivery systems that elicit clinical responses by carrying medications across the skin barrier to the bloodstream. Examples of these are transdermal gels and patches that are used in companion animals. Also of interest are dosage forms that are unique to veterinary medicine, such as spot-on, pour-on, and backliner formulations developed for the control of parasites.

A **dusting powder** is a finely divided insoluble powder containing ingredients such as talc, zinc oxide, or starch.

A **cream** is a semisolid emulsion formulated for application to the skin or mucous membranes. Droplet diameter in topical emulsions generally ranges from 0.1-100 μm.

An **ointment** is a greasy, semisolid preparation that contains dissolved or dispersed drug. Ointments are indicated for chronic, dry lesions and contraindicated in exudative lesions.

A **paste** for topical use is a stiff preparation containing a high proportion of finely powdered solids such as starch, zinc oxide, calcium carbonate, and talc. Pastes are less greasy than ointments because much of the fluid hydrocarbon fraction is absorbed onto the solid particles. Pastes are indicated for ulcerated lesions.

A **solution** for topical use is a mixture of 2 or more components that form a single phase down to the molecular level. Topical solutions include eye drops, ear drops, and lotions.

A **suspension concentrate** for topical use is a mixture of insoluble, solid active ingredients, which are normally at high concentrations, in water or oil.

A **suspoemulsion** combines the elements of an emulsion and a suspension, allowing active ingredients with widely varying physical properties to be formulated in a single product. Typically, a suspoemulsion contains one

or more solvent-soluble active ingredients in an

Adapted from the following sources:

http://www.petalk.com/drug-dosages.html
http://www.drugs.com/dosage/

1. Reading Comprehension. Answer the following questions about Lysvulpen.

1. Which domestic animals can me the Lysvulpen vaccine applied to?

2. What is the vaccine frequency placement?

3. Which form of bait placement is preferred in densely populated areas and why?

4. Why are frozen vaccines useless?

5. Why is it necessary to wear gloves when handling the vaccine?

6. What factors must be kept in mind when distributing the vaccine by air?

7. What is the function of tetracycline HCl contained in the vaccine?

2. TRUE or FALSE. Read the Lysvulpen insert and mark the following statements as true ☑or false☒.

1. In immunized foxes, the immunity develops in less than a fortnight. ☐

2. Baits can be placed at any time of year under any weather conditions. ☐

3. The vaccine contains an attenuated vaccination rabies virus. ☐

4. Tapaten is a thermo-regulating packaging of the vaccine. ☐

5. The immunization should take place at least once a year. ☐

6. The laid baits should be covered by leaves or grass to protect them from animal consumption. ☐

3. Match the expressions on the left with those on the right to form phrases from the leaflet.

1. evenly distributed	a. animal species
2. inhabitants must	b. be appropriately informed
3. low population	c. density
4. modified attenuated	d. direct sunlight
5. perform	e. gloves during bait placement
6. protect against	f. medical advice
7. seek	g. over the area
8. stored in	h. spring revaccination
9. target	i. thermo-insulating cartons
10. use protective	j. vaccine strain

4. Translate the following phrases from the vaccine insert. The first letter of each word has been given.

psík mývalovitý = r_____ d_____

potřísněnou oblast umyjte vodou a mýdlem =
w_____ e_____ a_____ w_____ s_____ a____ w_____

kartonová krabička s upevňovací mřížkou =
a c_____ b_____ w_____ an a_____ g_____

vystavit teplotám vyšším než 15 °C =
e_____ to t_____ a_____ 15°C

druhy cílových zvířat = t_____ a_____ s_____

celá oblast daného území =
w_____ a_____ of p_____ t_____

rozpoznat od terénního viru =
d_____ f_____ a f_____ v_____

klást návnady k obsazeným norám =
p_____ b_____ to o_____ e_____

ovlivnit lidským pachem =
a_____ by h_____ s_____

skladujte v temnu = s_____ in a d_____ p_____

LYSVULPEN por. ad us. vet.

Vaccine against rabies intended for oral immunization in foxes
PACKAGE INFORMATION

Composition - 1 dose - 1.8 ml
Active ingredient: Virus rabiei attenuatum SAD Bern
min. 1.8 x 107 TCID50 – max. 1.8 x 108 TCID50Excipients: - stabilization medium
In one bait, there is one vaccination virus dose (1.8 ml) closed in aluminum-plastic blister. Round, dark brown bait is made of feed mixture attractive for foxes and other target animal species. Each bait contains 150 mg of tetracycline HCl, which is intended as an indicator of ingestion by target animal species.

Pharmacotherapeutical group
Veterinary immuno-preparation

Uses
An immune system is activated after a virus has penetrated into the mucosa of the oral cavity or that of nasopharynx. Immunized foxes are thus protected against an infection caused by a virulent virus and rabies distribution becomes impossible. The immunization period is determined for a minimum of 1 year. The vaccine contains a modified attenuated vaccine strain SAD Bern rabies, propagated in cell cultures, antibiotics and a stabilization medium. The mixture is dispensed into blisters, plastic capsules sealed with an aluminum foil. These are covered with a bait substance including tetracycline. Tetracycline functions as a vaccination indicator. A vaccine virus can be differentiated from a field virus if monoclonal antibodies are applied. Foxes become immunized after they have eaten laid baits containing the vaccine virus. In immunized foxes the immunity develops within 21 days from the day a fox has eaten the bait containing the vaccine virus.

Indication
For prophylactic vaccination of wild red foxes and raccoon dogs against rabies.

Target animal species
Red fox (*Vulpes vulpes*), raccoon dog (*Nyctereutes procyonoides*).

Contraindication
The vaccine must not be applied to immunize domestic animals.

Adverse effects (frequency and severity)
Unknown.

Interaction
Unknown.

Method of administration
Oral. The immunization of target animal species takes place after consumption of placed baits with vaccination virus. The vaccine is placed 2 times a year, in April-May and September-October. There are usually 15 to 20 or more baits placed per km^2 based on the epizootological situation and density, especially of fox population. Distribution of baits with the vaccine must be performed uniformly in the whole area of particular territory. If a plane or a helicopter are used, it is necessary to accommodate the flying lines to it. Baits are dropped e.g. each 250m and the distance of lines from each other must also be 250m. If necessary, due to infectious situation in the particular area, it is recommended to perform spring and possibly autumn revaccinations, or possibly placement of baits in a limited area in the summer times or placement of baits to occupied earths, in a determined quantity up to 10 pcs to one earth. The form of bait placement from a plane is preferred on free areas and in case of low population density. In densely populated areas is preferred manual placement of baits. Vaccination of particular area should be performed for several subsequent years, but at least for three years after the last occurrence of rabies on the particular area. It is possible to use the vaccine for the protection of area without rabies, i.e. for creation of a protective zone. The width of such zone, which reaches up to the area with rabies occurrence, should be at least 50km.
Placement of baits from a plane: Baits are placed in accordance with prepared flying maps along predetermined flying lines. Satellite navigation system (GPS) is used for orientation and to ensure correct placement.

Dosage
The vaccine is laid twice a year, in April/May and in September/October, usually 15-20, or more units of bait per km^2. The vaccines must be evenly distributed over the whole field area. If planes or helicopters are used, bait is laid every 250m where the distance between lines is 250m as well.

Package
For laying manually: The vaccine (contents of a plastic capsule, closed with aluminum foil, stored in bait) is packed in a cardboard box with an attachment grate, each containing 20 units of bait. Group packaging - a carton containing 30x20 doses (i.e. 600 doses).
For laying by air: The vaccine (contents of a plastic capsule, stored in bait) is packed: either as 40 doses that are loosely layered with a packaging material called "tapaten" and stored in thermo-insulating cartons (group packaging is 10x40 doses in a carton), or loosely in polyethylene bags with 350 doses put into a thermo-insulating carton (group packaging - a carton containing 2x350 doses).

Special concerns
The vaccine must not be exposed to temperatures above 15 °C (carriage in thermo-suitcases, possibly packaging to thermo-isolation material, so that vaccine was sufficiently protected against the effects of higher environmental temperatures) until the time of placement, whether manual or from a plane. During manual placement in the terrain, the bait in carton box is carefully dropped on the ground. The bait is placed to sites protected against direct sunlight and after placement is covered with natural material (leaves, grass, plant litter, etc.) to protect from sun. Baits should not be placed in winter period at temperatures 0°C and lower. Frozen vaccine cannot flow out after blister perforation inside the bait and reach mucous membranes in the oral cavity and ensure vaccination of the animal. Within a period of two weeks after bait placement, free movements of dogs and cats should be prevented in the vaccination area, because they are food competitors from the point of eating the baits. Areas, where vaccination takes place, must be properly labeled and inhabitants must be appropriately informed. The vaccine contains an attenuated vaccination rabies virus. If the vaccine (content of aluminum-plastic blister placed in the bait) reached eyes, mouth or nose of a human or injured skin, it is necessary to seek medical advice immediately. In this case, it is realized according to the regulations for the case of exposure to rabies virus in force. In case of hand exposure or other uncovered parts of the body with the vaccine, it is necessary to wash exposed area immediately with water and soap. Baits containing vaccine must be stored so that access of unauthorized persons, especially children, was prevented! In case that there is a direct contact of the person's hand with the bait, it is necessary to use protective gloves during bait placement, so that the baits were not affected by human smell. Gloves are intended for single use only (for placement of 1 carton = 20 pieces of baits).

Storage
The vaccine must be stored in a dark place at a temperature of-20°C, or lower. The preparation should not be used after the expiry date marked on the label.

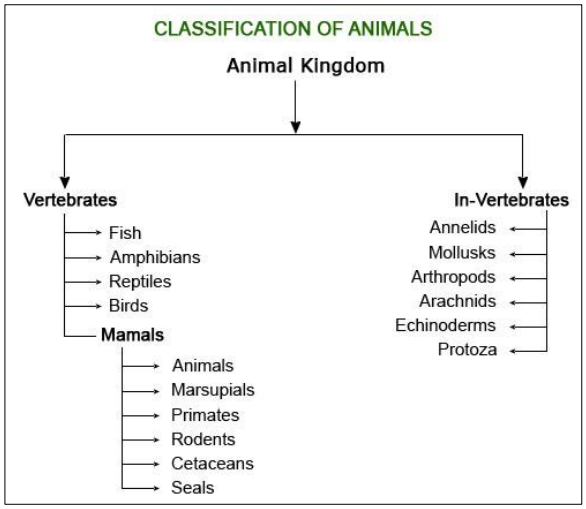
Protective deadlines
Not intended for food-producing animals.

Expiry date
24 months

Source: http://www.bioveta.cz/en/veterinary-division/products/product-catalogue/animal/fox/lysvulpen-por-ad-us-vet.html

3. **ANIMAL TAXONOMY**

Animals are a major group of mostly multicellular, eukaryotic organisms of the kingdom *Animalia.* Animals have bodies differentiated into separate tissues. These include muscles which are able to contract and control locomotion and nerve tissue which sends and processes signals. All animals are heterotrophs, meaning that they feed directly or indirectly on other living things. They are often subdivided into groups such as carnivores, herbivores, omnivores and parasites.



<u>INVERTEBRATES – animals without a backbone</u>

There are several groups of invertebrates: **protozoa** are simple, single-celled organisms. Most protozoa are microscopic in size and they play an essential role in the food chain. Protozoa take in oxygen and give off carbon dioxide through their cell membrane. **Echinoderms** are marine animals (e.g. sea star, sea urchin). Most of them have arms or spines that radiate from the center of their body. **Annelids** have existed on Earth for over 120 million years. Their bodies are divided into segments. Commonly known annelids include earthworms, roundworms and flatworms. **Mollusks** have a soft, skin-like organ covered with a hard outside shell. They live both on land (the snail and slug) and in water (the oyster, mussel and octopus). Land living mollusks move slowly on a flat sole; ocean living mollusks swim by ejecting water from their body. **Arthropods** make up over 75% of the world´s animal species and include animals such as insects (fly, beetle, butterfly, bee, wasp) or arachnids (spiders, scorpions, mites, ticks) and crustaceans. Arthropods have limbs with joints that allow them to move. Some have antennae as part of their sensory system.

<u>VERTEBRATES – animals with a backbone</u>

Almost ¾ of the world´s surface is covered in water which is home to over 20,000 different species of **fish**. Most fish breathe through gills which perform the gas exchange between the water and the fish´s blood and allow the fish to breathe oxygen in the water. Fishes are vertebrates with a skeleton made of bone or cartilage. Bony fishes have a swim bladder, a gas-filled sac, that they can inflate or deflate which allows them to float in the water. Most fish swim using a tail fin; other fins help the fish change direction and stop. **Amphibians** lay their eggs in water and their young resemble small fish. Most amphibians can both walk and swim in water, their body temperature changes with its environment. In cold climates, amphibians hibernate during the winter. **Reptiles** are air-breathing animals living not only on land but in water. Their most noticeable feature are the scales that cover their body. Reptiles are often called cold-blooded because their body temperature depends on the external temperature. Crocodiles and alligators are large reptiles that feed on large animals they catch on land or in water using their powerful jaws and teeth. Lizards and snakes form the largest group of reptiles. Lizards often shed their tail to escape from predators and they can grow a new tail. Some snakes are poisonous, or venomous, such as the rattle snake or cobra. They have fangs which bite into their prey and inject poison into the victim. There are over 8,000 species of **birds**. Birds have

three major differentiating characteristics: wings for flight, feathers and a beak. Their bones and skull are very thin, making their bodies extremely light. They also have claws and muscles on their feet designed to hold onto a perch even while the bird is sleeping**.**

Mammals have several unique characteristics that differentiate them from other animals. Most mammals have hair, or fur, covering their body. They are capable of regulating their body temperature. Their metabolism controls heat production, and the sweat glands help cool the body. These allow the mammal to maintain a constant body temperature. One other difference is that mammals give birth to fully formed babies and the female mammals produce milk to feed their young. Most mammals walk on four legs, with the exception of humans. Common mammals include: **primates**, **carnivores, marsupials**, **rodents**, **ungulates**, **whales, dolphins and seals**.

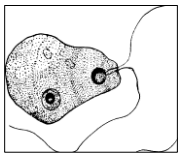
- ***Marsupial Mammals*** are best known for the Australian members of the family, the kangaroo and the koala. Marsupials are different from other mammals because they have an abdominal pouch to carry their young. Here the baby marsupial matures for weeks or even months.
- ***Carnivores*** are meat-eaters. They have sharp claws and teeth with which to kill their prey. This group includes cats both domestic and big cats, dogs, wolves, hyenas, bears, foxes, etc. Cetaceans are also carnivores but they have their own category.
- ***Rodents*** are the largest family of mammals. The name of the species means "gnawing animal", because of their large incisor teeth and the way they eat. There are 3 major types of rodents: squirrel-like (squirrel, gopher) with large eyes and bushy long tails; mouse-like rodents (mouse, rat, hamster) and porcupines with their long, sharp quills for protection.
- ***Ungulates*** are animals that have hooves. Ungulates can be further split into - odd-toed ungulates - have an odd number of toes and are also grazing animals - horse, donkey, zebra; even-toed ungulates - have an even number of toes - pig, giraffe, deer, antelope, goat, cow, sheep, llama, camel and elephants.
- ***Cetaceans*** live in water, but they must come to the surface to breathe air. Whales and dolphins can dive deep in the water on a single breath. They also have a highly developed brain and are considered to be very intelligent. Dolphins, as well as some whales, can use echolocation to find food and identify objects around them.
- ***Seals, Seal Lions and Walrus*** are marine mammals. Seals are well designed to swim in water. Their bodies are very streamlined and their flippers propel them quickly through the water. Walruses differ from seals in that they have large tusks.
- ***Primates*** have several distinctive features that separate them from other mammals: well developed hands and feet with fingers and toes, and opposable thumbs enabling them to grab things. Primate eyes are forward in the head giving them stereoscopic vision and allowing them to judge distance. They also have large, highly developed brains. Parents care for and educate their young much longer than other animals.

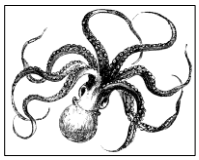
Adapted from: http://www.tulane.edu/~wiser/protozoology/notes/INTRO.html, http://www.kidport.com/RefLIB/Science/Animals/Animals.htm, www.wikipedia.org; http://www.naturalhistoryonthenet.com/Mammals/classification.htm

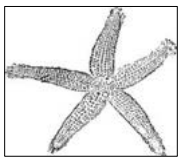
1. **Reading comprehension**
   Answer the questions

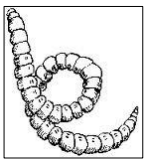
1) What is the main feature of invertebrates and which family is the largest one?
2) Explain the mechanism of fish breathing
3) Name some distinctive characteristics of birds
4) What is unique about mammals?
5) What is the function of thumb and eyes in primates?

2. **Lexis: Label the pictures of invertebrates with correct name of their phylum:**


a) …….


d) …….


b) …….


e) …….


c) ……..

3. **Translation**
   Translate the following expressions into English. The first letters have been given.

a. jednobuněčný organismus s_____ - c_____ o_____

b. řídit pohyb c_____ l_____

c. tvrdá vnější ulita h_____ o_____ s_____

d. plavat vypuzováním vody s_____ by e_____ w_____

e. klást vajíčka ve vodě l_____ e_____ in w_____

f. živit se velkými zvířaty f_____ o___ l_____ a_____

g. křídla, peří, zobák w_____, f_____, b_____

h. stálá tělesná teplota c_____ b_____ t_____

i. velké kly l_____ t_____

j. ostré ostny na ochranu s_____ q_____ for p_____

4. Gap fill: Fill in the gaps in the text below with the words from the box

feed	**fur**	**controls**	**birth**	**from**	**capable**
temperature	**glands**	**constant**	**differentiate**		

Mammals have several unique characteristics that…… them …….. other animals. Most mammals have hair, or ……, covering their body. They are…….. of regulating their body …….. Their metabolism…….. heat production, and the sweat……. help cool the body. These allow the mammal to maintain a…… body temperature. One other difference is that mammals give…… to fully formed babies and the female mammals produce milk to……. their young.

5. Complete the table by writing distinctive features or name of the phylum. An example has been done for you.

DISTINCTIVE FEATURES	PHYLUM
body divided into segments	annelids
hard outside shell	
inflate/deflate swim bladder	
	amphibians
scales covering body; cold-blooded	
	birds
	marsupials
meat-eating mammals; sharp teeth to kill prey	
	rodents
dive deep on a single breath	
	primates
hoofed mammals	

6. **Identify proper phylum/subphylum for each of the animals below and give their Czech equivalent:**

	Phylum	*Czech*
1) wasp	_____	_____
2) horse	_____	_____
3) koala	_____	_____
4) lizard	_____	_____
5) fox	_____	_____
6) sheep	_____	_____
7) squirrel	_____	_____
8) rattle snake	_____	_____
9) alligator	_____	_____
10) porcupine	_____	_____

LARGE ANIMALS ANATOMY – SKELETAL AND MUSCULAR SYSTEMS

Anatomy is a branch of biology and medicine that deals with the structure of living organisms and their parts. It is a general term that comprises human anatomy, animal anatomy and plant anatomy. Zootomy is a specific term used for animal anatomy. Anatomy of animals describes not only **internal organs**, **tissues** and other elements but also **externally visible parts of the body**. Sorted roughly from cranial to caudal direction the main parts of large animals are the head, throat (neck), forelimbs, the trunk including chest (thorax) and abdomen (stomach), tail and the hind limbs. On the head we find forehead, eyes, muzzle in a cow and snout in a pig, mouth with lips, ears, and horns in a cow. Underneath the snout in pigs there is a jowl, sometimes referred to as pig's chin. The neck is located behind the ears and in front of the shoulder. The belly and ribs are found just behind the shoulders and elbow pocket.

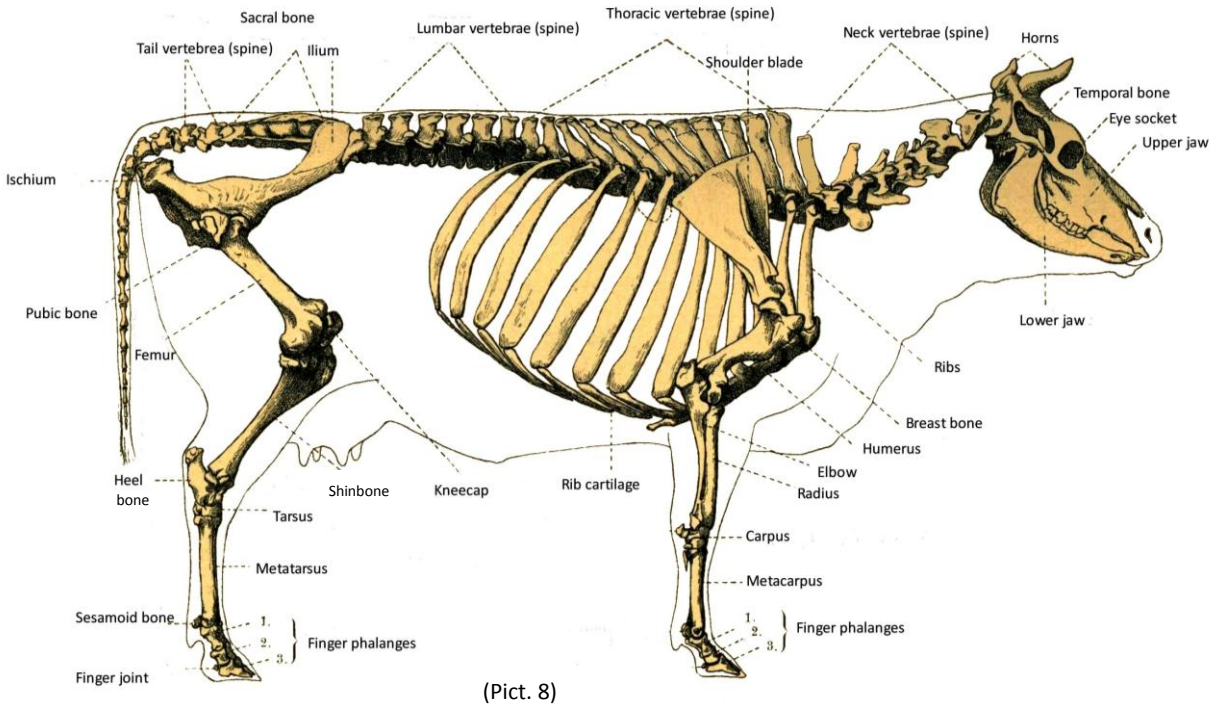
Skeletal System

The skeletal system is a structural framework that provides **support and protection** to the animal body as well as attachment sites for organs. Minerals, lipids, calcium and other important elements are stored in the bones and bone marrow produces blood cells. The skeletal system is also necessary for **motion of animals** as muscles are attached to the skeleton and joints are movable. The basic components of this system are bones, cartilages and ligaments. **Bones** in general consist of protein and calcium phosphate. Bones having a long axis and medullar cavity are called long bones (e.g. most bones of forelimbs and hind limbs), on the other hand short bones as carpals or tarsals that are without the long axis. Bones such as ribs or bones of the skull have a flat pattern and thus are called flat bones. The bones of the last type are classified as irregular since they have no particular shape. Vertebrae or patella are examples could be examples of this last group. The main factors that influence bone development are stress of animals, level of hormones in the organism and also nutrition of animals represented by well-balanced diet and a certain amount of vitamin D in the foodstuff.

The skeleton can be divided into **axial part** lying on the long axis or midline of the body comprising skull, vertebral column, vertebrae and ribs, the sternum or breastbone, and appendicular part consisting of bones of the forelimbs and the hind limbs. **The skull** or cranium can be divided into two main parts: the first one protecting the brain is called neurocranium and the second one forming the face is called splanchnocranium. In this part we find eye-sockets or orbits, nasal cavity, upper jaw or maxilla and the only separate bone of the skull called lower jaw or mandible. Upper and lower jaws have so called alveolar pockets where teeth are embedded. The part of the tooth firmly connected to the socket in the ridge of the jaw is called the root, the part above the gum is the crown and the area between the root and the crown is the neck. In large animals we distinguish four types of teeth: incisors generally serving for biting, canines for tearing and piercing, premolars and molars for chewing and grinding. The types and the number of the teeth in animals differ according to various types of food eaten.

The central part of the skeleton is represented by the vertebral column which serves as a support for the skull and protection for the spinal cord. Certain number of ribs as well as pectoral and pelvic girdles are attached to it. The whole vertebral column consists of five parts formed by particular number of vertebrae divided according to their structure and position. These sections are: cervical (neck) vertebrae, thoracic (chest) vertebrae, lumbar vertebrae, fused sacral vertebrae forming the sacrum and tail vertebrae. The bones representing the ribs are of a flat and narrow pattern having a distinctive bow-shaped curve. The first pairs of ribs are called true ribs as they are firmly joined to the breast bone by their cartilages. The rest of them are called false ribs and they include vertebrochondral and floating ribs. Chest vertebrae, ribs and the sternum form together a ribcage that encloses the heart and lungs and plays an important role in breathing mechanism.

The appendicular part of the skeleton comprises the girdles and the bones of the limbs. **The forelimb** is joined to the pectoral or shoulder girdle that is made of two flat triangular bones called shoulder blades (scapulae) and two rod-shaped collar bones (clavicles). The skeleton of the forearms includes the upper arm bone, the forearm, the knee or carpus, the cannon or metacarpus, and the foot. The upper part of **the hind limb** is formed by the femur or thigh bone which is usually the longest and most massive bone in the animal's body. The lower part of the hind limb comprises tibia or shinbone, fibula, tarsus, metatarsus and the bones of the foot. The horny sheath covering on the feet of ungulate mammals that protects the toes is the hoof.



(Pict. 8)

Muscular System

The main functions of muscular system are movement, providing support and posture as well as producing heat. The system comprises **smooth, cardiac, and skeletal muscles**. Smooth muscles are formed by non-striated, spindle-shaped cells, directed by autonomic nervous system. They are a part of ducts, blood vessels, digestive and reproductive system. Cardiac muscle forming the heart is on the other hand made of branching and striated cells. Similarly as smooth muscles they are regulated by autonomic nervous system and cause involuntary movements as e.g. heartbeat. The last type of muscles is represented by skeletal muscles that are made up of a large number of giant cells referred to as muscle fibres. These muscles are able to move the skeleton and are responsible for all voluntary movement as well as for particular involuntary movements as standing or breathing. According to the type of movement they perform we distinguish **flexors, abductors, adductors, and sphincters**.

Among the main changes in muscle size we classify **hypertrophy, hyperplasia, and atrophy**. If there is an increase in muscle fibre size, which can be caused e.g. by increased work load overtime, we call it hypertrophy. On the contrary, particular increase in number of muscle fibres as a result of e.g. regular resistance training, increased demand, chronic inflammatory response or hormonal dysfunctions is known as hyperplasia. Both features can affect smooth and skeletal muscles. Cardiac muscles can only undergo hypertrophy. Atrophy is represented by a certain decrease in the muscle mass, which may spring from malnutrition, disease, injury or wrong level of hormones in organism of the animal. It is a serious problem as it may lead to total immobilization of the animal.

ACTIVITIES

1. Reading comprehension
Correct the mistakes in these statements. Two of the sentences are correct.

The horny sheath covering the feet of ungulate mammals that protects the toes is called the declaw.
Muscles are attached to the skeleton and joints are removable.
Atrophy is represented by a certain increase in muscle size.
The ribcage protects the heart and lungs and plays an important role in breathing.
According to the type of tissue we can distinguish flexors, abductors, adductors ad sphincters.
The part of the tooth above the gum is called the crown.
Cardiac muscle can be only affected by atrophy.

2. Lexis
Match the bones below to the parts of the skeleton in the table

carpus, mandible, maxilla, nasal bone, rib, shoulder blade, temporal bone, thigh bone

Axial skeleton	Appendicular skeleton

4. Lexis
Match the English name with the anatomical expression

skull	cranium
shinbone	tibia
rib	costa
jaw bone	mandibula
shoulder blade	scapula
breast bone	sternum

5. Lexis
Read the definitions and fill in the gap with a proper expression

h_____	the part in the middle of an animal's back leg
k_____	the joint between the forearm and the cannon bone
m_____	the nose and mouth of an animal such as a cow or horse
w_____	the upper part of a horse's back, between its shoulders
m_____	the long hair on the neck of a horse or lion
s_____	the long nose of a pig
d_____	the hanging piece of loose skin under the neck of an animal
n_____	the part of the body that joins the head to the rest of the body

6. Translation
Translate the following sentences into English

Oči jsou u prasete umístěny na obličeji pod ušima.
_____

Rychlost u koní je spojována s dlouhým krkem, zatímco síla s krkem krátkým.
_____

Široké koňské nozdry umožňují maximální příjem vzduchu.
_____

Prasata bývají chována nejen pro maso, ale malé variety i jako domácí mazlíčci.
_____

Kostra funguje jako podpora těla, ochrana vnitřních orgánů i jako depo minerálních látek.
_____

7. Lexis
Chose the correct directional term from the box:

caudal or posterior - cranial or anterior - deep or internal – distal – dorsal – lateral – medial – parietal – proximal – rostral - superficial or external – ventral - visceral

towards the head _____
towards the tail or buttocks _____
towards the tip of the nose _____
towards the neck _____
towards the belly _____
towards the median plane _____
away from median plane _____
towards the centre of the body or body part _____
towards the surface of the body or body part _____
towards the body or body part _____
away from the body or body part _____
toward the organ _____
away from the organ _____

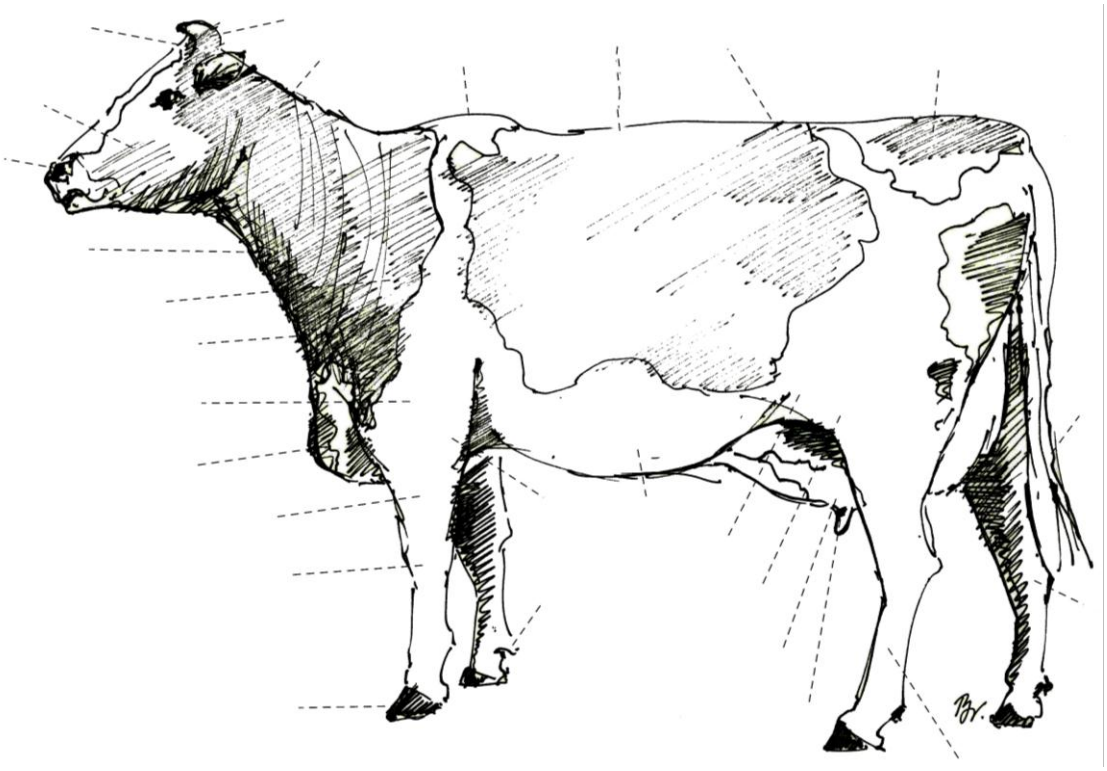
8. Writing
Form sentences about the anatomical structures on the left using expressions on the right

sternum, shoulder, breastbone, hip, chest vertebrae, sacral vertebrae, mane, eyes, cheek, tail, hind limb, rib cage	be attached to, be composed of, consist of, comprise, be divided into, include, form, vary, be situated, be located, be similar to, carry, fuse, pass through, transport, transmit

_____
_____
_____
_____
_____
_____
_____
_____
_____

9. Anatomy
Label the pictures using vocabulary in the boxes below
Cow

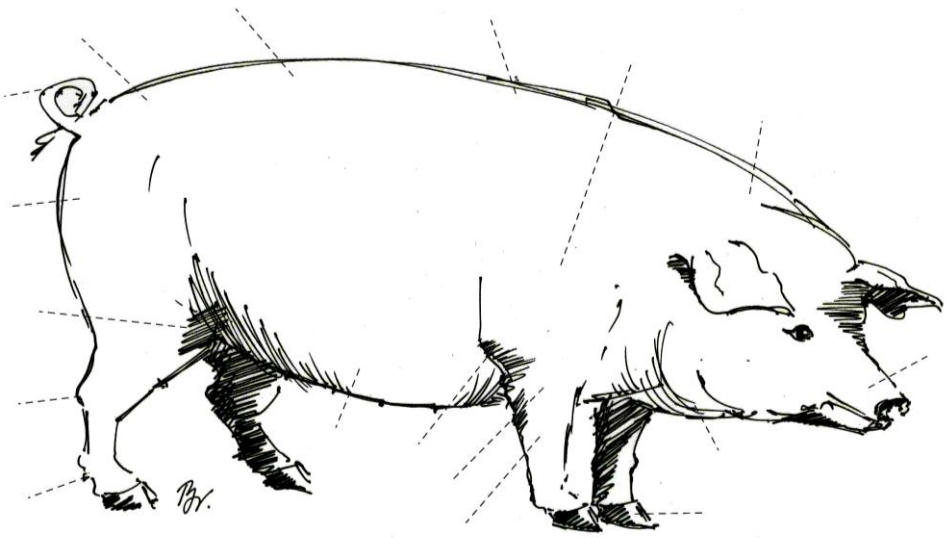
arm, back, belly, brisket, cannon, crest, dewclaw, dewlap, flank, forearm, hock, hoof, horn, knee, loin, muzzle, neck, nostril, point of shoulder, poll, rump, shoulder, stifle joint, tail, teat, udder, withers



(Pict. 9)

Pig

back, belly, claw, declaw, elbow, forearm, ham, hock, jowl, knee, loin, neck, rump, shoulder, snout, stifle, tail



(Pict. 10)

VOCABULARY LIST

abdomen (n)	/ˈæbdəmən/	břicho
abductor (n)	/æbˈdʌktə/	abduktor
adductor (n)	/əˈdʌktə/	adduktor
anterior (adj)	/ænˈtɪəriə/	přední
appendicular (adj)	/ˌæpenˈdɪkjələ/	apendikulární
arm (n)	/ɑːm/	paže
atrophy (n)	/ˈætrəfi/	atrofie
attachment (n)	/əˈtætʃmənt/	připojení
axis (n)	/ˈæksɪs/	osa
back (n)	/bæk/	záda, hřbet
belly (n)	/ˈbeli/	břicho
bone marrow (n)	/bəʊn ˈmærəʊ/	kostní dřeň
bow-shaped (adj)	/baʊ ʃeɪpt/	obloukovitý
breastbone (n)	/ˈbrestˌbəʊn/	prsní kost
brisket (n)	/ˈbrɪskɪt/	prsa, hruď
calcium (n)	/ˈkælsiəm/	kalcium
canine (n)	/ˈkeɪnaɪn/	špičák
cannon (n)	/ˈkænən/	metakarpus, metatarsus
cartilage (n)	/ˈkɑːtəlɪdʒ/	chrupavka
caudal (adj)	/ˈkɔːdl/	kaudální
cervical (adj)	/ˈsɜːvɪk(ə)l/	krční
clavicle (n)	/ˈklævɪkl/	klíční kost
claw (n)	/klɔː/	spárek
collar bone (n)	/ˈkɒlə bəʊn/	klíční kost
comprise (v)	/kəmˈpraɪz/	zahrnovat, obsahovat, skládat se z
coronet (n)	/ˈkɒrənɪt/	korunka (kopyta)
cranial (adj)	/ˈkreɪniəl/	kraniální
cranium (n)	/ˈkreɪniəm/	kranium
crest (n)	/krest/	hřeben, korunka
croup (n)	/kruːp/	záď koně, sakrální oblast
curve (n)	/kɜːv/	ohyb, oblouk
dewclaw (n)	/ˈdjuːklɔː/	paspárek
dewlap (n)	/ˈdjuːˌlæp/	lalok
distal (adj)	/ˈdɪstəl/	distální
dorsal (adj)	/ˈdɔːsəl/	dorsální
duct (n)	/dʌkt/	trubice
ear (n)	/ɪə/	ucho
elbow (n)	/ˈelbəʊ/	loket
embed (v)	/ɪmˈbed/	vložit, vsadit
enclose (v)	/ɪnˈkləʊz/	obklopovat
eye-socket (n)	/ˈaɪ ˈsɒkɪt/	oční důlek
fetlock (n)	/ˈfetlok/	spěnka
fibre (n)	/ˈfaɪbə/	vlákno
firmly (adv)	/fɜːmli/	pevně

flank (n)	/flæŋk/	bok
flexor (n)	/fleksə/	flexor
floating rib (n)	/ˈfləʊtɪŋ rɪb/	volné žebro
foodstuff (n)	/ˈfuːdˌstʌf/	potravina
forearm (n)	/ˈfɔːrˌɑːm/	předloktí
forehead (n)	/ˈfɒrɪd/ or /ˈfɔːˌhed/	čelo
forelimb (n)	/fɔːlɪm/	přední končetina
framework (n)	/ˈfreɪmwɜːk/	podpěra, kostra
fused (adj)	/fjuːzd/	srostlý
gaskin (n)	/ˈgæskɪn/	bérec
ham (n)	/hæm/	šunka
haunch (n)	/hɔːntʃ/	kyčel, bok, zadní kýta
head (n)	/hed/	hlava
hind limb (n)	/ˈhaɪnd lɪm/	zadní končetina
hip (n)	/hɪp/	bok
hock (n)	/hɒk/	hlezno
hoof (n)	/huːf/	kopyto
horn (n)	/hɔːn/	roh
hyperplasia (n)	/ˌhaɪpəˈplæzɪə/	hyperplázie
hypertrophy (n)	/haɪˈpɜːtrəfɪ/	hypertrofie
cheek (n)	/tʃiːk/	tvář
chin (n)	/tʃɪn/	brada
immobilization (n)	/ɪˌməʊbɪlaɪˈzeɪʃ(ə)n/	imobilizace, znehybnění
incisor (n)	/ɪnˈsaɪzə/	řezák
inflammatory (adj)	/ɪnˈflæmət(ə)ri/	zánětlivý
involuntary (adj)	/ɪnˈvɒləntəri/	bezděčný, vegetativní
joint (n)	/dʒɔɪnt/	kloub
jowl (n)	/dʒaʊl/	lalok
knee (n)	/niː/	karpus koně, přežvýkavců
lateral (adj)	/ˈlæt(ə)rəl/	laterální, postranní
ligament (n)	/ˈlɪgəmənt/	šlacha
lip (n)	/lɪp/	pysk
loin (n)	/lɔɪn/	bedra
lower jaw (n)	/ˈləʊə dʒɔː/	dolní čelist
lumbar (adj)	/ˈlʌmbə/	bederní
malnutrition (n)	/ˌmælnjʊˈtrɪʃ(ə)n/	podvýživa, nesprávná výživa
mandible (n)	/ˈmændɪb(ə)l/	mandibula
mane (n)	/meɪn/	hříva
maxilla (n)	/mækˈsɪlə/	maxilla
medial (adj)	/ˈmiːdɪəl/	mediální
medullar cavity (n)	/mɪˈdʌlə ˈkævəti/	dřeňová dutina
midline (n)	/ˌmɪdlaɪn/	střednice
molar (n)	/ˈməʊlə/	stolička
motion (n)	/ˈməʊʃ(ə)n/	pohyb
mouth (n)	/maʊθ/	tlama
muzzle (n)	/ˈmʌz(ə)l/	čumák; mulec

neck (n)	/nek/	krk
neurocranium (n)	/ˌnjʊərəʊ ˈkreɪniəm/	neurokranium
non-striated muscle (n)	/nɒnstraɪˈeɪtɪd ˈmʌs(ə)l/	hladký sval
nostril (n)	/ˈnɒstrəl/	nozdra
parietal (adj)	/pəˈraɪɪtəl/	parietální
pastern joint (n)	/ˈpæstən ˈdʒɔɪnt/	korunkový kloub
patella (n)	/pəˈtelə/	patela
pattern (n)	/ˈpætən/	vzor, model
pectoral (adj)	/ˈpekt(ə)rəl/	prsní, hrudní
pelvic girdle (n)	/ˈpelvɪk ˈgɜːd(ə)l/	pánevní pletenec
phosphate (n)	/ˈfɒsfeɪt/	fosfát
pierce (v)	/pɪəs/	probodnout
pocket (n)	/ˈpɒkɪt/	váček, ložisko
point of shoulder	/ˈpɔɪnt əv ˈʃəʊldə/	ramenní hrbol
poll (n)	/pəʊl/	temeno, kštice u koně
posterior (adj)	/pɒˈstɪəriə/	zadní
posture (n)	/ˈpɒstʃə/	postoj, držení těla
premolar (n)	/priːˈməʊlə/	zub třenový
provide (v)	/prəˈvaɪd/	poskytovat
proximal (adj)	ˈprɒksɪməl	proximální
quarter (n)	/ˈkwɔːtə/	zadek
rear flank (n)	/rɪə flæŋk/	zadní bok
rib (n)	/rɪb/	žebro
ribcage (n)	/ˈrɪbkeɪdʒ/	hrudní koš
ridge (n)	/rɪdʒ/	rýha
rod-shaped (adj)	/rɒd ʃeɪpt/	tyčinkovitý
rump (n)	/rʌmp/	záď, kostrč
sacral (adj)	/ˈseɪkrəl/	křížový
scapula (n)	/ˈskæpjʊlə/	lopatka
sheath (adj)	/ʃiːθ/	pochvový
shinbone (n)	/ˈʃɪnˌbəʊn/	kost holenní
shoulder (n)	/ˈʃəʊldə/	rameno
shoulder blade (n)	/ˈʃəʊldə bleɪd/	lopatka
skull (n)	/skʌl/	lebka
smooth (adj)	/smuːð/	hladký
snout (n)	/snaʊt/	rypák
sphincter (n)	/ˈsfɪŋktə/	svěrač
spindle-shaped (adj)	/ˈspɪnd(ə)l ʃeɪpt/	vřetenovitý
splanchnocranium (n)	/splæŋknə’kreɪniəm/	splanchnokranium
stifle joint (n)	/ˈstaɪf(ə)l dʒɔɪnt/	kolenní kloub
striated muscle (n)	/straɪˈeɪtɪd ˈmʌs(ə)l/	příčně pruhovaný sval
superficial (adj)	/ˌsuːpəˈfɪʃ(ə)l/	superficiální, povrchový
tail (n)	/teɪl/	ocas
tear (v)	/teə(r)/	trhat
teat (n)	/tiːt/	struk
trunk (n)	/trʌŋk/	trup

udder (n)	/ˈʌdə/	vemeno
undergo (v)	/ˌʌndəˈgəʊ/	podléhat
ungulate (adj)	/ˈʌngjəlit/	kopytnatec
upper jaw (n)	/ˈʌpə dʒɔː/	horní čelist
ventral (adj)	/ˈventrəl	ventrální
vertebra (n)	/ˈvɜːtəbrə/	obratel
vertebral column (n)	/ˌvɜːtəbrəl ˈkɒləm/	páteř
vertebrochondral (adj)	/ˌvɜːtəbrəʊˈkɒndrəl/	vertebrochondrální
visceral (adj)	/ˈvɪsərəl/	viscerální
whithers (n)	/ˈwɪðəz/	kohoutek
work load (phr)	/wɜːk ləʊd/	pracovní zatížení

Source: BUCHALOVÁ, K.,SCHÜLLEROVÄ, S.: *Angličtina pro posluchače bakalářského studijního programu FVHE VFU Brno. Texty a cvičení.* Brno 2010.

LARGE ANIMALS ANATOMY – ORGAN SYSTEMS

The structure of animal body is arranged into particular systems that have their specific functions. The basic and smallest elements sharing certain characteristics are called **cells**. According to the function we distinguish e.g. nerve cells, fat cells or liver cells. The majority of cells contain a nucleus which carries genetic material. Cells together form **tissue** which is grouped to form organs. The most widespread is connective tissue including cartilage and bone the function of which is to separate and support other tissue and organs. Other types of tissue are e.g. adipose tissue (providing energy storage and insulation), epithelial tissue (protecting and lining surfaces of many body organs), muscle (allowing movement) or nervous tissue (generating and conducting electric signals in the body). Each **body organ** has a specific shape and is composed of various types of tissue that provide complex physiologic activities. Two or more organs usually together with other tissue that provide particular types of body functions are called **body organ systems**. In animals we distinguish following systems: integumentary, nervous, endocrine, lymphatic, cardiovascular, respiratory, digestive, urinary, reproductive, muscular and skeletal. It is important to realize that these systems do not just exist and work as individual units. The final product of this cooperating system is one unique body. Each system is directly or indirectly dependent on the others to keep the body functioning normally.

The **integumentary system** is the largest organ system in animals. It serves as an enclosing barrier to invasion by infectious organisms, protects the body internal parts from damage and dehydration, regulates temperature, produces pigment, vitamin D, stores nutrients and provides sensory perception. The integument of the animals is formed of three main parts: epidermis, dermis and hypodermis. The biggest portion of the integumentary system in animals is represented by hide.
Among the skin related structures we can include hair, glands, claws and declaws, hooves and horns. The main types of hairs are guard hairs (primary hairs), wool-type hairs (secondary hairs), tactile hairs (concerning the sense of touch) and whiskers. An important part of the integumentary system is formed by sebaceous glands located in dermis. They produce an oily matter called sebum which helps keep the skin of animals soft and hydrated. The second type of glands are sweat glands being a part of thermoregulatory system. Their primary function is to cool the organism; to a high degree in horses and to a lesser degree in swine, sheep or goats. External covering of distal digits is represented by claws. The remains of digits or hooves are called dewclaws. In some species as in the cattle the size of dewclaws is much smaller than the size of hoofs and so they never touch the ground, however e.g. in pigs they are only a little smaller than hoofs, and can reach the soft ground or when jumping. Finally, some hoofed animals as horses have no dewclaws.

The **cardiovascular system** comprises the heart, a network of vessels, and lymphatic system. Its main function is to transport nutrients, oxygen and waste via blood or lymph fluid. The heart is a cone-shaped muscular structure organ located in the thoracic cavity and pumps blood through the whole body. Continuation of the heart is represented by blood vessels which bring blood away from the heart (arteries), form a close contact with tissue for exchange (capillaries) and bring blood back to the heart (veins).

The **lymphatic system** is closely connected not only with the cardiovascular, but also with the immune system and plays an important role in defending the animal body against such intruders as germs, microorganisms, cancer cells and other foreign bodies. This system also helps to absorb excessive fluid and returns it into the blood stream. The organs of lymphatic system are bone marrow, lymph, lymph nodes, lymph vessels and capillaries, thymus, spleen and two ovoid masses of lymphoid tissue - tonsils. Bone marrow is a spongy, fatty, vascular tissue which can be found in cavities of large bones. It is a source of stem cells that include red and white blood cells and thrombocythes. The lymph vessels which carry the lymph are closely associated with the circulatory system vessels. This interstitial fluid picks up bacteria and transports them to lymph nodes where they are destroyed. Lymph also moves away fats from the digestive system. The spleen is an organ

that houses, filters and cleans the blood and lymph fluid that passes through it. The thymus, a small glandular organ, produces a hormone known as thymosin that plays an important role in T-cell maturation.

The **urinary system** is formed by kidneys, ureter, urinary bladder and urethra. Renal system serves for excretion of metabolic waste products through urine and regulates the amount and composition of extracellular fluids. Kidneys are a pair organ having different shapes in different animals. Most animal species have bean-shaped kidneys, however, in horses we can find heart-shaped kidneys and in cattle lobulated ones. Ureter can be characterized as a smooth muscle lined tube which transmits urine from renal pelvis to urinary bladder. Urine is stored in a hollow smooth muscular organ called urinary bladder and further conveyed to exterior by urethra.

The **nervous system** can be divided into two basic parts, the central nervous system (CNS) represented by brain and spinal cord, and peripheral nervous system including cranial, spinal and autonomic nerves. The brain is composed of two cerebral hemispheres and is responsible for consciousness or awareness of living creatures, associating and intelligence as well as learning. Somesthetic (perception of the pressure and temperature), visual, auditory and olfactory (perception of smell) areas are a part of the cerebrum, too. Some sections of the brain are responsible for movement as well.

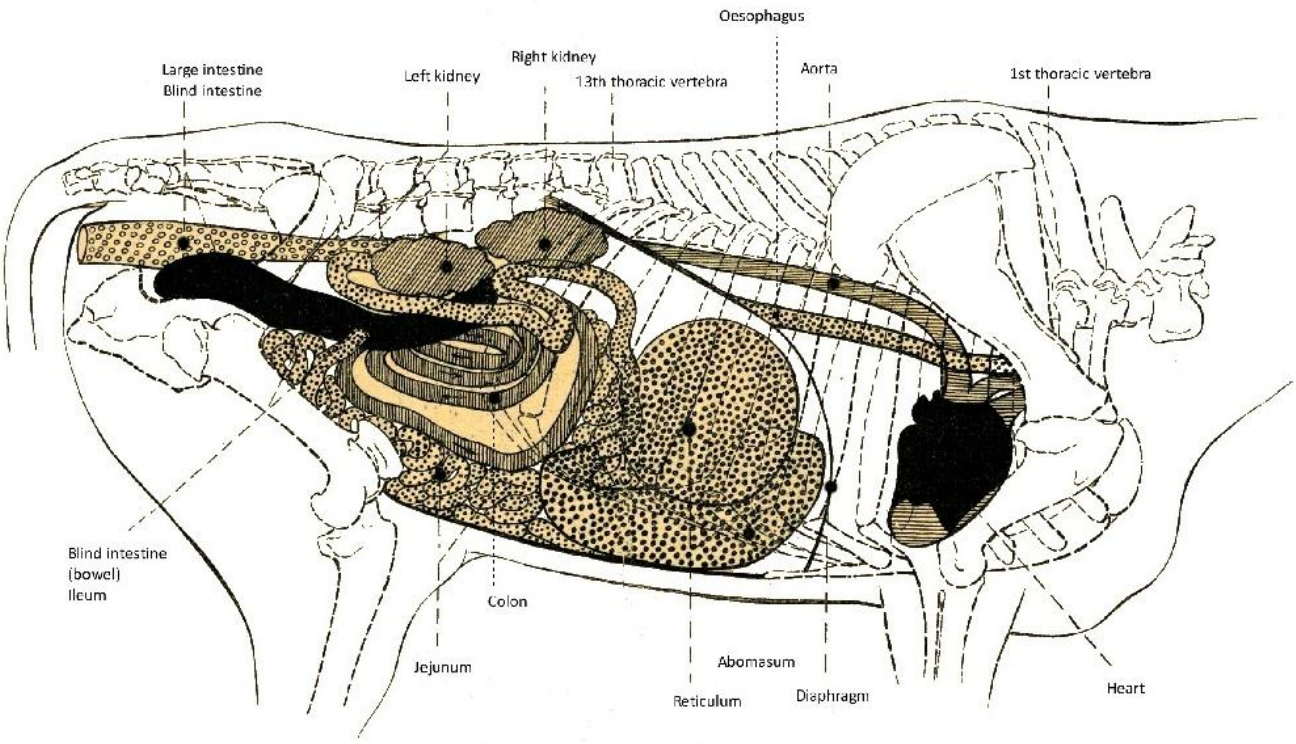
Another body communication system is the **endocrine system**. Endocrine glands release chemical substances called hormones into the blood stream. Hormones direct many body regulatory processes as growth and energy production. The main endocrine glands are pituitary, thyroid, parathyroid, thymus, and suprarenal.

The **reproductive system** is different in males and females. The main function of the male reproductive system is to form sperm and transport it into the female. Sperm as well as male sex hormones are produced in testis, whereas scrotum helps to regulate and keep the right temperature for sperm maturation. Sperm is transmitted via urethra into the copulatory organ – penis that gets rigid and erected to penetrate female. Female reproductive system produces ova and provides the environment needed for fetus development. The main female reproductive organs are: ovary where the ovum is produced, oviduct where the fertilization happens, uterus where embryo and fetus develop and grow, cervix of the uterus that serves as a kind of barrier being closed during pregnancy and female copulatory organs vagina and vulva (the beginning of female reproductive tract). An organ containing the mammary glands of female quadruped mammals, especially ruminants such as cattle, goats, sheep and deer, is called udder.

The **respiratory system** exchanges gases between body tissue and external environment. Oxygen in the air is inhaled from the external environment through the nostrils of the muzzle and passes through pharynx, larynx, trachea and bronchi into the lungs which help to transport oxygen into the blood and tissue. Here it is further transformed into carbon dioxide which is carried back through vessels into the lungs and is expelled (ehhaled) out of the body.

The **digestive system** serves for digesting and absorbing nutrients from the food. According to the type of diet in a natural state we classify animals into carnivores (“meat-eaters”), herbivores (“plant-eaters”) and omnivores (“plant- and meat-eaters”).
The food enters the system by oral cavity where it is chewed and cut by teeth. The tongue seizes and brings food mass to mouth and molars, mixes it with saliva, and assists in swallowing into pharynx and then through oesophagus into the stomach. The stomach is an elastic muscular organ where the food is stored and digested with the help of gastric juices. From the stomach the food passes through duodenum and other parts of small intestine - jejunum and ileum, being broken up by intestinal juices and juices produced by pancreas and liver. The second to last part of the digestive system is

the large intestine. It is a place of fermentation and it consists of two parts: cecum and colon. The final stage of the alimentary canal is called the anus. Animals that regurgitate and remasticate the food are called ruminants. Ruminants have a special type of stomach referred to as compound stomach which is adapted for fermentation of ingested food by bacteria and protozoa. It consists of three forestomachs (rumen, reticulum, and omasum) and the abomasums, the last one being very similar to the stomach of monogastrics.



(Pict. 11)

ACTIVITIES

1. Lexis
Write the particular body system for each organ or gland

spleen _____
trachea _____
urinary bladder _____
sweat glands _____
gall bladder _____
brain _____
uterus _____
thymus _____
skin _____

2. Lexis
Match the conditions with the organs affected. Write the Czech equivalents on the given lines.

gastric ulcer	_____	skin	_____
pneumonia	_____	gall bladder	_____
nephritis	_____	lung	_____
hepatitis	_____	liver	_____
cholecystitis	_____	kidney	_____
blister	_____	stomach	_____

3. Gap fill
Complete the sentences using the words from the box

appetite, grouping, marrow, ordinary, output, passed, recovered, responsible for, shape, stored

Some parts of the brain are _____ movement.
Most external parts of the animal's body have not only Latin but also _____ English names.
Heart failure occurs when is not able to maintain sufficient cardiac _____.
Urine is _____ in the bladder until it is passed.
Each body organ has a specific _____.
Spongy and vascular tissue in the large bones is called _____.
When the animal returns to normal health after illness, it has _____.
The cow has no _____ and has lost 10 kilograms in a week.
If you note a rash you should also note its distribution and _____.
Has the horse _____ blood in the urine?

4. Pronunciation
Which words from the texts above have been transcribed below? Write the words in English and translate them into Czech.

/ˈʃəʊldə(r)/	_____	_____
/ˈstʌmək/	_____	_____
/ˈθaɪrɔɪd ˈglænd/	_____	_____
/ˈspaɪn(ə)l ˈkɔː(r)d/	_____	_____
/ɪkˈsesɪv/	_____	_____

/ˈʃɪnˌbəʊn/	_____	_____
/ˈtɪʃuː/	_____	_____
/ˈfiːtəs/	_____	_____
/rɪˈtɪkjələm/	_____	_____
/səˈlaɪvə/	_____	_____

5. Translation
Translate the following sentences into English

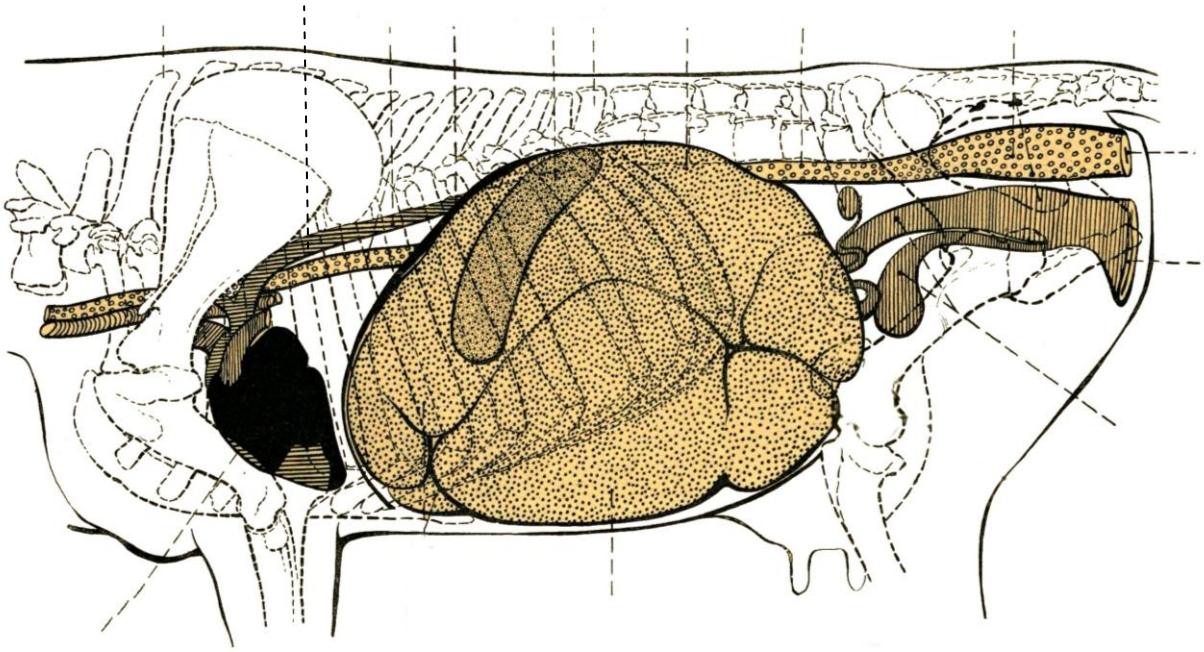
Lebka je tvořena plochými a nepravidelnými kosmi.
_____
Kost stehenní je nejmasivnější kostí v těle krávy.
_____
Soustava cév zahrnuje tepny, žíly a vlásečnice.
_____
Hrudní koš chrání srdce a plíce před poškozením.
_____
Dutina ústní je první částí zažívacího ústrojí.
_____
Zuby slouží k rozkousání potravy.
_____
Ledviny jsou párový organ uložený v dutině břišní.
_____
Štítná žláza je největší žlázou s vnitřní sekrecí.
_____

6. Writing
Think about these questions and write your answers

How would you describe the function of the spleen and pancreas?
_____
_____
_____
Where can you find the main organs of the immune system?
_____
_____
_____
What can influence the senses of animals?
_____
_____
_____
Why are the sweat glands important for the organism?
_____
_____
_____
How would you compare the process of digestion in ruminants and monogastric animals?
_____
_____
_____

7. Anatomy
Look at the picture and label the given parts

aorta, diaphragm, heart, large intestine, oesophagus, ovary, rectum, rumen 2x, spleen, thoracic vertebra, urinary bladder, uterus, vulva



(Pict. 12)

VOCABULARY LIST

abomasum (n)	/ˌæbəˈmeɪsəm/	slez
adipose tissue (n)	/ˈædɪˌpəʊs ˈtɪʃuː/	tuková tkáň
alimentary canal (n)	/ˈælɪˌment(ə)ri kəˈnæl/	trávicí trubice
anatomy (n)	/əˈnætəmi/	anatomie
anus (n)	/ˈeɪnəs/	řiť
appendicular (adj)	/ˌæpənˈdɪkjʊlə/	přívěskový
awareness (n)	/əˈweənəs/	vědomí
axial (adj)	/ˈæksɪəl/	osový, podélný
bean-shaped (adj)	/biːn ʃeɪpt/	fazolovitého tvaru
bronchus (n)	/ˈbrɒŋkəs/	průduška
capillary (n)	/kəˈpɪləri/	kapilára, vlásečnice
carbon dioxide (n)	/ˌkɑːbən daɪˈɒksaɪd/	oxid uhličitý
cardiovascular (adj)	/ˌkɑːdiəʊˈvæskjʊlə/	kardiovaskulární
carnivore (n)	/ˈkɑːnɪvɔː/	masožravec
cavity (n)	/ˈkævəti/	dutina
cecum (n)	/ˈsiːkəm/	tlusté střevo
cell (n)	/sel/	buňka
cerebrum (n)	/səˈriːbrəm/	mozek
cervix (n)	/ˈsɜːvɪks/	děložní hrdlo
claw (n)	/klɔː/	dráp, pazneht
colon (n)	/ˈkəʊlɒn/	tlusté střevo
cone-shaped (adj)	/kəʊn ʃeɪpt/	kuželovitého tvaru
connective tissue (n)	/kəˈnektɪv ˈtɪʃuː/	pojivová tkáň
consciousness (n)	/ˈkɒnʃəsnəs/	vědomí
cartilage (n)	/ˈkɑːtəlɪdʒ/	chrupavka
dewclaw (n)	/ˈdjuːklɔː/	paspárek
dehydration (n)	/ˌdiːhaɪˈdreɪʃ(ə)n/	odvodnění, dehydratace
diet (n)	/ˈdaɪət/	strava
digestive (adj)	/daɪˈdʒestɪv/	trávicí
distinguish (v)	/dɪˈstɪŋgwɪʃ/	rozlišovat
duodenum (n)	/ˌdjuːəʊˈdiːnəm/	dvanáctník
embedded (adj)	/ɪmˈbedɪd/	vložený, začleněný, usazený
enclose (v)	/ɪnˈkləʊz/	uzavřít
endocrine (adj)	/ˈendəʊkraɪn/	endokrinní
epithelial (adj)	/epɪˈθiːlɪəl/	epiteliální
excretion (n)	/ɪkˈskriːʃ(ə)n/	vyměšování, vylučování
exchange (v)	/ɪksˈtʃeɪndʒ/	vyměnit
expel (v)	/ɪkˈspel/	vyloučit
extracellular fluid (n)	/ˌekstəˈseljələ ˈfluːɪd/	mimobuněčná tekutina
fermentation (n)	/ˌfɜːmenˈteɪʃ(ə)n/	fermentace, kvašení
fertilization (n)	/ˌfɜːtəlaɪˈzeɪʃ(ə)n/	fertilizace, oplodnění
fetus (n)	/ˈfiːtəs/	plod
guard hairs	/gɑːd heəs/	pesíky
gland (n)	/glænd/	žláza

herbivore (n)	/ˈhɜːbɪˌvɔː/	býložravec
hide (n)	/haɪd/	kůže, useň
hollow (adj)	/ˈhɒləʊ/	vydutý
ileum (n)	/ˈɪliəm/	kyčelník
insulation (n)	/ˌɪnsjʊˈleɪʃ(ə)n/	izolace
integumantary (adj)	/ˌɪntegjʊˈmentərɪ/	kožní
interstitial (adj)	/ˌɪntəˈstɪʃ(ə)l/	vsunutý, vmezeřený
intruder (n)	/ɪnˈtruːdə/	vetřelec, narušitel
jejunum (n)	/dʒəˈdʒuːnəm/	lačník
kidney (n)	/ˈkɪdni/	ledvina
large intestine (n)	/lɑːdʒ/ ɪnˈtestɪn/	tlusté střevo
larynx (n)	/ˈlærɪŋks/	hrtan
lining (adj)	/ˈlaɪnɪŋ/	lemující
liver (n)	/ˈlɪvə/	játra
lobulated (adj)	/ˈlɒbjʊleɪtɪd/	laločnatý
lung (n)	/lʌŋ/	plíce
lymphatic (adj)	/lɪmˈfætɪk/	lymfatický
mass (n)	/mæs/	hmota
maturation (n)	/ˌmætʃʊˈreɪʃ(ə)n/	zrání
muscular (adj)	/ˈmʌskjʊlə/	svalový
muzzle (n)	/ˈmʌz(ə)l/	čumák, tlama
nervous (adj)	/ˈnɜːvəs/	nervový
nodular (adj)	/ˈnɒdʒələ/	uzlinatý
nostril (n)	/ˈnɒstrəl/	nozdra
nutrient (n)	/ˈnjuːtriənt/	živina
oesophagus (n)	/ɪˈsɒfəgəs/	jícen
omasum (n)	/əʊˈmeɪsəm/	kniha
omnivore (n)	/ˈɒmnɪˌvɔː(r)/	všežravec
oviduct (n)	/ˈəʊvidʌkt/	vejcovod
ovoid (adj)	/ˈəʊvɔɪd/	vejčitý
ovum (n)	/ˈəʊvəm/	vajíčko (zárodečná buňka)
pancreas (n)	/ˈpæŋkriəs/	pankreas
parathyroid gland (n)	/ˌpærəˈθaɪrɔɪd glænd/	příštitné tělísko
pharynx (n)	/ˈfærɪŋks/	hltan
pituitary gland (n)	/pɪˈtjuːtəri/	hypofýza
pregnancy (n)	/ˈpregnənsi/	těhotenství
protozoan (n)	/ˌprəʊtəˈzəʊən/	prvok
provide (v)	/prəˈvaɪd/	poskytovat, poskytnout
quadruped (adj)	/ˈkwɒdrʊped/	čtyřnohý
regurgitate (v)	/rɪˈgɜː(r)dʒɪteɪt/	regurgitovat
remasticate (v)	/rɪˈmæstɪkeɪt/	přežvykovat
reproductive (adj)	/ˌriːprəˈdʌktɪv/	reprodukční
respiratory (adj)	/rɪˈspɪrət(ə)ri/	respirační
reticulum (n)	/rɪˈtɪkjələm/	čepec
rigid (adj)	/ˈrɪdʒɪd/	tuhý, pevný
ruminant (n)	/ˈruːmɪnənt/	přežvýkavec

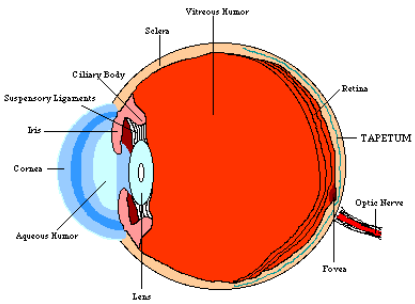
saliva (n)	/sə'laɪvə/	slina
scrotum (n)	/'skrəʊtəm/	skrotum
sebaceous gland	/sə'beɪʃəs glænd/	mazová žláza
share (v)	/ʃeə(r)/	sdílet
skeletal (adj)	/'skelɪt(ə)l/	kosterní
small intestine (n)	/smɔːl ɪn'testɪn/	tenké střevo
smooth muscle	/smuːð 'mʌs(ə)l/	hladký sval
somesthetic (adj)	/səʊməs'θætɪk/	somatický
spleen (n)	/spliːn/	slezina
spongy (adj)	/'spʌndʒi/	porézní, houbovitý
stem cells	/stem sels/	kmenové buňky
suprarenal gland (n)	/suːprə'riːnl glænd/	nadledvina
swallow (n)	/'swɒləʊ/	polykat
tactile (adj)	/'tæktaɪl/	taktilní, dotekový
thoracic cavity	/θəː'ræsɪk 'kævəti/	dutina hrudní
thymosin (n)	/'θaɪməsin/	thymosin
thymus (n)	/'θaɪməs/	brzlík
thyroid gland (n)	/'θaɪrɔɪd glænd/	štítná žláza
tissue (n)	/'tɪʃuː/	tkáň
tonsil (n)	/'tɒns(ə)l/	mandle
trachea (n)	/trə'kiːə/	průdušnice
udder (n)	/'ʌdə/	vemeno
ureter (n)	/jʊ'riːtə/	močovod
urethra (n)	/jʊ'riːθrə/	močová trubice
urinary (adj)	/'jʊərɪn(ə)ri/	močový
urnary bladder (n)	/'jʊərɪn(ə)ri 'blædə(r)/	močový měchýř
vagina (n)	/və'dʒaɪnə/	vagina
vascular (adj)	/'væskjʊlə/	cévní
via (prep)	/'vaɪə/	skrz, pomocí (čeho)
visceral (adj)	/'vɪsərəl/	tělesný, fyzický; útrobní
vulva (n)	/'vʌlvə/	pochva
waste (n)	/weɪst/	odpad
whisker (n)	/'wɪskə/	vous, hmatový chlup
widespread (adj)	/'waɪdˌspred/	rozšířený

Source: BUCHALOVÁ, K., SCHÜLLEROVÁ, S.: *Angličtina pro posluchače bakalářského studijního programu FVHE VFU Brno.* Brno 2010.

SMALL ANIMALS ANATOMY – FELINES AND CANINES

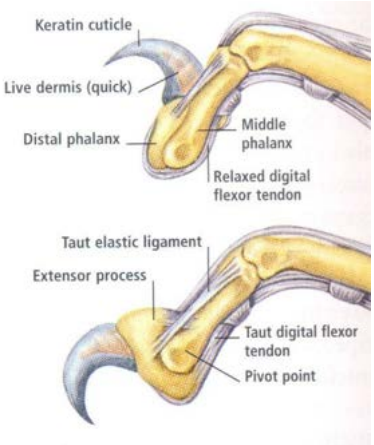
FELINE ANATOMY

Cat is an interesting and unique subject in the animal kingdom. They have extreme strength and agility for their size, along with heightened senses and the ability to reason. Their eyes are complex organs with **keen eyesight** and a **broad range of hearing**. All felines (along with several other animals such as dogs and cows), have a physiological feature in their eyes not found in humans called the *tapetum lucidum*, a layer of tissue found behind the retina. The function of the *tapetum lucidum* is to aid in vision for animals that are active during low light and dark. It reflects light that enters the retina back into the eye. Because of this, cat eyesight suffers in lighted environments, but is superior at night and in low lit areas. All cats are carnivores and hunt their prey at night. The need for superior night vision is a survival mechanism developed in certain species, such as cats, to give them a distinct advantage over prey.



Due to the intricate nature of a cat's body and physiological properties, a delicate balance must be upheld with care. Cats are extremely resilient, but when the immune system or inner organs are affected by infection or disease, the outcome is often bleak. The feline anatomy consists of many similarities to that of other species, namely the human body. A cat skeleton has a few more bones, but many of these are identical to those of the human skeleton. Uniquely, a cat's collar bone is unattached to the other bone structures, and its muscular structure is designed for agility, allowing it to leap, twist and fall with grace. Felines and canines have **secodont teeth** - teeth with sharp cutting edges that produce a shearing action - the teeth pattern in adult cats being: upper jaw 3 1 3 1, lower jaw 3 1 2 1. The temporomandibular joint in felines and canines aids greatly the function of teeth. It has a substantial influence on the occlusion allowing merely a scissors-like movement of jaws (blocks the sideways movement of jaws which is typical of ruminants).

It is a common mistake to refer to the feline claw as retractable. When a cat is relaxed, the claws are sheathed. When the cat voluntarily stretches an elastic ligament, the claws are unsheathed and ready for action. Thus the **feline claws are protractile**. In the case of cheetahs, the fastest animal on Earth, their claws are always extended to keep its running speed, which the animal depends on for hunting.



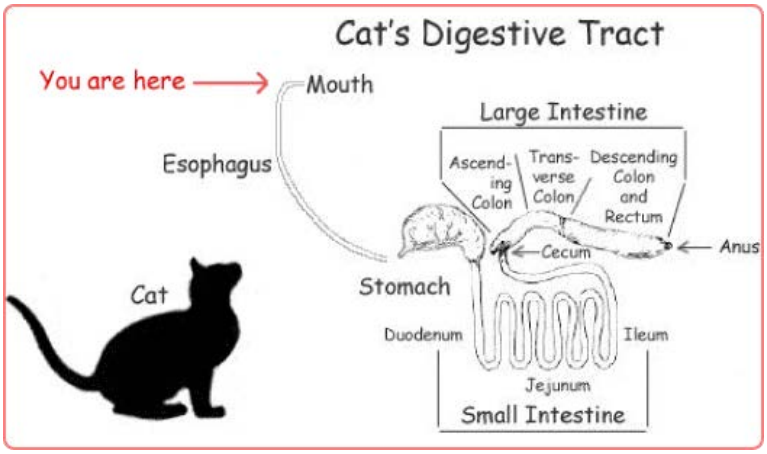
Skeletal System

Cats are naturally slim and their shoulders are unattached to the animal's main skeletal frame. This allows for the maximum of flexibility. Their frame is also held together with incredibly strong and elastic ligament. Feline anatomy has **3 types of joints**:

- **Synovial joints** – *articulatio synovialis* – these joints are found in the female anatomy where the cat performs the most movement, in the legs. The joint capsule is filled with synovial fluid that lubricates the joint when it is functioning. When cats get older the fluid starts to disappear from the joints and you animal may suffer from arthritis.
- **Cartilaginous joints** – *junctura cartilaginea* - the joints in the spine are comprised of thick cartilage disks that are suppler in cats than in other animals. During infancy these joints are susceptible to injury because they have not yet matured.

- **Fibrous joints** – *junctura fibrosa* - these joints have no flexibility at all and are found in areas like the jaw or mandible.

Intestinal Tract



Cats´ teeth play a role in digestion by tearing sharply at meats and other substances. As in other species, the salivary glands, oesophagus, stomach, intestines, liver and kidneys work together to aid the digestive process. The gastric acids and enzymes in a cat's intestines rapidly break down meat and bones as well as destroy bacteria. This is the part of feline anatomy that protects cats from disease and food poisoning from the carrion they ingest. A cat in the wild has a digestive system that digests meat very efficiently. This accounts for their **relatively short intestinal tracts**. A domestic, housebound cat will have a tract that is slightly longer because of the controlled diet and lifestyle.
Illnesses of the gastro-intestinal tract in the feline anatomy are as follow:

- Inflammatory Bowel Disease (IBD)
- Worms
- Feline Distemper (Feline Panleukopenia)
- Feline Infectious Peritonitis (very rare)
- Cancerous tumours

Nervous System

A cat's nervous system is a unique part of the feline anatomy. The nervous system fully develops as the kitten ages, barring any trauma or infection that can hinder this process. The **central nervous system** (CNS) is responsible for the brain and spinal cord messages, the **peripheral nervous system** (PNS) affects muscles and movement, and the **autonomic nervous system** (ANS) controls the involuntary functions of the body. Kittens are born blind with closed eyelids that open by fourteen days of age, exposing the eyeball which is now only mildly sensitive to light. Most kittens will have vision by three to four weeks of age, but it will not be fully developed until after ten weeks of age. All kittens are born deaf as well as blind. Just like the eyelids, the ear canals remain closed until about two weeks of age when most kittens can hear some noises. However, they are easily startled by sharp noises. Kittens over four weeks of age can hear quite well.

Reproductive System

The reproductive system is the part of the feline anatomy that's responsible for mating, copulation, pregnancy and birth. Female cats, or **queens**, can produce 2 to 3 litters per year and can give birth to multiple kittens per pregnancy. Cats will not usually go into heat in the winter months, and spaying or neutering will not only prevent unwanted litters and strays, but can also make for a calmer and more relaxed house pet.

Feline Behaviour

A cat's behaviour is usually evidenced by its stance or meow. The behavioural aspects of the feline physiology lead us to believe that it's a very intelligent animal. Cats have reasoning abilities, and express anger with certain posture, movements and sounds. The temperament of cats varies greatly and can swing

from docile and laid back to finicky and aggressive, even pertaining to the same cat. A quick change in attitude or evidence of unexpected hiding or aggressive behaviour can indicate a problem. Cats do not react well under stressful conditions and an examination may prove helpful in this case.

CANINE ANATOMY

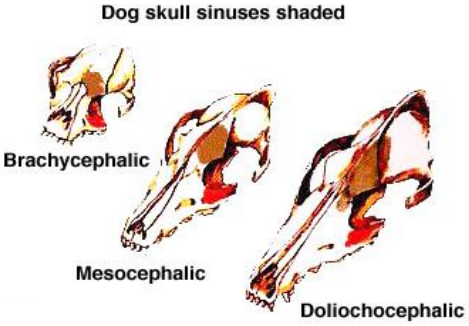
Canine anatomy, which deals with the structure of the dog, is of basic importance to the veterinarian in the treatment of diseases. For it is only because of their deep knowledge of anatomy that the veterinarian can determine the exact location of any ailment whenever a disease occurs. Whether we speak of veterinary medicine or of human medicine, the fact remains that dog anatomy is the foundation stone upon which the entire edifice of modern medicine is built.

Disease is essentially an impairment of the function of a particular organ. Without an understanding of the anatomy of the organ, scientific treatment is impossible.

Respiratory system

Canines are so called macrosomatic animals in which there is critical importance of the piriform cortex and the other olfactory structures for survival and reproduction. Dog´s *regio olfactoria* is very large. By the length of the skull of individual canine breeds, three types of canine skull can be distinguished:

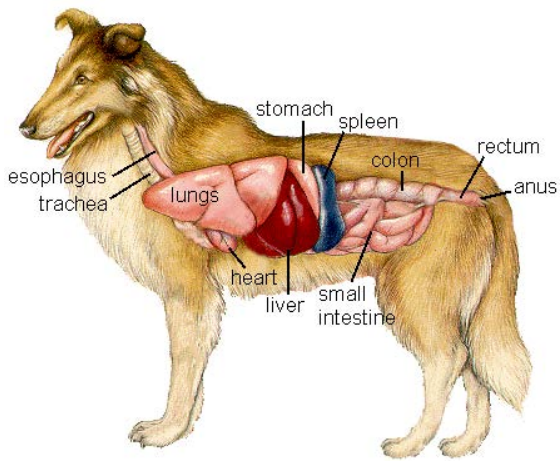
- **dolichocephalic skull** – "longheaded", relatively long skull (typically with the breadth less than 80% or 75% of the length), typical canines e. g. Collie, Dachshund, Greyhound, Great Dane, Siberian Husky
- **mesocephalic skull** - of intermediate length and width, typical representatives are Labrador Retriever, Beagle, Dalmatian, Rottweiler, Yorkshire Terrier
- **brachycephalic skull** - relatively broad and short (typically with the breadth at least 80% of the length), with representatives such as Boxer, Pug, Maltese, Chow Chow, Bulldog.



Canine *concha nasalis media* (the middle thin, spongy, bony plate with curved margins, projecting from the lateral wall of the nasal cavity) is very long. Its main functions are purification, humidification and warming of the air inhaled from the external environment. The system of paranasal cavities is small due to the fact that it consists only of *sinus frontalis* and *recessus maxillaris*.

Digestive System

The dog's digestive system begins with its strong jaws and its powerful teeth. Just as felines, canines have secodont teeth with strong incisors, canines, premolars and molars. Their teeth pattern is as follows: upper jaw 3 1 4 2, and lower jaw 3 1 4 3. Their salivary glands do not produce α-Amylase, an enzyme which breaks down starch as seen in humans, pigs or rabbits. After chewing the food, this is guided to the back part of the mouth and from there to the throat and the oesophagus. The walls of the canine oesophagus differ from human. Throughout the course of the whole oesophagus there is striated muscle tissue which facilitates vomiting. The walls are thick but elastic, which allows the dog to ingest very big servings of meals. The stomach wall is covered with glandular mucosa that produces acids and enzymes which contribute to the digestion of food. The shape and size of canine stomach accommodates to great extent to the amount of ingested food. In large breeds, there is susceptibility to GDV – gastric dilatation and volvulus,



or the twisting of the stomach. It can be partly prevented by minimizing overfeeding, large water intake in a short period of time or before or after exercise. From the stomach the predigested food continues through the pylorus on the way to the duodenum (first part of the small intestine). Here, the peristaltic movements (small intestine wall muscle contractions) are in charge of pulling the food to the next part of the intestine. Once it is mixed up with the enzymes that come from the liver and the pancreas, its nutrients can be assimilated by the blood flow. The water contained in food is partially absorbed when going through the large intestine, where a huge quantity of bacteria is found. These bacteria contribute to the decomposition of the disposal material. Finally, the remains are expelled by the body.

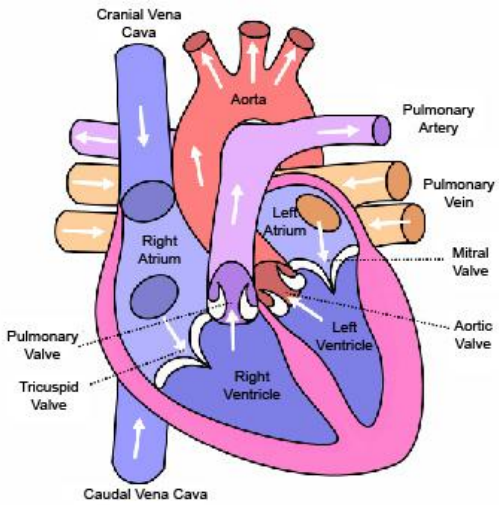
Excretory system

The excretory system is in charge of eliminating toxic substances and metabolic residues from the body, besides regulating the quantity of water present in the body. The residues present in blood are filtered by kidneys. Subsequently, wastes pass through ureters into the bladder to be stored until disposal in the form of urine which is passed out of the body through the urethra in the penis in males or vulva in females.

Reproductive system

The reproductive system guarantees the perpetuation of the species. In the male dog, the testicles are in charge of producing the sperm which are transported into the female via penis. The penis is musculo-cavernous in design and it is stiffened by *os penis*. In the female dog, the ovaries are in charge of producing the ova that after being mature enough go through the Fallopian tube heading to the uterus. The uterus of the female dog has a very characteristic shape of Y since it is formed by two horns that meet at the womb. During pregnancy, the foetuses mature lined up on the uterine body, resembling the distribution of the peas in their pod.

Cardiovascular System



The cardiovascular system ensures the distribution of food and essential substances (especially oxygen and nutrients) throughout the body via blood and the lymphatic system. The speed at which the blood flows varies according to the dog's activity level. Approximately 20% of the blood pumped from the heart goes to the brain permanently. In periods of intense activity, the amount of blood pumped is increased to raise the oxygen proportions. The blood flow of different parts of the body is controlled by nerves and hormones. The heart has four chambers — a right and left atrium and a right and left ventricle. Between the right atrium and the right ventricle the *ostium atrioventriculare dextrum* is enclosed by the tricuspid valve (*valve tricuspidalis*). Its *cuspis angularis* is often indistinct and it is for this reason that the valve is called bicuspid valve. The chambers on the right side receive blood from the body and send it out to the lungs, to be enriched with oxygen. Blood returns to the heart from the lungs on the left side, and the strong left ventricle then pumps the oxygen-rich blood out to the body.

Nervous System

The nervous system controls many mechanisms in the body in order to adapt them to the animal necessities and the surrounding circumstances. The dog's central nervous system is formed by the brain and the spinal cord that is extended until the base of the tail. The nerve receptors of the skin, the muscles and the articulations collect the information related to the environment; for example, if it is hot or cold and also the information related to the dog itself such as its position, for example and constantly send it to the brain and the spinal cord for this information to be processed.

The dog's cerebral functions have not been completely studied in detail yet, even though it is known that it has learning centres that process all the information obtained by senses, specially the senses of smell and sight. The dogs, as well as man, have emotional centres that provoke chemical reactions as an answer to the stimulus, which, at the same time, lead to certain types of conduct.

Hormones

The endocrine system contributes to the regulation of the corporal functions through certain glands and tissues able to produce hormones. The pituitary glands control the dog's overall hormonal system. The hormones are responsible for the presence of stress, sexual activity and sugar levels of the blood, three factors that have a clear influence on the dog's behaviour.

Links:

http://www.doghealthproblems.org/doghealthproblems63.php

http://www.meowmeister.com/felineanatomyandphysiology.aspx

http://www.vetinfo.com/studying-feline-anatomy-physiology.html

http://www.vetmed.wsu.edu/ClientED/anatomy/

http://www.mypetsdentist.com/site/view/114195_TMJproblems.pml

http://www.pawsonline.info/claws.htm

http://www.associatedcontent.com/article/2357034/the_form_and_function_of_a_cats_eyesight_pg2.html?cat=53

http://www.sfds.net/Academics/Student_Projects/2001-2002/8th_Grade_Cow_Eye_Dissection/tapetum1_w.html

http://www.felineconstipation.org/gut101condensed.html

http://www.veterinerara.com/tag/frontal-sinus/

Many thanks to Dr. Paral and Dr. Pyszko for their help with completing this topic.

SMALL ANIMALS ANATOMY – FELINES AND CANINES

FELINE ANATOMY

ability to reason	/ˈriːz(ə)n/	schopnost uvažovat
account for	/əˈkaʊnt/	vysvětlit čím
advantage over	/ədˈvɑːntɪdʒ/	výhoda nad
agility	/əˈdʒɪləti/	agilnost, hbytost
aid in vision	/eɪd/ /ˈvɪʒ(ə)n/	napomáhat vidění
attitude	/ˈætɪˌtjuːd/	chování
bar	/bɑː(r)/	zamezit, zabránit
bleak outcome	/bliːk ˈaʊtˌkʌm/	smutná konec
bowel	/ˈbaʊəl/	střeva
canine	/ˈkeɪnaɪn/	pes, psovitý, psí
carrion	/ˈkæriən/	mršina
cartilaginous joint	/ˌkɑː(r)tɪˈlædʒɪnəs/	chrupavčité spojení kostí
collarbone	/ˈkɒlə(r)ˌbəʊn/	klíční kost
common mistake	/ˈkɒmən/	běžná chyba
copulation	/ˌkɒpjʊˈleɪʃ(ə)n/	kopulace
cutting edge	/ˈkʌtɪŋ edʒ/	ostrý okraj
distemper	/dɪˈstempə(r)/	felinní panleukopenie
distinct	/dɪˈstɪŋkt/	zřetelný
docile	/ˈdəʊsaɪl/	snadno zvládnutelný
ear canal	/kəˈnæl/	zvukovod
eyesight	/ˈaɪˌsaɪt/	zrak
feline	/ˈfiːlaɪn/	kočka, kočkovitý, kočičí
fibrous joint	/ˈfaɪbrəs/	vazivové spojení kostí
finicky	/ˈfɪnɪki/	vybíravý
grace	/greɪs/	grácie, půvab
heightened senses	/ˈhaɪt(ə)nd/	bystré smysly
hinder	/ˈhɪndə(r)/	znemožnit, zabránit, brzdit
cheetah	/ˈtʃiːtə/	gepard
intricate nature	/ˈɪntrɪkət/	složitá povaha, komplexní charakter
laid back	/leɪd bæk/	poklidný
leap	/liːp/	skočit
litter	/ˈlɪtə(r)/	vrh (mláďat)
mating	/ˈmeɪtɪŋ/	páření
mature	/məˈtʃʊə(r)/	dospívat, dospět
meow	/mjaʊ/	mňoukat
merely	/ˈmɪə(r)li/	pouze
neuter	/ˈnjuːtə(r)/	vykastrovat
occlusion	/əˈkluʒən/	skus, okluze
peritonitis	/ˌperɪtəˈnaɪtɪs/	zánět pobřišnice
pertain to	/pərˈteɪn/	týkat se čeho
posture	/ˈpɒstʃə(r)/	postoj
prey	/preɪ/	kořist
protractile	/proʊˈtræktɪl/	protažitelný, vytažitelný
queen	/kwiːn/	dospělá kočka
resilient	/rɪˈzɪliənt/	houževnatý
retractable	/rɪˈtræktəb(ə)l/	zatažitelný
scissors-like movement	/ˈsɪzə(r)z/	nůžkovitý pohyb

secodont teeth	/səkədənt/	sekodontní chrup
shearing action	/ˈʃɪərɪŋ/	sříhání
sheath	/ʃiːð/	pochva, pouzdro, skrýt
spay	/speɪ/	kastrovat
stance	/stæns/	postoj
stray	/streɪ/	toulat se, toulavý, zatoulané zvíře
substantial influence	/səbˈstænʃ(ə)l/	značný vliv
superior	/sʊˈpɪəriə(r)/	dokonalý
suppler	/ˈsʌp(ə)l/	ohebnější
susceptible to injury	/səˈseptəb(ə)l/	náchylný ke zranění
swing	/swɪŋ/	měnit se
synovial joint	/saɪˌnəʊviəl/	synoviální kloub
teeth pattern	/ˈpætə(r)n/	zubní vzorec
temporomandibular joint	/ˌtempərəʊmænˈdɪbjələr/	čelistní kloub
trauma	/ˈtrɔːmə/	trauma
tumour	/ˈtjuːmə(r)/	tumor, nádor
twist	/twɪst/	otočit, otočení
unattached	/ˌʌnəˈtætʃt/	volný, nepřirostlý, nepřipevněný
uphold	/ʌpˈhəʊld/	podporovat
voluntarily	/ˌvɒlənˈteərɪli/	vědomně, dobrovolně

CANINE ANATOMY

accommodate	/əˈkɒmədeɪt/	přizpůsobit
ailment	/ˈeɪlmənt/	onemocnění
articulation	/ɑː(r)ˌtɪkjʊˈleɪʃ(ə)n/	kloub
assimilate	/əˈsɪmɪleɪt/	vstřebat
atrium	/ˈeɪtriəm/	předsíň
base of the tail	/teɪl/	kořen ocasu
bicuspid valve	/baɪˈkʌspɪd vælv/	dvoucípá chlopeň
blood flow	/blʌd/	krevní tok
brachycephalic	/ˌbrækisəˈfælɪk/	brachycefalický
break down	/breɪk/	štěpit, rozložit
canine	/ˈkeɪnaɪn/	špičák
cerebral function	/ˈserəbrəl ˈfʌŋkʃ(ə)n/	mozková funkce
curved margin	/kɜː(r)vd ˈmɑː(r)dʒɪn/	zakřivený okraj
Dachshund	/ˈdæks(ə)nd/	jezevčík
Dalmatian	/dælˈmeɪʃ(ə)n/	dalmatinec
determine	/dɪˈtɜː(r)mɪn/	určit
disposal material	/dɪˈspəʊz(ə)l məˈtɪəriəl/	odpad
distinguish	/dɪˈstɪŋgwɪʃ/	rozlišit
dolichocephalic	/ˌdɒlɪkoʊsəˈfælɪk/	dolichocefalický
edifice	/ˈedɪfɪs/	konstrukce
enriched	/ɪnˈrɪtʃt/	obohacený
enzyme	/ˈenzaɪm/	enzym
excretory system	/ɪkˈskritəri/	vylučovací soustava
expel	/ɪkˈspel/	vyloučit
facilitate	/fəˈsɪləteɪt/	umožnit, usnadnit
foetus	/ˈfiːtəs/	plod

foundation stone	/faʊnˈdeɪʃ(ə)n/	základní kámen
gastric dilatation and volvulus	/ˈgæstrɪk ˌdaɪləteɪʃ(ə)n ən ˈvɒlvjələs/	torze žaludku
glandular mucosa	/ˈglændʒələr mjuˈkoʊsə/	žláznatá sliznice
Great dane	/deɪn/	německá doga
Greyhound	/ˈgreɪˌhaʊnd/	anglický chrt
humidification	/hjuˈmɪdəˌfɪkeiʃ(ə)n/	ovlažení
impairment	/ɪmˈpeə(r)mənt/	poškození, zhoršení
incisor	/ɪnˈsaɪzə(r)/	řezák
indistinct	/ˌɪndɪˈstɪŋkt/	nevýrazný
intense activity	/ɪnˈtens/	zvýšená aktivita
lower jaw	/dʒɔː/	spodní čelist
macrosomatic animals	/ˈmækroʊsoʊˈmætɪk/	makrosomatická zvířata
Maltese	/mɔlˈtis/	maltézský psík
mesocephalic	/ˌmezoʊsəˈfælɪk/	mesocefalický
metabolic residue	/ˈrezɪˌdju/	metabolický zbytek
molar	/ˈməʊlə(r)/	molár
musculo-cavernous	/ˈmʌskjʊləu ˈkævərnəs/	muskulo-kavernózní
nasal cavity	/ˈneɪz(ə)l/	dutina nosní
olfactory structures	/ɒlˈfækt(ə)ri ˈstrʌktʃə(r)z/	čichové ústrojí
overfeeding	/ˌoʊvərˈfiːdɪŋ/	přežrání
ovum, *pl.* ova	/ˈəʊvəm/	zárodečná buňka, vajíčko
partially	/ˈpɑː(r)ʃəli/	částečně
pea	/piː/	hrášek
perpetuation of the species	/pə(r)ˌpetʃuˈeɪʃ(ə)n/	zachování živočišného rodu
piriform cortex	/pɪrɪfɔː(r)m ˈkɔː(r)teks/	piriformní kůra mozková
pituitary gland	/pɪˈtuɪˌteri/	hypofýza
plate	/pleɪt/	destička
pod	/pɒd/	lusk
premolar	/priˈmoʊlər/	premolár
project	/ˈprɒdʒekt/	vystupovat z
Pug	/pʌg/	mopslík
purification	/ˌpjʊərɪfɪˈkeɪʃ(ə)n/	čištění
pylorus	/paɪˈlɔrəs/	vrátník
sense of sight	/saɪt/	zrak
spongy	/ˈspʌndʒi/	houbovitý
starch	/stɑː(r)tʃ/	škrob
stiffen	/ˈstɪf(ə)n/	zpevnit
stimulus	/ˈstɪmjʊləs/	stimul, podnět
surrounding circumstances	/səˈraʊndɪŋ ˈsɜː(r)kəmˌstænsɪz/	okolní podmínky
susceptibility to	/səˌseptəˈbɪləti/	náchylnost k čemu
testicles	/ˈtestɪk(ə)lz/	varlata
to great extent	/ɪkˈstent/	do velké míry
tricuspid valve	/traɪˈkʌspɪd vælv/	trojcípá chlopeň
type of conduct	/kənˈdʌkt/	způsob chování
upper jaw	/dʒɔː/	horní čelist
ventricle	/ˈventrɪk(ə)l/	komora
vulva	/ˈvʌlvə/	vulva, pochva
water intake	/ˈɪnteɪk/	příjem vody
width	/wɪdθ/	šířka
womb	/wuːm/	děloha

BOVINE SPONGIFORM ENCEPHALOPATHY (BSE)

BSE is a progressive neurological disorder of cattle that results from infection by an unusual transmissible agent called a prion. It is a fatal neurodegenerative disease causing a spongy degeneration in the brain and spinal cord. The incubation period is quite long, from 30 months to 8 years. It usually affects adult cattle at of four to five years of age. The disease may be easily transmitted to human beings by eating food prepared from the contaminated animals or infected carcasses.

The nature of prion causing the infection is not well understood. It is believed to be a modified type of a normal protein. The prion can change its configuration in the molecule structure thus causing substantial changes.

In cattle **the symptoms** of BSE appear slowly. They start with an odd change in activity and attitude, and are followed by increasingly uncoordinated simple movements, such as walking or standing. The cow may experience a noticeable decrease in weight, loss of appetite and may begin to lag in milk production. These symptoms deteriorate the health state and the animal eventually dies**. Scrapie** is a fatal, degenerative disease that affects the nervous systems of sheep and goats. It is one of several **transmissible spongiform encephalopathies** (TSEs), which are related to bovine spongiform encephalopathy (BSE or "mad cow disease") and **chronic wasting disease of deer** (CWD). Humans can contract a form of BSE called **Creutzfeldt-Jakob disease** (CJD) the symptoms of which are similar to those in cattle, sheep or goats. Infected individuals begin to lose their ability to remember and/or concentrate. As the disease progresses some patients have difficulties with movement and experience severe muscle jerks. In the later stage of the vCJD patients fall into coma and eventually die.

The origin of BSE remains unknown. It is supposed that the epizootic was caused by cattle which are normally herbivores but were fed feed containing ingredients including antibiotics, hormones, pesticides, fertilizers and protein supplements which entered the food chain. Moreover the use of meat and bone meal and cooked left-overs of the slaughtering process as well as from the cadavers of sick and injured animals such as cattle, sheep, or chickens, entered the food chain and in the early 1980´s they caused the first BSE spread in Europe. The first confirmed animal to fall ill with the disease occurred in 1986 in the UK. In November 1987 the British Ministry of Agriculture accepted BSE as a new disease. Subsequently, 165 people (up until October 2009) acquired and died of this disease with similar neurological symptoms which was subsequently called variant of Creutzfeldt-Jakob disease. In July 1988 the UK banned the use of ruminant proteins in preparation of animal feed. The use of bovine offal in the food chain was considered to pose a potential risk to humans and was also banned in the UK in 1989. In 1994 the EU banned feeding MBM to ruminants; however, the measures taken, the date of their implementation and the extent of enforcement vary from country to country. In 2001 because of the continued risk from cross contamination, the EU introduced a total feed ban on feeding MBM to all farm animals. The World Health Organization (WHO) has been dealing with this disease as well. In 1999 it accepted conclusions and recommendations to reduce exposure to the BSE agents. Among the most important ones there belong:

- All countries must prohibit the use of ruminant tissues in ruminant feed and must exclude tissues that are likely to contain the BSE agent from any animal or human food chain.
- All countries are encouraged to conduct risk assessments to determine if they are at risk for BSE in sheep and goats. It is advised that any tissue which may come from deer or elk with CWD is not used in animal or human food (at this time there is no evidence to suggest that CWD can be transmitted to humans).
- Milk and milk products are considered safe. Tallow and gelatine are considered safe if prepared by a manufacturing process which has been shown experimentally to inactivate the transmissible agent and, if prepared from specifically identified tissues or from cattle without risk of exposure to BSE.
- Human and veterinary vaccines prepared from bovine materials may carry the risk of transmission of animal TSE agents. The pharmaceutical industry should ideally avoid the use of bovine materials and materials from other animal species in which TSEs naturally occur. If absolutely necessary, bovine materials should be obtained from countries which have a surveillance system for BSE in place and which report either zero or only sporadic cases of BSE. These precautions apply to the manufacture of cosmetics as well.

Adapted from: http://en.wikipedia.org/wiki/Bovine_spongiform_encephalopathy
http://en.wikipedia.org/wiki/Creutzfeldt-Jakob_disease
http://en.wikipedia.org/wiki/Scrapie

BOVINE SPONGIFORM ENCEPHALOPATHY (BSE)

Vocabulary

acquire a disease	/əˈkwaɪə(r)/	onemocnět
animal feed	/fiːd/	krmivo
ban	/bæn/	zakázat
be likely to	/ˈlaɪkli/	mít sklon k
conduct	/kənˈdʌkt/	provádět
confirm	/kənˈfɜː(r)m/	potvrdit
cross contamination	/krɒs kənˌtæmɪnˈneɪʃ(ə)n/	křížová kontaminace
CWD		chronické chřadnutí jelenovitých
degeneration	/dɪˌdʒenəˈreɪʃ(ə)n/	degenerace
elk	/elk/	los
encourage	/ɪnˈkʌrɪdʒ/	podporovat, doporučovat
enforcement	/ɪnˈfɔː(r)smənt/	prosazení
eventually	/ɪˈventʃuəli/	konečně
extent	/ɪkˈstent/	rozsah
fall ill	/fɔːl ɪl/	onemocnět
fall into coma	/ˈkəʊmə/	upadnout do komatu
fatal	/ˈfeɪt(ə)l/	smrtelný
fertilizer	/ˈfɜː(r)təlaɪzə(r)/	hnojivo
food chain	/tʃeɪn/	potravní řetězec
lag in sth	/læg/	opozdit se s čím
left-overs	/ˈleftˌəʊvə(r)z/	zbytky
loss of appetite	/ˈæpətaɪt/	nechutenství
meat and bone meal (MBM)	/miːt ən bəʊn miːl/	masokostní moučka
nature	/ˈneɪtʃə(r)/	povaha
neurological disorder	/ˌnjʊərəˈlɒdʒɪk(ə)l dɪsˈɔː(r)də(r)/	neurologická porucha
obtain	/əbˈteɪn/	získat
odd change	/ɒd tʃeɪndʒ/	podivná změna
offal	/ˈɒf(ə)l/	odpad, vnitřnosti
pesticide	/ˈpestɪsaɪd/	pesticid
pose a potential risk	/pəʊz/ /pəˈtenʃ(ə)l/	představovat potenciální riziko
precautions	/prɪˈkɔːʃ(ə)n/	opatření
prion	/ˈpraɪɒn/	prion
progress	/ˈprəʊgres/	pokročit
prohibit	/prəʊˈhɪbɪt/	zakázat
protein	/ˈprəʊtiːn/	bílkovina
risk assessment	/əˈsesmənt/	vyhodnocení rizika
severe muscle jerks	/sɪˈvɪə(r) ˈmʌs(ə)l dʒɜː(r)ks/	silné záškuby svalů
subsequently	/ˈsʌbsɪkwəntli/	následně
substantial changes	/səbˈstænʃ(ə)l/	značné změny
surveillance system	/sə(r)ˈveɪləns/	systém dozoru nad čím
take measures	/ˈmeʒə(r)z/	podniknout kroky
tallow	/ˈtæləʊ/	lůj
transmissible agent	/trænzˈmɪsibl ˈeɪdʒ(ə)nt/	agens přenosu
variant	/ˈveəriənt/	varianta

DISEASE

Disease itself is as old as life and humankind has never been spared the need to combat it. Early humans would contract illnesses from water, food as well as the environment which surrounded them. Disease outbreaks were not uncommon, however, due to population and settlement density, only small groups of people would be decimated. At this phase, we cannot talk about epidemic proportions of a disease for **an epidemic** is "*a term used in human medicine to describe a disease affecting many people in the same locality at the same time"* (CONCISE VETERINARY DICTIONARY, 1988), and in case of animal population, the definition is as follows:

> "*Epidemic is a level of disease occurrence in an animal population which is significantly greater than usual; only occasionally present in the population, widely diffused and rapidly spreading. The disease is clustered in space and time. The word has common usage in veterinary science in preference to the more accurate, epizootic."* (BLOOD, STUDDERT, GAY, 2007)

Domestication of wild animals and farming led to permanent settlements, which of course brought more people and animals together and created proper breeding ground in which many microbes would thrive and spread. Food and feed storing, human and animal waste, poor sewerage and sanitation, as well as the necessity for standing water used for irrigation in areas with scarce rivers attracted scavenging creatures (eg. mice and rats) and mosquitoes, all of which can be considered disease-carrying vectors who could move rather promptly from settlement to settlement and transmit bacteria and viruses. Expansion in trade both overland and overseas only supported spread of diseases worldwide, nowadays fortified and accelerated even more due to globalization.

The terms **disease, illness or sickness** are broad terms referring to any medical condition which impairs health. Such medical conditions include **infectious and non-infectious diseases** as well as various disorders. Non-infectious diseases can have different causes – genetic, environmental, nutritional etc. Although they may sometimes be passed down on the offspring of the disease carrier, they are nor contagious and cannot thus be transmitted via a pathogen to other individuals.

Infectious diseases, on the other hand, present an ongoing threat to humankind and animal kingdom. Infectious diseases can be of different origins though not all of them are **contagious** (or **communicable**), the difference between these two groups being the transmissibility to another individual by direct contact with the affected individual, by contact with bodily discharges of the affected individual, or indirectly by getting in contact with objects touched by the individual. Their etiologic agens can be bacteria, viruses, prions, fungi or protozoa, and their virulence, or relative severity, varies from disease to disease. Infections causing a great deal of concern throughout the world and posing a risk to public health as well as animal welfare are **zoonoses** – infectious diseases communicable from animal to animal, from animals to humans **(anthropozoonoses)**, or from humans to animals (the latter being known as reverse zoonoses or **anthroponoses**). The following is a partial list of pathogen carriers, or vectors: bats, birds, cats, cattle, dogs, fish, mosquitoes, lice, flies, fleas, rodents or horses. Examples of zoonotic diseases are anthrax, brucellosis, bovine tuberculosis, rabies, BSE, Ebola or swine influenza.

The outbreak of an infection, or sudden rise in the incidence rate of an infection, may differ by the extent of the affected area. It can be restricted to one locality (an outbreak), to a region of a country or the whole of a country (an epidemic), or it can spread across boundaries of countries throughout a continent or even worldwide **(a pandemic)**.

ACTIVITIES

1. Write definitions of the following terms

anthroponosis - ____
____
anthropozoonosis ____
____
contagious disease ____
____
disease outbreak ____
____
epidemic ____
____
infectious disease ____
____
pandemic ____
____
zoonosis ____
____

2. Lexis

Are the following expressions in their singular or plural forms? Write sg. or pl. on the line next to them. Then write their forms in the opposite grammatical number.

bacteria _____ ______________________
diseases _____ ______________________
fish _____ ______________________
flea _____ ______________________
flies _____ ______________________
fungi _____ ______________________
illness _____ ______________________
mosquito _____ ______________________
mouse _____ ______________________
virus _____ ______________________
zoonoses _____ ______________________

3. Pronunciation

Transcribe the following English expressions using proper transcription symbols

health ______________
deal ______________
virus ______________
differ ______________
microbe ______________
bat ______________
prion ______________
feed ______________
thrive ______________
sudden ______________

4. Lexis

Form adverbs from the words below using the suffix –ly

significant ______________
rapid ______________
necessity ______________
occasional ______________
wide ______________
environment ______________

partial	_____	locality	_____
severe	_____	direct	_____

5. Lexis

A. Form the opposites from the adjectives below using prefixes un-, in-, non-, im-

direct	_____	usual	_____
infectious	_____	limited	_____
partial	_____	necessary	_____
common	_____	accurate	_____
proper	_____	significant	_____

B. Form the opposites from the words below using a different expression

wide	_____	different	_____
permanent	_____	more	_____
occasional	_____	wild (animal)	_____
healthy	_____	public	_____
accelerated	_____	individual	_____

6. Translation

Translate the following expressions into English. The first letters have been given

onemocnět	c_____	a d_____
tělní tekutina	b_____	d_____
poškozovat zdraví	i_____	h_____
výskyt onemocnění	d_____	o_____
nakažlivé onemocnění	c_____	d_____
představovat riziko	p_____	a r_____
mrchožravé zvíře	s_____	c_____
nakažený jedinec	a_____	i_____
přenašeči chorob	d_____	c_____
živočišná říše	a_____	k_____

7. Gap fill

Fill in the gaps in the text below with the words from the box

both – due – irrigation - permanent – proper – scavenging – sewerage – thrive – transmit – vectors

Domestication of wild animals and farming led to _____ settlements, which of course brought more people and animals together and created _____ breeding ground in which many microbes would _____ and spread. Food and feed storing, human and animal waste, poor _____ and sanitation, as well as the necessity for standing water used for _____ in areas with scarce rivers attracted _____ creatures (eg. mice and rats) and mosquitoes, all of which can be considered disease-carrying _____ who could move rather promptly from settlement to settlement and _____ bacteria and viruses. Expansion in trade _____ overland and overseas only supported spread of diseases worldwide, nowadays fortified and accelerated even more _____ to globalization.

VOCABULARY LIST

accelerate	/ək'seləreɪt/	urychlit, uspíšit
accurate	/'ækjʊrət/	přesný
affect (v)	/ə'fekt/	nakazit, ovlivnit
affected area	/ə'fektɪd//'eəriə/	postižená oblast
affected individual	/ə'fektɪd//ˌɪndɪ'vɪdʒuəl/	nakažené, postižené zvíře
animal kingdom	/'ænɪm(ə)l//'kɪŋdəm/	živočišná říše
anthrax	/'ænθræks/	antrax, sněť slezinná
anthroponosis	/ˌænθrəpə'nəʊsɪs/	antroponóza
anthropozoonosis	/ˌænθrəpə'zuːnəʊsɪs/	antropozoonóza
bacterium, *pl.* bacteria	/bæk'tɪəriəm//bæk'tɪəriə/	bakterie
bat	/bæt/	netopýr
be spared	/speə(r)d/	být ušetřen čeho
bodily discharge	/'bɒdɪli//'bɒdɪli/	tělní tekutina, výpotek
boundary	/'baʊnd(ə)ri/	hranice
bovine tuberculosis	/'bəʊvaɪn//tjuːˌbɜː(r)kjʊ'ləʊsɪs/	bovinní tuberkulóza
breeding ground	/'briːdɪŋ//graʊnd/	živná půda
brucellosis	/brʊse'ləʊsɪs/	brucelóza
carrier	/'kæriə(r)/	přenašeč
cluster (v)	/'klʌstə(r)/	shromáždit, nahromadit
combat (v)	/'kɒmbæt/	bojovat, zápasit
communicable	/kə'mjuːnɪkəb(ə)l/	přenosný, nakažlivý
contagious	/kən'teɪdʒəs/	nakažlivý
continent	/'kɒntɪnənt/	kontinent
contract an illness	/kən'trækt//'ɪlnəs/	nakazit se nemocí
decimate	/'desɪmeɪt/	decimovat, zničit
density	/'densəti/	hustota
differ (v)	/'dɪfə(r)/	lišit se
direct contact	/daɪ'rekt//'kɒntækt/	přímý kontakt
disorder	/dɪs'ɔː(r)də(r)/	porucha
due to	/djuː/	kvůli
Ebola	/i'bəʊlə/	ebola
environment	/ɪn'vaɪrənmənt/	životní prostředí
environmental	/ɪnˌvaɪrən'ment(ə)l/	environmentální
epidemic (n)	/ˌepɪ'demɪk/	epidemie
epizootic	/ˌepɪzuːtɪk/	epizoocie
etiologic agens	/ˌetɪɒlədʒɪk/	původce
expansion	/ɪk'spænʃ(ə)n/	expanze, šíření
extent	/ɪk'stent/	rozsah
flea	/fliː/	blecha
fly (n)	/flaɪ/	moucha
for	/fə(r)/	protože
fortify	/'fɔː(r)tɪfaɪ/	posílit, zesílit
fungus, *pl.* fungi	/'fʌŋgəs//'fʌŋgɪ/	houba
genetic	/dʒə'netɪk/	genetický

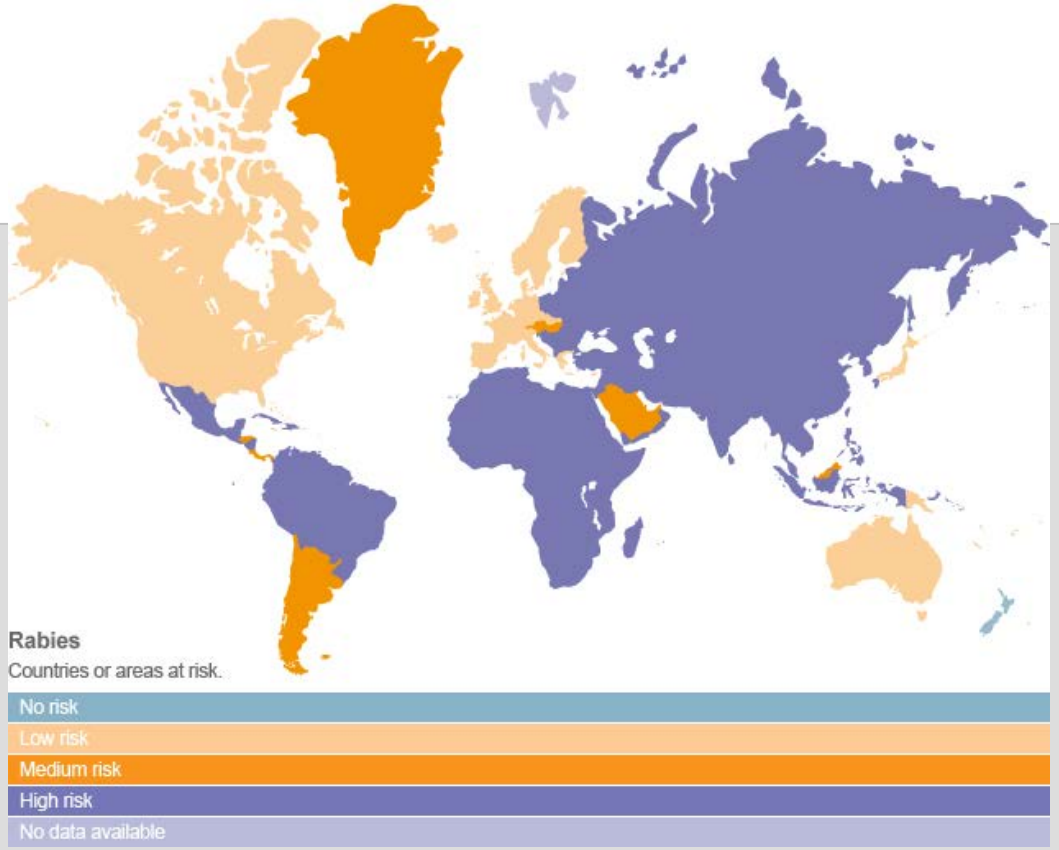
globalization	/ˌgləʊbəlaɪˈzeɪʃ(ə)n/	globalizace
great deal of concern	/greɪt//diːl//ɒv//kənˈsɜː(r)n/	velké starosti
humankind	/ˌhjuːmənˈkaɪnd/	lidstvo
impair health	/ɪmˈpeə(r)//helθ/	poškodit zdraví
incidence rate	/ˈɪnsɪd(ə)ns//reɪt/	četnost výskytu
indirectly	/ˌindəˈrektli/	nepřímo
infectious disease	/ɪnˈfekʃəs//dɪˈziːz/	infekční onemocnění
irrigation	/ˌɪrɪˈgeɪʃ(ə)n/	zavlažování
locality	/ləʊˈkæləti/	lokalita, místo
louse, *pl.* lice	/laʊs//laɪs/	veš
medical condition	/ˈmedɪk(ə)l//kənˈdɪʃ(ə)n/	somatický stav
microbe	/ˈmaɪkrəʊb/	mikrob
mosquito	/mɒˈskiːtəʊ/	komár
mouse, *pl.* mice	/maʊs//maɪs/	myš
necessity	/nəˈsesəti/	nutnost
need (n)	/niːd/	potřeba
non-infectious disease	/nɒnɪnˈfekʃəs//dɪˈziːz/	neinfekční onemocnění
nutritional	/njuːˈtrɪʃən(ə)l/	nutriční
object (n)	/ˈɒbdʒekt/	předmět
occassionally	/əˈkeɪʒ(ə)nəli/	málokdy, zřídkakdy
occurrence	/əˈkʌrəns/	výskyt
offspring	/ˈɒfˌsprɪŋ/	potomstvo
on the other hand	/ðiː//ˈʌðə(r)/	na druhou stranu
ongoing threat	/ˈɒnˌgəʊɪŋ//θret/	stáletrvající hrozba
origin	origin	původ
outbreak	/ˈaʊtˌbreɪk/	vypuknutí
overseas trade	/ˈəʊvə(r)siːz//treɪd/	zámořský obchod
pandemic (n)	/pænˈdemɪk/	pandemie
partial list	/ˈpɑː(r)ʃ(ə)l//lɪst/	částečný seznam
pass down on	/pɑːs/	postoupit, předat
pathogen	/ˈpæθədʒən/	patogen
phase (n)	/feɪz/	fáze
poor sewerage	/pʊə(r)//ˈsuːərɪdʒ/	špatná kanalizace
pose a risk to	/pəʊz//rɪsk/	představovat riziko
preference	/ˈpref(ə)rəns/	upřednostňování
prion	/ˈpraɪɒn/	prion
proportion	/prəˈpɔː(r)ʃ(ə)n/	proporce, podíl, rozsah
protozoan	/ˌprəʊtəˈzəʊən/	prvok
public health	/ˈpʌblɪk/ /helθ/	veřejné zdraví
rabies	/ˈreɪbiːz/	vzteklina
rapid	/ˈræpɪd/	rychlý
rat	/ræt/	krysa
region	/ˈriːdʒ(ə)n/	region, oblast
relative (adj)	/ˈrelətɪv/	relativní
restricted	/rɪˈstrɪktɪd/	omezený
reverse (adj)	/rɪˈvɜː(r)s/	opačný, obrácený

rodent	/ˈrəʊd(ə)nt/	hlodavec
sanitation	/ˌsænɪˈteɪʃ(ə)n/	sanace, hygienická opatření
scarce (adj)	/skeə(r)s/	vzácný, ojedinělý
scavenging creature	/ˈskævɪndʒɪŋ//ˈkriːtʃə(r)/	mrchožravý tvor
severity	/sɪˈverəti/	závažnost
significantly	/sɪgˈnɪfɪkəntli/	značně
standing water	/ˈstændɪŋ//ˈwɔːtə(r)/	stojatá voda
sudden rise	/ˈsʌd(ə)n//raɪz/	náhlá (ná)růst
surround (v)	/səˈraʊnd/	obklopovat
swine influenza	/swaɪn//ˌɪnfluˈenzə/	prasečí chřipka
the latter	/ˈlætə(r)/	posledně zmíněný
though	/ðəʊ/	ačkoliv
thrive	/θraɪv/	bujet
throughout the world	/θruːˈaʊt/	po celém světě
transmissibility	/trænzˈmɪsɪˌbɪlɪtɪ/	přenosnost
transmit	/trænzˈmɪt/	přenášet
usage	/ˈjuːsɪdʒ/	užití
vector	/ˈvektə(r)/	vektor
virulence	/ˈvɪrʊləns/	virulence, prudká nakažlivost
virus	/ˈvaɪrəs/	virus
widely diffused	/ˈwaɪdli//dɪˈfjuːzd/	velmi rozšířený
zoonosis, *pl.* zoonoses	/zuːnəʊsɪs/	zoonóza

Zdroj:

BUCHALOVÁ, SCHÜLLEROVÁ: *English for Bachelor's study program FVHE UVPS Brno.* 2010.

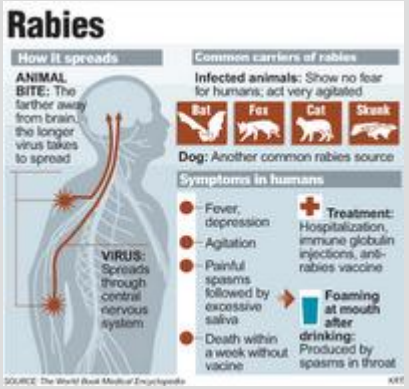
RABIES



Mgr. Kateřina Podveská

PhDr. Lenka Řitičková

Mgr. Silvie Schüllerová, Ph.D.



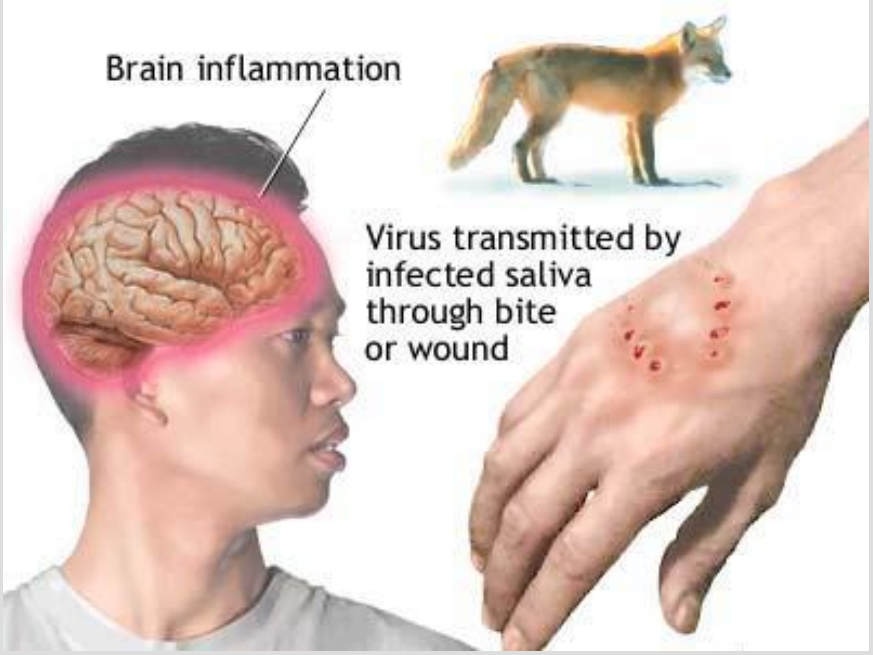
Basic facts

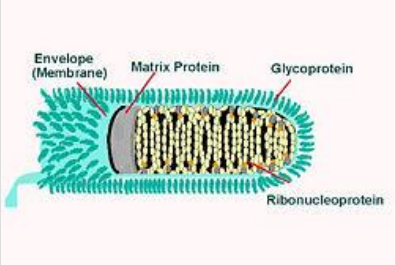
- from Latin *rabies, ei. F*
- viral zoonotic disease
- causes acute encephalitis (inflammation of the brain) in warm-blooded animals

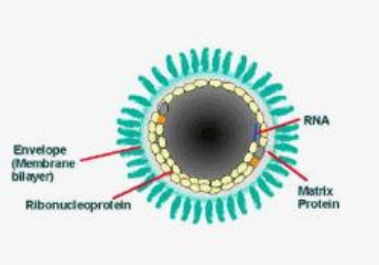
- transmitted by a bite from an infected animal (dogs, foxes, bats, monkeys, skunks, raccoons etc.)

- the period between infection and symptoms – incubation period – is normally two to twelve weeks (eventually two years)
- in humans the incubation period is usually several months depending on the distance the virus travels to the CNS

Basic facts (2)







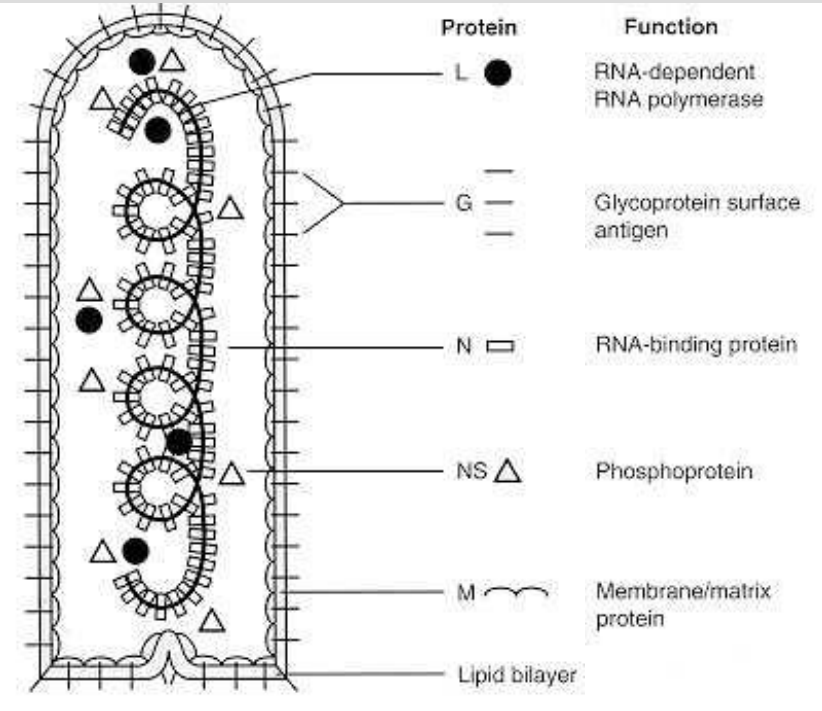
- the rabies virus travels to the brain (follows the peripheral nerves)
- infects CNS → brain inflammation
- once it reaches the central nervous system and symptoms begin to show, the infection is effectively untreatable
- almost invariably fatal disease if post-exposure prophylaxis not administered prior to onset of severe symptoms

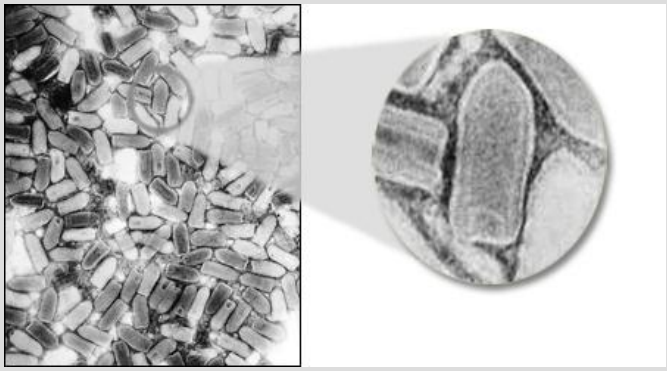
Symptoms

- early-stage
  - headache and fever, malaise, acute pain
  - **violent movements**, uncontrolled excitement
  - depression and hydrophobia,
  - periods of **mania and lethargy** → coma
- later stages
  - production of large quantities of **saliva** and **tears** coupled with an inability to swallow (throat paralyzation)
  - **respiratory insufficiency** – primary cause of death
  - death two to ten days after the first symptoms
  - the disease eliminated substantially due to animal control and vaccination programs

The rabbies virus

- type species of the *Lyssavirus* genus in the family *Rhabdoviridae*, order *Mononegavirales*
- helical symmetry with the length of approx. 180 nm
- enveloped and single stranded RNA
- neurotropic, travels quickly into CNS and further organs
- salivary glands recieve high concentration of the virus thus allowing further transmission





Diagnosis

- animals
  - PCR (polymerase chain reaction) or viral culturing on brain, skin, saliva or urine samples
  - inclusion bodies called **Negri bodies** (stainable substances/proteins indicating viral multiplication) are 100%
- humans
  - differential diagnoses in case of suspected human rabies may initially include any cause of encephalitis, particular infections of viruses such as herpes virus, enterovires or arboviruses

Occurance

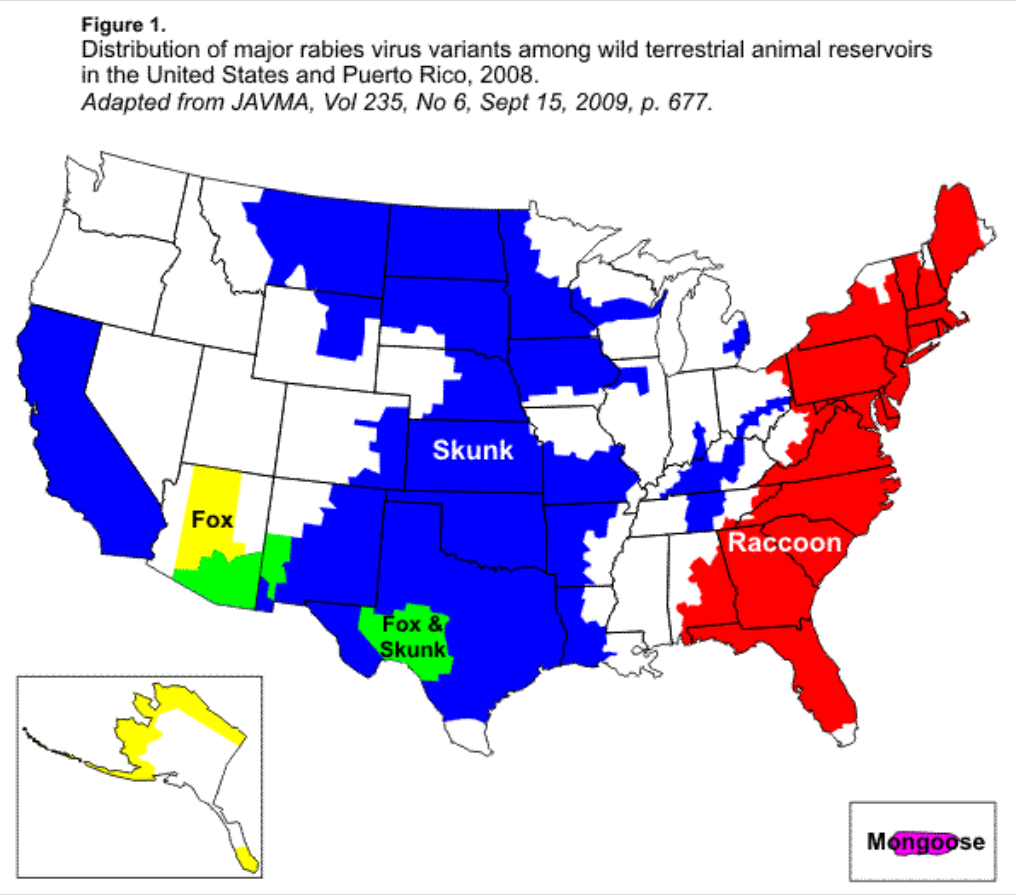
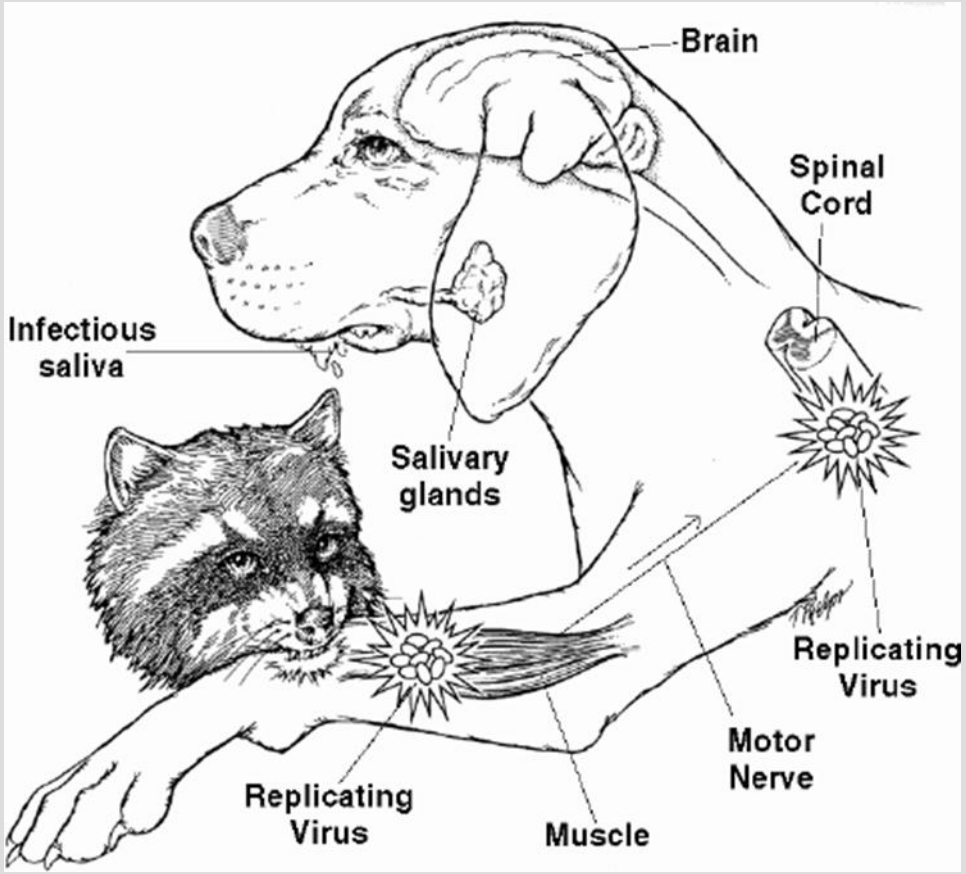


Figure 1.
Distribution of major rabies virus variants among wild terrestrial animal reservoirs in the United States and Puerto Rico, 2008.
Adapted from JAVMA, Vol 235, No 6, Sept 15, 2009, p. 677.

- common in all continental regions of Asia, America and Africa
- Greenland and many countries in Europe - rabies in animal population
- Scandinavia, the British Isles, Japan, Australia and New Zealand are rabies free

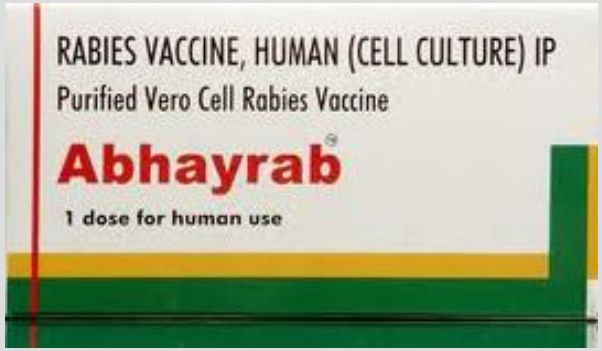
Transmission



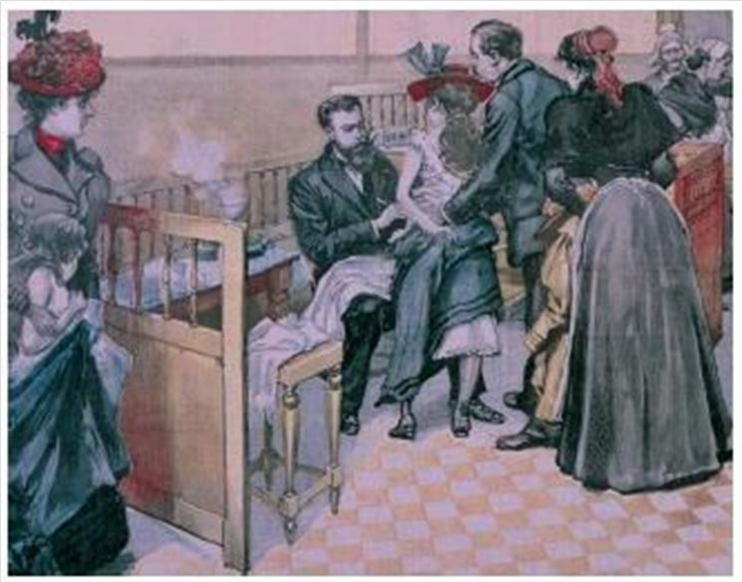
- 7,000 cases in animals reported annually to Centres for Diseas Control and Prevention (CDC)
- most common carries - raccoons, foxes, and dogs
- the most likely to infect people in USA are bats
  - due to widespread vaccination programs transmisson from dogs to people is rare

Prevention

- until 1885 all human rabies cases were fatal
- 1885 – Luis Pasteur and Emile Roux invented rabies vaccine
- virus harvested from infected rabbits was subsequently weakened by allowing it to dry for five to ten days
- 1967 - the human diploid cell rabies vaccine was started
- 1970s - new less expensive chicken purified embryo cell vaccine and purified Vero cell rabies vaccine available



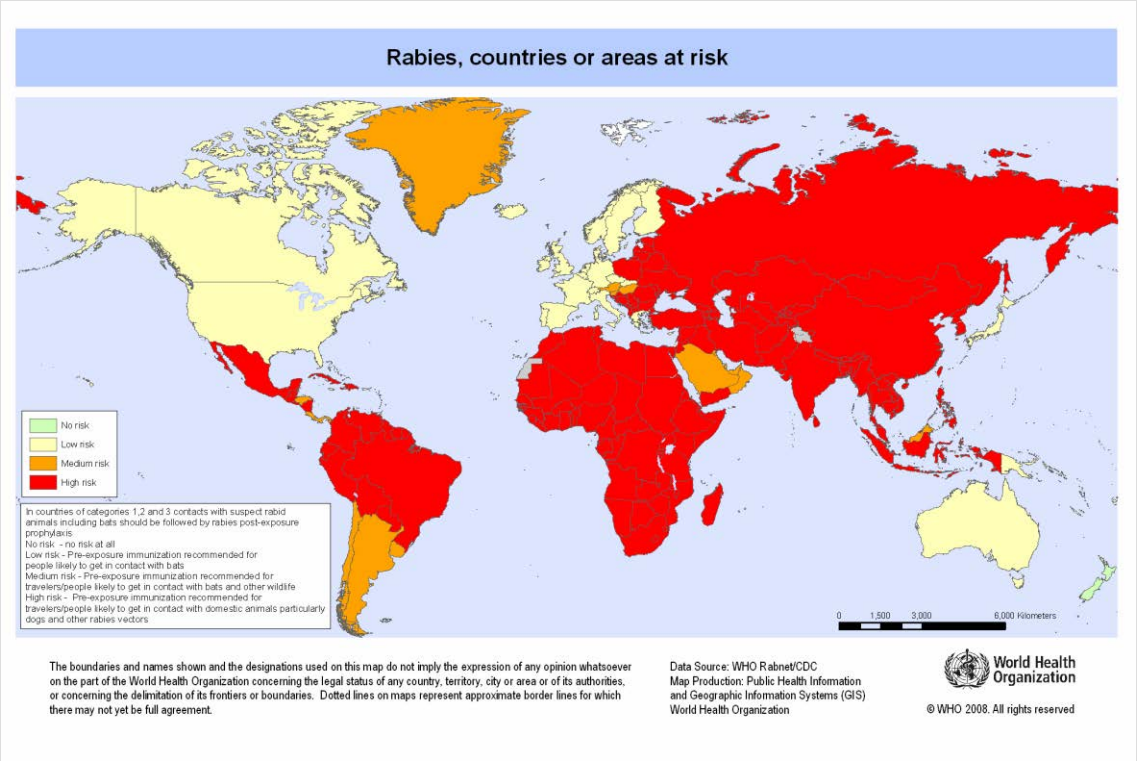
Louis Pasteur



- patients being vaccinated against rabies at the Pasteur Institute in Paris, France
- Louis Pasteur's rabies virus was milder with a shorter incubation period than the wild virus
  - a person bitten by a rabid animal would be inoculated with the Pasteur virus and rapidly develop immunity to the wild strain
- The first human patient (Joseph Meister) was successfully treated in 1885

Prognosis

- in unvaccinated humans, rabies is mostly fatal after neurogological symptoms have developed
- rabies kills around 55,000 people per year (mostly Africa and Asia)
- there are only about six known cases of a person surviving symptomatic rabies



…and

- domesticated animals are required to be vaccinated in many jurisdictions
- September 28 World Rabies Day

Thank you for your attention

BLUETONGUE VIRUS

Bluetongue is a non-contagious, arthropod-borne viral disease of both domestic and wild ruminants. Bluetongue virus (BTV) is endemic in some areas with cattle and wild ruminants serving as reservoirs for the virus. Epizootics of Bluetongue virus killing approximately 179,000 sheep within 4 months have threatened the livestock industry in recent years. For this reason, regulatory veterinarians have heightened their interest in this devastating disease. Bluetongue virus replicates in both arthropod and mammalian host cells. The virulence of BTV varies quite markedly; even strains with matching serotypes have variable virulence.

Diagnostics

Testing diagnostically for BTV can be difficult. Two types of viral antigen are used for BTV testing. All Bluetongue serotypes share a common antigenic determinant called antigen protein P7, while the antigen protein Ps is variable and is used to determine the specific serotype of a virus (1-25). Virus isolation from blood of a viremic animal is the most definitive means of BTV diagnosis. Virus isolation can be labour intensive, time-consuming, and expensive; however, spleen and brain tissues (often from aborted foetuses) are used to isolate the BTV.

Occurrence

BTV infection occurs in both wild and domestic ruminants/camelids from the bite of the vector midge of the genus *Culicoides.* The *Culicoides* vector infects most species during mid-summer to early fall when it is most active. The virus can also be transmitted sexually in infected semen and transplacentally from dam to offspring. Transmission via embryo transfer may also be a concern if the embryo is not washed at least ten times. *Culicoides* transmission is by far the most important method of transmission in endemic areas.

Clinical manifestation and symptoms

Bluetongue is clinically manifested as two syndromes: 1) vascular insult of several organ systems and 2) a reproductive syndrome. Sheep are commonly seen with clinical disease, but other domestic ruminants such as cattle and goats only rarely show clinical signs. After a prepatent period of 3-8 days, sheep may begin to show clinical signs such as transient fever (up to 106F), oedema of the face, lips, muzzle and ears, excessive salivation, and hyperaemic oral mucosa. The disease name stems from the fact that affected sheep begin to develop a mucopurulent nasal discharge after the first few days and the tongue may become cyanotic. This is actually an infrequently reported sign; however, the oral lesions may progress to petechial haemorrhages, erosions, and ulcers. A marked pulmonary oedema is often seen. Late in the disease (7-12 days), lameness characterized by petechial haemorrhages at the coronary band may occur and the hooves may eventually slough. Fragile wool and diarrhoea are commonly seen. Many affected animals become depressed and die while others make a full recovery. The reproductive portion of the disease varies greatly. Signs include abortions, stillbirths, and weak “dummy lamb” live births. BTV can be both abortigenic and teratogenic in cattle experimentally, but neither is commonly seen in field conditions. Early embryonic loss and decreased reproductive efficiency is a more frequently seen manifestation of the disease in cattle and can be devastating to their calf/milk production. Clinical signs in cattle also include hyperaemia and necrosis of the muzzle (“burnt muzzle”) and patchy dermatitis. Regulatory officials should be notified if an outbreak in cattle occurs or is suspected.

Treatment

Supportive treatment is used since no antibiotic for BTV exists. Because animals with severe oral lesions are reluctant to eat, they should be fed via stomach tube or encouraged to eat soft feedstuffs. Muscle and coronary band pain limits mobility and therefore shade and water should be made readily available. Sulfas may be administered to treat secondary bacterial pneumonia and NSAIDs are commonly used to control pain.

Adapted from: http://www.addl.purdue.edu/newsletters/2002/spring/bluetongue.shtml

BLUE TONGUE
VOCABULARY

abortigenic (adj)	/əˌbɔːtəˈdʒenɪk/	způsobující portaty
arthropod (n)	/ˈɑː(r)θrəpɒd/	členovec
be mediated	/...ˈmiːdieɪtɪd/	být zprostředkovaný
be reluctant	/...rɪˈlʌktənt/	být neochotný, odporovat
borne	/bɔː(r)n/	přenášený
camelids (n)	/ˈkæm(ə)lɪd/	camelid
contagious ecthyma	/kənˈteɪdʒəs ˈekθɪmə/	nakažlivé ektyma
cross-react (v)	/ˈkrɒs riˈækt/	reagovat zkříženě
cyanotic (adj)	/saiəˈnɒtɪk/	cyanotický, namodralý
dam (n)	/dæm/	samice
dummy	/ˈdʌmi/	loutka, hastroš, panák
ecchymotic (adj)	/ˌekɪˈmɒtɪk/	ekchymózní
embryonic loss	/embrɪˈɒnɪk.../	ztráta embrya
erosion (n)	/ɪˈrəʊʒ(ə)n/	eroze
fragile (adj)	/ˈfrædʒaɪl/	křehký, slabý, lámavý
hyperemia (n)	/haipəˈriːmɪə/	překrvení
hyperemic (adj)	/haipəˈriːmɪk/	hyperemický, překrvený
induced disruption	/ɪnˈdjuːst dɪsˈrʌpʃ(ə)n	indukované přerušení
labour intensive (adj)	/ˈleɪbə(r) ɪnˈtensɪv/	pracovně intenzivní
midge (n)	/mɪdʒ/	muška, komár
mucopurulent (adj)	/mjʊkəʊˈpjʊrəlent/	mukopurulentní, hlenohnisavý
necropsy (n)	/ˈnekrɒpsiː/	nekropsie, pitva
offspring	/ˈɒfˌsprɪŋ/	potomstvo, potomek
petechial (adj)	/pəˈtiːkiəl/	petechiální
pulmonary edema	/ˈpʌlmən(ə)ri ɪˈdiːmə/	plicní edém
replicate (v)	/ˈreplɪkeɪt/	zdvojit se, opakovat se
seroprevalence (n)	/serəʊˈprevələns/	seroprevalence; prevalence seropozitivity na určitý mikroorganismus
sheep pox	/...pɒks/	ovčí neštovice
slough	/slʌf/	loupat se
spleen (n)	/spliːn/	slezina
stem from	/stem/	odvíjet se od, pocházet z
stillbirth (n)	/ˈstɪlˌbɜː(r)θ/	narození mrtvého plodu
strain of a virus	/streɪn/	kmen viru
subcutaneous (adj)	/sʌbkjuːˈteɪnɪəs/	podkožní
sulfas (n)	/sʌlfəs/	léky obsahující *sulfa* skupinu
transient	/ˈtrænziənt/	přechodný, dočasný
ulcer	/ˈʌlsə(r)/	vřed
vascular insult	/ˈvæskjʊlə(r) ˈɪnsʌlt//	poškození cév
vesicular	/veˈsɪkjələ/	puchýřkovitý
viral (adj)	/ˈvaɪrəl/	virový
viremia (n)	/vaɪrəˈriːmɪə/	virémie (přítomnost viru v krvi)
viremic (adj)	/vaiˈriːmik/	viremický
virulence (n)	/ˈvɪrʊləns/	virulentnost, prudká nakažlivost

COMMON ZOONOSES - FOOT-AND-MOUTH DISEASE, BRUCELLOSIS, AND TUBERCULOSIS

Infectious diseases are diseases caused by pathogenic microorganisms, such as bacteria, viruses, parasites or fungi which subsequently grow and multiply in the body. Due to their potential of transmission from one person or species to another by a replicating agent they are also called communicable diseases or transmissible diseases. The infectious agents can be spread directly through physical contact with infected individuals or indirectly through liquids, food, contaminated objects, or through vector-borne spread. Zoonotic diseases are infectious diseases of animals maintained in nature by animals and directly or indirectly transmissible to humans. The diseases dealt with in this chapter - foot-and-mouth disease, brucellosis, and tuberculosis are all typical zoonoses; however, each time caused by different pathogen. While foot-and-mouth disease is caused by a virus, tuberculosis and brucellosis are caused by bacteria.

Foot-and-mouth disease (FMD)

Foot-and-mouth disease, also known as hoof-and-mouth disease, is described as a highly contagious viral disease, affecting mainly cloven-hoofed animals such as cattle, sheep, pigs, goats, or deer. Other animals susceptible to the disease are camelids (camels, llamas etc.). However, these animals show only mild symptoms and do not transmit the disease to other animals of the same species. FMD is currently endemic in parts of Asia, Africa, the Middle East and South America, with sporadic outbreaks in disease-free areas.

Although humans can be affected by the disease through the contact with an infected animal, it happens extremely rarely. The virus cannot be spread to people via consumption of infected food, because it is sensitive to acid stomach juices and thus destroyed in the stomach.

For animal health and for the economics of the livestock industry FMD may be a disaster as it can spread in a rapid or even uncontrolled way. Seven different **serotypes** of FMD as O, A., C, SAT1, SAT2, SAT3, and Asia 1 have been identified in laboratory serological tests. The frequency of occurrence is dependent on region, whereas O serotype is the most common. All of them are characterized by similar symptoms.

The after-effects of FMD are severe. In addition to treating and nursing a herd of sick animals, a reduction in the milk production in a dairy herd will certainly appear, at least until the next lactation. Mastitis may develop and the value of a cow is permanently reduced due to possible sterility. The disease is usually fatal to young animals, adult animals die rarely. But those who survive are often debilitated and suffering from chronic heart disease and lameness.

The **clinical signs** in the first stage of the disease include a quick rise in temperature, sudden severe lameness, and reduction in yield of milk. Usually within a few hours blisters on the dental pad, inside the lips, and sometimes on the muzzle, will be found, as well as those on the upper surface of the tongue. At first the blisters resemble small raised areas, whitish in colour and containing fluid but they quickly increase in size; they may be as big as half a walnut. Two or more blisters may join together and form a larger one. The lips of the affected animals quiver, they hardly move the lower jaw and they salivate excessively. About the same time there is evidence of pain in the feet caused by painful blisters. Later, the blisters in the mouth burst and collapse, sometimes forming aphthae. After this phase the animals usually make recovery: the temperature decreases, pain is lessened and the animals are able to start eating again.

As regards **the spread of the disease**, it is very easy and quick as the virus is fast-moving in the air and under favourable conditions it can survive for long periods. Animals are affected by the virus either by direct contact with an infected animal or by contact with foodstuffs or other things which have been contaminated. The boots, clothing, and hands of a stockman or a farmer who has been in contact with the infected animals can harbour the virus of the disease: the virus is found in great quantity in the fluid from the blisters, and it can also occur in the saliva, milk and dung. Heat, sunlight and disinfectants work against the virus, whereas cold and darkness tend to keep it alive.

Since the usage of **vaccination** against FMD is problematic, certain rules and laws have to be obeyed on a farm. Farmers and cattlemen should know who is on their property at all times. They should

immediately report any suspicious and unusual signs pointing to the disease. Moreover, basic hygienic rules as washing hands, clothes and footwear when travelling from farm to farm should be observed.

Brucellosis

Brucellosis of cattle, also called "contagious abortion", is a notifiable disease caused by infection with various species of the bacterium of the genus Brucella, which can also be the cause of a human disease known as "undulant fever". These bacteria are primarily spread among animals and they very often affect sheep, goats, cattle, deer, pigs, dogs, etc. A gram-negative bacterium *Brucella abortus* infects cattle and humans, *Brucella suis* infects pigs. Other species of the genus Brucella *Brucella melitensis* infects sheep and goats and can cause a disease in humans known as "Malta fever".

The **clinical signs** are represented by abortion or premature calving of recently infected animals; the fetus, placenta and uterine fluid contain large amount of *Brucella abortus* bacteria which can infect other cattle coming into contact with an infected animal around the time of calving. The pathogenic organism continues to be excreted in the milk; in the past people would be frequently infected due to drinking unpasteurised milk. Infected breeding bulls can transmit the disease to cows via inserting infected semen.

There are no characteristic post mortem signs of brucellosis of cattle. **Diagnosis** is made by laboratory testing of blood or bone marrow samples to detect antibodies against bacteria. Additionally, examination of laboratory culture of bacteria from the placenta, vaginal discharge or the milk of infected cows is possible.

Treatment for brucellosis of cattle may be difficult. Animals can be given effective antibiotics as doxyciclyne and rifampin. Sometimes all infected cattle and those which have been exposed to infection must be slaughtered.

Since brucellosis of cattle is still present in many countries including Ireland and several other countries of the European Union, prevention of brucellosis relies on careful checks of imported cattle and continuing surveillance which is based on regular testing of bulk milk samples from dairy herds and investigation of cattle abortions.

Bovine Tuberculosis Detected At Fresno County Dairy

Published on Feb 2, 2008 - 9:10:00 AM

By: California Department of Food and Agriculture

> *"SACRAMENTO, February 1, 2008 - A detection of Bovine Tuberculosis (TB) has occurred at a dairy in Fresno County. State and federal animal health officials are working closely with the dairy farmer and his veterinarians to implement control strategies to eradicate the disease.*
>
> *The diagnosis of TB was made after a cow with suspicious lesions was found during routine slaughter inspection. This week, CDFA and USDA veterinarians completed tests on some herds that may have been exposed based on animal tracing records and determined that, to date, TB is present in just one herd. The tracing of related animal movement will continue, as will TB testing.*
>
> *Tuberculosis does not threaten the quality and safety of milk and meat products in California. Almost all milk sold in California is pasteurized, which destroys organisms that could be harmful to humans, including TB organisms. The state's two raw milk dairies are regularly tested for TB. All cattle processed for meat are inspected for signs of TB infection and rejected for consumption if they show signs of the disease.*

Tuberculosis is a chronic, slow-spreading disease that can remain undetected for years. Infected animals, even those that appear healthy, can spread infection to other animals. The state of California has been involved in TB eradication programs since 1917. The last known case of Bovine TB in California was in 2003.

The best way for farmers and ranchers to prevent bovine tuberculosis is to follow animal import regulations, require TB testing of new cattle before purchase, maintain permanent identification of animals, keep records of animal movements into and out of their herd, prevent contact of breeding cattle with cattle of unknown origin, and cooperate with government officials on TB investigations.

The California Department of Food and Agriculture protects and promotes California's agricultural industry. California's farmers and ranchers produce a safe, secure supply of food, fiber and shelter; marketed fairly for all Californians; and produced with responsible environmental stewardship."

ACTIVITIES

1. Reading comprehension
Answer these questions in full sentences

What is an infectious disease?
Name some possible pathogens and characterize them in brief.
What animals are most frequently affected by FMD?
Where is FMD most spread at the present time?
Why is brucellosis of cattle sometimes called “contagious abortion”?
How can brucellosis be diagnosed?
Can you name some preventive hygienic rules that should be obeyed at animal farms to prevent infectious diseases?

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

2. Essay writing
The last article in the text deals with concrete occurrence of bovine tuberculosis in California. Write its summary in your own words (max. 80 words).

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

3. Symptoms
Match the features on the left side with the symptoms on the right

Feature		Symptom
Main site		Is there anything else affected by the rash?
Time of onset		How would you describe the behaviour?
Severity		How often does the pig get this pain?
Relieving factors		Where are the blisters?
Frequency		When the cow did start limping?
Associated features		How serious was the bleeding?
Character		Does anything make the nausea better?

4. Lexis
Form the proper word form and translate the new word into Czech

Noun	Verb	Czech
protect		
promote		
maintain		
move		
trace		
originate		
breed		

5. Translation
Translate the expressions in Czech into English. The first letters have been given.

nemoc podléhající hlášení n_____ d_____
vzorky kostní dřeně b_____ m_____ s_____
stálý dozor c_____ s_____
děložní mléko u_____ f_____
mléčné stádo d_____ h_____
podezřelé známky s_____ s_____
nepřímo přenosný t_____ i_____
bolestivé puchýře p_____ b_____
náchylná zvířata s_____ a_____
pokles teploty t_____ d_____

6. Pronunciation
Rewrite the words as they are spelled below

/kən'sʌmpʃ(ə)n/ _____ /dɪ'ziːz/ _____
/'sælɪveɪt/ _____ /'lɑːmə/ _____
/'lɑːmə/ _____ /'fʊtˌweə(r)/ _____
/ɪ'miːdiətli/ _____ /ɪn'kluːdɪŋ/ _____
/ɪˌrædɪ'keɪʃ(ə)n/ _____ /ɪnˌvestɪ'geɪʃ(ə)n/ _____

7. Grammar

Find grammatical mistakes in these sentences and correct them. Each sentence contains one mistake.

Tuberculosis is a chronic disease that can remain undetect for many years.

_____

Almost all milk in the Czech Republic is pasteurized that kills organisms that can be harmful to humans.

_____

The cow is suffering of FMD.

_____

I expect the treatment will improve the state of the horse and he may recover completely.

_____

The pigs have lost on weight recently.

_____

VOCABULARY LIST

abortion (n)	/əˈbɔː(r)ʃ(ə)n/	potrat
antibody (n)	/ˈæntɪˌbɒdi/	protilátka
as regards (phr)	/əz rɪˈgɑːds/	co se týče, pokud jde o
bacteria (n)	/bækˈtɪəriə/	bakterie
blister (n)	/ˈblɪstə/	puchýř
breeding bull	/ˈbriːdɪŋ bʊl/	plemenný býk
brucellosis (n)	/bruːsəˈləʊsis/	brucelóza
burst (v)	/bɜːst/	prasknout
calving (n)	/kɑːvɪŋ/	telení
camelid (n)	/ˈkæm(ə)lɪd/	camelid
cloven-hoofed (adj)	/ˌkləʊv(ə)n ˈhuːfd/	sudokopytný
collapse (v)	/kəˈlæps/	sklesnout, stáhnout se
communicable (adj)	/kəˈmjuːnɪkəb(ə)l/	přenosný, nakažlivý
contagious (adj)	/kənˈteɪdʒəs/	nakažlivý, infekční
dairy herd (n)	/ˈdeəri hɜːd/	mléčné stádo
debilitate (v)	/dɪˈbɪlɪteɪt/	oslabit, zeslabit
disinfectant (n)	/ˌdɪsɪnˈfektənt/	definfekční prostředek
dung (n)	/dʌŋ/	trus
eradicate (v)	/ɪˈrædɪkeɪt/	vymýtit, vyhubit
fairly (adv)	/ˈfeəli/	slušně, poměrně, docela
fatal (adj)	/ˈfeɪt(ə)l/	fatální
favourable (adj)	/ˈfeɪv(ə)rəb(ə)l/	příznivý, příhodný
fiber (n)	/ˈfaɪbə/	vlákno
fungus (n)	/ˈfʌŋgəs/	houba
harbour (v)	/ˈhɑːbə/	skrývat v sobě, obsahovat
herd (n)	/hɜːd/	stádo
implement (v)	/ˈɪmplɪˌment/	provést, uskutečnit
infectious (adj)	/ɪnˈfekʃəs/	infekční
lameness (n)	/ˈleɪmnəs/	chromost
lesion (n)	/ˈliːʒ(ə)n/	poranění, léze
livestock (n)	/ˈlaɪvˌstɒk/	dobytek, skot
mastitis (n)	/mæˈstaɪtɪs/	mastitida
microorganism (n)	/ˌmaɪkrəʊˈɔːgənɪz(ə)m/	mikroorganizmus
muzzle (n)	/ˈmʌz(ə)l/	čumák, tlama, mulec
nurse (v)	/nɜːs/	ošetřovat
occurrence (n)	/əˈkʌrəns/	výskyt
outbreak (n)	/ˈaʊtˌbreɪk/	propuknutí
parasite (n)	/ˈpærəsaɪt/	parazit
pathogenic (adj)	/ˌpæθəˈdʒenɪk/	patogenní
placenta (n)	/pləˈsentə/	placenta
promote (v)	/prəˈməʊt/	podporovat, propagovat
purchase (n)	/ˈpɜːtʃəs/	nákup, koupě
quiver (v)	/ˈkwɪvə(r)/	chvět se, třást se
rarely (adj)	/ˈreəli/	zřídka

recovery (n)	/rɪ'kʌv(ə)ri/	uzdravení, zotavení
reject (v)	/rɪ'dʒekt/	odmítnout
replicating agent	/'replɪkeɪtɪŋ 'eɪdʒ(ə)nt/	replikační agens
semen (n)	/'siːmən/	sperma
serological test	/sɪrɒ'lɒdʒɪkl test/	serologický test
severe (adj)	/sɪ'vɪə/	vážný
shelter (n)	/'ʃeltə/	úkryt, útočiště
slaughter (v)	/'slɔːtə/	porážet (dobytek)
sporadic (adj)	/spə'rædɪk/	sporadický
sterility (n)	/stə'rɪləti/	sterilita
stewardship (n)	/'stjuːədʃɪp/	správcovství
stockman (n)	/'stɒkmən/	dobytkář
sudden (adj)	/'sʌd(ə)n/	náhlý
supply (n)	/sə'plaɪ/	zásoba
surface (n)	/'sɜːfɪs/	povrch
surveillance (n)	/sə'veɪləns/	dohled, dozor
susceptible (adj)	/sə'septəb(ə)l/	citlivý, náchylný
threaten (v)	/'θret(ə)n/	hrozit, ohrožovat
transmissible (adj)	/træns'mɪsəbl/	přenosný
treat (v)	/triːt/	léčit
tuberculosis (n)	/tjuːˌbɜːkjʊ'ləʊsɪs/	tuberkulóza
vaginal discharge	/və'dʒaɪnəl dɪs'tʃɑːdʒ/	vaginální výtok
vector-borne spread	/'vektə bɔːn/	šíření přenašečem
viral (adj)	/'vaɪrəl/	virový
virus (n)	/'vaɪrəs/	virus
walnut (n)	/'wɔːlnʌt/	vlašský ořech
yield (n)	/jiːld/	výnos
zoonosis (n)	/zuː'nəʊsis/	zoonóza

Zdroj:

BUCHALOVÁ, SCHÜLLEROVÁ: *English for Bachelor's study program FVHE UVPS Brno.* 2010.

SWINE ERYSIPELAS

Erysipelas is an infectious disease caused by *Erysipelothrix rhusiopathiae* seen mainly in growing pigs and characterized clinically by sudden death, fever, arthritis, and skin lesions. The disease may be acute, subacute, or chronic.

Etiology

E rhusiopathiae is a gram-positive bacillus. It can survive for several months in animal tissue, eg, frozen or chilled meat, cured and smoked ham, and dry blood. It can survive in swine feces for up to 6 months at temperatures below 12 °C.

On farms where the organism is endemic, pigs are exposed naturally to *E rhusiopathiae* when they are young; their maternal antibodies provide a degree of active immunity without visible disease. The organism is excreted by infected pigs in feces and/or oronasal secretions and survives for short periods in most soils. Recovered pigs and those chronically infected may be carriers of the organism, possibly for life. The mode of entry is by ingestion and through skin abrasions. Following ingestion, the organism most likely enters the body via the tonsils or lymphoid tissue of the GI tract.

Clinical Findings

Pigs with the acute septicemic form may die suddenly without previous signs. This occurs most frequently in finishing pigs (45-90 kg). **Acutely infected pigs** are febrile (40-42°C), walk stiffly on their toes, lie on their sternums separately rather than piling in groups, and are reluctant to move. They may shift weight from foot to foot when standing. Anorexia and thirst are common. Skin discoloration may vary from widespread erythema and purplish discoloration of the ears, snout, and abdomen, to diamond-shaped skin lesions particularly the lateral and dorsal parts. They may disappear or progress to a more chronic type of lesion such as diamond-skin disease. If untreated, necrosis and separation of large areas of skin can occur, but more commonly, the tips of the ears and tail may become necrotic and slough.

Clinical disease is usually sporadic, and affects individuals or small groups. Mortality is 0-100%, and death may occur up to 6 days after the first signs of illness. Acutely affected pregnant sows may abort, probably due to the fever, and suckling sows may show agalactia. Untreated pigs may develop the **chronic form**, usually characterized by chronic arthritis, vegetative valvular endocarditis, or both. Chronic arthritis, the most common form of chronic infection, produces mild to severe lameness; the affected joints may be difficult to detect but tend to become hot and painful to touch and visibly enlarged. Mortality in chronic cases is low.

Diagnosis

Acute erysipelas is difficult to diagnose in individual pigs showing only fever, poor appetite, and listlessness; however, in outbreaks involving several animals, the presence of skin lesions and lameness is likely to be seen in at least some cases and would support a clinical diagnosis. Erysipelas responds extremely well to penicillin—a marked improvement within 24 hours also supports the diagnosis. The typical diamond-shaped skin lesions are diagnostic. Arthritis and endocarditis are difficult to diagnose in live animals because other agents can cause similar syndromes. An ELISA has been developed and is considered reliable for chronic infections on a herd basis.

Treatment

Penicillin is the drug of choice for the treatment of acutely affected pigs. The drug should be given daily for 2-3 days; alternatively, a long-acting form may be used. Improvement is usually seen in 24 hr. Treatment of chronic infection is usually not cost effective, and such pigs should be culled.

Prevention

Prevention is best achieved by regular vaccination using killed bacterins which protects growing pigs from acute disease until they reach market age. An oral vaccine of low virulence is also used. Young breeding stock should be vaccinated twice at intervals of 3-5 weeks before entering the herd, and then revaccinated every 6 months or after each litter (sows). Piglets born to vaccinated sows will be protected for 10-12 weeks. Vaccination raises the level of immunity but does not provide complete protection. Good sanitation, efficient disposal of feces, and regular disinfection of pens is also important in the prevention of erysipelas.

Adapted from: http://www.merckvetmanual.com/mvm/index.jsp?cfile=htm/bc/50902.htm

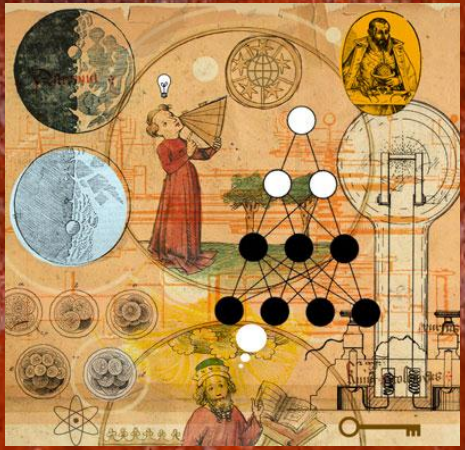
SWINE ERYSIPELAS

Vocabulary

acute septicemic form	/əˈkjut ˌsɛptəˈsimik fɔː(r)m/	akutní septikemická forma
agalactia	/ˌægəˈlæktɪə/	agalakcie (ztráta schopnosti vylučovat mléko)
arthritis	/ɑː(r)ˈθraɪtɪs/	atritida
bacillus, *pl.* bacilli	/bəˈsɪləs/	bacil
bacterin	/ˈbæktərɪn/	bakterin
cost effective	/ɪˈfektɪv/	finančně výhodný
culled	/kʌld/	vyřazený
diamond-shaped	/ˈdaɪəmənd/	kosočtverečný
disposal of feces	/dɪˈspəʊz(ə)l/ /ˈfiːsiːz/	likvidace výkalů
erythema	/ˌerəˈθimə/	erytém, zrudnutí, zarudnutí kůže
for life	/laɪf/	do smrti
chilled meat	/tʃɪld/	chlazené maso
ingestion	/ɪnˈdʒestʃ(ə)n/	přijímání potravy
listlessness	/ˈlɪstlɪsnəs/	netečnost, apatie
lymphoid tissue	/ˈlɪmfɔɪd ˈtɪsju/	lymfoidní tkáň
maternal antibodies	/məˈtɜː(r)n(ə)l ˈæntɪˌbɒdis/	mateřské protilátky
mode of entry	/məʊd/ /ˈentri/	cesta vnikutí
on a herd basis	/hɜː(r)d/ /ˈbeɪsɪs/	v rámci stáda
oronasal secretion	/ˌɔrəʊˈneɪzəl sɪˈkriːʃ(ə)n/	oronazální sekrece
pen	/pen/	kotec
poor appetite	/ˈæpətaɪt/	nechutenství
purplish	/ˈpɜː(r)p(ə)lɪʃ/	fialový, nafialovělý
reach market age	/riːtʃ ˈmɑː(r)kɪt eɪdʒ/	dosáhnout obchodovatelného stáří/věku
respond to	/rɪˈspɒnd/	reagovat na
sanitation	/ˌsænɪˈteɪʃ(ə)n/	asanace
skin abrasion	/əˈbreɪʒ(ə)n/	abraze kůže, oděrky
skin discoloration	/dɪsˌkʌləˈreɪʃ(ə)n/	zbarvení kůže
skin lesion	/ˈliːʒ(ə)n/	poranění kůže
slough	/slʌf/	loupat se
soil	/sɔɪl/	půda
suckling sows	/ˈsʌk(ə)lɪŋ səʊs/	kojící prasnice
tonsils	/ˈtɒns(ə)ls/	tonzily, krční mandle
vegetative valvular endocarditis	/ˈvedʒətətɪv ˈvælvjələr ˌendoʊkɑrˈdaɪtɪs/	vegetativní valvulární endokarditida

Ethics
and Veterinary Medicine

- General Ethics
- Animal Ethics
- Veterinary Profession Ethics



General Ethics

- **Definition:**
  also known as moral philosophy, is a branch of philosophy which seeks answers to questions about morality, evaluates man-to-man relationship, as well as the relationship of man to both animate and inanimate environment from the point of view of good and evil
- **Other philosophical disciplines:**
  - onthology (existence)
  - gnoseology (knowledge)
  - aesthetics (beauty and perfection)

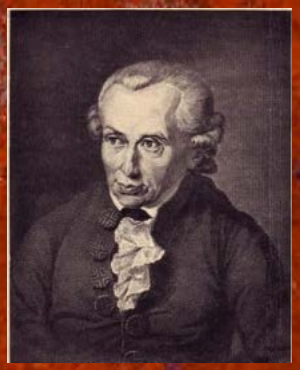
Development of Ethics

- **Aristotle** (4th century BC) – ethics as practical philosophy

- **Christianity** (1st century AD) – the ultimate good is love to one's fellow man

Development of Ethics (2)

- **Immanuel Kant** (18th century) – man's moral principles control our behaviour



- **utilitarists** (19th century) – ethical behaviour brings benefit to the biggest number of people

Jeremy Bentham (1748-1832)

- **ethical relativism** (20th century) – there are no generally valid principles of good and evil

Principles

on which we build our actions

- our conscience (moral subjectivism)
- relevant social norms (moral objectivism)
- from both (”according to one’s best consciousness and conscience”)

Applying the Principles

Ethical principles are applied:

- above all in a relationship to a man
- less frequently in a relationship to the animate environment, and
- least of all towards the inanimate environment

The most current ethical issues

- wildlife protection
- animal protection
- manipulation with a human being
  - abortions, cloning, organ transplantation, euthanasia
- discrimination of human individuals
  - racial, religious, age

Animal Protection Ethics

- I. Anthropocentric
- II. Non-anthropocentric
- III. Pathocentric

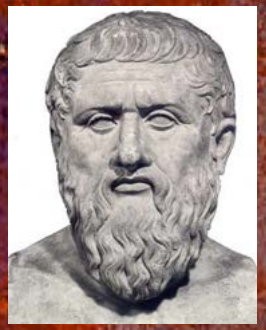
I. Anthropocentric (1)

the man's point of view

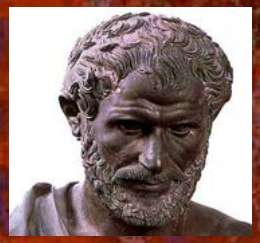
- domestication - violent and painful methods and means of animal subjection by man
  - castration, calibration, cropping
  - whips, spears, chains, collars

I. Anthropocentric (2)

- Antiquity
  - Plato – animals have immortal souls



  - Aristotle – animals exist in the wild for humans



  - Rome – animals are things (legislation)

I. Anthropocentric (3)

- Christianity (Bible)
  - the man is the governor of the world and the master of sea fish, heavenly birds and all that makes the world go round
- The Middle Ages
  - the devil takes on the form of animals
    - cats, billy goats, bats, and toads

I. Anthropocentric (4)

- Renaissance
  - The method of getting to know the wild (and animals as well) is like being put to the rack for questioning (Francis Bacon)
  - new cathegorization of animals
    - useful
    - predators
    - harmful vermin

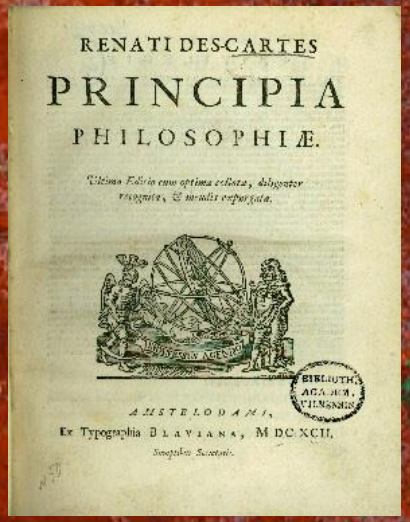
I. Anthropocentric (5) Modern Period

- universal mechanism (philosophical doctrine)

  René Descartes (17th century)

  based his scientific work on the understanding of all natural objects, non-human animals and human bodies as completely mechanistic automata

  - moaning and howling of animals was a purely mechanical reflex



RENATI DES-CARTES

PRINCIPIA

PHILOSOPHIÆ.

AMSTELODAMI,

Ex Typographia BLAVIANA, MDCXCII.

I. Anthropocentric (6) Modern Period

- experiments on animals
  experimental physiology
  18th and 19th centuries
  - laboratories, public demonstrations (cats, dogs, rabbits, frogs and rats)
  - live animals were nailed down onto boards and cut open in order to observe the body functions, eg. blood circulation (vivisections)

I. Anthropocentric (7) Modern Period

the cult of meat

19th century American industry

Mammoth slaughterhouse - Chicago

I. Anthropocentric (8) Modern Period

Animals used for amusement of the masses

- horseracing, fights
- hunts
- circuses
- zoos

II. Non-anthropocentric environmental

- **A** holistic – the Earth (both animate and inanimate nature)
- **B** biocentric – plants and animals
- **C** zoocentric – animals including humans

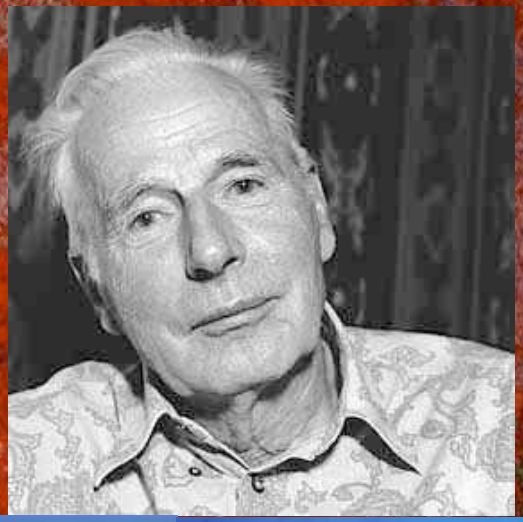
II/A - Holistic
(the interests of the Earth)

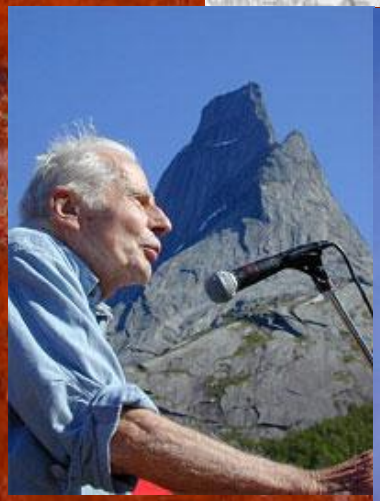
"God sleeps in stones, breaths in plants, dreams in animals, and wakes in men" *(native Indian saying)*

- The founder of the modern-day holistic ethics - Aldo Leopold (USA, 1930's) – respect the needs of the Earth, including all animate and inanimate nature and the man
-

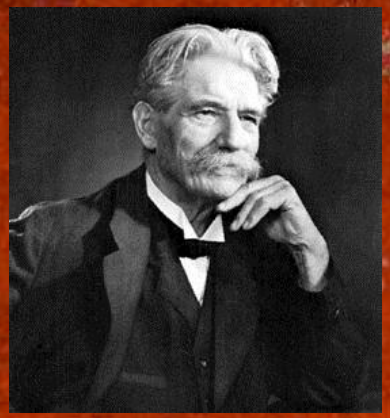
II/A - Holistic
(the interests of the Earth) (2)

- Creator of modern "deep ecology" Arne Naess (Norway, 1990's) – change notably the consumer way of life of people for the sake of preserving the values of animate and inanimate nature





II/B Biocentric
(the interests of plants and animals)



- Albert Schweitzer (1875-1965)

  German doctor (Africa), philosopher, theologist, musician

respecting life should become the basis for the ethical cultivation of man dominated by a cold and emotionless intellect of the modern times

II/C Zoocentric (1)

- Eastern philosophies
  - buddhism, jainism, and hinduism
    - vegetarianism
    - resigning the change of the world

- Christian saints
  - Francis of Assissi – 13th century (October 4 – International animal Protection day)

II/C Zoocentric (2)

- Modern-day organized movements for animal protection
  - sentimental romanticists – regressing to the pre-domestication period
  - neo-pagan orientation – supernatural nadpřirozené forces - astrology magic, ocultism
  - liberal philosophers – differences in mental abilities between the man and animal

II/C Zoocentric (3)

Universal Declaration of Animal Rights (1977)

- all animal species have the same rights
- it is man's obligation to invest his knowledge into animal service
- killing of animals must be fast and painless
- man shall not interfere with the life of animals living in their natural environment
- domesticated animal must live and grow to a rhythm natural to his species

II/C Zoocentric (4)

- animals selected by man as companions must have a life corresponding to their natural longevity

- working animals must only work for a limited period and must not be worked to exhaustion. They must have adequate food and rest

- experiments on animals are inadmissible

- no animal should be used for entertainment

- action causing the unnecessary death of an animal is cruel and a crime against life, killing large numbers of animals is genocide

- dead animals must be treated with respect

III Pathocentric (1)

18th century to present – modern official ethics

Men and animals share the ability to experience pain, suffering and joy

English artists (18th century poets and painters) - William Hogarth, engravings “Four stages of cruelty”- from animal torture to the murder of a man

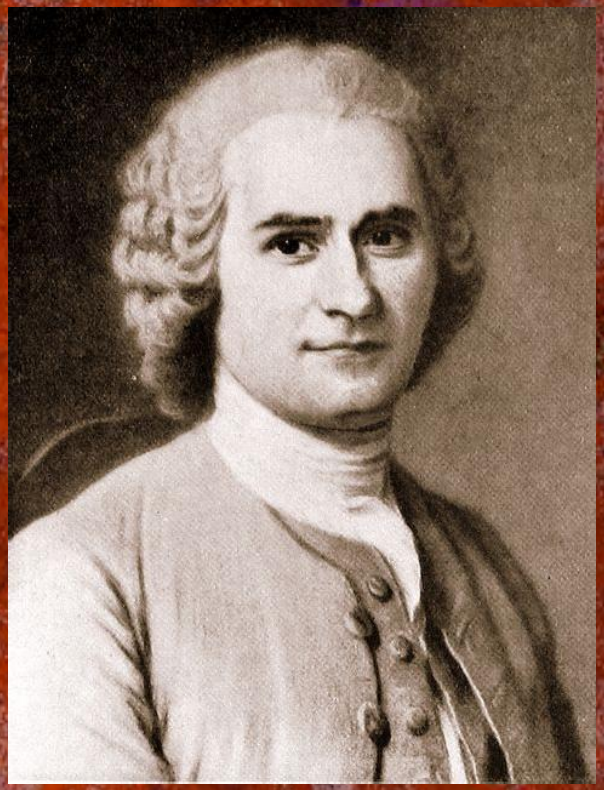
William Hogarth

The Four Stages of Cruelty: The Reward of Cruelty 1 February 1751
Etching and engraving
320 x 380 mm
Courtesy of Andrew Edmunds, London

Jean Jacques Rousseau (1712-1778)

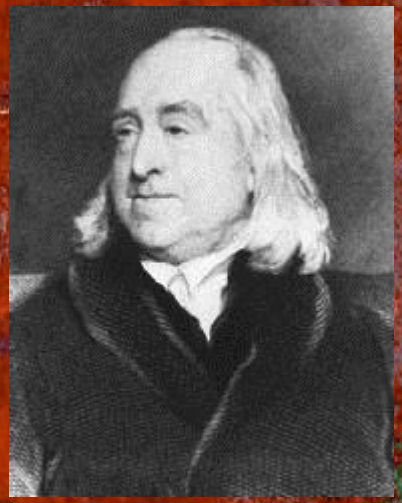
- French philosopher

  - natural human morals exclude the suffering of slaves, the mentally ill, and animal torture



III Pathocentric (2)

- Jeremy Bentham (19th century, England)



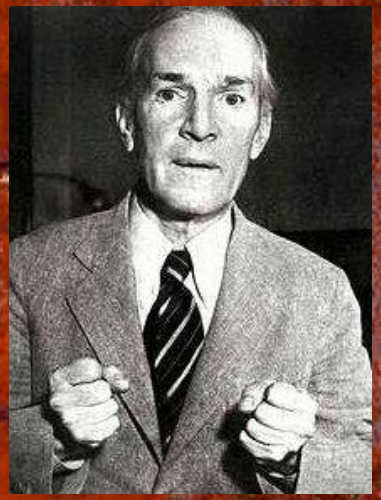
- English philosopher, the founder of utilitarism
- Adversary to experiments on animals. ”The question is not: *Are they capable of thinking? Can they talk?* But: Can they feel pain?“
- The only acceptable experimets are those <u>the benefit (goodness)</u> of which <u>dominates over the evil (pain)</u> they cause – ulitilitarism

III Pathocentric (3)

- 1824 - The Royal Society for Prevention of Cruelty to Animals - Great Britain
- 1847 – first Vegetarian Society – Great Britain
- 1850 – Grammont law – a law against torturing animals in public – France
- half of the 19th century - first animal anesthetics (ether and chloroform) - deaths, negative effect on meat quality
- 1861 – draught dogs protection bill in Germany

III Pathocentric (4)

- 1876 – law regulating experiments on animals (vivisection) – Great Britain
- 1906 - Uptona Beall Sinclair's novel The Jungle – suffering of fatstock in American abattoirs



Ruth Harrison

- 1964 - Ruth Harrison (1920-2000) and her book "Animal Machines" - term welfare

- **welfare**
  - prosperity
  - benefit
  - success
  - well-being (benefit)
  - social care (public)
  - good
  - social

Awarded in 1986 by the Order of the British Empire

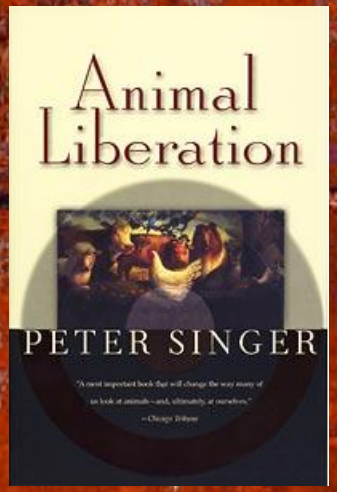
- Concerned the most endangered and tortured fatstock. Only later did welfare expand to other animal groups differentiated according to their importance to man.

World Society for the Protection of Animals

1981 - merger of the World Federation for the Protection of Animals (WFPA, 1953), and the International Society for the Protection of Animals (ISPA, 1959), the first organisations to campaign internationally on animal welfare issues

WSPA is the world's largest network of animal protection specialists with 13 offices worldwide and over 400,000 individual supporters

III Pathocentric (5)



- 1975 - Peter Singer's "Animal Liberation"
  - philosopher (USA, Australia)
  - no qualitative difference between man and animal (soul), but only quantitative differences (nervous system maturity)

1975 - Peter Singer

Divided animals into 3 groups based on perception of pain, self-awareness and communication:

- creatures without awareness
- self-aware creatures
- persons

Creatures without awareness

- Living beings without central nervous system (CNS) – can be treated as objects

Self-aware creatures

- Animals with CNS - productive farm animals – in justified cases they can be killed, but without suffering

Persons

- Animals as self-aware as human beings – dogs, cats, horses, dophins, chimpanzees, gorillas etc. – may not be killed with the exception of endangering a person's life.

"A healthy dog is of a bigger value than a mentally ill person" (tolerates euthanasia)

Animal welfare (1)

- 5 basic animal needs
  - food and water
  - space, warmth, light, and air
  - protection from diseases
  - protection from stress and cruel handling
  - natural behaviour conditions
  (emotional and social needs satisfaction)

Animal welfare (2)

- application of animal etology findings (“animal ethics”)
- 1966 – International Society for Applied Etology
- 1994 to present: Conference on “Animal Protection and welfare” at UVPS Brno (Novak - welfare, Vetcherek – legislation, Baranyi - etology)

Animal Protection and Welfare 2008 – 15th international conference – 24 September 2008, Pavillion of prof. Klobouk

Animal welfare (3a)

fatstock and utility animals for nutrition and other materialistic interests of man

cattle, pigs, poultry, sheep, rabbits etc.

- 1978 – European Convention for protection of farm animals
- 1999 – EU directives on layer hens (technological changes in cage housing)
  - space, boxes, lighting, feeding, noise
  - 2012 definitive ban on cage breeding and keeping

Animal welfare (3b)

fatstock and utility animals for nutrition and other materialistic interests of man

- environmental farms
  - pastures
  - traditional breeding methods with minimal need for veterinary treatment
- research of experiencing pain in farm animals conducted at universities and scientific institutes
  - 1973 – first animal anesthesiology textbook
    - negative effects of pain – self-induced injuries, reduced infection resistance, second-rate meat quality
- advanced regulations on abattoir animals breeding, transport and killing

Animal welfare (4)

animals for sport and amusement

horses, dogs, bulls, cocks, exotic animals etc.

Racing, zoos, circuses, corrida

- ethology findings utilization
  - competitiveness
  - natural affection towards man
- specific zoo welfare concept
  - cage – natural environment – specific environment
    - » 1828 - London – caged animals
    - » 1907 - Hamburg - “Animal Paradise” (barless zoo)
    - » 2004 - Prague – Tropical Wildlife Pavilion
  - animal stimulation towards active occupation - games

Animal welfare (5a)

laboratory and experimet animals

mice, frogs, guinea pigs etc.

- welfare is based on principles of utilitarism which calls for minimal animal suffering according to their usefulness to man (medicine - cosmetics)
- 1959 birth of the **3R rule**

  Refinement of experiment conditions

  Reduction of experiment duration and animals

  Replacement by tissue structures or organs wherever possible

Animal welfare (5b)

laboratory and experiemt animals

- exercising of these principles resulted in:

  - animal experiments reduction especially in the field of production and commerce

  - legalization of professional qualification for animal experiments for scientific and other purposes

Animal welfare (6)

pets

cats, dogs, canaries, rabbits, guinea pigs,…

- European Convention for Animal Protection Kept for Farming (1998) (man's companion, not source of profit)
  - share in treatment of the ill (pet therapy, canistherapy, hippotherapy)
  - improving life quality in children, the elderly, and the mentally ill
  - ban on surgical procedures improving physical appearance of animals (cropping, teeth extraction, declawing, vocal cords extration)
  - stray animal protection (shelters)

Development of Animal Protection in Czech Lands (1)

- 1899 Austria-Hungary
  - first animal torture regulations
    - Torturing of draught animals in public
      - 20 crowns fine
- 1939 Protectorate of Bohemia and Moravia
    - torturing of all animals even in private
      - upto 5.000 crowns fine and 14-day imprisonment
    - definition of torture: "Any act by which severe pain or suffering is intentionally inflicted on an animal without any reasonable or justifiable reason"

Development of Animal Protection in Czech Lands (2)

- 1950 Czechoslovakia
  - CZK5.000 fine or 7-day imprisonment
- 1987 Czechoslovakia – Veterinary Treatment Bill
  - torture is a violation of the law
  - CZK5.000 fine

Development of Animal Protection in Czech Lands (3)

- 1992 – Act no. 246 for animal protection against torture
- 1995 – Ordinance no. 245 about large farm animals slaughter
- 1997 – Ordinance no. 311 about experiment animals breeding and use

Ethics in Veterinary profession

- Definition of a profession
  occupation enjoying high esteem and reputation than it is usual with most common jobs
- Profession characteristics
  - mental activity dominates over the physical
  - university education is a must
  - irreplaceable by another profession
  - flexible working hours
  - its members form professional organizations
  - respect řídí the principles of ethically correct professional behaviour – so called tzv. Code of Ethical Conduct – in their relation to
  - clients,
  - other members of the same profession,
  - state institutions and social standards (traditions, religion)

Ethical principles of veterinary profession (1)

1. Benefit of veterinary profession precedes the benef of an individual veterinarian. Veterinarians are required to represent their profession in both veterinary practice and private lives.

2. Veterinarians are expected to have deep professional knowledge and also deep sense of integrity, righteousness, conscientiousness, and absolute moral correctness.

Ethical principles of veterinary profession (2)

3. Veterinarians act independently in their choice of treatment methods and means. With the authority of their profession they are bound to combat any demonstration of brutality towards animals.

4. When evaluating animal products, veterinarians are bound to consider people and animals health risks and protection first.

Ethical principles of veterinary profession (3)

5. Advance in medical knowledge requires constant self-improvement and professional knowledge enrichment of veterinarians.

6. Public voicing of negative opinions about other veterinary profession members is considered unethical and inadmissible. Evaluation of the work of other veterinarians can be realized only on the grounds of a professional organization or upon state authority request.

Ethical principles of veterinary profession (4)

7. Advertising of veterinary services may not be misleading, deceptive or inaccurate.

8. Relationships between veterinary profession members are based on mutual respect, understanding, and willingness to provide colleague help especially in relation to the ill, the retired, and young veterinarians.

Chamber of Veterinary Surgeons of Czech Republic - Code of Ethical Conduct

- There is no currently existing document

Professional Regulations

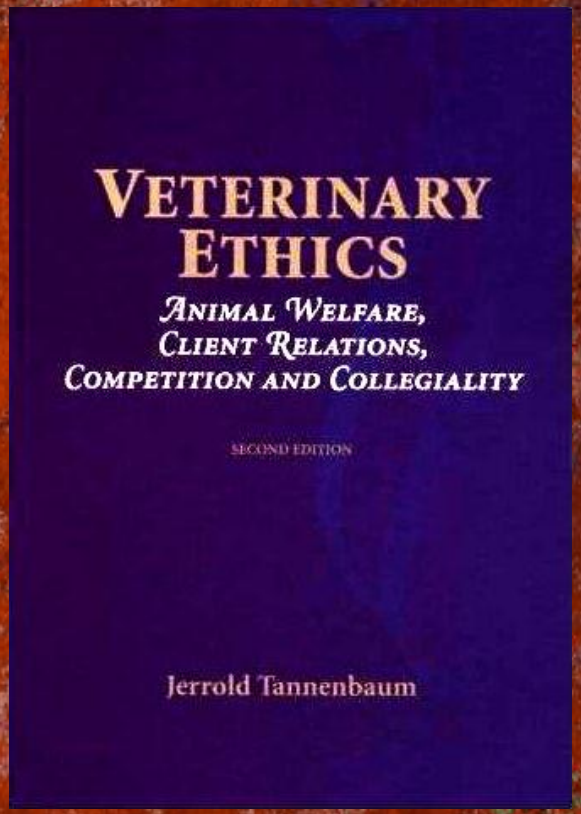
Article 1

Responsibility of a veterinary surgeon

1) The profession of a veterinary surgeon is a freelance occupation defined by Act no. 381/91 of the Code of Law on the Chamber of Veterinary Surgeons Czech Republic (hereinafter as Chamber).
2) While exercising their profession, veterinary surgeons must follow the principles of professional ethics:
   a) towards the patient…
   b) towards the keeper…
   c) towards the public…
   d) towards their colleagues…
3) Unprofessional behaviour means both intentional and careless violation of professional duties. A veterinary surgeon cannot be prosecuted for faulty diagnosis if the conducting of a corresponding examination is proved.

Principal work on Veterinary Ethics

Jerrold Tannenbaum:
Veterinary Ethics,
USA 1989. 615 s.



Thank you for your attention

and enjoy the study of one of the most remarkable fields of medicine

Pavel Brauner, DVM

Head of Department of foreign Languages and History of Veterinary Medicine UVPS Brno