

Syllabus FVM-04 Physiology of exercise

Module title:	Physiology of exercise	ECTS	2
Polish translation:	Fizjologia wysiłku		
Course:	Veterinary Medicine		

Module language:	English	Stage: JM-FVM	
Form of studies: <input checked="" type="checkbox"/> intramural <input type="checkbox"/> extramural	Type of module: <input checked="" type="checkbox"/> basic <input type="checkbox"/> mandatory <input type="checkbox"/> directional <input checked="" type="checkbox"/> elective	Semester: IV	<input type="checkbox"/> winter semester <input checked="" type="checkbox"/> summer semester
Academic year:	2022/2023	Catalogue number:	FVM-V-JMSS-04S-EB01_22

Module coordinator:	Prof dr hab. Piotr Ostaszewski. MS, PhD
Teachers responsible for the module:	Academic teachers of the Institute of Veterinary Medicine, Department of Physiological Sciences, PhD students in accordance to the internal legal acts; visiting professors; other specialists in the field of study
Unit responsible for the module:	IVM, Department of Physiological Sciences
Faculty in charge:	Faculty of Veterinary Medicine

Objectives of the module:	<p>Physiology of exercise is one of the allied health professions that involves the study of the acute responses and chronic adaptations to exercise. Understanding the effect of exercise involves studying specific changes in muscular, cardiovascular and neurohumoral systems that lead to changes in functional capacity and strength due to endurance training or strength training. The effect of training on the body conditions is presented in human athletes, racing/sled dogs and sport horses.</p> <p>There are 15 consecutive lectures scheduled. Each lecture lasts 2 hours.</p> <p>Lecture topics cover:</p> <ol style="list-style-type: none"> <li>1) An introduction to the physiology of exercise and sport</li> <li>2) muscular control of movement</li> <li>3) Neurological control of movement</li> <li>4) Neuromuscular adaptations to resistance training</li> <li>5) Metabolism and basic energy systems</li> <li>6) Hormonal regulation of exercise</li> <li>7) Metabolic adaptations and thermoregulation of exercise</li> <li>8) Cardiovascular control during exercise</li> <li>9) Respiratory regulation during exercise</li> <li>10) Cardiorespiratory adaptations to training</li> <li>11) Nutrition and nutritional ergogenics</li> <li>12) The canine athlete performance, nutrition and training</li> <li>13) Growth, development and the young athlete.</li> <li>14) Exercise and nutrition of sport horses</li> <li>15) Obesity, diabetes and physical activity.</li> </ol>
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Teaching forms, number of hours:	Lectures; 30 hours
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Teaching methods:	<p>Lectures in the form of multimedia presentations prepared by dr Piotr Ostaszewski and other members of the Department of Physiological Sciences university staff.</p> <p>Consultations for students will be scheduled as 1 hour per week.</p> <p>Detailed schedule of lectures will be defined by the coordinator of the course at the beginning of semester.</p> <p>Detailed organization of consultations will be defined by the coordinator of the course at the beginning of semester.</p>
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Formal prerequisites and initial requirements:	It is expected that students will represent a basic knowledge of histology and embryology, chemistry, animal anatomy, biochemistry and animal physiology
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Learning outcomes:	<table border="0"> <tr> <td style="vertical-align: top;"> <p><b>Knowledge:</b> Student:</p> <p>1- knows and understands morphology of the animal organism ;cells, tissues, organs and systems structure, functions, regulatory mechanism and integration of the systems of the animal organism (muscular, nervous, cardiovascular, respiratory, gastrointestinal, urinary, reproductive)</p> <p>2- knows basic interspecies differences in the metabolic processes on the molecular, cellular, organ and organism level between humans, horses and dogs</p> <p>3- knows functional interactions between various tissues/organs</p> </td> <td style="vertical-align: top;"> <p><b>Skills:</b> Student:</p> <p>1- knows how to: describe changes in the function of the organism occurring upon alteration of homeostasis , predict direction of biochemical processes depending on the energetic status of the myocyte during the muscular contraction</p> <p>2- knows how to describe the basis of the physical effort in terms of aerobic vs anaerobic exercise and may indicate differences between various species in the functioning of nervous, muscular, respiratory and</p> </td> <td style="vertical-align: top;"> <p><b>Competences:</b> Student:</p> <p>1- is prepared for the evaluation and interpretation of the functioning organism during the physical exercise and knows how to counteract in case of excessive exercise</p> <p>2- is prepared to analyse physiological parameters defining intensity of training and its influence on a given sport discipline</p> <p>3- is prepared to perform critical self-evaluation, formulate constructive criticism regarding</p> </td> </tr> </table>	<p><b>Knowledge:</b> Student:</p> <p>1- knows and understands morphology of the animal organism ;cells, tissues, organs and systems structure, functions, regulatory mechanism and integration of the systems of the animal organism (muscular, nervous, cardiovascular, respiratory, gastrointestinal, urinary, reproductive)</p> <p>2- knows basic interspecies differences in the metabolic processes on the molecular, cellular, organ and organism level between humans, horses and dogs</p> <p>3- knows functional interactions between various tissues/organs</p>	<p><b>Skills:</b> Student:</p> <p>1- knows how to: describe changes in the function of the organism occurring upon alteration of homeostasis , predict direction of biochemical processes depending on the energetic status of the myocyte during the muscular contraction</p> <p>2- knows how to describe the basis of the physical effort in terms of aerobic vs anaerobic exercise and may indicate differences between various species in the functioning of nervous, muscular, respiratory and</p>	<p><b>Competences:</b> Student:</p> <p>1- is prepared for the evaluation and interpretation of the functioning organism during the physical exercise and knows how to counteract in case of excessive exercise</p> <p>2- is prepared to analyse physiological parameters defining intensity of training and its influence on a given sport discipline</p> <p>3- is prepared to perform critical self-evaluation, formulate constructive criticism regarding</p>
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	<p>4- knows methods of the evaluation of the physiological parameters during the resting state and during the endurance training like: water management and acid-base balance, whole body efficiency in aerobic and anaerobic training,, kidney function and intermediate metabolism</p> <p>5-knows the mechanisms of adaptation to the physical exercise maintaining the homeostasis (thermoregulation, water balance, metabolism, energy consumption)</p> <p>6- knows age-related adaptations to the physical exercise.</p> <p><b>7 –knows the laws governing intellectual property</b></p>	<p>cardiovascular systems , also in aspect of the length and intensity of exercise. (temperature, pressure,</p> <p>3- knows how all above mentioned tissues and organs may interact between each other and what are the consequences for the entire organism</p> <p>4- knows which external factors may affect the physiological status and body condition of the exercising individual as well as his mental health</p> <p>5- knows how to set up the training program taking into the consideration :species, age, gender, degree of training and individual predispositions of an organism</p>	<p>physical exercise and methods of training</p> <p>4-is prepared to constantly update knowledge and skills for professional development , especially what concerns new methods of training</p> <p>5-is prepared to collaborate with with specialists of other professions to exchange ideas and experience</p> <p>6- is prepared to monitor all dangers caused by a very intensive exercise</p>														
Assessment methods:	<p>Assessment methods in teaching are verified by a final single choice test . It consists of 40 questions and covers all presented material. Each questions has 4 different answers and only one is correct . Student may obtain either 0 or 1 point. In case, student failed or was not present during the test (excused absence) he may pass retake in a time defined by the coordinator. In individual cases due to health problems oral test can be offered. In principle, lectures are not obligatory, but from time to time the list of participants can be checked. Being on such a list may affect (increase) the final note. These lists will be stored in the course portfolio. No extra assessment methods are anticipated.</p> <p>In case of unforeseen, unusual circumstances mandatory remote teaching and remote assessment methods might be adopted.</p>																
Formal documentation of learning outcomes:	<p>eHMS entry. Each completed test has to be signed by the student and later after evaluation it is considered as an important documentary.</p> <p>Records collected in the course portfolio i.e. individual records of student results, presence lists, database of oral and written questions, written assessments of the students.</p>																
Elements impelling final grade:	<p>Final evaluation is based on the test results. Number of points is crucial for the final grade.. In addition to that activity during the lecture, questions addressed to the speaker, sharing own knowledge with others are also taken into the consideration For such an activity student may obtain additional 3 points but first he has to pass the test. Each student has to receive at least 52-100% of the final test.</p> <p><b>Points scale used in the final test of the Physiology of exercise :</b></p> <table border="1"> <thead> <tr> <th>Points number:</th> <th>Grade:</th> </tr> </thead> <tbody> <tr> <td>0 – 19,5</td> <td>2.0 (not satisfactory)</td> </tr> <tr> <td><b>20,0</b> – 23,0</td> <td>3.0 (satisfactory)</td> </tr> <tr> <td>23,5 – 27,0</td> <td>3.5 (satisfactory plus)</td> </tr> <tr> <td>27,5 - 31,0</td> <td>4.0 (good)</td> </tr> <tr> <td>31,5 - 35,0</td> <td>4.5 (very good)</td> </tr> <tr> <td>35,5 - <b>40,0</b></td> <td>5.0 (excellent)</td> </tr> </tbody> </table>			Points number:	Grade:	0 – 19,5	2.0 (not satisfactory)	<b>20,0</b> – 23,0	3.0 (satisfactory)	23,5 – 27,0	3.5 (satisfactory plus)	27,5 - 31,0	4.0 (good)	31,5 - 35,0	4.5 (very good)	35,5 - <b>40,0</b>	5.0 (excellent)
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Teaching base:	Institute of Veterinary Medicine , Auditorium 3 or 7, bldg. 24																
<p>Mandatory and supportive materials :</p> <ol style="list-style-type: none"> <li>1. W.D. McArdle, F.I. Katch, V.L. Katch: Sports &amp; Exercise, Nutrition, A Wolter Kluwer Company, 1999</li> <li>2. R.J. Geor, P.A. Harris, M. Coenen: Equine Applied and Clinical Nutrition, Saunders Elsevier, 2013.</li> <li>3. M. C. Zink, J.B. van Dyke: Canine sports medicine and rehabilitation. Wiley-Blackwell, 2013.</li> </ol> <p>Relevant scientific publications, including those of the module coordinator.</p> <ol style="list-style-type: none"> <li>1. Scientific publications recommended by the coordinator concerning physiology of exercise</li> </ol>																	
<p>ANNOTATIONS</p> <p>These students who are very much interested in the physiology pf exercise are encouraged to participate in the scientific projects performed at our Institute of Veterinary Medicine.</p>																	

Quantitative summary of the module:

Estimated number of work hours per student (contact and self-study) essential to achieve presumed learning outcomes of the module - base for quantifying ECTS:	<b>50 h</b>
Total ECTS points, accumulated by students during contact learning:	<b>1 ECTS</b>

Learning outcomes of the module relative to the learning outcomes of the subject:

Outcome category	Learning outcomes:	Learning outcomes relative to the course outcomes	Impact on the course outcomes*)
Knowledge -1	1- knows and understands morphology of the animal organism ;cells, tissues, organs and systems structure, functions, regulatory mechanism and integration of the systems of the animal organism (muscular, nervous, cardiovascular, respiratory, gastrointestinal, urinary, reproductive)	A.W.1	2
		A.W.2, A.W.3, A.W.4 A.W.10	3

Knowledge -2	2- knows basic interspecies differences in the metabolic processes on the molecular, cellular, organ and organism level between humans, horses and dogs	A.W.2	3
Knowledge-3	3- knows functional interactions between various tissues/organs	A.W.2, A.W.4	2
Knowledge-4	4- knows methods of the evaluation of the physiological parameters during the resting state and during the endurance training like: water management and acid-base balance, whole body efficiency in aerobic and anaerobic training,, kidney function and intermediate metabolism	B.W.4,B.W.6	1
Knowledge-5	5-knows the mechanisms of adaptation to the physical exercise maintaining the homeostasis (thermoregulation, water balance, metabolism, energy consumption)	A.W.4, A.W.5, A.W.11	2
Knowledge-6	6- knows age-related adaptations to the physical exercise.	A.W.9	1
Knowledge—7	7—knows the laws governing intellectual property	A.U.23	1
Skills-1	1- knows how to: describe changes in the function of the organism occurring upon alteration of homeostasis , predict direction of biochemical processes depending on the energetic status of the myocyte during the muscular contraction	A.U.5, A.U.8	2
Skills-2	2- knows how to describe the basis of the physical effort in terms of aerobic vs anaerobic exercise and may indicate differences between various species in the functioning of nervous, muscular, respiratory and cardiovascular systems , also in aspect of the length and intensity of exercise.	A.U.4, A.U.5, AU.7	1
Skills-3	3- knows how all above mentioned tissues and organs may interact between each other and what are the consequences for the entire organism	A.U.7, A.U.8	2
Skills-4	4- knows which external factors may affect the physiological status and body condition of the exercising individual as well as his mental health	AU.1, A.U.4, A.U.5	2.
Skills-5	5- knows how to set up the training program taking into the consideration :species, age, gender, degree of training and individual predispositions of an organism	A.U.1, A.U.4, A.U.5, A.U.6, A.U.7	2
Competences-1	1- is prepared for the evaluation and interpretation of the functioning organism during the physical exercise and knows how to counteract in case of excessive exercise	KS.1, KS.4, KS.5, KS.6, KS.7	2
Competences-2	2- is prepared to analyse physiological parameters defining intensity of training and its influence on a given sport discipline	KS.1, KS.4	2
Competences-3	3- is prepared to perform critical self-evaluation, formulate constructive criticism regarding physical exercise and methods of training	KS.5	2
Competences-4	4-is prepared to constantly update knowledge and skills for professional development , especially what concerns new methods of training	KS.4, KS.5, KS.7. KS.8, KS.9	3
Competences-5	5-is prepared to collaborate with specialists of other professions to exchange ideas and experience	KS.3, KS.4, KS.7, KS.9	1
Competences-6	6- is prepared to monitor all dangers caused by a very intensive exercise	KS.1, KS.4, KS.5, KS.6, KS.7, KS.8, KS.9	2