

**Building Capacity  
of Serbian Agricultural  
Education  
to Link with Society**



Tempus

**Izgradnja kapaciteta  
srpskog obrazovanja  
u oblasti poljoprivrede  
radi povezivanja sa društvom**

**Coordinator:  
University of Belgrade  
Faculty of Agriculture**

**Koordinator:  
Univerzitet u Beogradu  
Poljoprivredni fakultet**

## COURSE REGISTRATION FORM

<b>Teacher</b>	Vesna Davidović
<b>University</b>	University of Belgrade, Faculty of Agriculture
<b>Course</b>	Physiology of digestion and reabsorption in mono- and polygastric animals
<b>Target</b>	Agricultural Middle Schools
<b>Type</b>	classic
<b>Duration</b>	1 day - 8 hours

<b>Description</b>	<p>Digestive tract in some species of domestic animals differs by its structure and function. In monogastric animals an enzymatic digestion influenced by ferments produced by digestive tract cells is carried out. In polygastric animals (ruminants) food is digested mainly under the influence of microflora and microfauna enzymes, which are constantly present in digestive tract. Besides the differences in the structure and mode of food decomposition, for all animals is common that ingested nutrients (proteins, fats and carbohydrates) breaks down into its simplest components, and then followed by their smoothly resorption through the intestinal epithelium into the blood or lymph. Water, minerals and vitamins are not subject to the process of change in the digestive tract, but they have been reabsorbed and used in unchanged form. After resorption, all of this substances the organism uses to synthesize its own ingredients and as a source of energy.</p> <p>The purpose of the course is to provide teachers gaining of the new and innovation of the previous knowledge from basic studies by introduction of new concepts in the area of overall activity and functional organization of the digestive tract of domestic animals, neuroendocrine cells in the mucosa of the gastrointestinal tract (DNES-a), synthesis and reabsorption of nutrients, functions of macro and microelements and balance of vitamins in the diet of farm animals.</p> <p>Furthermore, the course should enable the teachers to master specific practical skills in the field of knowledge and evaluation the effects of digestive tract enzymes on nutrients digestion, as well the application and addition of adequate levels of minerals and vitamins in food for animals.</p>
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<b>Contents</b>	Theme of the course is the physiology of digestion and reabsorption in mono- and polygastric animals
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<b>Objectives</b>	<ol style="list-style-type: none"> <li>1. To enable teachers attainment the new and innovation of previous knowledge from basic studies by introduction to new concepts in the field of activities and the overall functioning of the organization and neurohormonal regulation of the digestive tract of domestic animals, the roles and functions of the diffuse neuroendocrine system (gastrin, secretin, cholecystokinin, VIP, GIP, somatostatin, glucagon, motilin, neurotensin, substance P), synthesis and</li> </ol>
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resorption of nutrients, use of mineral substances (macro- and trace elements) and vitamins in the diet in order to maintain health and improve the productive and reproductive characteristics.

2. To allow teachers to master the specific practical skills in the field of knowing and evaluation the enzymes of the digestive tract effects on nutrients digestion, as well the application and addition of adequate levels of minerals and vitamins in food for animals.

### Activities

1. Course participants receive introductory instruction from the teacher and get to know about the theme and objectives of the course.
2. They complete the questionnaire to check their previous knowledge of nutrients' digestion and resorption processes.
3. Participants listen the introductory lecture of the teacher complemented by the power point presentation on the structural and functional characteristics of the digestive system in mono- and polygastric animals. In this way, they restore previous knowledge acquired at the basic studies.
4. Participants listen the lecture of the teacher complemented by the power point presentation on the new concepts in the area of overall activity and functional organization of domestic animals' digestive tract, neuroendocrine cells in the mucosa of the gastrointestinal tract (DNES), synthesis and resorption of nutrients, the function of the macro- and microelements and the balance of vitamins in animal nutrition. They relate and apply the new information to existing experience and knowledge of the physiology of the digestive system.
5. After the teacher expose some segments of the lectures, participants can request information and explanations for what is unclear and they can share their experience and knowledge of that theme.
6. After completion of the theoretical part, the teacher divides participants into the groups and each group gets the task to prove the effect of the digestive tract enzymes (pepsin, lab enzyme, trypsin, amylase, saccharose) on digestion of nutrients (amylum and protein) in the laboratory conditions.
7. Participants from the previously formed groups have an additional task to assess the type of deficit based on the image of an animal with certain vitamin or mineral deficiency, and to determine appropriate levels of these substances which should be added to the food.
8. Participants define the problem, plan a solution, record the results and tell them to the colleagues, they conduct an argumentative dialogue, and they make decision.
9. At the end of the course, participants fill in a test to check the progress of the course.

### Materials

Laboratory equipment (tubes, racks of test tubes, burners), water bath, Feling I

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and Feling II solutions, 1% and 5% amyllum solution, Lugol solution, lab enzyme, milk, extract of gastric and intestinal mucosa, pancreatic extract, 0.3% HCl, 1% Na<sub>2</sub>CO<sub>3</sub>, 5% NaOH, 0.25% CuSO<sub>4</sub>, coagulated egg white, 1% saccharose, paper, pens.

Pictures of the animals with deficiency of certain vitamins or minerals.

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