THE SYSTEM OF STUDY AND PRACTICAL TRAINING REALISED IN FACULTY OF BIOTECHNOLOGY AND FOOD SCIENCES IN SAU OF NITRA (ACCORDANCE WITH BOLOGNA DECLARATION)

A. Michalcová, H. Frančáková, J. Golian

Abstract: *The Faculty of Biotechnology and Food Sciences of SAU in Nitra provides a three-level accredited education in bachelor, magisterial and PhD study programmes in accordance with Bologna Declaration. The Faculty offers follow study programmes: bachelor's degree (3-year study) - Agro Food Processing, Applied Biology, Biotechnologies; master's degree (2-year study) - Food Technology with specializations Food of Plant Origin and Food of Animal Origin, Applied Biology, Biotechnologies, Physiology of Animals and postdoctoral programs - Food Technology and Biotechnologies. The Faculty realizes flexible system of study with credits evaluation according with ECTS rules.*
Key words: *three-level accredited education, flexible system of study, credits evaluation, ECTS*

INTRODUCTION

The principle of the Bologna Process is a co-operation between nation states that each decide on its higher education policy. The objectives of the Bologna Process are described by ten action lines [1] on the road towards the achievement of a European Higher Education Area. The goals defined in the Bologna Process include the adoption of a comparable degree system with two main cycles, aimed at facilitating movement between countries and establishment of a system of credits as a proper means of promoting the most widespread student mobility. This is a condition for achieving the goal of increased mobility for students and academic and administrative staff in higher education. The promotion of quality assurance and increased inter-institutional cooperation is also an objective of the Bologna Process [2].

The Prague Communiqué in 2001 set out directions and priorities for the next stages of the Bologna Process. The Prague Communiqué defined following actions lines: lifelong learning, higher education institutions and students and promoting the attractiveness of the European Higher Education Area.

The Berlin Communiqué in 2003 defined doctoral studies and synergy between the European Higher Education Area and the European Research Area [3].

IMPLEMENTATION OF THE BOLOGNA PRINCIPLES IN THE SYSTEM OF STUDY IN FACULTY OF BIOTECHNOLOGY AND FOOD SCIENCES IN SAU OF NITRA

The Slovak Agricultural University is the only university of its kind in Slovakia. It has acquired a unique, national status. The Faculty of Biotechnology and Food Sciences, as a one of the six faculties, was established in 2002 and launched its activities on the 1-st January 2003. Its aim is to offer such education, research and advisory services which would create conditions for the development of agriculture, food production and processing and biotechnology. The Faculty is dedicated to the objective of educating experts oriented to knowing, understanding and managing with biological, technological and economic sciences specializing in modern processes of food production, evaluation and processing and specific products of biotechnologies. The main goal is to achieve the biological and technological integrity of the "agricultural product - food "system.

1. The system of study based on three cycles

The Faculty provides a three-level accredited education leading to the degrees

of Bachelor of Science (Bc.), Master of Science (MSc.) and Doctor of Philosophy (PhD.). The Faculty offers follow study programmes: bachelor's degree (3-year study) - Agro Food Processing, Applied Biology, Biotechnologies; master's degree (2-year study) - Food Technology with specializations Food of Plant Origin and Food of Animal Origin, Applied Biology, Biotechnologies, Physiology of Animals and postdoctoral programs(3-year study) - Food Technology and Biotechnologies.

Standard length for pursuing bachelor study programs as the study programs of the first level is three years. The admission to the bachelor study is conditional on completing secondary school-living examination and passes the admission exams. According to recommendations of the Bologna Declaration the bachelor study programs are aimed to acquisition of theoretical knowledge and practical knowledge based on the present state of science and on their use at the pursuit of the occupation as well as at continuing in the follow-up master study. The stress is laid on such a design of the curricula that would enable graduates of the bachelor study to find placement in both the Slovak and foreign labour market and their qualification would be sufficient for pursuit of the given occupation.

Standard length for pursuing master study programs as the study programs of the second level is two years. The admission to the master study is conditional on completing the bachelor study.

The length for pursuing PhD study programs is three years. PhD study programs are conditional on completing the higher education study of the second level and pass admission exams. The study based on PhD study program is ongoing according to individual study plan under supervision of a tutor and it consists of a study part and scientific part.

Faculty try to make study more attractive for students and implement to study programs the latest knowledge of science. Besides that, we prepare new bachelor study program reflecting requirements of present market and which allow students easily find placement in labour market. The new accredited study program – Safety and Control of Foods – permits students to obtain knowledge of proposition of general hygienic demand on conditions that have to fulfilled food enterprises, storage facilities and retailers, basic legislative requirements in accordance with valid alimentary legislation of SR and EC, standards of qualities and security foods, epidemiology and prevention alimentary affection and allergy from food and principles good manufacturing and good agricultural practice.

2. Establishment of a system of credits (ECTS)

The Faculty realizes flexible system of study with credits evaluation according with ECTS rules. At creation of study programs appears necessity to define each educational activity, included in programs, as a single (independent) unit with a goal, content, used forms of educations and method of evaluation. Because of an effective work at creation of study program oneself show applicable, that all the subjects were taught only one semester. Credit values of subjects were carried out under quantity of student work and no under the position of subjects from the view of study focus. Subjects, which teaching is realised by other faculties, have those credit values as belong them in the Faculty of Biotechnology and Food Sciences (FBFS). Flexibility of content formation study program from the view of expectation educational ascent and carrying-capacity student must firstly make allowance for assigned credits of individual subjects.

Implementation of ECTS required a lot of work in individual subjects, but makes educational process more transparent from the point of content and used

educational forms, discover overlap of subject contents and reveal topicality content of subjects. Therefore, it is very important to joint teachers to preparation of credit system.

Other very important step was assigning a credit value to the other duties in study plans besides teaching subjects, e.g. practice, bachelor work and master thesis.

Student of bachelor's degree has to receive 164 credits for compulsory theoretical and special subjects and optional subjects and 6 credits for practice and 10 credits for final bachelor's work.

On master's degree student has to receive 90 credits for compulsory theoretical and special subjects and optional subjects and 10 credits for practice and 20 credits for final master's thesis.

PhD student has to receive 60 ECTS for the study part of study program, which consists first of all from lectures, seminars and individual study of professional literature. He/she has to receive other 60 ECTS for the scientific part consists of individual research project of the student. This part of studying full-time form also includes performing pedagogical activity. The completion of PhD study consists of completing dissertation examination and the defence of a dissertation (tab.1).

Table 1: Structure of credits on study programs in FBFS

<table>
<tr><th colspan="2">BACHELOR´S DEGREE</th><th colspan="2">MASTER´S DEGREE</th><th colspan="2">DOCTOR of PHILOSOPHY</th></tr>
<tr><th>subjects</th><th>ECTS</th><th>subjects</th><th>ECTS</th><th>subjects</th><th>ECTS</th></tr>
<tr><td>compulsory theoretical and special</td><td rowspan="2">164</td><td>compulsory theoretical and special</td><td rowspan="2">90</td><td rowspan="2">study part (compulsory theoretical and special subjects)</td><td rowspan="2">60</td></tr>
<tr><td>optional</td><td>optional</td></tr>
<tr><td>practice</td><td>6</td><td>practice</td><td>10</td><td rowspan="2">scientific part (publications, pedag.activity, dissertation, etc.)</td><td rowspan="2">60</td></tr>
<tr><td>bachelor work</td><td>10</td><td>master thesis</td><td>20</td></tr>
<tr><td>Total credits</td><td>180</td><td>Total credits</td><td>120</td><td>Total credits</td><td>120</td></tr>
</table>

Practice of students posses unsubstitutable place in profiling graduates of bachelor and magister study. Practice is aimed to acqusition of practical knowledge, required habit and technological skilfulness from production and occupational procedures and methods, which create a part of study program. Students of bachelor study have to complete four weeks and students of master study six weeks of practice. Practice is realised after summer examination session during summer holiday of students. Students find the placement by themselves or in co-operation with teacher responsible for practice. Students may to take in practice in foreign organisations within the frame of exchange programmes (Socrates, Leonardo, etc.). Students have to write report from practice. They received credit signed by teacher responsible for practice on the base of this report.

Tables 2 - 4 show an example of structure of subjects and credits in bachelor study program - Agro Food Processing and follow-up master program - Food Technology - specialization Foods of Plant Origin (PR). At creation particular educational program is very important consistently differentiate for which level are

particular subjects assigned.

According to the Bologna Declaration and the Act of Higher Education of Slovak Republic graduates of FBFS have to receive the Diploma Supplement compulsorily along with the diploma. The Diploma Supplement contains list of subjects passed by student in study program and the evaluation of exam.

FBFS prepare together with Wageningen University an international interdisciplinary double-diploma master study program followed up bachelor study program – Safety and Control of Foods taught in English.

Table 2: Obligatory subjects for Agro Food Processing study program

Obligatory Subjects	**Semester / credits**					
	1	**2**	**3**	**4**	**5**	**6**
Zoology	4					
Inorganic Chemistry	6					
Biophysics and Physical Properties of Foods	6					
Information and Commutation Technologies	6					
Mathematics		6				
Organic Chemistry		6				
Botany		6				
Morphology of Vertebrates		6				
Protection of animals and food production		4				
Genetics			6			
Biochemistry			6			
Plant Physiology			6			
Management of Nutrients in Agro ecosystem			6			
Microbiology				6		
Integrated Crop Production				6		
Integrated Livestock				6		
Physiology of Animals				6		
Theory and Methodology of Final Wright Paper				2		
Storage of Plant Products					4	
Evaluation of Animal Raw Material and Foods					6	
Labelling and Food Packaging					6	
Management of Food Quality					4	
Evaluation of Plant Raw Materials and Foods						6
Food Hygiene						6
Analytic Chemistry						6
Bioactive Components of Foods						4
Final Bachelor Work (Theses)					5	5
Total obligatory credits	22	28	24	26	25	27
Practice		3		3		
Total obligatory elective and optional credits	5	2	6	1	5	3
Total credits per semester:	**30**	**30**	**30**	**30**	**30**	**30**

Table 3: Compulsory optional subjects for Agro Food Processing study program

Subjects	Semester / credits					
	1	**2**	**3**	**4**	**5**	**6**
Chemistry Seminar	1					
General Food Hygiene			4			
Biochemistry of Nutrition					4	
Molecular Biology					4	
Sanitation in Food Industry					4	
Diseases and Pests of Stored Products					4	
Rudiments of Biological Security						4
Sensory Analysis of Agricultural Products						4
Total credits	**1**		**4**		**16**	**8**

Table 4: Obligatory subjects for Food Technology - specialization: Foods of Plant Origin (PR)

Obligatory Subjects	Semester / credits			
	7	**8**	**9**	**10**
Food Chemistry	6			
Food Conservation	6			
Cereal Technologies	6			
Food Microbiology		6		
Food Safety		6		
Food Equipment I.		6		
Technology of Gardening Products		6		
Processing Tech. of Root-crops and Special Crops			6	
Malting and Brewers´ Trade			4	
Marketing			6	
Control and Legislation of Foods			4	
Final Work (Theses)				20
Total obligatory credits	18	24	20	20
Practice				10
Total obligatory elective and optional credits	12	6	10	

Table 5: Compulsory optional subjects for Food Technology - specialization: Foods of Plant Origin (PR)

Compulsory Optional Subjects	Semester / credits			
	7	8	9	10
Biochemical Methods	4			
Sophistication and Authentication of Foods	4			
Technology of Meat I. (Slaughtering)	6			
Buildings for Food Industry	4			
Technology of Soft Drinks	4			
Physiology of Nutrition	4			
Environmental Chemistry		4		
Medical Herbs and its Utilization		4		
Enzymatic Engineering		4		
Biochemical Technologies		6		
Hygiene of Nutrition and Public Catering		6		
Technology of Meat II. (Processing)		6		
Technology of Milk I. (Chemistry)		6		
Technology of Sheep and Goat Milk			6	
Food borne Diseases			4	
Hazardous Substances in Food Chain			4	
Cheese Making			6	
Bioengineering			6	
Milling and Bakering Workshop			3	
Microbiology of Milk and Milk Products			6	
Technology of Milk II. (Processing)			6	
European Union			3	
Water chemistry			4	
Food Equipment II.			6	

3. Mobility of students

Students may to take in a part of study in foreign Universities within the frame of exchange programmes (Socrates, Leonardo, CEEPUS, etc.). The student consults the application with a faculty coordinator and a vice-dean for education, a PhD. student also with a tutor. The planned extent of study should be of the same number of credits as awarded for a particular period of study at the faculty (30 credits per semester). The student is selected by a commission during a selection procedure (if mobility is carried out through a selection procedure). The commission assesses the above mentioned documents and the student's preconditions for a successful mobility. The mobility is approved by the dean. Upon the return, the student will submit the Transcript of Records to the Dean's office. The dean automatically recognizes the subjects and credits awarded in accordance with the agreement. Credits are counted in the year in which the mobility was carried out.

4. Quality assurance

System of quality assurance is based on internal quality assessment and external evaluation and accreditation. Within the framework of the internal quality assessment the scientific board of FBFS assess regularly once a year.

External evaluation is carried out by the Accreditation Commission. Accreditation Commission gives opinions on ability of faculty to carry out the academic degree to its graduates, on ability of faculty to carry out habilitation

procedure and procedure for nomination of professors. Regular complex accreditation of the faculty carries out in six-year interval.

CONCLUSIONS

The implementation of principles of the Bologna Declaration is one of the key elements of the extensive and deep reform of higher education. The implementation shall bring to the education its international dimension which will mean in the future an increase mobility of students and teachers in foreign higher education institutions, recognition of results of study or a period of the study completed in a foreign institution.

Because, one from a fundamental aim application ECTS is create conditions for mobility of students, it is necessary introduce ECTS on all university. Application of ECTS requires development of an infrastructure requisite for an effective function. The key element is an information system of the university containing relevant information about the educational system. It supposes unified study regulations (rules) and compatibility of conceptions creation of study programs of faculties.

REFERENCES

[1]. Nyborg, P. 2004. Principles and Objectives of the Bologna Process. <www.bologna-bergen2005.no>

[2]. Bologna Action Lines. 2005. <www.bologna-bergen2005.no>

[3]. The Bologna Process - Towards the European Higher Education Area (January 2004). 2004 <www.bologna-bergen2005.no>

ABOUT THE AUTHORS

A. Michalcová, Slovak Agricultural University in Nitra, Tr. A. Hlinku 2, 949 76 Nitra, Slovak Republic, E-mail: Anna.Michalcova@uniag.sk

H. Frančaková, Slovak Agricultural University in Nitra, Tr. A. Hlinku 2, 949 76 Nitra, Slovak Republic, E-mail: Helena.Francakova@uniag.sk

J. Golina, Slovak Agricultural University in Nitra, Tr. A. Hlinku 2, 949 76 Nitra, Slovak Republic, E-mail: Jozef.Golian.AF@uniag.sk