



**Summer School in Aquaculture  
5 - 12 July 2020, Sarajevo  
(Education students of veterinary medicine from fish farming and  
Measures of control and prevention of fish diseases)**

**Background**

Aquaculture (production of aquatic plants and animals under controlled conditions) provides a significant share of total global needs of fish and shellfish with constant increase production on land, combined with the stagnation or reduction in the catch of fish from natural conditions. Global trends, production operations that accompany most freshwater fish species in aquaculture are vertical integration, increase production capacity and high population density with established feeding regimes to optimize growth. This intensive growth conditions aquaculture production, affected the development of the discipline that follow, first of all, health and economic aspects of production.

Occurrences of fish diseases have significant impact on the health and economic benefits of fish farming. The important factor which causing the emergence and spreading fish diseases, high levels of fish mortality, economic losses and the risk for the infecting other fish is non-implementation of prophylactic measures (one is bathing and treatment with preparations) which neutralize pathogens and reduce the occurrence of fish diseases. Also, stress can increase susceptibility to other diseases and manifested in significant losses in terms of mortality, which is reflected in the actual production.

Mortality occurs in all stages of breeding, but the highest is in the fry until 6-8 months of life and ranges from 20-65 %.

The application of preventive measures on farms and health control (monitoring and surveillance) of the fish, especially in full system farms, is essential part of good manufacturing practices, with a goal to reduced present fish pathogens in to a minimum.

**Goal of education**

The goals of education is to acquire of new knowledge and skills of students of veterinary medicine in the areas of fish farming management and the application of preventive measures on farms and control the health status of fish, dating from the most significant diseases of freshwater and marine fish, compared to the occurrence and spread of pathogens and farming technology, current EU legislation in the field of aquaculture and instruments (HACCP, SSOP, Instructions for preventive care and protection of fish) that enable recognition of a serious and successful producers.

Education includes theoretical and practical field work.

Education of students will contribute to their better competence, using the effective measures to control and monitoring of the disease and the methods of collecting and sending samples to specialized laboratories on appropriate diagnostic analysis.

**Training program**

The aim of this program is to extend the level of standard education at veterinary faculties focusing on certain parts of aquaculture health management.

Veterinary faculty of the University of Sarajevo has necessary personnel, material and professional prerequisites to fulfill the objectives of the program. Department of Aquaculture with their laboratories has a long tradition in education and field work on health care of fish more than 60 years.

The field work will be carried out directly in a few fish farms on river Neretva and sea fish farms in Neum.

### **Theoretical and practical education**

Theoretical education will be carried out in facilities of Veterinary Faculty, and partly at field premises prior to the execution of practical work. Theoretical part of education is aimed to prepare students for execution of practical work.

It should provide fundamental knowledge about management and economics of fish farming, modern fish farming, overview of the most important fish diseases (viral, bacterial, parasitic, fungal, nutrition), fish diseases and farming technology, monitoring and surveillance of diseases, legislation in aquaculture.

Practical part of training will follow theoretical classes and will be focused on examination of fishes and basic diseases symptoms, sampling and sending materials to the laboratory analysis, storage of samples, laboratory diagnostic methods, control measures with therapy and prevention of fish diseases, HACCP, SSOP, instructions for preventive care and protection of fish, growing salmon fish for open waters stocking, Processing in slaughterhouse.

The teaching will be carried out by principal and associate lecturers in a group of 10-15 students maximum, allowing direct and individual work.

### **Fish farms and slaughterhouse included in the training**

1. Salmon fish farm „Eko Fish“, Grabovica
2. Salmon fish farm "Salmon", Salakovac
3. Salmon fish farm "Laks", Salakovac
4. Salmon fish farm "Blagaj", Blagaj
5. Slaughterhouse "Salakovac", Salakovac
6. Marine fish farm "Karaka", Neum
7. Marine fish farm „Ancora comerc“, Neum
8. Shellfish farm, Ston

### **Conclusion**

Participants of the Summer School in Aquaculture shall receive certificate of attending this specialized program.

### **Financial backing of the program**

To participants from veterinary universities/faculties of Ljubljana, Vienna, Budapest, Kosice, Brno, Wroclaw, Sarajevo, Beograd, Skopje and Tirana we can offer limited number of CEEPUS mobility's (accommodation, food & pocket money).

### **Optional - Trips**

Field trips to Old Town, Tunnel of Hope in Sarajevo, springhead of river Buna in Blagaj, Old Bridge in Mostar are anticipated.

### **Summer school organization**

Summer School will be carried out in English language by experienced teachers from the Veterinary Faculty of Sarajevo and Faculty of Veterinary Medicine, Zagreb, Croatia.

**Coordinator and Contact person:** Prof. Almedina Zuko, DVM, PhD, Veterinary Faculty in Sarajevo

#### **Responsible teachers:**

Prof. Adnan Jažić, DVM, PhD, Veterinary Faculty in Sarajevo

Prof. Almedina Zuko, DVM, PhD, Veterinary Faculty in Sarajevo

Prof. Lidija Kozačinski, DVM, PhD, Faculty of Veterinary Medicine, Zagreb

Prof. Alen Slavica, DVM, PhD, Faculty of Veterinary Medicine, Zagreb

**Duration of training:** 8 days (6 days of theoretical and practical field work)

**Venue:** Sarajevo, Neum, Ston, Blagaj  
**Number of students:** 12  
**Period of training:** 5-12 July of 2020.  
**Program**

**An overview of program**

Day/dan		Date/datum	Activities/aktivnost	Teachers/nastavnici	T (h)	P (h)
1	Sunday Nedelja	5 July 2020	Sarajevo ( <i>arrival /dolazak</i> ); <i>The acceptance by students and teachers</i> ; Prihvata od strane studenata i nastavnika			
2	Monday Ponedjeljak	6 July 2020	<i>Registration on VFS (8-9h); lectures on VFS (9-15); tour of Sarajevo</i> Registracija na VFS (8-9h); predavanja na VFS (9-15h); obilazak Sarajeva	prof.dr.sc. Almedina Zuko prof.dr.sc. Adnan Jažić	6	
3	Tuesday Utorak	7 July 2020 CROATIA	<i>Departure from Sarajevo to Pelješac, R Croatia; field exercises at shellfish, Ston</i> Odlazak iz Sarajeva za Pelješac, R Hrvatska; terenske vježbe na uzgajalištu školjkaša, Ston	prof.dr.sc. Adnan Jažić prof.dr.sc. Almedina Zuko prof.dr.sc. Lidija Kozačinski prof.dr.sc. Alen Slavica		6
4	Wednesday Srijeda	8 July 2020 CROATIA	<i>Field exercises at shellfish, Ston</i> Terenske vježbe na uzgajalištu školjkaša, Ston	prof.dr.sc. Adnan Jažić prof.dr.sc. Almedina Zuko prof.dr.sc. Lidija Kozačinski prof.dr.sc. Alen Slavica		6
5	Thursday Četvrtak	9 July 2020 CROATIA	<i>Field exercises at shellfish, Ston; field exercises on the marine farm: Karaka and Ancora, Neum; departure for Blagaj</i> Terenske vježbe na uzgajalištu školjkaša, Ston; terenske vježbe na ribogojilištu Karaka i Ancora, Neum; polazak za Blagaj	prof.dr.sc. Adnan Jažić prof.dr.sc. Almedina Zuko prof.dr.sc. Lidija Kozačinski prof.dr.sc. Alen Slavica	2	6
6	Friday Petak	10 July 2020	<i>Field exercises on the farm Blagaj, Blagaj and farm Salmon, Salakovac ;</i> Terenske vježbe na ribogojilištu Blagaj, Blagaj i ribogojilištu Salmon, Salakovac <i>optional (visit Tekija-Buna, Old Bridge - Mostar, Kravice waterfall)</i> opciono (posjeta Tekiji-Buna, Stari Most-Mostar, vodopad Kravice);	prof.dr.sc. Almedina Zuko prof.dr.sc. Adnan Jažić		6
7	Saturday Subota	11 July 2020	<i>Field exercises on the and farm Laks, Salakovac and farm Eko Fish, Grabovica; arrival in Sarajevo</i> Terenske vježbe na ribogojilištu Laks, Salakovac i ribogojilištu Eko Fish, Grabovica; dolazak u Sarajevo	prof.dr.sc. Lidija Kozačinski prof.dr.sc. Almedina Zuko prof.dr.sc. Adnan Jažić		6
8	Sunday Nedelja	12 July 2020	Sarajevo ( <i>departure /odlazak</i> )		2	6
					10	36

**T**-teoretska nastava /theoretical classes

**P**-praktična terenska nastava /practicalfield work

**Summer School in Aquaculture - 6 ECTS**

