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| **Al-Farabi Kazakh National University**  **Syllabus**  **(Code) Microbiological control of biotechnological production**  **7 semester 2019-2020 ed. year** | | | | | | | | | | | | |
| **Code of the discipline** | | **Name of the discipline** | **Type** | **Number of hours per week** | | | | | **Number of credits** | | | **ECTS** |
| **Lec** | **Pract** | | **Lab** | |
|  | | **Microbiological control of biotechnological production** | GC | 2 | 0 | | 1 | | 3 | | | 5 |
| **Lecturer** | | Shokatayeva Dina Habdulmanatovna | | | | **Office-hours** | | | | According to schedule | | |
| **e-mail** | | [dina\_ibrayeva\_91@mail.ru](mailto:dina_ibrayeva_91@mail.ru) | | | |
| **Телефоны** | | +7 702 715 81 11 | | | | **Auditory** | | | | 507 | | |
| **Academic presentation of the course** | | **The aim** of the discipline is to form a holistic view of the basic principles and methods of sanitary and hygienic assessment of food quality. As a result of education, the student will be able to:  - master the methods of sanitary-microbiological control of food products;  - characterize sanitary-indicative microorganisms as indicators of sanitary state;  - use the methods for sanitary-indicative microorganisms detection;  - conduct sanitary-microbiological control of food products in laboratories of biotechnological production. | | | | | | | | | | |
| **Prerequisites** | | Microbiology and virology, Biochemistry | | | | | | | | | | |
| **Informational resources** | | 1. Mudretsova-Viss K.A., Dedyukhina V.P. Microbiology, sanitation and hygiene. M: ID FORUM, 2008, p. 400.  2. Sboychakov V.B. Sanitary microbiology. M.: GEOTAR-Media, 2007, p. 192.  3. Rabinovich G.Yu., Sulman E.M. Sanitary-microbiological control of environmental objects and food products with the basics of microbiology: a textbook. Tver, 2005.  4. Bamforph,C.W. 2005. Food, Fermentation and Microorganisms. Blackwell Pubs.  5. Buchanan,R.L. and Whiting,R.C. 1994. Pathogen Modelling Program Version 4.0. Microbial Safety Research Unit. USDA ARS Eastern Regional Research Centre.  6. Harrigan,W.P. 1988. Laboratory Methods in Food Microorganism. 3rd. Ed. Academic Press. San Diego.  7. Jay,J.M. 2000. Modern Food Microbiology. CRC Press. London.  8. Lund,B.M., Parker,T.C. and Gould,G.W. 2000. The Microbiological Safety and Quality of Food. Vol 1 & 2.  9. Marianne,D., Miliotis dan Jefrey,W.B. 2003. International Handbook of foodborne pathogens. Marcell & Decker Inc.  10. Marriot,N.G. and Gravani,R.B. 2006. Principles of Food Sanitation. 5th Edition. Springer Publ.  11. Ray,B. 2001. Fundamental Food Microbiology. CRC Press. London.  12. Lelieveld,H.L.M., Mostert,M.A., Holah,J. and White,W. 2003. Hygiene in food processing. CRC Press, New York. | | | | | | | | | | |
| **Academic policy of the course in the context of university values** | | **Rules of academic behavior:**  Obligatory presence in the classroom, inadmissibility of being late. Mandatory compliance with the deadlines for the completion and delivery of assignments (SIW, final controls, laboratory, project works, examinations, etc.).  **Academic values:**  Academic honesty and integrity: independence at all tasks fulfillment; inadmissibility of plagiarism, forgery, the use of cribs, cheating at all stages of knowledge control, deception of the teacher and disrespectful attitude towards him. (Code of Honor of a student of KazNU)  Students with disabilities can receive advice on the electronic address dina\_ibrayeva\_91@mail.ru, phone +7 702 715 81 11 | | | | | | | | | | |
| **Evaluation and attestation policy** | | **Criterial evaluation:** evaluation of learning outcomes in relation to descriptors (checking the formation of competences on the final control and examinations).  **Summative estimation:** assessment of the completed tasks in laboratory classes - 30%, SIW - 21%, colloquium - 9%, examination - 40%.  The formula for calculating the final grade:  Your final score will be calculated using the formula  Final score on the discipline = FC1+FC2/2 \* 0,6 + 0,1 МТ + 0,3IC  Below are the minimum estimates in percentage terms:  95% - 100%: А 90% - 94%: А-  85% - 89%: В+ 80% - 84%: В 75% - 79%: В-  70% - 74%: С+ 65% - 69%: С 60% - 64%: С-  55% - 59%: D+ 50% - 54%: D- 0% -49%: F | | | | | | | | | | |
| **Calendar for the implementation of the training course content:** | | | | | | | | | | | | |
| **Week** | **Topic name** | | | | | | | **Number of hours** | | | **Максимальный балл** | | |
| **1** | L 1. Introduction to the course «Microbiological control of biotechnological production». Factors influencing microbial growth in foods (extrinsic and intrinsic). General overview to the methods of microbiologcal control | | | | | | | 2 | | | 2 | | |
| LW 1. Determination of microbiological, organoleptic and physico-chemical properties of raw milk | | | | | | | 1 | | | 10 | | |
| **2** | L 2. Indicator microorganisms. Nutrient media for the isolation and study of sanitary-indicative microorganisms | | | | | | | 2 | | | 2 | | |
| LW 2. Determination of microbiological, organoleptic and physico-chemical properties of raw milk | | | | | | | 1 | | | 10 | | |
| **3** | L 3 General principles underlying spoilage. Spoilage of different kinds of foods, cereals and cereal products – sugar and sugar products – vegetable and fruits – meat and meat products – fish and other sea foods – eggs and poultry | | | | | | | 2 | | | 2 | | |
| LW 3. Isolation of pure cultures of lactic acid bacteria. Preparation of fermented milk products. | | | | | | | 1 | | | 10 | | |
| SIW 1. Significance of microbiological control of food, pharmaceutical and cosmetics products | | | | | | |  | | | **20** | | |
| **4** | L4. Spoilage of dairy and fermentative products (ice cream/milk/bread/wine) | | | | | | | 2 | | | 2 | | |
| LW 4. Microbiology of cheeses | | | | | | | 1 | | | 10 | | |
| **5** | L 5. Food Poisoning: food borne infections (a) Bacterial: Staphylococcal, Brucella, Bacillus, Clostridium, Escherichia, Salmonella (b) Fungal : Mycotoxins including aflatoxins, (c) Viral: Hepatitis, (d) Protozoa – Amoebiasis | | | | | | | 2 | | | 2 | | |
| LW 5. Sanitary microbiological research of ice cream | | | | | | | 1 | | | 10 | | |
| **1 Final Control** | | | | | | |  | | | **20** | | |
| **1** | L 6. Food preservation: Principles of food preservation – methods of preservation. a. Physical (irradiation, drying, heat processing, chilling and freezing, high pressure and modification of atmosphere) | | | | | | | 2 | | | 2 | | |
| LW 6. Types of microbial spoilage of fruits and vegetables, characteristics of pathogens | | | | | | | 1 | | | 10 | | |
| **2** | L 7. Food preservation: Principles of food preservation – methods of preservation. b. Chemical (Sodium benzoate Class I & II). Antimicrobial preservatives and acid | | | | | | | 2 | | | 2 | | |
| LW 7. Microbiological examination of sauerkraut | | | | | | | 1 | | | 10 | | |
| **3** | L 8. Food Sanitation: Good manufacturing practices – HACCP, Personnel hygiene | | | | | | | 2 | | | 2 | | |
| LW 8. Sanitary and hygienic examination of flour | | | | | | | 1 | | | 10 | | |
| **SIW2. Requirements to the microorganisms producers** | | | | | | |  | | | **20** | | |
| **4** | L 9. Presentation of techniques and tools used in the identification (diagnosis) of microorganisms and their culture techniques | | | | | | | 2 | | | 2 | | |
| LW 9. Sanitary microbiological examination of flour | | | | | | | 1 | | | 10 | | |
| **5** | L 10. Sanitary and epidemiological control methods for treated sewage and drinking water | | | | | | | 2 | | | 2 | | |
| LW 10. Determination of the quantitative and qualitative composition of the dough microflora | | | | | | | 1 | | | 10 | | |
| **2 Final Control** | | | | | | |  | | | **20** | | |
| **1** | L. 11. Quality control of activated sludge (microorganisms) – in the process of aerobic wastewater treatment | | | | | | | 2 | | | 2 | | |
| LW 11. Determination of the quantitative and qualitative composition of the dough microflora | | | | | | | 1 | | | 10 | | |
| **2** | L 12. Quality control of sewage sludge in the process of their further processing and management | | | | | | | 2 | | | 2 | | |
| LW 12. Sanitary-hygienic analysis of bread | | | | | | | 1 | | | 10 | | |
| **3** | L 13. Methods of disinfection of waste and substrates posing a sanitary epidemiological threat to humans health and natural environment | | | | | | | 2 | | | 2 | | |
| LW 13. Sanitary-microbiological analysis of flour and bread | | | | | | | 1 | | | 10 | | |
| SIW 5. Control of Nonconforming Product | | | | | | |  | | | **20** | | |
| **4** | L 14. Microbiological quality control within the framework of the production of drugs | | | | | | | 2 | | | 2 | | |
| LW 14. Preparation of a Kombucha beverage by cultivation of an association of microorganisms | | | | | | | 1 | | | 10 | | |
| **5** | L 15. Quantitative Microbial Risk Assessment (QMRA) | | | | | | | 2 | | | 2 | | |
| LW 15. Microbiological analysis of beer | | | | | | | 1 | | | 10 | | |
| **2 Final Control** | | | | | | |  | | | **20** | | |
|  | **Exam** | | | | | | |  | | | **100** | | |
|  | **Total** | | | | | | |  | | | **100** | | |

Dean of the faculty Zayadan B.K.

Chairman of the Methodical Bureau Zhumabayeva B.A.

Head of the department Kistaubayeva A.S.

Lecturer Shokatayeva D.H.