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Laptev, Georgi Yu., Yildirim, Elena A., Ilina, Larisa A., Ponomareva, Ekaterina S., Kalitkina, Kseniya A., Turina, Darya G., Filippova, Valentina A., Dubrovin, Andrei V., Bashir, Khairullamin, Smetannikova, Tatyana and others (2023) ***[Effect of a probiotic strain administration in different feeding phases on α- and β-diversity and gene expression of the rumen microbiome in lactating cows] Влияние введения пробиотического штамма на разных этапах кормления на α- и β-разнообразие и экспрессию генов микробиомы рубца у лактирующих коров.*** **[Conference item]**

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ADOP 2023

Third International Conference on
Agriculture Digitalization and Organic Production

ADOP 2023

Conference Programme and Abstracts

June 5–7, 2023
St. Petersburg
Russia

СПб ФИЦ РАН

Springer

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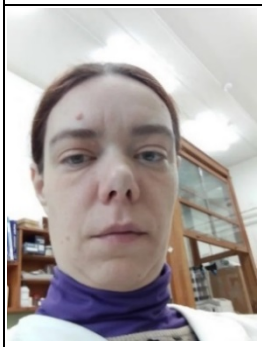
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Conference Programme

Monday, June 5, 2023	
09:00-10:00	**On-line Registration**
10:00-10:15	**Opening Ceremony (room 401)** https://us06web.zoom.us/j/87926743169?pwd=Y1RWWGtua1JtWEgyZEZob3ZUNlp4UT09 **Chair: Andrey Ronzhin**
10:15-12:15	**Plenary Session: (room 401)** https://us06web.zoom.us/j/87926743169?pwd=Y1RWWGtua1JtWEgyZEZob3ZUNlp4UT09 **Chair: Andrey Ronzhin**
	Keynote lecture 1: *Alexander Kostyaev.* Socio-Economic Problems of Digital Transformation of Rural Areas
	Keynote lecture 2: *Andrey Ivanov and Igor Savin.* Digital Technologies for Optimizing the use of the Resource Potential of Russian Lands in Agriculture
	Keynote lecture 3: *Sergey Pulnikov.* From Consumer to Investors – Digital Cooperation for the Mobilizational Economy of Russia
	Keynote lecture 4: *Elena Semenova.* Problems of Marketing of Organic Agricultural Products
12:15-12:30	**On-line Joint Photography of Conference Participants**
12:30-14:00	**Lunch break**
14:00-16:00	**Oral Session 1: Strategic and Regional Factors of Organic Production (room 401)** https://us06web.zoom.us/j/87926743169?pwd=Y1RWWGtua1JtWEgyZEZob3ZUNlp4UT09 **Chair: Galina Nikonova**
	Valentina Kundius and Noov Bayarsukh. Organic Agriculture as a Strategic Factor of a New Quality of Economic Growth
	Natalya Nikonova. Global Trends in the Production and Consumption of Organic Products
	Natalya Zaruk, Yuliya Romantseva, Maria Kagirova, Muzaffar Aramov, and Shukhrat Zhumaev. Analysis of the State and Location of Organic Crop Production in Australia
	Aleksey Nikonov. Improving the Competitive Strategies of Organic Agricultural Producers
	Galina Nikonova, Svetlana Timoshenko, and Habas Bekulov. About Staffing the Production of Organic Products in Russia
	Aleksandr Nesmyslenov. Methodological Approach to the Assessment of the Development Opportunities of Organic Plant Production – Regional Aspect
14:00-16:00	**Oral Session 2: Interdisciplinary Aspects of Organic Agriculture (room 406)** https://us06web.zoom.us/j/87926743169?pwd=Y1RWWGtua1JtWEgyZEZob3ZUNlp4UT09 **Chair: Evgenia Rakhimova**
	Magomed Chabaev, Zhenis Ramazanov, Roman Nekrasov, and Evgenia Tuaeva. Improving the Quality of Haylage as Part of the Strategy of Organic Production of Livestock Products
	Yan Li and Viktar Lemiasheuski. Review of Publications on the Study of Poultry Manure Problems in Environmental Pollution and Its Reuse
	Astghik Pepoyan, Vardan Tsaturyan, Vardges Manukyan, Ivan Egorov, and Larisa Ilina. Novel Probiotic Lactiplantibacillus Plantarum Str. ZPZ as a Possible Candidate for "One Health" Probiotic
	Georgiy Laptev, Valentina Filippova, Larisa Ilina, Elena Yildirim, Darya Turina, Elena Gorfunkel, Andrey Dubrovin, Veronika Melikidi, Kseniya Kalitkina, Irina Kluchnikova, Ekaterina Ponomareva, Dmitriy Gromov, and Jie Zhu. Influence of Glyphosate Herbicide on the Functional State of the Poultry Intestine Microbiome
	Jan Puhalsky, Svyatoslav Loskutov, Anton Savelyev, Jacob Shiffon, Gleb Postnikov, Polina Kaushan, and Mikhail Vinogradov. Prospects for the Use of

	Additives in the Form of Fly Ash and Coke Breeze in the Creation of Soil Mixtures for Growing Plants
	Ludmila Bakina, Marina Chugunova, Alexander Gerasimov, and Yulia Polyak. Efficiency Evaluation of the Rehabilitation of Oil-contaminated Agricultural Soddy-podzolic Soils
16:00-16:30	**Coffee break**
16:30-18:00	**Oral Session 3: Approaches to the Production of Organic Agricultural Products (room 401)** https://us06web.zoom.us/j/87926743169?pwd=Y1RWWGtua1JtWEgyZEZob3ZUNlp4UT09 **Chair: Vladimir Surovtsev**
	Georgiy Laptev, Darya Turina, Elena Yildirim, Larisa Ilina, Elena Gorfunkel, Valentina Filippova, Andrey Dubrovin, Veronika Melikidi, Natalya Novikova, Kseniya Kalitkina, Vitaliy Molotkov, Ekaterina Ponomareva, Dmitriy Gromov, and Michael Romanov. Analysis of Changes in Broiler Microbiome Biodiversity Parameters Due to Intake of Glyphosate and Probiotic Bacillus Sp. Gl-8 Using Next Generation Sequencing
	Konstantin Ostrenko, Natalia Nevkrytaya, Anastasia Ovcharova, Ivan Kutyin, and Kirill Koltsov. Effect of Essential Oils of Coriander and Fennel on the Nonspecific Resistance of Dairy Calves
	Nadezhda Bogolyubova, Roman Nekrasov, Aloyna Zelenchenkova, Roman Rykov, Nikita Kolesnik, Natalia Volkova, Anastasia Vetokh, and Julia Bogolyubova. Metabolic Processes Indicators in Chickens of Different Productivity Directions and Their Relationship with the Composition of Muscle Tissue
	Ivan Perov, Kiro Petrovski, and Esmaeil Ebrahimie. Differences in Milk Production Curves on Ten Dairy Farms with Automated and Conventional Milking System in South-East Australia
	Mehak Rai Sethi, Vandana Singh. Sowing the Seeds of Change: a Study of Technology and Plant Breeding in Indian Agriculture from Stakeholder Perspectives
16:30-18:00	**Oral Session 4: Opportunities, Limitations and Digital Aspects of Organic Production (room 406)** https://us06web.zoom.us/j/87926743169?pwd=Y1RWWGtua1JtWEgyZEZob3ZUNlp4UT09 **Chair: Abusupyan Dibirov**
	Khapsat Dibirova. Opportunities and Constraints for the Development of Organic Production in Small-scale Farms in the North-West of Russia
	Petr Akmarov, Olga Abramova, Olga Knyazeva and Ekaterina Alypova. Development of the Labor Potential of Agricultural Production on the Basis of Improving the Digital Competencies of the Rural Population
	Lyubov Vinnichek and Nadezhda Smelik. Research of Regional Shifts in the Provision of Information Technologies
	Georgiy Laptev, Elena Yildirim, Larisa Ilina, Ekaterina Ponomareva, Kseniya Kalitkina, Darya Turina, Valentina Filippova, Andrey Dubrovin, Khairullamin Bashir, Tatyana Smetannikova, Ivan Malakhov, Natalya Novikova, and Michael Romanov. Effect of a Probiotic Strain Administration in Different Feeding Phases on α- and β-diversity and Gene Expression of the Rumen Microbiome in Lactating Cows
	Sophya Popletaeva, Denis Erokhin, and Vitaly Dzhavakhiya. Comparison of the Protective Activity of Elicitor Proteins MF2 and MF3 Applied Individually or in Combination Against Tobacco Mosaic Virus on Tobacco Leaves
18:00-20:00	**Social event**

	**Petr Akmarov, Olga Abramova, Olga Knyazeva and Ekaterina Alypova,** Izhevsk State Agricultural Academy, Izhevsk, Russia. **Ольга Абрамова,** Government of the Udmurt Republic, Izhevsk, Russia. **Lecture Title:** Development of the Labor Potential of Agricultural Production on the Basis of Improving the Digital Competencies of the Rural Population. **Abstract:** The decrease in the number of rural residents is partly due to the technological transformation of agricultural production. Modern digital technologies significantly reduce the need for live labor, making new demands on its quality. Over the past decades, the number of workers in the agricultural production of our country has halved. The report discusses the activities, the implementation of which should become part of the state program for the development of rural areas, which will create a reliable basis for the formation of the labor potential of innovative agriculture.
	**Lyubov Vinnichek and Nadezhda Smelik,** St. Petersburg State Agrarian University, St. Petersburg, Russia. **Lecture Title:** Research of Regional Shifts in the Provision of Information Technologies. **Abstract:** Regional shifts in the provision of information infrastructure and information technologies in the North-Western and Volga Federal Districts, as well as in the Russian Federation, have been studied on the basis of Rosstat data and own calculations. The number of organizations in the Russian Federation and the subjects under consideration is decreasing over the period 2014-2021 due to the impact of sanctions and the pandemic. In these conditions, the provision of organizations with personal computers, the use of cloud services, access to broadband Internet is more stable and the use of local computer networks and server equipment by organizations is less stable. The use of applied management information technologies by organizations in the studied subjects is characterized by the stability and predominance of enterprise resource planning software and customer relations. The domain space of the Russian Federation is recovering faster after the pandemic than in the studied regions.
	**Georgiy Laptev, Darya Turina, Elena Yildirim, Larisa Ilina, Kseniya Kalitkina,** BIOTROF+ LTD, St. Petersburg State Agrarian University, Pushkin, St. Petersburg, Russia. **Valentina Filippova, Andrey Dubrovin, Natalya Novikova, Ekaterina Ponomareva,** BIOTROF LTD, Pushkin, St Petersburg, Russia. **Khairullamin Bashir, Tatyana Smetannikova, Ivan Malakhov,** St. Petersburg State Agrarian University, St. Petersburg, Russia. **Michael Romanov,** School of Biosciences, University of Kent, Canterbury, UK. **Lecture Title:** Effect of a Probiotic Strain Administration in Different Feeding Phases on α- and β-diversity and Gene Expression of the Rumen Microbiome in Lactating Cows. **Abstract:** In cows, there is a drastic metabolic stress caused by violations of the rumen microbiome composition during lactation. The aim of the present study was to investigate the α-and β-diversity of the rumen microbiome of lactating cows using next generation sequencing (NGS) and gene expression assessed by qPCR, as well as evaluation of the corrective properties of a probiotic strain introduced into the rumen. The results showed that the addition of the probiotic to the diet contributed to an effective increase in the fat content of milk during early lactation period ($P \leq 0.05$). The NGS-based analysis of the rumen microbiome of the studied cows using the 16S rRNA gene sequences showed that the Shannon and Chao1 indices of α-diversity of prokaryotic communities remained unchanged during various feeding phases, as well as due to the probiotic effects. In the early lactation period and under the

	probiotic's impact, the number of representatives of the Clostridia_UCG-014 and Clostridiaceae families declined by 2.4 and 1.6 times, respectively (in Group 2 as compared to Group 1, $P \leq 0.05$). Expression of the bacterial Ldh-L and ldhD genes was lower by 2.9 and 13.5 times, respectively ($P \leq 0.05$), when adding the probiotic to the diet in the early lactation period.
	**Sophya Popletaeva, Denis Erokhin, and Vitaly Dzhavakhiya,** All-Russian Research Institute of Phytopathology, Bolshie Vyazemy, Moscow regions, Russia. **Lecture Title:** Comparison of the Protective Activity of Elicitor Proteins MF2 and MF3 Applied Individually or in Combination Against Tobacco Mosaic Virus on Tobacco Leaves. **Abstract:** Proteins inducing plant resistance to diseases represent a promising base for plant protection in organic agriculture. We identified and studied two promising proteins, a cold shock protein from Bacillus thuringiensis (MF2) and a FKBP-type peptidyl prolyl cis/trans isomerase from Pseudomonas fluorescens (MF3). Structures of these proteins and their active centers responsible for their protecting activity are different suggesting they may have different targets in plant tissues and their combined action may improve the plant protection against various pathogens including plant viruses. To examine this hypothesis, the protective effect of MF2, MF3, and their combination against tobacco mosaic virus (TMV) was compared on detached tobacco leaves. Each of the proteins was applied on one leaf half, while the mix of equal volumes of MF2 and MF3 solutions was applied on the second half. The final concentration of each protein in the mix was twice lower than in individual solutions. The MF1+MF2 mix more efficiently reduced the number of TMV-induced leaf necroses than individual proteins taken at twice higher concentrations. This fact may evidence good prospects for the development of a hybrid protein or polypeptide based on MF2 and MF3 or their active centers as a basis for plant-defense-inducing preparations.
Oral Session 5: Robotics and Digital Technologies in Agriculture	
	**Viktor Smelik, Alexandr Perekopskiy and Anton Zakharov,** Federal Scientific Agroengineering Center VIM, St. Petersburg, Russia. **Lecture Title:** Prerequisites and Effectiveness of the Introduction of Precision Farming Elements in the Sowing of Grain Crops. **Abstract:** Effective farming is the basis of Russia's food security. At the present stage, the agricultural industry, and in particular crop production, is experiencing a constant shortage of qualified machine operators, high-performance equipment, there is no developed infrastructure, etc. The main direction of agricultural production in the North-Western region of the Russian Federation should be resource conservation and technological modernization, including through the use of "precision agriculture" (PA). It has been revealed that there are prerequisites for this: there are enterprises in the Leningrad Region where PA elements have been introduced. The analysis of the sowing campaign on a specific example of an enterprise for soil preparation and sowing of grain crops revealed factors affecting the productivity of aggregates and additional costs. The prerequisites for the introduction of PA elements in the sowing of grain crops were: large overlap on the aisles of the units, work on the incomplete width of the guns, curved movement of the units across the field, incorrect rotation scheme of the unit with manual control. Fuel overspending on soil preparation and sowing of grain crops in monetary terms amounts to 513632 rubles with manual control of the units, and with an automatic control system of 2.5 cm and an RTK station will amount to 20496 rubles.