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CLUB FUNGI IS OBJECT OF BIOTECHNOLOGY

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In present work questions of the club fungi (Basidiomycetes) biotechnological potential are viewing. Its can be used as source in food and pharmaceutical industry. Many fungi have medicinal properties. Preventive and medicinal club fungi remedies promote to human adaptation to adverse conditions and raise, on the one hand, organism resistance, show tonic action, and, on the other hand, hasten the raising of radioactive nuclides, heavy metals, various toxins out of organism. Medicinal – sanitations preparations on basis of edible fungus have no unwanted side effects and poisonous action.

Collection of herbariums and analysis of mycological material were realized in forest ecosystems of the Kirov region in 2006. During the expeditionary researches 230 types of fungi were discovered, most of them has valuable biotechnological properties. The Kirov region disposes of vast fungi resources, they have huge valuable, and so continuation of the works of forest mycobiota detail inventory and gene bank organization to preserve wild types of club fungi biovariety is necessary. It allow to develop and introduce the technologies of industrial growth of fungi which have food and medicinal function.

Deep method of club fungi growth is one of the available directions in fungi biotechnology.

Deep method allows to organization fully control conditions of fungi culture growth.

Comparatively low speed of mycelium growth is one of the problems of deep method. It demands high sterility and energy consumption. Author offer to use bacteria metabolites which are the club fungi symbionts to improvement of deep method. Symbionts of club fungi can hasten club fungi mycelium growth in present method of growth. Biotechnological approaches of club fungi growth are advancing. It is possible to organize industrial branch which deals with ecologically safety vegetative biomass production.

ECONOMIC EFFICIENCY USING OF PROBIOTICS AS A BIOLOGICALLY ACTIVE SUBSTANCE FOR PRODUCTIVE ANIMALS

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It has been established positive influence of probiotic preparations on metabolism, increasing of alive weight, parameters of sickness rate and probability of survival on young cattle age up to 4 - month in farm Kirov ЛОС ВНИИКормов.

Levels and durations sickness rate of dyspepsia have been decreased and probability of survival of young cattle has been increased at inclusion lactoamilovorin and streptobifid-forte probiotics in calf's rations accordingly on 3,8 % and 3,58 % as compared with control.

Increasing of alive weight of 1 head and average daily increasing of young cattle in both cases was higher in development groups on 7,21 % (+lactoamilovorin), and on 5,17 % (+streptobifid) relatively control on average for all development period.

Economic effect using of probiotic preparations at growing calfs on the basis of 1 head has made from lactoamilovorin - 279,76 roubles, from streptobifid - 157,22 roubles (prices of 2005year).

Recommendations: at growing calfs to use probiotics: lactoamilovorin on 1,0 gramm on 1 head per day (up to 4-monthly age), streptobifid - forte - on 1 doze on 1 head per day 10-day's cycles with breaks for 10 days (up to 2 - monthly age).

HARDWARE - TECHNOLOGICAL COMPLEX AND INTENSIVE TECHNOLOGY OF AN OPERATING TIME OF PURE CULTURE ALCOHOL YEAST

Supervisor of the project - *Emelijanov Victor Mikhailovich - the dean of chair of food technologies, director of chair of chemical cybernetics, d.m.h., professor, honored worker of science of the Russian Federation, laureate of State premium of the Russian Federation in the field of science and engineering.*

Fundamentally new approach to the problem of growing pure culture of alcohol yeast, consisting in increasing biomass of alcohol yeast with high density and high fermentative activity in aerobic conditions on a sterile nutrient medium in intensive mass exchange reactors is offered.

Scientific and technical advantages offered aerobic technology nofailure operating time of pure culture of alcohol yeast consist in the following:

- § Selective properties of initial industrial culture remain invariable;
- § Probability of yeast infection has been reduced due to conducting cultivation process in sterile conditions;
- § concentration of pure culture of alcohol yeast has been increased at 8-10 time;
- § duration of processes yeast generation and fermentations have been reduced on 20-25 %;
- § quantity unfermented carbohydrates has been decreased on 30 %;
- § consumption of grain to obtain quantity of yeast required according to working rules has been reduced from 6 % up to 1 %.

Laboratory and starting technological orders have been developed.

Working experimental sample of biotechnological complex have been developed and made. Problems availability of technological process and its hardware registration for factory application, reliability and relative simplicity in management of a complex have been solved.

Experimental-industrial tests of aerobic technology nofailure operating time of pure culture of alcohol yeast have been made on Aleksandrovsk alcohol factory of Tatarstan Republic. First the opportunity of tenfold increasing concentration of the grown on new aerobic yeast generation technology barmy culture has been shown under production conditions.

The patent of the Russian Federation № 2136746 with a priority from 17.08.98. « The way of yeast cultivation for alcohol manufactures », Emel'janov V.M., Shajhutdinov R.R., Vladimirova I.S., Filippova N.K., Valeeva R.T. is received

HIGH PERFORMANCE COMPUTING IN RESEARCH OF BIOTECHNOLOGY SECTOR IMPACT ON MACROINDEXES OF EFFICIENCY AND DEVELOPMENT FOR KIROV REGION ECONOMY

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Key words: Dynamic model, regional economy, biotechnology sector impact

A normative balance mathematical model for regional economy contains a lot of unspecified parameters which are not defined directly by the data of economic statistics. Only confidence intervals for the unknown parameters can be computed from the statistical data. A method for estimation of the model parameters by application of parallel computations on multi-processors systems are presented here. They determine the unknown parameters of economic model by indirect way, comparing time series for macro indexes calculated by model with statistical time series for these indexes. The use of the method is illustrated by the parameter estimation of a macroeconomic model of Kirov Region of Russia for 2000-2006. Production sectors in the regional economic model are presented by three sectors: (X) the timber industry complex including forestry; (Y) a complex of new innovation industries in biotechnology and the chemistry, including science and education; (Z) combination of the remained industries. The each production sector shadow money stock grows due to sale of shadow final product to households and as intermediate product to other sectors. The simulation model of regional economy enables to receive a quantitative estimation of dynamics of macroindexes for regional economy. Calibrated model is used for estimation of the Regional Government economic politics and for research of bio-technology sector impact on Kirov Region economy.

The model constructed here is an innovative product and the experience received on its parameter estimation is those "know-how" which can be used in the adaptation of the given model for concrete regional economic systems.

The work is in part supported by the Russian Humanitarian Scientific Foundation (Grant 06-02-91821); by the Russian Foundation of Basic Research (Grant 08-01-00377); by the Program of State Support of Leading Scientific Schools (Grant SS- 2982.2008.1); and by the Program of Basic Research no.15 of Presidium of the Russian Academy of Sciences.

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INFLUENCE OF BIOTECHNOLOGY DERIVATIVES (REKICEN-RD) ON EFFICIENCY, QUALITY OF PRODUCTION AND ECONOMIC PARAMETERS IN GROWING OF MINKS

Zernov V.S., Zernov R.V., Vyatka State Academy of Agricultural Sciences. Materials of conference

It has been established positive influence of preparation « rekicen-RD » on an organism of young mink at the hutch maintenance in « Fur farming Vyatka », Ltd. Kirov region. Parameters of increasing alive weight of 1 head for the period of growing and average daily increasing of young mink in second development group (+rekicen-RD) were on 40,0 % ($P < 0,05$), relatively control.

Preparation rekicen-RD promoted decreasing quantity of fells with defects of fur cover on 13,3 %, and at the same time it promoted increasing quantity of standard fells (free of defects) - on 13,35 %, in comparison with first control group.

Economic efficiency of preparation « rekicen-RD » on the basis of 1 head (on 1 fell) in second development group has made 19,47 roubles (prices of 2005 year), and profitability of growing of young mink from birth up to slaughter has increased on 2,74 %.

Recommendations: use preparation « rekicen-RD » at growing of young mink on 0,45 gramm on 1 head per day at feeding animals.

MULTIPURPOSE REACTOR FOR LABORATORY RESEARCHES

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The reactor is intended for performance of researches liquid-phases chemical reactions, oxidizing processes, processes of mass transfer during chemical transformations, microbiological and fermentative processes, processes of sewage treatment, etc.

The reactor is executed in the form of easily folding design from the stainless steel including the basis with the established drive of the mixing device, обечайки with a shirt of cooling, the top cover with unions of submission and selection of components, installations of gauges and an observation port.

Geometrical volume of a reactor 6 litres.

The reactor is tight, supposes steam sterilization, maintains superfluous pressure up to 0,15 MPa.

Speed of rotation of the mixing device varies within the limits of from 100 up to 1700 rev/min.

A feed from a network of an alternating current- 220 volt.

Power consumption - up to 400 watt.

Measured characteristics of power of the mixing device are registered on the liquid crystal display. Designs of the mixing device, devices of submission and selection of components can be made on individual conditions of the customer.

«standard air»- мпа

RECOMBINANT PROBIOTICS AS A BASIS OF NEW GENERATION OF ENTEROSORBENTS FOR THE CONTROL OF THE BIRD'S FLU **(BRIEF THESES)**

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Since 2003 and till today strain versions of a flu A H5N1 and H7N1-7, so-called bird's, cause large epizootic in various areas of the world, including and Russia. During with 2003-2007 only in Southeast Asia, the Europe and Russia, have been destroyed tens millions birds. Up to 1997 was considered, that viruses of the bird's flu are not dangerous to people but after a virus began to allocate and at them, and with heavy forms of a pneumonia (mortality up to 70 %).

The bird's flu began to carry to viruses pandemic for the person, capable similarly to Spanish influenza H1N1, to cause flashes of especially strong intensity. According to all available information, in January, 2008 in Indonesia, as a result of the bird's flu was lost 8 people. Viruses of flu A have the broad audience of owners among mammals and birds. But their natural owners and the basic tank in the nature are wild birds water and semi-aquatic spaces.

The most susceptible to a virus A (H5N1) is the poultry. The maximal danger is predicted for a bird of the industrial maintenance, by virtue of features of its cultivation (the massed application of antibiotics, vaccines, hormones, imbalance of forages, etc.), resulting, finally to decrease in the general immunity. All these factors together taken, favor to fast distribution of a virus. For prevention introduction of infection, at immunodeficiency conditions enter various immune response-modulating agents, cytokines among which preparations of interferon are widely used. Among preparations of the similar class which is till now not having analogues, preparation "Subalin", a being ancestor of the whole series of preparations, but surpassing them on a level of a level of scrutiny and depth of scientific study is.

The basis of a preparation is made with bacteria Bacillus Subtilis producing interferon possessing high anti-virus and antibacterial activity. All necessary researches of a preparation have been lead within the limits of the state programs (V. Beljavskaja, doctoral dissertation, 2005). The basic purpose of the given project is essential decrease, on some orders, a threshold of occurrence of epidemic of the bird's flu in wildlife with simultaneous increase of the general immunity to virus diseases at a bird of industrial production. To reach it is possible under condition of creation of a new design (form) of the forage, being, in turn both a forage, and means of delivery interferon - a producer in an organism of a bird, simultaneously. For a bird of an industrial way of cultivation it to make not difficultly. For a wild bird it to make much more difficultly.

The certain complexity, in the given problem, the decision of a question on giving waterproof properties to a forage containing interferon - producer makes. The matter is that lyophilic dried up bacteria Bacillus Subtilis (a powder of white color), it is good solvable in waters from which them it is necessary "to isolate and create such conditions, at which a preparation, getting in a gastroenteric path of a bird, will start to show the "active" beginning. For achievement of an object in view it is necessary to solve the following primary goals: alongside with water resistance to give to a forage of property of the raised buoyancy (not less than two weeks); the forage should possess high organoleptic qualities (willingly to be eaten by a bird and on far enough distance it is visible on a surface of water); to start "to work" only at hit in a gastroenteric path.

The main principle incorporated in a basis of the given project, is feeding скармливание specially prepared forage to a wild bird, in places of its mass congestion (these are places of its

wintering), with simultaneous submission of a preparation in a forage and drink, a bird of industrial production. At realization of such approach to a problem of the bird's flu, it will be possible to lower considerably probability of occurrence of virus epidemic both in the nature, and in conditions of its industrial maintenance.

RESOURCE-SAVING TECHNOLOGIES IN AGRICULTURE

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In order to solve a number of problems tied with the necessity of increasing the agriculture efficiency and profitability we offer several new science-intensive developments based on the achievements of Russian scientists mainly in the field of nano-technology implementing the use of a new class of polyfunctional compounds possessing unique properties. Being highly biologically active these preparations are safe for the man and the environment.

In the sphere of plant growing there has been developed a new class of pesticides and fungicides (**MILECIDE**, **MILEFUNG**). These have the plant-growth stimulating property. The advantage of the above mentioned substances lies in their combining direct protection against plant-pathogenic microflora with growth-inducing properties. These preparations produce growth-stimulating effect on both the seeds and the vegetating plants; they act as inducers of disease-resistance against root rot and aerogenic infections.

We think that these preparations have a very important ability of stabilizing crop under various unfavorable climatic conditions. The increase in the crop yield of various agricultural cultures is accompanied by simultaneous rise of its quality (protein composition protein contents, gluten contents and sugars contents).

To increase the percentage of the preserved crop we offer a new preservative – **MILECONStm** which has a pronounced antiseptic effect against a wide range of viruses, bacteria, fungi and moulds. It can be used while storing fruits, vegetables, potatoes and various grains. It is also advisable to use **MILECONStm** for the purpose of effective disinfection of warehouses, storage facilities, packaging, freight vehicles etc. used for storing and transporting of agricultural produce.

The increase of the percentage of the preserved crop, the crops' more thorough processing, lengthening of guaranteed storage terms, possibility of getting new produce this is a by far incomplete list of possible applications of **MILECONStm**.

Application **MILEFUNG** and **MILECONStm** at producing, storing and processing of agricultural produce can be valued as a prophylactic measure against the outbreaks of plant diseases and transfer of pests and pathogens.

THE LABORATORY AUTOMATED INSTALLATION FOR RESEARCH OF BIOTECHNOLOGICAL PROCESSES

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Laboratory installation with technological stud provides carrying out periodic cultivation in aseptic conditions with high accuracy of stabilization of parameters. The system of automated management on the basis of the standard local automatic regulators, including contours thermostating, stating pH, o oxystating, measurements and managements of the charge of liquid and gaseous streams is developed.

Characteristics:

Geometrical volume of fermenter..... 2 litres
Hashing three-floor a mixing machine.....from 250 up to 1200 rev/min
Defoaming mechanical and chemical defoaming agents
Aeration by sterile air..... from 0,5 up to 5 l/l.min
Thermostatingfrom 25 up to 40 deg within the accuracy of 0,5 unit deg
pH – stating..... anywhere 2 from to 8 unit pH within the accuracy of $\pm 0,5$ pH
oxystating with management of aeration from...../..... 0,5 up to 6,0 mg /l
Automatic or manual management of batching of liquid components.

SENSITIVE DIAGNOSTICUM ON BASIS OF STABILIZATION OF MITOCHONDRIONS NANOSTRUCTURE FOR ESTIMATE PHYSIOLOGICAL STATE OF ORGANISM AND FOR DESEASES TREATMENT

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Any function in living organism needs energy and gets the energy of mitochondrion continuous activity. Quantity of these organelles in various organs and tissues are unequal. Functional mitochondrions activity determines physiological organism state and incident with homeopathic systems relevant need in energy. Conception that primaries and seconds violations of bioenergy processes lies at the heart of many pathologic processes are consolidate among scientific people. Therefore today such currents as mitochondrial physiology, mitochondrial medicine, mitochondrial pharmacology, mitochondrial diagnostics are promptly advancing.

Immune system is charged with inside medium constancy. Immunocompetent cells – lymphocytes are actually passing in system bloodstream and implement on duty and informative functions, which demand high energy costs level. Lymphocytes mitochondrions answer to changing of organs and systems functions provided by age, day's and seasonal biorhythms, changing of meteorological conditions, nutrition of various pathologic processes and diseases pharmacotherapy. Energy status of lymphocytes (like state of mitochondrion reticulum)reflects their functional activity and can be cytochemically appreciate by activity of dehydrogenasa sukcinat (SDH) – marker mitochondrion enzyme, which can oxidize succinic acid. At that estimation of mitochondrion intracellular organization and activity and its population descriptions take place. Population descriptions reflect integral energy organism status.

Some cytochemical methods for definition SDH lymphocytes activity were suggested. These methods characterize by simplicity, small invasiveness (only $(5 - 10) \times 10^{-6}$ liters need), high self-descriptiveness and use in some medical centers in RF for “cytochemical examination of life quality and health “ and for estimation treatment effectiveness and prevention various diseases.

Fundamentally new method of functional mitochondrions activity in 5 metabolic conditions (by the example of SDH lymphocytes) in “thin layer” estimate was suggested in The Institute of Theoretical and Experimental Biophysics of The Russian Academy of Sciences under the direction of Professor Kondrashova M. N. “Thin layer” is organelles active nanostructure which can oxidize various energy substrates. Combination of the new method with computer morphometry possibilities and multivariate factorial analysis will allow to turn method self-descriptiveness to higher abstract level and to estimate physiologic organism state, preventive and medical interference effectiveness by total of multitude cytochemical indexes (Q, S, P, L, I, CV, As, Ex) in 5 metabolic conditions. Individual description of health state and energy human homeostat by Pattern from 40 indexes value could be the basis of “human health passport” from infantile age.

Standard collection of chemical agents (dye, substrates and inhibitors, catcher), conditions for standard procedure and criteria of energy status estimate by various organism conditions organization are suggested. It is necessary to unification of measurings in different laboratories.

Indexes can be used such as new universal human organism descriptions with forecasting properties and suitable for health monitoring.

SIMULATION MODELLING IN ENVIRONMENTAL IMPACT ASSESSMENT

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Key words: mathematical modeling, period of recurrence, contamination dispersion

Last years activity essentially grows in the field of realization of the technical projects on a shelf of ocean. This activity concerns as facility of various objects on a coast, such as terminals on a unloading of petroleum, port facilities or energy stations, and construction and operation of objects in the sea - offshore drilling units, underwater pipelines etc. At realization of such projects of one of problems is obtaining the qualitative information about the characteristics of an environment, which knowledge is necessary at definition of parameters of technical facilities for maintenance of their effective and safe operation. Other important problem is the estimation of effect of projected object on an environment. At the solution of both of these problems the important role is performed by methods of mathematical modeling. It is connected on the one hand that the existing observations over the characteristics of an environment have known incompleteness and do not enable to estimate these characteristics, especial their extreme values, which are characterized by the large period of recurrence (about 1 times in 100 or even in 1000 years). Namely the extreme values are taken into account at designing of facilities. On the other hand mathematical modeling is necessary at an Environmental Impact Assessment (EIA), of value of effect on an environment for satisfaction of the nature protection normative requirements. In the series of lectures three types of problems connected with each other are considered.

In the first part of course the problems and mathematical models connected to obtaining of the metocean information are considered. The hydrodynamic models of a tidal and storm surge processes are studied. The numerical methods of approximation of these equations are analyzed. Also the questions of obtaining of extreme values based on statistics of extremes are included.

In the second part of course the questions connected with dispersion of various substations in marine environment are examined. The number models are included for consideration: the model of dispersion of drilling cuttings from marine drilling platforms, the model of oil spill trajectory and fates in water environment, and the model describing distribution of thermal discharges relating designing of cooling coast Energy Power Station. In the third part of course the questions, connected with the bed load transport are studied. In these problems it is necessary to consider a complex of hydrodynamic processes in coastal surf zone, in which accumulation and erosion processes are observed and could especially amplify as a result of disturbance of an existing equilibrium under the influence of engineering objects.

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