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## **IMPORTANCE OF INFORMATION TECHNOLOGIES IN THE EFFICIENCY INCREASE OF DAIRY CATTLE BREEDING MANAGEMENT**

### **Authors:**

Yudin Vitaliy Maratovich - Candidate of Agricultural Sciences, Senior Lecturer, Department of Feeding and Breeding of Farm Animals. Izhevsk State Agricultural Academy (11, Studencheskaya Street, Izhevsk, Russian Federation, 426069, e-mail: vitaliyudin@yandex.ru).

In most regions of Russia we can observe intensive development of dairy cattle breeding due to livestock inventory increase as well as high rates of productivity rising. High milking ability is achieved by means of balanced feeding, optimal conditions of animal care and management. The expediency of milk production increase in a market economy can only be due to high efficiency of production. Therefore, despite having a competitive advantage, efficiency of the sector will depend on the quality of management decisions in the organization of the production process. World genetic resources of the leading breeds are currently intensively used in dairy cattle breeding, which imposes special responsibility on the quality and level of management of the industry. Information support is a requirement for the successful operation of cattle breeding enterprises; it includes the collection and processing of information necessary for making reasonable management decisions in the operational, tactical, strategic modes. The software applied in agricultural production can be divided into two parts; the first part includes programs used for the control of technical processes, some of these programs are integrated into the equipment and usually have a rather limited capacity. The programs of the other part are not integrated and have a more extended range of capabilities. The most notable example is a program for milking equipment management; these programs allow not only to analyze the productivity of the herd, but also to control the technological cycle on an on-going basis.

**Key words:** information technologies; breeding records; valuation; inbreeding; rotation of lines; large-scale breeding.

## **THE INFLUENCE OF BETA-CAROTENE SOURCE ON THE PHYSIOLOGICAL CHARACTERISTICS OF SUCKLING PIGLETS**

### **Authors:**

Gorodilova Lubov Ivanovna – Postgraduate, Department of Veterinary and Sanitary Inspection and Radiobiology. Izhevsk State Agricultural Academy (11, Studencheskaya Street, Izhevsk, Russian Federation, 426069, e-mail: lubasha79\_79@mail.ru).

The article shows the positive effect of the studied drugs Lipocar and Kuxavit, containing beta-carotene on the piglets in the suckling period. After the 30-day research experiment a blood serum test for biochemical values was conducted. We evaluated natural resistance, mortality rate, growth and development of piglets in the suckling period. The increase of piglets' viability under the influence of drugs containing beta-carotene was stated. This indicator in the experimental groups reached 106.1 and 103.2% respectively as compared with the control group. The study of biochemical parameters of blood serum revealed a significant increase in the activity of enzymes AsAT and ALAT. The content of AsAT in the first experimental group was higher by 18.3%, in the second experimental group only by 4.7%. A significant increase of the enzyme ALAT in the experimental groups was 2.4 and 1.0% respectively as compared with the control group. It was statistically shown that the total protein level in the experimental groups increased by 105.8 and 103.9% respectively. The objective increase of vitamin A after application of beta-carotene was found out. Thus, the level of vitamin A was higher by 13.1% in the first experimental group and by 8.0% in the second experimental group as compared with the control group. The introduction of beta-carotene in the diet contributed to the decrease in the level of urea in the blood of experimental animals by 3.4%. The studied drugs containing carotene had a stimulating effect on biochemical processes in the piglets' organisms and had a positive impact on indicators of natural resistance. Increase of blood germicidal activity by 40.7 and 11.2% respectively, and lysozyme activity by 33.1% and 27.7 as compared with the control group was statistically shown.

**Key words:** beta-carotene; suckling piglets; vitamin A and E; feed additives; average daily gain; live weight.

## **DIRECT ELECTROCHEMICAL OXIDATION OF BLOOD**

### **Authors:**

Rudenok Vladimir Afanasievich – Candidate of Chemical Sciences, Associate Professor, Head of Chemistry Department. Izhevsk State Agricultural Academy (11, Studencheskaya Street, Izhevsk, Russian Federation, 426069, e-mail: Rudenva@rambler.ru).

Alimov Azat Mirgasimovich – Doctor of Veterinary Sciences, Professor, Pro-rector of Research, Head of Department of Biological and Inorganic Chemistry, Bauman Kazan State Academy of Veterinary Medicine (35, Sibirskiy tract, Kazan, Russian Federation, 420029, e-mail: Stady@Ksavm.senet.ru).

Zakomyrdin Aleksander Alekseevich - Professor, Head of Research and Methodological Centre in electrochemical technology. Ural branch of All-Russia Scientific Research In-

stitute of Veterinary and Sanitary Hygiene and Ecology of RAAS (18/A, Sverdlovskiy tract, Chelyabinsk, Russian Federation, 454008, e-mail: Vniivshe@mail.ru).

Milaev Vyacheslav Borisovich – Candidate of Veterinary Sciences, Professor, acting Head of Department of Internal Diseases and Surgery. Izhevsk State Agricultural Academy (11, Studencheskaya Street, Izhevsk, Russian Federation, 426069, e-mail: svm@izhgsha.ru).

Shabalina Ekaterina Vyacheslavovna – Candidate of Veterinary Sciences, Associate Professor, Department of Internal Diseases and Surgery. Izhevsk State Agricultural Academy (11, Studencheskaya Street, Izhevsk, Russian Federation, 426069, e-mail: svm@izhgsha.ru).

Efficiency of DC impact on blood was detected during the work on the fuel elements. Direct current flew through the various liquids, including blood. It has been found out that this has destructive effect on the bacteria and their toxins. In Russia this trend was developed by the school of Academic Yu.M. Lopukhin. However, suddenly considerable limitations of this method appeared. Blood cells influenced by the electric field were adsorbed in the conditions of electrolysis in the stationary liquid in the electrolyser on the electrodes surface and blocked them. Current in the circuit ruptured. An attempt to restore the lost electrical conductivity with the help of rigid mechanical effects on the electrodes released electrodes, and electrolysis could last for a considerable time, but a number of other problems emerged preventing this direction from developing. The researches changed the direction to studying electrolysis of aqueous solutions of sodium chloride followed by introduction of electrolysis products into the blood. The advance of this process received a new impulse after the development of method of direct electrochemical oxidation of blood with electrolysis directly in a blood vessel. This technology greatly simplifies the methodology and instrumentation of a process. Animal testing demonstrated its effectiveness during various diseases. Simultaneously a new previously unavailable opportunity of the methodology was discovered. The direct electrolysis in the bloodstream provides blood with elemental hydrogen. High reducing ability of hydrogen enables to restore non-equilibrium radicals during the cancer chemotherapy helping the healing process. This led to the development of process variety offering the possibility to saturate the blood selectively with hypochlorite or hydrogen only, depending on the purpose of methodology application.

**Key words:** Electrochemical oxidation; blood; detoxification.

## **EPIZOOTOLOGICAL MONITORING CIRCOVIRUS, PARVOVIRUS INFECTIONS AND REPRODUCTIVE AND RESPIRATORY SYNDROME OF PIGS IN THE UDMURT REPUBLIC**

### **Auhtors:**

Krysenko Yuriy Gavrilovich – Doctor of Veterinary Sciences, Professor of Department of Veterinary and Sanitary Inspection and Radiobiology. Izhevsk State Agricultural Academy (11, Studencheskaya street, Izhevsk, Russian Federation, 426069, e-mail: krysenkoyu2010@yandex.ru).

Kapachinskih Nadezhda Anatolyevna – Candidate of Biological Sciences, Senior Laboratory Assistant of Department of Veterinary and Sanitary Inspection and Radiobiology. Izhevsk State Agricultural Academy (11, Studencheskaya street, Izhevsk, Russian Federation, 426069, e-mail: [zay\\_z@bk.ru](mailto:zay_z@bk.ru)).

Porcine circovirus infection (PCV), parvovirus infection of pigs (PVIS), porcine reproductive and respiratory syndrome (PRRS) at the present time, according to the productive serological monitoring in various countries, including the Russian Federation, are very widespread in pig breeding industrial enterprises. The aim of this study was to conduct serological monitoring for PCV, PVIS and PRRS in the Udmurt Republic taking into account a certain age factor when these diseases begin to appear and develop. Contamination of pig population aged from 28 to 120 days was determined above 50%, indicating that the virus is circulating widely in the study age group of animals. It was found that the level of PCV seropositivity was 49.1%, PRRS level - 47.5%, PVIS varied about 36.3%. During the study of different types of pathological materials in the polymerase chain reaction (PCR) viral antigens on PCV and PRRS were revealed, which indicates the associated form of the disease in group of weaning piglets.

**Key words:** monitoring; seropositivity; PCV; PVIS; PRRS.

## **SPECIAL CHARACTERISTICS OF EPIZOOTIC PROCESS OF INFECTIOUS PUSTULAR VULVOVAGINITIS**

### **Authors:**

**Novykh Nikolay Nikolaevich** - Doctor of Veterinary Sciences, Professor, Head of Department of Anatomy and Biology. Izhevsk State Agricultural Academy (11, Studencheskaya street, Izhevsk, Russian Federation, 426069, tel. 8(3412) 59-88-11).

Due to the wide spread of viral diseases in recent years farms register mixed forms of viruses (IPVV, IRT, PI-3) and bacteriosis (pasteurellosis, salmonellosis, etc.). Therefore, their timely diagnosis and study of the development of epizootic process in case of IPVV are undoubtedly relevant. Revealing special characteristics of manifestation of epizootic process in case of infectious pustular vulvovaginitis (IPVV) of cattle was the purpose of our work. Nosological independence of IPVV and IRT was also established. Cattle in the farms of Krasnoyarsk, Stavropol regions and 25 districts of the Udmurt Republic were subjected to epizootic analysis. The target of research was cows with IRT, IPVV, heifers, heifers of breeding age (breeding stock) and youngsters from 6 to 12 months. 12,560 cows, 812 heifers, 670 heifers of breeding age, 2810 heads of young animals were examined. Three indicators characterized manifestations of epizootic process and assessment of its intensity. The first is the intensity of epizootic process which characterized the coverage of livestock with infectious disease in the herd. At the same time we determined the incidence of a disease, prevalence, incidence, mortality, lethality and focality. The second indicator of extensivity of

epizootic process represented the coverage of infectious disease of a herd in relation to all herds of Udmurtia. In this case we took into account the ill-being, the prevalence - the territorial confinement to IPVV, i.e. it's being enzootic. The third indicator of epizootic process was the duration of this process manifestations, reflecting the frequency of epizootic diseases, the recurrence of disease outbreaks, stationary state of diseases and their seasonality. Results of gynecological examinations showed that the manifestation of IPVV was accompanied by the development of catarrhal vulvovaginitis with 120 cows (23.9%), 306 cows (61%) had pustular vulvitis and vestibulitis, which was combined with urethritis with 127 cows (21.9%). Analysis of the research results revealed that IPVV is one of the most common herpetic infections in the farms of Udmurtia. Peculiarities of epizootic process, clinicopathological grounding of IPVV and IRT systematics determined their nosological independence.

**Key words:** viruses; genetic information; epizootic process; infectious pustular vulvovaginitis; special characteristics of manifestation; infectious rhinotracheitis.

## **MODELLING OF MODES OF A THREE-PHASE CIRCUIT WITH LONGITUDINAL ASYMMETRY**

### **Authors:**

Karabashev Gennadiy Pavlovich – Candidate of Technical Sciences, Associate Professor of Department of Electrical Engineering, Equipment and Power Supply. Izhevsk State Agricultural Academy (11, Studencheskaya street, Izhevsk, Russian Federation, 426069, e-mail karabashevgp@mail.ru).

The modelling process of modes of electric circuits in software environment LabVIEW is shown. The purpose of modelling is the designing a computer program (device) both for an illustration of electric processes in a three-phase circuit under various asymmetrical modes in educational process, and for definition of parameters of these modes for practical purposes (calculation of asymmetrical modes, including phase break). The article considers the process of design and application of virtual installation for research of the electric phenomena in three-phase circuits with longitudinal asymmetry as an example of virtual laboratory work in educational process of electrotechnical subjects. It is frequently necessary to consider such modes at phase break of asynchronous electric motors. The mathematical description of a three-phase electric circuit at various modes of longitudinal asymmetry is applied. The article shows how the expert in electric circuits can create the program with the help of software environment LabVIEW and without direct help of programmers. The device has the form of virtual installation where it is possible to carry out various researches as on the real device. The process of graphic programming of the electric phenomena, development of the device front panel and the basic moments of designing block diagram are described. The research results of concrete examples of possible modes are given; their vector and topographical diagrams are shown.

**Key words:** software environment LabVIEW; modelling of electric circuits modes; three-phase circuits with longitudinal asymmetry.

## **ANALYSIS OF TRANSIENT PROCESS OF SINGLE PHASE-TO-GROUND FAULT IN ELECTRIC SYSTEM WITH RESISTIVE NEUTRAL GROUND**

### **Authors:**

Kochetkov Nikolay Petrovich – Candidate of Technical Sciences, Associate Professor of Department of Electrical Engineering, Equipment and Power Supply. Izhevsk State Agricultural Academy (11, Studencheskaya street, Izhevsk, Russian Federation, 426069, e-mail: nkochetkof@mail.ru).

Rodygina Tamara Aleksandrovna - Candidate of Technical Sciences, Associate Professor of Department of Electrical Engineering, Equipment and Power Supply. Izhevsk State Agricultural Academy (11, Studencheskaya street, Izhevsk, Russian Federation, 426069, e-mail: 9058748130@mail.ru).

Chazov Yuriy Olegovich – Engineer, Head of Department. Branch of OJSC “SO UES” Udmurt RDA (30, Sovetskaya street, Izhevsk, Russian Federation, 426004, e-mail: jurok-87@mail.ru).

Researches of many authors show the noticeable overvoltage reduction in case of unstable single phase-to-ground faults (SPGF) for the mode of resistive neutral ground of electric lines 6-35 kV. Presently there is an effective method of transferring any type of SPGF in steady metallic SPGF by bridging of the line faulty phase. The aim of work is analytical description of transient single metallic SPGF in an electric line of 35 kV with resistive neutral ground. The analysis of transient process with a classic method was conducted under following assumptions: capacitance of line phases is equal to zero; regime and structural parameters of electric network on phases are symmetric; parameters of transient process are determined by inductive resistances of power transformer windings, line wires and by capacity admittances of line phases relative to ground. The equivalent circuit of capacity admittance substitution of line phases on ground and analytical expressions of initial conditions before transient process were obtained on the basis of T circuit of substitution for a line 35 kV with a resistive neutral ground. The substitution scheme for transient stability analysis of voltage of retarding line 1 at ground fault of line 2 was given and on the basis of Kirchhoff's equations the third order differential equalization was received. The roots of characteristic equation were defined; analytical expressions for forced and free components of transient process of voltage of retarding line 2 at ground fault of line 1 were obtained. On the basis of obtained expressions the form of voltage curve of transient process of line 2 at line 1 ground fault for the parameters of the real line 35 kV with the length of 30 kilometers executed with the AS-70 wire was investigated. Results of transient stability analysis for the different moments of SPGF and different values of resistance of a grounding resistor are given. The conclusions are drawn about efficiency of classic method application for the analysis of transient process

of metallic SPGF in electric system with resistive neutral ground and influence of resistance size of grounding resistor on the parameters of transient process of SPGF.

**Key words:** isolated neutral system; resistive neutral ground; single phase-to-ground faults; transient process of metallic single phase-to-ground fault.

## **DEVELOPMENT OF ASSESSMENT PROCEDURE OF CAPITAL EFFICIENCY**

### **Authors:**

Antonov Petr Vitalievich - Candidate of Economic Sciences, Associate Professor of Department of Accounting, Finance and Audit. Izhevsk State Agricultural Academy (11, Studencheskaya street, Izhevsk, Russian Federation, 426069, e-mail: antonovpv@bk.ru).

Zlobina Oksana Olegovna - Candidate of Economic Sciences, Associate Professor of Department of Accounting, Finance and Audit. Izhevsk State Agricultural Academy (11, Studencheskaya street, Izhevsk, Russian Federation, 426069, e-mail: oksamari@rambler.ru).

Mezentseva Marina Anatolievna - economist of Financial Department of Izhevsk Electromechanical Plant Kupol, JSC (3, Pesochnaya street, Izhevsk, Russian Federation, 426033, e-mail: marina\_mezenceva@mail.ru).

An essential element of the reproduction process is the replacement of worn-out components of non-current assets with new ones. Capital investments are carried out through the mechanism of accumulation of different sources of funds and their direction for the acquisition of new instruments of labour and technological improvement of operating tools. The aim of the study was substantiation of theoretical statements and methodical algorithms for calculating the indicators for assessing the capital investments efficiency in upgrading and improving the material and production base. The material for the study was the realization of restructuring and development program of "IEMP "Kupol" JSC for 2014-2016, which assumes the implementation of investments in the renovation and improvement of material and production base of the organization. Based on totals of Cash Flow Budget of "IEMP "Kupol" the assessment of capital efficiency of the organization applying a variety of indicators was conducted. A positive net present value indicates that the implemented project will provide a refund of the advanced capital and anticipated return. The value of the profitability index of a positive net present value, therefore the project is effective and can be adopted for implementation. The internal revenue rate of the project indicates its effectiveness as an indication exceeds the required by investors rate of return (18.00%). Simple financial profitability of the project capital investment is 0.65. Discounted payback period is 0.99725, which corresponds to 35 months. On the basis of the calculation and evaluation of the above figures, we can conclude about the effectiveness of the project of capital investments of JSC "IEMP "Kupol".

**Key words:** assessment of capital efficiency; material and production base of the organization; net present value; index of profitability; internal rate of return; simple financial profitability; discounted payback period.

## **LABOUR FORCES AUDIT AS ONE OF THE MOST IMPORTANT ASSESSMENT TOOLS OF STAFF MOTIVATION SYSTEM**

### **Authors:**

Selezneva Irina Petrovna – Candidate of Economic Sciences, Associate Professor of Department of Accounting, Finance and Audit. Izhevsk State Agricultural Academy (11, Studencheskaya street, Izhevsk, Russian Federation, 426069).

Selezneva Anastasia Aleksandrovna - Assistant Manager. LLC «TITAN Project» (7, Poyma street, Izhevsk, Russian Federation, 426028).

The efficiency of company economic activity does not depend only on the tangible and financial resources endowment, but also human labour resources. This requires the formation of such human resource management system, where staff stimulation and motivation is of great importance not only by means of the organization and regulation of labour payment, but in whole a comprehensive assessment of all operating system of staff motivation. The labour forces audit has particular significance in the assessment of staff motivation system. The aim of the study is the development of theoretical and practical recommendations for the process of staff audit, including the assessment of company staff motivation. On the basis of analysis of economic literature, views of modern scientists-economists it was determined that under the conditions of modern "new economy" human capital as the production factor took on a new meaning and this fact requires the application of modern effective activities in terms of policy development of human resources use, selection and development of forms and types of staff motivation, including labour forces audit and assessment of staff motivation system. The proposed activities, the coverage of the proposed list and content of audit procedures will ensure a high level of their effectiveness, will solve many problems of human resources endowment of the organization, staff motivation and will increase effectiveness of all HR processes and company efficiency as a whole.

**Key words:** efficiency of economical activity; staff; human resource management; human capital; motivation; payment; motivational function of payment; staff audit; audit stages; audit procedures.

## **ECONOMIC CONTROL OF BORROWED FUNDS IN AGRIBUSINESS COMPANIES**

### **Authors:**



Ostaev Gamlet Yakovlevich – Candidate of Economic Sciences, Associate Professor of Department of Accounting, Finance and Audit. Izhevsk State Agricultural (11, Studencheskaya street, Izhevsk, Russian Federation, 426069, e-mail: ostaeff @yandex.ru).

Kontsevaya Stanislava Rolanovna - Candidate of Economic Sciences, Associate Professor of Department of Economic Analysis and Audit. RSAU–MAA named after K.A. Timiryazev (49, Timiryazevskaya street, Moscow, Russian Federation, 127550, e-mail: s.kontsevaya@mail.ru).

The article discusses the economic control of borrowed funds in agribusiness companies. Economic control is the verification of performance of some or other business decisions on borrowed funds for the purpose of establishing their credibility, legitimacy and economic feasibility. Control covers all aspects of financial and economic activities of the organization; it is based on the principles of documentary and actual control. Audit is a part of control. Audit is a system of compulsory controlling operations of a comprehensive analysis of legitimacy and validity of economic and financial transactions of the organization during the inspected period, correctness of their accounting and financial reporting, as well as the legality of the actions of the Director and Chief Accountant and other officials. In his work the auditor is guided by current legislation and regulatory requirements. The objective of the audit of the borrowed funds account is to obtain reasonable assurance of the validity of the financial statements, reflecting the organization's debt in obtained borrowings. To achieve the objective the auditor forms the main task - to identify specific areas of check of the borrowed funds. This work analyzed various aspects of the account of borrowed money applying economic control procedures, determined the most effective methods and procedures for monitoring loans and borrowings. Developed working papers are aimed at control planning, monitoring, evidence gathering and at the inspection and audit of credits and loans. The practical application of the obtained results will allow determining the amount of control procedures necessary for the formation of opinions and conclusions regarding the reliability of financial reporting in providing information on borrowings.

**Key words:** economic control; audit; borrowed funds; credits; loans; agricultural organization; planning.

## **INTERNAL AUDIT ORGANISATION OF ACCOUNTING OF COMPANY UNTITLED ASSET**

### **Authors:**

Ostaev Gamlet Yakovlevich – Candidate of Economic Sciences, Associate Professor of Department of Accounting, Finance and Audit. Izhevsk State Agricultural Academy (11, Studencheskaya street, Izhevsk, Russian Federation, 426069, e-mail: ostaeff @yandex.ru).

Kontsevoy Grigoriy Rolanovich - Postgraduate of Department of Accounting, Finance and Audit. Izhevsk State Agricultural Academy (11, Studencheskaya street, Izhevsk, Russian Federation, 426069, e-mail: g.r.kontsevoy@mail.ru).

The article discusses the necessity of consideration for issues of organization and implementation of the audit of property not belonging to the organization on the right of ownership. To achieve the objective, the auditor sets the main task: to identify specific areas of testing, including areas of high risk of distortion. While conducting the audit of property not belonging to the organization on the right of ownership the auditor is guided by the Federal Law "On auditing activity" No. 307 FZ of 30.12.2008. For the purpose of untitled asset accounting in accordance with Plan of accounts of financial and economic activities of organizations and instructions on its use approved by the order of Ministry of Finance of the Russian Federation of 31 October 2000, No. 94n, off-balance-sheet-accounts are applied for summarizing the information about the presence and movement of values, which are temporarily in use or in the possession of the organization (leased assets, material assets in safe custody, processing, etc.), contingent rights and obligations as well as for the control of separate business transactions. Accounting of specified objects is conducted according to a simple system. The auditor conducts a general analysis of property not belonging to the organization on the right of ownership to determine the volume of transactions associated with the use of such property. In the performance of the internal audit the evidence base includes: lease contracts, commissions, rendering of services for materials processing, and also orders of the writing off debit debts with expired statute of limitations or there are documents confirming noncollectability of sums from the debtor, etc. Applying and objectively evaluating audit results, auditors establish adherence to technological, budgeted, financial, payment and settlement discipline, as well as the veracity, legality, expediency and economic efficiency of financial and economic activity of the audited objects.

**Key words:** internal audit; accounting; planning; checking; off-balance-sheet-accounts.