

## BIOLOGICAL SCIENCES

UDK 574.3:574.472:581.9

### **Monitoring of biodiversity of the flora of mountain Cheget (Prielbrusye)**

**Aida Ya. Tamakhina**

**Abstract.** In the context of the actualization of the problems of preserving mountain ecosystems in the implementation of tourism and other activities, one of the tasks for the further development of sustainable tourism in the Elbrus National Park is to systematize the monitoring of anthropogenic activities and its impact on the park's ecosystems. A reliable parameter reflecting the level of anthropogenic pressure on mountain ecosystems is the biodiversity of the flora and the level of synanthropization of the vegetation cover. The aim of the study was to assess the species richness of angiosperms of herbaceous plants on the eastern slope of Mount Cheget, which is subject to severe anthropogenic stress. Based on the results of monitoring, a decrease in species richness and a sharp increase in beta-diversity of angiospermous herbaceous plants from the subalpine to alpine altitudinal belt were established. The greatest similarity of species richness is noted between phytocenoses at altitudes of 2200-2300, 2500-2600 and 3000-3100 m a. s. l. For subalpine and alpine phytocenoses, moderate and slightly moderate synanthropized vegetation was noted with synanthropization indices of 23.5 and 11.8%, respectively. Extreme environmental conditions, high diversity of physical and geochemical conditions and ecological niches, lack of competition contribute to the active flow of speciation processes, which is confirmed by the presence of endemics and species in the "locus classicus" (4 species) in the study area. The relict refugium of the eastern slope of Cheget is represented by 13 tertiary and glacial relics. In the list of angiosperms growing in the study area, 9 Red Data Book species were noted, including 4 declining in number and 5 rare. In connection with the intensification of anthropogenic stress, the protection of individual elements of the landscape and rare florocenotic complexes will become important measures for the conservation of the biodiversity of the Cheget mountain flora.

**Keywords:** mountain ecosystems, monitoring, biodiversity, angiosperms, synanthropization, anthropogenic stress, relics, endemics, environmental management

## AGRONOMY, FORESTY AND WATER MANAGEMENT

### **General Farming and Crop Production**

UDK 633.15:631.543.2:631.81.095.337(470.64)

### **Productivity of corn hybrids for grain depending on fertilizers and plant density in the foothill zone of the KBR**

**Yuri M. Shogenov**

**Abstract.** The article presents the results of studies on the productivity of corn hybrids depending on the plant density and the dose of mineral fertilizers to increase the yield and quality of grain, as well as the characteristics of plant growth and development and photosynthetic activity. Field experiments were carried out in 2020-2022 in the educational and production complex of the Kabardino-Balkarian State Agrarian University named after V.M. Kokov. Experiments were laid on leached chernozem. The availability of nitrogen and phosphorus is average, and that of potassium is increased. It was found that at a density of 60 thousand/ha, the height of plants of the hybrid Katerina SV in the control was 221 cm, the level of ear attachment was 63 cm, then with the

application of fertilizers it increased to 236-247 cm and 74-79.5 cm, respectively, and in the middle early hybrid Krasnodar 291 AMV, these indicators were within the limits of the plant height of 220-232 cm and the level of attachment of the cob 86-91 cm. According to the structure of the crop in the early ripe hybrid Katerina SV, the average length of the cob in the best variant was 23.5 cm, the number of grains per cob 249.9 pieces, the weight of 1000 grains is 257.2 g, then their maximum value was noted in the middle-early hybrid Krasnodar 291 AMB, respectively, 25.4 cm, 281.4 pieces. and 337.1 cm. The maximum grain yields were obtained at a dose of mineral fertilizers N90P90K40 in the early ripe hybrid Katerina SV at a density of 60 and 70 thousand/ha, respectively, 54.0 and 61.5 centners/ha and the medium early hybrid Krasnodar 291 AMV – 76.9 and 74.6 c/ha, which fully use the conditions of the mountain zone of the KBR. The analysis of economic efficiency showed that the highest net income was obtained from the mid-early hybrid Krasnodarsky 291 AMV at a density of 60 and 70 thousand/ha – 85.1 and 82.3 thousand rubles, which is 1.21-1.42 times higher than the early ripe hybrid Katerina SV, where an income of 1 rub. costs 11.4-11.8 rubles.

**Keywords:** corn hybrids Katerina SV and Krasnodar 291 AMV, number of cobs per 100 plants, number of grains per cob, weight of 1000 grains, cob length, grain weight per cob, yield, standing density, doses of mineral fertilizers

UDK 633.15:631.81.095.337(470.64)

## **The productivity of early-ripening corn hybrids depending on the timing of microfertilizers application in the foothill zone of Kabardino-Balkaria**

**Yuri M. Shogenov**

**Abstract.** The article presents the results of studies on the impact of zinc microfertilizer on the growth, development and productivity of early maturing corn hybrids under rainfed conditions in the foothill zone of Kabardino-Balkaria on leached chernozem. It has been established that the best conditions for the development and growth of plants and obtaining a higher yield of corn grain occur when seeds and plants are jointly treated with zinc during the growing season. When applying zinc fertilizers, the most favorable conditions are created under which a powerful photosynthetic apparatus develops, ensuring the formation of maximum yield. When treating seeds and plants during the growing season, the leaf area increased for Katerina SV by 8.2-24.7%, Mashuk 150 MV – 5.1-12.6% and NUR – 14.7-19.8%. The largest area on average for all phases was in the variant Background + seed treatment + zinc treatment of plants. With the combined application of N<sub>60</sub>P<sub>60</sub>K<sub>30</sub> and treatment of seeds and plants with zinc during the growing season, an increase in yield was obtained for the Katerina SV hybrid of 13.7-17.2 c/ha, for the Mashuk 150 MV hybrid – 13.9-15.9 c/ha and hybrid NUR – 11.3-17.0 c/ha. The weight of ears increased in the variant Background + treatment of seeds with zinc by 1.1%, in the variants Background + treatment of plants with zinc and Background + treatment of seeds and plants with zinc, respectively, by 5.2 and 5.8%. The weight of 1000 seeds increased depending on: the treatment of seeds with zinc by 2.7%, the treatment of plants during the growing season – 2.6% and 2.8%. On the crops of the hybrid Mashuk 150 MV, the number of ears per 100 plants in the variants Background + seed treatment with zinc, Background + plant treatment with zinc and Background + treatment of seeds and plants with zinc is higher by 1-3%, and the weight of the ear is 0.4-1.7 %, weight of 1000 grains in the range – 0.6-4.3%. The productivity elements of the NUR hybrid increased to 1% in terms of the number of cobs – 0.7-4.7% and in the weight of 1000 grains – 0.9-2.5%.

**Keywords:** corn hybrids Katerina SV, Mashuk 150 MV and NUR, number of cobs per 100 plants, number of grains per cob, weight of 1000 grains, cob length, grain weight per cob, yield, trace element

## **Horticulture, Vegetable Growing, Viticulture and Medicinal Crops**

UDK 635(470.64)

### **Improvement of the production technology of organic vegetable products in the conditions of the mountain zone of Kabardino-Balkaria**

**Zalim-Geri S. Shibzukhov, Albina A. Dyshekova,  
Beslan B. Beslaneev, Zalina S. Shibzukhova**

**Abstract.** The production of a high-quality, competitive environmentally friendly product requires a well-thought-out technology, the choice of a place for the implementation of organic farming is of great importance, on which the success of production depends. At the state level, many countries encourage farmers to master organic farming and offer to use grants for its implementation. Ecologization is especially relevant in the production of vegetables and fruits. Scientific work was carried out in order to improve the technology of growing organic vegetable products in the soil and climatic conditions of the mountainous zone of Kabardino-Balkaria using scientifically based crop rotation. The mountain zone has the advantage that there are fewer pathogens that cause plant diseases, fewer pests and in most cases do not require pesticide treatment and plants do not need protection. The production of organic products is a very labor-intensive and financially costly process. Costs increase for manual labor, the use of agricultural practices and the use of organic fertilizers, as well as, if necessary, the use of biological products. The results of the research showed that by observing the requirements of ecological farming in the conditions of the mountainous zone of the KBR, it is possible to obtain fairly stable crops with a product marketability of about 90%. Stable yields have been maintained over all the years of research (2020-2022). This was facilitated, first of all, by a properly drawn up crop rotation and the introduction of rotted manure with its subsequent plowing, while the yield of early potatoes with a good presentation and corresponding to the highest environmental standards reached 27.5 t/ha. Among the studied varieties and hybrids, Izora and Anost hybrids showed the highest yield.

**Keywords:** early potato, mountain zone, organic fertilizer, productivity, quality indicators, economic efficiency

## **CONSTRUCTION AND ARCHITECTURE**

### **Hydraulic engineering, hydraulics and engineering hydrology**

UDK 626.31

### **Computational model of optimization of polygonal sections of hydraulic channels**

**Saligaji O. Kurbanov, Ahmed A. Sozaev, Asker Z. Bakhov**

**Abstract.** Currently, channels for various purposes of rectangular and trapezoidal sections have become more widespread than channels of polygonal profile. At the same time, it is known that polygonal channels are economically and hydraulically more efficient, and the issues of reliability and efficiency of rectangular and trapezoidal channels remain relevant. The methods of hydraulic and technical and economic calculation of polygonal channels recommended in the

technical and regulatory literature for their design do not allow selecting sections with optimal characteristics, there are no scientifically sound design methods and calculation justification. And the foreign practice of designing polygonal profile channels uses complex methods of hydraulic calculation, and not available for open use. The proposed proven calculation model for optimizing cross sections according to the Kurbanov S.O. method. provides an optimal ratio of depths, slope deposits, relative width and channel width below, which together give more stable hydraulic modes. The calculation model based on the proposed methodology is based on obtaining dimensionless optimization criteria for the channel section – relative width and relative depth, which are integral indicators of the optimal channel section of a polygonal profile. Based on these criteria, a computational model for selecting optimal hydraulic and technical and economic characteristics of polygonal profile channels is proposed. This model is easily expressed through a cross-section optimization graph, which can be effectively used in the design and reconstruction of reclamation and energy channels of polygonal cross-section.

**Keywords:** water supply channels, polygonal sections, hydraulic efficiency, calculation method, optimization criteria for the channel section, relative width and relative depth

## **ANIMAL SCIENCE AND VETERINARY MEDICINE**

### **Private Animal Husbandry, Feeding, Feed Preparation and Livestock Production Technologies**

UDK 636.084.523

#### **Digestibility and nutrient balances of the diets of holstein cows when using the feed additive "Animax"**

**Orest A. Basonov, Ruben V. Ginoyan, Vadim M. Barinov**

**Abstract.** Physiological studies were carried out on cows of the Holstein breed in the conditions of LLC "Plemzavod im. Lenin" of the Koverninsky district of the Nizhny Novgorod region, during the period from July 1 to December 1, 2021. The purpose of this work was to establish the degree of influence of the mineral supplement "Animax" on the physiological state and hematological parameters of experimental cows. In the course of the work, experimental studies were conducted on the use of the mineral feed additive "Animax" in the diets of dairy cows of the Holstein breed. As a result of the study, data on the effect of the mineral feed additive "Animax" on the physiological state of the body of cattle were obtained for the first time. Three similar groups of cows were formed, 5 heads each. Animals of the I and II experimental groups, in addition to the main diet, received an Animax supplement of 75 and 50 grams per head per day, respectively, cows of the control group received the main diet without Animax. As a result of the research, it was found that: indicators of body temperature and heartbeat were within the physiological norm, which confirmed the healthy condition of the animals; feeding cows with the mineral feed additive "Animax", leads to an increase and normalization of glutathione, leads to an increase and normalization of fat metabolism.

**Keywords:** Holstein cows, feed additive, physiological status, clinical indicators, hematological indicators, minerals

## **Evaluation of the index of neonatal chickens «Dominant CZ»**

**Elena E. Epimahova, Nikolai Z. Zlydnev, Ksenia V. Chervyakova**

**Abstract.** The article presents the results of experiments on the incubation of eggs of three crosses of 32- and 38-week-old hens «Dominant CZ» in farm and industrial incubators and on growing chickens on the floor and in cages. During incubation, eggs were rotated after 45 minutes. In the vivarium, the eggs were aerosolized with the Sporazin probiotic at a dose of 1 l/m<sup>3</sup>. The percentage of day-old chick weight to egg weight or neonatal chick index was in the range of 64.7-70.5%. According to «D-107» in comparison with the control after treatment of eggs with the drug «Sporazin» for 11.5 and 18.5 days. The neonatal chick index is higher by 4.8 and 2.6%. 7-day-old hens were larger than the control by 1.8% in «D-149» after the treatment of eggs with the drug «Sporazin» for 18.5 days. When incubated in industrial incubators, the neonatal chick index «D-104» is more than «D-107» and «D-149» by 1.2 and 1.1%. The neonatal chick index of three crosses «Dominant CZ» in the range of 66-69% was 86.9%. Larger chicks with higher the neonatal chick index when grown in cages up to 7 days of age had better viability and growth rates. It was concluded that the neonatal chick index at the level of 68.0% to a greater extent guarantees optimal chick viability and performance.

**Keywords:** meat and egg hens, incubation, hatch, day-old chicks, neonatal chickens, chick quality, raising chickens

## **Improving the safety and growth rate of young merino sheep**

**Yuri A. Kolosov, Vasily V. Aboneev**

**Abstract.** The increasing role of meat productivity in the issue of economic efficiency of sheep breeding poses new challenges not only in the problem of breeding and feeding systems for sheep, but also sharpens the requirements for the growth rate and safety of young animals. The article proposes to solve this problem by using the drug Yuberin, which is known as a complex drug that has tonic properties, normalizes metabolic and regenerative processes, has a stimulating effect on protein, carbohydrate and fat metabolism, and also increases the body's resistance to adverse environmental factors and promoting the growth and development of animals. As a result of the research, the authors established that the use of the drug "Yuberin", administered in the morning before feeding, intramuscularly for 5 days at a dosage of 2-2.5 ml. helps to increase the growth rate and safety of young animals during the rearing period, i.e. The absolute increase in live weight over 4 months of the experiment in the experimental group was higher than in the control by almost 20%, and safety was higher by 15%. The use of a biostimulator allows you to increase profitability when raising young sheep by 8-10%.

**Keywords:** sheep breeding, safety, growth rate, absolute gains, live weight, drug Yuberin, efficiency

## **Breeding, Selection, Genetics and Biotechnology of Animals**

UDK 636.3.082.262

### **Some results of crossing in commercial merino sheep breeding**

**Vasily V. Aboneev, Yuri A. Kolosov, Anna Ya. Kulikova,  
Ekaterina V. Aboneeva, Vyacheslav G. Borulko**

**Abstract.** Commercial herds of fine-fleeced sheep in our country, concentrated in various categories of farms, must be converted into a livestock of animals producing good quality wool and high meat productivity. Such signs are relative to the created "Verkhnestepnovsky" type of sheep, a semi-fine-fleeced meat-wool breed of sheep – the North Caucasian meat-wool. In the commodity herd "Novomaryevsky" of the Shpakovsky district of the Stavropol Territory, various options for crossing with fine-fleeced, including semi-fine-fleeced sheep – producers were used to obtain animals combining high wool and meat productivity. In this regard, the task was set to study some results of crossing rams of the "Upper Stepnovsky" type of semi-fine-fleeced meat-wool breed of sheep – North Caucasian having good meat forms and more thinned wool, with fine-fleeced ewes of the commercial herd. As a result of the grading and shearing, the main indicators of the productivity of purebred and crossbred offspring were determined. It has been established that the crossing of a new type of North Caucasian meat-wool breed with fine-fleeced queens increases the live weight of crossbred young animals, improves body shape, and increases the quantitative and qualitative indicators of wool productivity. This determines their best comprehensive assessment and competitiveness of the animal.

**Keywords:** Sheep, breeds, Caucasian, North Caucasian, valuation, wool, expert evaluation of runes, economic efficiency

## **AGROENGINEERING AND FOOD TECHNOLOGIES**

### **Technologies, Machines and Equipment for the Agro-industrial Complex**

UDK 631.316.44

#### **Investigation of the process of interaction of safety wheels of two-rotor vertical milling cutters with a tree stem**

**Aslan K. Apazhev, Artur M. Egozhev, Evgeny A. Polishchuk,  
Asker A. Egozhev, Nizam A. Aliev**

**Abstract.** The development of land on slopes for fruit plantations significantly limits the methods of mechanical processing of trunk strips, since there is a need to approach the trunk strip from one side. To improve aeration, the destruction of rain channels and the assimilation of nutrients, milling of the prishtambovy zone of fruit plantations is used. An important problem for entrepreneurs and farmers engaged in the production of fruit products in conditions of both flat and slope farming is the lack of modern machines for mechanical processing of row spacing and the tamp zone. Most manufacturers operating in the conditions of slope gardening do not have a special technique for machining the tamp zone in one pass of the unit. The development and introduction of new mechanisms and machines for complete mechanical processing of the tamp zone in one pass, in conditions of slope gardening, is relevant. Theoretical studies of the process of interaction of safety wheels of milling rotors on a tree trunk during its complete bypass, in one

pass of the unit, have been carried out. The main design parameters of a vertical two-rotor milling cutter, for which a patent for a utility model was obtained, are presented. Analytical dependences are obtained that allow us to determine the influence of the safety wheel parameters on the quality of the technological process.

**Keywords:** vertical milling cutter, tree trunk, safety wheel, trunk strip, slope farming

UDK 631.347.2

### **Simulation of erosion processes under artificial spinter**

**Aslan K. Apazhev, Yuri A. Shekikhachev, Luan M. Khazhmetov,  
Lyudmila Z. Shekikhacheva**

**Abstract.** The article considers the problem of reducing erosion processes during sprinkling of agricultural crops, taking into account the fact that for each soil there is a maximum allowable value of a single layer of precipitation, at which interruptions in sprinkling lead to an increase in the irrigation rate compared to continuous positional sprinkling. There are various designs of technical means for fine sprinkling. The most effective is synchronous pulse sprinkling, the principle of which is the accumulation of a certain volume of water in the accumulators of pulse sprinklers and its subsequent release under the action of compressed air. The principle of operation of pulse sprinklers and their design features predetermined not only the reliability of the process equipment, but also ensured the same operating parameters: splash volume, upper and lower pressure limits. To reduce erosion processes that may develop during sprinkling, it is necessary to investigate the kinematic parameters of artificial rain drops. The studies were carried out taking into account the fact that when a water drop moves in an air medium, pressure arises under the influence of air resistance, which acts only on the frontal surface of the moving drop. As according to Pascal's law, the pressure of a liquid in equilibrium is transmitted in all directions with the same force, the droplet is deformed. The drop is flattened until it separates. Based on the research, an expression was obtained for calculating the maximum diameter of an artificial rain drop. Calculations have shown that with a surface tension coefficient of 0.07286 N/m and a volumetric weight of water of 9810 N/m<sup>3</sup>, it will be equal to 6.67 mm, which is consistent with the experimental data (6-7 mm). The dependence of the critical speed of raindrops on the diameter of the drop and the coefficient of resistance to the movement of the drop, as well as the permissible intensity of rain at various slopes and for various crops, has also been established.

**Keywords:** irrigation, sprinkling, efficiency, intensity, erosion, modeling, drop, parameter, size

UDK 631.317

### **Justification of the structural elements of the working bodies of the tilling cutter**

**Mukhamad Kh. Misirov, Asker A. Egozhev, Nizam A. Aliev**

**Abstract.** The article discusses the features of the milling process to justify the structural elements of the working bodies of a straight rotator with a vertical axis of rotation. During the research, methods of cutting theory and design of cutting tools were used, as well as the analogy method for analyzing the process of soil milling and searching for new solutions for milling working bodies. When studying the process of soil milling, face and end metal-cutting mills were considered as an analogue of a cutting tool. The revealed similarity of the processes of processing by metal-cutting cutters and the working bodies of the rotator has made it possible to

use some physical and mathematical models of the process of operation of metal-cutting cutters to describe the process of milling by the working bodies of the rotator. The models used are in good agreement with practical and theoretical data on soil milling. Substantiations of the need for one or another structural element of milling working bodies are given, as well as their functional purpose and influence on the work process are determined. It is shown that in order to increase the efficiency of the milling process, it is necessary to increase the uniformity of milling by increasing the number of simultaneously working knives and using knives with oblique cutting edges. A method for determining the required number of knives, both with straight and oblique cutting edges, is given. The necessity of using knives with oblique cutting edges is substantiated. The required angle of inclination of the cutting edge of the knife, at which the milling process will be steady, is determined by calculation.

**Keywords:** tillage, soil tillage cutter, cutter with a vertical axis of rotation, working bodies of a tillage cutter, angle of inclination of the cutting edge of the knife, soil cutter, milling knife

## Food Systems

UDK 641.5:664.951.65

### Modeling the rheological characteristics of minced meat based on fish raw materials

**Anna T. Vasyukova, Alexandra S. Moskalenko, Anatoly R. Edvars**

**Abstract.** On the basis of theoretical studies, the expediency of using vegetable and cereal components to increase nutrition, is created and confirmed incl. biological value of molded culinary products based on minced fish. The possibilities of an integrated approach to the optimization of the developed recipes of molded culinary products in terms of amino acid, fatty acid and mineral compositions, in accordance with modern requirements of nutrition science, are shown; the possibility of using a computer program to create recipes from fish, vegetables, cereals, cereal flour, skimmed milk powder, optimized for amino acid composition, and the dependences of the degree of swelling of cereals (cereal flour) on water temperature and soaking time were established. On the basis of experimental studies, equations have been compiled that characterize changes in the dependence of stickiness, water-holding capacity (WHR) and fat-retaining capacity (FHR) on the number of introduced components with functional properties, and data have been obtained on the effect of the composition of vegetable and fat compositions on the structure of fish and vegetable semi-finished products. The influence of components with functional properties on the organoleptic, physicochemical, technological, structural and mechanical parameters of fish and vegetable semi-finished products has been established. It was determined that starch-containing additives have the best water-retaining capacity, which allows increasing the WHC of all samples by 1.7-2.2 times. This indicates an increase in ultimate shear stress by 10-77%. At the same time, the protein in fish and vegetable minced meat is in a hydrated state, which makes it possible to create stable emulsion structures. The larger part of fat introduced into the multicomponent system will be in the form of an emulsion. The FRC of vegetable compositions is 1.2-1.5 times and 1.6-2.2 times of cereal (flour) compositions more than the control. This indicator correlates with the values of WHC. A correlation between VUS and FRS was established – 0.72. The developed technology provides an expansion of the range of functional chopped fish semi-finished products for preventive nutrition, increased biological value and improved functional, rheological properties.

**Keywords:** functional formulations, water- and fat-holding capacity, enrichment, micronutrients, vegetable raw materials



## **The influence of French mustard on the quality, safety and economic efficiency of the production of natural semi-finished products from marbled beef**

**Zinaida I. Lavrenova, Irina A. Babenko, Tatiana V. Zaletova**

**Abstract.** The article presents the results of the influence of physico-chemical and biological parameters of French mustard on the properties of portioned semi-finished products (steaks) from marbled beef, when spices are added to meat raw materials. Beef with a high marbling score is a unique product containing B vitamins, 20% of which are choline, a large amount of Omega-3 and Omega-6 fatty acids, up to 40% iron and phosphorus. Also, the marbling of meat affects the amount of cholesterol in meat – 40 mg per 100 g of meat, and the calorie content in the average 170-200 kcal per 100 g of the product. French mustard has a mashed thick mass without lumps with inclusions of whole or crushed mustard seeds. The color is yellow with a brown tinge. The taste is spicy with the aroma of spices. Mustard seeds have excellent nutritional and taste qualities, as well as biological and physico-chemical and preservative properties. 100 g of French mustard contains 170 kcal, up to 9% protein, 13% fat and 15% carbohydrates. The seeds are also rich in fat-soluble vitamins (A, B<sub>9</sub>, PP, D, E, K and P), fatty unsaturated acids (oleic – 7-12%, linoleic – 12-50%, linolenic – 4-17%, eicosene – 0-19%, erucic – 0-58%). Also, the chemical composition of grain mustard includes minerals such as copper, potassium, phosphorus, calcium, iron and manganese. As a result of the conducted research, it was found that the addition of French mustard to marbled beef steaks makes it possible to create a low-calorie product rich in easily digestible iron, which is recommended to be consumed in combination with folic acid (B<sub>9</sub>) contained in mustard seeds. Steaks with French mustard can be considered as a functional product that can be used by people for the prevention of anemia, cardiovascular diseases, for the normalization of fat metabolism, for the prevention of diabetes.

**Keywords:** portioned semi-finished products, steaks, marbled beef, French mustard, caloric content, physico-chemical properties, functional product

## **Flour confectionery products of functional purpose based on cottage cheese and pumpkin**

**Natalya T. Shamkova, Ilya O. Konyagin, Kirill Ya. Kechin, Alexandra V. Ivanova**

**Abstract.** The purpose of this research was the scientific and practical substantiation of the recipe and technology of functional cheesecake. The traditional dessert "Cheesecake" – an open pie stuffed with cream cheese – is a popular flour confectionery product in Russia and many countries of the world, the main disadvantage of which is the excess fat content, low content of protein, minerals, and dietary fiber. To eliminate these shortcomings, the authors substantiated the expediency of using a composite mixture of pumpkin puree and low-fat cottage cheese in a ratio of 50:50 as the basis of an innovative cheesecake. It has been established that the content in the base of the cheesecake is 1.5% apple pectin. The recipe and technology of cheesecake "Curd-Pumpkin" were developed. It has been established that the developed flour confectionery product, in comparison with the traditional one, has a higher nutritional and biological value, is low in calories. Thus, the degree of satisfaction of a person's daily need for physiologically

functional ingredients when consuming one serving of cheesecake increases in relation to protein by 6%, dietary fiber – by 15%, ascorbic acid – by 4%, while it decreases in relation to fat – by 23%, energy value – by 6%. The cost per unit of production per 1 kg is 698.06 rubles, while the expected production profit for 12 months is about 907.70 thousand rubles; cost-effectiveness ratio – 1.51; the payback period for production costs is 0.66 year, which confirms the economic efficiency of producing new products. The results of the study are of interest to food industry and catering enterprises producing functional products.

**Keywords:** flour confectionery, cheesecake, nutritional value, cottage cheese, pumpkin, functional products

## ECONOMY

UDK 338.436.33

### **Development of a corporate management model in the integration structures of the regional agro-industrial complex**

**Fatima I. Pilova**

**Abstract.** The article reveals the essence of corporate management and its role in the development of integration processes in the agro-industrial complex at the regional level. The necessity of professional management of companies to achieve the effectiveness of the results of their activities is substantiated. Competent construction of the corporate management system is one of the most important elements in ensuring the effectiveness of the integration structures. Corporate management includes a system of relationships and interactions between the subjects of integration and their founders. The article also proposes such management models as a model of the organizational structure of a regional economy subject, a structural model of corporate governance, a model of interaction between subjects of integration formation, a model of operational management of an intersectoral complex. For the purposes of building corporate governance, the need to improve the skills of management personnel and the level of legal awareness of all employees of the company becomes relevant both at the level of a separate organization and at the level of integration structures. Improving the corporate management system in the company should lead to strengthening the role of the institution of independent directors, developing and adopting corporate governance codes, revising the practice of remuneration of top management and directors of integration entities in the agro-industrial complex.

**Keywords:** corporate management, integration processes, regional economy, agro-industrial complex, company

UDK 338.43:631.1(470.64)

### **The state and main dynamic and structural trends of agricultural development in the KBR in 2010-2020**

**Khadis M. Rakhaev, Madina N. Eneeva, Agnesa V. Shakhmurzova**

**Abstract.** The Kabardino-Balkarian Republic is one of the dynamically developing subjects of the south of Russia, the main branch of which is diversified agriculture. The growth rates in the

industry are higher than the average for the regional economy, and from 2015 to 2020 they are also higher than the average for Russia and are characterized by stability. It is noteworthy that the industry also induces growth in related industries (processing, seed farming, construction, energy, etc.). The very dynamics of agriculture is created by the original architecture of factors and conditions of the formed organizational and economic model. At the same time, contradictory trends are observed in certain segments, sub-sectors and sectors. For example, there is a decrease in the gross harvest of certain types of agricultural crops, a reduction in their acreage and productivity of various types of livestock, individual segments of the feed base, but, on the other hand, the growth of gross collections of other types of crops, yields, livestock and productivity, feed costs and applied mineral fertilizers. In this regard, it deserves attention to study not only the dynamic trends of individual factors, but in general the architecture of the growth development of the industry as a whole, as well as individual subcomplexes, sectors and segments. The solution of this problem is not only tactical in nature (identification of trends), but also strategic (development of prospects for the development of the industry and its constituent sectors and segments). The task also has an important theoretical, methodical and methodological character, because it allows to identify, formalize, quantify and verify a number of new phenomena that appear in the interactions of factors separately, as well as in a certain ensemble.

**Keywords:** agriculture, subcomplexes, sectors, segments, growth, growth architecture