

PRIORITY TASKS AND THE ALTERNATIVE TRENDS OF INNOVATIVE DEVELOPMENT FOR NATIVE ZOOENGINEERING SCIENCES AND TECHNOLOGIES OF PRODUCTION OF ECOLOGICALLY SAFE, BIOLOGICALLY VALUABLE PRODUCTS OF ANIMAL HUSBANDRY AT COMPLEXES NEW GENERATIONS

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***Summary.** In article the alternative conceptions of innovative development for native zooengineering science and technologies of production of ecological safe, biological valuable products of animal husbandry at complexes new generations on coming 20-30 years have been presented due to ensure securing the decision of problems realization of genetic potential of productivity, starvations and hunger mortalities of population in lowdeveloped countrys, successful animal husbandry at global warming, get free 150-200 millions hectares of arable from forages production in planets scale and use of it for food cultures, that is a defence from starvations about 1 milliards population of the planets of Earth.*

***Key words:** innovative development, alternative technologies of feeding and housing of animals, earth-energy saving, ecological safety, complexes of new generations, global warming, problem of starvations.*

Problem urgency. The mankind history convincingly testifies, that primary factors of scientific and technical progress and dynamic development of a society are on principle new ideas, discoverys, inventions, concepts, the newest methods, tools, innovative production technologies of material means and population foodstuff, and the basic restraining of this progress are stereotypes of inert thinking of people and the negative relation to all to the newest, unusual. And everything, new, useful to a society though and with great difficulties, but sooner or later, reaches practical development.

In the third millenium the mankind has entered with amazing achievements of scientific and technical progress, but with an unresolved global problem of hunger and insufficient providing of the population of a planet with high-quality foodstuff and, first of all, biologically high-valuable protein of an animal origin on scientifically well-founded norms. The fundamental problem - a disproportion between prompt increasing population and inadequate increase in production of foodstuff is not solved, first of all, an animal origin, a consequence of that is chronic starvation and extinction of tens and hundreds millions

people in underdeveloped countries of the African and Asian continents.

This tragedy will last, in our opinion, until the mankind will not seize the next 15-20 years alternative, to the earth-energo - and resourcessavings system large-scale, all-the-year-round, hydroponics production of ecologically safe, biologically high-valuable forages and feeding of agricultural animals on principle new, almost inexhaustible, energy basis - energy of the Sun in a complex with energy biofermented in methantanks manures, a plant growing wastes, and also a winds.

Well-known traditional systems and technologies foragesproduction and feedings of agricultural animals have the basic lacks, limiting achievement of genetic potential of productivity, reproductive ability, productive longevity of animals and production of high-quality, ecologically safe livestock products. These lacks are:

- Huge (to 20-50 percent and more) losses of nutritious and biologically active substances, especially vitamins, irreplaceable amino acids, polynon-saturated fat acids, sugars in the course of preparation and storage of traditional forages (a silo, hay, haylage) in foragestorehouses;
- Deficiency of carotin and vitamin A in forages of the stall period of the housing of animals that is the main reason of their low reproductive ability, the limited productive longevity of cows, an immunodeficiency and the lowered resistance to diseases;
- Necessity of huge financially-resource investments for building and the equipment foragestorehouses, forageshops, foddersmixes plants;
- Low levels of conversion and productive action of traditional forages on transformation of energy and a protein in energy and protein of cattle-breeding production because more than half of energy of usual forages it is spent by animals not for production, and on providing of ability to live of an organism, heatproduction and neutralisation of the raised fodder stresses;
- Ecological safety of forages and livestock products owing to large-scale use of herbicides, pesticides, chemical fertilizers is not provided at traditional system of cultivation of forage crops and technogenic and radionuclide pollution of soils, forages and cattle-breeding production;
- Social and economic impossibility, or the extremely limited possibility of take out of the arables areas from forage lands for the purpose of evacuation from radionuclides, heavy metals, other harmful chemical substances of a technogenic origin and for strategic, at level of national safety, providing increase of gumuses in soils and their fertility;
- Irrational use of ground resources on requirement foragesproduction, when practically 40-50 percent of an arable land are taken away under cultivation of forage cultures instead of necessary 20-25 percent due to of de-

velopment of innovative, alternative system all-the-year-round hydroponics production vitamine- microelements the green forages, developed and patented by authors of this article.

As it is known, under forecasts of scientists NAAS of Ukraine and corresponding competent establishments, the next 20-30 years in southern regions of Ukraine (Kherson, Nikolaev, Odessa, Dnepropetrovsk, Kirovograd), in southeast (Donetsk, Lugansk) and in the south and the east Kharkov areas, and also the Russian Federation extreme increase of summer temperatures to level of the African heats is expected, which will influence sharply negatively on physiological and immune condition of animals, dairy productivity, reproductive ability, productive longevity of highly productive cows, especially holsteins breeds and the genotypes, not enough adapted even to the present conditions of the providing and feeding. Therefore, achievement of their genetic potential of dairy productivity (8-10 thousand the milk, kg), reproductive ability (90-95 calfs on 100 cows), productive longevity (to 4-5 lactations) in the conditions of extreme high temperatures and biologically defective feeding is extremely problematic, and the dairy cattle breeding will be unprofitable, noncompetitive without development on principle new, adapted, physiologically comfortable, energy-resursosafety, innovative systems of the housings of animals and alternative, all-the-year-round stable, biologically high-valuable production technologies of forages and normed feedings on modern to the detailed norms.

The purpose of researches. A scientific substantiation of priority problems and alternative directions of innovative development of a domestic zooengineering science and production technologies of ecologically safe, biologically high-valuable livestock products on complexes of new generation.

Materials and methods of researches. Results of experimental researches and generalisation of the domestic and world workings out presented in the author's monography «Altenatively-innovative, soil-energy saving system of high-valuable feeding and the comfortable housing of highly-productive animals on farms and complexes of new generation XXI of century in the traditional and extremely conditions of global warming» are used.

Results of researches. The perspective earth-energy-resourcessavings, ecologically safe production technologies of biologically high-valuable forages and the livestock products, capable to provide the decision of a global problem of hunger and extinction of millions people on planet Earth, on principle new, alternative production technologies of milk, beef, mutton, other livestock products (meat of ducks, geese, ostriches, partially pork) on the basis of all-the-year-round conveyor cultivation of green forages grains cultures with method hydroponics (without soil) in developed and patented by authors system (V.N.Kandyba, E.I.Chigrinov, A.M. Mamenko) with shops hydroponics which work on energy of the suns, a winds and the biofermented manures, vertically

blocked with deepened buildings for the housing of animals.

Innovative alternative technologies of high-valuable feeding of highly productive agricultural animals with use green hydroponics forages.

In the conditions of ecological trouble and it is constant world increasing population when traditional technologies do not provide production in enough of non-polluting, high-quality livestock products, it is necessary to develop and master alternative, on principle new technologies of feeding of cattle and other kinds of agricultural animals. The basic requirements to perspective technologies of feeding of cattle, for example, by milk and beef production, on farms and complexes XXI-st century should be:

- The organization on principle new, ecologically safe, isolated from the polluted environment, system foragesproduction on the basis of all-the-year-round conveyor hydroponics cultivation of green forages from fodder grains cultures - barley, oats, corn, peas, a soya and others on special technology which provides simultaneous balancing of diets for the account hydroponics microelementized green forages for achievement of genetic potential of productivity and high reproductive ability of animals in conditions radionuclids and industrial pollution of fodder grounds;
- Use in diets to 60-70 % on nutritiousness hydroponics green forages and 30-40 % special antiradionuclides, poorconcentrates, the granulated mixed fodders with the raised contents fibers, a complex of microelements, dry pulps and other special components for removals radionuclides, heavy metals, nitrates, nitrites from an organism of animals;
- Rationing of diets on improved to the domestic detailed norms of feeding of a cattle and other animals, optimised in a direction of increase in dry matter of concentration of vitamins A, E, C, groups B, microelements (zinc, selenium, copper, manganese, cobalt and others) and macroelements (calcium, sulphur, magnesium, etc.);
- The computerised system of distribution on fodder tables of forages in a kind alldiets forage a mix with optimum frequency rate (2-3 times a day), the maximum consumption of dry matters and metabolizables energy on 100 kg live and metabolic ($M^{0,75}$) masses due to of high biological value of the forages, the digesting juice of qualities raised flavouring, aromatic and stimulating allocation, and also by means of developed in animals conditioned reflexes on distribution of a forage accompanied by classical music, singing of birds and additional inclusion of green illumination of feeding tables during forage distributions;
- Use in diets in structure premixes and mixed fodders special antistressful, adapting, immunestimulating substances, as providing factors at high level of a homeostasis, functional reactance of immune system and health of animals in the conditions of ecological troubles and radionuclides pollution of

forages;

- Economy of traditional kinds of energys, fuels, the electric energys due to of priority all-the-year-round use of solar energys by means of vertical blocking of shops on production hydroponics green forages with a transparent roof with semi deepened buildings for the housing and feeding of animals for the purpose of use heatproduction and carbonic acids of animals at cultivation of green forages in shop hydroponics;
- Use in winter and transition periods for heating of hydroponics shops of energy of the methane received in the process of a biofermentation of manures in methantanks and transformed to the electric energy or in thermal energy in gas burners.

Calculations on the basis of received results of work of functioning foreign and domestic shops of hydroponics testify, that potential productivity of 1 hectares of the vegetative area hydroponics fields at conveyor all-the-year-round cultivation makes of 10-12 and more thousand tons of vitamine-proteinous, biologically high-valuable, green forage, which in 250-300 times exceeds annual productivity of green forages from 1 hectare blackearthes at traditional, seasonal, the earth-energy expenseresources technologies of cultivation and feedings usual forages (a silo, haylage, hay). So, 1 hectare of the vegetative area hydroponics fields at all-the-year-round conveyor cultivation of a vitamin green forage can really replace 250-300 hectares of forages grounds and at the same time in tens and hundreds times to raise the contents of a vitamin complex - carotin, vitamins A, E, C and groups B in hydroponics forages.

In Ukraine in 1990 total gathering of corn on a silo, haylage, the green forage made 98,372 million tons, and also other forage crops on a silo (without corn) - 1,282 million tons, in all 99,654 million tons, on the average 100 million tons. At actual productivity of corn on a silo, haylage, a green forage of 208,0 c/hectare, the area of crops made 4,791 million hectares. Such quantity of a silo it is possible to replace with adequate quantity green hydroponics forages - 99,654 million tons, due to of a removals from forages use of 4,791 million hectares of an arable lands, on which really annually in addition to grow up 24 million tons of food wheat (4,791 million in hectares \times of 5 t/hectar = 23,955 (24 million tons) for the sum roughly 48 billion hrn. (6 billion dollars). It is enough such quantity of in addition grown up food wheat for full, scientifically proved, nutritions with a food of 24 million people in Ukraine or the starving 24 million population in the countries of Africa, Asia.

For production of 100 million tons green hydroponics forages (GHF) it is necessary to have 10 thousand in hectares of the vegetative area hydroponics shops for all-the-year-round, conveyor (daily) cultivation green hydroponics forages, considering that on 1 hectare hydroponics fields in a year grows up 10 000 tons of a vitamin green forage: 10 000 hectares \times 10 000 tons = 100 million

tons GHF.

Practically, in animal industries of agrarian and industrial complex of Ukraine with that end in view it is necessary to equip 10 000 hydroponics shops with annual productivity on 10 000 tons everyone, or 5 000 hydroponics shops on 20 000 tons GHF, with the vegetative area on 1 and 2 hectares everyone, accordingly. Rationally hydroponic shop to equip in each farm, a complex, breeding factory, agrofirma, which, except removals on 250-300 hectares of an arable land from foragesproductions at the calculation on 1 hectare vegetative hydroponics the shop areas hydroponics, will guarantee increase dairy, meat and other kinds of productivity of agricultural animals on 20-30 % and corresponding increase of providing of the population of the country by high-quality, ecologically safe livestock products to level of medical norms of a food.

As it is known (Sokol A.I., Grimblat S.O., Batyr J.G., etc., 2012), an arable lands total area in the world makes 1381,2 million in hectares, from them more than half is occupied under the grain crops, which production (cereals and leguminous) in 2010 made 2499, 9 million tons. It is slightly less than half of areas of an arable lands, occupy the areas under forage crops, reaching about 500-600 million hectares. Removals to 30 % of this arable lands, occupied under foragesproduction for animal industries, i.e. 150-180 million hectares and cultivation on this area of food wheat, with productivity to 50 c/hectare (5 t/hectares), will ensure in addition 750-900 million tons of food grain, i.e. will protect from hunger of 750-900 million starving world's population, and, as it is known, today in the world 1 billion people in the countries of Africa, Asia and the South America starves.

Decrease of the silo, haylage, green forages productions in field foragesproduction entirely it is really possible to compensate reduction of production of forage crops for the account of adequate quantity green hydroponics forages, which are all-the-year-round grown up in hydroponics shops, 1 hectare of which vegetative areas in 250-300 times exceeds on mid-annual productivity of vitamin green masses of an arable land of 1 hectare in field foragesproduction at traditional seasonal technology of cultivation, for example corn on a silo, annual and long-term grasses on haylage.

So, 1 hectare hydroponics fields can replace on productivity of green forages of an arable lands of 250-300 hectares, and all in the world, for removals of 150-180 million hectares of an arable lands from field cultivation of forage crops, it is necessary to equip: 150-180 million in hectares: 300 = 500-600 thousands in hectares of the vegetative area hydroponics shops, i.e. 500-600 thousand of hydroponics shops the area on 1 hectare everyone, which will produce on 10 thousand tons green hydroponics forages at the rate on 1 shop in a year that will make all 5-6 billion tons ecologically safe, with raised vitamin, amino acids, fat acids, fermental value green forages.

As it is known from domestic and foreign practical operating experience, hydroponics installations and shops, productivity of vitamin green forages from 1 m² the vegetative area for 8-10 days of cultivation makes, without problems, 30-40 and to 50 kg, and in a month in 3 cycles for 10 days everyone – on the average 100 kg, in a year in 36 cycles × of 10 days - 1200 kg, we round off to 1 ton.

So, if 1 m² the vegetative area hydroponics shops throughout a year at conveyer-all-the-year-round cultivation from foddergrains cultures (barley, oats, corn, peas, etc.) yields a harvest of a green forage of 1 ton about 1 hectare (10000 m²) it is grown up in a year, without problems, 10000 tons unique vitamin, biologically high-valuable, non-polluting, soilsaving a forage, which can replace 10000 tons of usual tinned forages (a silo, haylage) and a part of concentrates in diets of a highly productive cattle, sheep, pigs, rabbits at simultaneous reduction of the areas of an arable land by 250-300 hectares in structure foragesproduction. In the conditions of such innovative technology the basic energy source for illumination, photosynthesis, heating of the vegetative area of shop green hydroponics forages is energy of the sun which replaces electric energy.

In planetary scale removals to 30 % of an arable lands from spheres foragesproduction for animal industries branch in sphere of cultivation of food cultures (for example wheat, a soya) for a food for the starving population will really provide the decision of the most actual modern problem of hunger and extinction of tens and hundreds millions people in underdeveloped countries of Africa and Asia and appreciably preventive of an immunodeficiency and other diseases of the population in XXI century on planet Earth.

In the conditions of unprecedented approach the next 20-25 years on the south of Ukraine, the Russian Federation it is extreme high temperatures, droughty summer, sharp reduction of production of high-quality green, juicy, rough forages the agrarian science should urgently, till 2015-2020, work out adequate, on principle new systems of physiologically comfortable housings and high-valuable feeding of highly productive dairy and meat cattle for the purpose of realisation, even in extreme conditions, its genetic potential of productivity, reproductive ability and productive longevity.

Conceptual technological decisions, concerning creation comfortable, the earth-energy - resourcessaving systems of the housings of highly productive cows in a complex with all-the-year-round production biologically high-valuable, a vitamine-microelementizirungs of the green forages which have been grown up from grainsforages of cultures by an advanced method hydroponics, are presented in article and the monography.

Conclusions

1. On complexes and farms of new generation XXI of century in usual

and extreme conditions of global warming (or cooling snaps), have been presented in the monography-reference book the alternative-innovative system of high-valuable, ecologically safe feedings and physiologically comfortable housings of highly productive animals is developed for specialists, managers, heads of animal industries of agrarian and industrial complexes, farmers, scientists-agrarians, masters degrees, teachers of technological disciplines of production of animals products in agrarian high schools and colleges.

2. Practical installation of on principle new technological decisions of the housings and feedings of highly productive animals on the next 20-30 years will provide elimination of thermal and forages stresses for animals, microclimate stabilisation in buildings at the minimum expenses of energys resources, production of ecologically safe animal-breeding productions without pesticides, nitrates, with the raised biological fullvalue, reduction on 20-30 % of the ground areas under forage crops, an exception of annual losses of 20-40 % of nutrients at storage of a silos, hays; reduction on 30-40 % of investments on building foragestorehouses and on 50-80 % on purchase and production of vitamin preparations, premixes; increase on 20-30 % of dairy, meat productivity and reproductive ability of animals on industrial farms and complexes of new generation XXI of century.

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ПРІОРИТЕТНІ ЗАВДАННЯ І АЛЬТЕРНАТИВНІ НАПРЯМКИ ІННОВАЦІЙНОГО РОЗВИТКУ ВІТЧИЗНЯНОЇ ЗООІНЖЕНЕРНОЇ НАУКИ І ТЕХНОЛОГІЙ ВИРОБНИЦТВА ЕКОЛОГІЧНО БЕЗПЕЧНИХ, БІОЛОГІЧНО ПОВНОЦІННИХ ПРОДУКТІВ ТВАРИННИЦТВА НА КОМПЛЕКСАХ НОВОГО ПОКОЛІННЯ

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Анотація. У статті представлені альтернативні концепції інноваційного розвитку вітчизняної зооінженерної науки і технологій виробництва екологічно безпечних, біологічно повноцінних продуктів тваринництва на

комплексах нового покоління в майбутні 20-30 років, широкомасштабне освоєння яких дозволить вирішити проблеми реалізації генетичного потенціалу продуктивності тварин, голоду і підвищеної смертності населення в слаборозвинених країнах, успішного ведення тваринництва в умовах глобального потепління, вивільнення 150-200 млн. га землі, зайнятої під кормовиробництвом у планетарному масштабі і перепрофілювання її під продовольчі культури, що врятує від голоду 1 млрд. населення планети Земля.

Ключові слова: інноваційний розвиток, альтернативні технології годівлі та утримання тварин, земле-енергозбереження, екологічна безпека, комплекси нового покоління, глобальне потепління, проблема голоду.

**ПРИОРИТЕТНЫЕ ЗАДАЧИ И АЛЬТЕРНАТИВНЫЕ НАПРАВЛЕНИЯ
ИННОВАЦИОННОГО РАЗВИТИЯ ОТЕЧЕСТВЕННОЙ ЗООИНЖЕНЕР-
НОЙ НАУКИ И ТЕХНОЛОГИЙ ПРОИЗВОДСТВА ЭКОЛОГИЧЕСКИ
БЕЗОПАСНЫХ, БИОЛОГИЧЕСКИ ПОЛНОЦЕННЫХ ПРОДУКТОВ
ЖИВОТНОВОДСТВА НА КОМПЛЕКСАХ НОВОГО ПОКОЛЕНИЯ**

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Аннотация. В статье представлены альтернативные концепции инновационного развития отечественной зооинженерной науки и технологий производства экологически безопасных, биологически полноценных продуктов животноводства на комплексах нового поколения в предстоящие 20-30 лет, широкомасштабное освоение которых позволит решить проблемы реализации генетического потенциала продуктивности животных, голода и повышенной смертности населения в слаборазвитых странах, успешного ведения животноводства в условиях глобального потепления, высвобождения 150-200 млн. га земли, занятой под кормопроизводством в планетарном масштабе и перепрофилирования ее под продовольственные культуры, что спасет от голода 1 млрд. населения планеты Земля.

Ключевые слова: инновационное развитие, альтернативные технологии кормления и содержания животных, земле-энергосбережение, экологическая безопасность, комплексы нового поколения, глобальное потепление, проблема голода.
