

**SCIENTIFIC BEGROUNDING OF GENERAL BIOLOGICAL REGULARITIES OF FEED-CONVERSION ABILITY, FORMING AND PROGNOSED OF MEAT PRODUCTIVITY OF CATTLE IN ONTOGENESIS AND NEW MODERN NATIVE FEEDING NORMS**

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***Summary.** The generalized experimental begronnded conclusions, biological regularitys of feed-conversion forming and prognosing of meat productivity of youngsters cattle in ontogenesis and new fundamental conceptions, developed of author, in context of perfection of native feeding norms have been presented*

***Key words:** feeding norms, feed-conversion ability, biological regularitys, forming of meat productivity, ontogenesis, model, norms setting, feeding.*

**Problem urgency.** The created outstanding genofund of new breeds of a cattle with the raised genetic potential of dairy and meat efficiency, but sensitive to disbalanse of nutritious and biologically active substances in traditional economic diets at rationing on out-of-date norms and technologies of feeding, demands fundamental improvement of system of rationing, technology and technics of feeding, the maximum improvement of quality and biological value of forages of in actual practice raised ecological pressure in the majority of regions of Ukraine.

In our opinion conceptual modern requirements to the organization normed, biologically high-grade feeding of highly productive dairy and meat cattle in economy of Ukraine forthcoming 10-20 years should be:

- Program scientific and practical maintenance of actual achievement of genetic potential of dairy and meat productivity of cattle of existing breeds and genotypes;
- Physiological-technological maintenance of the maximum conversion ability of cows, heifers and fattened youngsters on transformation of energy and a protein of forages in energy and protein of dairy and meat production;
- Manufacture high-quality, biologically high-grade, at level European and the world standards, competitive cattle-breeding production;
- Increase to level of pedigree potential of reproductive ability, resistance to diseases and productive industrial longevity of cows to 5-6 lactations;
- Reduction in 1,5-2 times of expenses of forages and cumulative energy resources on 1 c milk and beef against actual level in branch of dairy cattle breeding;

- Decrease in the cost price 1 c milk and beef and growth of profitability of their manufacture to level of highly productive conducting branch at the expense of decrease in the cost price of 1 MDg of metabolizable energy and 1 kg a protein of forages;
- Guarantee of ecological safety of home dairy and meat production at level of the world standards.

Existing out-of-date norms and technologies of feeding of a cattle in Ukraine do not meet modern requirements to the organization of biologically high-grade feeding of highly productive animals and demand fundamental improvement and appreciably replacement.

**Materials and methods of researches.** Results of long-term experimental researches of the author and its generalisation of the newest scientifically-practical experience of the best foreign and home agofirms, complexes, scientists and experts in the field of cattle breeding are used.

**Results of researches.** For the first time, in a context new, developed by the author, member-correspondent NAAN of Ukraine, professor V.M. Kandyba of modern theoretical concepts and breeds technologies of growth and feeding of young bull-calves to optimum high body weights standards of 550-650 kg in 21-24-monthly age, are opened, experimentally proved and patented biological regularities of formation and forecasting of their meat productivity and feed-conversion ability in ontogenesis.

First in context of new, developed modern theoretical conceptions and breeds technologys of growth and fattening young bulls to optimal higher slughters conditions of 550-650 kg in 18-24 month, biological regularitys to forming and prognosing of their meat productivity and feed-conversion ability in ontogenesis, discovered experimental grounded and patented by corresponding member of NAAS Ukraine, professor V.N. Kandyba

Conducted by a professor V.N. Kandyba complex researches on the problems of consumption, metabolism, deposit and efficiency of the use of energy and protein on the synthesis of meat products for bull-calves at growing to different living mass (100-650 kg) and age from 3-6 to 18-24 months in ontogenesis gave to him a base to ground key regularitys to forming of the meat productivity and food-conversion ability of youngsters of cattle in ontogenesis:

- with the increase of living mass of bull-calves in the process of growth in ontogenesis regularity the relative consumption of dry matter and metabolizable (to accessible for an metabolism energy) of foods and it metabolic parts on heat-production + maintenance metabolism on unit (100 kg) of living mass diminishes and the accumulation of energy rises in edible part of carcasses on unit of mass and area (1 m<sup>2</sup>) of surface of body; a relative consumption and accessible for an metabolism energy is stable on heatproduction + maintenance of life on unit of area of surface of body;

- relative intensity of metabolism (relative losses) of energy diminishes on heatproduction + maintenance of life from a calculation on unit of living mass of bull-calves in ontogenesis, that is consequence of reduction of relative surface of body on unit of mass of body; taking into account that heatlosses an organism proportional to free-surface of body, therefore, than greater mass of body, the less his relative surface, less than formation of heat is needed for maintenance of temperature of body and less than lost heat in an environment;

- with the increase of age and mass of bull-calves in ontogenesis the synthesis of protein goes down in a body and in this connection the expenses of energy diminish on the processes of metabolism and synthesis of protein, that reduces the level of metabolism of accessible for an metabolism energy on heatproduction calculating on unit of mass of body;

- regularity to growth and forming of the meat productivity of bull-calves in ontogenesis is a decline of coefficients of conversion of protein of feed in the protein of meat products because of next principal reasons:

- diminishing of consumption and retention of nitrogen of feed on 100 kg of living and metabolic mass of body both in absolute and logarithm expression;
- decline of efficiency of the use of nitrogen of feed on 100 g of the consumed and digestible nitrogen;
- diminishing of retention of nitrogen in a body and albumen in beef of carcass from a calculation on 1 MDg of metabolizable energy, metabolic ( $M^{0.75}$ ) mass of body consumed and retented on 100 kg;
- diminishing of retention of nitrogen in a body and protein in meat of carcass from a calculation on unit of surface of body of bull-calves;
- with the increase of living mass and age of bull-calves at the intensive growing (average daily increases are 0,9-1,0 kg) efficiency of the use of the consumed metabolizable energy grows on a retention in meat and fat of carcasses, but goes down on a retention in a protein;
- like efficiency of the use of metabolizable energy, consumed over expenses on maintenance grows also, that bound by the high positive coefficients of correlations from  $0,70 \pm 0,19$  to  $0,87 \pm 0,14$  with living and metabolic mass of body of bull-calves ( $P < 0,001$ );
- efficiency of the use of accessible for an metabolism energy rises on a retention in meat of carcasses, expressed on the known system ARC (1980) as a relation  $\Delta$  (delta) of increase of retention of energy in meat of carcass to  $\Delta$  the increase of consumption of accessible for an metabolism energy, and characterized by the coefficients of correlation  $0,57 \pm 0,27$  with living and  $0,67 \pm 0,25$  with metabolic mass of body.

V.N. Kandyba experimentally grounded (1978-2000) basic regularitys and advantages of the intensive forming of the meat productivity at growing of bull-

## Проблеми зооінженерії та ветеринарної медицини

calves to the high body weight and for slaughter standards (600-650 kg):

- improvement of for slaughter indexes and morphological composition of carcasses : gain in weight of carcass from 200-250 to 300-350 kg, meat in carcass from 160-200 to 240-280 kg, coefficient of meat from 4,0-4,5 to 5-5,5, for slaughter output from 55-57 to 59-63%, output of carcasses from 53-54 to 56-58% ( $P < 0,01-0,001$ );
- by characteristic regularity at the intensive growing of bull-calves there is forestalling of rate of improvement of for slaughter indexes to the high for slaughter standards, morphological composition of carcasses by comparison to the increase of living mass : if living mass on the average increases on 35-40%, then mass of carcass on 41-50%, meat on 40-48%;
- increase of synthesizing ability of heavy bull-calves to the increase of edible meat products (meat, albumen, fat) both on a head and on 100 kg of living and metabolic mass and on one day of life for a complete technological cycle from birth to the slaughter, that is fundamentally important in an economic aspect;
- an regular ( $P < 0,001$ ) intensive increase is in the beef of heavy bull-calves of content of edible matters, protein + of fat in optimal for consumers attitude of albumen toward fat from 1,5-2:1 to 1:1 and gradual diminishing (on 1-1,5%) of content of albumen;
- the dominant factor of forming of the meat productivity and chemical composition of beef in of carcasses is living mass in optimal age and mass of carcasses, as a function of living mass and energy level of feed; a energy feed through mass and chemical composition of carcasses influences on achievement of chemical maturity of beef, when content of fat in her approaches content of albumen.

The system of pair (110) and plural (75) equations is worked out with the use of computer regressions, in which biological regularitys and parameters of consumption, retention, are mathematically shown in meat of carcasses and efficiency of the use of metabolizable (accessible for an metabolism) energy, retention of albumen, fat, albumen + of fat in meat of carcasses, of albumen in meat of carcasses. Some of plural equations of regression are given below:

- Retention of energy in meat of carcass for twenty-four hours (MDg) –  $Y_1$ , depending on middle metabolic ( $M^{0,75}$ ) mass of body ( $M_1 + M_2$ ) : 2 from birth to the slaughter ( $X_4$ ) and size of accessible for an metabolism energy over a maintenance metabolism calculating on middle living mass from birth to the slaughter (MDg) –  $X_8$ .  
 $Y_1 = 0,8536X_4 - 0,002122X_8 - 1,75$  (coefficient of plural correlation 0,89, error of aproximation 7,0%).
- Retention of energy in meat of carcass for twenty-four hours  $Y_2$  depending on middle metabolic ( $M^{0,75}$ ) mass of body ( $M_1 + M_2$ ) : 2 from birth to the

slaughter ( $X_4$ ) and size of accessible for an metabolism energy on a growth and fattening (MDg) -  $X_9$ .

$Y_2 = 0,0829X_4 - 0,0079X_9 - 1,8538$  (coefficient of plural correlation 0,89, error of approximation 6,9%).

- Retention of energy in meat of carcass for twenty-four hours calculating on 100 kg of middle metabolic ( $M^{0,75}$ ) mass of body from birth to the slaughter (MDg) -  $Y_3$  depending on middle metabolic mass ( $X_4$ ) and net energy on an increase in a body (MDg) -  $X_{11}$ .

$Y_3 = 0,00831X_4 - 0,016X_{11} - 1,8496$  (coefficient of plural correlation 0,88, error of approximation 6,9%).

- Efficiency of the use of accessible for an metabolism energy, consumed over expenses on maintenance, retention of albumen (on middle living mass from birth to the slaughter), -  $Y_4$  depending on middle metabolic ( $M^{0,75}$ ) mass of body from birth to the slaughter ( $X_4$ ), to accessible for an metabolism energy on heatproduction -  $X_{10}$ , percentage ratio of accessible for an metabolism energy, consumed over expenses on maintenance to consumed metabolizable energy  $X_{35}$  and average daily increase, g of  $X_{73}$ .

$Y_4 = 17,1518 - 0,0815X_4 + 0,07514X_{10} - 0,25507X_{35} + 0,00543X_{73}$  (coefficient of plural correlation 0,95, error of approximation 4,8%).

- Efficiency of the use of accessible for an metabolism energy, consumed over expenses on maintenance, on the retention of albumen (on middle living mass from birth to the slaughter) -  $Y_5$  depending on middle metabolic mass of body from birth to the slaughter ( $X_4$ ), consumed metabolizable energy on middle living mass from birth to the slaughter, MDg ( $X_6$ ); metabolizable energy on maintenance on middle living mass from birth to the slaughter for twenty-four hours, MDg  $X_7$ .

$Y_5 = 7,0306 - 0,01677X_4 - 0,07997X_6 + 0,10864X_7$  (coefficient of plural correlation 0,93, error of approximation 6,7%).

- Day's retention in meat of carcass of albumen + of fat in the optimal relation of 1-2:1 on 100 kg of middle clean (without a digestive channel) living mass from birth to the slaughter, g ( $Y_6$ ) depending on middle living mass from birth to the slaughter of  $X_9$ , accessible for the metabolism of energy over expenses on a maintenance metabolism calculating on middle living mass from birth to the slaughter ( $X_3$ ) and net energy on an increase in a body calculating on middle living mass from birth to the slaughter -  $X_{11}$ .

$Y_6 = 73,683 - 0,10437X_3 + 0,05433X_8 - 0,0845X_{11}$  (coefficient of plural correlation 0,87, error of approximation 3,9%).

- Day's retention in meat of carcass of albumen+of fat in the optimal relation of 1-2:1 on 100 kg of middle clean (without a digestive channel) living mass from birth to the slaughter, g ( $Y_7$ ) depending on middle metabolic ( $M^{0,75}$ ) mass from birth to the slaughter ( $X_4$ ) (kg), to accessible for an metabolism

energy over expenses on a maintenance metabolism calculating on middle living mass from birth to the slaughter of  $X_8$ , and net energy on an increase in a body calculating on middle living mass from birth to the slaughter -  $X_{11}$ .

$Y_7 = 82,613 - 0,5712X_4 + 0,05395X_8 + 0,1703X_{11}$  (coefficient of plural correlation 0,87, error of approximation 4,1%).

- Day's retention in meat of carcass of albumen + of fat in the optimal relation of 1-2:1 on 100 kg of middle net (without a digestive channel) living mass from birth to the slaughter, g ( $Y_8$ ) depending on middle metabolic ( $M^{0,75}$ ) mass from birth to the slaughter ( $X_4$ ) (kg) and accessible for an metabolism of energy on a height and fattening calculating on middle living mass from birth to the slaughter, MDg -  $X_9$ .

$Y_8 = 83,978 - 0,55368X_4 + 0,06219X_9$  (coefficient of plural correlation 0,87, error of approximation 3,9%).

### **Contribution of V.N. Kandybas to development of native new norms and technologies of feeding of cattle**

- The scientific analysis of the systems and detailed of the newest systems of setting of norms and technologies of feeding with of highly productive dairy and meat cattle the USA, Great Britain, Germany, Russia and last home gone into detail norms of feeding of animals in Ukraine is conducted;

- Of principle lacks and certain lag of the home system of setting of norms and technology of feeding of dairy and meat cattle are certain, for example, in relation to energy in outs forage units, to protein on raw and digestible protein, to the raw cellulose without the account of setting of norms neutrally-detergent and acid-detergent fractions; on amino acids, some oligoelements (selenium); to the vitamins ( $B_5$ ).

- The key value of optimization of concentration of metabolizable energy is reasonable in unit of dry matter of forage of rations, as a main factor of size of coefficients of digestibility of nutritives, output of metabolizable energy from gross, to efficiency of the use of metabolizable energy on maintenance, synthesis of albumen and fat of products, to the general requirement of animals in energy and the necessity of differentiation of norms of energy nutrition of cattle is accented depending on the concentration of metabolizable energy in a dry matter;

- The key role of maximal consumption of dry matter of forage is certain on 100 kg of living mass, as one of major physiological factors of forming of the milk and meat productivity of highly productive cows and intensively grown meat youngsters, that provides common day's consumption of metabolizable energy;

- Basic regularitys of the normed consumption of dry matter and metabolizable energy are grounded on 100 kg of living mass of cows, heifers, bull-calves

depending on living mass and concentration of metabolizable energy in 1 kg of dry matter of forage of ration;

- Parameters are certain minimum to the necessary concentration of metabolizable energy in 1 kg of dry matter of rations depending on the milk and meat productivity, the norms of feeding are calculated depending on minimally necessary, middle and maximal concentrations of metabolizable energy in a dry matter with differentiation in relation to physiology periods, phases of lactation, yield, living mass of cows;

- The new indexes of the normed nutrition are taken into account for highly productive cows: fissionable and unfissionable in a rumen protein, used protein, neutrally-detergent and acid-detergent cellulose, selenium, vitamin of B<sub>5</sub>, irreplaceable amino acid (lysin, a methionine + cystine, leucine, histidine);

- Scientifically grounded together with prof. V.I. Gnoevyy, I.V. Gnoevyy physiological, zootechnical, technological, ecological and economic advantages of the stable system of the whole-year feeding with of cattle high-quality, priority feeds from foodstorages in the extreme and ordinary conditions of conduct of the dairy and meat cattle breeding in most regions of Ukraine above the traditional seasonal system of feeding with the use of green forage;

- Worked out and scientifically grounded the effective system of production of premixes of new generation;

- Together with prof. V.I. Gnoevyy, I.V. Gnoevyy receptures, priority, fundamental advantages and possible some lacks of fullration mashes, balanced on the improved norms of feeding, prepared and given away on forage tables by mobile mix-distributers have been grounded;

- World experience and concrete practical methods of prophylaxis of violations of digestion, metabolism, trophonosis of highly productive cows in different physiological periods and phases of lactation is generalized;

- Breeds technologies of growing and feeding of bull-calves are worked out 6 breeds of Ukraine to the high for slaughter standards for the receipt of lean albuminous beef with the experimentally grounded norms of consumption of dry matter and metabolizable energy on a head, on 100 kg of living mass and by mathematical models for operative prognostication of these indexes on any living mass from 100 to 650 kg, age from 100 to 650 days with the assured prognostication of for slaughter indexes, mass of carcasses, output of carcasses, mass of albumen and fat, output of meat, bones, relations of meat toward bones, and other indexes of quality of beef at the use of the worked out norms of consumption of dry matter and metabolizable energy in composition breeds technologies of the intensive growing and feeding of bull-calves of basic breeds of Ukraine;

- The computerized programs of optimization of rations and fullration mashes are worked out for the practical use for cows, heifers, bull-calves on growing and fattening on the criteria of maximal level in rations and minimum

charges of metabolizable energy of forage on 1кг milk, increase of living mass and their minimum prime price;

- Translated the last norms of feeding of NRC-2001 and scientifically adapted into Ukrainian language for a cattle and these basic normative indexes are optimally used in the improved domestic norms of feeding of cattle.

By a professor V.N. Kandyba in the process of development and perfection of the newest home norms the high-quality improved methodically-practical positions and norms as compared to the previous gone into detail norms of feeding edited M.T. Nozdrin (1991) next key positions are grounded:

- In basis of setting of norms of feeding and estimation of food value of forage metabolizable energy and her technical expression is accepted in energy forage units, when 10 MDg contains 1 EFU of metabolizable energy;
- Norm of energy, protein, other nourishing and bioactive matters expressed calculating on 1 kg of dry matter of forage of ration, but not on a 1 outs feed unit, as was before;
- A main factor and criterion of level and efficiency of transformation (conversions) of metabolizable energy in net (productive) is accept the concentration of metabolizable energy in 1 kg of dry matter;
- In new norms the use of physiological reasonable, minimum necessary concentration of metabolizable energy is certain priority conception of setting of norms of energy feed of highly productive cattle in unit (1 kg) of dry matter in the feeds of ration in combination with the physiological maximal consumption of dry matter on 100 kg of living mass;
- Norms of metabolizable energy are differentiated depending on her concentration in unit of dry matter. What higher concentration of metabolizable energy in 1 kg of dry matter, the higher coefficient of transformation of metabolizable energy in net energy of lactation and gains, the there can less be a general requirement in metabolizable energy for the receipt of the same level of yield of milk or increase of living mass;
- The concentration of metabolizable energy in 1 kg of dry matter is differentiated depending on the level of the dairy and meat productivity and living mass of cows, repair, fattening and meat youngsters. What higher the productivity of cattle, the higher concentration of metabolizable energy in 1 kg of dry matter of forage of ration. What anymore living mass of cows, can those be less concentration of metabolizable energy in a dry matter for the receipt of the same level of yields of milk due to the greater general consumption of dry matter and metabolizable energy by large cows with living mass 600, 650, 700, 750 kg against 400, 450, 500, 550 kg;
- In the improved home norms of feeding of cattle the level of fissionable and unfissionable in a rumen protein is taken into account: on the average 30-40 % unfissionable and 60-70 % fissionable, taking into account the productivity of cows. What higher the productivity, the higher level of unfissionable protein in the feeds of ration;



- The generalized reference norms of irreplaceable amino acid are first given in new norms, in particular lysin, methionine + of cystine, leucine + of isoleucine, histidine and their contents in feeds;
- The new elements of the improved carbohydrate nutrition of highly productive cows in the worked out norms are generalize the world norms of neutrally-detergent cellulose, which containing of gemycelluloses, celluloses of both lignin and acid-detergent cellulose which consists of cellulose and lignin, unlike an only raw cellulose in old norms. On the average content of neutrally-detergent cellulose is accepted at the level of 30-40 % from the dry matter of forage of ration, and acid-detergent 20-25%. From newest data of world science optimization of level of fractions of carbohydrates provides the increase of digestibility of dry matter, his consumption and yields of milk of highly productive cows.

Worked out by corresponding member V.N. Kandyba and presented in official editions "Theory and practice of the normed feeding of cattle" (2012) and "Norms and rations of the full value feeding of cattle" (2012) priority directions of development of science about the normed feeding of agricultural animals and increase of the productivity and profitability of animal husbandry in Ukraine in the followings 10-20 years:

- Publication, large-scale approbation, mastering and introduction at state level worked out by the scientists of the National academy of agrarian sciences of Ukraine of the newest norms, rations and technologies of the full value feeding of highly productive cattle under scientific methodical guidance of corresponding member V.N. Kandyba and departament of zootechniy of NAAS of Ukraine;
- Complex laboratory estimation and working out in detail of composition, to the food value and biological value of all present forage resources and forage in a zonal aspect for 25-30 and more than to the elements of the newest norms and further correction of necessities of highly productive animals in the complex of nourishing and bioactive matters for practical achievement of genetic potential of the productivity, reproductive ability, productive longevity, prophylaxis of immunodeficit and diseases of alimentary origin;
- Optimization of norms of feeding of highly productive animals taking into account breeds necessities, zoohygiene terms of housing, technological and stress factors, extreme temperature and weather changes;
- Experimental grounding of norms physiological maximal consumption of dry matter of forage on 100 kg of living mass in connection with the concentration of metabolizable energy in a dry matter, by the breeds size of living mass, phases of lactation, level of the productivity, by technology of preparation and feeding of forage in composition mashes and in combination with the automated feeding troughs for the additional feeding by energy and albuminous-vitamin-mineral additions of superhighly productive animals of modern breeds;
- Experimental correction of norms of unfissionable and fissionable protein is in the rations of highly productive cows, repair heifers in connection with the productivity, structure of rations, technology of housing, storage, canning and feed

ing of forage;

- A scientific grounding of norms of amino acid by feeding of highly productive dairy and meat cattle and development of effective methods and technologies of defence of protein and irreplaceable amino acid from breaking up in a rumen and prolonged mastering is in bowels;
- Optimization of norms of feed of protein in the direction of their decline due to correction of level of unfissionable protein and protected irreplaceable amino acid in the rations of cows;
- Grounding of optimal parameters of energy-aminoacid relation in the rations of highly productive cows taking into account the productivity and phases of lactation;
- Optimization of norms of carbohydrate nutrition of highly productive cows in the context of grounding of optimal levels of neutrally-detergent and acid-detergent cellulose in feeds and rations;
- Development of compounding and organization of the large-scale practical use of home zonal and address premixes of new generation with an enhanceable biological, productive action, antistress, immunity activating, antiradionuclides, by methaneinhibiting properties in relation to actual composition of forage;
- Development and applying in farms of zonal recipes accessible for economies, economic advantageous proteinous-vitamin-mineral additions (PVMA) with deployment of local forage of proteins, slowlyfissionable in the rumen of protein of synthetic sources and heat-treated beans.

A professor V.N. Kandyba together with prof. V.I. Gnoevyy, I.V. Gnoevyy worked out effective, real for most agrofirms, farms, economies, complexes practical methods, technologies and organization of the biologically full value feeding of highly productive cows and feedpreparations in the economies of Ukraine on the followings 10-20 years:

- Providing of normative, optimally high, concentration of metabolizable energy, protein, carbohydrates, mineral matters (makro- and oligoelementss), vitamins in 1 kg of dry matter of forage;
- Differentiated norming of feeding of cows taking into account their physiology state, yield of milk, phase of lactation, living mass and dry period;
- Upgrading of forage (silo, haylage, hay) to the level of requirements of standards of a 1 class due to mastering of growing of soy on green mass for an ensilage together with green mass of corn, and also due to enriching of corn silo during the ensilage of protein (carbamide, diammoniumphosphate) synthetic sources in a complex with salts of difizient in feeds oligoelements and demands of optimal terms and requirements of technology of making hay, haylage;
- Optimization of structures and balancing of rations in accordingly to the gone into detail norms of feeding for highly productive cows for to 24-35 indexes of food value;

- Use of concentrates, proteins and mineral additions exceptionally in composition of the full value mixed fodders, made in economies on the base of own grain-growing, protein and zonal and address vitamin-mineral premixes;
- Feeding of all types of forage and balancing additions in composition semi-moist mashes, balanced for to 24-35 indexes of norms of feeding, made in universal mobile mix-distributed of type of "Seko", "Samurai - 3 plus" and other modifications;
- Clear implementation of requirements physiological of the optimal mode of feeding and chart of distribution of forage, foremost shutting out double and onetime distribution of concentrates to the highly productive lactic cows in the conditions of the yet not used preparation of fullration mashes and separate feeding of different forage, giving advantage no less as 4-valid feeding of the concentrated forage as the balanced mixed fodders;
- Mastering of most effective feeds-resourcessaving system of the whole-year of the same type feeding with the high-quality canned feeds (cereals-beans silo, haylage, hay);
- Use in a summer period of the combined type of feeding with introduction to the rations of green forage from cereal-leguminous grassmashes in combination with high-quality canned feeds from (a silo, haylage) in optimal correlation (20-30 % green mass and 70-80 % the canned feed and concentrates);
- In the western regions of Ukraine at presence of by farms of cultural pastures the level of green forage can make 60-70 %, and canned and concentrates to 30-40 % on a food value.

A professor V.N. Kandyba first worked out and patented the fundamentally new system stably full value feeding and housing of cows and repair youngsters of cattle on the base of the whole-year growing and feeding of green hydroponics forage and housing in semideep livestock houses, blocked vertical with the workshops of hydroponics with the transparent roofs of hangar type, which solving the problem of effective management of animal husbandry production even in the conditions of expected extremely high temperatures of south of Ukraine, Russian Federation and other countries of Europe, Asia, Africa in forthcoming 20-30 years of global rise in temperature.

The practical mastering of the worked out, fundamentally new technological decisions of feeding and housing of highly productive animals will provide neutralization of extreme thermal stresses, stabilizing of microclimate in apartments at the minimum charges of energyresources due to the large-scale use of sun energy, a receipt ecologically of safe, with an enhanceable biological value, foods of stock-raising guarantees without pesticides, nitrates, heavy metals, radionuclides; reduction on 20-30% of the landed areas under green crops, silo, exception of annual losses of 20-40% of nutritives at traditional storage of silo, hay, haylage; diminishing on 30-40% investments on building of foodstorage-

houses and 50-80% on the purchase of imported and production of own vitamin preparations, premixes; increasing on 20-30% of the dairy, meat productivity and reproductive ability of animals.

Taking into account extraordinary actuality and vital necessity, at the level of national safety, providing of population of Ukraine animals products on the European and world standards, professor V.N. Kandyba together with the professors of V.I. Gnoevyy, A.K. Trishin and doctor of agricultural sciences I.V.Gnoevyy first worked out and under the general release of Minister of agrarian policy and food of Ukraine, doctor of agricultural sciences N.V. Priszajhnjuk published the "Informative database for innovative development of animal-breeding" (in 2012), which embraces all modern normative technological requirements, standards fully, newest home norms of feeding of agricultural animals, poultry and determines basic directions and terms of dynamic increase of production of milk, meat, eggs to the level of medical norms of feed of population due to innovative intensive development of all industries of animal-breeding in Ukraine in subsequent 10-20 years.

#### **Conclusions**

1. Key biological regularities of feed-conversion ability, forming and prognostications of the meat productivity of cattle, are scientifically reasonable and author in ontogenesis and conceptual positions of the improved home gone into detail norms of feeding of highly productive cattle are certain.

2. Practical application of the worked out and improved norms, rations, feeds-mashes by the specialists agrofirms, complexes, farms, economies will provide a receipt on a cow of the 7-8 thousand kg of milk for a year, 90-95 calves on 100cows, lengthening of duration of productive longevity of cows to 4-5 lactations, increase of average daily increases of youngsters on growing and fattening a to 1000-1200 g, increase of before-slaughter living mass of bull-calves to 550-650 kg, the masses of carcass to 300-350 kg in 21-monthly age.

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