

Prospects of development of organic farming in connection with the developed animal husbandry

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The purpose. To prove expediency of the prospect of development of organic farming in Ukraine together with the developed animal husbandry with the purpose of provision of population with qualitative food stuffs.

Methods. Power consumption of production received during lifetime of each group of cows of Golshtein and Ukrainian red milk breeds which were formed depending on duration of their productive use was determined in view of power consumption of milk, increase of alive mass, breeding cattle and excrements according to power equivalents for production of cattle breeding.

Results. According to the power equivalents calculated on the basis of caloric content, among all cumulative production that is made during life of cows, the greatest power consumption have excrements and milk. So, at cows of Golshtein breed power consumption of excrements, depending on duration of productive use of animals, makes 60 – 62,5%, at cows of Ukrainian red milk breed — 62 – 65, and milk — 35 – 37 and 33 – 35% accordingly. **Conclusions.** For provision of population with qualitative food stuffs (according to scientifically proved norms) and preservation of national treasure — Ukrainian chernozem, it is necessary, that branches of plant growing and animal husbandry developed together in each agricultural enterprise. Among all cumulative production that is made during the life of cows, the greatest power consumption has excrements and milk. The account of expenses for basic and collateral production of milk cattle breeding, will allow determining more objectively its cost price and efficiency of branch.

Key words: *organic farming, humus, cows, milk, manure, power consumption, straw.*

Ukraine with its nature climate and resource potential must occupy one of the first places among the producers of agricultural organic product, first of all for their supply to the internal market and then for realization. There is no country not providing in the internal consumption with organic products according to the consumer needs and market terms. It also will promote the creation of ecologically safe conditions for population vital activity, natural environment preservation, rational use of natural resources and understanding of priority of agriculture development, first of all as socially meaningful branch.

Soil-climatic conditions of country allow to extend considerably the volumes of organic agriculture, which by expert estimations can attain 7 % agricultural lands in 2020 [1].

On the whole, ecological agricultural production must engulf all continuous technological cycle: production, transporting, processing, storage and realization of products to the user.

The generally accepted concept «organic agriculture» in economic terminology of the English-language countries of EC and the USA means such method of agricultural production, which the use of synthetic chemical (finished shaving, pesticides and antibiotics) excluded and genetically modified organisms are for getting the ecologically clean products [2].

The main features of organic agriculture as the Ukrainian scientists understand, are: the rejection from use of use of easily soluble mineral fertilizers, foremost nitric, and also synthetic facilities of plant protection, stimulation of soil biological activity, including wide use of organic wastes from plant-grower and stock-raising, composts, green fertilizers and atmospheric nitrogen fixing by tuberous bacteria, the system of shallow soil cultivation [3].

Thus the organic agriculture foresees the wide use of organic fertilizers consisting of animal and vegetable origin matters. Manure is the most valuable organic fertilizer. Fertilizer of different animals on an average contained (%): water – 75, organic matter – 21, total nitrogen – 0,5, assimilated phosphorus – 0,25, potassium

oxide – 0,6. However presently because of the total number of livestock in Ukraine, the manure volumes went down and its applying diminished from 6,5 t/h till 0,5 t/h in 1990.

Black earths worked out, degraded, gumus content was diminished and exhausted. In Steppe zone the signs of deserting appeared and at Lesosteppe and Polesye the soils died [4]. Annual losses of gumus because of the soils mineralization and erosion reached 32-33 million tons, that is almost 2 billion on USA dollars losses [5]. Only for the last three years the Ukraine soils on the average lost 0,05 % gumus, 4 ml/kg soil-mobile phosphates and 6 ml/kg – exchange to potassium. As a result of unbalanced applying and caring out the organic matter and soils erosion the annual gumus losses on the average 0,6 - 0,7 t/h, that is over 40 million tons. At the same time some soil changed so much, that they can be delivered to another variety or even to other type soils [6].

From data of many native researchers, for supporting nondeficient gumus balance, it is necessary to apply the organic fertilizers arable earths 12-15 t/h for turn-ashy and 9-13 t/h for black earth [7]. Characterizing the perspectives and potentialities of manure use, D.N. Pryanishnikov wrote 1963 that it might be a blunder to consider that with production growth and mineral fertilizers application the manure role, as one of the main fertilizers, will go down. Quite the reverse, at intensive chemicals use the manure value becomes even bigger. The organic matter of manure promotes buffering, absorption capacity, soil moisture capacity, strengthens microbiological processes in it and multiplies carbon dioxide content in near soil air layer. Manure applying not only makes the soil cultivation better but also reduces negative influence at out of time ploughing.

Manure quality depends on the type of animal, its forage, bedding and method of storage. Thus at pigs feeding many concentrates are used. Therefore their manure differs by high nitrogen content and in the there ruminant animals ration there is much cellulose – their manure has more potassium. Half rotten manure provides the biggest harvest increase. Average payment of one ton manure by the harvest increase in the regions with sufficient moistening makes up 0,3-0,4 c of grains, 2,5-4 c of sugar beets, 2-3 c of potatoes and 4 c of maize for silage [8].

Organic fertilizers value in the common system «soil – plant – animal – soil» lies in the fact that their use promotes drawing in to the rotation the matters, taken out from soil by harvest and applied into it by fertilizers (fig 1).

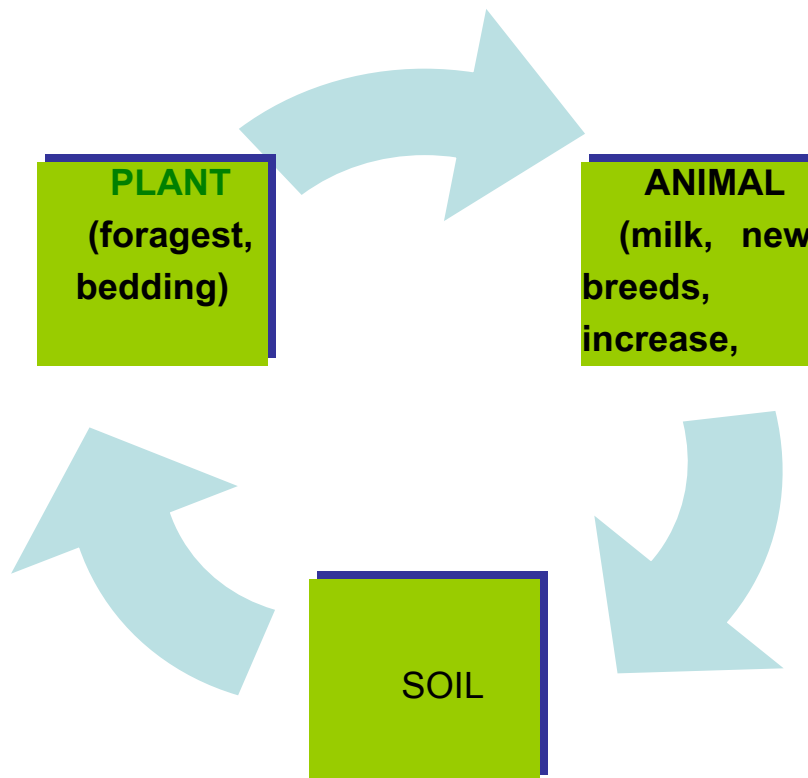


Fig. 1. Rotation in the system «soil – plant – animal – soil»

In connection with it is necessary that both branches, plant-growing and stock-raising developed together in every agricultural enterprise. First of all milk cattle breeding needs renewal and broadening. For the last years the number of livestock in Ukraine diminished from 8,4 million cows in 1990 till 2172,3 thousand in 2015, that is 4 % less in comparative with 2014.

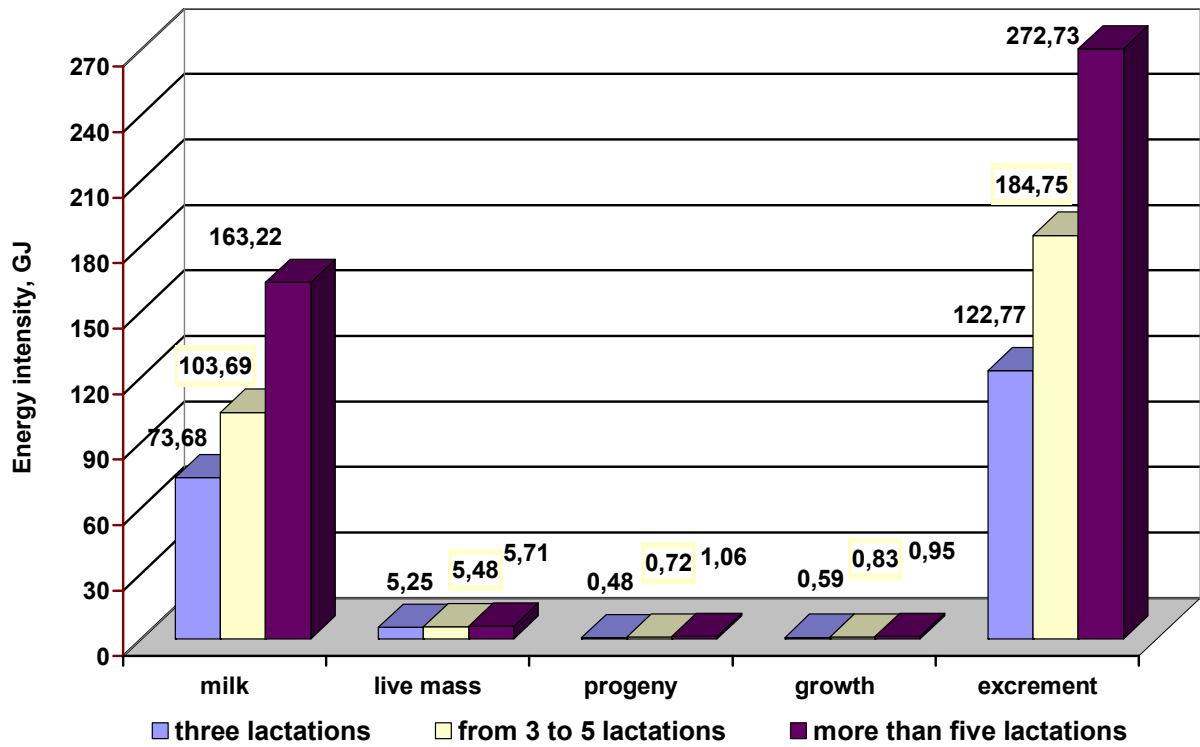
As to State statistics data of the results of 2015 in Ukraine (without taking into account occupied Crimea and part of Donbas area) demonstrate the shortening as compared to 2014: meat production (in living weight) 1,4 % (to 3276,8 thousand tons), milk – 4 % (to 10 682,4 thousand tons)/ eggs – 14,3 % (to 16 780,4 million of things).

Purpose of work. Grounding the perspectives of development organic agriculture in Ukraine on a level stock-raising with the purpose of providing the population necessities in high-quality food stuffs.

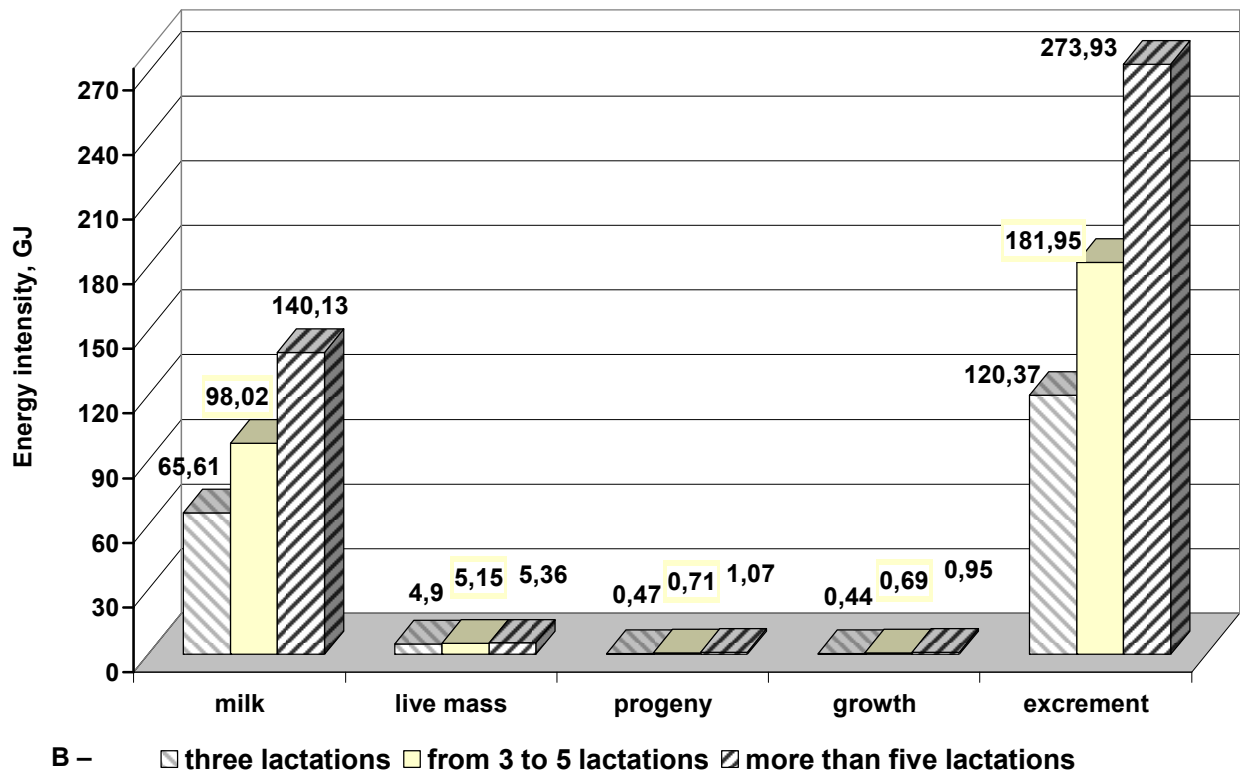
Method of researches. At researches conducting productive indexes of Holstein and Ukrainian red milk breeds cows were used depending on their productive use duration. Energy content of the products, got for the life time from every testing sub-group, was determined taking into account milk, energy contents, living mass increase, new breeds and excrements in accordance with energetic equivalents for cattle breeding products according to VASKHNYL method, 1985 [9].

Results of researches. The increase of the citizen's viability in Ukraine is possible only under condition of high-quality, ecologically safe and healthy diet. According to scientifically grounded medical norms of nutrition a person must daily consume 3300 kilo-calories, a part of them one third – as milk products (unskimmed milk, soured-milk products, cheeses and others). Therefore, providing of the state food safety from foreign market conjuncture stipulates the necessity of permanent search of ways of increase the production volumes of cheap, high-quality stock-raising products and milk, in particular. At this the important value at prime milk price forming has the forages prices reduction due to structural changes, increase of green crops productivity and their cost prime lowering.

According to energetic equivalents, calculated on the calorie content basis, among all joint products, got for the cow's life, milk and excrements have the biggest energy contents. Thus among Holstein cows the energy contents measles of excrements, depending on their productive use duration, accounts 60-62,5 %, among the cows of Ukrainian red milk breed – 62-65 % and as to milk, this index is 35-37 % and 33-35 % correspondingly (fig 2). These data must be taken to account at allocation of charges on the basic and additional products of milk cattle breeding, that will allow to define their cost price and the efficiency of breeding conducting more objectively.



A – Holstein cows



B – three lactations from 3 to 5 lactations more than five lactations

Ukrainian red milk breeds cows

Fig. 2. Energy accumulation in cattle-breeding production at milk producing depending of cows productive use on duration

The volume of possible manure accumulation on farms depends on animals kind, age, method of their maintenance, level of feeding and forages structure, animals productivity, the use bedding etc.. Manure producing is one of the reserves of income increase in stock-raising industries. At 5 thousand kg milk yield from the cow it is possible to get almost 16 tons of fresh manure for a year.

The output of fresh manure for a year from the cow, taking into account its productivity at the reference norm of bringing of bedding (straw) applying, 3 kg per cow daily can be calculated with the help of developed equalization of regression (correlative relation between cows productivity and manure output makes 0,993):

$$Y=8,9+1,4*x$$

where y – is manure general amount from one cow for a year, in fresh form, t;

8,9 – is free member; 1,4 – is coefficient of regression; x – milk yield from one per year, kg.

For manure accumulation of pus and detainment of nutritive matter in it at storage bedding has great importance. The more bedding – the higher manure output will be and lower the losses of nitrogen, phosphorus and potassium. In our region cereal straw is the best bedding material. It is set that straw can absorb itself till three parts of dung liquid, as a result in the stock-raising housing the content of ammonia and carbon dioxide diminishes in 2,5 times and relative humidity goes down from 100 to 75 %. The use of chopped straw with 10-12 centimeters length makes work of conveyers easier, the absorption of urine and gas is bigger, manure becomes homogeneous, it is much easier to throw it over the field and to plough it into soil. At application of insufficient amount of bedding (to 1 kg of chopped straw for one head daily) manure turns to be semi fluid and a part of liquid fraction is lost.

Experience of progressive enterprises shows that manure accumulation in summer camps and motion-fodder grounding is a large reserve of increasing the organic fertilizers production. For this animals resting place cover with 30-40 centimeters straw layer. When the manure is accumulated enough, it is deleted by bulldozer and the grounding is covered with a layer of fresh straw.

Method of manure removed proper facilities of mechanization using, which depends on the method of animals maintenance and also manure state (hard, semi-fluid, liquid) influence much on the manure cost.

To decide successfully the problem of providing the plant-growing with cheap high-quality organic fertilizers is possible at technologies with unleashed maintenance of cows on long permanent deep straw bedding. Manure is deleted from stock-rising housings by bulldozer 1-2 times a year directly under ploughing as to the technological scheme of organic fertilizers applying «farm-field», from motion-fodder groundings-once in 2-3 days, from before - and after milking groundings-daily. At that the combined energy expenses on manure deleting and transporting in account on one head per year are 1,5 times lower in comparison with the fastened method of cows maintenance and make up 12054 MgJ [10]. At such production technology the experimental milk complex «Kutuzovka» of stock-raising Institute of the NAAS, having 1100 cows, is working successfully from 1963.

The main brunch problem is the diminishment of animals total number and volumes of livestock production, which takes place in enterprises of all ownership forms. Overwhelming majorities of agricultural enterprises have no stock-raising industry. Therefore the wastes of plant-growing, in particular, straw are used in such farmings as organic fertilizer. However quite often stubble is burned, considering that ashes will serve as fertilizer for soil and this is the way of fighting against weeds and pests. But here the organic matter of straw burns and partly soil gumus burns, disturbing the ecological balance in soil. And so it is better to apply straw in agriculture with an other aims: forage for cattle, bedding, in composts with manure or bird dung. It is known in fact, that for decay acceleration of one ton of straw and other plant-growing waster, left on the soil surface, it is expedient to add a 6-8 t/h liquid manure.

Conclusions

So, for satisfaction of population necessities in high-quality food, in accordance with the scientifically grounded norms per capita and for saving the national treasure – Ukrainian black earth – it is necessary that both branches, plant-grower and stock-raising developed together in every agricultural enterprise. For this purpose, state adjusting of stock-raising development is expedient as this brunch foresees material well-being of population with basic food stuffs – milk, meat and eggs.

Among all joint products, produced during the cows life, milk and excrements have the biggest energy content. Accounting the expenses on the basic and additional products of milk cattle breeding, will allow to define their cost price and the efficiency of brunch conduction more objectively.

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