

KEEPING AND NUTRITION OF DAIRY COWS IN ORGANIC MILK PRODUCTION*

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SUMMARY: Organic dairy farms are closed agroecosystem within which is implement a balanced cultivation of plants and animals according to strict principles and regulations of organic agriculture. Organic production of plants for animal nutrition, organic nutrition, natural fertilization of soil are processes that define organic production of milk to the greatest extent and contribute to the natural fertility of land, clean air and water, and biological differences, avoiding possibilities of soil contamination. Organic milk production in developed countries takes up an increasing share of total agricultural production. In Europe, organic agriculture is led by members of the European Union. Market for organic food and beverages in the countries of Central and Eastern Europe is still underdeveloped, but the demand for organic products is increasing. Despite undoubtedly a natural prerequisite for the development of organic agriculture, and especially clearly expressed agroecological diversity of national agricultural area, Serbia enters the group of countries where this form of agricultural production is still underdeveloped. Although the organic production has been written about almost every day, the fact is that at this time a few number of Serbian products may bear the sign »Serbia Organica.« However, optimism is awakening by the fact that the number of registered Serbian organic producers increases. It is estimated that Serbia currently has about 15,000 hectares under organic crops, and potentially, organic food could be produced on 600,000 acres.

Key words: organic production, organic food, animal nutrition.

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INTRODUCTION

Stables for cattle - a factor for success in organic livestock production

The basic strategy when building the stables for dairy cows must be below cost to build. Prior to construction it should verify preliminary and main location projects and construction permits, municipal approvals and contributions. When creating a project for the construction or reconstruction of facilities for keeping cows in organic milk production should be ensured that stables must be constructed and equipped so that the animals are kept in the most natural way. It should create conditions in which animals are not exposed to stress. It should be kept in mind that the stable structures, in which animals live and produce and people works in them for several hours a day. They must therefore meet the needs of man and animals to the greatest extent, must be built according to ethological, ecological, zoohygienic and ethical principles with the aim of producing high-quality organic milk.

The internal arrangement of the stables must ensure the logical flow of daily operations, without disturbing the normal behavior of animals.

Ensuring quality by selecting animals, maintenance of fertility and the application of proper nutrition is most important, but not enough for an economical and efficient production of organic milk. Also important is the choice of location for the construction of appropriate buildings: barns, storehouses for food, water tanks, manure pits, etc.

The choice of sites is primarily affected by: fitness of location, road connectivity, electricity connections, the possibilities of water supply, macro-ventilation, sunlight, etc. Furthermore, it is also important technological and technical equipment and the mutual arrangement of objects (barns, warehouses and ancillary premises which have a large impact on the functionality of the facility and performance)

Transport pathways for roughage, litter, manure equipment is usually not permitted to cross-over. Areas where the animals are moving, should not end up in a “blind street”.

The barn should have suitable climatic and microclimatic conditions (Krajinović, 2006) Animals in organic production must have enough space for feeding, drinking, lying down (resting) and movement (Tosić, 2001). Access to fresh water and food must be free. Animals must not be kept tied and individually. Minimal inner surface of the breeding dairy cows is 6 m²/cow (surface area available for animals) and external surface (to move, not including pasture) to 4.5 m²/cow (Popovic Vranjes, 2010). Free housing system is more convenient because it is a natural way of keeping the cows of which is ensured freedom of movement, where the cows have access to a number of places for lying. All other functions of the free ways of keeping are separated, Figure 1

This means that feeding, drinking, lying, and milking are separated. Freedom of movement and separation of functions that are forcing the cows often waking up and moving is very important, because it positively affects the general state of health, physical condition of the cows, the length of production life and production results. Free system of holding is almost without exception used for any larger herds ranging from 10-20 cows, and so forth. Automation of work processes in the free system of keeping cows led to the proportion of human labor was reduced to 40 hours per cow per year. The advantage is also that the job is easier, because it is fully automated the most

complicated operations like milking. There are very significant advantages in terms of microclimate because this system are supplied with optimal zootechnical and zoohygienic conditions. In fact, there are secured sufficient quantities of fresh air, vent, and the optimum temperature.

It can be freely recommend to all farmers who wish to engage in organic milk production adaptation of old buildings in the stalls with free grazing.

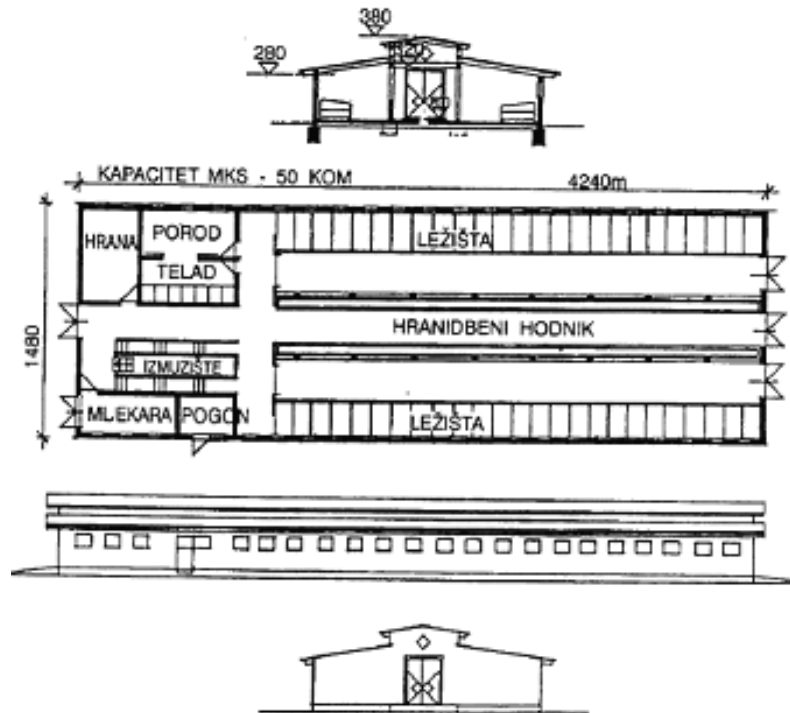


Figure 1. Stable for dairy cows, free grazing system with capacity of 50 head
Slika 1. Štala za mlečne krave, slobodan sistem držanja sa kapacitetom od 50 grla

The main characteristics of these farms are specializations for the production of milk, with modern equipment, wherever this is possible and profitable, then the free way of keeping; functional parlor and a system of holding on deep litter cages or league.

The traditional way of keeping the cattle must be fundamentally changed. Small farms with inadequate facilities (very bad microclimate), inadequate nutrition and poor management have to amend and adapt in every way to succeeded in organic livestock production. The best farms for milky cows are stables with external environment. Organic livestock production can be based on production units whose members are composed of pastures or other land on which the products are fodder, or provides fodder for which the certificate is issued (the Law on Organic Production, Official Gazette of RS, No. 30/10)

Inclusion of livestock production in organic farming can begin at least one year from the date of inclusion of land plots in organic agriculture to ensure that when organically produced feed for livestock from these plots.

Organic livestock production is a new type of food for humans but also a new challenge for the entire zootechnics. Its precondition is organically produced food for the animals which practically means a return to ekstenzivnost to some extent.

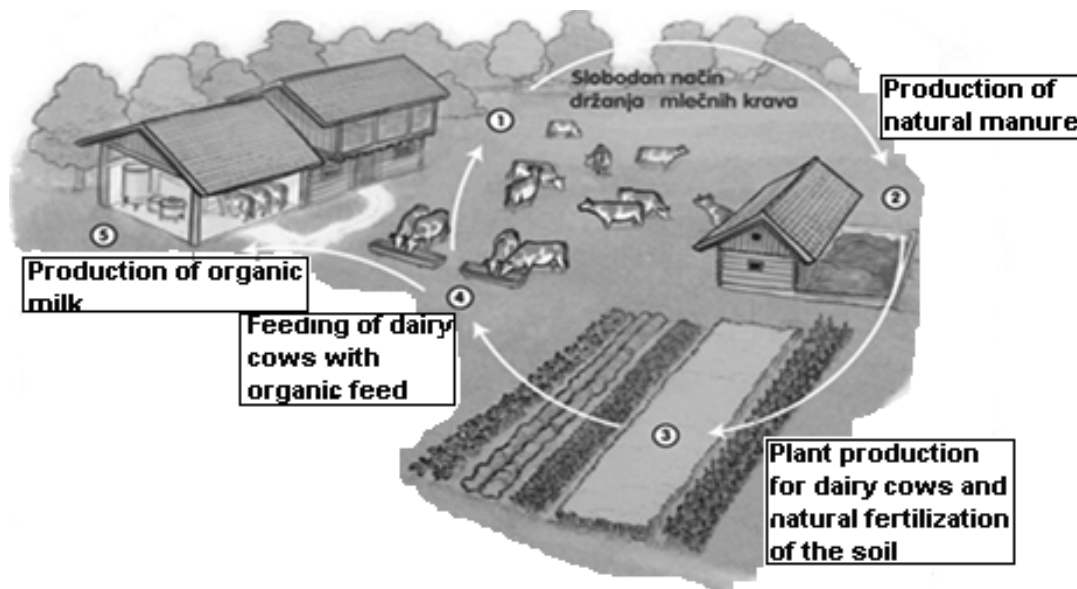


Figure 2. Interconnectivity of organic livestock and crop production in the organic milk production (<http://www.dukat.hr>)

Slika 2. Međusobna povezanost organske stočarstva i ratarske proizvodnje u organskoj proizvodnji mleka

DAIRY COW'S FEEDING IN ORGANIC PRODUCTION OF MILK

Animal feeding main principle applied in organic breeding is that animal feeding has to be adjusted to their physiological requests with maximum using of available food in rounded production process. The food has to be prepared in the form that allows animals to show their natural feeding habit and satisfy their needs. Animals, especially cuds, are the part of ecological agriculture. Thans to their ability to use feed rich with raw fiber, the cuds take active role in the closed process of matter and energy circulation in ecosystem.

Main principles of milk cow feeding are:

- sufficient and complete feeding in order to use genetic milk potential maximally
- even feeding that meets the requests of each phase in cow life during the whole year, which is especially important in the time of pregnancy and lactation.
- balanced meals concerning nutrient content
- healthy food without harmful impurity
- economical meals

Cow feeding has great influence to profitability of one organic farm. (Jovanovic, 2009). Knowing of the main principles in milk cow feeding is necessary for making good results in milk production and in keeping animals in good health as well. In order to make as optimal as possible meals for milk cow feeding it is necessary to know the kind of food and its content.

Pasture is the most simple and the healthiest but also the cheapest way of cow feeding in organic production, but this is not enough to make high milk production so it is necessary to introduce concentrated feed as well.

Pasture may be free or controlled. Controlled pasture is more recommended because of lesser wastage (grass trampling) and at the same time it allows better utilization and maintenance of the pasture.

Green feed made on farm in accordance with organic production principles is the sort of bulky food used in organic production. Among those feed, utilization of green grass pasture mass, green mass from plow, dry feed like hay, straw, corn straw, barley straw, oats straw, wheat straw, chaff, peelings and so on, is the most practical.

Silage of whole corn is one of the most important energy sources in DAIRY cow feeding because this plant gives a lot of green mass, has relatively high content of energy in dry matter and represent infallible component for preparing of completely mixed meal. (Forouzmand et al., 2005)

Winter feeding of cows is usually based on quality hay that can be given during the whole year as well. Hay received from different kind of clover (lucerne, "leptirnjaca", red clover...) is the best because of high content of nutrient (proteins) (Dewhurst, 2001). Meadow hay, like hay of several years grass, is good as well. Feeding of milk cow with quality hay only is not enough to provide optimal milk production so it is necessary to introduce concentrated and juicy feed as well. Concentrated feed also have to be produced in accordance with organic production principles or bought on the organic farm that deals with husbandry and processing of grain produced in organic way.

The feeding of cuds is based on maximally using of pasture in accordance with pasture availability during the year. (Popovic-Vranjes, 2009). At least 60% of dry matter in daily meal is consisting of fodder, fresh or dry bulky feed or silage. Organic production unit can provide the most 10% of conventional feed for cuds that is 20% of feed for other animal when another organic food can not be provided. Given percents are calculated on the yearly base as the percent of meal dry content.

Participation of conventional feed in daily meal must not be more than 25% of meal dry content. In the case of extreme climate condition, weather disaster or men's harmful influence when it is not possible to produce green, bulky feed, federal inspector may allow higher participation of conventional feed during limited time period, in specific region. For meal preparation and conservation it can be used preservatives like bacteria, fungus and enzyme. For silAGE preparation, like preservatives it can be used formic, acetic, LACTIC or propionic acid.

Animal origin feed can be used in organic production if they are produced and prepared in accordance with regulations concerning organic production and preparation (milk, milk powder, skim milk, skim milk powder, whole milk, whole milk powder, whey, whey powder, whey powder with little sugar content, whey powder protein and so on). Following mineral elements can be used for animal feeding in organic production: sodium, calcium, phosphorus, magnesium, sulfur as well as following elements in small quantities: iron, iodine, cobalt, copper, manganese, zinc, molybdenum, selenium in the form that is in accordance with the Regulations. Vitamins, provitamins and chemical substances that have similar effect used for animal feeding must be FROM natural origin. Antibiotics, coccidiostatics, medical preparation, growth stimulators or any matter tha stimulate growth or production can not be used for animal feeding.

Animal feed must not contain growth stimulator, remedy for appetite, artificial colors, urea, amino acid, clinical waste and droppings.

CONCLUSION

Organic agriculture development should contribute to optimal use of natural resources, local production increase and comprehensive prosperity of rural region inhabitants. In organic production animal WELFARE are of high priority. First of all it should be provided conditions for animal growth and develop in accordance with natural genetic potential. That means respect of animal physiological and ecological needs and making the conditions them to satisfy their natural function and behavior. The number of animal at organic farm is in relation with farm area in order to avoid industry farm and too much excretion of nitrates to the ground and underground water.

The animals should be from organic system breeding. Building for animal keeping should be in accordance with animal sort (enough space, light and possibility to be out). The animals should be feeded with organic food made on own farm or made on the farm at the same region.

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DRŽANJE I ISHRANA MUZNIH KRAVA U ORGANSKOJ PROIZVODNJI MLEKA

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Izvod

Organske mlečne farme predstavljaju zatvoren agroekosistem unutar kojeg se provodi uravnotežen uzgoj biljaka i životinja prema strogim načelima i propisima organske poljoprivredne proizvodnje. Organska proizvodnja biljaka za ishranu životinja, celokupna, organska ishrana te prirodno đubrenje zemljišta su procesi koji u najvećoj meri definišu organsku proizvodnju mleka i doprinose prirodnoj plodnosti zemljište, čistoći vazduha i vode te biološkoj razlici, izbjegavajući mogućnost zagađenja zemljišta.

Organska proizvodnja mleka u razvijenim zemljama zauzima sve veći udeo u ukupnoj poljoprivrednoj proizvodnji. U Evropi organsku poljoprivredu predvode zemlje članice Evropske unije. Tržište organske hrane i pića u državama srednje i istočne Evrope i dalje je nerazvijeno, ali potražnja za organskim proizvodima stalno raste. Uprkos nesumnjivim prirodnim preduslovima za razvoj organske poljoprivrede, a posebno jasno izraženoj agroekološkim razlikama nacionalnog poljoprivrednog prostora, Srbija ulazi u grupu zemalja u kojima je ovaj oblik poljoprivredne proizvodnje i dalje nedovoljno razvijen. Iako se o organskoj proizvodnji gotovo svakodnevno piše i govori, činjenica je da u ovom trenutku malen broj srpskih proizvoda može nositi znak „Serbia organica“. Ipak, optimizam budi činjenica da broj registrovanih srpskih organskih proizvođača neprestano raste. Procenjuje se da u Srbiji trenutno ima oko 15.000 hektara pod organskim usevima, a potencijalno bi organska hrana mogla da se proizvodi i na 600000 hektara.

Ključne reči: organska proizvodnja, organska hrana, ishrana životinja.

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