

## ORGANIC DAIRY PRODUCTION – MOST COMMON ISSUES CONCERNING HEALTH CARE AND NUTRITION\*

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*SUMMARY: In most countries transition from conventional to organic dairy production came as a result of two influences: first, as a way of additional employment, and second, in regions with problems that came as a result of pollution of soil. There are several problems in encouraging producers to practice organic dairy. One of them is health care – prevention and treatment and the other is feeding of cows, both with their limitations and prohibitions. This paper gives a brief review of most common health issues in organic dairy production and feeding through experiences in some countries.*

*Key words: organic dairy production, udder health, mastitis, feeding.*

### INTRODUCTION

Organic farming is a developing production, not only a radical fringe that attracts only the most innovative and risk taking farmers. Although organic dairy farming is still a minority faction within the dairy industry, there is certainly a lot more interest in it by various agricultural professionals who work with farmers. Full support to an organic dairy sector comes from linked producers in area of providing seeds, soil, animal nutrition and veterinary sector. Of course, it all has to have a result on a market. Organic dairy market has many typical characteristics:

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Review paper / Pregledni rad

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- 1) Typical consumer has extra incomes and is in socio-economic status which allows him to buy this products;
- 2) A deep conviction regarding the natural resources;
- 3) A health condition that demands the consumption of such products;
- 4) Religious reasons.

Issues such as health, environment and animal welfare become more and more important for consumer as a guarantee that he pays for healthy and safe product and that makes this production totally consumer driven. (Karreman, H.J., 2007). Organic milk production system can bring mutually beneficial to the animals and for the environment compared to conventional production. For many people this is of great importance in making decisions about buying organic milk. However, for the rest of the population the main reason for buying organic food is the fact that this food is nutritionally more valuable compared to the conventional. Organically produced milk and dairy products for consumers represent healthier and safer alternative (Popovic-Vranjes et al, 2012). Tendencies in development of agricultural production in Serbia include greater participation of organic production. Our country has considerable areas suitable for organic production, particularly in the parts of protected areas where legislation restricts the conventional agricultural production. Also, the structure of farms (small farms with complete production - plant and animal) form the basis for the implementation of the principles of organic production. (Popovic-Vranjes et al., 2010a).

## HEALTH STATUS

One of the conditions for the establishment of organic livestock production is a spatial isolation of livestock farm and coordinated development of plant and animal production. In organic farming, animal welfare occupies a high priority. Better milk quality from organic production is associated with feeding that is mostly based on pasture, then with free grazing, improved level of fitness which all results with healthier and more satisfied animals (Popovic-Vranjes et al., 2011; Krajinović et al., 2011). First of all, animals should be provided with conditions for their growth and development in harmony with the natural genetic potential (Popovic-Vranjes et al., 2010b).

In their work, Rosati and Aumaitre (2004) analyzed all aspects of organic dairy production, their mutual dependence and interaction. They emphasize that organic production does not automatically mean reduced risk to animal health and that health care in organic farming is usually criticized. Authors point out to the importance of, so called, "natural management" considering that good environmental conditions and their good management are essential for preserving the health of animals especially in organic production, which limits the application of conventional therapy. In an effort to meet market requirements, which creates an image of organic farming as "satisfied cow on a green pasture" producers often forget the real welfare of the animals for which improvement there is always a space (Rosati and Aumaitre, 2004).

Organic animal husbandry has been strongly criticized, especially by veterinarians, who have claimed that organically bred animals are not treated properly when they are sick because of longer withdrawal time prescribed by the organic standards and because alternative medicine is preferred (including methods not recognized by science).

Organic farming and the specific requirements for the veterinary care and application of therapy significantly limits the use of drugs and conditions that are com-

monly treated with antibiotics now represent health problem. Mastitis represents a major health issue in dairy cows in conventional as well as organic production (Roderick *et al.*, 1996). Mastitis is the most common and economically most burdening contagious disease affecting dairy farms. The largest number of mastitis pathogens is endemic in some countries and therefore it is essential that, in purpose to prevent the entry and spread of pathogens, all bio-security measures should be carried out at local or farm level (Barkema *et al.*, 2009). They indicate that maintaining a closed herd decreases the risk of introduction of pathogens that affect udder health (directly or indirectly) and especially, if animals are purchased, their udder health history should be known and they should be examined and tested. Limitations of organic production, primarily due to the use of conventional therapy, require the strict observance of the rules in respect of quarantine (if the animal is purchased) and the implementation of prophylactic measures.

Results that indicate more or less occurrence of mastitis in organic farming compared to conventional are extremely contradictory. While some authors speak in favor of the less occurrence of mastitis in herds where is milk produced according to the principles of organic production like some earlier results from Norway (Ebbesvik and Loes, 1994) and Denmark (Vaarst and Enevoldsen, 1994), the results of other researchers suggest the contrary, as we can see in a survey conducted in Great Britain which reported higher incidence of dry mastitis and subclinical mastitis in organic comparing to conventionally managed herds (Hovi and Roderick, 1999). Most authors, however, agree that the potential for pathogens appearance and the spread and incidence of mastitis in organic herds is in most parts equal to those data's obtained from conventional production (Augustburger *et al.*, 1988; Krutzinna *et al.*, 1996; Weller and Cooper, 1996; Smolders, 2001). Barkema *et al.* (1999) in their work underscores the risk in the occurrence of pathogens and the creation of conditions for their growth is the environment, which is crucial in the prevention of disease and clearly points to the importance of good environmental management in organic production. Therefore, control program that includes prevention of clinical mastitis caused by environmental pathogens should focus on the environment as much as on cow's defense mechanisms.

Some studies have indicated that use of veterinary medicine is lower in organic herd. A survey conducted in U.S. by Stiglebauer *et al.* (2013) reports that organic farmers had less regular veterinary visits (36%) comparing to conventional non-grazing farmers (77%) or conventional grazing producers (56%). At the same time, 64% of organic farmers reported vaccinating adult cows as a part of prevention compared with 100% of conventional grazing and 97% of conventional non-grazing farmers.

Survey conducted in Norway showed that cows in conventional herds were found to be treated for mastitis about three times more often than cows in organic herds and somatic cell counts were at the same level in the two observed groups (Hardeng and Edge, 2001). Variations in udder health that were determined between herds as well as between years could be a result of the choice made - using antibiotics for infection treatment or not, and it is highly related to the management of the herd (Bartlett *et al.*, 1992). That generally brings us to simple conclusion - besides feeding good health management and the choices made considering health issues are crucial factors of good organic production.

Besides mastitis, a significant item related to the health status of the animals is the number of somatic cells in milk. Research conducted in the UK to over 5700 cows on 80 farms (40 organic and 40 conventional) showed no significant difference in number

of somatic cells in milk of cows that on average was about 214,000 cells / ml. At the same time, milk production was higher in conventional farm (8436 l per cow) compared to an organic farm (7311.5 l per cow) (*Haskell et al., 2009*). *Weller and Bowling (2000)* in a study conducted in US report similar results – according to them udder health in organic herds or bulk tank somatic cell counts is not different from conventional herds. In support of these results goes research conducted in Switzerland by *Roesch et al. (2006)* in 120 farms (60 organic and 60 conventional farms with integrated production) where the value of somatic cell count ranged from 119 000 cell/ml in organic farms to 117 000 cell/ml in conventional production. On the other side, a survey conducted in UK for a period of two years, reported that the risk of mastitis was similar in organic and conventional herds, while the occurrence of mastitis during the dry period was higher in organic herds. Also, increased presence of somatic cells in organically produced milk was determined (*Roderick and Hovi, 1999; Hovi and Roderick, 2000*).

Differences between organic and conventional herds in somatic cell counts and use of disease treatment may be a result of the individual herd manager independently of production system, or a result of general differences between regulation and production principles (*Bennedsgaard et al., 2003*).

Health is an important aspect when evaluating animal welfare in organic dairy production but it should be kept in mind that organic production itself does not automatically mean better welfare and health status of animals (*Hovi et al., 2003*). When it comes to the treatment of sick animals that are grown in an organic production system, it should be noted that the EU allowed the application of certain animal health products that allow animals returning to production while maintaining the organic status. On the other side, the U.S. strictly prohibited the use of conventional veterinary products and after treatment animal loses its organic status. At the same time, the veterinary regulations clearly indicate that animal must not be denied of medical care. All this put producers in a very difficult situation and requires the development of precise plans of prevention and their consistent application (*Stiglbauer et al., 2013*). How *Hovi et al. (2003)* conclude in their work, different data's regarding animal health on organic farms come from a limited number of farms applying organic milk production, and individual differences between managers are manifested. Also, *Sundrum (2001)* considered that the problem lies in the fact that most of the organic farms are mixed character (plant and animal production) and that producers pay more attention to one or the other production and this causes fluctuations in achieved production results.

## FEEDING

Adequate nutrition is the foundation of the organization and management of organic milk production. The meal must be designed in a way that provides all necessary substances for animals. Nutrients must originate in organic crop production, it is desirable to be produced on the farm or in the region and portions should be balanced and always available. If it is impossible to provide a completely organic meal for animals, it is allowed to use of nutrients from conventional production with limited participation up to 5 % in the diet per annum calculated on dry matter feed. The concept of organic milk production is based on the pasture way of keeping and feeding the cows. Grazing is economical and rational, pastures should not be too far from stall (no more than 1 to 1.5 kilometers) to avoid too much energy been spent on walking to and from the pasture.

It is particularly suitable combined usage of grassland for grazing and mowing, but it requires a larger area of grassland per cow (*Pantelić et al., 2008.*).

Basic characteristic of meal for dairy cows is to be designed to fulfill all production requirements of the organism. Meal must be sufficient by the amount, well balanced, versatile, economical, easy to manipulate. Feeding cows in organic milk production varies during the winter and summer period. Winter nutrition is based on the use of dry and succulent forage - hay (grasses and legumes) and silage (maize). The lack of certain nutrients can be compensated by adding concentrated mixtures. One of the major issues in animal feeding in organic dairy farming is protein, mineral, and trace elements deficiencies, especially for animals reaching high production (*Coonan et al., 2002*). Due to the restricted type of feeding, as imposed by EU regulations, in organic dairy farms, a clear deficiency in zinc, molybdenum, selenium, copper, and iodine can occur. The correct balance of minerals and trace elements must be constantly achieved.

The whole idea of organic production is based on the open stance and the pastoral way of feeding cows. Cows spend up to seven months during the year grazing depending on the region. Animals on pasture are in constant motion and energy consumption is much higher in this way of keeping in comparison to conventional. Also, in highly productive animals this diet is not sufficient and it is necessary to provide additional meal after returning from grazing.

With regard to dairy cow feeding, the European organic standards require forage based (60% of daily dry matter intake) and primarily home-grown diets and restrict the use of feed supplements and synthetic vitamins.

## REGULATION IN SERBIA

Organic animal production limits the use of chemical synthesized veterinary preparations, antibiotics, hormones and substances used to control reproduction. The legal framework in Serbia which regulates the organic livestock production clearly define in what cases is allowed to use conventional veterinary preparations, the duration of the withdrawal period, in this case, and if the situation repeats again translating the animals over a period of conversion into a new cycle of organic production (*Law on Organic Production, 2010*).

The essence of health care in organic production is in prevention and it strictly prohibits the use of any veterinary products for the prevention of disease. If the disease develops or animals get injured it is desirable to isolate such animal and immediately begin appropriate treatment. The advantage in this case have phytotherapeutic, homeopathic or immunological preparations, as well as certain elements and additives allowed in feeding under condition that their application has effect with certain types of animals and certain diseases. The use of phytotherapeutic preparations must be under strict control since some plants whose medicinal effect is already known may also have undesirable influence on products (milk discoloration or odor).

Homeopathic treatment is based on the provision of small amounts of substances that in high concentrations cause the same or similar symptoms that have the disease itself. The EU has stipulated the permissible concentration of substance in a solvent (1 part active substance in 10,000 parts of solvent) and these preparations are considered safe for use in the treatment of humans and animals. Immune preparations are used for activation of immune cells of the body and enhanced immune response to pathogens.

In addition to these substances it's permitted and the application of certain mineral supplements for animal feed and additives (vitamins (from natural sources), micronutrients - Fe, I, Co, Cu, Mn, Zn, Mo, Se, antioxidant elements, etc.) (*Regulation, 2011, 2012*).

In case when illness develops or, to prevent the suffering of animals it's permitted the use of conventional veterinary preparations or antibiotics with maximum responsibility of a veterinarian. After using these substances in the treatment of animals, should be kept in mind that the withdrawal period allowed in this case, is twice as long compared to the period of the withdrawal period in the conventional livestock production and can't be shorter than 48 hours.

In the case animals received therapy of chemically synthesized drugs or antibiotics for more than three times for a period of 12 months (more than one therapy in the case of animals whose productive cycle is shorter than one year), they lose status of the animal in organic production, and they should be re-through the conversion period (*Regulation, 2011, 2012*).

For veterinary interventions that are subjects to these restrictions, implementation of regular measures – programs of animal health protection, vaccination or treatment of parasites should be excepted.

## CONCLUSION

Disease prevention based on a selection of appropriate breeds and strains of animals, appropriate methods of breeding, feeding, number of animals per unit of production area, proper pasture and the hygiene conditions are of great importance in organic dairy production.

The producer of an organic livestock operation has a difficult task to fulfill all the requirements of an organic production concerning medical treatment on one hand, and on the other, he must not denied appropriate medical treatment for an animal.

The whole concept of organic production is based on the good management of health care and animal nutrition. Both of components have its strict limitations and good management to them is what brings results in this kind of production. The experiences and results that vary in some items (such as mastitis appearance in cows) clearly indicate that a good result in the production of organic milk exclusively dependent on the site where the production is carried out and the herd management.

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## ORGANSKA PROIZVODNJA MLEKA – NAJČEŠĆA PITANJA OBZIROM NA ZDRAVSTVENU ZAŠTITU I ISHRANU

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### Izvod

U većini zemalja tranzicija u organsku iz konvencionalne proizvodnje mleka došla je kao rezultat dva uticaja: kao način dodatnog zapošljavanja ruralnog stanovništva, i kao rešenje za područja sa zagađenim zemljištem. Postoji nekoliko problema u podsticanju proizvođača da prihvate organsku proizvodnju mleka. Jedan je zdravstvena nega - prevencija i lečenje a drugi ishrana, oba sa svojim ograničenjima i zabranama. Rad daje kratak pregled najčešćih zdravstvenih problema u organskoj proizvodnji mleka i ishrani muznih grla kroz iskustva u nekim zemljama.

**Ključne reči:** organska proizvodnja mleka, zdravlje mlečne žlezde, mastitis, ishrana.

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