

STUDY OF ANIMAL WELFARE, ENVIRONMENTAL AND FOOD SAFETY ISSUES IN DAIRY COW HERDS IN HUNGARY

Richard Gudaj, István Komlósi, Endre Brydl

*Centre for Agricultural and Applied Economics Science
Faculty of Agricultural and Food Sciences and Environmental Management
University of Debrecen
Böszörményi út 138.
4032 Debrecen, Hungary
rgudaj@agr.unideb.hu*

Abstract

For a long time there has been recognized existence of a link between microbial infections and animal welfare, affected by nutrition and stress. In the PhD project animal welfare was assessed and food safety aspects are reviewed for the purpose of this paper. Most farmers interviewed did not consider that any type of farm visitor has a high risk of introducing infectious agents into their herds. Personal communication found that there is a lack of knowledge transfer between scientists, advisors and farmers. So far, project succeeded in making farmers more aware of welfare and food safety issues on their farms. Basic welfare and hygiene measures taken show that majority of animals because of dirt and injuries might be likely to get infected with undesirable organisms. Neglected areas on the farms, like bad designed cubicles, dangerous alleys, dirty animals and low quality silage might be the first improvements to be done by farmers.

Keywords: dairy welfare, animal health, multivariable modelling, risk factor, environment, food safety.

INTRODUCTION

The quality of food coming from bovine was a hot topic in the last 2 decades. That fear rose from recent accidents in the dairy sector like bovine spongiform encephalopathy (BSE), verotoxigenic *E. coli* (VTEC), chronic wasting in cattle, food and mouth disease, bluetongue, and recall of penicillin-containing consumption milk (Noordhuizen and Metz, 2005). What is more, sometimes Listeriosis (*Listeria monocytogenes*), Crohn's disease, and Paratuberculosis are observed even locally in Austria and Germany (Baumgartner, 2010). All these outbreaks have induced concern of the general public about the way that food animals are being kept.

Nowadays, consumers have quite significant impact on animal production in Europe, especially on animal transportation, animal health and husbandry systems. European Union being aware of that opinion, set up in 2002 European Food Safety Authority (EFSA) (EFSA, 2008). This is an independent source of scientific advice and communication on risks associated with the food chain. EFSA's goal is to become globally recognized as the European reference body for risk assessment on food and

feed safety, animal health and welfare, nutrition, plant protection and plant health. So far, food safety, environmental protection and animal welfare are being linked in the various government agricultural policies and retailer and producer quality assurance schemes that are currently proliferating (Basset-Mens and van der Werf, 2005).

There many ways that improvements in animal welfare can enhance food safety and reduce environmental pollutions. However, in some cases, these three concerns are found to be antagonistic. De Passillé, and Rushen (2005) concluded that this is most worrying from the point of view of legislation body, when regulations set up to improve food safety or protect the environment risk have a negative impact on animal welfare or vice versa.

Following these ideas a PhD project was established to give a feasible and understandable knowledge to farmers and public about animal welfare, food safety and in some aspects about environment in Hungary. The main aim of the study is to use all available measures for assessing welfare of dairy cattle in Hungary. The survey will try to give answers what are the main areas for improvement. The work was created to emphasise the importance of animal welfare in Hungary and to use the information for an academic and commercial purposes. Another aim is to communicate with farmers and people involved in dairy industry to check their knowledge and attitude to welfare issues. The final report can be presented to the public and possibilities for improvement can be discussed. The conclusions will include the farmers' view on animal welfare and their experience from involvement in the project. They are interviewed about their expectations of this type of decision support in the future.

MATERIAL AND METHODS

18 dairy farms in Hungary were recruited into the study which is in progress (target – minimum 40). The selection was firstly created on a principle of searching for as different farms as possible. Among farms chosen are farms which are different in: ownership (private and cooperative), size (from 56 to 850 milking cows), husbandry systems (free stall, straw yard), access to the pasture (yes, no), scraping system (automatic, tractor), age (modern, old ones), number of animals per water troughs (12-120), surface quality (1 – relatively dry, no holes and not slippery; 2 – wet or some holes or slippery; 3 – wet, some holes and slippery). Farms differ also in more aspects which are not mentioned in this short material. Data collection was created according to already existed assessments (Whay, *et al.*, 2003). The project, however, needed the protocol to be established again, as in Hungarian conditions some of the points of the protocol would simply not work (for

example – access to the pasture – which is not so popular). Protocol covers, animal health, behaviour, hygiene and feedstuff condition of all animals on the farm. Additionally, general production data, facilities, lameness treatment and stockman attitude is measured for milking cows. Measures with full animal welfare and lameness assessments take around 6-7 hours for 500-600 heads herd.

RESULTS AND DISCUSSION

Egan *et al.* (2007) argue that the most important link between animal welfare and food safety is that stress and malnutrition animals experience is increasing susceptibility to microbial infection. Zoonotic diseases like *Salmonella*, *E. coli*, *M. bovis* can be transmitted to human body by animal products. There are number of different ways on the farms where bacteria can transfer. One of these ways might be faeces and or milk. Table 1 shows general animal welfare measures taken on the farms in relation to food safety, hygiene and environment for development of bacteria and viruses.

Table 1

Summary of the general animal welfare measures taken

	Younger calves (0-70 days)	Older calves (70+ days)	Dry cows	Heifers	Milking cows
Dirty flanks (%)	11.6	<u>27.6</u>	18.3	22.6	26.6
Dull/obviously sick (%)	3.2	2.7	<u>3.9</u>	3.0	3.7
Dirty Udder (%)	9.0	30.5	28.8	<u>37.8</u>	25.5
Hair loss - (%)	1.3	1.8	9.5	5.4	<u>16.7</u>
Nonhock injuries (%)	0.9	1.1	8.6	4.7	<u>20.9</u>
Hocks (%)	0.9	5.3	17.0	7.8	<u>22.3</u>
Dirty hindlimbs (%)	8.8	34.8	28.5	39.7	<u>41.8</u>
Lameness (%)	0.4	2.5	31.6	6.7	<u>43.8</u>
Neck rail injuries (%)	1.1	43.9	61.1	39.6	<u>61.7</u>

Basic hygiene measures taken on the farms show that majority of animals in all production groups are dirty and contamination of bacteria and other organisms might occur. Younger calves (up to 70 days) were found the cleanest on the farms. As production intensification moves to older animals living conditions are getting worse. 27,6% of older calves (70 days and more) were found with dirty flanks. 3,9% of dry cows were reported obviously dull and ill. Poor condition of animals is encouraging susceptibility to microbial infection. When it comes to heifers, 37,8 of them

were with dirty udders. This is the area where in the near future milk will be exploited and infections might spread by the milk or by the dirty and ill tits. Milking cows were recognised with the most areas exposed to the possible infections' areas. 16,7% of them were with clearly visible hair loss. In that occasion microorganisms have easier way for exploring the body of the milking cows by damaged tissue on the skin. Cattle typically live in the elements, exposed to all manner of insects, parasites and environmental stresses. And although they are typically hardy by nature, cattle are still susceptible to any number of infections and diseases, some of which cause hair loss. The same fear can rise when 20,9% of animals are assessed with nonhock injuries which are described as hocks on other parts of the body than legs. Similar access through a weaker tissue can be observed in normal hocks (22,3%) due to the hard bedding. This critical place on the farm is beneficial for cattle welfare but is the possible resource for numerous bacteria and allows for contamination onto animal hides. The study came across with 41,8% cows with dirty hindlimbs.

Dry, clean and deep bedding is providing the best conditions for animal comfort and udder hygiene. From the point of view of hygiene clean flooring should be provided for dairy cows, what is a must in prevention procedures against lameness. Proper grooved flooring provides animal with more grip and support against slipping (Gómez *et al.*, 2003). Clean floors are also providing fewer opportunities for development of bacteria and viruses, which are more likely to survive in the muck and on the hooves (Nicholson *et al.*, 2005). Lameness is the important issue in dairy industry nowadays due to the economical losses related to decrease in milk production and curing cost. Although lameness itself is not danger for human beings condition on affected hooves can also create a good environment for viruses and other organisms. In the study 43,8% of cows were discovered with lameness. Finally, neck rail injuries due to wrong positioned rails above the feeding trough and in the cubicles affected 61,7% of milking cows.

Regular cleaning of water troughs and feeders can prevent feed borne pathogens and digestion problems. Proper water quality is also essential in high producing milking cows. The study undertaken demonstrate that on 33,3% of farms animals had limited access to water by wrong positioned water troughs. There is also usually overcrowding next to the water troughs with 39,6 animals per water point. (Recommendation – 20 animals per water trough, (Blokhuys, 2009)). Calves on 44,4% of farms were given only milk for drinking in hot days or were given water just twice daily. Finally, water

quality was recognised to be of low quality (dirty, with algae and other organisms) on 55% of farms.

In professional dairy business, staff management should make sure disinfect clothes and boots are provided for visitors on the farms. People might be transmitters of viruses or bacteria from other farms. First observations give an impression that farmers and farm managers are not aware of hazard aspects of biosecurity. Among 18 farms visited so far, only one farm manager asked for wearing protection clothes and bags on boots.

Regarding feeding stuff and silage clamp where fermentation makes a huge contribution to good quality feed in average 17,5% of whole face wall in the silage clamp on all farms was evaluated to be mouldy and not fresh. On all 18 farms silage clamp wall where the silage was taken everyday was exposed to the sun.

The last measure taken related to use of antibiotics, hormones and other is conception rate of cows after first lactation. Successful insemination after first injection was in 28% of the cases. Reproduction performance has an extreme impact on how many other (unnecessary) injections animal will receive.

All measures described above are focusing on these moments and places on the farms where stress and microbial infections' opportunities avoided. More over, conditions of animals show the most common and the easiest routes for bacteria and other organisms to penetrate cows' organisms.

CONCLUSIONS

Animal welfare, protection of the environment and food safety are the major concerns public opinion has about current food production systems. These three issues are in conflict and finding solution on the farm and legislation level to reduce that conflict is essential as international standards governing animal welfare develop. These conflicts can be reduced if animal welfare is not judged according to the facilities they live in, by according to actual welfare status.

Animal welfare improvements have enormous potential for reducing antibiotic use, stress-induced immunosuppression, incidence of infectious disease on farms and shedding of human pathogens by farm animals. There would be smoother integration of food safety standards and animal welfare if continued development of hazard analysis and critical control point-based approaches to animal welfare would be described.

The research outcome demonstrates farmers need to be informed about health issues on their farms. The research found out farmers are interested in animal welfare, health and environment issues. On the other hand, they have an impression no one is taking care about their problems and they are running the businesses alone. Personal communication confirms there is need for continuing education and production aspects should be discussed regularly by running feasible and easily understandable welfare farm assessments. That would give farmers an idea of areas of the milk production on their farms which are neglected and needs for immediate actions to be taken. Finally, the cooperation would assure the welfare of dairy cows and would be beneficial for the food safety aspects of their products entering the food chain.

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