ELSEVIER

Livestock Production Science 93 (2005) 105–115

LIVESTOCK PRODUCTION SCIENCE

www.elsevier.com/locate/livprodsci

A comparison of production and management between Wisconsin organic and conventional dairy herds

K. Sato*, P.C. Bartlett, R.J. Erskine, J.B. Kaneene

A107 Vet Med Center, College of Veterinary Medicine, Michigan State University, East Lansing, MI 48823, USA

Received 9 September 2003; received in revised form 2 September 2004; accepted 15 September 2004

Abstract

An observational study was conducted in Wisconsin to compare production and management on organic and conventional dairy farms. Thirty organic dairy herds, where antimicrobials are rarely used for calves and never used for cows, were compared with 30 neighboring conventional dairy farms on which antimicrobials were routinely used for animals of all ages. A seven-page questionnaire regarding milk production, milking practices, housing, incidence of the major dairy diseases and medical treatments was used to assess management and production during 2000–2001. Body condition scores (BCS) of lactating cows and environmental and animal sanitation scores (EASS) were also collected on each of two occasions. The organic herds had significantly fewer cattle than did the conventional herds (P=0.017). The average daily milk production per cow in organic dairy herds (20.2 kg/day) was lower than that of conventional herds (23.7 kg/day). The incidence of clinical mastitis (CM) on organic farms (28 cases per 100 cow-years at risk) was not statistically different from that of on conventional farms (32 cases per 100 cow-years at risk). No significant difference in bulk tank somatic cell count (BTSCC) was observed between organic farms (262,000 cells/ml) and conventional farms (285,000 cells/ml). The average annual cull rate was 18.0 cases per 100 cow-years for the conventional farms and 17.2 for the organic farms (P=0.426). Our paired t-test results indicated significantly higher parasite burden on organic dairy farms; however, no significant difference between the two farm types when controlling for season (March and September), grazing intensity (no grazing, little grazing, grazing with access to housing and grazing only) and herd average milk production per cow. There was little evidence of other fundamental differences between the two farm types in other management and production parameters.

Keywords: Clinical mastitis; Bulk tank milk; Somatic cell count; Organic dairy

1. Introduction

Organic dairy production is drawing increasing attention because of public concerns about food safety, animal welfare and the environmental impacts of intensive livestock systems (Weller and Cooper,

* Corresponding author. Tel.: +1 517 432 3100x215; fax: +1 517 432 0976.

E-mail address: satokenj@msu.edu (K. Sato).

0301-6226/$ - see front matter © 2004 Elsevier B.V. All rights reserved.
doi:10.1016/j.livprodsci.2004.09.007

1996; Sundrum, 2001). The annual U.S. organic food market is approximately US$6 billion, which is less than 1% of total food consumption in the United States. However, the organic market has been growing at 20–30% per year (Greene, 2000; 2001). In the UK, a 30% to 40% per annum increase of organic products was observed (Weller and Bowling, 2000). In contrast, the organic (økologisk) milk market in Denmark is approximately 14% of the total milk consumption (Mann, 1999) and more than 25% of total sales of dairy products in Switzerland is labeled as organic (Busato et al., 2000). Organic agriculture is increasingly being recognized by governmental bodies as a tool to improve rural income diversity and stability (FAO, 2000). In Wisconsin, the organic dairy farmers sell their milk for almost twice as much as what conventional farmers receive. As such, organic milk production has created a niche market that has allowed many small dairy farms to stay in business during a time when profit margins are small, the dairy industry is consolidating and many small and moderately sized dairy herds are going out of business.

The standards for using antibiotics in organic dairies in the United States are stricter than those in the EU. The USDA Organic Standard prohibits the use of antimicrobial drugs for organic dairy cows (USDA, 2001). The standard also stipulates that all appropriate medications and antimicrobial treatments must be applied to restore an animal to health. When methods acceptable to organic production standards fail, however, this means that the animal will lose its organic status.

Mastitis is a major cause of economic loss in the dairy industry and the primary reason for which antibiotics are used in dairy operations (Kaneene and Miller, 1992). Field studies in Pennsylvania, Ohio and California indicated that the average annual herd incidence of CM was 45 to 50 cases per 100 cows (Hady et al., 1993). Milking hygiene and environmental sanitation are traditional ways to prevent the disease (Bartlett et al., 1992a). However, antimicrobial use for treating and preventing CM is also a common practice on most U.S. dairy farms. Routine intramammary treatment for all cows with long-acting antimicrobials after the end of lactation (dry cow treatment) is widely adopted in the United States as a preventive method. (Jayarao and Cassel, 1999; Hardeng and Edge, 2001). Although mild cases of CM may not always receive antibiotic treatment during the lactational period, dairy producers and veterinarians often treat severe cases with supportive therapies and intramammary antibiotic infusion or injection.

It has been suggested that organic dairy herds may have higher culling rates, primarily due to intramammary infections and reproductive problems (AHI (Animal Health Institute), 1998). However, Weller and Bowling (2000) reported that the incidence of CM in 10 organic dairies in the UK was not significantly different from the rate of CM in conventional dairies. Busato et al. (2000) reported that the prevalence of subclinical mastitis in organic dairies in Switzerland was lower than the national average. Few studies have compared the incidence of CM on organic and conventional dairy farms in the United States. Barlow (2001) reported bacteriological analysis of 109 CM quarters on six organic farms in Vermont; however, no incidence of CM was given or compared with conventional dairy farms.

It is generally assumed by the dairy industry that organic farms have lower milk production and higher culling and disease rates because farmers are not allowed to treat sick cows with antibiotics. However, valid comparisons are not available and are confounded by comparisons between small extensive organic dairies and large total-confinement dairy operations which employ a very different intensive nutritional and management strategy. In general, the organic restrictions on the use of insecticides and herbicides for producing animal feed have induced most Midwestern organic dairy farms to employ grazing to a much greater extent than do conventional farms. This generally creates less intensive feeding and housing management systems compared with what is seen in the mainline dairy industry.

The overall purpose of this study was to compare the major health, management and milk production parameters between organic and neighboring conventional Wisconsin farms.

2. Materials and methods

2.1. Data

A geographical cluster of 30 organic dairy farms in Southwestern Wisconsin were selected from 110