



J. Dairy Sci. 99:1–12
<http://dx.doi.org/10.3168/jds.2016-11346>
 © American Dairy Science Association®, 2016.

Organic dairy farmers put more emphasis on production traits than conventional farmers

M. Slagboom,^{*1} M. Kargo,^{*†} D. Edwards,^{*‡} A. C. Sørensen,^{*‡} J. R. Thomasen,^{*‡} and L. Hjortø^{*†}

^{*}Department of Molecular Biology and Genetics, Center for Quantitative Genetics and Genomics, Aarhus University, DK-8830 Tjele, Denmark

[†]SEGES Cattle, DK-8200 Aarhus N, Denmark

[‡]VikingGenetics, DK-8960 Assentoft, Denmark

ABSTRACT

The overall aim of this research was to characterize the preferences of Danish dairy farmers for improvements in breeding goal traits. The specific aims were (1) to investigate the presence of heterogeneity in farmers' preferences by means of cluster analysis, and (2) to associate these clusters with herd characteristics and production systems (organic or conventional). We established a web-based survey to characterize the preferences of farmers for improvements in 10 traits, by means of pairwise rankings. We also collected a considerable number of herd characteristics. Overall, 106 organic farmers and 290 conventional farmers answered the survey, all with Holstein cows. The most preferred trait improvement was cow fertility, and the least preferred was calving difficulty. By means of cluster analysis, we identified 4 distinct clusters of farmers and named them according to the trait improvements that were most preferred: Health and Fertility, Production and Udder Health, Survival, and Fertility and Production. Some herd characteristics differed between clusters; for example, farmers in the Survival cluster had twice the percentage of dead cows in their herds compared with the other clusters, and farmers that gave the highest ranking to cow and heifer fertility had the lowest conception rate in their herds. This finding suggests that farmers prefer to improve traits that are more problematic in their herd. The proportion of organic and conventional farmers also differed between clusters; we found a higher proportion of organic farmers in the production-based clusters. When we analyzed organic and conventional data separately, we found that organic farmers ranked production traits higher than conventional farmers. The herds of organic farmers had lower milk yields and lower disease incidences, which might explain the high ranking of milk produc-

tion and the low ranking of disease traits. This study shows that heterogeneity exists in farmers' preferences for improvements in breeding goal traits, that organic and conventional farmers differ in their preferences, and that herd characteristics can be linked to different farmer clusters. The results of this study could be used for the future development of breeding goals in Danish Holstein cows and for the development of customized total merit indices based on farmer preferences.

Key words: trait preference, organic farming, breeding goal, dairy cow

INTRODUCTION

In animal breeding, goals are defined to give relative importance to certain traits, usually based on economic weights (Groen et al., 1997). In Denmark, Finland, and Sweden, the Nordic Total Merit Index is based on common economic weights and is used as a breeding selection tool (Kargo et al., 2014). Breeding goals are defined for specific production systems and circumstances. To develop a breeding goal that farmers want to use, it is important to take account for farmers' objectives; a breeding goal that does not correspond to farmer preferences will make little sense (Nielsen et al., 2014). Such preferences can be defined using farmer choice experiments that use methods such as conjoint analysis (Tano et al., 2003), partial profile design (Nielsen and Amer, 2007), or pairwise rankings using preference-based tools such as 1000Minds (Byrne et al., 2012). Several studies have shown heterogeneity in farmers' preferences for breeding goal traits (Duguma et al., 2011, Ragkos and Abas, 2015), a finding that may be linked to different cattle production systems (Sy et al., 1997, Ouma et al., 2007). If farmer preferences are heterogeneous because of differences in production systems or farm or farmer characteristics, it might be necessary to create multiple breeding goals in a population (Nielsen and Amer, 2007).

Two production systems that are expected to influence farmer preferences for trait improvements are

Received April 22, 2016.

Accepted August 8, 2016.

¹Corresponding author: margotslagboom@mbg.au.dk

organic and conventional dairy farming. Organic farming has stronger regulations in terms of feed, outdoor access, and the use of antibiotics and anthelmintics than conventional farming. A lower use of concentrate feed causes lower milk production levels in most organic dairy systems (Bennedsgaard et al., 2003; Rosati and Aumaitre, 2004), but the price for organic dairy products is higher than that of conventional dairy products. In Denmark, organic farming is widely applied, and 10% of dairy farms are organic (Landbrug and Fødevarer, 2014). A previous study has shown that Swedish organic farmers place more emphasis on resistance to mastitis, parasites, and diseases, whereas conventional farmers emphasize higher milk production (Ahlman et al., 2014). Production level and farmer characteristics such as sex and age were found to affect improvement preferences for some traits, and the production system (organic or conventional) had the largest effect on farmer preferences (Ahlman et al., 2014).

Rather than analyzing farmer preferences in pre-defined groups (such as organic and conventional farmers), cluster analysis (CA) methods may be applied to identify groups of farmers with different preference profiles. These groups can be compared to see whether herd characteristics and production systems (organic or conventional) are associated with farmer preferences. Martin-Collado et al. (2015) showed that Australian farmers' trait preferences were heterogeneous and identified distinct groups by means of a CA. The groups they found, however, did not differ with respect to most of the herd characteristics measured in their study, suggesting that farmers' trait preferences were intrinsic to the farmers, rather than a result of measurable differences in characteristics. Cluster analysis can be a valuable tool to analyze farmer preferences.

The overall aim of this study was to characterize the preferences of Danish dairy farmers for breeding goal trait improvements. The specific aims were (1) to investigate the presence of heterogeneity in farmers' preferences by means of CA, and (2) to associate the clusters with herd characteristics and production systems (organic or conventional). We hypothesized that heterogeneity exists in farmers' preferences for trait improvements, and that it is related to the herd characteristics and production systems of the farmers.

MATERIALS AND METHODS

Farmer Preference Study

We established a web-based survey to characterize the preferences of dairy farmers for improvements in 10 traits. All traits, except for feed efficiency, were included in the current Nordic Total Merit index, but

some were composite traits of multiple (indicator) traits. The survey used the online software 1000Minds (1000Minds Ltd., Dunedin, New Zealand), which applies the PAPRIKA method to minimize the number of questions (Hansen and Ombler, 2009). The farmers chose from 2 alternatives, formulated in such a way that the first trait would be improved and the second would remain at the same level, or vice versa (Figure 1). Farmers could also choose the option "they are equal." Improvements in the 2 traits represented equal monetary value, based on economic weights calculated for an organic system in Denmark (Kargo et al., 2015). The underlying monetary value was unknown to the farmer, because trait improvements were expressed in phenotypic units (such as kg of milk or % pregnancy rate; see Table 1). Preferences were ranked accordingly. We sent the same survey to organic and conventional dairy farmers so that the results would be comparable. The correlation between the economic weights for an organic system and a conventional system was almost unity (Slagboom, 2015).

Farmers were also asked to answer a general questionnaire about characteristics of their herd, such as herd size, average milk yield, and housing system. In addition, we extracted data from the past year from the Danish Cattle Database for all farmers who completed the survey (Bundgaard and Høj, 2000). All recorded herd characteristics are described in Table 2, together with the average response for all items.

In April 2015, all Danish organic farmers with registered addresses in the cattle database ($n = 357$), regardless of the breed they used, were contacted by ordinary mail to access the web-based survey. Farmers who had not answered, or had only partially completed the survey were later sent an e-mail, contacted by phone, or both. In August 2015, almost all ($n \approx 3,000$) conventional farmers were contacted by e-mail to access the survey, and a random sample of these farmers were later also contacted by phone to minimize bias. The survey results for the organic dairy farmers were not published before the survey of the conventional dairy farmers was finished. The general questionnaire was linked to the preference survey based on the herd number that farmers filled in. Not all farmers filled in both the general questionnaire and the preference survey, and some herd numbers did not match. All farmers who completed the preference survey were included in the analysis. In this paper, only the results from Holstein data are presented.

Statistical Analysis

The part-worth utilities were translated into trait ranks by 1000Minds, where the most preferred trait

Download English Version:

<https://daneshyari.com/en/article/5542755>

Download Persian Version:

<https://daneshyari.com/article/5542755>

[Daneshyari.com](https://daneshyari.com)