The Old School, Brewhouse Hill, Wheathampstead,
Hertfordshire AL4 8AN, UK

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Welfare assessment on Japanese dairy farms using the Animal Needs Index

T Seo*†, K Date†, T Daigo†, F Kashiwamura† and S Sato‡

† Obihiro University of Agriculture and Veterinary Medicine, Inada, Obihiro, Hokkaido, 080-8555, Japan
‡ Graduate School of Agricultural Science, Tohoku University, Naruko, Miyagi, 989-6711, Japan
* Contact for correspondence and requests for reprints: seo@obihiro.ac.jp

Abstract

The Animal Needs Index (ANI) is used for on-farm assessment of welfare in Austria. However, no synthetic welfare assessment system exists in Japan. We performed a welfare assessment of Japanese dairy farms using the ANI scoring system. On 25 farms, 36 dairy herds were assessed using the ANI35L/2000-cattle survey. On 10 dairy farms, 16 herds were housed in free-stall barns. The other 20 herds of 15 dairy farms were housed in tie-stall barns. This study was conducted between December 2004 and January 2005. The ANI scores ranged from 6.0 to 40.0 points (mean 17.8 points). The four high ranking herds on ANI value were housed in free-stalls and allowed the use of outside areas. The 13 low ranking herds were housed in tie-stalls and were not allowed the use of outside areas. The free-stall herds had significantly higher ANI scores than tie-stall herds. The ANI scores of herds having access to outside areas were significantly higher than those of herds having no outside access. This scoring system might be useful for Japanese dairy farms. However, some assessment parameters contain subjective criteria such as cleanliness, floor slipperiness, and animal health. Further studies are necessary to improve the scoring system, in particular clarifying criteria related to those parameters.

Keywords: *Animal Needs Index, animal welfare, assessment index, cattle, housing, on-farm welfare assessment*

Introduction

Concern about animal welfare at the farm level has increased in many countries. In Japan consumers increasingly require animal products from animals that have been reared in high-welfare systems. Farmers also have a gradually increasing interest in improving the housing environment of animals.

A relevant, appropriate and synthetic assessment tool is necessary for assessment of animal welfare on farms in various production systems. For that purpose, the Animal Needs Index (ANI) was developed for on-farm assessment of welfare in Austria and Germany (Bartussek *et al* 2000). The current version for cattle is called ANI35L/2000-cattle. This index has the following five components (sheets) to assess animal welfare: Sheet 1, affording movement and locomotion (Locomotion), sheet 2, affording social interaction (Social interaction), sheet 3, type and condition of flooring (Flooring), sheet 4, light and air conditions (Light and Air) and sheet 5, stockmanship (Stockmanship).

These categories are assessed and recorded on each evaluation sheet by the assessor. Points are assigned to several parameters within each of the five categories. The total of the points in all sheets is the ANI score. The ANI score may range from -9.0 to +46.0 with high ANI scores indicating better welfare levels.

Bartussek (1999) proposed five grades of ANI scores for animal welfare assessments: A) > 28; very suitable, B) 24 – 28; suitable, C) 21 – 24; fairly suitable, D) 16 – 21; partially suitable, E) 11 – 16; scarcely suitable and F) < 11; unsuitable.

The ANI35L/2000 system is applied for assessing organic animal production in Austria (Bartussek 1999).

Despite its demonstrated utility, no such welfare assessment system exists on the farm level in Japan. This study examines the possibility of applying this ANI system to Japanese dairy farms.

Materials and methods

Farms and animals

On 25 farms we assessed 36 dairy herds kept in the following types of housing: 1) Free-stalls with outside exercise area (4 herds of 2 farms), 2) free-stalls without outside exercise area (12 herds of 8 farms), 3) tie-stalls with outside exercise area (4 herds of 4 farms), and 4) tie-stalls without outside exercise area (16 herds of 11 farms). All herds consisted of dehorned Holstein dairy cows and all farms were located in Hokkaido in northern Japan. The herd sizes ranged from 6 to 135. Milking took place in a milking parlour or in the animals' stalls twice a day. The herd average annual milk yield ranged from 7,385 to 11,232 litres.

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Figure 1

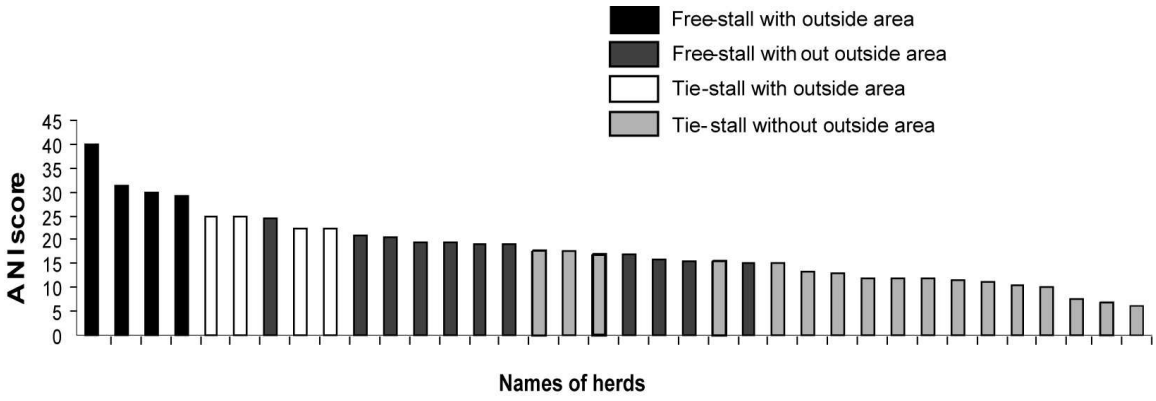

Figure 1 ANI- scores of herds. Figure shows the ANI scores: 6.0 – 40.0 points (mean 17.8 points). The four high ranking herds based on ANI score, were housed in free-stalls and were allowed to use outside exercise areas. The 13 low ranking herds based on ANI scores were housed in tie-stalls and were not allowed to use outside exercise areas. The free-stall herds had significantly higher ANI scores than tie-stall herds (22.2 vs 14.4, $P < 0.05$). However, even for tie-stall herds, the ranks of herds with outside areas were high. The ANI scores of herds with access to outside areas were significantly higher than those of herds with no outside access (28.3 vs 14.8, $P < 0.05$). Respective numbers of herds, as classified according to the five welfare level grades proposed by Bartussek (1999), were: A) 4, B) 3, C) 3, D) 10, E) 11, F) 5.

Assessment of welfare

The same two assessors using the ANI35L/2000-cattle assessment system conducted ANI scoring on dairy farms. The two assessors visited the farm once from November 2004 to January 2005 and scored each milking cow herd. The assessors were trained in the use of the ANI system before this investigation. The same assessors performed all investigations. Separate scores were recorded if milking herds were housed in different housing systems. The assessors asked the farmers questions to score their responses, eg the number of cows and the number of available days in the outdoor exercise area. The cows' weight for calculating 'available floor area' to assess locomotion (sheet 1) and social interaction (sheet 2) was extracted from the results of the dairy herd performance test offered by the Hokkaido Dairy Milk Recording and Testing Association. Standard weights of Japanese Holstein dairy cows were used if data were missing. Animal health and the condition of cows' feet were assessed to address stockmanship and were estimated from the incidence of foot disease from livestock insurance data offered by the Hokkaido prefectural union of agricultural co-operatives.

Statistical methods

Comparisons of ANI scores for different housing systems (free-stall vs tie-stall, housing with outside area vs without) were made using the Mann-Whitney *U* test.

Results

It was difficult to judge certain assessment parameters as they include subjective criteria for scoring cleanliness, floor slipperiness, and animal health. This is especially true for the stockmanship category (sheet 5) which contains numerous obscure parameters. For example, the cleanliness of pens and feeding/drinking areas were assessed according to statements such as 'clear', 'medium', 'insufficient', or 'soiled'. No sufficient explanation to judge these grades is supplied for this parameter.

Discussion

This is the first study to evaluate the dairy farm's welfare level in Asia using a synthetic animal welfare index.

The ANI scores were higher for herds housed with free-stalls and with access to outside exercise areas. Only these herds were awarded an A grade according to Bartussek's welfare level. Scores for herds with tie-stalls were low, but the scores of herds with access to outside exercise areas were higher. In this assessment system, the welfare level is necessarily higher in herds in free-stalls with outdoor access. However, a tethering system without outdoor access is most common among Japanese dairy farms. We must consider that an assessment for animals housed in comfortable cowsheds would indicate high welfare levels.

There remain difficulties regarding which criteria to judge the grades within the assessment parameters. Therefore, it is necessary to clarify those criteria. Both maximum and minimum ANI scores in our study were less than those given by Ofner *et al* (2003). They reported that ANI scores were 11.5 – 43.8 points for 11 Austrian dairy cowsheds. This difference might be attributable to different judgments on certain obscurely defined, and subsequently obscurely scored, criteria.

This scoring system is affected by the timing of farm visits because points differ before and after pens are cleaned. In addition, scoring of outdoor areas is heavily influenced by

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the climate ie it is impossible to score an area that is covered with snow. It is necessary to consider these problems.

Some correlations were found between the ANI score and behaviour and health parameters (Ofner *et al* 2003). However, in the ANI system, the welfare level on farms was assessed using only environmental parameters, not by the actual state of the animals. Capdeville and Veissier (2001) proposed a new method for assessing dairy cows' welfare based on five freedoms. Whay *et al* (2003a,b) described another method based on direct observations of animals and investigation of farm records. Waiblinger *et al* (2001) proposed an epidemiologically-based farm assessment system. We must consider a comprehensive method for assessing welfare level of cows assessed by environmental and animal-based parameters.

Conclusions and animal welfare implications

The ANI-scoring system might be useful for Japanese dairy farms. However, certain assessment parameters contain extremely subjective criteria for scoring such as cleanliness, flooring slipperiness, and animal health. Further studies are necessary to improve this scoring system and, especially, to clarify criteria concerning these parameters.

In this assessment system the welfare level is necessarily higher in herds of free-stalls with access to outdoors. Even if animals are housed without outdoor areas, the welfare level assessed by the developed scoring system is inferred to be high when housing management is very comfortable.

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