



**Danish Research Centre for Organic Farming**

# **Ecological Animal Husbandry in the Nordic Countries**

**Proceedings from NJF-seminar No. 303  
Horsens, Denmark 16-17 September 1999**

John E. Hermansen,  
Vonne Lund &  
Erling Thuen (Eds.)

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### **Danish Research Centre for Organic Farming**

Foulum • P.O. Box 50 • DK-8830 Tjele

Tel. +45 89 99 16 75 • Fax +45 89 99 16 73

E-mail: [foejo@agrsci.dk](mailto:foejo@agrsci.dk)

Homepage: [www.foejo.dk](http://www.foejo.dk)

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Editors

John E. Hermansen, Danish Institute of Agricultural Sciences  
Vonne Lund, Swedish University of Agricultural Sciences  
Erling Thuen, Agricultural University of Norway

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Tel. +45 89 99 16 75, fax +45 89 99 12 00  
E-mail: [foejo@agrsci.dk](mailto:foejo@agrsci.dk)  
Homepage: [www.foejo.dk](http://www.foejo.dk)

# Evaluation of animal welfare on organic dairy farms in Finland

*Ulla Roiba*

*University of Helsinki, Mikkeli Institute for Rural Research and Training,*

*Lönnrotinkatu 3 – 5, 50100 Mikkeli, Finland*

*E-mail: ulla.roiba@helsinki.fi*

## **Abstract**

The evaluation of animal welfare on organic dairy farms was carried out in connection with the first Finnish research study on animal healthcare and welfare in 1996 to 1998. 26 organic dairy farms took part in the research, including 20 tie-stall barns (332 cows) and 6 loose-housing systems (209 cows). They formed 36% of the organic dairy farms and 46% of the cows certified with *Luomuliitto* (Finland's Ecological Animal Production Standards) in 1996. Survey visits to the farms were conducted during early spring and autumn. Housing, feeding and health data was collected. The data from housing conditions and cattle health was used for estimating the Animal Needs Index values.

The two Austrian Animal Needs Indexes developed by Bartussek were used for the first time in Finland. The holistic approach considers five important husbandry components: possibility of movement, social contact, condition of the floors, stable climate and stockman's care (Bartussek, 1997). The Animal Needs Index value was determined with dairy cows according to TGI 35K/1995 and TGI 35L/1995. A few changes were made to accommodate the indexes to Finnish circumstances. The Animal Needs Index value on Austrian organic farms should be 21 points at least (for old cow barns) or over 24 points (for new cow barns). The longer version, TGI 35L/1995, proved to be more practicable in Finland than the shorter version, TGI 35K/1995. Determined according to TGI 35L/1995, 81% of the farms passed the point level needed for organic animal husbandry, but according to TGI 35K/1995 only 31% passed the limit.

## **Introduction**

Consumers are more and more interested in the origin of their food and the methods how it is produced. Public pressure concerning farm animal welfare is also very great in many European countries (Broom, 1992). Animal health, welfare, vitality and longevity belong to the goals of organic farming. Proper organic farming includes not only appropriate feeding with farm-grown fodder, but also changed breeding goals, better housing systems, enabling animals to perform their inborn natural behaviour and a commitment to disease prevention by the caretaker (Boehncke and Krutzinna, 1996; Boehncke, 1997).

From an ethical point of view, animals also have dignity. As such they deserve to be treated according to the requirements of the species to which they belong. This special status of farm animals should be as important to organic farmers as a responsible and gentle treatment of the soil and plants. (Fölsch and Hörning, 1996.)

The welfare of an individual animal can be judged by its state as regards to its attempts to cope with its environment (Broom, 1986). The methods which animals use to try to maintain control and to cope with difficulties include a range of physiological and behavioural responses (changes in heart rate, adrenal action, movements which reduce pain and actions which result in avoidance of excessive cooling) (Broom, 1992). Welfare varies from very poor to very good and will fluctuate during the animal's life (Broom, 1992; Fraser and Broom, 1997). The subjective feelings of an individual are also an important aspect of its welfare (Broom, 1992). Poor welfare occurs in situations in which the effects on the animal are so adverse that there is reduced fitness or clear indications that fitness will be reduced, i.e. the animal is stressed (Broom, 1992).

Different methods are developed to estimate animal welfare. Physiological measures (heart rate and adrenal cortex activity), behavioural measures (reduced activity, unresponsiveness, self-narcotising, stereotyping), immunological measures (immunosuppression), injury and disease (the extent of body tissue damage and the degree of disturbance of physiological and behavioural processes), fitness measures (mortality risk, growth and reproduction) and preference assessment (preference tests) are used (Broom, 1992). Welfare should not be defined solely in terms of subjective experiences, but a wide range of measures should be used (Broom, 1992). Numerous flexible systems for judging farm animal welfare have been developed (Schlichting and Smidt, 1984; item, 1987; Kohli and Kämmer, 1984; Zeeb, 1985; Bock, 1990; Irsps, 1985). At the moment, however, the two judgement systems, TGI 35 developed by Bartussek (1988, 1991, 1997) and TGI 200, developed by Sundrum et al. (1994), are mainly in use in Austria and Germany (Amon et al., 1997).

## **The Animal Needs Index (ANI)**

Beginning in 1985 an "Animal Needs Index" ANI (German; Tiergerechtheitsindex, TGI) has been developed (Bartussek, 1991). ANI is a pragmatic and only partly scientific system, based on a consensus of the people involved, which indicates the level of how an animal can perform its inborn natural behaviour in different housing systems. ANI matches the large variety of situations in practical farming better than a compulsory list of single conditions. It helps reduce conflicts between farmers' situations and consumer expectations (Bartussek, 1997). It has been officially used in Austria since 1995, mainly in controlling husbandry systems in organic farming and proprietary articles. By the end of 1997 more than 20 000 stables were investigated in Austria (Bartussek, 1997). The ANI has proved to be practicable and satisfactory (Bartussek, 1991; 1997).

The holistic approach assesses the welfare of animals by considering five important husbandry components: possibility of movement, possibility of social contact, condition of the floors, stable climate (including light and noise) and stockman's care. Scoring leads to a sum of points. These ANI values represent different categories of animal welfare along a continuum from not animal friendly to animal friendly. Before the estimation is done, the minimum standards relating to housing conditions and biological and ethological needs should be achieved. If minimum standards are not achieved the ANI values are settled with reservation. The fault in the animal housing system must be removed (Bartussek, 1997; Amon et al., 1997). The Animal Needs Index value on Austrian organic farms should be 21 points at least (for old cow barns, approximately 55% of the sum of points) or over 24 points (for new cow barns, over 60% of the sum of points).

## Material and methods

The evaluation of animal welfare on organic dairy farms was estimated in connection with the first Finnish research study on animal healthcare and welfare in 1996 to 1998. 26 organic dairy farms took part in the research, with a total of 541 cows. They formed 36% of the organic dairy farms and 46% of the cows certified with *Luomu-liitto* (Finland's Ecological Animal Production Standards) in 1996. There were 20 tie-stall barns (332 cows) and 6 loose-housing systems (209 cows). Survey visits to the farms were done during the early spring and autumn of 1997. Cattle health was studied through existing health reports of the herd, questionnaires and physical examination of the animals and the housing conditions were controlled. Feeding data was also collected.

The welfare of the animals was evaluated according two Austrian Animal Needs Indexes, TGI 35K/1995 (Bartussek et al., 1995) and TGI 35L/1995 (Anon., 1995), developed by Bartussek. The shorter version, TGI 35K/1995, ranges from 5 to 35 points. The version, TGI 35 L/1995, is more specific, with a range of minus 10 to plus 45,5 points. TGI 35 L/1995 is used in monitoring organic animal husbandry in Austria. A few changes were made to accommodate the indexes to Finnish circumstances. Because of the small herd size in Finland, all animals were included in the estimation and not only a quarter of the animals that had the worst housing conditions, as is done in Austria. The minimum standards used in this estimation were: Finnish animal protection legislation (Eläinsuojelulaki, 1996; Eläinsuojeluasetus, 1996; Anon., 1997b), regulations concerning housing conditions of animals by the Ministry of Agriculture and Forestry (Anon., 1996a;1996b) and Finland's Ecological Animal Production Standards (Anon., 1997a).

## Results

### *Possibility of movement*

TGI 35K/1995 gives points according to the time animals stay in a free-range or limited exercise area. The longer version, TGI 35L/1995, examines loose-housing systems and tie-stalls separately. It takes account of the total area for movement (space per animal), ease of lying down and standing up, opportunity for outdoor exercising and pasturing. In tie-stalls, TGI 35L/1995 also determines the size of lying boxes and latitude of the tying system. This field gave on average 3.7 points according to TGI 35K/1995 and 5.3 points according to TGI 35L/1995 (Table 2).

In summer cows are put out to pasture. Grazing season in Finland (3.5 months) is shorter than in Central Europe, but usually cows are allowed to stay out during daytime for about 5 months. For that reason we didn't use specific numbers regarding how many days cows are grazing during the summer months, but the amount of days of possible grazing according to region (whole grazing season, 2/3 of the grazing season, 1/3 of the grazing season). During winter, 73% of the farms let the animals out at least two or three times per week (Table 1).

**Table 1** Winter exercise of cows on organic dairy farms.

Times/Week	Stables %	Number of tie stall barns	Number of loose housing systems
0	4	0	1
1	23	6	0
2 - 3	50	11	2
3 - 4	8	1	1
4 - 5	4	1	0
5 - 6	0	0	0
6 - 7	11	1	2
Total	100	20	6

**Table 2** Animal needs indexes, TGI 35K/1995 (K) and TGI 35L/1995 (L). The sum of points within each field of influence gives the ANI value.

Field Stables	Possibility of movement		Social contact		Condition of the floors		Stable climate		Stockman's care		ANI value	
	K	L	K	L	K	L	K	L	K	L	K	L
1	3	5,5	3	5	4	5	4	4,5	6	6	20,0	26,0
2	3	5,5	3	5	4	4	4	4,5	5	4,5	19,0	23,5
3	3	4,5	3	4,5	4	4,5	5	4,5	7	6,5	22,0	24,5
4	3	4,5	3	4,5	4	4,5	4	5	6	5,5	20,0	24,0
5	3	4,5	3	4,5	1	1	4	5,5	5	4	16,0	19,5
6	3	5,5	3	4,5	3	4	2	4	6	5	17,0	23,0
7	3	5	3	4,5	3	2,5	3	4,5	7	7	19,0	23,5
8	3	5	3	4,5	3	3	3	4	7	7	19,0	23,5
9	3	4	3	4,5	4	3,5	4	5	6	6	20,0	23,0
10	3	5	3	4,5	4	4	4	5	7	6,5	21,0	25,0
11	5	7,5	5	7,5	5	4,5	2	4	7	7	24,0	30,5
12	3	4,5	3	3,5	3	5	2	4	5	4,5	16,0	21,5
13	3	5	3	4,5	3	5	4	3,5	6	6	19,0	24,0
14	7	9,5	7	9	6	6	5	6	7	6,5	32,0	37,0
15	3	3,5	3	3	4	5	4	6	6	5	20,0	22,5
16	3	4	3	3,5	3	3,5	4	5,5	5	4	18,0	20,5
17	5	8,5	5	7,5	5	5	3	4	7	7	25,0	32,0
18	7	10	7	9	5	4,5	7	7	6	5,5	32,0	36,0
19	5	5	5	7	4	3	2	3	6	5	22,0	23,0
20	3	4	3	4,5	2	3	2	3,5	5	4	15,0	19,0
21	5	5	4	5,5	4	4,5	6	6	6	5,5	25,0	26,5
22	3	5	3	4,5	4	4	4	5,5	7	6,5	21,0	25,5
23	3	4,5	3	4,5	4	5	2	3	5	4,5	17,0	21,5
24	3	5	3	4,5	4	5	2	4	6	5	18,0	23,5
25	3	4,5	3	4,5	2	3,5	2	3,5	5	4	15,0	20,0
26	5	2,5	5	4	4	4,5	2	4	4	2	20,0	17,0
AV.	3,7	5,3	3,7	5,1	3,7	4,1	3,5	4,6	6,0	5,4	20,5	24,4
MAX	7	10	7	9	6	6	7	7	7	7	32	37
MIN	3	2,5	3	3	1	1	2	3	4	2	15	17
STDEV	1,3	1,7	1,2	1,6	1,0	1,0	1,4	1,0	0,9	1,2	4,3	4,8



### *Possibility of social contact*

TGI 35K/1995 gives points according to box type (different areas for feeding and resting behaviour) and the time animals stay in a free-range or limited exercise area. The longer version, TGI 35L/1995, examines total area for movement (space per animal), consistence of the herd, opportunity for outdoor exercising and pasturing. This field gave on average 3.7 points according to TGI 35K/1995 and 5.1 points according to TGI 35L/1995 (Table 2).

### *Condition of the floors*

TGI 35K/1995 gives points according to the softness of the rest area and the firmness of walking area. TGI 35L/1995 examines softness, cleanliness and firmness of the resting area and quality of the floor in activity areas and passages. Attention is paid to outdoor exercise areas, slatted floors in loose-housing systems and passages in tie-stalls. The field gave on average 3.7 points according to TGI 35K/1995 and 4.1 points according to TGI 35L/1995 (Table 2). Stable number 5, in the table, got only one point because of slippery and partly dirty boxes in a tie-stall without any bedding material.

### *Stable climate*

TGI 35K/1995 gives points according to ventilation, stable type and outdoor exercise time. TGI 35L/1995 pays attention to lightness of the stable, ventilation, draught and access to outdoor areas. The field stable climate gave on average 3.5 points according to TGI 35K/1995 and 4.6 points according to TGI 35L/1995 (Table 2).

### *Stockman's care*

Both index versions examine the same areas: tidiness of the feeding area and water bowls, condition of stable equipment, equipment-caused injuries, skin condition, cleanliness of the animals, claw condition and health of the animals. The points given differ between versions, with the shorter version, TGI 35K/1995, giving more points. This field gave on average 6.0 points according to TGI 35K/1995 and 5.4 points according to TGI 35L/1995 (Table 2). As an exception to the other fields, the stockman's care gave the same amount or more points in all stables. The greatest difference was points given to stable 26.

### *The Animal Needs Index value*

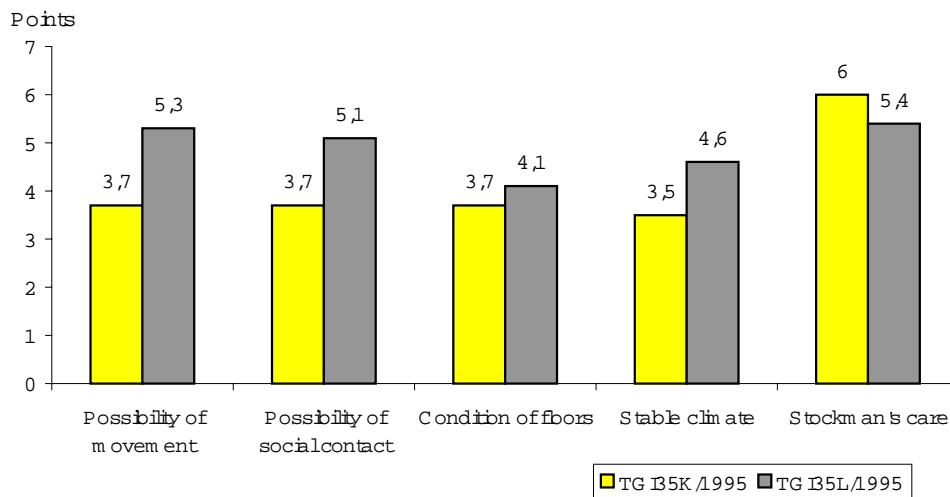
The sum of points averaged 20.5 according to TGI 35K/1995 and 24.4 according to TGI 35L/1995 (Table 2). The sum of points was greater in estimation according to TGI 35 L/1995, except for loose-housing system number 26. That stable got more points, according to TGI 35K/1995, in the fields of possibility of movement, possibility of social contact and stockman's care.

When looking at the different fields of the ANI value, the TGI 35 L/1995 gave on average 1.6 points more in the field of possibility of movement, 1.4 more points for possibility of social contact, 0.4 more points for condition of the floors and 1.1 more points for stable climate. Stockman's care gave 0.6 points more on average according to TGI 35K/1995. Figure 1 shows the different fields of the ANI-values and figure 2 provides the ANI numbers of the stables.

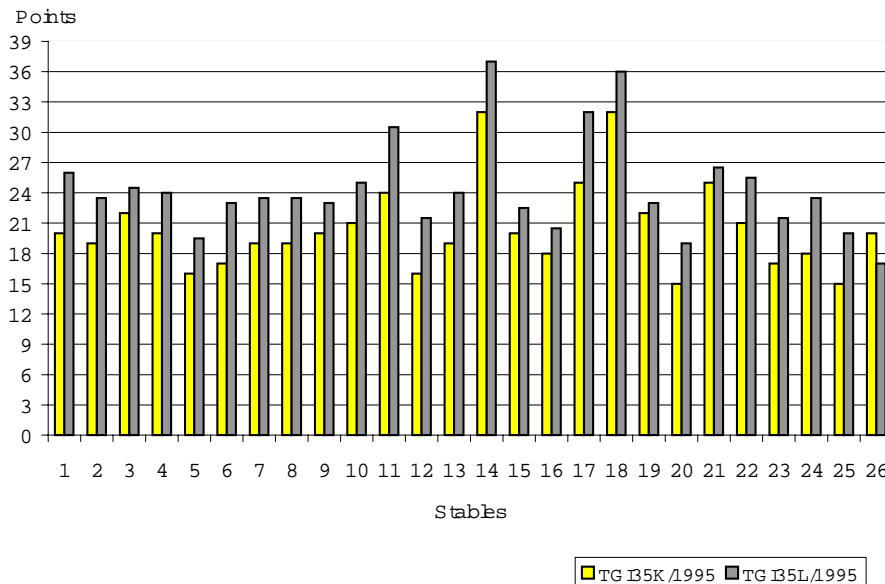
Access to an exercise area or pasture belong to three different fields of determination. They can form 27% of the points of the ANI number (12.5 points in TGI 35L/1995). If animals have not access to outdoor exercise, the sum of the ANI will be low. When collecting information for this research, Finland's Ecological Animal Production Standards had not settled standards for outdoor exercise during winter time. Today dairy cows are put out to pasture or exercise area during summer time and at

tie-stall barns they should get out at least three times per week (weather conditions permitting) in winter time (Anon. 1997a).

The Animal Needs Index value on Austrian organic farms should be 21 points at least (for old cow barns) or over 24 points (for new cow barns). The longer version, TGI 35L/1995, proved to be more practicable in Finland than the shorter version, TGI 35K/1995. Determined according to TGI 35L/1995, 81% of the farms (21 stables) passed the level needed for organic animal husbandry, but according to TGI 35K/1995, only 31% (8 stables) passed the limit (Figure 3). Table 3 shows the evaluation according to environmental naturalness, satisfaction of animal needs and animal welfare

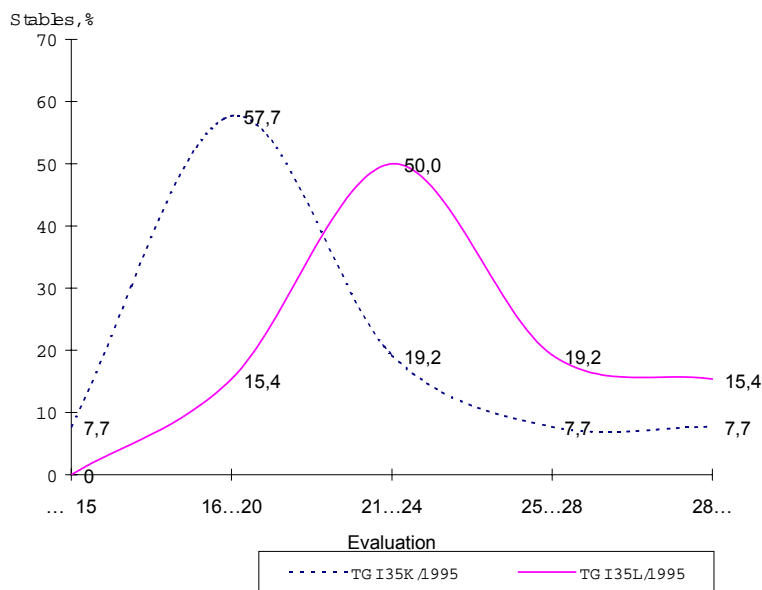


**Figure 1** Average points in the five fields of the Animal Needs Index.



**Figure 2** The Animal Needs Index values according to TGI 35K/1995 and TGI 35L/1995. Stables number 11, 14, 17, 18, 19 and 26 are loose-housing systems.

(Bartussek, 1991). Determined according to TGI 35K/1995, 57.7% of the stables were evaluated as follows: not near to nature, little adequate for animal needs, medium welfare standard: behavioural deprivation, and slight damage. According to the more specific version, TGI 35L/1995, only 15.4% of the stables got the same evaluation and 50% of the stables were estimated as near to natural, fairly adequate for animal needs, quite good welfare standard: behavioural restrictions, no damage. In loose-housing systems animals are able to perform most inborn behavioural needs and that is why loose-housing systems usually get more points than tie-stall barns. Still, according to this estimation two loose-housing systems (stables numbers 19 and 26) did not pass the limit required for organic dairy farms.



**Figure 3** The stables evaluated according to TGI 35K/1995 and TGI 35L/1995.

**Table 3** Stables according to ANI numbers.

ANI number	TGI 35K/1995 Number of stables	%	TGI 35L/1995 Number of stables	%	Evaluation (Bartussek, 1991)
< 11	0	0.0	0	0.0	Unnatural, industrial, not at all adequate for animal needs, extremely poor welfare standard: behavioural suffering, severe damage
11-15	2	7.7	0	0.0	Far off nature, barely adequate for animal needs
16-20	15	57.7	4	15.4	Not near to nature, little adequate for animal needs, medium welfare standard: behavioural deprivation, slight damage
21-24	5	19.2	13	50.0	Near to natural fairly adequate to animal needs, quite good welfare standard: behavioural restrictions, no damage
25-28	2	7.7	5	19.2	Natural, adequate to animal needs, high welfare standard
>28	2	7.7	4	15.4	Natural, very adequate to animal needs, very high welfare standard

## Discussion

According to this determination, the difference between the two versions was rather great. The same stable can be estimated as “not near to nature” or “near to natural” depending on what method is used. That is why it is not possible to compare the housing conditions and animal welfare of one farm to another if it is not estimated according to the same method. There are also some sectors that should be added to the estimation. Organic farms are run according to the regulations of organic livestock production, where animal welfare, through housing conditions, nutrition, breeding, free-range exercise areas and human care, is taken account. However, an ordinary farm with high levels of concentrates in feeding can get higher ANI numbers in an estimation. In that case it is impossible for a consumer to draw conclusions from animal welfare on the grounds of an ANI number. It might be useful to also include some fields concerning feeding in the estimation.

The human-animal relationship is one of the most important factors influencing animal health and welfare in housing systems (Boehncke, 1997). Bartussek’s original version estimated human care by herd size or working time (Bartussek, 1991). The field of stockman’s care has been further developed, however, and the human-animal relationship is now estimated indirectly via animal health and cleanliness and the condition of the equipment and animals. Many parts of the five fields are subjectively estimated, for instance the cleanliness of the animals. So persons working in the monitoring of livestock systems should be trained in order that the deviation between people can be diminished (Amon et al., 1997).

For more objective results, different types of measuring equipment should be available. For instance, stable gasses can be measured with infusion tubes and the light level with photometers.

## Conclusion

The evaluation of animal welfare on organic dairy farms was estimated for the first time in Finland. The estimation gave encouraging results, concerning how housing can be evaluated from the animals' point of view. Finland's geographical location and how this influences the different fields of the Animal Needs Index should still be taken into account; the index must accommodate Finnish circumstances. The Animal Needs Index draws attention to the importance of animal welfare and more animal friendly housing systems. The index would also be suitable in Finland for monitoring husbandry systems in organic farming and would assure a higher market value for organic or proprietary articles. As part of the quality systems of agriculture it could satisfy the interests of producers, advisors and consumers.

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