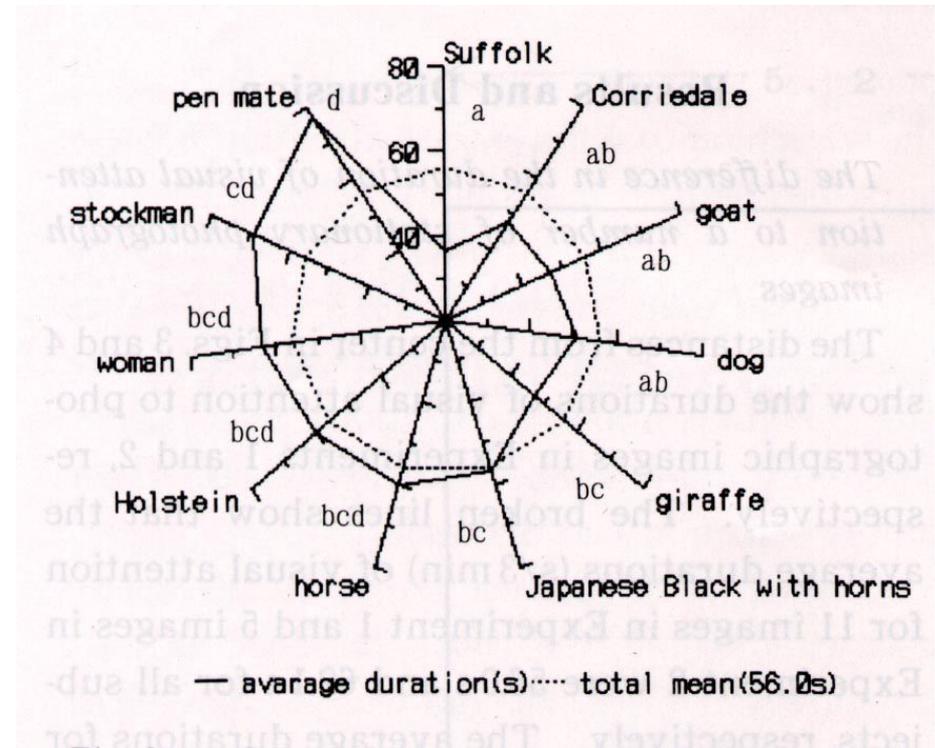# 畜産動物の福祉を考える

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佐藤衆介

本日の話題

1. 畜産動物はイヌ・ネコほど賢くないのか？

2. 福祉改善は利用目的を阻害するのか？

3. 行動を変えるには「認知」を変える

4. 動物福祉改善は人間福祉改善に通じる

１．畜産動物はイヌ・ネコほど賢くないのか？

例１）ウシは仲間やいつも世話してくれる人を良く見る
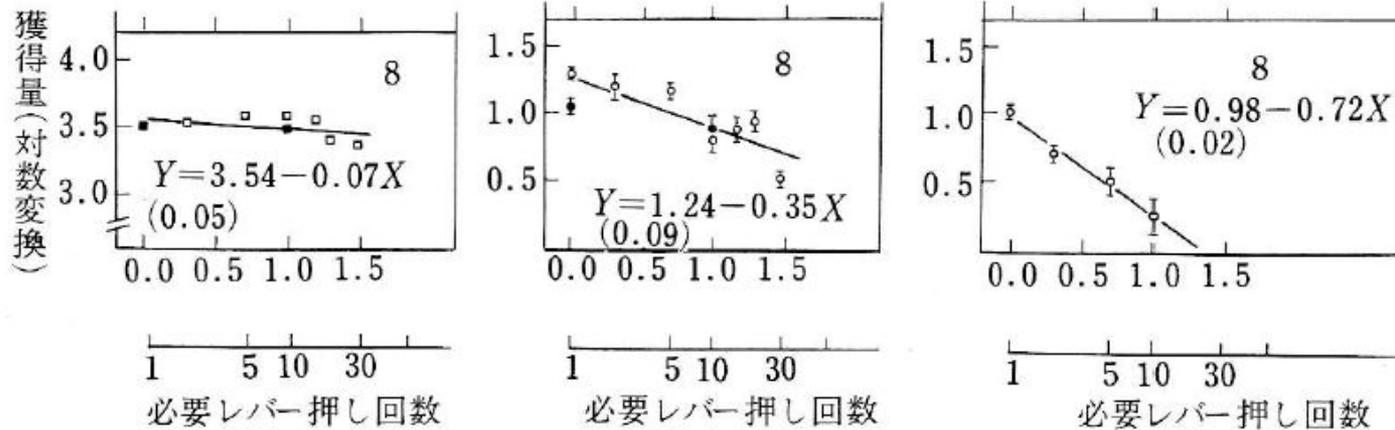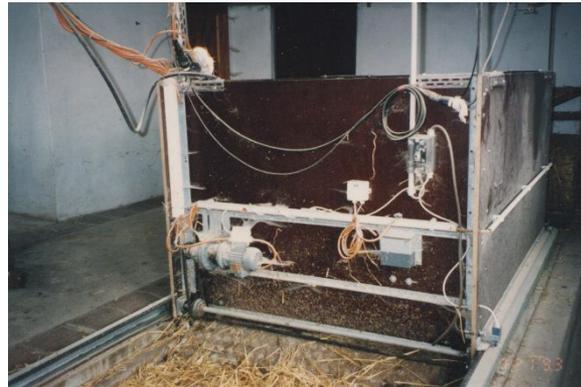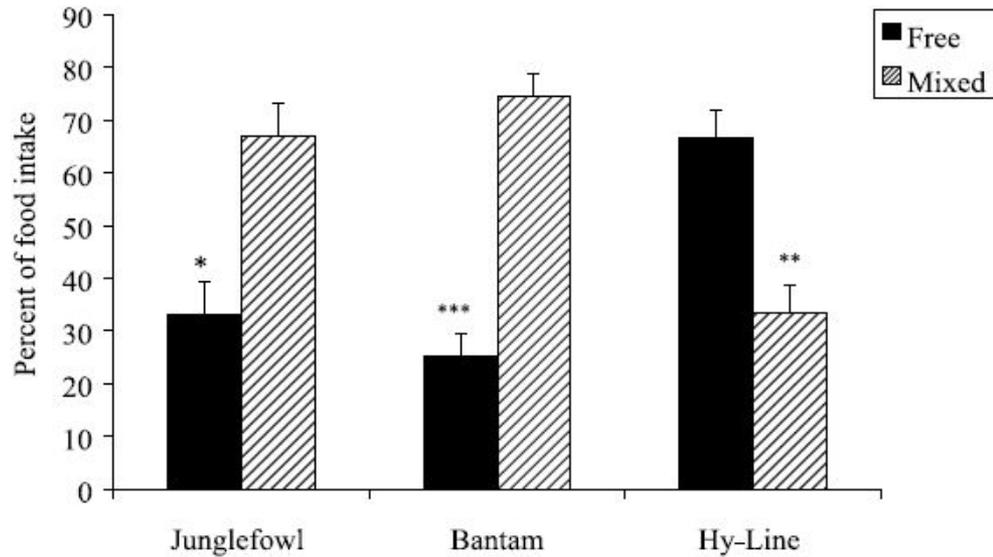

Sato & Yoshikawa(1996)

例2）ブタは広い居間より仲間と対面したがる

図5.7 オペラント条件づけされた豚における，報酬獲得のために必要な
レバー押し回数の増加に伴う報酬獲得量の変化
（報酬は左から餌，社会的接触，ドアの開放）
（Matthews, L.R. and J. Ladewig, Anim. Behav., 47：713–719.
1994. を改変）

Matthews & Ladewig(1994)

例3）ニワトリは皿に置かれた餌よりもおが屑の中にある餌を食べたがる

760　　　　　K. E. Schütz & P. Jensen （2001）

Fig. 1: Proportion of total food intake (% + SE) obtained from the food source with ad libitum free access to food ('free food'), and from the food source with ad libitum food mixed with wood-shavings ('mixed food'), for each of the three breeds studied (n = 8 groups for each breed). Statistically significant differences by paired t-test within breeds are indicated (*p < 0.05, **p < 0.01, ***p < 0.001; using food consumption in g/group as unit of analysis)

２．福祉改善は利用目的を阻害するのか？
＝精密飼養管理

生活の質の改善の５つのポイント（５フリーダムス）
①餌と水
②物理環境
③衛生環境
④取扱い
⑤行動を多様化させる刺激

CHAPTER 7.1.

INTRODUCTION TO THE RECOMMENDATIONS FOR ANIMAL WELFARE

Guiding principles for animal welfare

7) That improvements in farm *animal welfare* can often improve productivity and food safety, and hence lead to economic benefits.

Oie WORLD ORGANISATION FOR ANIMAL HEALTH
Protecting animals, preserving our future

例１）福祉レベルと生産性（日屠体重増）との関係

福祉レベル評価項目：牛房、床、飼槽、休息場、換気、給水、騒音、光環境、屋外飼育や放牧の有無、飼料、衛生、損傷、蹄障害、除角、被毛状態、群再編、群サイズ、人との関係、取扱い施設、搭載施設、闘争回数など４３項目
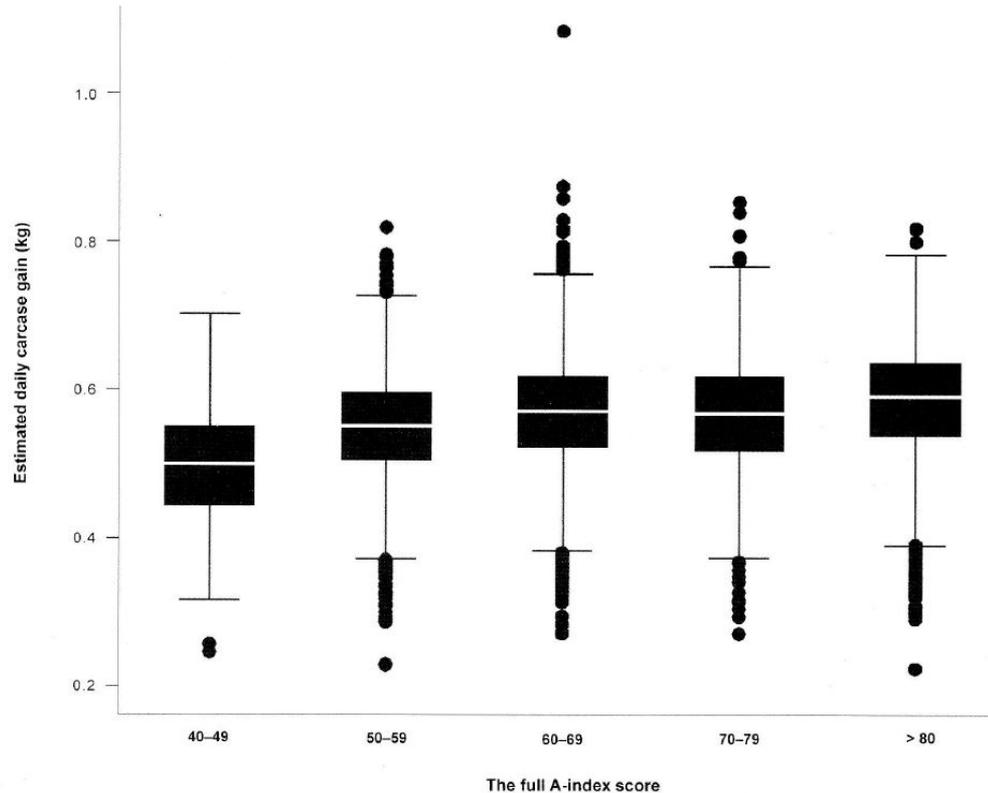
Box-and-whisker plot showing the relationship between on-farm welfare, measured using the full A-Index and, estimated daily carcase gain of 13,787 slaughtered bulls delivered first time in 2003 by Atria Ltd.

(Hervaら, 2009)

例2）人への恐怖性と豚、乳牛、ブロイラー、産卵鶏の生産性との関係

	Fear and animal productivity
Pig industry	
Hemsworth *et al.* (1981b)	−0.51*
Hemsworth *et al.* (1989)	−0.55*
Hemsworth *et al.* (1994c)	−0.01
Dairy industry	
Hemsworth *et al.* (1995)	−0.46*
Broiler industry	
Hemsworth *et al.* (1994a)	−0.57**
Cransberg (1996)	−0.10
Hemsworth *et al.* (1996a)	−0.39
Egg industry	
Barnett *et al.* (1992)	−0.58**

Significant correlations (* = $P < 0.05$ and ** = $P < 0.01$) indicate associations between the two variables.
Fear of humans by pigs and cows was assessed by the time spent near a stationary experimenter, while fear of humans by poultry was assessed by the avoidance of an approaching experimenter. The productivity variables were reproduction in pigs, milk yield in cows, feed conversion in chickens and egg production in hens.

例3）食肉処理場到着時の死亡率に影響する要因

TABLE 2. Factors associated with the percentage of dead on arrival (DOA) birds in 1,907 broiler flocks slaughtered at a Dutch processing plant in 2000 and 2001

Variable	Percentage of flocks	Odds ratio[1]	95% Confidence interval	
Moment of transport[2]				
Night	42.3	1		
Morning	9.8	1.28***	1.14	1.43
Daytime	48.0	1.46***	1.33	1.61
Ambient temperature[3]				
≤5°C	23.7	1.45*	1.04	2.03
>5°C to ≤10°C	28.6	1.23	0.92	1.65
>10°C to ≤15°C	20.9	1		
>15°C to ≤20°C	16.3	1.54*	1.10	2.14
>20°C to ≤25°C	7.3	2.78***	1.91	4.06
>25°C	3.2	2.52**	1.43	4.45
Catching company				
A	32.0	1		
B	28.4	0.78	0.75	1.00
C	19.9	1.63***	1.44	1.84
D	9.2	0.85	0.72	1.02
E	10.5	0.97	0.80	1.18
Breed				
A	77.1	1		
B	12.3	0.67***	0.59	0.75
C	10.6	0.76***	0.67	0.87
Flock size				
Per 10,000-bird increase	—	1.04*	1.00	1.09
BW				
Per 100-g increase	—	1.10***	1.07	1.14
Compartment stocking density				
Per bird increase	—	1.09***	1.07	1.11
Transport time				
Per 15-min increase	—	1.06***	1.02	1.08
Lairage time				
Per 15-min increase	—	1.03***	1.02	1.03

[1]Odds ratio of 1 = reference value for that variable.

[2]Moment of transport: Night = last load departed from farm before 0800 h; morning = intermediate; daytime = first load departed from farm after 0800 h.

[3]Ambient temperature: If moment of transport = night, then minimum temperature at a neighboring meteorological center was used; if moment of transport = daytime, then maximum temperature at the meteorological center was used; if moment of transport = morning, then the mean of minimum and maximum temperature at the meteorological center was used.

*$P < 0.05$; **$P < 0.01$; ***$P < 0.001$.

輸送時間帯

外気温

捕鳥会社

品種

群サイズ
体重
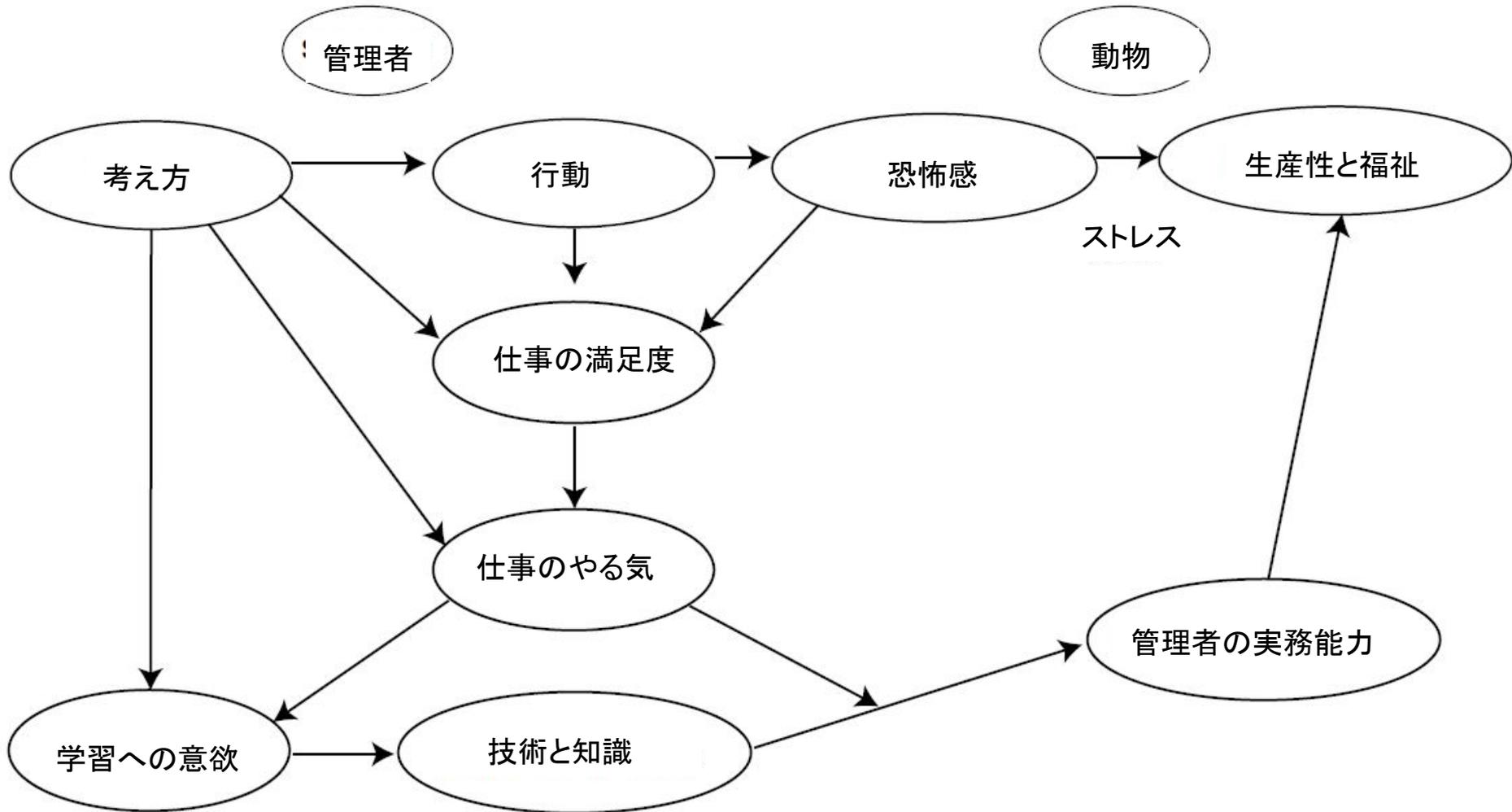輸送密度
輸送時間
待機時間

(Nijdamら, 2004)

3. 行動を変えるには「認知」を変える ＝「認知行動療法」

Fig. 1
Important work-related characteristics in the sequential relationship between attitude and welfare (1) (Coleman &Hemsworth, 2014)

認知行動療法

3段階：管理者の考え方の変更、行動の変更、補強

考え方の変更：「信念-管理者の行動-動物の行動-生産性」の関係に関する研究データの提示。口頭あるいはマルチメディア

行動の変更：動物へのポジティブ及びネガティブな接し方についてのビデオ提示。動物の行動を条件づける刺激となることの説明。

補強：仕事場にポスター掲示。毎月、重要点を要約。自身の行動変化があるか否かの評価を推進する。

考え方と行動の変更

Table 1. Results of an analysis of covariance on the human variables in Exp. 1 in 1997/98 (Year 2) using 1996/97 (Year 1) data as the covariate

考えの変化

行動の変化

Variable	Means		P-value	LSD (P = 0.05)
	Control	Intervention		
Characteristics of cows				
"Easy to work with" subscale[a]	13.8	13.2	0.26	0.97
"Negative attitude" subscale	11.7	11.2	0.42	1.21
"Pleasant animals" subscale[a]	10.5	10.9	0.29	0.80
"Easy to manage" subscale[a]	4.0	4.4	0.34	0.49
"Negative characteristics" subscale	13.9	13.6	1.00	—
Behavioral beliefs				
ale[a] （管理が容易）	116.2	120.6	0.14	5.93
" subscale[a]	27.7	32.0	0.005	2.97
Individual items				
' item[a] （ウシに話しかける）	2.9	3.9	0.01	0.77
tem[a]	2.0	4.5	0.22	1.00
ポジティブな接し方	0.045 (0.11)	0.110 (0.32)	0.001	0.0338
弱いネガティブな接し方	0.43	0.24	0.05	0.154
強いネガティブな接し方	0.020 (0.05)	0.005 (0.01)	0.01	0.011
Total interactions, number/cow/milking	0.59	0.57	0.83	0.085
Negative behaviors, %	80.6	48.1	0.001	13.43
Forceful negative behaviors, %[b]	0.90 (10.1)	0.36 (2.6)	0.001	0.28

[a] For these subscales, the higher the score, the more positive the attitude. For the other factors, the higher the score, the more negative the attitude.

[b] Data transformed logarithm (x + 1) for statistical purposes. Arithmetic mean presented in parentheses.

動物側の変化

Table 2. Results of an analysis of covariance on the cow variables in 1997/98 (Year 2) in Exp. 1 using 1996/97 (Year 1) data as the covariate

Variable	Means		P-value	LSD (P = 0.05)
	Control	Intervention		
Cow fear				
人からの逃走距離	4.49	4.16	0.05	0.332
%	36	67	—	—
% Cows entering within 1m of experimenter	2.5	3.7	0.37	2.55
% Cows entering within 3 m of experimenter	29.4	30.3	0.82	7.78
Cow behavior in parlor				
FS, number/cow/milking	1.26	1.39	0.17	0.2002
FSK, number/cow/milking	0.10	0.13	0.41	0.064
FS + FSK, number/cow/milking	1.35	1.53	0.11	0.227
FS in 2nd mo, number/cow/milking	0.61	0.70	0.15	0.114
FSK in 2nd mo, number/cow/milking	0.07	0.08	0.66	0.060
FS + FSK in 2nd month, number/cow/milking	0.69	0.78	0.06	0.120
FS in 3rd mo, number/cow/milking	0.66	0.69	0.71	0.181
FSK in 3rd mo, number/cow/milking	0.04	0.05	0.66	0.662
FS + FSK in 3rd mo, number/cow/milking	0.69	0.74	0.62	0.187
Milk cortisol				
2カ月後の乳中コルチゾール	2.05	1.40	0.06	0.660
	1.23	1.34	0.56	0.386
Cortisol (mean of 2nd and 4th mo), nM/L	1.60	1.30	0.19	0.419
Milk yield				
3 mo postintervention, L/cow/mo	668	695	0.23	44.9
6 mo post-intervention, L/cow/mo	618	638	0.27	37.03

[a]FS = Flinch and step response.
[b]FSK = Flinch, step, and kick response.

乳量と乳質への影響

Table 3. Results of an analysis of covariance examining the effects of the Intervention treatment on cow productivity variables from November 1998 to May 1999 (using 1997/98 data as the covariate) in Exp. 2

Productivity	Means		P-value	LSD (P = 0.05)
	Control	Intervention		
乳量	509.1	529.5	0.05	20.57
乳蛋白質	16.7	17.4	0.07	0.69
乳脂肪	21.7	22.5	0.07	0.83

Table 4. Results of an analysis of covariance examining the effects of the Intervention treatment on cow productivity variables from November 1998 to March 1999, the peak period of production following the intervention (using 1997/98 data as the covariate), in Exp. 2

Productivity	Treatment		P-value	LSD (P = 0.05)
	Control	Intervention		
乳量	550.6	579.8	0.02	23.98
乳蛋白質	17.7	18.5	0.03	0.78
乳脂肪	22.8	23.8	0.04	0.93

動物愛護管理法に関しての結論

１．第44条：・・・「愛護動物」とは、次の各号に掲げる動物をいう。

一　牛、馬、豚、めん羊、山羊、犬、猫、いえうさぎ、鶏、いえばと及びあひる
→畜産動物に関しても、実効性の担保が必要

２．動物の愛護及び管理に関する施策を総合的に推進するための基本的な指針
→畜産動物に関しても、普及啓発の更なる推進（One Welfareを目指した推進：①人のwelfare尊重の指標、②食の安全、③生産者のwelfare改善、④生産性の改善、⑤温暖化・持続性・災害管理へ貢献、⑥環境保全・生物多様性への貢献）