

# Evaluation of Animal Hygiene Management from Personal Inference System

Obihiro University of Agriculture and  
Veterinary Medicine  
Satoko Kubota

# Introduction

- 2001: BSE (Bovine Spongiform Encephalopathy) was outbreak in Japan
  - Consumer's concern for food safety has increased
- 2003: Food Safety Commission (FSC) was established
  - Japan's supply chain has worked on ensuring food safety "from the farm to the table"
- 2004: The part of Act on Domestic Animal Infectious Disease Control was revised
  - Standards of Rearing Hygiene Management (SRHM) was enacted

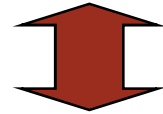
# Introduction

## Standards of Rearing Hygiene Management (SRHM)

- Before the standard was established, animal hygiene management was entrusted to individual farmer
- The standard is minimum rule that the livestock farmer have to observe
- The standard is consisted by 10 criteria such as the cleaning of cowshed, the measures for wild animal and the learning of knowledge about animal disease

# Introduction

- Animal hygiene management is an issue which not only affects food safety but which directly relates to how livestock farms are run



- It is guessed that not all farmers are necessarily engaged in “steady, effective” behavior because the situation of animal hygiene management involves limited rationality

This study attempts to demonstrate the attributions of Japanese farmers by analyzing the animal hygiene management behavior of dairy farmers in Hokkaido from personal inference system

# Personal inference system

- Dual Process Theory

→ In the field of social cognition, Epstein et al. (1996) advocate a dual process theory in which intuitive and analytical thinking systems are used in information processing in humans

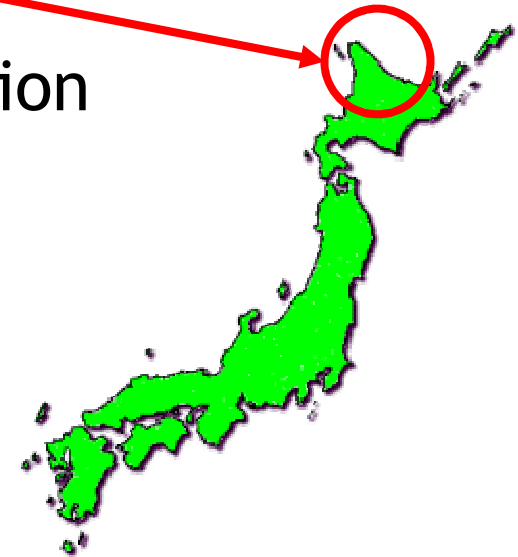
Intuitive type	Analytical type
Holistic	Analytic
Automatic	Intentionally
Speedy	Slowly
Emotionally	Logically
Understanding of reality by image and metaphor	Understanding of reality by language and number
It is not easy to change (Change by experience)	It is easy to change (Change by new evidence)

# Materials & Methods; Survey area

- A questionnaire survey of dairy farmers was conducted in 2 area of Hokkaido in Japan

A area→-Farmers account for  
10.4% of the total population  
-78 dairy farms  
-137 head/farm

B area→-In 2001, JA merged widely  
-200 dairy farms  
-89 head/farm



- A questionnaire form was sent to 98 farm households by mail (71.4% response rate)

# Materials & Methods; Questionnaire

- Information of farm owner
- Dairy type (Number of cow, Cowshed type, ...etc)
- Risk perception for infectious disease  
7 questions (5 point scale for each question; from “Not aware of any risk” to “Strongly aware of risk”)
- Level of animal hygiene management
- Personality scale which presents “intuitive system” or “analytical system”

# Materials & Methods; Level of animal hygiene management

- The Questionnaire included 33 questions
- It was answered subjectively
- SRHM was categorized 4 groups by each establishment purpose
  - Category 1; Spread prevention measures by exclusion of pathogen in farm
  - Category 2; Interception measures of invasion route for pathogen
  - Category 3; Treatment for risk that pathogen spreads to other farms by moving animal and human
  - Category 4; Treatment that should be considered in managing animal health



## Materials & Methods; Personality scale

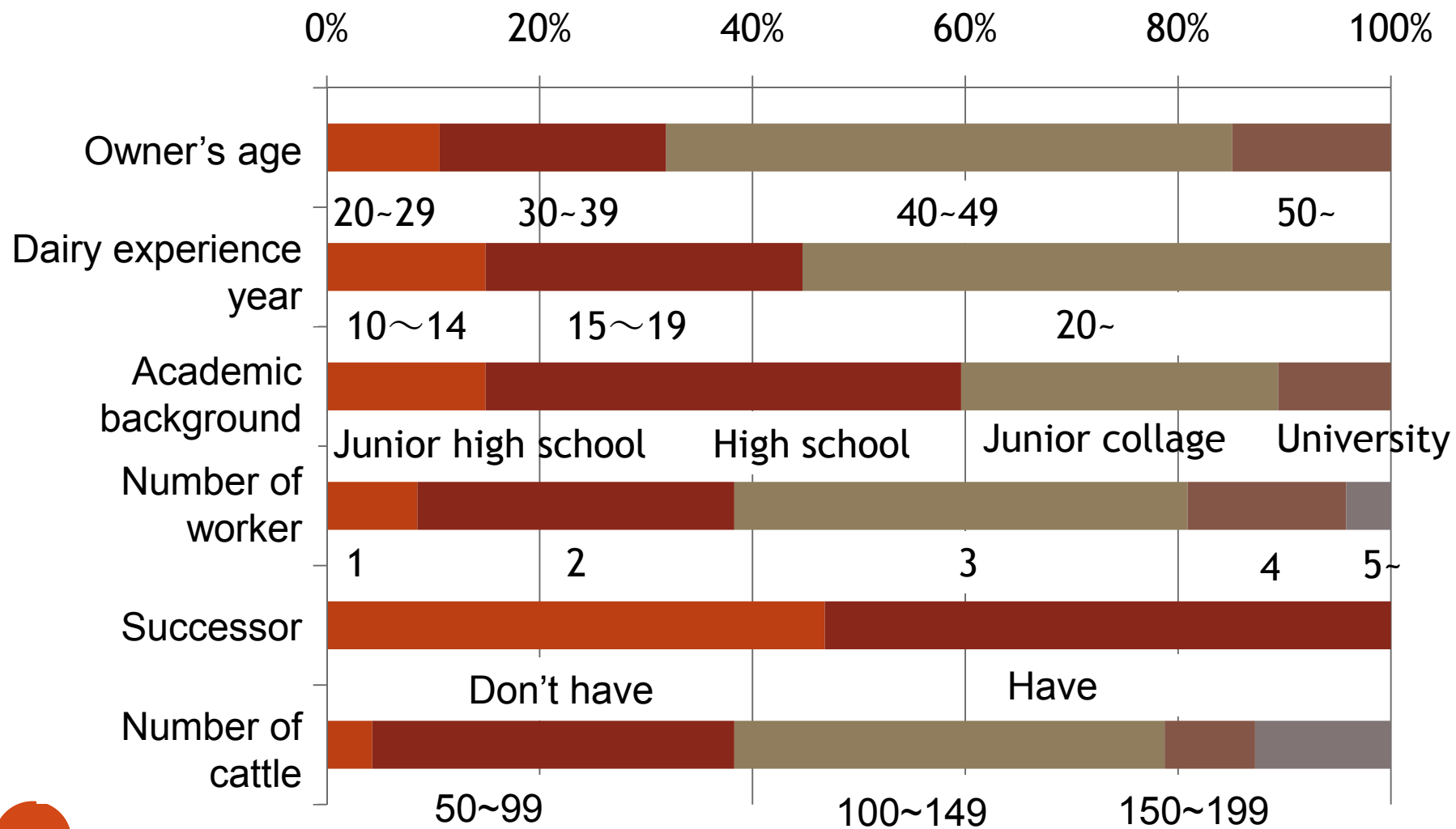
- The personality scale was designed on 12 questions for each system
- The scale is intended to identify how the farmers would respond when they are facing with various life and lifestyle issues, and whether they have a preference for intuitive or analytical thinking system
- Respondents were to select their responses from a 5 point scale ranging from “Totally inapplicable” to “Highly applicable”

Higher total score indicating a stronger inclination towards an intuitive or analytical system of respective information processing

# Materials & Methods; Analysis Methods

- The average of intuitive and analytical score on risk perception level and animal hygiene management level was calculated
- The structural equation models (SEM) analysis was conducted
  - In this study, it assumed that the information processing influences risk perception, and then the risk perception operates level of animal hygiene management

# Results; Outline of the investigated farmer



# Results; Average score of information processing system on milk yield

	Milk yield during year per head, kg		Sig.
	<8,027	8,027≤	
	n=36	n=33	
Intuitive score	33.00	32.24	
Analytical score	37.25	40.36	**

Note. Sig.; Significance: \*p<0.1, \*\*p<0.05, \*\*\*p<0.01

# Results; Average score of information processing system on number of cow

	Number of cow, head				Sig.
	<50	50≤	<100	100≤	
	n=14	n=55	n=52	n=17	
Intuitive score	33.18	30.50	32.21	33.94	*
Analytical score	36.43	39.33	37.96	41.12	**

Note. Sig.; Significance: \*p<0.1, \*\*p<0.05, \*\*\*p<0.01

# Results; Average score of information processing system on agricultural income

	Agricultural Income, million yen								
	<30	30≤	Sig.	<50	50≤	Sig.	<100	100≤	Sig.
	n=21	n=48		n=37	n=32		n=62	N=7	
Intuitive score	33.65	30.33	**	32.30	33.03		32.40	34.71	
Analytical score	39.67	38.33		38.41	39.13		37.98	45.43	**

Note. Sig.; Significance: \*p<0.1, \*\*p<0.05, \*\*\*p<0.01

# Results; Average score of information processing system on risk perception

	Risk perception, point		Sig.
	<28.77 n=35	28.77≤ n=34	
Intuitive score	33.77	31.47	
Analytical score	36.94	40.59	**

Note. Sig.; Significance: \*p<0.1, \*\*p<0.05, \*\*\*p<0.01

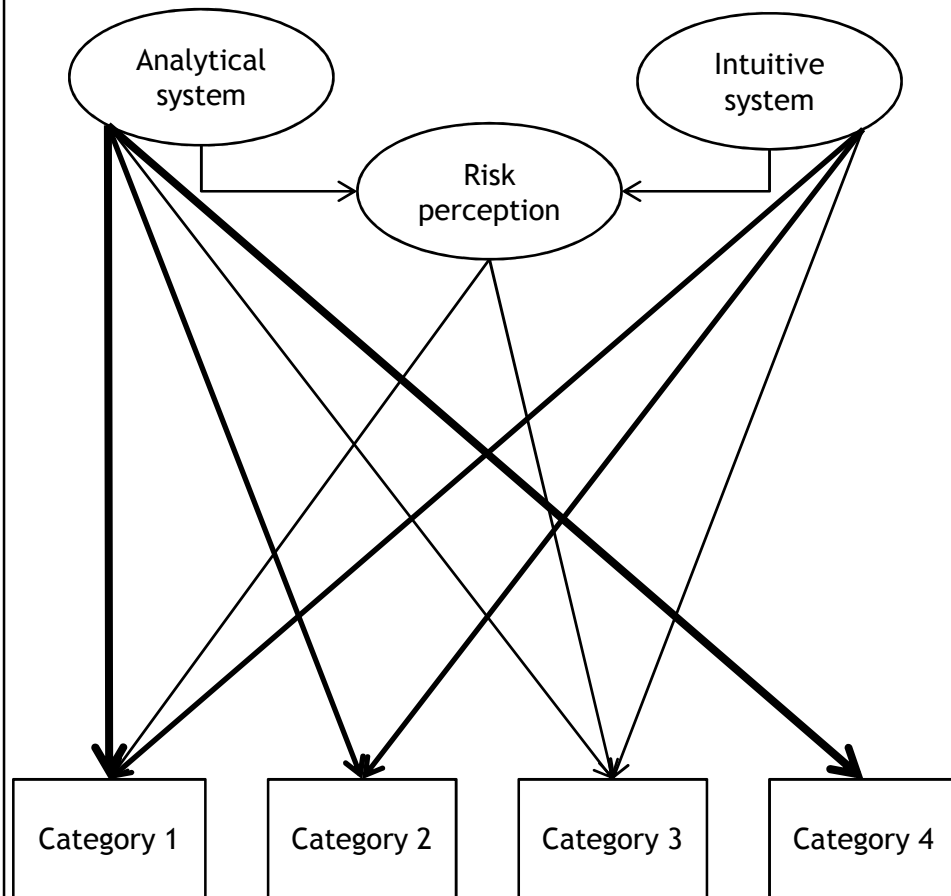
# Results; Average score of information processing system on animal hygiene management

	Category 1, point		Category 2, point		Category 3, point		Category 4, point				
	<19.56	19.56≤	<14.87	14.87≤	<16.30	16.30≤	<20.70	20.70≤			
	Sig.		Sig.		Sig.		Sig.				
	n=30	n=39	n=37	n=32	n=28	n=41	n=36	n=33			
Intuitive score	32.27	32.92	31.62	33.81	31.04	33.73	**	32.19	33.12		
Analytical score	35.60	41.15	**	37.22	40.50	**	38.96	38.59	36.39	41.30	***

Note. Sig.; Significance: \*p<0.1, \*\*p<0.05, \*\*\*p<0.01



# Results; Effect on animal hygiene management



Note. Square; observation variable  
 Oval; latent variable  
 CFI; 0.59, RMSEA; 0.11

Risk Perception	<---	Analytical system	0.275*
Risk Perception	<---	Intuitive system	-0.407*
Category 1	<---	Analytical system	0.403***
Category 2	<---	Analytical system	0.302**
Category 3	<---	Analytical system	0.163*
Category 4	<---	Analytical system	0.459***
Category 1	<---	Intuitive system	0.268**
Category 2	<---	Intuitive system	0.228**
Category 3	<---	Intuitive system	0.245*
Category 4	<---	Intuitive system	0.074
Category 1	<---	Risk Perception	0.131*
Category 2	<---	Risk Perception	0.092
Category 3	<---	Risk Perception	-0.143*
Category 4	<---	Risk Perception	0.083

Note. Sig.; Significance: \*p<0.1,  
 \*\*p<0.05, \*\*\*p<0.01

# Conclusion

- This study was designed to ascertain animal hygiene management behavior from personal inference system
- This study demonstrated that the dual process theory
- The farmers who process information analytically were more aware of risks than their more intuitive counterparts
- They also exhibited greater compliance with the SRHM
- They do suggest that by actively gathering and analyzing information, analytical farmers can act with a long-term outlook, rather than being bound by immediate interests