

Prevention and Control Measures against Highly Pathogenic Avian Influenza (HPAI) in Kyoto Prefecture in 2004



Kyoto Prefectural Nantan Livestock Hygiene Center (NLHC)

Livestock and Poultry Population in Kyoto Prefecture

(As of 1 Feb. 2009)

	No. of farms	No. of animals
Dairy cattle	94	5,836
Beef cattle	124	6,732
Pigs	21	17,631
Chickens	946	2,274,811

Tango Livestock Hygiene Center

Chutan Livestock Hygiene Center

HPAI Outbreak

Nantan Livestock Hygiene Center

Yamashiro Livestock Hygiene Center

HPAI (H5N1) Outbreak in Japan in 2004

First case in 79 years

Outbreak Date	Prefecture	Type	No. of birds
Jan. 12	Yamaguchi	Layer	34,000
(First time in 79 years)			
Feb. 17	Oita	Bantam	14
Feb. 29	Kyoto	Layer	225,000
Mar. 4		Broiler	15,000

Outline of affected farms in Kyoto Pref.

	Farm A	Farm B
Type	Layer	Broiler
No. of birds	225,000	15,000
Type of house	Open, 4-tiered high-rise battery house, multihead, 10 houses	Pen-Reared (open, semi-windowless), 14 houses
Water source	Underground, valley and pond water	Well water
No. of employees	28	4
Remarks	1 st case	2 nd case 4 km from Farm A ₄

Chronology of HPAI Outbreaks in Kyoto Prefecture

Around 17 Feb. **Increased number of dead birds in House No. 8 of Farm A**

25-26 Feb. Spent hen shipped from House No. 5

26 Feb. Anonymous call
On-site inspection

27 Feb. Positive rapid test result

29 Feb. Institution of culling, zoning and compartmentalization
movement restriction initiated

3 Mar. **Positive rapid test result at Farm B**

4 Mar. Institution of culling

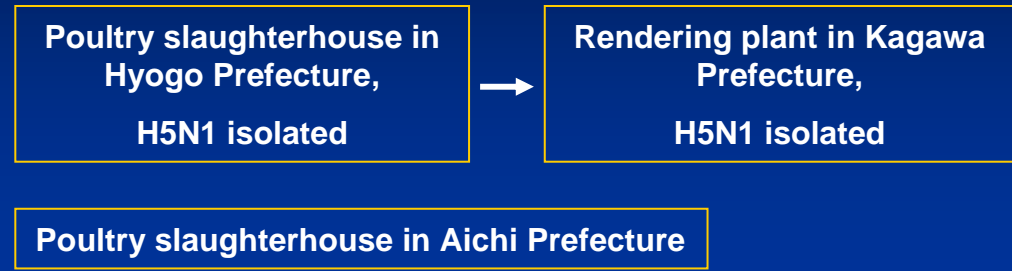
7 Mar. Virus isolated from a dead crow

11 Mar. Control measures completed in Farm B

22 Mar. Control measures completed in Farm A

23 Mar. – 10 Apr. Confirmatory inspections for HPAI freedom (twice)

13 Apr. **Lifting of movement restriction**



★ Poultry Population within movement restriction areas

		No. of farms	No. of birds
≥ 1,000 birds	Layer	25	992,331
	Broiler	9	104,118
	Breeder	2	38,300
	Duck	1	6,400
Subtotal		37	1,141,149
.....			
< 1,000 birds		1,190	17,976
Total		1,227	1,159,125



Farm A (Layer)

Pond

First outbreak

Infected areas

Burial site

P

Clean area

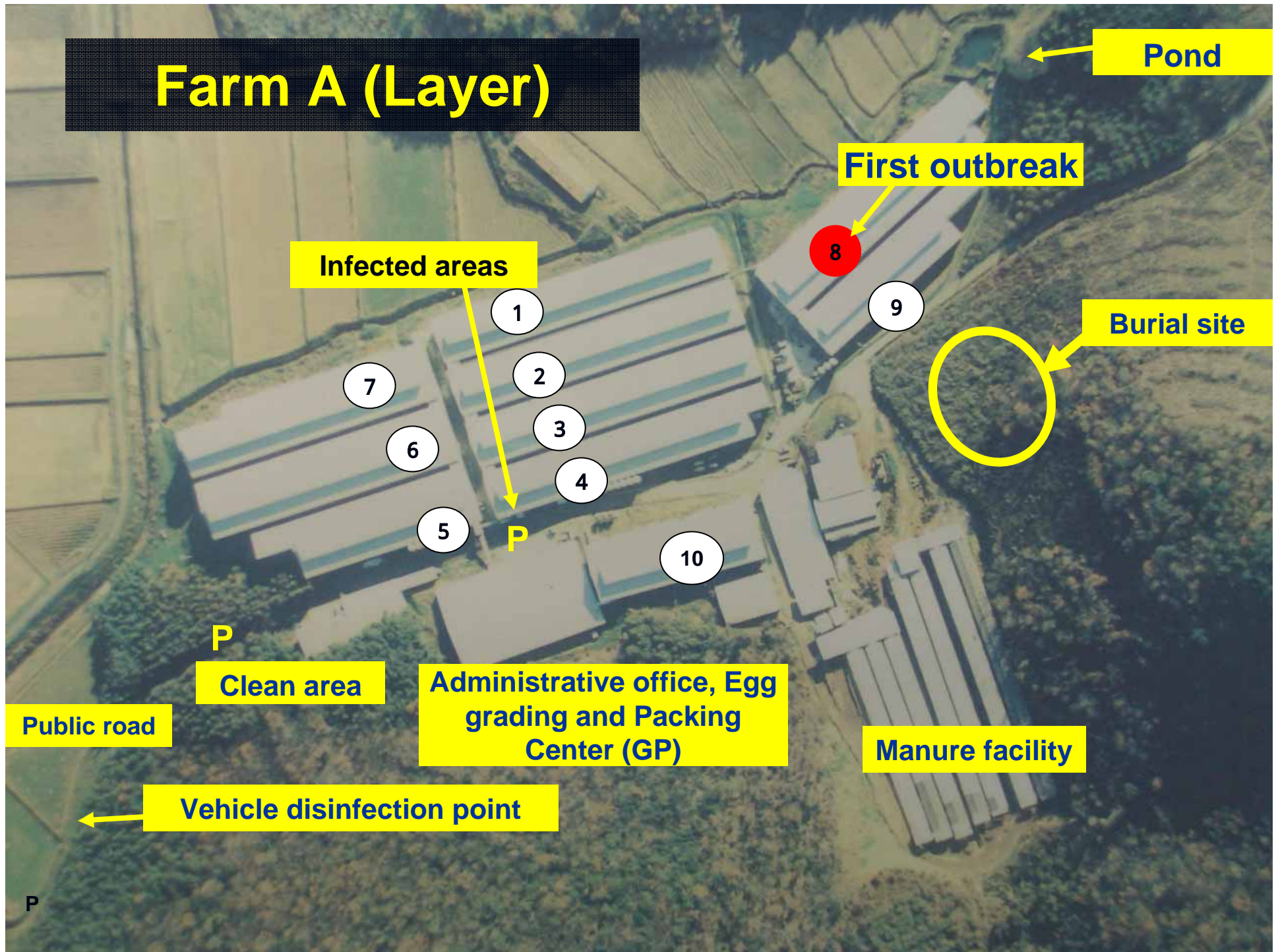
Administrative office, Egg grading and Packing Center (GP)

Manure facility

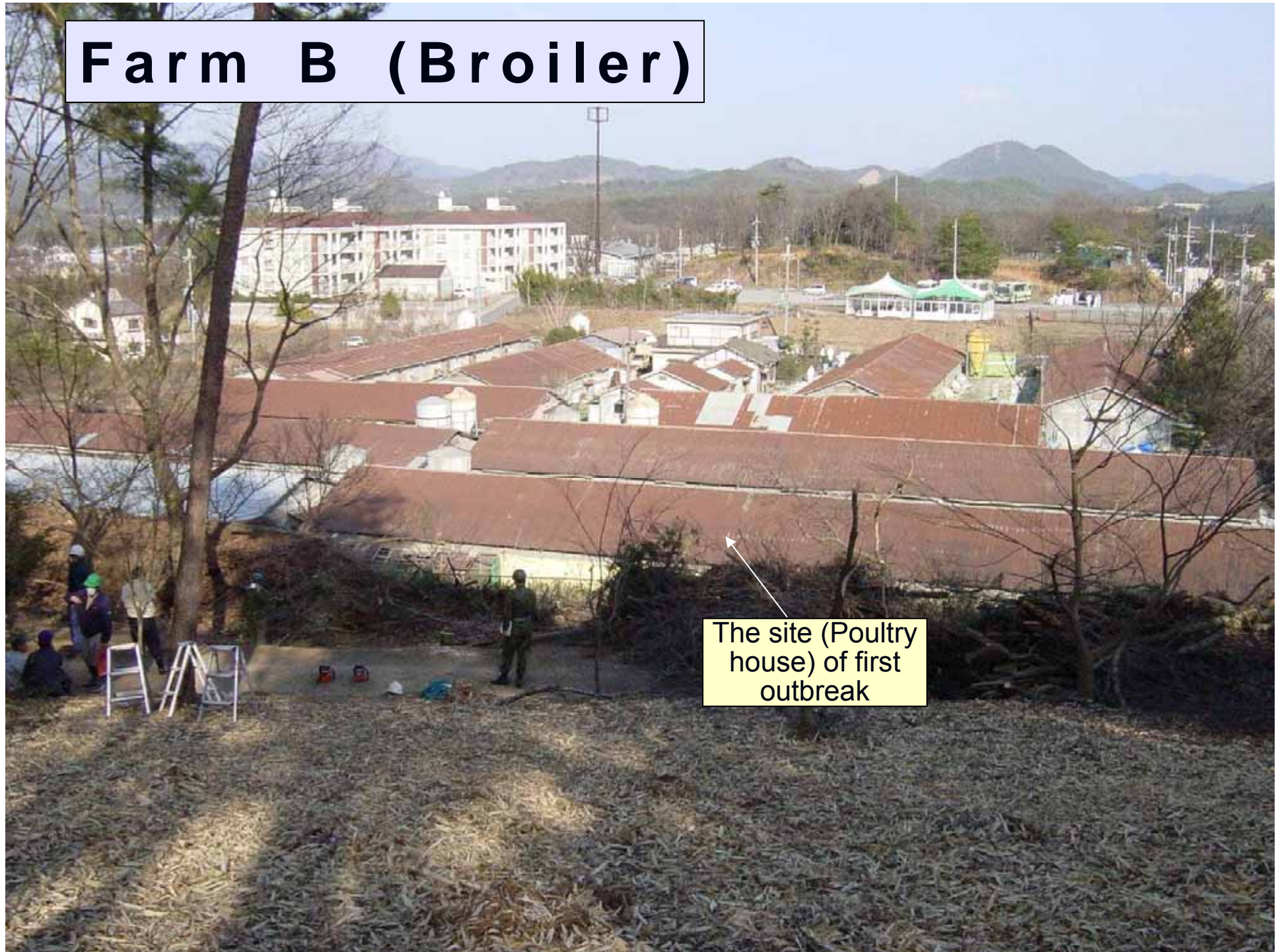
Public road

Vehicle disinfection point

P



Farm B (Broiler)



The site (Poultry house) of first outbreak

HPAI Outbreak in Farm A

★ 26 Feb.

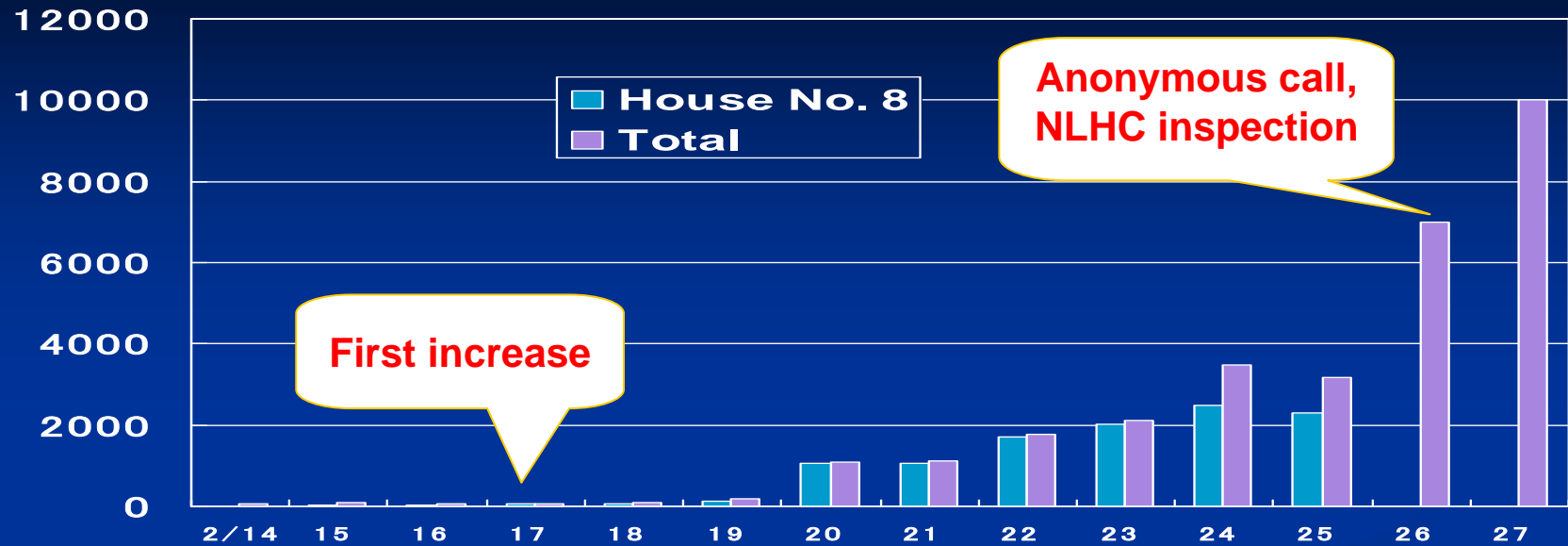
- Anonymous call (7:30 p.m.)
- NLHC staff rush to Farm/ stand by (arrived at 8:30 p.m.)
- First contact with farm owner (11:15 p.m.)

★ 27 Feb.

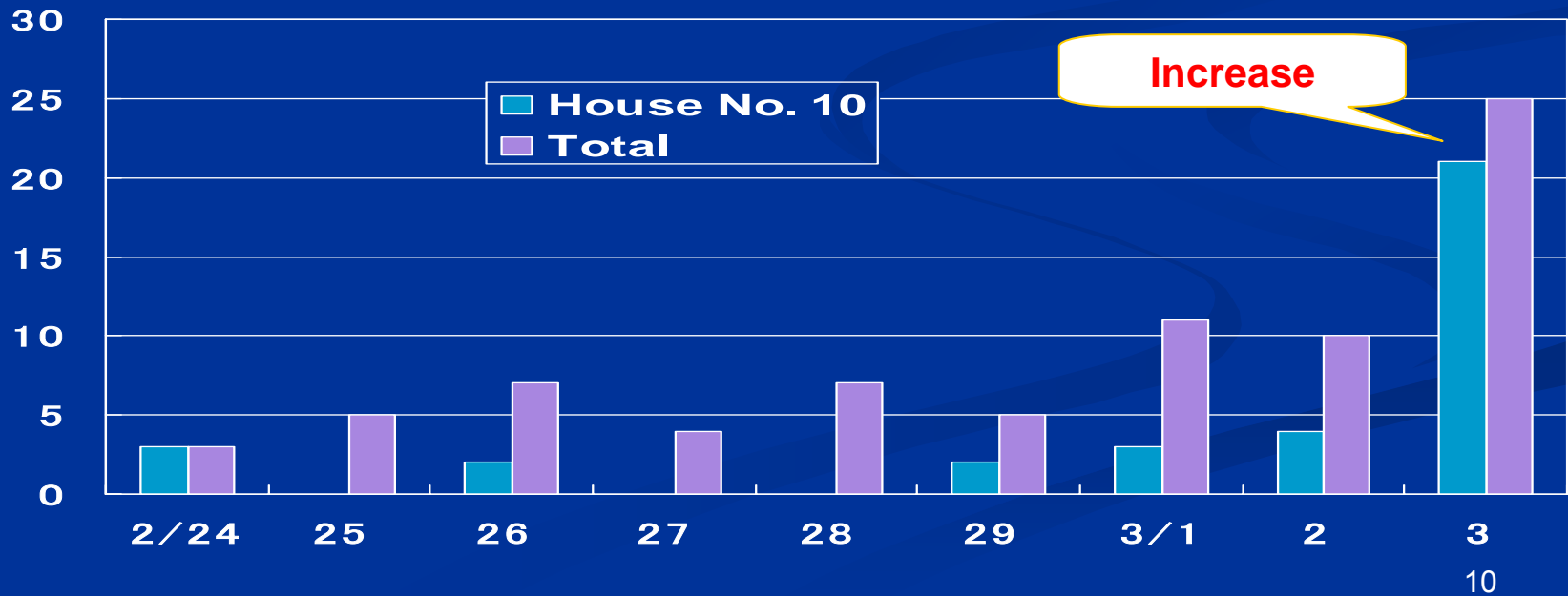
- On-site inspection (01:15 a.m.)
- Press release (06:30 a.m.)
- Positive rapid test result (09:00 a.m.)

Number of Dead Birds: Time Course

Farm A



Farm B



On-site Inspection

-) Increase in the number of dead birds
-) Symptoms: depression, lethargy, death in sleep
-) Appearance of dead bird: cyanotic comb, dark red cloacal mucosa

Farm A: Immediately after Outbreak

Dead Birds, Farm A



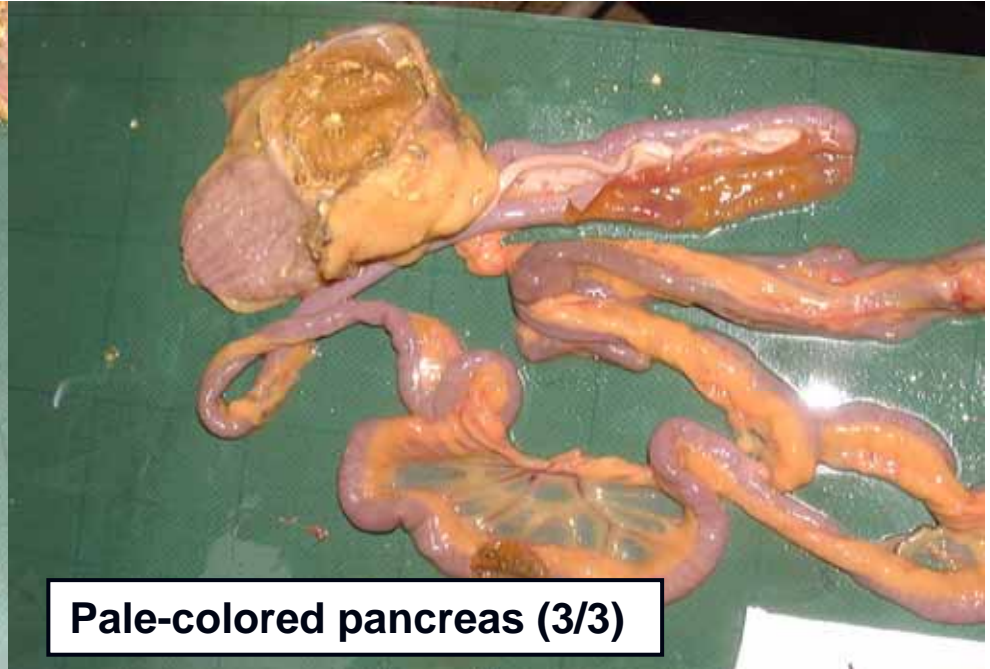
Lethargic bird



**Degenerated ovarian follicles (3/3),
Hematomas in ovarian follicles
(1/3)**



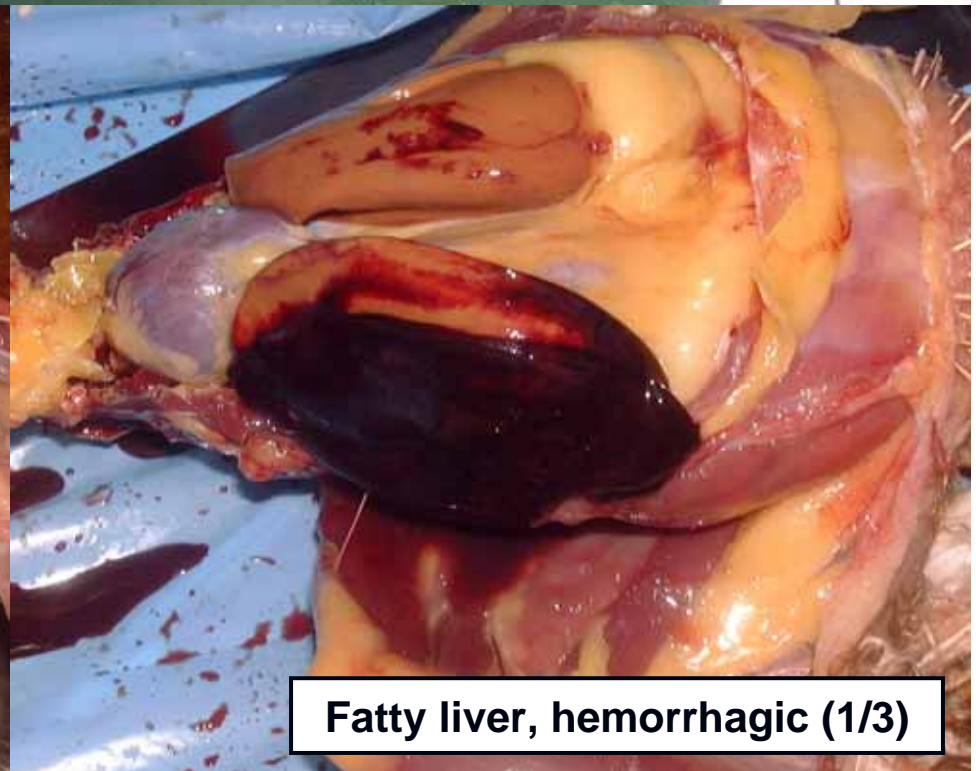
Pale-colored pancreas (3/3)



**Dark red-color in the
colon and cloaca (3/3)**



Fatty liver, hemorrhagic (1/3)



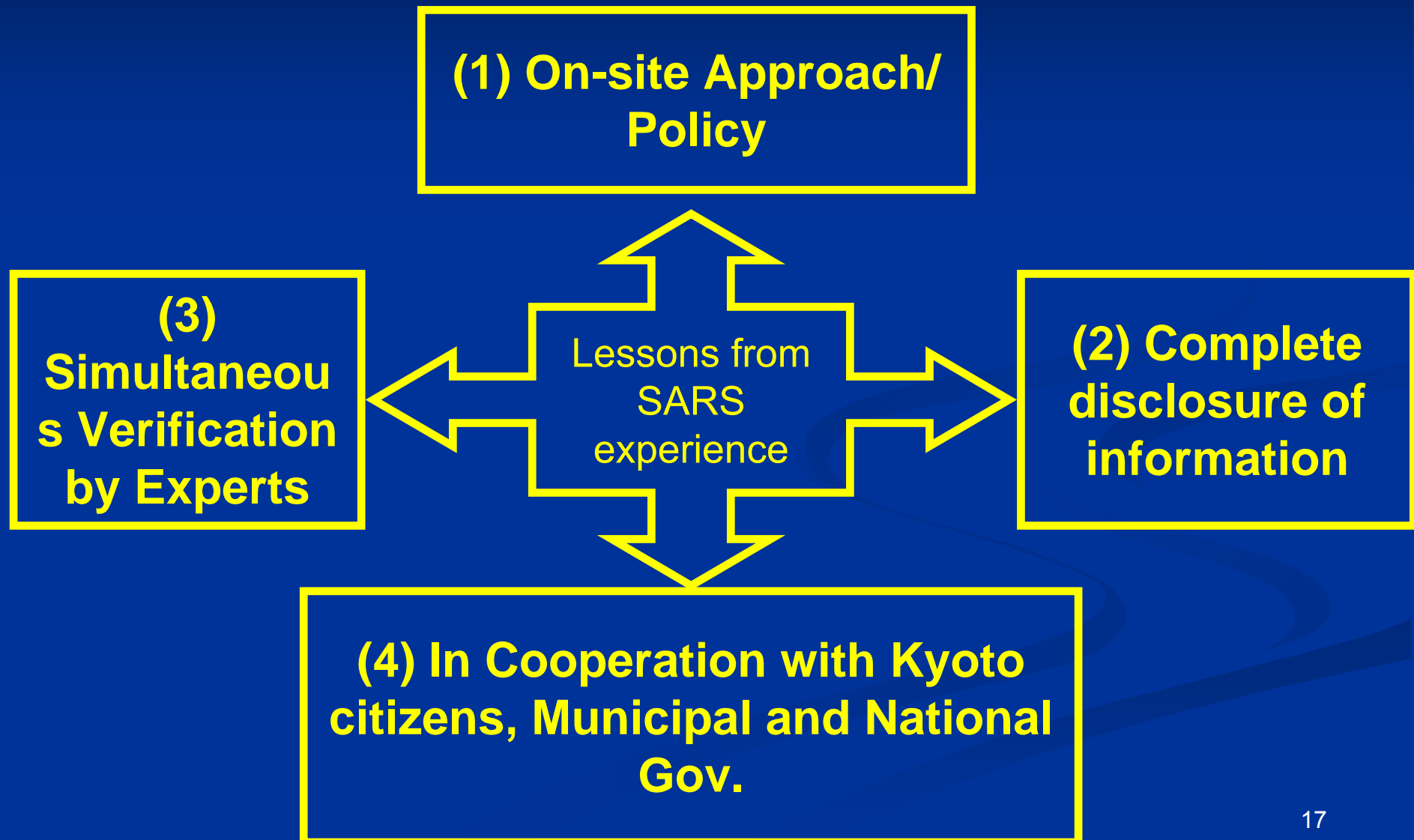
Issues in Kyoto case

- **Outbreak at a large-scale farm of 250,000 birds (First case in Japan)**
- **No notification for 7 days despite increase in the number of dead birds**
- **15,000 live birds were shipped during this period (to Hyogo and Aichi Prefecture)**
- **Spreading infection to a nearby farm**
- **Enormous culling/disposal required**
- **Damage caused by rumors**

High Level of Media Interest



Actions/ Responses taken by Kyoto Prefecture



(1) On-site Inspection Immediately after Notification (Saturday, 28 Feb. 2004)



(2) Task Force Meeting fully open to the Public



(3) Simultaneous Verification by Experts

Immediate Setting up of “Third Party Committee (Experts Meeting)”

1 Mar. 2004

Objectives ○ Verification of measures taken by Kyoto Pref. Gov.
(Simultaneous Verification)

- Implementation of disease control measures
- Procedure for disposal of dead birds and manure
- Control of wild birds

} Advice on:

The Committee:

- Dispatched a total of 10 members in four times to conduct on-site inspection during 1-6 March 2004.
- Organised 4 committee meetings and 4 sectional meetings
- Built a sense of public trust in dealing with the media and on-site responses

○ Committee Members:

Nine experts in the field of: Infectious diseases, microbiology, water and soil contamination, legislation, ornithology, agricultural economics, soil chemistry and veterinary microbiology

(4) Cooperation with Kyoto Citizens, Municipalities and National Government

- Large-scale of mobilization of Kyoto Pref. Gov. personnel and the Mobile Police
- Request to the National Gov., neighboring Municipalities and Pref. Authorities concerned for dispatch of their staff
- Request for dispatch of Self-Defense Force personnel (Contracted operation → Dispatch for Disaster)
- Private sector, Japan Agricultural Cooperatives
- Cooperation with local residents and Tanba Municipal Gov. (Setting burial sites, manure disposal, local volunteers, etc.)

Framework

**Head : Prefectural
Governor**

Administrative Director: Deputy Governor

Movement Restriction

Livestock and Poultry Division, etc.

Disinfection Point

**Agricultural Production and Commerce
Division, etc.**

On-site Inspection

**Livestock Hygiene Centers,
Municipalities, etc.**

Tracing shipped birds & eggs

Environmental Health Division, etc.

**Recall and disposal (meat &
eggs)**

Environmental Health Division, etc.

Compensation and Financing

Agricultural Administration Division, etc.

**Communication with National
& Pref. Gov.**

Agricultural Administration Division

Budget and request

**Forest Environment Conservation
Division**

Culling and Burial

Livestock Industry Division

Third Party Committee

Dep. of Administration

On-site Approach

**Policy Planning and Administration
Board**

Support System

Human Resource Division, etc.

Wild Bird Control

**Forest Environment Conservation
Division, etc.**

On-site Framework

Local Task Force
(Regional Promotion Office)

Farm guidance Team

Local Liaison & Coordination Team

Administrative Team

Mobilization Team

Material Logistics Team

Transportation Team

Disinfection Team

Health Care Team

Local Response Team
(NLHC)

Disinfection Team

Bird Disposal Team

Facilitators

Vehicle Disinfection Team

Investigation Team

Roles of Local Task Force (Sonobe Municipal Gov. Office Building)

- ◆ Head: Director General of Sonobe Regional Promotion Office
- ◆ Administrative, Mobilization and Material Logistics Teams: Department of Agriculture, Forestry and Commerce
- ◆ Transportation Team: Agricultural Extension Center
- ◆ Traffic Control Team: Civil Engineering Office
- ◆ Health Care Team: Public Health Center
- ◆ Farm Instruction and Training Team: NLHC, Department of Agriculture, Forestry and Commerce
- ◆ Excavation Team: Land Improvement Office
- ◆ School Care Team: Education Bureau



Disinfection



Disposal of contaminated objects (Burial of dead birds, etc.)

○ Culling:

1. Five birds were put into in a doubled plastic bag (0.05 mm thickness, 70 – 90 L)
2. Carbon dioxide gas was put into the bags.
3. Plastic bags were put into flexible containers (200 culled birds in 40 plastic bags)



○ (ゼロ set)

- ・取り出し係 2人
- ・袋詰め 7人
- ・記録 1人

10 現在地

1 田井	4	ND
2 森田	9 B	3
3 林	8 A	2
4 森		NE 7
	1	

鶏処理 A 56機

- ・取り出し係 2人
- ・輸送係 4人
- ・ガス調整 1人
- ・ひもくり記録 1人
- ・ビニール袋準備 2人

10 現在地

1 田井	4	ND
2 森田	9 B	3
3 林	8 A	2
4 森		NE 7
	1	









O Burial pits

Farm A (Burial site located in adjacent land owned by the Forest Cooperatives)

	Pit size (m ³)	Width	Depth	Length
Pit 1	940	4.4 – 6.2	4 – 4.5	47.5
Pit 2	170	3	3	8

Dead birds: 420 t Eggs: 84 t Feed: 47 t
 Bagged manure: 27 t Protective Clothing: 62 t

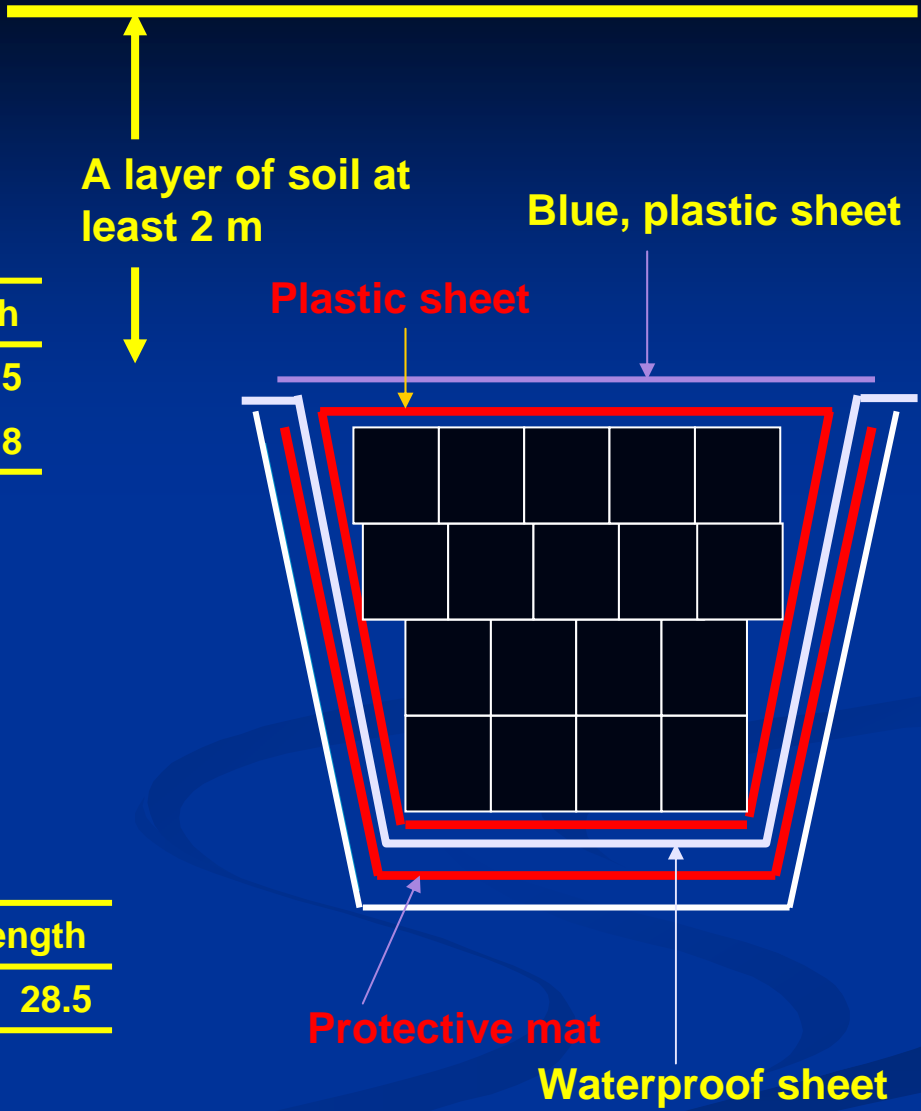
Total: 640 t

Farm B (Burial site located in Kyoto Pref. Gov. owned land: Tanba Nature and Athletics Park)

	Pit size (m ³)	Width	Depth	Length
Burial pit	295	2.0 – 2.6	4.5	28.5

Dead birds: 20 t Feed: 10 t
 Manure in the poultry units: 110 t Protective Clothing: 3t

Total: 143 t











Manure Disposal

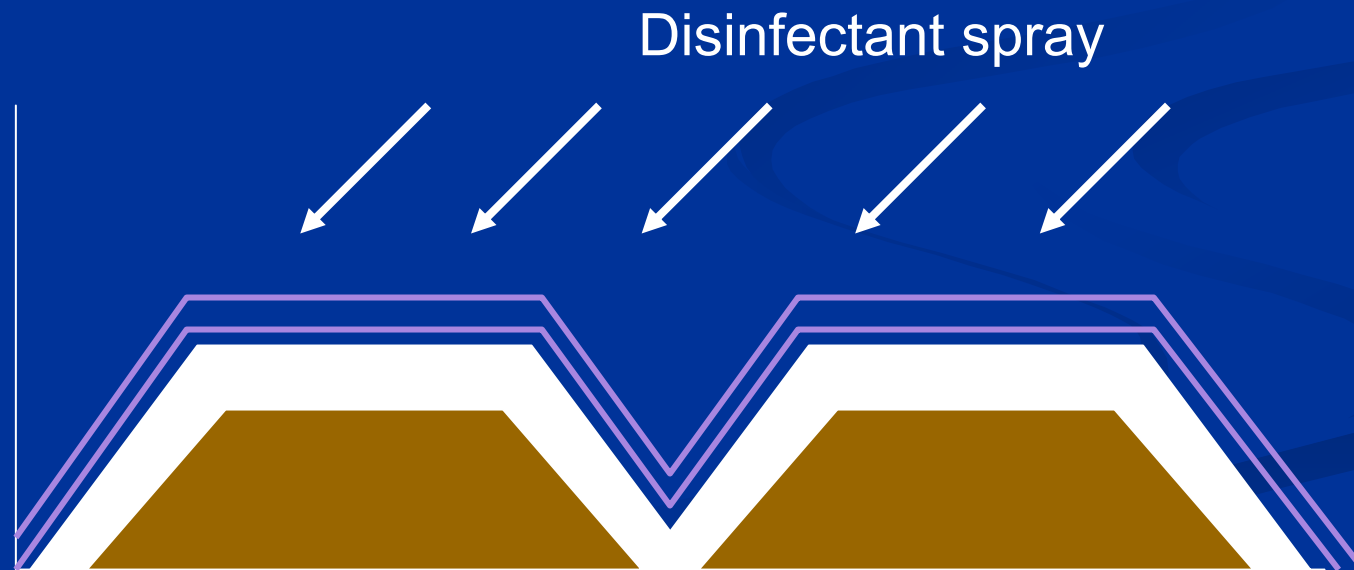
○ Procedure:

1. Covered with Calcium hydroxide (15 cm depth)
2. Covered with two plastic sheets
3. Sprayed with Disinfectant

○ Volume of manure disposed:

Poultry house + Treatment facility: 4,000 t

Calcium hydroxide: 1,250 t





Before



Covering with plastic sheets

- Local residents volunteered in response to the request by the town
- Exhausting labor - covering with plastic sheets (101 people signed up for volunteer)



Dust of calcium hydroxide soaring in the air



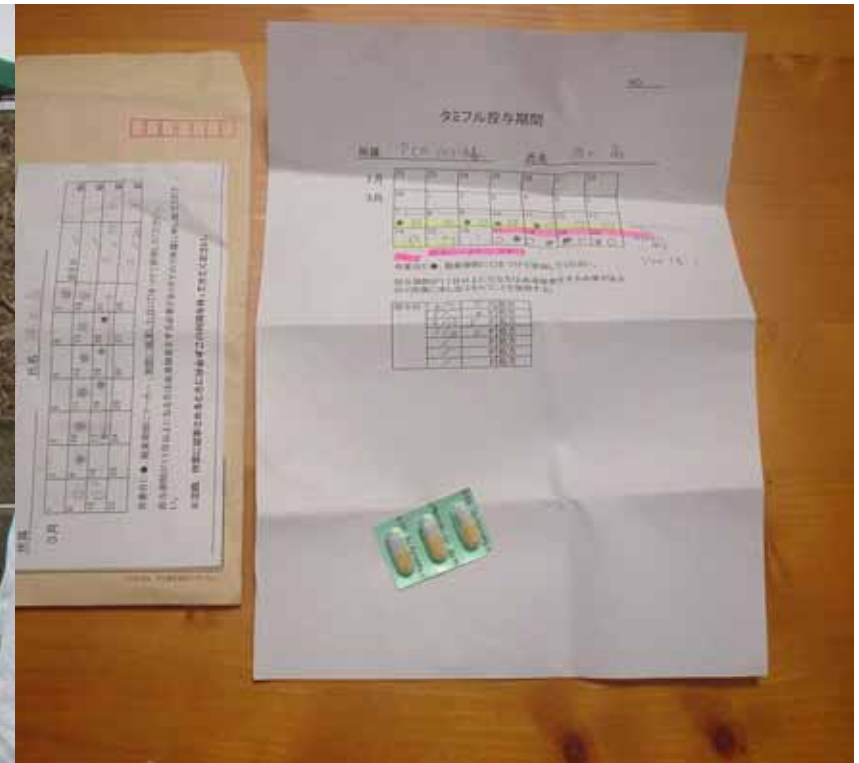
After

Health Risk Management

(Coordinated by 12 public health centers in Kyoto Prefecture)

Director of Public Health Center giving instructions on how to wear/take off protective clothing





On-site worker

- Protective clothing
- Goggle
- Mask
- Double gloves
- Long boots
- Tamiflu

Disinfection Point for worker





Medical Interview for workers with nurses (after operation)



Health check by Doctor



Duties of Stand-by Staff of NLHC

- **Inquiries to large-scale poultry farms for dead birds and other critical information (by phone or visit)**
- **Laboratory diagnosis of dead birds (focusing on small-scale farms)**
- **On-site inspection and Guidance on Rearing Management**
- **Telephone consultation for and complaint handling from residents**
- **Collection of swab samples from crows, wild birds, etc.**
- **Sampling for BSE diagnosis (NLSC is responsible for sample collection from all dead cattle in Kyoto Prefecture)**
- **Responses to the media**



Number of Staff involved

26 Feb. – 23 Mar. 2004

National, other Pref. and Municipal Gov.	864
Self-Defense Force	2,020
Police	899
Volunteer	52
Others	29
Kyoto Pref. Gov.	10,220
Total	14,066



o Prefectural Animal Health Inspectors

Before Outbreak: 66 staff → After : 105 staff (added 39 staff)

Confirmatory Inspection for HPAI freedom

• **Target Farms:** 1,227 farms

• **Method:** Farms with $\geq 1,000$ birds: All farms
 Farms with $< 1,000$ birds:

1. Husbandry status and style
2. Presence of reservoir in surrounding area accessible for wild birds
3. Recent fatal case
4. Insufficient control measures against wild birds

} → Selected based on:

• **Inspections:** Clinical sign, antibody test, virus isolation (tracheal and cloacal swab)

• **Results:**

	Inspection date	No. of farm inspected	Antibody test	Virus isolation	Results
Preliminary Inspection	17 – 19 Mar.	1,227	–	–	–
1 st Inspection	23 – 30 Mar.	151	1,094	1,769	All negative
2 nd Inspection	5 – 10 Apr.	153	1,116	1,844	All negative

Examination Workflow of Dead Wild Birds

Dead wild bird

NLHC

Sampling
(tracheal and cloacal swabs)

Kyoto Pref.
Agricultural
Research Institute

Kyoto Pref.
Forestry
Experimental
Station

Kyoto Pref.
Fisheries
Technological
Research Center

Kyoto Pref.
Livestock
Technology
Department

Private
research
institutes

Rapid
test

LHC for
Livestock
Laboratory
Diagnosis

Kyoto Pref. Institute of
Public Health and
Environment

Kyoto
Prefectural
University of
Medicine

Virus
isolation

National Institute
of Animal Health

Serotyping



Tests Results of Dead Wild Bird

- Test period: 29 Feb.– 25 Jun. 2004
- Subjects: All dead wild birds found in Kyoto Pref., some cases of captured pest birds
- Results (Kyoto Pref.)

	No. collected	Rapid test	Virus isolation	Positive
Crows	307	178	101	7
Other birds	2,048	1,727	58	0
Total	2,355	1,905	159	7

○ Positive samples (H5N1; Kyoto and Osaka Prefecture)

Date of discovery	Site of discovery	Isolated by	Date of discovery	Site of discovery	Isolated by
3 Mar.	Tanba	Yamashiro LHC	Mar. 10	Tanba	Kyoto Prefectural Institute of Public Health and Environment
5 Mar.	Sonobe	Yamashiro LHC	Mar. 14	Kameoka	Kyoto Prefectural Institute of Public Health and Environment
5 Mar.	Osaka Pref.		Mar. 17	Osaka Pref.	
4 Mar.	Tanba	Tottori University	Apr. 2	Kameoka	Kyoto Prefectural University of Medicine
5Mar.	Tanba	Tottori University			

Declaration of HPAI Eradication (13 April 2004)

- 31 Mar. 1st Confirmatory inspection completed
- 1 Apr. Movement restriction area was narrowed from 30-km to 5-km radius.
Eggs shipment for sales, Incineration started
Broilers shipment for sales.
- 12 Apr. 2nd confirmatory inspection completed

■ Declaration of HPAI Eradication (at 00:00 a.m. on 13 April)

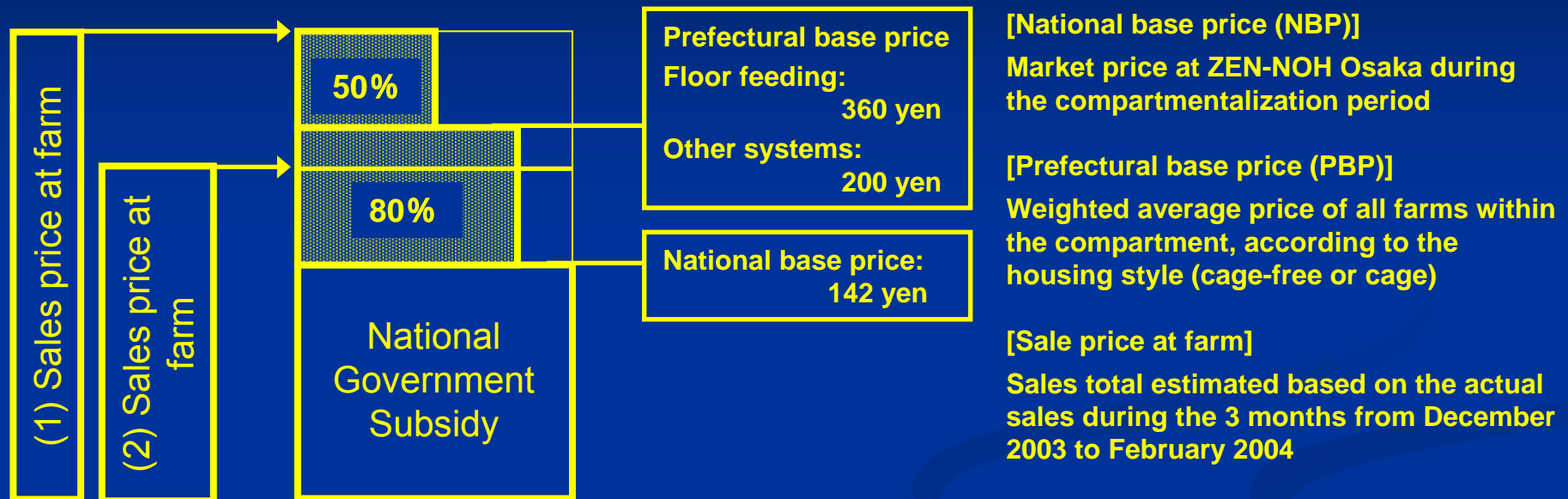
Economic Losses caused by Movement Restriction

- **Temporary Suspension of eggs shipment:**
All eggs produced during the period of Movement Restriction had to be incinerated.
- **Temporary Suspension of broilers shipment:**
Overgrown broilers, which had lost their market value, were forced to be disposed.
- **Breeders:**
Hatching eggs and hatched chicks had to be disposed.
Egg incubation was suspended.

Compensation for Poultry Farms

- Compensation for layer, broiler and breeder farms, and affected farms.
- Compensation through National Scheme.
- Additional compensation paid by Kyoto Pref. Gov. to cover gap between national compensation and actual economic losses

Compensation Made for Layer Farms



Calculation of additional compensation (price/kg)

(1) When the sales price is above the PBP:

$$[(\text{PBP} - \text{NBP}) \times 0.8 + (\text{Sales price} - \text{PBP}) \times 0.5] \times \text{Normal egg production rate (0.922)} \times \text{Sales rate}$$

(2) When the sales price is equal to or below the PBP:

$$(\text{Sales price} - \text{PBP}) \times 0.8 \times \text{Normal egg production rate (0.922)} \times \text{Sales rate}$$

Compensation Made for Broiler Farms

- Compensation for decrease in broiler market value (covered by the national compensation scheme)

If the broiler sales price is below the NBP (determined according to the 5 categories listed below), the difference is compensated by the prefecture.

- Compensation for feed during shipment delay (covered by the national compensation scheme)
- Compensation for other expenses during shipment delay (covered by Kyoto Prefecture)
During the shipment delay, other fixed expenses that do not link to production activity are compensated

Category	Compensation for decreased value		Compensation for Delayed Shipment		
	Base price (yen/bird)	Amount compensated	Feed cost (yen/100 birds)	Other expenses (yen/100 birds)	Amount compensated
Broiler	461	The difference from the base price is 100% compensated.	840	60	Unit compensation price × No. of applicable birds/100 × No. of days of delay
High-quality broiler	867				
Brand chicken	752				
Locally-branded chicken	2,000				
Duck	1,900				
	National		Prefectural		

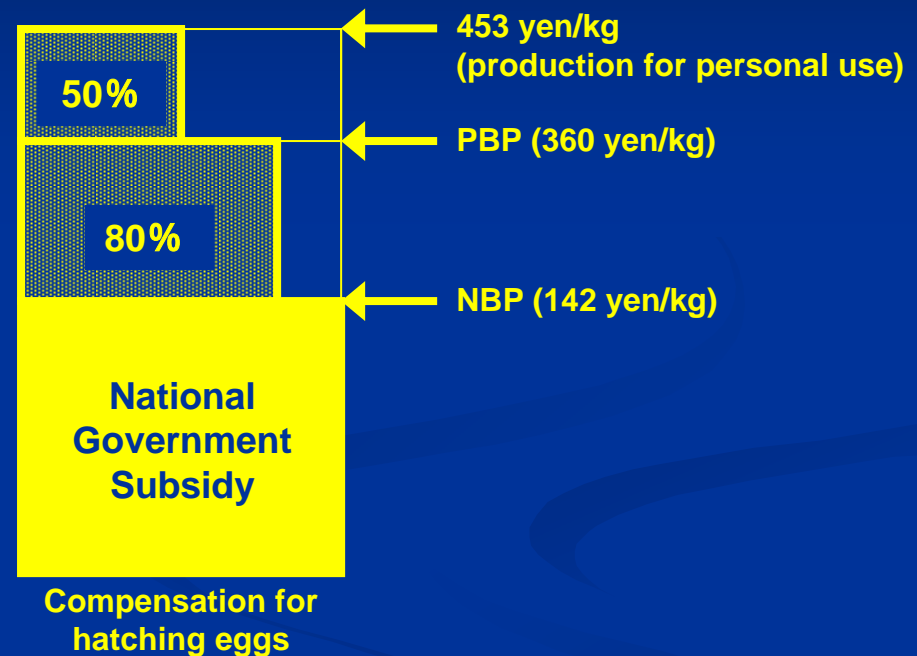
Compensation Made for Breeder Farms

- Compensation for decrease in breeder market value (covered by the national compensation scheme)

Chicks and hatching eggs that have been disposed by necessity to protect compartmentalization are compensated (covered by the national compensation scheme)

Based on the defined prefectural base price, the amount exceeding the national base price is additionally compensated by the prefecture

Compensation for:	NBP	PBP
Chicks	62 yen/bird	No additional compensation
Incubated hatching eggs	46 yen/egg	No additional compensation
Hatching eggs	142 yen/kg	360 yen/kg



- Compensation for expenses (covered by Kyoto Prefecture)
Fixed expenses during suspension of egg incubation are compensated.

Support for Affected Farms toward Resumption of Operation

- Expenses spent during the suspension period for reopening are partially compensated (covered by Kyoto Prefecture)

Disease Control and Prevention Measures based on Experiences

- Installation of bird proof net and instruments for disinfection
- Enhancement of patrolling and guidance by Livestock Hygiene Centers
- Disease Control and Prevention Map and Emergency Contact Network
- Guidelines for Disease Control and Prevention Measures unique to Kyoto Pref. Gov.
- Formation of Crisis Management Structure (Guideline for rapid setting up of Task Force headed by Pref. Governor)

1. Control measures for wild birds

- Wire fence with a mesh size of 2 cm or smaller
- Bird proof net for feed storage and manure facilities
- Protection against crows



2. Control measures for drinking water for chickens

- Supply tap water or water treated with chlorine, ozone, etc.
- Chlorine level: 0.1 ppm or higher



3. To prevent spread of HPAI via people and vehicles

- Restriction of entry and visitor check
- Disinfection of vehicles (feed and bird transportation)
- Step-in disinfection tub



4. To prevent spread of HPAI via wildlife and Hygiene pests

- Routine disinfestation of rats and maintenance of animal houses
- Complete disinfestation of flies, mosquitoes, cockroaches and other hygiene pests
- Protection against weasels, dogs and cats

Guideline for Disease Control and Protection Measures of Kyoto Pref. and 41 Manuals

Prevention Measures

- Enhancement of surveillance system
- Enhancement self-control & prevention measures

Preparedness for Outbreak

- Control measures and crisis management framework
- Disease Control and Prevention Map and Contingency Contact Network
- Study of disposal methods: incineration or burial
- Preliminary investigation on exemption from movement restriction
- Preparation and procurement of materials and equipment for disease control
- Guidance for poultry owners with birds for personal use/consumption

Control Measures in the event of Outbreak

- Notification and on-site inspection
- Laboratory Diagnosis
- Measures/response after virus isolation
- Epidemiological investigation of affected farm
- Confirmation of Pathogenicity
- Measures/responses after Laboratory Diagnosis
- Control measures for affected farm
- Measures for /responses to epidemiologically relevant farms
- Measures for other farms
- Movement restriction, etc.
- Follow-up after completion of control measures

Control of Dead wild birds

- Responses to Dead Wild Birds

Strengthening Prevention Measures

1. Strengthening patrolling and guidance by Livestock Hygiene Centers

- Farms with $\geq 1,000$ birds: Quarterly inspection of all 78 farms (clinical signs, bird proof net)
- Small-scale farms with $< 1,000$ birds: 1,100 farms inspected all at once

2. Strengthening virus surveillance

- Farms with $\geq 1,000$ birds: Quaternary blood test at all 78 farms
- Monthly blood test from 12 selected poultry farms



Drills for Disease Control throughout Kyoto Prefecture



Opinion Exchanges with Consumer Groups





Raising Public Awareness on HPAI

