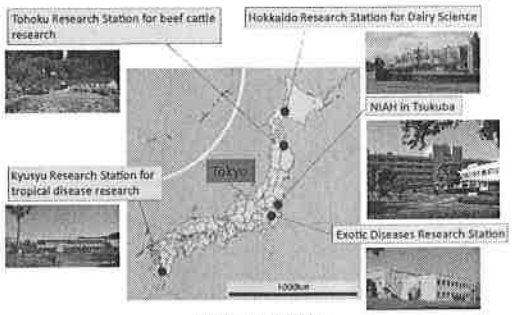
# Current work/study/research on swine diseases control and diagnosis in National Institute of Animal Health in Japan

**Organization:** National Institute of Animal Health (NIAH), National Agriculture and Food Research Organization (NARO)
**Mandate/Nature and size of the organization:** The NIAH prides itself on supporting the health of all living beings. We cover a range of research in animal diseases, from basic research to diagnosis, treatment, and prevention.
OIE collaborating center for Diagnosis and Control of Animal Diseases and Related Veterinary Products Assessment in Asia
OIE Reference Laboratories; BSE, CSF, Equine Infectious Anemia, Swine Influenza



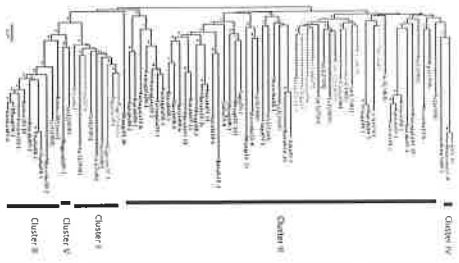

**The location of NIAH**
Headquarter and main research center in Tsukuba and 4 research stations
- Run by 128 researchers, 47 technicians and 60 administration staffs

## Organization of NIAH

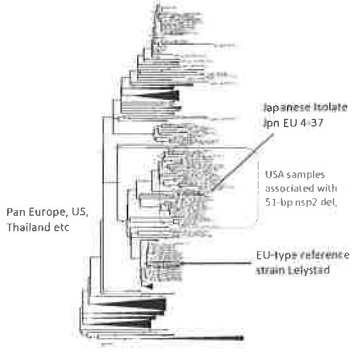
Director-General
- Department of planning and general administration
- Senior coordinator of animal health research
- Viral disease and Epidemiology research division
  - Research for detecting and controlling viral/zoonotic diseases
  - Research for epidemiological risk elucidation of infectious diseases *i.e.*, FMD, BSE, HAPI
  - Influenza
  - Avian viral diseases
  - Bovine viral diseases
  - Swine viral diseases
    - CSF
    - Respiratory disease (PRRS, PCV2 etc)
    - Diarrhea
- Bacterial and Parasitic disease research division
  - Research for diagnosing and preventing bacterial/parasitic diseases
  - Research for improving feed and food safety
- Pathology and Pathophysiology research division
  - Research for preventing production diseases via pathophysiological analysis
- Dairy hygiene research division
  - Research on dairy sciences and production disease of dairy cattle
- Subtropical disease research division
  - Research for preventing and controlling insect-borne diseases
- Exotic disease research division
  - Research for preventing and eradicating exotic diseases *i.e.*, FMD, PPV, CSF
- Prion disease research center
  - Development of technologies for controlling TSE
- Center for animal disease control and prevention
  - Production of veterinary biologics
  - Bank of natural and intellectual resource

## Current work/study/research on control and diagnosis for PRRS:

- Monitor genetic variation of PRRS virus
  - Genetic variation of North American (NA) type (type 2) PRRS virus widely spread in Japan from 1993 to 2010.
  - Isolation of European (EU) type (type 1) PRRS virus for the first time in 2008
  - Pathogenicity of PRRS virus Japanese isolates
  - Vaccine efficacy for PRRS virus Japanese isolates
- Evaluate interactions PRRS virus and other pathogens
  - Experimental model – PRRS virus and *Mycoplasma*
- New methods for control
  - Development of drug delivery system
  - New vaccine




**Phylogenetic tree of NA-type PRRS virus ORF5 nucleotide sequences in Japan <1993-2010>**
The ORF5 sequences of Japanese NA-type PRRS viruses were classified into five clusters. Eight samples from 2007 to 2010 belonged cluster II constructed with MLV vaccine strain. Cluster III consisted of 36 samples of 57 PRRS viruses from 2007 to 2010. And one strain was firstly classified in cluster IV in this study.



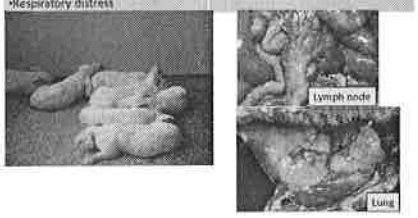

**Phylogenetic tree of EU-type PRRSV ORF5 in world**
We firstly detected and isolated EU type, "Jpn EU 4-37", from one farm
In phylogenetic analysis based on ORF5, Jpn EU4-37 was included in the group of US viruses associated with 51 nt deletion in nsp2.

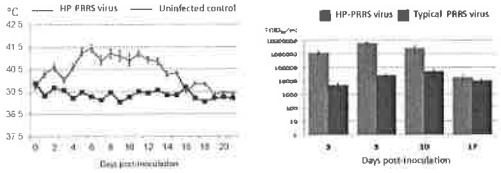
- Highly pathogenic PRRS
  - Experimental infection
  - Development of diagnostic method, search for drug candidate
  - International collaboration

**Animal experiment 1**
✓SPF piglets (4 weeks ) were inoculated with Vietnamese isolates of HP-PRRS virus by nasal route
✓Observation of clinical signs and viral load
✓Postmortem examination at 3, 7, 14, 21days post-inoculation

**Clinical signs and gross lesions at 7 days post-inoculation**

| Clinical signs | Gross lesions |
|---|---|
| •Fever(41.5°C)<br>•Lethargy, anorexia<br>•Edema<br>•Respiratory distress | •Kidney with blood spots<br>•Lymph node enlargement<br>•Demarcated reddish pneumonia |




**Body temperature and viral load**
The body temperature started to rise within 1 to 2 dpi, the high fever, 40 to 41.5 degree Celsius, continued for approximately 14 days.
The viral load of pig infected with HP-PRRS (red) has approximately 10-100 times higher as comparison with that of pigs infected with typical PRRS virus (blue).

**Animal experiment 2 –contact exposure-**
✓Five 4-weeks SPF piglets were combined with the five infected piglets with HP-PRRS virus at 4 days post-inoculation

Results
•All animal developed high fever, loss of appetite and lethargy, and died within 12 days after contact exposure.
•Hemorrhage in various organs
•*E.coli* and *Campyrobacter jejuni* were isolated in heart, liver, kidney and brain.


**Experimental infection of highly pathogenic PRRS**

| Done by | Inoculums | Animals (age) | Clinical outcome | | Bacterial isolation | Reference |
|---|---|---|---|---|---|---|
| | | | Severe disease | Mortality | | |
| China | Isolated virus (Chinese virus) | SPF (5wks) | Yes | 100% (12/12) | | |
| | | (60 days) | Yes | 100% (5/5) | | |
| | Infectious clone | PRRS-free (5wks) | Yes | 100% (6/6) | | |
| USDA | Isolated virus (Vietnam 2007) | SPF (4-6wks) | Moderate | 0% (0/3) | | |
| | Tissue homogenate | SPF (4-6wks) | Yes | 100% (3/3) | Streptococcus suis | |
| Japan | Isolated virus (Vietnam 2007&2010) | SPF (4wks) | Yes | 5.6% (1/18) | | |
| | Isolated virus (Vietnam 2010) | SPF (4wks) | Yes | 100% (10/10) | *E.coli* and *Campylobacter jejuni* | |

## Details of activities and services in the OIE Collaborating Centre

- Outbreak investigation and epidemiological studies
- Development, improvement and evaluation of diagnostic tests
- Surveillance and control of animal diseases
- Quality control of veterinary products
- Monitoring of antibiotic resistant bacteria
- Contribution to international animal hygiene activities by OIE and other international organizations
- Cooperative studies with other organizations
- Convening of international scientific meetings and workshops Hosting of researchers and technicians from foreign countries

## Recent Activities on Swine Viral Diseases (e.g. PRRS, CSF) for their Global Controls from Asia

•Viral Disease and Epidemiology Research Division
•Pathology and Pathophysiology Research Division

- Animal Disease Control Project ; 2008-2010 by JICA
  - •Epidemiological study for PRRS in Vietnam
  - •Workshop for training on PRRS in 2010
  - •Experimental reproduction of HP-PRRS to examine viral pathogenicity
- Participation in meetings
  - •Presentation in Regional Workshop on HP-PRRS and related pig diseases in Southeast Asia, 2011, Thailand, 2011 (by FAO-ROAP)
  - •Presentation in OAH/SVA Workshop on Classical Swine Fever (CSF), Vietnam, 2011 (by OAH-VN/SVA-SE)
  - •Presentation in Thailand-Japan Joint Conference on Animal Health 2012, Thailand, 2012 (by Japan and Thailand NIAHs)
  - •Presentation in 6th FAO/OIE Regional Steering Committee Meeting on GF-TADs, Thailand, 2012

## *Preparation of research projects on transboundary swine diseases (e.g.PRRS, CSF) among Asian countries*

- Control for pig diseases such as FMD, CSF and HP-PRRS is a big issue in our regions to improve pork production.
- We are developing laboratory network to control pig diseases in Asia

# OIE/FAO Regional Workshop on Swine Health Management in South East and East Asia

Ho Chi Minh City, Vietnam
22-24 August 2012

Tatsumi Okura D.V.M.
Deputy Director
Animal Health Division
Food Safety and Consumer Affairs Bureau
Ministry of Agriculture, Forestry and Fisheries
Japan

MAFF

## 1. Country Profile

- ✓ Japan is situated in northeastern Asia and consists of four major islands.
- Food self-sufficiency ratio is 39 percent (based on calories)
- Import a lot of agricultural products (including livestock products) from abroad
- About 6.2 million foreign tourists (4.7 million from Asia) visited Japan last year


MAFF

## 2. Agriculture Profile

- Key Statistics (as of 2010) of Agricultural Production -

| Item | Unit | Data |
|---|---|---|
| GDP at current prices | 100 mil.$ | 54,589 |
| per capita | $ | 43,136 |
| Agriculture, forestry and fisheries part of GDP | 100 mil.$ | 633 |
| Ratio to GDP | % | 1.2 |

| Item | Unit | Data | Ratio (%) |
|---|---|---|---|
| Total agricultural output | 100 mil.$ | 925 | 100 |
| Crop farming | 100 mil.$ | 628 | 68 |
| Livestock | 100 mil.$ | 290 | 31 |
| Pig production | 100 mil.$ | 60 | 6 |

Source : "Statistics Agricultural Income Produced", MAFF
"System of National Accounts", CAO

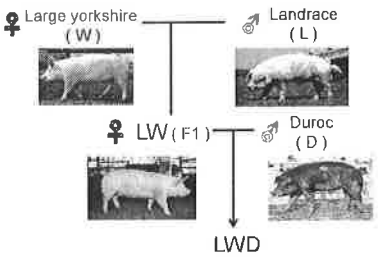
MAFF

## 2. Agriculture Profile

- Swine Production Profile -

- ✓ As westernization and diversification of diet led to rising demand for meats in Japan, pork has become one of the most commonly consumed meats.
- ✓ With regard to management structure, "consistent farming" which operates breeding and fatting is popular.
- ✓ Almost all commercial pork in Japan derives from LWD pigs (see right).

◆ LWD pigs (threeway crossing)

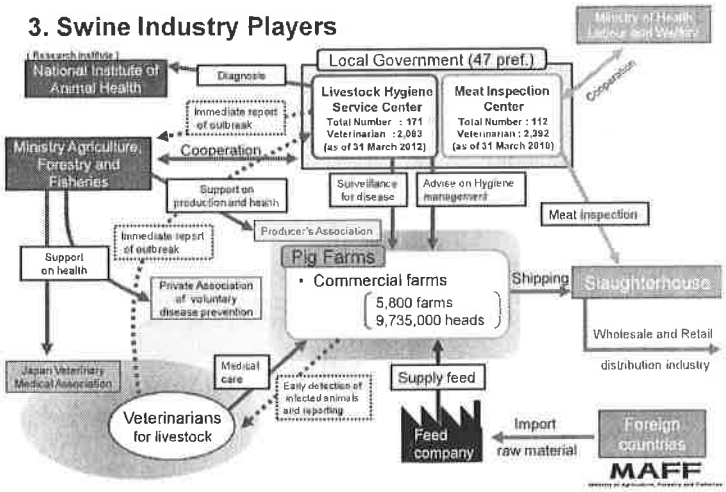



**? The reason why produce LWD pigs ?**

- ✓ Reproductive ability and meat quality can be improved.
- ✓ Growth improvement can be expected.

MAFF

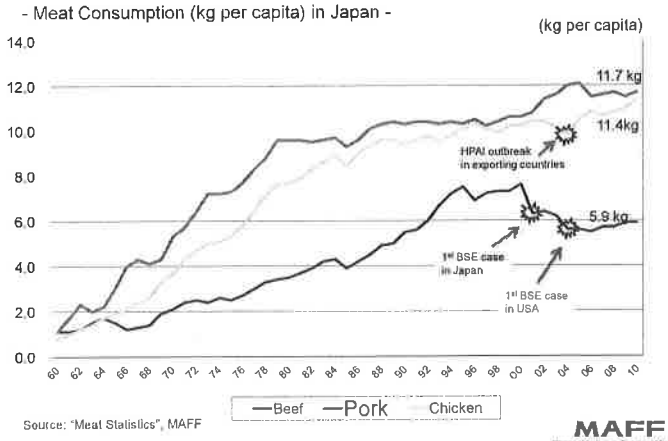
## 3. Swine Industry Players




MAFF

## 4. Swine Marketing and Trade

- Meat Consumption (kg per capita) in Japan -

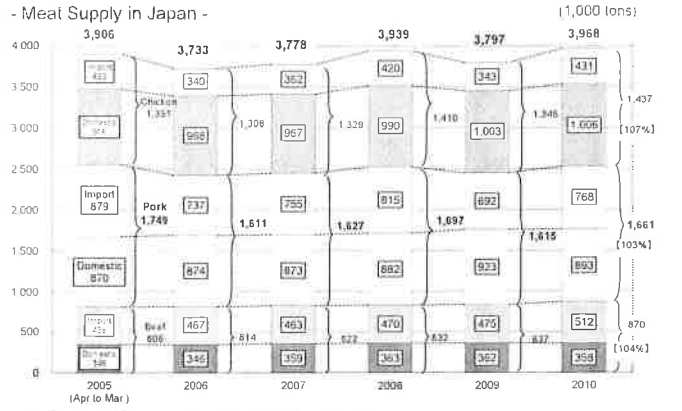



Source: "Meat Statistics", MAFF

MAFF

## 4. Swine Marketing and Trade

- Meat Supply in Japan -




Source: "Meat Statistics", MAFF; "Trade Statistics of Japan", Ministry of Finance.
Notes: (1) Figures are on a boneless meat equivalent basis
(2) Percentages shown in brackets are on a year-on-year basis

MAFF

## 4. Swine Marketing and Trade

- Pork import and export -

[Import]

(Unit: 1,000 tons(upper), % compared to the same period the previous year (lower))

| Japanese Fiscal Year | | 2007 (Apr-Mar) | 2008 | 2009 | 2010 | 2011 |
|---|---|---|---|---|---|---|
| Amount of Import | Chilled | 239 | 273 | 224 | 236 | 258 |
| | | (106) | (115) | (82) | (105) | (109) |
| | | 755 | 815 | 692 | 768 | 803 |
| | | (102) | (108) | (85) | (111) | (105) |

- Japan imports the same amount of pork as approximately domestic production each year, most of which is occupied by imports from EU, USA and Canada.

[Export]

(Unit: ton(upper), % compared to the same period the previous year (lower))

| Japanese Fiscal Year | 2007 (Apr-Mar) | 2008 | 2009 | 2010 | 2011 |
|---|---|---|---|---|---|
| Amount of Export | 1,012 | 1,889 | 2,113 | 519 | 663 |
| | (230) | (187) | (112) | (25) | (128) |

- On the other hand, Japan has few exports of pork, and only a small amount has been exported to Hong Kong, Singapore and Macao.

MAFF

## 5. Swine Production Systems

- Structure of Swine Herds -

(As of 1 February in each year)

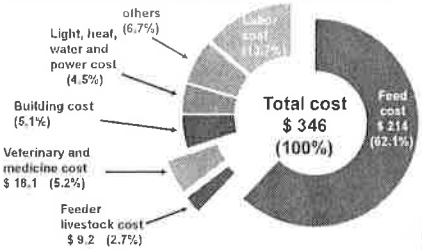
| Year | 1990 | 1995 | 2000 | 2006 | 2007 | 2008 | 2009 | 2011 |
|---|---|---|---|---|---|---|---|---|
| No. of Farms (1,000 farms) | 43.4 | 18.8 | 11.7 | 7.8 | 7.6 | 7.2 | 6.9 | 6.0 |
| (% change from previous year) | (▲13.5) | (▲14.9) | (▲6.4) | (▲12.2) | (▲3.2) | (▲4.2) | (▲4.7) | (▲12.8) |
| No. of Large Farms (1,000 farms) | - | - | 2.0 | 2.0 | 2.1 | 2.0 | - | 2.0 |
| (% in total farms) | (-) | (-) | (27.2) | (31.0) | (33.6) | (34.2) | (-) | (37.0) |
| No. of Pigs (1,000 heads) | 11,816 | 10,250 | 9,806 | 9,620 | 9,759 | 9,745 | 9,899 | 9,768 |
| (% change from previous year) | (▲0.4) | (▲3.5) | (▲0.7) | (▲0.9) | (1.4) | (▲0.1) | (1.6) | (▲1.3) |
| Sows (1,000 heads) | 1,182 | 970 | 918 | 915 | 910 | 937 | - | 902 |
| (% change from previous year) | (▲2.6) | (▲3.8) | (▲1.3) | (0.9) | (▲0.5) | (2.9) | (-) | (▲3.7) |
| No. of Pigs Large Farms (1,000 heads) | - | - | 6,874 | 7,379 | 7,379 | 7,831 | - | 8,022 |
| (% in total No. of pigs) | (-) | (-) | (74.7) | (79.7) | (80.8) | (82.5) | (-) | (84.8) |
| No. of Pigs Per Farm (Heads) | 272.3 | 545.2 | 838.1 | 1,233.3 | 1,292.6 | 1,347.9 | 1,436.7 | 1,625.3 |
| No. of Sows Per Farm (Heads) | 31.1 | 58.4 | 90.2 | 133.8 | 139.5 | 145.6 | 157.4 | 176.5 |

Source: "Livestock Industries Statistics", MAFF
Notes: (1) "Large Farms" means farms which rear more than 1,000 heads of pigs for fattening at any given time.
(2) "▲" shows decrease
(3) In 2010, survey was not conducted due to implementation of the Census in the same year.

MAFF

## 6. Swine Production and Health

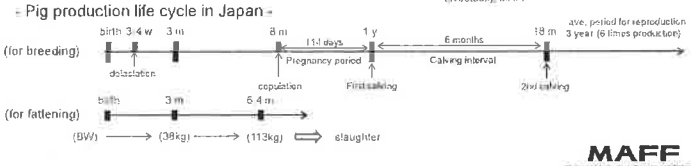
-Production cost of fattening pig (per head) (as of 2010) -




- Cost required to produce 1kg as live weight : $ 3.06
- Average litter size : 10.5 heads
- Rate of maturity : 89%
- Calving per year : 2.2 times

Source: Report of Statistical Survey on Farm Management and Economy (Production Cost of Livestock), MAFF

- Pig production life cycle in Japan -

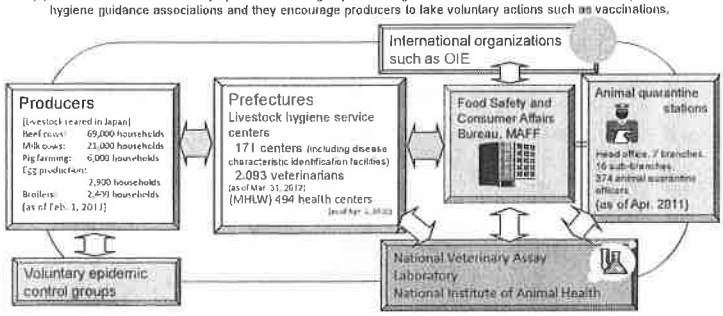



MAFF

## 6. Swine Production and Health

- Livestock Epidemic Control Systems -

(1) In cooperation with prefectures, the National Institute of Animal Health and other organizations, the state plans, coordinates and provides guidance on livestock epidemic control measures in Japan. It installs animal quarantine stations and conducts imports/exports quarantine in cooperation with international organizations.
(2) Prefectures install livestock hygiene service centers as the frontline organizations for livestock epidemic control in order to implement epidemic control measures. The state supports the development of livestock hygiene service centers and conducts training for staff.
(3) National and local voluntary epidemic control groups were organized such as livestock and livestock product hygiene guidance associations and they encourage producers to take voluntary actions such as vaccinations.




## 6. Swine Production and Health

(1) Free status
- ✓ Classical Swine Fever
- ✓ FMD

(2) Voluntary Control Programmes in place
- ✓ Aujeszky's Disease
  - Vaccination and test / slaughter for eradication
- ✓ PRRS
  - Vaccination for control

(3) Swine diseases subject to surveillance
- ✓ Classical Swine Fever
  - Serum test has been carried out across the country to confirm the freedom.
- ✓ Swine Influenza
  - Swine flu is not so important for pig health, but as a preparation for pandemic influenza, the MAFF has surveyed about 100 samples every year. (In addition, the MHLW has also examined over 1,000 samples every year.)

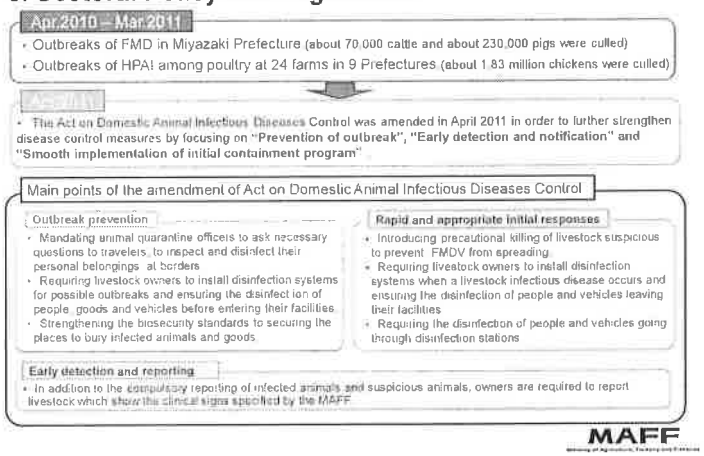
MAFF

## 7. Constraints to Swine Production and Health

- ✓ Aging of farmers and a lack of successors.
- ✓ Recent prices of corn used for animal feed have been hovering at high price.
- ✓ Need to adapt to consumer's needs grown for better food quality and greater food safety/security as the basis of life.
- ✓ Appropriate Treatment and Promotion of utilization of Livestock Manure.
- ✓ Preventing the outbreak of infectious diseases and improving the standard of hygiene management.

MAFF

## 8. Sectoral Policy and Legislation




MAFF

# OIE/FAO Regional Workshop on Swine Health Management in South-East Asia


## Hong Kong SAR

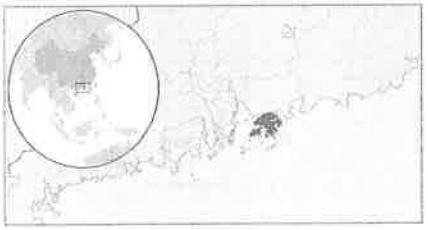
Dr. Veronica Yin-Ming LEONG

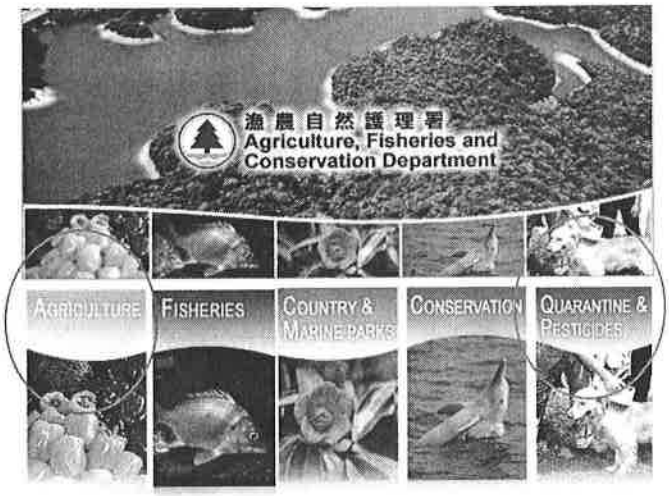
Agriculture, Fisheries and Conservation Department (AFCD)

## I. Hong Kong SAR Profile

- Hong Kong,with a population of seven million people, is located on China's south coast, 60 km east of Macau on the opposite side of the Pearl River Delta.
- The territory's 1,104 km$^2$ area consists of Hong Kong Island, the Kowloon Peninsula, the New Territories, and over 200 offshore islands, of which the largest is Lantau Island.
- Hong Kong is one of the world's largest re-export centre and leading international financial centres. Hong Kong's economy is dominated by the service sector, which accounts for over 90% of its GDP, while industry constitutes 9%.
- The territory has little arable land and few natural resources, so it imports most of its food and raw materials outsides HK; for example from the Mainland China.

Reference:
http://www.afcd.gov.hk/misc/download/annualreport2006/big5/appendces.html
http://zh.wikipedia.org/wiki/%E9%A6%/%99%E6%B8%AF%E8%BE%B2%E6%A5%AD






## II. Agriculture Profile

### A. Agriculture's role in the economy

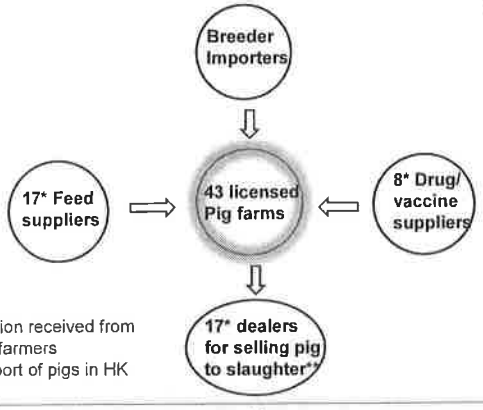
- Providing local consumers with high quality fresh food through intensive land use and production methods
- Currently there are about 2,500 farms in the territory. They employ directly about 4,600 farmers and workers
- Follows the general policy framework of free market. Except where social considerations are overriding, the allocation of resources in the economy is left to market forces with minimal government intervention
- The Government is responsible for the provision of basic infrastructure and technical support necessary for the development of modern, efficient, safe and environmentally acceptable farming, but leave the industries to adjust to market forces
- The Agriculture, Fisheries and Conservation Department is responsible to promote adaptive new production method and help the industries to take advantage of new market opportunities

## II. Agriculture Profile

### The role of livestock and swine sector in the agricultural economy

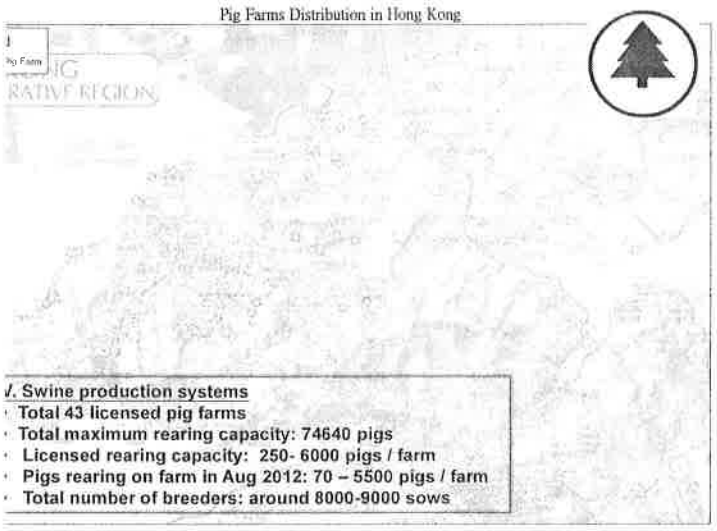
- In 2011, the local agriculture industry produces $743 million worth of produce. It comprises $241 million of crop production, **$284 million of livestock production** and $218 million of poultry production
- The average daily production of vegetable, live chicken and **live pigs are** 45 tonnes, 10,300 birds and **255 heads** respectively
- In 2011, local production accounted for 2.3 percent of fresh vegetables, 57.0 percent of live poultry and **7.0 percent of live pigs** consumed in the territory
- **38%** share of livestock production in the total agriculture economy;
- Number of Live pigs slaughtered in 2011 were **around 90,000 local pigs** and **1,460,000 imported pigs**
- The imported chilled pork (weight : **about 15,539 tonnes**) and frozen pork (weight : **about 250,206 tonnes**) for the year 2011.

## III. Swine industry players




*Information received from local pig farmers
** No export of pigs in HK

**Monitored and facilitated by Hong Kong SAR Government**




## VI. Swine production and health

- Source of stocks for each production system
  - Cost of gilts: HKD$900-$5000
  - Cost of weanlings: HKD$200-$2500
  - Farrowing index: 8-20 per litter
  - Average weight of animals for slaughter: 102kg~ 144kg
  - Age of animals for slaughter: 6-10 months
  - Average cost to produce a kilogram of pig: HKD$4.2 – 10.2
  - Farm gate prices for the last 3 years: HKD$3.6 – 10.2/kg
- Source of Feeds for each production system
  - Average cost of feeds: HKD$1.8 – 7.5/kg
  - Feed conversion: 3.5
- Cost of medication-including vaccines: HKD$25-250 per pig
- What are the common health problems encountered in each production system?
  - Common swine disease:

    From 2009 to 2012, FMD, Leptospirosis and PRRS had been reported to OIE.

    *Swine Erysipelas*, Swine Influenza, *Streptococcus suis* and APP were also diagnosed.
  - Emerging diseases ( diseases not previously present):

    Suspected PED/TGE

## VI. Swine production and health

- **Facilities to diagnose swine diseases:**

  Tai Lung Veterinary Laboratory (TLVL) of AFCD provides veterinary laboratory diagnostic services that safeguard animal and public health. Samples, carcasses, or animals from local farms or the slaughterhouse are examined in TLVL at the request of veterinary surgeons from Animal Health Division (AHD) of AFCD and Food and Environmental Hygiene Department (FEHD).

- **Capacity of TLVL to monitor and diagnose swine diseases:**
  - TLVL, being accredited by the National Association of Testing Authorities (NATA), Australia implement a quality management system to ensure we provide consistent and accurate results to our clients.
  - TLVL possesses post-mortem facilities, containment facilities such as class 2 safety hood and fume cabinets, multiple headed teaching microscope, automated bacteriology identification system, automated immunoanalyzer, embedding center, rotary microtome, autostainer, tissue processor, cryotome, nucleic acid extraction and purification system, real time PCR systems, and genetic analyzer.
  - TLVL headed by the veterinary officers and veterinary pathologist with a team of qualified registered veterinary technologists and technicians oversee the operation of the laboratory.
  - The following OIE listed swine diseases that can be diagnosed at TLVL:
    Aujeszky's disease, CSF, FMD, PRRS, TGE, SVD, Vesicular stomatitis and Leptosporosis.

## VI. Swine production and health

**Surveillance system in HK**

- **Active surveillance**

  - Slaughterhouse (Veterinary) Section of FEHD submit 1800 swine blood samples to TLVL a year for the surveillance of the serological prevalence of *Toxoplasma* and *Trichinella* in pigs. Beside this, 720 bovine facecal samples and 360 bovine faecal swabs are submitted each year for the surveillance of *Cryptosporidium* and *E. coli O157:H7* respectively in cattle.

  - Around 49,000 urine and serum samples from pigs, cattle, goats and chickens were submitted to TLVL per year for testing of prohibited and restricted chemicals regulated under Cap.139N Public Health (Animals and Birds) (Chemical Residues) Regulation.
- **Passive surveillance**

  - About 180 tissue samples were submitted by FEHD in 2011 for the surveillance of swine pathogens such as *Streptococcus suis*, *Leptospira spp.*, *Erysipelas*, Porcine Reproductive and Respiratory Syndrome Virus, Porcine Circovius and Foot and Mouth Virus.

  - Upon receipt of farmer's notice. live sick animals or carcasses or tissue samples will be submitted by AFCD officers to TLVL for swine disease testing and diagnosis.

## VII. Constraints to swine production

1. The Swine sector in HK is too small to gain priority att & resources;
2. High selling prices of feed, raw materials, drugs & vaccines;
3. Aging of pig farm owners in addition to the difficulties in getting workers

## VIII. Sectoral Policy and Legislation

**Policy Initiatives of Food and Health Bureau for 2010-2011**

***Quality City and Quality Life***

**Mission and Vision**

The Food and Health Bureau (FHB) is committed to building a healthy society and accountable for formulating related policies under its ambit. On the food safety and environmental hygiene fronts, we will continue to ensure food safety and provide a clean and hygienic environment to promote public health and raise the living standard of our citizens.

## VIII. Sectoral Policy and Legislation

**AFCD's Vision**

- To see our community enjoy a reliable and plentiful supply of safe and high quality fresh food and a well managed natural environmental, which we can pass on to our future generations.

**Legislations:**

- Cap.139A PUBLIC HEALTH (ANIMALS AND BIRDS) REGULATIONS
- Cap.139L PUBLIC HEALTH (ANIMALS AND BIRDS) (LICENSING OF LIVESTOCK KEEPING) REGULATIONS
- Cap.139N PUBLIC HEALTH (ANIMALS AND BIRDS) (CHEMICAL RESIDUES) REGULATIONS
- Cap.169 PREVENTION OF CRUELTY TO ANIMALS ORDINANCE
- Cap.137 ANTIBIOTIC ORDINANCE
- Cap.138 PHARMACY AND POISONS ORDINANCE
- Cap.529 VETERINARY SURGEONS REGISTRATION ORDINANCE

**More details :** http://www.afcd.gov.hk / http://hklaw.ccgo.hksarg/eng/index.htm

**THANK YOU!**


| | |
|---|---|
| Land Area | 1,910,931 km² |
| Human Population | 237,556,363 |
| GDP - composition by sector | |
| agriculture | 14.7% |
| industry: | 47.2% |
| services | 38.1% (2011 est.) |

| Description | Indonesia |
|---|---|
| contribution of agriculture to National GDP | 14.7% |
| Contribution of livestock to agriculture | 12,5% |
| Gross National Product of Livestock Sector | 389,862.89 US$ |
| Proportion swine population in livestock | 14% and 0.5% (with poultry) |
| Contribution of swine sector to agriculture | |
| Pork demand vs supply | 130,37 |
| Pork consumption per capita | 0.6/g/day |

Industry: >1000

2. Commercial

Large scale: ± 1000

Small scale: ± 20-70

3. Backyard: <20

| No | Jenis/ Species | Tahun/ Year | | | | |
|---|---|---|---|---|---|---|
| | | 2007 | 2008 | 2009 | 2010 | 2011 *) |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| I | RUMINANSIA/ RUMINANT | | | | | |
| 1 | Sapi Potong/ Beef Cattle | 11,515 | 12,257 | 12,760 | 13,582 | 14,624 |
| 2 | Sapi Perah/ Dairy Cattle | 374 | 458 | 475 | 488 | 597 |
| 3 | Kerbau/ Buffalo | 2,004 | 1,931 | 1,933 | 2,000 | 1,305 |
| 4 | Kambing/ Goat | 14,470 | 15,447 | 16,815 | 16,920 | 17,483 |
| 5 | Domba/ Sheep | 9,514 | 9,605 | 10,199 | 10,725 | 11,372 |
| II | NON RUMINANSIA/ NON RUMINANT | | | | | |
| 1 | Babi/ Pig | 6,711 | 6,838 | 6,975 | 7,477 | 7,758 |
| 2 | Kuda/ Horse | 401 | 393 | 399 | 415 | 416 |
| 3 | Kelinci/ Rabbit | 708 | 748 | 887 | 834 | 919 |
| III | UNGGAS/ POULTRY | | | | | |
| 1 | Ayam Buras/ Native Chicken | 272,251 | 243,423 | 249,563 | 257,644 | 274,883 |
| 2 | Ayam Ras Petelur/ Layer | 111,469 | 107,955 | 111,418 | 105,210 | 110,300 |
| 3 | Ayam Ras Pedaging/ Broiler | 891,659 | 902,652 | 1,026,379 | 986,872 | 1,041,968 |
| 4 | Itik/ Duck | 35,867 | 39,843 | 40,678 | 44,302 | 48,302 |
| 5 | Puyuh/ Quail | 6,646.1 | 6,653.3 | 7,547.8 | 7,053.6 | 7,055.5 |
| 6 | Merpati/ Pigeon | 152.5 | 1,499.0 | 1,814.8 | 498.1 | 419.5 |

**SWINE PRODUCT**

| YEAR | Export | | Import | |
|---|---|---|---|---|
| | Volume (kg) | VALUE (USD) | Volume (kg) | VALUE (USD) |
| 2009 | 758.367 | 440.836 | 162.920 | 198.983 |
| 2010 | 56.734 | 34.257 | 27.818 | 60.972 |
| 2011 | 21.014 | 17.100 | 35.927 | 191.743 |

**SWINE**

| YEAR | Export | | Import | |
|---|---|---|---|---|
| | Volume (kg) | VALUE (USD) | Volume (kg) | VALUE (USD) |
| 2009 | 25.711.350 | 39.666.635 | 0 | 0 |
| 2010 | 27.044.692 | 50.341.569 | 0 | 0 |
| 2011 | 21.689.099 | 41.845.619 | 0 | 0 |

- COMMON SWINE DISEASE : Classical Swine Fever (CSF)

## The Distribution of CSF in Indonesia in 2007-2012

| Province | Distribution of CSF cases | | | | | |
|---|---|---|---|---|---|---|
| | 2007 | 2008 | 2009 | 2010 | 2011 | 2011 |
| North Sumatra | 254 | | 582 | 906 | 1228 | |
| West Sumatra | | 22 | | | | |
| Riau | | | 17 | | | |
| Jambi | | | 2 | | | |
| South Sumatra | | 9 | | | | |
| Bengkulu | | 58 | | | | |
| Lampung | | 5 | | | | |
| West Java | | 12 | | | | |
| West Kalimantan | 58 | 90 | 106 | 90 | 538 | 16 |
| South Kalimantan | | | 40 | | | |
| NTT | 104 | 92 | 131 | 47 | 433 | 70 |
| Bali | 51 | 1024 | 3060 | 1651 | 453 | |
| South Sulawesi | 2 | | 71/13 | 123 | 759 | |
| Central Sulawesi | 33 | 1 | | 22 | 1591 | 194 |
| North Sulawesi | | | 1 | | | |
| Maluku | | | 3 | | | |
| Papua | 105 | | 12* | | 161 | |

## CSF Diagnosis in Indonesia

- Epidemiologic
- Clinic
- Laboratory
  - Antigen Detection
    - virus isolation
    - Polymerase Chain reaction (PCR)
    - ELISA Antigen
  - Antibody Detection
    - Neutralization Peroxidase-Linked Assay (NPLA)
    - ELISA Antibody

## REGISTERED CSF VACCINE

| NO | BRAND NAME | MANUFACTURER | IMPORTER |
|---|---|---|---|
| 1. | Live HC Vaccine *) | Kitasato Institute, Japan | PT. SHS |
| 2. | Pest Vac **) | Fort Dodge SA, Brazil | PT. Paeco Agung |
| 3. | Pestiffa **) | Merrial, France | PT. Romindo |
| 4. | Suivac, KBL *) | Kyoto Biken, Japan | PT. Agro Makmur Sentosa |
| 5. | Plivak KS | Pfizer, Vet.AH, Croatia | PT. Pfizer Indonesia |
| 6. | HOGSIVET | PUSVETMA | -- |

Keterangan :
*) Strain Kitasato
**) Strain China

## Constraints to Swine Production and Health

1. Traffic supervision of swine and their product is difficult to be monitored
2. Vaccination coverage is not optimal
3. Distribution of gilts is not by coordination with local authority
4. Small scale farmer involment in the health program is limited
5. Most of the raising system is implemented extensively.
6. Imported vaccine is costly

## Sectoral Policy and Legislation

Strategy of CSF control and eradication:

- Vaccination in contaminated area
- Stamping out in new contaminated area
- Surveillance (clinic, epidemiology, serology and virology)
- Biosecurity
- Traffic supervision
- Public Awareness (Communication, Information and Education)

Strategy of Production:

- Support the conversion from semi-intensive farming system into intensive farming system
- Implement biodigester technology
- Encourage new farmer and new group farmer growing
- Support level upgrading of farming scale

## Thank you

# MALAYSIA

moa INCORPORATED
KEMENTERIAN PERTANIAN DAN INDUSTRI ASAS TANI MALAYSIA

## GEOGRAPHY

Economy: Mix

## AGRICULTURE PROFILE

A : Agriculture's Role In The Economy

- 7.66 % from total GDP
- Physical – In 2011, Malaysia had 1,754,990 standing pig population (SPP)in 759 farms encompassing Peninsular Malaysia (West Malaysia) and East Malaysia ( Sabah, Sarawak, Labuan).
- Social – Pig farming viable in West Coast Peninsular Malaysia where non-Muslims population are concentrated but increasing urbanization leads to closure of small scale farms, whereas East Coast of Malaysia not viable due to majority Muslim population and lack of demand for pork and pork products. Sabah and Sarawak have large tracts of land available and viable for future pig farming because non-Muslim indigenous population form a sizable portion of population there but disadvantage is disparate distribution of non-Muslim population vs land size.

  Pig Farming Areas have been developed in state of Negeri Sembilan (Peninsular Malaysia), Sabah and Sarawak.
- Economy – - Increasing feed costs, lack of breeding stock and due to Nipah outbreak in 1997, Singapore has yet to lift ban on imports of Malaysia produced pork and pig products but have recently allowed import of added-value products of non-Malaysian origin pork.

## AGRICULTURE PROFILE

Future and current development planning, MDGs, Poverty Reduction Strategy (PRS), and national and regional food security programmes are being planned and implemented in close alignment to the National Agro-Food Policy 2011 -2020.

National Agro-Food Policy 2011 -2020

1. Ensuring food Supply- availability, safety, accessability, affordability
2. Developing of high value agriculture
3. Developing sustainable agriculture
4. Dynamic agriculture clusters, maximizing income generation
5. Private investment as catalyst of modern farming
6. Informative and connected agriculture human resource
7. Modernized agriculture driven by research, development technology, innovation
8. Excellence of agriculture supporting services

## AGRICULTURE PROFILE

B : Role of livestock in the agriculture economy

- 0.83 % livestock share
- RM 5,884 million – livestock value
- RM 54,299 million – agriculture economy

## AGRICULTURE PROFILE

C : Role of swine sector from the total livestock sector

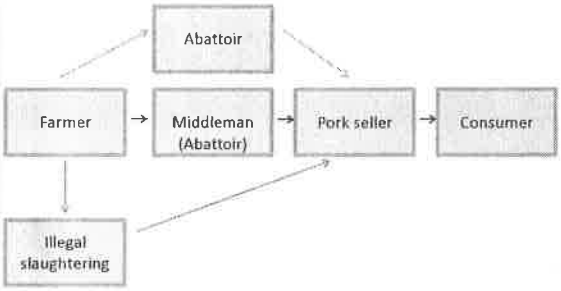
- Pork demand : 202,967 metric tonnes
- Pork supply : 192,973 metric tonnes
- Pork Consumption: 229,820 metric ton
- Swine Population: 1,754,990 (0.04 % of total livestock)
- RM 771 million

# Swine Industry Players

- Government and government agencies (MARDI)
- FLFAM (National level)
- Swine Associations (State level)
- Pharmaceutical companies (Rhone Ma, Taseen)
- Feedmill companies (Alltech, Gold Coin, Cargill,)
- Equipment suppliers (Taseen, Big Dutchman)
- Total farms : 548 farms

# Swine Marketing & Trade

Production system : Intensive system




# Swine Marketing & Trade

- Export of value added products ONLY
- Do not export live pigs and frozen meat cuts
- Amount of export (2011): 466,652.30kg
- Value of export (2011): RM 6, 399, 399. 48

# Swine Production Systems

| State | Total no. of farms according to farm size (SPP) | | | Total | Total Standing Pig Population according to farm size (SPP) | | | Total |
|---|---|---|---|---|---|---|---|---|
| | ≤ 1000 | 1001-5000 | ≥ 5001-10,000 | | ≤ 1000 | 1001-5000 | ≥ 5001-10,000 | |
| Perlis | 1 | 0 | 0 | 1 | 888 | 0 | 0 | 888 |
| Kedah | 0 | 2 | 0 | 2 | 0 | 2,442 | 0 | 2,442 |
| Pulau Pinang | 97 | 96 | 9 | 202 | 56,737 | 200,004 | 67,996 | 324,737 |
| Perak | 33 | 64 | 31 | 128 | 17,265 | 170,926 | 318,680 | 510,871 |
| Selangor | 26 | 97 | 5 | 128 | 21,685 | 187,270 | 43,218 | 252,173 |
| N.Sembilan | 1 | 0 | 0 | 1 | 939 | 0 | 0 | 939 |
| Melaka | 22 | 13 | 1 | 36 | 17,067 | 21,416 | 7,268 | 45,751 |
| Johor | 10 | 24 | 15 | 49 | 7,350 | 69,600 | 198,600 | 275,550 |
| Pahang | 0 | 1 | 0 | 1 | 0 | 3,811 | 0 | 3,811 |
| Total | 190 | 297 | 61 | 548 | 122,383 | 659,469 | 635,762 | 1,417,614 |
| % | 34.67 % | 54.2 % | 11.1 % | 100 % | 8.6 % | 46.5 % | 44.8 % | 100 % |

# Swine Production & Health

- Cost of gilts: RM 1000
- Cost of weanlings: RM 161.03/ weaner
- Farrowing Index: 1.8 – 2.0
- Slaughter weight: 105-120kg
- Cost of 1 kg meat : RM 7.10/ kg
- July 2012 farm gate price : RM 705/100kg
- FCR: 3.2
- Population growth rate per year

| | |
|---|---|
| 2011 | ↓ 0.43 |
| 2010 | ↑ 2.68 |
| 2009 | ↓7.9 |

# Swine Production & Health

- Farm gate prices (RM/kg) over the past 3 years

| Month/Year | 2010 | 2011 | 2012 |
|---|---|---|---|
| January | 7.60 | 8.50 | 5.50 |
| February | 7.60 | 8.50 | 5.50 |
| March | 7.60 | 7.50 | 4.95 |
| April | 7.83 | 7.80 | 5.46 |
| May | 7.90 | 7.95 | 5.83 |
| June | 7.90 | 8.10 | 6.59 |
| July | 7.90 | 7.85 | 7.05 |
| August | 7.90 | 7.00 | - |
| September | 7.90 | 5.50 | - |
| October | 7.90 | 6.50 | - |
| November | 7.90 | 8.00 | - |
| December | 7.90 | 8.00 | - |
| Average | 7.82 | 7.60 | - |

## SWINE PRODUCTION & HEALTH

- Feed cost

| | | |
|---|---|---|
| Boar | Breeder feed | RM 4347.00 |
| Sow/Gilt | Gestation feed (154 days) | RM 619.85 |
| | Lactating feed (28 days) | RM 182.56 |
| Piglet | Creep feed (10 days) | RM 0.50 |
| Porker | Prestarter (22 days) | RM 13.48 |
| | Starter (29 days) | RM 40.08 |
| | Growers (59 days) | RM 156.25 |
| | Finishers (72 days) | RM 310.15 |

## SWINE PRODUCTION & HEALTH

- Common production problems : Disease threats, poor facilities/handling, reduced sow productivity, reduced feed optimization, change in selling weight/age and lastly nutrition problems
- Common swine diseases: FMD, PRRS, Atropic rhinitis, PMWS, PCV-2, MMA, mycotoxicosis, nutritional disorders,PRDC, APP
- Emerging diseases: Nil

## SWINE PRODUCTION & HEALTH

- Vaccine

| Company | Vaccine Name | Price (RM) |
|---|---|---|
| A | Circoflex | 499 |
| B | Mycoflex | 255 |
| C | PRRS | 363 |
| D | Aujespig | 75 |
| E | CSF | 38 |
| F | Aradicator | 52 |
| G | Litterguard | 48 |
| H | PR VAC Plus | 90 |
| I | Respisure | 110 |
| J | Respisure One | 230 |

## SWINE PRODUCTION & HEALTH

- Herd Health

1. Vaccination Programme

| Disease | Sows | Boars | Gilts | Weaners |
|---|---|---|---|---|
| Swine Fever | Every Six Months | Every Six Months | 7.5th month -1st dose 8th month 2nd dose | 38th day Booster 68th day |
| Aujesky's | Every 6 mths | Every 6 mths | 6th month Booster at 7th months | |
| FMD | Every six Months | Every six Months | | |
| Porcine Parvo virus | | | 8th month | |

## SWINE PRODUCTION & HEALTH

2. Parasitic Control

a)Internal Parasites

| Compound | Dosage | Target group |
|---|---|---|
| Efficazole 8% in feed | 1050g per ton of feed for six days<br>85g per ton of feed for 15 days | Every six month for breeders Weaners |
| Ivermectine | 1kg per ton of feed for 1 week | Every six month for breeders |

b) External Parasites

| | | |
|---|---|---|
| Ivermectine | Every six month for breeders | |
| Neguvon / Malathion Spray | Once moved into farrowing pen for sows | All other group twice a month |
| Sumithion / Icon fogging | Every two weeks – entire farm | |

## SWINE PRODUCTION & HEALTH

- Government Lab : Veterinary Research Institute (VRI) in Malaysia → CSF, HP PRRS, PMWS, NIPAH, JE, SWINE INFLUENZA, PRRS, ASF, PCV 2 – RT PCR, CONVENTIONAL PCR, CELL CULTURE
- Surveillance program:-

  (CSF, Nipah, FMD, PMWS, PRRS, Aujeszky's)

  a)Government – Federal, state

  b)Private – Farms, feedmill and pharmaceutical companies

## Constraint To Swine Production & Health

- Land restriction
- Licensing issues
- Societal rejection
- Pollution issues
- Over dependant on imported feed ingredients and imported breeders
- High capital investment
- Ineffective waste treatment system
- Disease threat
- Ineffective cold chain market
- Lack of interest from younger generation and lack of man power

## Sectoral Policy & Legislation

- Generally government policy on swine production and health is to develop environmental friendly and centralised farming. This to enable long term sustainability and co-existence with increased urbanization and better disease control.
- In 2012, DVS Malaysia initiated Pig Consultative Council Meeting with Federation of Farm and Livestock Association (FLFAM) as a platform to discuss and manage swine industry issues.

## Sectoral Policy & Legislation

- In 2011, government allocated RM90,000.00 for pig industry development expenditure.
- Issues related to environment pollution by pig farms exists but only about 10% pig farms involved. These farms hopefully will improve pollution control measures as soon as a new farming pollution mitigating legislation by Department of Environment is enforced end of 2012.

## Acknowledgement


- Veterinary officers and assistant veterinary officers of Department of Veterinary Services, Putrajaya
- Dr Ooi Peck Toung, Department of Clinical Studies , Faculty of Veterinary Medicine, Universiti Putra Malaysia
- Dr Liew Yew Seng, Dr Yew Ee Ling, Dr Lee Jin Wee, Dr Khan Lee Ching, Dr Wasu Kasimani, Dr Evonne Lim

THE REPUBLIC OF THE UNION OF MYANMAR

MINISTRY OF LIVESTOCK & FISHERIES

LIVESTOCK , FEEDSTUFF AND MILK PRODUCTS ENTERPRISE

# COUNTRY REPORT

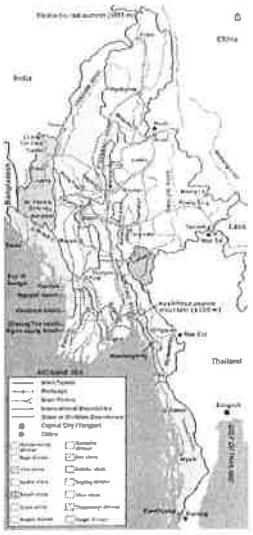
## PRESENTED BY

## Dr.Paik Htwe

1

Myanmar , the Largest Country
on the Main Land of South East Asia

-Total Land Area – 676877 sq-km
- Bangladesh & India on the North West
- China on the North East
- Laos on the East
-Thailand on the Southeast East
- Total Population - Approximately 62.1 millions
-Total Coast line - 2832 km
- Stretches - 2090 km from North to South
925 km from East to west



2

**Seasons**

- Hot season from March to May.
- Raining Season from June to October
- High humidity
- Cold Season From November to February
- Temperature - Average Annual Temperature
  - 32 □C in Coastal and Delta
  - 21 □C in the Northern Low land
  - Warmer in the central Dry zone

**Average Annual Rain Fall**

- 500 cm in coastal Regions
- 75 cm or less in Central Dry Zone

3

## Economy

Agriculture plays a crucial role in the Economy 70% of the Population involved in Agri sector

Major Crops
- Paddy, Oil Producing Crops
- Maize, Sugar Cane
- Cotton , Bean

Livestock Sector
- Draft Power (Land Cultivation and Rural Transport )
- Meat and Milk and Eggs
- Hide and Skins
- Manure ( Natural Fertilizer )

4

Per Capital Consumption of Meat , Milk and Eggs

| Particular | 2010-2011 | 2011-2012 |
|---|---|---|
| Human Population ( million) | 60.9 | 62.1 |
| Meat Production(kg million) | 1957.36 | 2123.2 |
| Per Capital Consumption of meat(kg) | 32.1 | 34.1 |
| Milk Production ( kg million) | 1603.6 | 1691.3 |
| Per Capital Consumption of milk (kg) | 26.3 | 27.2 |
| Egg Production ( million) | 7727.1 | 8442 |
| Per Capital Consumption of egg (number ) | 127 | 137 |

5

Swine Economy

| Particular | 2010-2011 | 2011-2012 |
|---|---|---|
| Human Population(million) | 60.9 | 62.1 |
| Swine Population(million) | 10.3 | 11.43 |
| Pork Population( kg million) | 58.154 | 63.87 |
| Per Capital Consumption (kg) | 0.96 | 1.03 |
| Total meat Production(kg million) | 1987.36 | 2123.21 |
| % of Pork Production(%) | 2.97 % | 3 |

6

| Particular | 2010-2011 | 2011-2012 |
|---|---|---|
| Human Population( million) | 60.9 | 62.1 |
| Swine Population( million) | 10.3 | 11.43 |
| Pork Population( kg million ) | 58.154 | 63.87 |
| Per Capital Consumption(kg) | 0.96 | 1.03 |

Exotic pig breed were imported since 1978.

Commercial Production - 10% of total production.

Smallholder Production - 90% of total production.



Livestock Population

Million

| No | Livestock | 2010-2011 | 2011-2012 | Improvement | Remark |
|---|---|---|---|---|---|
| 1. | Buffaloes | 3.09 | 3.21 | 3.9% | |
| 2. | Cattle | 14.02 | 14.51 | 3.5% | |
| 3. | Sheep, Goat | 4.55 | 5.24 | 15.34% | |
| 4. | Pig | 10.3 | 11.43 | 10.97% | |
| 5. | Poultry | 198.84 | 213.17 | 7.21% | |



## The Ministry of Livestock and Fisheries

Organized with (5) agencies

- Directorate of livestock and Fisheries ( DLF )
- Livestock Breeding and Veterinary Department ( LBVD )
- Department of Fisheries ( DOF )
- Livestock, Feedstuff and Milk Products Enterprise ( LFME)
- University of Veterinary Science ( UVSc )

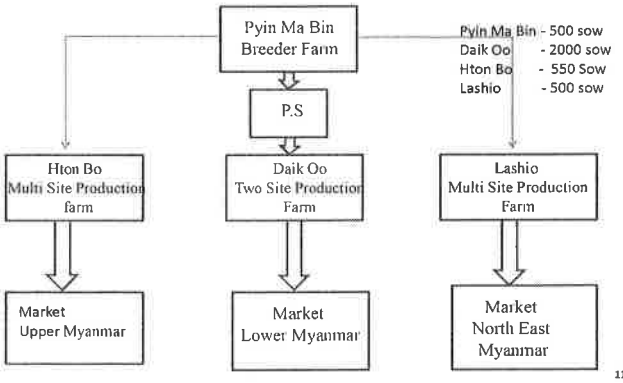


## Organization Related to the Ministry

- Myanmar Livestock Federation (MLF)
- Myanmar Fisheries Federation ( MFF )
- Myanmar Veterinary Council ( MVC )
- Myanmar Veterinary Association ( MVA )
- Myanmar Livestock and Fisheries Development Bank ( MLFDB )



## The Structure of Swine Industry of Livestock ,Feedstuff and Milk Products Enterprise





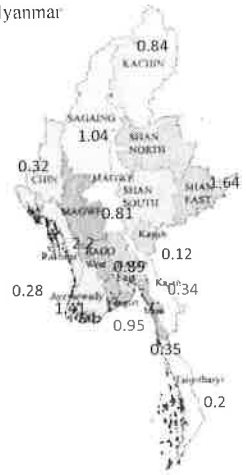

Common Swine Disease

- -Food and Mouth Disease ( FMD )
- - Classical Swine Fever ( C.S.F )
- - E.Coli
- - Heamophillius
- - Mycoplasma
- - Pasteurella
- - Salmonella

Prevention

- - FMD Disease - Vaccinated and Biosecurity
- - C.S.F Disease - Vaccinated and Biosecurity
- - Bacterial Disease - Medicated and Biosecurity

Swine Indensity In Myanmar




millions

| | |
|---|---|
| Kachin | - 0.84 |
| Kayar | - 0.12 |
| Kayin | - 0.34 |
| Chin | - 0.32 |
| Shan | - 1.64 |
| Mon | - 0.35 |
| Rakhine | - 0.28 |
| Sagaing | - 1.04 |
| Naypyidaw | - 0.2 |
| Mandalya | - 0.6 |
| Magwe | - 2.2 |
| Tannintharyi | - 02 |
| Yangon | - 0.95 |
| Ayarwadary | - 1.41 |
| Bago | - 0.89 |



# THANK YOU

OIE/FAO Regional Workshop on Swine Health Management in East and Southeast Asia

22-24 August 2012
Ho Chi Minh, Vietnam

Laarni Z. Cabantac, DVM
Head, Disease Intelligence & Epidemiology Section
Animal Health Division
Bureau of Animal Industry
PHILIPPINES

# Country Profile

## Geographic Profile – The Philippines


➢ Located in Southeast Asia


➢ Tropical climate
➢ Has 7, 107 islands
➢ 3 main island groups :
Luzon, Visayas, Mindanao

## Economic Profile

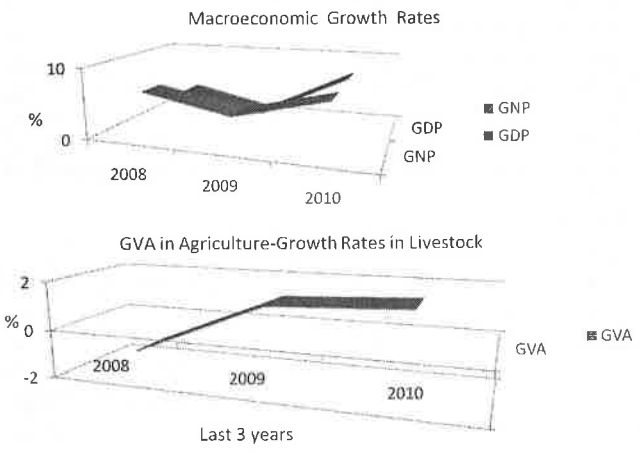
- The Philippines economy is the world's 47th largest economy (as of 2008).
- The Philippine peso is the country's unit of currency.
- The Philippines has undergone a transformation from being an agriculture based country to that of a newly industrialized country
- The economy is now vastly dependent on the services and manufacturing sector.
- The country has a total labor force of around 38.1 million.
- As of October 2009, its foreign currency reserves stood at US$36.13 billion.

## Agriculture Profile

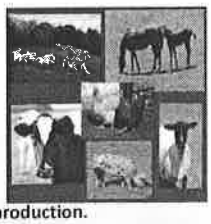
### Agriculture's role in the economy

- The agricultural sector employs about 32.98 per cent of the population but contributes only 12 per cent of GDP.
- Almost 5 million farmers cultivate 9.7 million hectares, or about 30 per cent of the total land area of the country. Coconut, rice, maize and sugarcane are the top four crops cultivated.
- Although the economy is moving away from agriculture to services and manufacturing, the sector is crucial to realizing the Government's target of becoming food self-sufficient by 2013.

## Agricultural Economic Performance




## Role of livestock in the total agricultural economy



Livestock production contributed 15.47 percent to total agricultural output.

The most common livestock raised in the Philippines include chickens, carabao, cattle, ducks, goats, and swine.

**The livestock subsector recorded a 3.17 percent gain in production.**
It accounted for 15.47 percent of the total agricultural output.

The 3.42 percent output increase recorded in the hog industry pushed up the subsector's growth during the first quarter of 2012.

Livestock production was valued at P49.86 billion at current prices, up by 0.52 percent from last year's record.

## Role of swine sector from total livestock economy

The PHP 172 billion hog industry is the second leading contributor to Philippine agriculture coming in second to rice despite being almost exclusively without government subsidy.

The derived annual per capita pork consumption in 2007 was 15.07 kilograms excluding offals and processed meat.

The swine industry which accounted for 80 percent of total livestock production registered a 2.72 % growth in 2007.

In terms of value, however, the pig sector posted an 11.29% increase with PHP 172 billion (USD 4.09 billion) from PHP 161 billion (USD 3.7 billion) in 2010. The BAS attributed the growth to improved farm prices which averaged PHP 90.56 (USD 2.09) per kg in 2010 compared to PHP 85.72 (USD1.97) per kg in 2009.

## Swine Industry Players

| Private Sector Investment | Concern/ Interest | Priority Support Services from the Government |
|---|---|---|
| Research & development of feed formulation & other ingredients supplements | Reduction of Input Cost (Corn) | Regulatory environment for private hog raisers and importers |
| Development & upgrading of breeding stocks from genetic engineering and artificial insemination to ensure quality breeding stocks | Farm efficiency enhancement | Establishment of breeding farms/ centers to support backyard and small hog raisers to ensure availability and supply of stocks. |
| Construction of market infrastructure and development of processing facilities | Transport and handling cost | Policy formulation on equal treatment of livestock (hog) as prime agricultural commodity |
| Access of data holding & data sharing among hog raisers and other stakeholderss | Information and technology | Provision of reliable/quality information |
| Strict implementation of biosecurity measures to attain disease-free country & promotion of export products | Animal health | Strict implementation of quarantine rules & regulations to prevent & control the spread of disease. |

## Swine Marketing and Trade

**Domestic Trade**

➢Commercial and Backyard Farms trade practices on direct selling, licensed livestock handlers for live pigs

➢Pork processor buy directly from commercial farm, slaughter and process to meat products

➢Pork products trade practices through wholesale and retail prices to consumers

**International Trade**

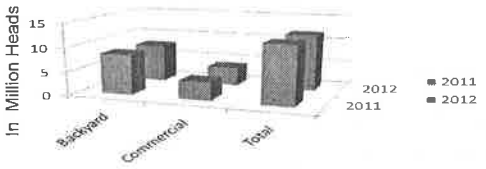
❖ Import trade – 2% of total national pork demand regulated under WTO compliant Tariff Rate Quota and related Minimum Access Volume

❖Export trade - processed canned pork products to Australia , Saudi Arabia, Qatar and United Arab Emirates countries

- under negotiation with Malaysia and Singapore

## Swine Production System

Sizes of Farm Types

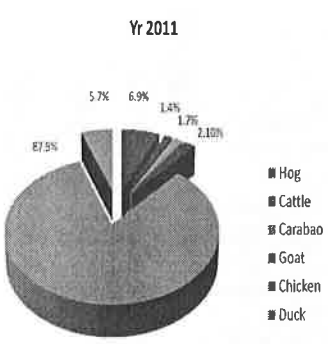



67% backyard swine population- fattener, piglet to fattener
37% commercial swine population-breeder, piglet to fattener

Population Growth for last 3 years

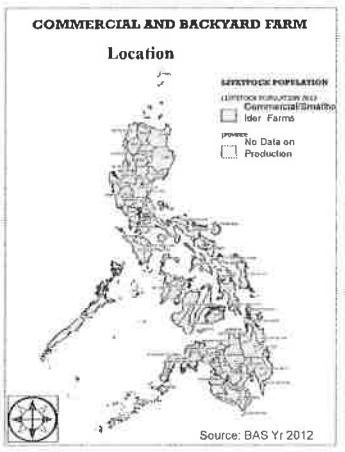

Source: BAS Y2012

## Swine Production System




6.9% Swine Population of Total Livestock Production

Source: BAS Yr. 2012




Source: BAS Yr 2012

## Swine Production and Health

- Source of stocks for each production system
  - Cost of gilts = PhP 9,500.000
  - Cost of weanlings = PhP 3,000.00
  - Farrowing index (commercial and commercial) = 2.2 per year
  - Average weight/age of animals for slaughter = 70-80kg/ 4-6 months
  - Average cost to produce a kilogram of meat = PhP 90.00-92.00 per kg
  - Farm gate prices for the last 3 years : 2012=PhP 85.11 ; 2011=PhP 86.11 ; 2010= P86.92
- Source of Feeds for each production system
  - Average cost of feeds = PhP 21.00 per head/day
  - Accepted production parameter for feed conversion = average gain in weight; average feed consumption
- Common production problems encountered in each production system: marketing risk, weak in export market, high feed input prices, animal disease with no quality vaccine in the market to control the disease like PED.

## Swine Production and Health

| Health Program | Biosecurity Measures<br>✓ Commercial Farms<br>Feed Supply availability<br>✓ Commercial Farms<br>✓ Backyard Farms<br>Vaccine Supply availability<br>✓ Commercial Farms<br>✓ Backyard Farms |
|---|---|
| The average cost of medication including vaccines is 3% of total cost of feed as against total production | |
| Common swine diseases | CSF, PRRS, PCV2, PED |
| Facilities to diagnose swine diseases | national and regional diagnostic laboratory, state university diagnostic laboratory, government accredited private diagnostic laboratories. |
| Government Laboratory | to monitor and diagnose swine diseases: diseases that can be diagnose: bacterial and viral diseases of swine; equipment available, decreasing government personnel; can do differential diagnosis if reagents are available; vaccines and medicines sometimes available. |
| Surveillance System | active surveillance on serological survey on the endemnicity of true disease situation, herd immunity on areas to be declared CSF-Free and disease monitoring. |

## Constraints in Swine Production and Health

High cost of inputs/ high logistics cost

Poor technology level among backyard raisers

Limited access to credit

Low breeder base/ low productivity
Incidence of diseases (CSF,PRRS, PCV, etc)

Illegal trade/ influx of cheap imports

Wide gap between retail and farm gate prices

## Sectoral Policy and Legislation

- DA Administrative Order No. 13 Series of 2012

  Guidelines on the transport/shipment of hogs,cattle,carabaos,sheep and goats and other cloven-footed animals, their meat and meat products, animal products and by-products in between Luzon, Visayas and Mindanao

- DA-BAI Administrative Order No. 10 series of 2004

  Guidelines in the Importation of Pork by Qualified Importers / Minimun Access Volume (MAV) Holders - Eligible under the Swine Meat Importation Program of the Department of Agriculture (DA)

- Batas Pambansa Blg. 97 (The Domestic Animal Disease Prevention and Control Act of 1980)

  An Act providing for the compulsory immunization of livestock, poultry and other animals against dangerous communicable diseases

# 中国养猪业现状及疫病防控策略

# Profile of Swine Industry and Control of Swine Diseases in China

田克恭

中国动物疫病预防控制中心

Kegong TIAN

China Animal Disease Control Centre

## 目录 / Content



## 中国养猪业现状-区域分布 / Regional distribution

- 中国生猪养殖主要集中在沿江沿海，分布于长江沿线、华北、沿海以及部分粮食主产区。其中，长江流域约占42.61%、华北区占22.5%、东南沿海占16.84%
- Major producing areas: Yangtze River valley, northern China and some major grain-producing areas: Yangtze River valley accounts for 42.61%, northern China 22.5%, and southeastern coastal area 16.84%.

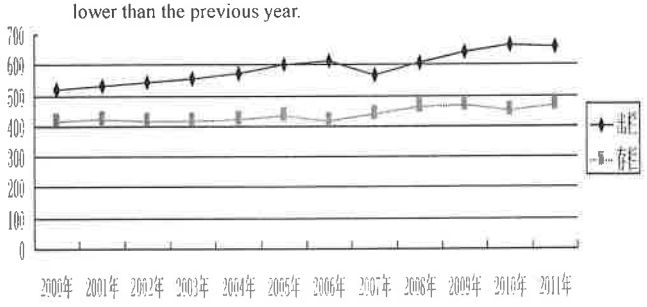

## 中国养猪业现状-养殖模式 / Farm mode

- 饲养方式既有大规模集约化养殖场，又有小区和小规模农户饲养，在生产管理过程中存在很大的差异。与发达国家相比，我国养猪生产力水平较低。
- Different farming scales (large farms, farming parks and backyard rearing) and varied management capacities lead to low productivity in pig farming.

| | 中国 China | 发达国家 Developed countries |
|---|---|---|
| 饲料转化率 FCR | 育肥期2.6-2.8：1 Fattening period 全期3.6-3.8：1 Whole period | 育肥期2.4-2.5：1 Fattening period 全期3.4-3.5：1 Whole period |
| 繁殖率 Reproductive rate | 年均窝数2.0-2.1 Number of littering per annum | 年均窝数2.2-2.4 Number of littering per annum |
| 窝均活仔数 No. of live piglets per littering | 9-9.5头 | 10-12头 |
| 每头母猪年生产肥猪 Fattened pigs by each sow per annum | 16-17头 | 20-22头 |

## 中国养猪业现状 / Profile of China pig industry

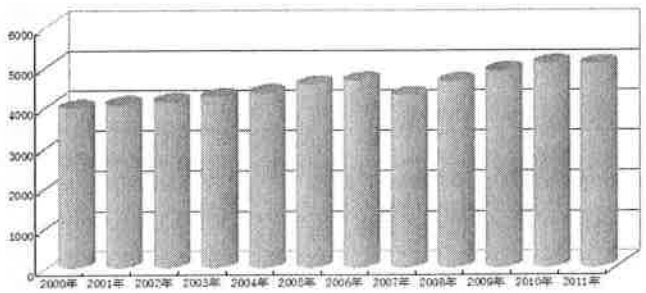
- 在2011年，存栏4.73亿头，比上年增加5.09%， 出栏6.61亿头，比上年减少0.8%。
- In 2011, pigs in inventory amounted to 473 million, 5.09% higher than the previous year. The number of slaughtered pigs totaled 661 million, 0.8% lower than the previous year.



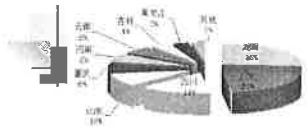

## 中国养猪业现状-猪肉产量 / Pork production

2011 年全国肉类产量7803 万吨，其中猪肉产量达到5053万吨，猪肉在肉类结构中的比重可达 64.76% ，足见猪肉在我国人们肉类食品中的重要性。

**In 2011, China's meat production reached 78.03 million tons, of which the output of pork amounted to 50.53 million tons ( about 64.76%). Pork is important for China's meat consumption.**

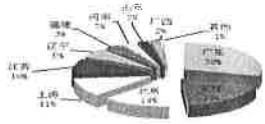


## 中国养猪业现状-国际贸易 / International trade

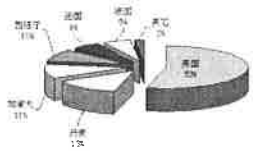


2011年猪肉出口省市 / Pork exporting provinces

2011年猪肉出口国家 / Pork exporting countries



2011年猪肉进口省市 / Port importing provinces



2011年猪肉进口国家 / Pork exporting countries

In 2011, pork production for export reached 335,400 tons, worth 1.075 billion USD in value. Import pork totaled 1,904,400 tons, worth 3.407 billion USD in value.

## 中国猪群中主要疫病流行情况
## Main diseases of pig herds in China

### ➢ 病毒性疾病 Viral diseases:

- 猪瘟 Classical swine fever
- 猪繁殖与呼吸综合征（蓝耳病） Porcine Reproductive and Respiratory Syndrome (blue ear disease)
- 猪伪狂犬病 Swine pseudorabies
- 猪流行性腹泻 Porcine epidemic diarrhea virus
- 猪圆环病毒病 Porcine circovirus

### ➢ 细菌性疾病 Bacterial diseases:

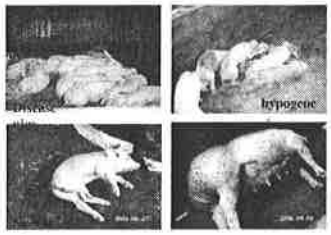
- 副猪嗜血杆菌病 Haemophilus parasuis disease
- 传染性胸膜肺炎 Contagious pleuropneumonia
- 附红细胞体病 Eperythrozoonosis

## 高致病性猪繁殖与呼吸综合征
## HP-PRRSV

### ➢ The geographical coverage of "SHFD"

Geographical distribution of HP-PRRS confirmed cases in 2006 in China.
2006年HP-PRRSV 发病情况

White area : HP-PRRSV distribution ; blue area: no HP-PRRSV



symptom

"猪高热病" 高温，高发病率，高死亡率。
'Swine high fever disease, SHFD'--high fever (40-42°C); high morbidity; high mortality.

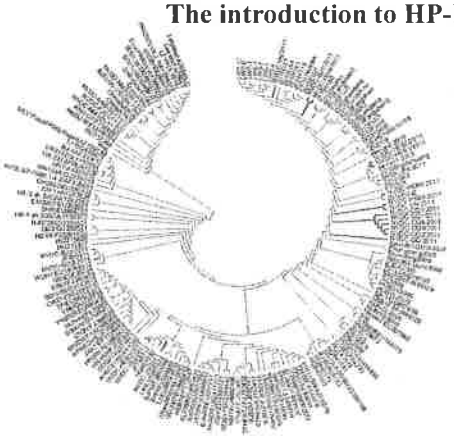
## 高致病性猪繁殖与呼吸综合征
## HP-PRRSV

Emergence of Fatal PRRSV Variants: Unparalleled Outbreaks of Atypical PRRS in China and Molecular Dissection of the Unique Hallmark

INTRODUCTION

- The atypical PRRSV was firstly isolated from diseased pigs by our research group, which contains a unique molecular hallmark in this viral strain, namely a discontinuous deletion of 30 amino acids in nonstructural protein 2 (NSP2). The etiological agent of "SHFD" was identified. The first viral isolated was named JXA1. HP-PRRSV病原学鉴定 Identification of HP-PRRSV pathogen
- The research result of "SHFD" was published in PLOSONE. Our group was the first to identify the HP-PRRSV in China pig herds.
- The vaccine was developed using JXA1 isolates on Marc-145 cells.

## 高致病性猪繁殖与呼吸综合征
## The introduction to HP-PRRSV



The phylogenetic tree analysis of the HP-PRRSV isolates from 2009 to 2011

- ➢Isolation of HP-PRRSV from 2009 to 2011
- ➢14 isolates in 2009
- ➢21 isolates in 2010
- ➢19 isolates in 2011
- ➢ all these isolates from 2009 to 2011 have 97.2%-99.q% nucleotide identity with JXA1。

## 2009-2011 HP-PRRSV致病性分析
## The pathogenicity of HP-PRRSV from 2009 to 2011

| Year | Strains | Generation | Challenge titer ($TCID_{50}$/mL) | Piglet age (week) | Morbidity (%) | Mortality (%) |
|---|---|---|---|---|---|---|
| 2009 | JXA1 | 5代 | $10^{4.5}$ | 4 | 100 | 100 |
| | 09SC | 5代 | $10^{4.5}$ | 4 | 100 | 100 |
| | 09JL1 | 5代 | $10^{4.5}$ | 4 | 100 | 100 |
| 2010 | JXA1 | 5代 | $10^{4.5}$ | 10 | 100 | 40 |
| | 10BJ-5 | 5代 | $10^{4.5}$ | 10 | 100 | 40 |
| | LW1-13 | 5代 | $10^{4.5}$ | 10 | 100 | 60 |
| 2011 | NVDC-HuN/2011 | 5代 | $10^{4.5}$ | 10 | 100 | 60 |
| | NVDC-VN/2011 | 5代 | $10^{4.5}$ | 10 | 80 | 20 |
| | NVDC-HED/2011 | 5代 | $10^{4.5}$ | 10 | 60 | 0 |

➢2009和2010年分离的HP-PRRSV的致病力与2006年分离的JXA1株相似，仍为高致病性猪蓝耳病病毒。2011年分离的HP-PRRSV，其中1株的致病力与2006年分离株的致病力相似，仍为高致病性猪蓝耳病病毒；另2株的致病力有不同程度下降。

The isolates in 2009 and 2010 belongs to HP-PRRSV with similar pathogenicity to JXA1 in 2006, while the isolates in 2011 have different pathogenicity (one is similar to JXA1 as HP-PRRSV, while the other two show reduced pathogenicity).

防控措施

## Prevention and Control of HP-PRRSV in China

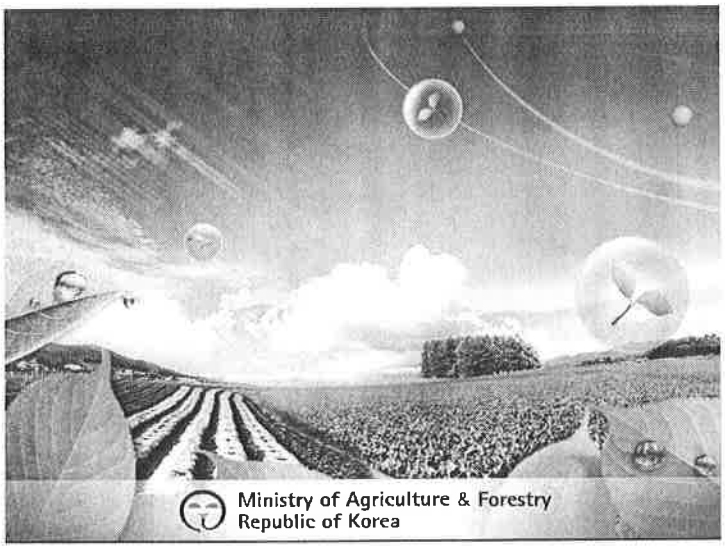
HP-PRRSV 弱毒疫苗研制成功，获第十三届中国专利金奖，并申报成功OIE 参考实验室
Attenuated HP-PRRSV vaccine won the gold medal of the 13th China Patent Award.
Application for OIE reference lab was approved.

# Thank You !

防控措施

## Prevention and Control of Swine Diseases in China

- 一是制定了明确的猪病防控对策和措施。/ Establish detailed strategies for swine disease prevention and control.
- 二是加强疫情监测和报告工作。/ Strengthen disease monitoring and reporting
- 三是加大投入力度,提高检测水平。/ Increase investment and improve testing capacity.
- 四是加强流通控制和检疫监管。/ Strengthen control over circulation and quarantine supervision.
- 五是加强科普知识宣传。/ Strengthen the dissemination of scientific knowledge.
- 六是《国家中长期动物疫病防治规划（2012—2020年）》的颁布实施，为中国猪病提供了防控指南。/ Promulgate the National Long-Term Animal Disease Prevention Plan (2012-2020), which will provide guidance for prevention and control of swine diseases in China.




## Geographic Profile

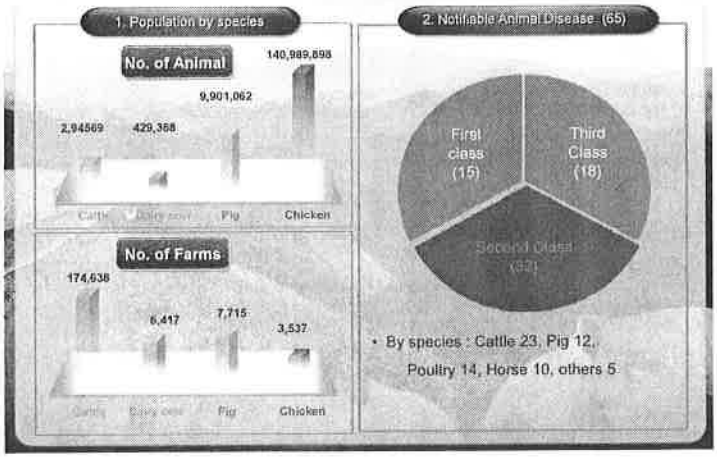
1. Republic of Korea is located in North East Asia, northwest of the Pacific Ocean.
2. The Korean Peninsula is surrounded by sea on three sides, and shares its sole land border with Democratic People's Republic of Korea(DPRK).
3. The neighbors of Korea include Japan, China, Russia, Mongolia and Chinese Taipei, and all of them have experienced incidents of FMD recently.
4. Korea is comprised of 16 provincial and metropolitan municipalities(1 capital municipality, 6 metro municipalities, and 9 provinces).

## The amount of Production

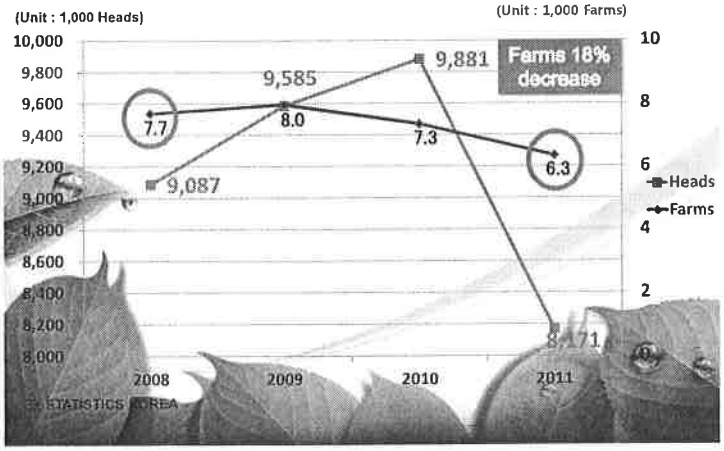
- ✓ Agriculture(including livestock and forestry) output value from 2007 to 2010 has grown 55 times(800 to 44,000 billion won).
  - But, swine output value has grown 266 times(2 to 530 billion won).
- ✓ Proportion of swine industry in agriculture production value has increased five times
  - (1970) 2.5% → (2010) 12.2%

| Classification (Unit:100billion won) | '70 | '80 | '90 | '00 | '10 |
|---|---|---|---|---|---|
| Agriculture output value(A) | 0.8 | 6.8 | 18.4 | 33.1 | 43.5 |
| Swine output value(B) | 0.02 | 0.4 | 1.2 | 2.4 | 5.3 |
| Proportion(B/A%) | 2.5 | 5.9 | 6.5 | 7.3 | 12.2 |

## General livestock industry

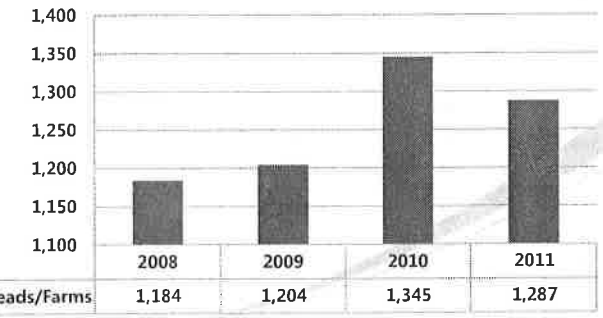



## Pigs and Farms




## Pigs per Farm

(Unit : Heads)




| | 2008 | 2009 | 2010 | 2011 |
|---|---|---|---|---|
| Heads/Farms | 1,184 | 1,204 | 1,345 | 1,287 |

※ STATISTICS KOREA

## Amounts of Meat Consumption

(Unit : 1,000 ton)

| Item | 2009 | 2010 | 2011(p) |
|---|---|---|---|
| Pork | 915.5 | 940.6 | 940 |
| Beef | 395.5 | 431.3 | 505 |
| Chicken | 469.1 | 522.3 | 546 |
| Total | 1,780.1 | 1,894.2 | 1,991 |

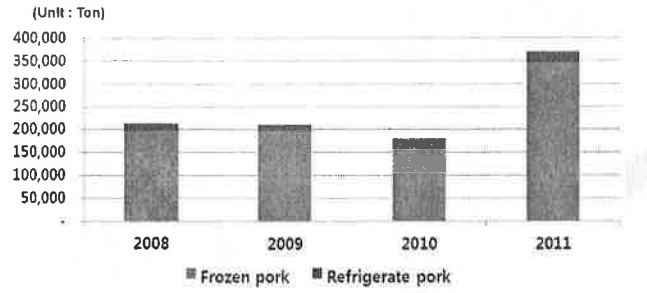
※ KOREA RURAL ECONOMIC INSTITUTE

## Meat Consumption (%)

| Item | 2009 | 2010 | 2011(p) |
|---|---|---|---|
| Pork | 51.4% | 49.7% | 47.2% |
| Beef | 22.2% | 22.8% | 25.4% |
| Chicken | 26.4% | 27.5% | 27.4% |

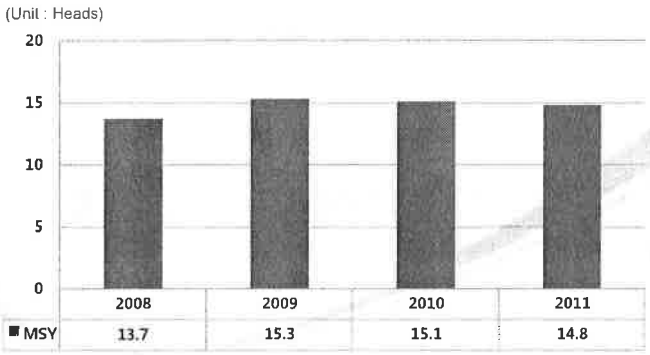
※ KOREA RURAL ECONOMIC INSTITUTE

## Pork Import



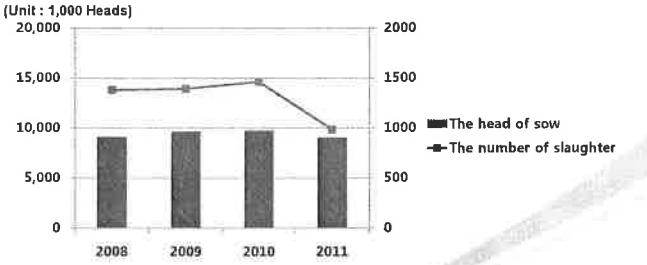

| Item | 2008 | 2009 | 2010 | 2011 |
|---|---|---|---|---|
| Frozen | 197,313 | 198,578 | 167,318 | 344,648 |
| Chilled | 16,976 | 11,257 | 12,173 | 25,599 |
| Total | 214,289 | 209,835 | 179,491 | 370,247 |

## Korea MSY




※ MINISTRY FOR FOOD, AGRICULTURE FORESTRY AND FISHERIES

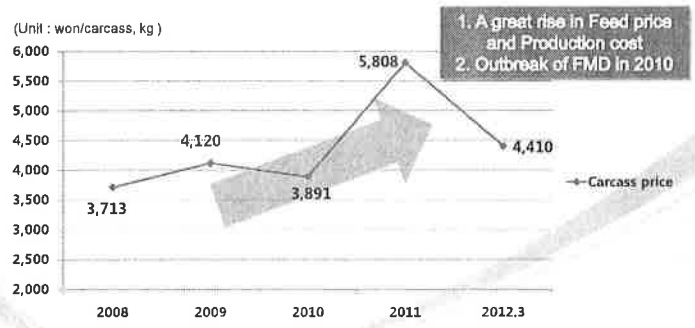
## The number of slaughter




| Item | 2008 | 2009 | 2010 | 2011 |
|---|---|---|---|---|
| The head of sow | 912 | 966 | 976 | 903 |
| The number of slaughter | 13,805 | 13,934 | 14,619 | 9,851 |

※ MINISTRY FOR FOOD, AGRICULTURE FORESTRY AND FISHERIES

## Carcass Price




※ Carcass price =The average price of the whole country

※ 1 dollar = 1,129 won (2012. 8)

※ MINISTRY FOR FOOD, AGRICULTURE FORESTRY AND FISHERIES

## Outbreak Situation of Animal diseases

(unit : case, head)

| Disease | Korea | other countries | Remarks |
|---|---|---|---|
| FMD | Report in Mar. 2000 (Sep. 19th 2001 Free), May 2002 (Nov. 29th, 2002 Free) Jan.~April/Nov. 2010 | Report in China, Russia, Rumania, Japan, North Korea, etc. | Resident in Asia, Africa, South America countries(approx.) 39countries |
| BSE | No report | Report in 25 countries such as Canada, United States | |
| HPAI | Dec. 2003-March 2004(19cases) Nov. 2006- Mar. 2007[7cases] April 2008-May 2008[33cases] Dec. 2010-April, Nov[52cases] | Report in 19 countries including Vietnam, China, Indonesia, etc in 2010 | Resident in South Asian countries |
| Classical Swine Fever | 72 cases in 2003, 9 cases in 2009, 5cases in 2005, 2 cases in 2006, 5 cases in 2007, 7 cases in 2008 | Report in Republic of Dominica, India, China, Peru, Russia, etc. | Resident in South Asian countries |

## Animal Health Control Strategy(Quarantine)

### At borders

- Continuously search carry-on products of travelers at ports
  - * if detected, fine up to US$ 5,000, Quarantine detective dogs are on their duty at ports
  - * Check Custom declaration form and disinfect person who had visited oversea farms
  - * Focus on flights, ships from FMD, HPAI outbreak countries

### PR Campaign

- Reinforce PR Campaign for oversea travelers in borders
  - * Personal involved in Livestock industry should declare and disinfect whenever they depart from or arrive at Korea
  - * Run PR Campaign for participants/group travelers planning to attend livestock-related festivals held in overseas before depart
  - * Hand out PR letter at flight check-in desk and missions at overseas

## Animal Health Control Strategy(Domestic)

### Improved farming system

- Improved farming system by modernizing farming facilities
  - * Support consulting program and expand vaccine program in order to prevent disease

### Main aim by animal species

- Cattle : Prevent FMD, Eradicate Bovine Brucellosis and BVD-MD by 2013
- Pig : Support consulting program and expand vaccine program by 2014 in order to achieve CSF free status and eradicate PMWS
- Poultry : Run Year-round animal health control and reinforce surveillance program in order to prevent reoccurrence of HPAI, eradicate egg-transmission disease like Fowl typhoid and Pullorum disease

## Action Plan for CSF Free Status

### Detect/Delete risk factor by farms

- Monitor Slaughterhouse, Serologic test 2 times a year for each farm
- Compulsory diagnostic test by private laboratory

### Farm-centered control system

- Designate exclusive person for each farm
- Provide registered number, indication mark

### Comparative Study for each vaccination process

- Effectiveness of CSF marker vaccine, Expectation of circovirus vaccine, etc.

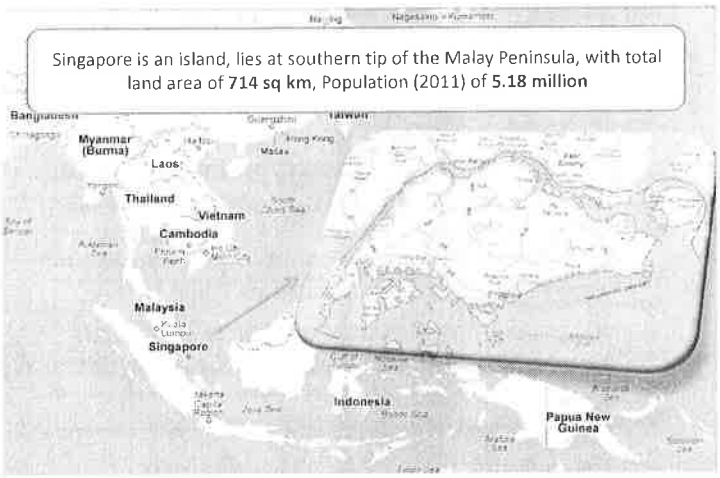
### Preactivation measures for Risk factor

- Manage vaccine and virus strain, test wild boar
- Slaughter infected/suspected animal, control exclusive village, etc

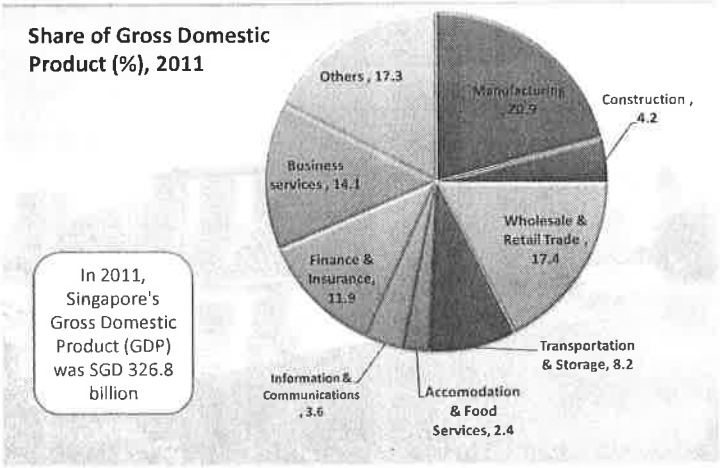
# Singapore, Agri-food & Veterinary Authority

Country report for
OIE/FAO Regional workshop on Swine Health Management in South-East and East Asia
Vietnam, 22 – 24 Aug 2012

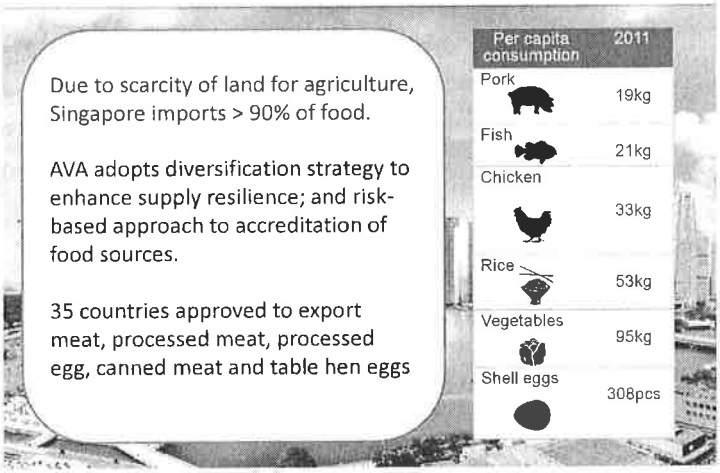
## Geographical profile of Singapore



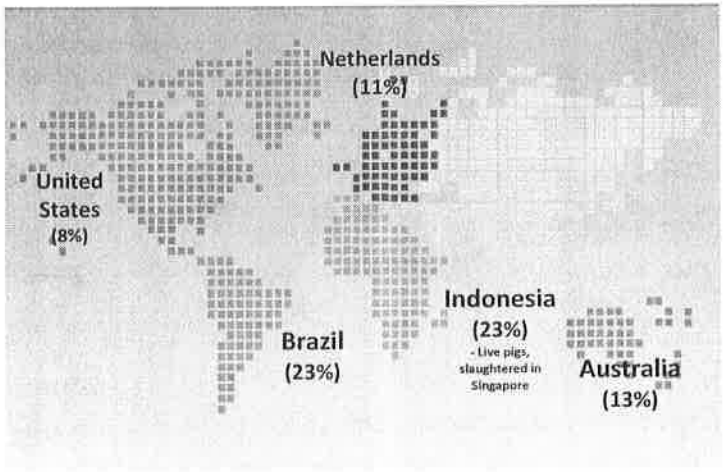

## Economic profile of Singapore




## Food supply & consumption in Singapore




## Imported sources of pork (2011)




## Local food supply in Singapore

There is local farming in Singapore in the named industries, albeit limited. There is no pig farming in Singapore.

**Production (percentage of local consumption)**

| Eggs: 24 % | Leafy vegetables: 7 % | Fish: 7 % |
|---|---|---|

# Laboratory capabilities for swine diseases

## Virology

| Swine disease agent | Method of detection | Equipment used (if relevant) |
|---|---|---|
| Aujeszkey's Disease virus | Serology by SNT, VI | |
| Classical swine fever virus | RT-PCR, VI, serology by NPLA | PCR: T3000 Thermocycler |
| Foot and Mouth Disease virus (Type O) | Serology by ELISA | ELISA reader |
| | RT-PCR | PCR: T3000 Thermocycler |
| Japanese encephalitis virus | Indirect ELISA (serology), PRNT (serology), RT-PCR | ELISA: Tecan washer & reader |
| Nipah virus | Indirect ELISA (serology) | ELISA: Tecan washer & reader |
| Porcine circovirus (PCV1& 2) | PCR | PCR: T3000 Thermocycler |
| Porcine Parvovirus | Serology by HI | |
| Porcine Reproductive and Respiratory Syndrome virus | Nested PCR | |
| Swine influenza A virus (generic) | RRT-PCR (matrix gene); VI | PCR: ABI7900HT, Lightcycler 2.0 |
| Swine influenza viruspH1N1/2009 | RRT-PCR (HA gene); VI | PCR: ABI7900HT, Lightcycler 2.0 |
| Transmissible Gastro Enteritis virus | SNT(serology) | |

# Laboratory capabilities for swine diseases

## Bacteriology

| Swine disease agent | Method of detection | Equipment used (if relevant) |
|---|---|---|
| *Actinobacillus pleuropneumoniae* | Culture | |
| *Bordetella bronchiseptica* | Culture | |
| Burkholderia pseudomallei | Culture | |
| *Campylobacter spp* | Culture | |
| *Escherichia coli* O157:H7 | -Culture.<br>-PCR for *Escherichia coli* Genes Of O157 And H7 Antigens.<br>-PCR (Verotoxins I And II, Intimin and Plasmid-Encoded Enterohaemolysin genes); -PCR (O157 And H7 genes) | Biometra T3000 Thermocycler |
| *Erysipelothrix rhusiopathiae* | Culture | |
| *Leptospira* Grippotyphosa, *Leptospira* Pomona and *Leptospira* Tarassovi | Serology by Microscopic Agglutination Test (MAT) | |
| *Listeria monocytogenes* | Culture | |
| *Pasteurella multocida* | Culture | |
| *Salmonella spp* | Culture | |
| *Streptococcus suis* | -Culture.<br>-PCR (generic);<br>-PCR (serotypes 2 and 1/2); -PCR (Extracellular Factor Gene) | (using PCR) Biometra T3000 Thermocycler |
| *Yersinia paratuberculosis* and *Yersinia enterolitica* | PCR | Biometra T3000 Thermocycler |

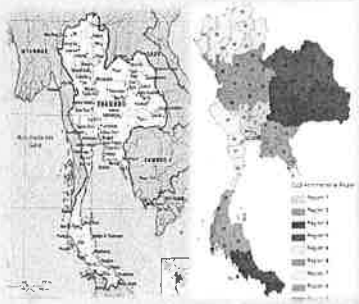
# Swine Health Management in Thailand

Department of Livestock Development


## Country profile

Geographic profile

- The Kingdom of Thailand's 513,120 square kilometers located in the centre of the mainland SEA
- Bordered by Myanmar, Lao People's Democratic Republic, Cambodia and Malaysia and has 2,420 kilometers of coast line on the Gulf of Thailand and the Andaman sea .
- The total length of the country borders is approximately 4,863 kilometres
- Thailand comprises of 77 provinces and divided into 6 geographical regions
- In line with DLD responsibility , it can be grouped into 9 Livestock Administrative Regions



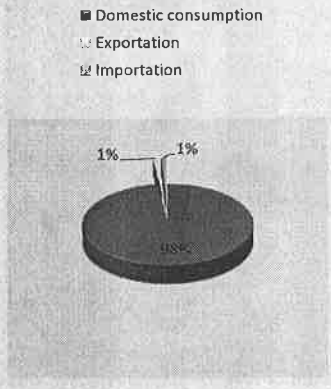
Economic profile

- Mix industry : agricultural and industrial

## Agriculture Profile

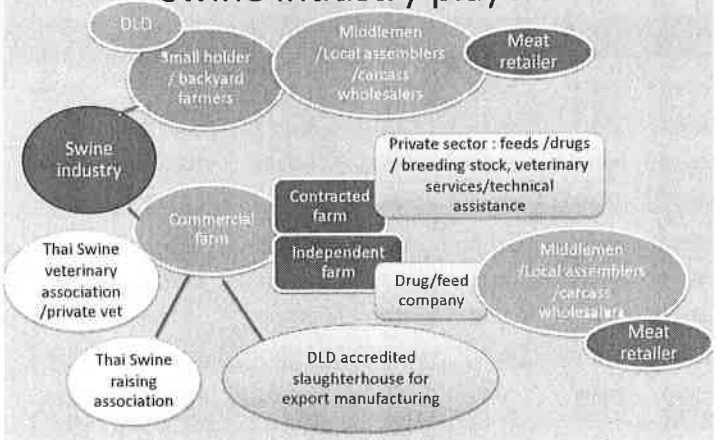
- Statistics GDP $601.4 billion and GDP growth 0.1% (2011)
- GDP by sector agriculture (13.3%), industry (34%), services (52.7%)
- In 2011, Thailand exported THB 459.8 billion worth of agriculture products.
- The agriculture industry contributed approximately 13.3% to Thailand's economy.
- Livestock industry contributed approximately 3.5 % in the total agricultural economy

## The role of the swine sector from the total livestock economy



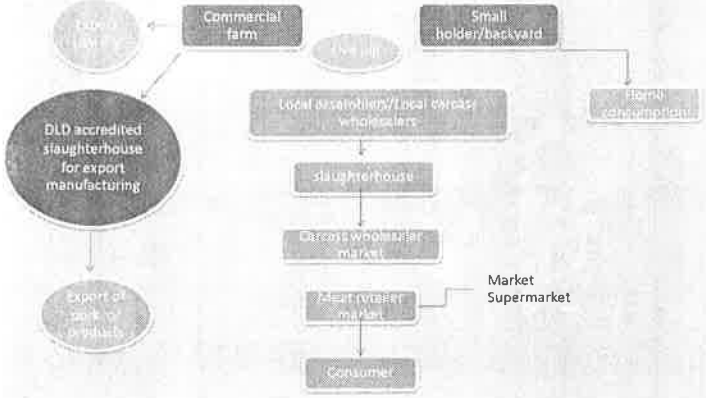

- Pork demand (consumption) vs. supply
  - Pork production : 0.95 million tons (2011)
  - Domestic consumption 0.93 million tons (2011)
- Swine sector contributes less than 1 % in the total agricultural economy
- The role of pig production is mainly for domestic consumption because Thailand still encountered with diseases problem such as FMD

## Swine industry players



## Swine marketing and trade

- Commercial farm : 80 % Small holder/Backyard farmer : 20 % of the swine production




## Swine marketing and trade

✓ FORMAL EXPORTATION

- The volume of the exportation of swine produces equals to 3,820 million baht in Year 2011
- Swine and swine products are
  - Live pigs(Breeding pigs, Piglet, Fattening pig ): 425,000 heads (equals to 1,870 million baht ) >> Cambodia 80.51% ,Laos 18.82% Myanmar 0.67 %
  - Pork : 250 tons of Frozen pork, Cool (Chilled) pork to Hong Kong (app. 130 million baht)
  - 9,000 tons Cooked pork (meat) to Japan (app. 1,820 million baht)

✓ INFORMAL EXPORTATION

- No data

## Pork export volume and value (Year 2011-2012(f))

Pork: Export Volume Classified By Market Destination 2012

| PRODUCTS | 2011 | | 2012 (f) | | (%) CHANGE 11/12 | | Jan-May 2011 | | Jan-May 2012 | | (%) CHANGE 12/12 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MT | Mil. Baht | MT | Mil. Baht | Volume | Value | MT | Mil. Baht | MT | Mil. Baht | Volume | Value |
| Raw | 878 | 76 | 1,000 | 92 | 13.92 | 34.98 | 308 | 29 | 449 | 38 | 32.87 | 32.77 |
| Further | 15,534 | 3,624 | 20,000 | 4,640 | 28.68 | 28.00 | 4,238 | 815 | 5,297 | 1,112 | 25.03 | 36.54 |
| Total | 16,412 | 3,700 | 21,000 | 4,732 | 27.99 | 27.24 | 4,626 | 843 | 5,746 | 1,151 | 24.21 | 36.41 |

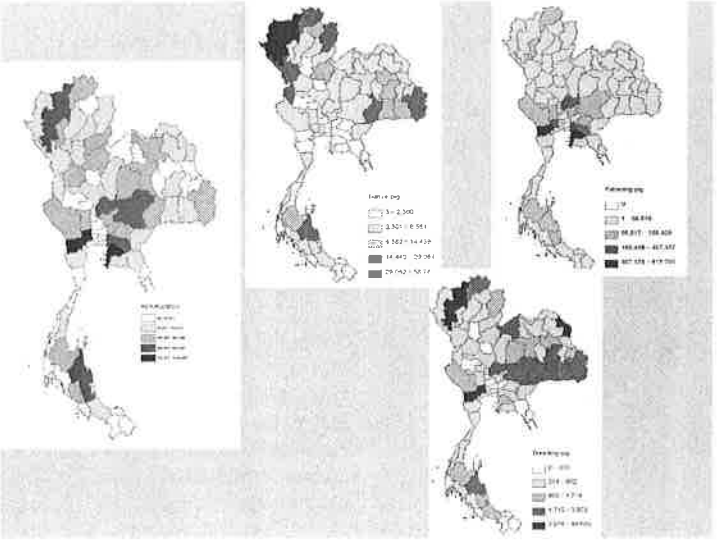
| MARKET DESTINATION | 2011 | | 2012 (f) | | CHANGE (%) 11/12 | Jan-May 2011 | | Jan-May 2012 | | CHANGE (%) 11/12 |
|---|---|---|---|---|---|---|---|---|---|---|
| | MT | (%) Ratio | MT | (%) Ratio | | MT | (%) Ratio | MT | (%) Ratio | |
| Hong Kong | 678 | 4.13 | 750 | 3.57 | 10.60 | 142 | 3.06 | 261 | 6.54 | 83.85 |
| Japan | 15,158 | 92.36 | 18,850 | 94.53 | 24.35 | 4,244 | 91.75 | 5,185 | 93.25 | 22.18 |
| Singapore | 56 | 0.34 | 67 | 0.27 | 1.36 | 16 | 0.34 | 23 | 0.38 | 44.37 |
| Vietnam | 15 | 0.09 | 15 | 0.01 | 0.03 | 2 | 0.03 | - | - | 0.00 |
| Maldive | - | - | - | - | 0.00 | - | - | - | - | 0.00 |
| Lebanon | - | - | - | - | 0.00 | - | - | - | - | 0.00 |
| Malaysia | 327 | 1.99 | 330 | 1.57 | 0.83 | 226 | 4.76 | 271 | 4.73 | 20.71 |
| India | 33 | 0.01 | 12 | 0.06 | 1.65 | 3 | 0.07 | 5 | 0.06 | 69.70 |
| Total | 16,412 | 100.00 | 21,000 | 101.00 | 27.99 | 4,626 | 100.00 | 5,746 | 100.00 | 24.21 |

Source : Department of Livestock Development

## Swine production system

## Number of swine by region in Thailand ,2011

| Region | Native pigs | Breeding boars | Breeding sows | Breeding piglets | Fattening pigs | Total |
|---|---|---|---|---|---|---|
| Region 1 | 29,854 | 8,280 | 95,822 | 189,881 | 774,866 | 1,098,703 |
| Region 2 | 17,813 | 9,747 | 159,018 | 312,489 | 1,322,146 | 1,821,213 |
| Region 3 | 143,104 | 29,076 | 117,559 | 211,036 | 583,728 | 1,084,503 |
| Region 4 | 91,037 | 23,037 | 55,585 | 143,118 | 271,180 | 583,957 |
| Region 5 | 204,221 | 19,354 | 115,274 | 207,184 | 521,474 | 1,067,507 |
| Region 6 | 88,331 | 33,285 | 76,284 | 120,678 | 348,190 | 666,768 |
| Region 7 | 51,942 | 12,801 | 223,059 | 385,084 | 1,580,650 | 2,253,536 |
| Region 8 | 57,201 | 9,667 | 46,520 | 99,691 | 328,442 | 541,521 |
| Region 9 | 28,440 | 8,477 | 53,465 | 112,121 | 361,563 | 564,066 |
| Total | 711,943 | 153,724 | 942,586 | 1,781,282 | 6,092,239 | 9,681,774 |



## Swine production system

- Commercial farm ( 80% of the swine production and 95% of market share)
  - Company's farm: Breeding pig
  - Contract farming : Breeding pig and fattening pig
  - Private owning farm: fattening pig
- Small holder sector production
- Backyard raising system

20% of swine

5% of market share

## Swine production system

-DLD accreditation(standard) farm

In 2011 ,there are 3,594 DLD standard farm categorized into

- Large scale farm (swine population >5,000)
- Medium scale farm (swine population 500-5,000)
- Small scale farm (swine population 50-500)

**The farm standard is based on the "Good Agricultural Practice" (GAP)-. The products from standard farms would be certified by DLD to ensure the consumers that the products are clean and safe. It is voluntary program.

-Small holder sector ( swine population< 50): Non registered farm

-Backyard or village raising system (Low biosecurity)

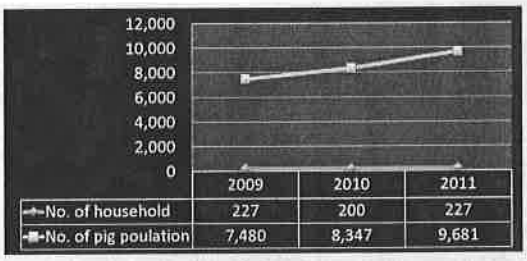
## DLD Standard farm (Swine)

Number of DLD accredited standard farms, by region in Thailand, 2011

| Region | Swine |
|---|---|
| Region 1 | 364 |
| Region 2 | 626 |
| Region 3 | 390 |
| Region 4 | 613 |
| Region 5 | 498 |
| Region 6 | 304 |
| Region 7 | 305 |
| Region 8 | 385 |
| Region 9 | 109 |
| Total Number of animals | 3594 (5,870,988) |

## Population Growth rate

| | 2009 | 2010 | 2011 |
|---|---|---|---|
| 1.Number of household with at least 1 pig | 227,688 | 200,145 | 227,406 |
| Population growth rate | 22.07 | -19.23 | 13.62 |
| 2.Total swine population | 7,480,530 | 8,347,017 | 9,681,774 |
| Population growth rate | 10.30 | -2.33 | 15.99 |




1000 heads/ farmers

## Swine production and health

## Swine production : source of stock

- Cost of gilts :4000 ± 56 baht ( market price in July 2012)

  DLD breeding center

  Pure breed : less than 12 kg of weight ( 1300 baht) more than 12 kg ( additional 50 baht per kilo)

  Tested gilts: 60 baht per kilo
- Cost of weanlings :1500 ± 58.50 baht ( market price in July 2012)
- Average weight of swine for slaughter :110 kilos
- Farm gate price for the last 3 years: Thai swine raiser association

| Year | Baht/kilo |
|---|---|
| 2009 | 55.94 |
| 2010 | 57.73 |
| 2011 | 64.33 |

## Common production problem in each production

- Commercial farms or DLD standard farm (High biosecurity) :
  - Recurring of swine diseases such as PRRS PED
  - Unstable market price : oversupply
- Small holder ( varies from moderate to low biosecurity) :
  - Recurring of swine diseases such as PRRS PED
  - Excess use of ABO /Usage of illegal drugs
  - Unstable market price : oversupply
- Backyard (low biosecurity) : household consumption
  - Swine diseases outbreak
  - No compulsory veterinary services

## Health program for each production

### Commercial farms/DLD standard farm

For replacement gilts: 290 baht/gilt

For sow : 247 baht/sow

For piglet : 211 baht/piglet ( full option vaccination program)

## Health program for each production

### Commercial farms/DLD standard farm

For fattening pigs (10 weeks of age): 74 baht/fattening pig (full option vaccination program)

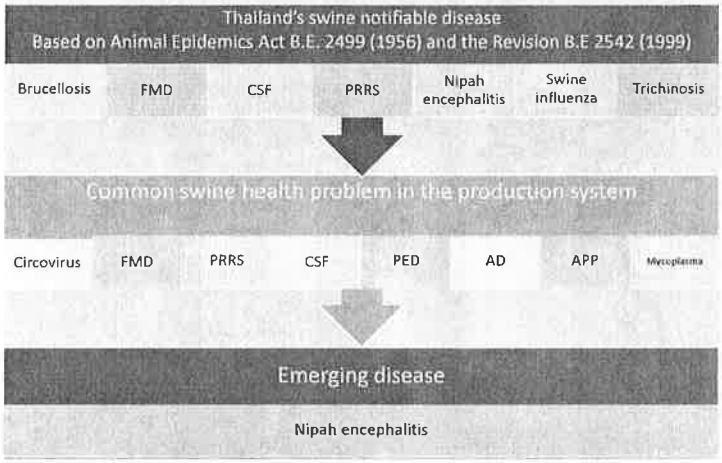
### Small holder

Similar to commercial farm :not full program

### Backyard

No vaccination is practiced. Some farmers might vaccinate their pigs with SF or FMD vaccine which produces by DLD. The price of DLD vaccines is lower than the commercial one.

## Common Swine disease in Thailand



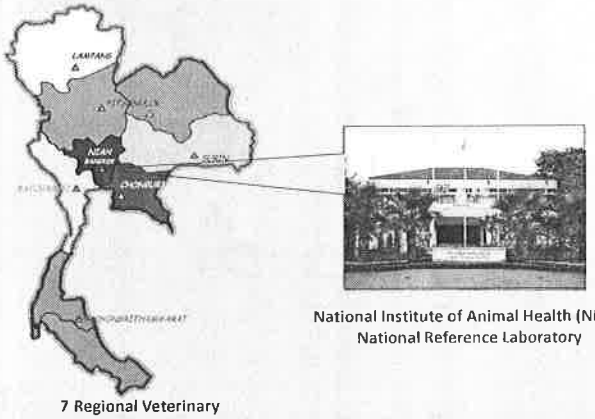

## Laboratory facilities

- Government laboratory : NIAH / 7 Regional Veterinary Research & Development Centers and RRL
  :Services for commercial ( export purposes)/ small holder/backyard farmer
- Private sector laboratory (CP or Betagro)
  : Services for company's farm/contracted farm/client's farm
- Faculty of Veterinary sciences
  : Services for commercial)/ small/Client's farm/Consultation farm

| Laboratory | Diagnostic technique that can be undertaken |
|---|---|
| National Institute of Animal Health | A B C D |
| Northern (Upper Region)VRDC, Lampang | A B C |
| Northern (Lower Region)VRDC,Pitsanulok | A B C |
| Northeastern (Upper RegionVRDC,Khon Kaen | A B C |
| Northeastern (Lower Region) VRDC, Surin | A B C |
| Eastern VRCD,Chonburi Province | A B C |
| Western VRDC, Ratchaburi Province | A B C |
| Southern VRDC, Nakhon sri thammarat | A B C |
| Faculty of Veterinary Medicine,Chulalongkorn university | A B C D |
| Faculty of Veterinary Sciences, Kasetsart University,Kampansang | A B C D |
| Faculty of Veterinary Sciences, Kasetsart University | A C D |
| Faculty of Veterinary Sciences, Mahidol university | A B C D |
| Faculty of Veterinary Sciences,Chiang Mai university | A B C D |
| Faculty of Veterinary Sciences, Khon Kaen university | A B C D |

**A= Viral isolation B= RT-PCR C= PCR D= sequencing**

## DLD Veterinary laboratory Network



National Institute of Animal Health (NIAH)
National Reference Laboratory

7 Regional Veterinary
Research & Development Centers
(RVRDCs)

## National Institute of Animal Health : Thailand's National laboratory

- NIAH is a BSL 2 laboratory which can diagnose all swine diseases according to OIE Manual of Diagnostic tests and Vaccines for terrestrial animal
- Diagnostic techniques that can be undertaken are Virus isolation, Antibody detection and Molecular diagnosis.
- NIAH is fully equipped with modern equipment that has been provided through funding from international organization such as JICA, FAO and OIE and technology transferring from profession and experts through many collaboration projects
- **Equipment available** :

  - Virus isolation : Cell culture ,Incubator 37 (1) ,$Co_2$ incubator (7) ,BSL 2 cabinet(7) ,Liquid nitrogen tank (3),-20 and -80 degree celcius refrigerator(3) and Inverted microscope (3)

  -Antibody detection : ELISA reader (3)

  -Molecular diagnosis : PCR machine (9) , Real time PCR machine (2) and Sequencing machine (2)

## National Institute of Animal Health : Thailand's National laboratory

- Personnel : There are 8 personnel involved in swine disease diagnostic services at NIAH. The staffs are a combination of veterinarian and animal scientist whom are well trained and fully experienced.
- NIAH has the capability in differential diagnosis animal diseases. Moreover , reagents are available to diagnosis all swine disease based on OIE manual. For exotic diseases such as Nipah encephalitis, West Nile virus or Ebola which Thailand has never exposed, collaboration with reference laboratory for further confirmation is available.

## Vaccine Availability

- Department of Veterinary Biologics is responsible for manufacturing DLD animal vaccines
- Bureau of Disease Control and Veterinary Services is the core agency in planning and providing sufficient vaccine/medicines to all relevant activities such as animal health management and outbreak response.
- Vaccines manufactured by DLD are

| Animal | Vaccine |
|---|---|
| Cattle Buffalo Goat and sheep | Trivalent FMD vaccine(cattle buffalo goat and sheep), Black leg, Anthrax, Hemorrhagic septicemia and Brucellosis (cattle) |
| Swine | Trivalent FMD vaccine(swine),Swine Fever |
| Avian | Duck plaque, ND lived vaccine(Lasota strain),Fowl pox, Combine vaccine (ND and IB),IB vaccine and Fowl cholera |

## National surveillance program

- All animal surveillance protocol in Thailand comprises of both Passive and Active surveillance
- Specific surveillance for swine diseases

✓ National Nipah encephalitis surveillance program ( in collaboration with Department of National parks, Wildlife and Plant conservation

✓ National FMD Sero-surveillance protocol under the project Establishment of FMD free zone in region 2

✓ National PRRS surveillance program in DLD breeding center

✓ National Trichinosis surveillance program in the risk area ( start in October 2012)

## Constraints to swine production and Health

- Domestic livestock rising in Thailand still encountered with disease problem such as Foot and Mouth disease. FMD is the biggest constraints for export facilitation.

  -DLD has a project : Establishment of FMD free zone in the eastern part of Thailand.DLD will submit the dossier for recognition of free zone in the last week of August 2012
- Poor cooperation and no information sharing from private sector and other stakeholder with the government sector

  - Thai Swine veterinary association is working very closely with all related agencies as the coordinator in moving the Thai swine industry forward

## Sectoral Policy and Legislation

- Government policy for swine production and health

✓ There is a PIG Board which is a committee responsible for the National swine industry policy.The minister of MOAC is the head of the committee.

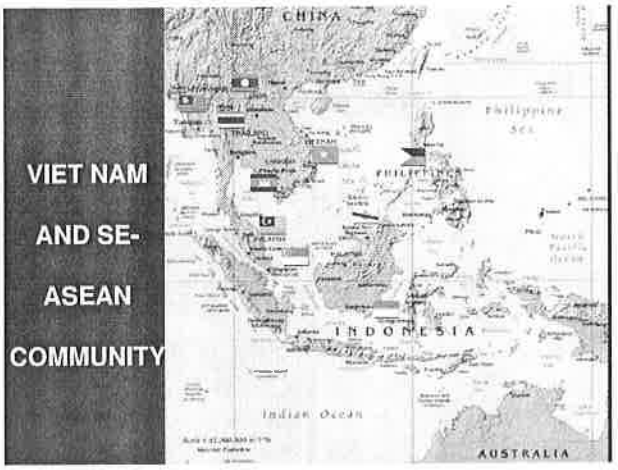
✓ DLD under the MOAC hopes to gain OIE FMD free status with vaccination in the eastern part of Thailand by 2013 for export purposes.

✓ Updated Ministerial regulations of the swine diseases in The Animal Epidemics Acts B.E 2499 : The revised regulation version B.E 2554 ( 2011) includes swine influenza


Thank You for your attentions

# VIETNAM SWINE PRODUCTION AND HEALTH

Drs. To Long Thanh & Van Dang Ky
DAH - Vietnam
Ho Chi Minh City - 2012




## Vietnam country profile

**Mainland Territory:** 331,051.4 sq. km
**Population:** 86,927.7 thousand inhabitants (2010)
**National Capital:** Hanoi

**Borders:**
China to the north,
Laos and Cambodia to the west,
The East Sea to the east
and the Pacific Ocean to the east and south.

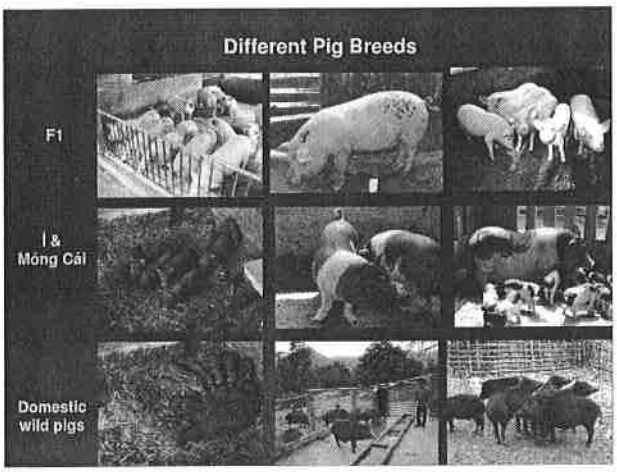
The country's total length from north to south is 1,650km

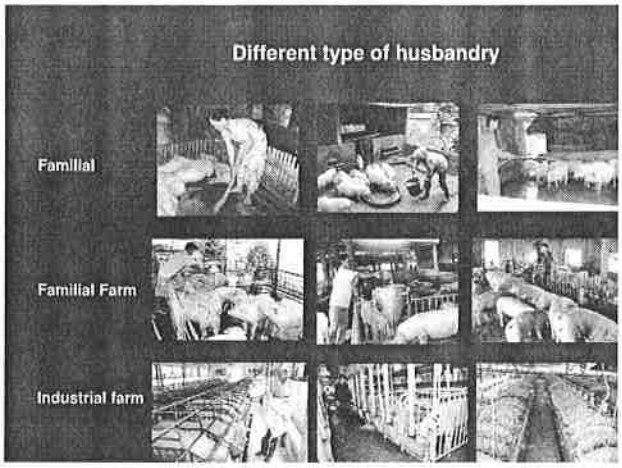
## Agriculture profile

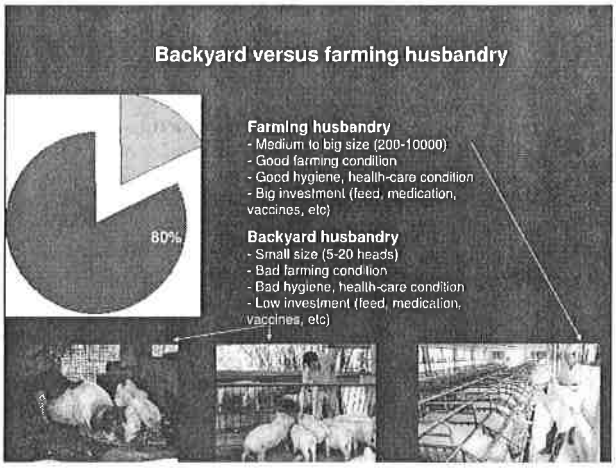
- Agriculture, forestry and fisheries, 21% GDP of the country (2009).
- Livestock production, accounted for 30-32% of the total agricultural economy.
- Production of live pigs: 3.1 million tons (2010); 3.2 million tons (2011).
- Import of pork: 348.41 tons (2010).
- Pork supply did not meet the demand in the mid of 2011 due to outbreaks but recovered quickly the ending half of 2011.

Table 1: Pig population 1990 – 2011 (thousand)

| Year | Total | Year | Total |
|---|---|---|---|
| **1990** | **12,260** | 2006 | 26,855 |
| 1991 | 12,194 | 2007 | 26,560 |
| 1992 | 13,891 | 2008 | 26,701 |
| 1993 | 14,873 | 2009 | 27,627 |
| 1994 | 15,587 | **2010** | **27,300** |
| ..... | ..... | **2011** | **28,500** |






## Swine industry players

- Feed supplier
- Drug and vaccine supplier
- Equipment supplier
- breeders
- Labors
- Land hire
- Electricity and water supplier
- Environmental protection
- Government

Swine production

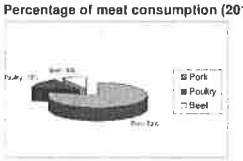
## Agriculture profile (cont.)

Population of livestock animals (2010)

| Livestock | Units | Number of heads |
|---|---|---|
| Pigs | Million heads | 23.37 |
| Poultry | Million heads | 268.40 |
| Buffalo | Million heads | 2.84 |
| Cattle | Million heads | 5.72 |
| Dairy cattle | Million heads | 0.13 |
| Sheep and goat | Million heads | 1.36 |

Percentage of livestock production value (2010)


Percentage of meat consumption (2010)

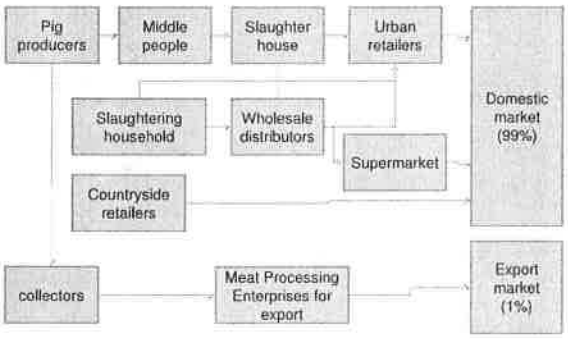



**Value of swine production: 129,679 billion VND**

**Total agricultural economy: 528,739 billion VND**

*Source : Department of Livestock Production and General statistics office 2010*

## Swine industry players (cont.)




## Swine production system

**Two types of swine production systems:**

- ***Commercial farms:***
  - total production value/year >= 1 billion VND;
  - Sow farms: >= 30 sows regularly present
  - Pork farms: >= 100 pigs (exclude piglets) regularly present
  - For conversion: 1 sow = 100 pigs
- ***Smallholder farms:*** less than 1 billion VND

*(Circular 27/2011/TT-BNNPTNT date 13 April 2011 and definitions by some provinces)*

# Swine production system

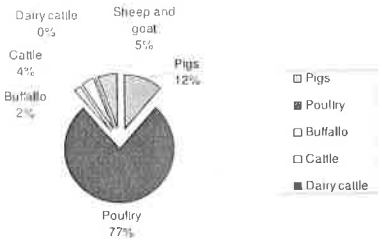
- **Whole country: 8,500 pig farms**
- **Distribution of pig population by farms**
  - 81.4% pig population in commercial farms
  - 18.6% pig population in smallholder farms
- **Pork production**
  - By commercial farms accounted for 45%
  - By smallholder farms accounted for 55%

*(Source: Vietnam DLP 2010)*

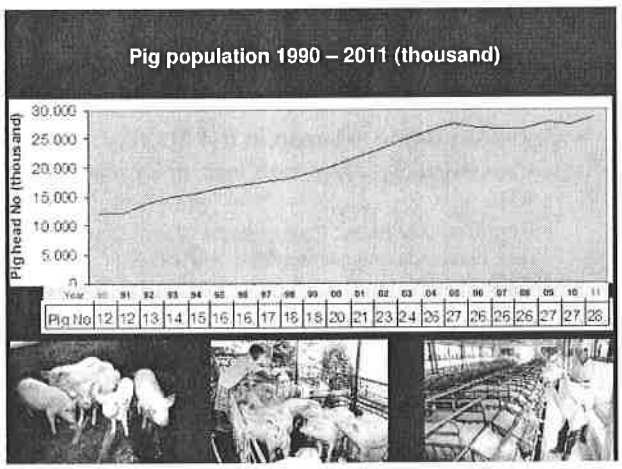
# Swine production system

Total and percentage swine population of total livestock production

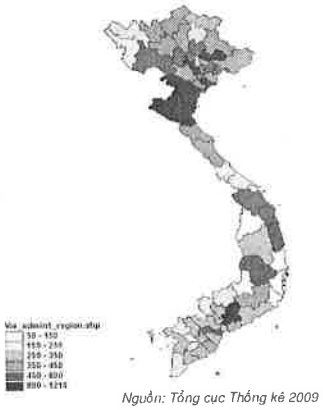
| Live-stock | Million heads |
|---|---|
| Pigs | 23.37 |
| Poultry | 308.40 |
| Buffallo | 2.91 |
| Cattle | 5.92 |
| Dairy Cattle | 0.13 |
| Sheep, goat | 1.38 |




*Source: General statistics office 2010*

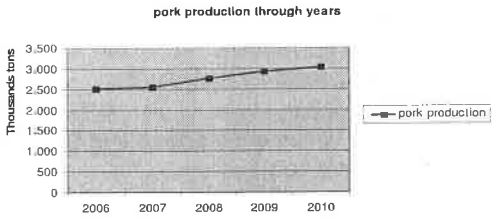



Pig density 2008 (thousand heads)



*Nguồn: Tổng cục Thống kê 2009*

# Swine production system




Pork production growth rate per year (2006-2010): 4.96%

*Source: General statistics office 2010*

# Swine production and health

- Cost of gilts (average 80-90 kg): 50,000 - 80,000 VND/kg
- Cost of weanlings (average 20 kg): 77,000 - 90,000 VND/kg
- Average weight/age of animals for slaughter: 100-115 kg/24-26 weeks
- The farrowing index in
  - commercial farms: 2.2 -2.4 litters/year
  - Smallholder farms: <2,2-2,4 litters/year

*(Source : Report no 24/BC-CN-GSN Department of Animal Health date 27 June 2012 and http://vnexpress.net/gl/kinh-doanh/2012/06/gia-thit-lon-gia-cam-giam-manh/)*

# Swine production and health

- Average cost to produce a kg of meat: 43.000 -47.000 VND
- Farm gate prices: 35,000 VND – 55,000 VND/kg
- The accepted production parameter for Feed conversion: *kilogram of feed / kilogram of gaining weight*

*(Source :*
*- Report no 24/BC-CN-GSN Department of Animal Health date 27 June 2012*
*- http://vnexpress.net/gl/kinh-doanh/2012/06/gia-thit-lon-gia-cam-giam-manh/)*

# Swine production and health

**Common production problems:**

- Commercial farm: small scale; lack of overall and long-term plan; weak coherence in the development of farm economy: livestock products not meet the requirements in both domestic and export markets; complicated land-lease procedures, qualifications, experience, management and market knowledge of farm owners are limited; Prices of animal products are usually suppressed by dealers and causing losses to farmers; difficult to access to credit sources
- Smallholder farms: difficult to control diseases, environment pollution, low production efficiency, uneven product quality, poor hygiene

# Swine production and health

- Health programs
  - Stratifying pig herd based on age, sex, characteristics
  - Pig house: good ventilation and hygiene
  - Vaccinations against important diseases: at 10-12 weeks old and repeat when necessary
  - Elimination of parasitic worms

# Swine production and health

- Common swine disease in the country:
  - Virus diseases: PRRS, FMD, CSF, PCV2, PED, TGE,
  - Bacterial diseases: Pasteurolosis, Streptococcus suis, Ecoli (edema), salmonelosis (salmonella cholerae suis).
  - Parasite diseases: Ascaris,

**Animal Health Laboratories in Vietnam**

**Ministry of Agriculture and Rural Development**

- Department of Animal Health
  - National Center Vet Diagnosis (1)
  - Regional Animal Health Offices
    - No.1 Hanoi (2)
    - No.2 Hai Phong (3)
    - No.3 Vinh (4)
    - No.4 Da Nang (5)
    - No.6 Ho Chi Minh (6)
    - No.7 Can Tho (7)
- National Institute of Veterinary Research
  - Hanoi (8)
  - Nha Trang (9)

○ FMD, PRRS AI diag. center

# Swine production and health

- Diagnostics for Swine diseases
  - 8 veterinary laboratories in the DAH system: 1 NCVD and 7 regional laboratories:
  - 2 Veterinary research institutes: National Institute for Veterinary research and Central Vietnam Veterinary institute.
  - Some provincial labs

## Constraints to swine production and health

Swine production:

- Lack of connection between markets: the reason of continuous price fluctuations
- Domestic consumption decrease due to economic crisis.
- Illegal import of animal products
- High feed cost

Swine health:

- PRRS and FMD diseases occur every year
- Lack of vaccines for important diseases
- High percentage of smallholder farm

## Sectoral policy and legislation

- Promote the market forecast
- Encourage pig production only in areas where there are advantages of land and environment
- Issue policies to support the innovation of swine production in smallholder farms toward safe and sustainable development and policies to promote commercial farm
- Review, amend and supplement conditions for business in swine production

**THANK YOU**
**FOR YOUR ATTENTION!**

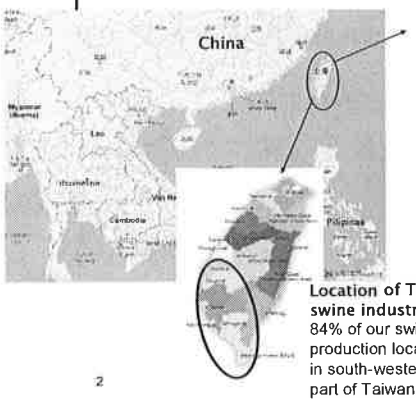
# Swine Health Management in Taiwan

**Nien-Nung Lin**

Bureau of Animal and Plant Health Inspection and Quarantine
August, 2012



## Location of Taiwan



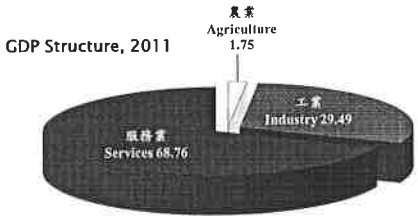

Taiwan

- The total land area is 3,619,282 ha.
- Two-thirds are mountains and hills.
- The cultivated land area is 808,294 ha, occupied 22.45 % of the total land area.

**Location of Taiwan's swine industry**
84% of our swine production locates in south-western part of Taiwan



## Agriculture profile

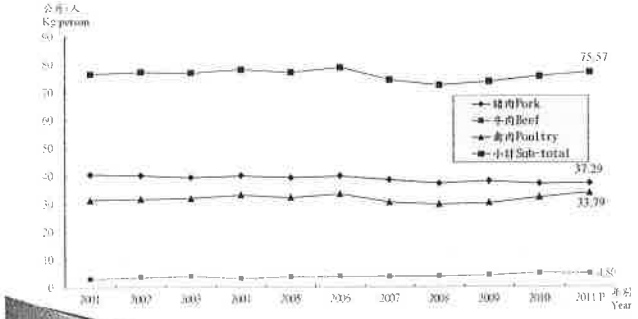



Some basic facts about agriculture and pig production

| Year | Agri. prod. million NT$ | Anim. prod. million NT$ | Pig prod. million NT$ | Pig prod. % Agri. Prod | Pig prod. % Anim. Prod |
|---|---|---|---|---|---|
| 2011 p | 471,570 | 158,901 | 75,158 | 15.94 | 47.30 |

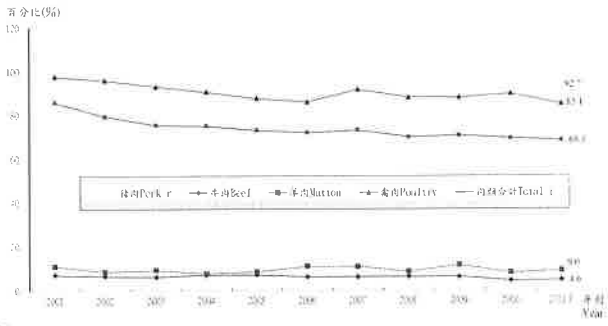


## Per capita consumption of red meat and poultry






## Meat self-sufficiency rate in Taiwan






## Scales of pig farms in 2011

| 規模別(頭) Size ( head ) | 養豬戶數 No. of farms | % | 飼養頭數 No. of pigs | % | 平均規模(頭/戶) Ave. No. / farm |
|---|---|---|---|---|---|
| 1-99 | 3,562 | 37.24 | 102,916 | 1.65 | 29 |
| 100-199 | 1,172 | 12.18 | 171,875 | 2.75 | 147 |
| 200-299 | 594 | 6.18 | 146,120 | 2.34 | 246 |
| 300-499 | 876 | 9.11 | 349,660 | 5.60 | 399 |
| 500-999 | 1,652 | 17.17 | 1,227,378 | 19.64 | 743 |
| 1,000-1,999(Small) | 1,207 | 12.55 | 1,669,206 | 26.72 | 1,383 |
| 2,000-4,999(Middle) | 413 | 4.29 | 1,203,122 | 19.26 | 2,913 |
| 5,000-9,999(Large) | 70 | 0.73 | 482,048 | 7.72 | 6,886 |
| 10,000以上 | 53 | 0.55 | 895,623 | 14.33 | 16,899 |
| 總計Total | 9,619 | 100.00 | 8,247,948 | 100.00 | 650 |

Source：Hog population survey on Nov. 30, 2011. Council of Agriculture, Executive Yuan.

## Common health problems encountered in each production system

- Common swine disease: PCV2, PRRS, SEP, APP, etc.
- Emerging swine disease: No.

## Swine diseases diagnosis facilities

- Central government institute (Animal Health Research Institute; AHRI)
- More than 20 local government disease control centers
- A agency research institute and 4 Vet schools that do so as well.
- All the above facilities possess diagnostic laboratories with basic equipment. Some facilities also house biosafety level-2 labs which are used for routine diagnosis of general swine pathogens.
- In addition, AHRI's biosafety level-3 lab is used to diagnose highly contagious animal pathogens. The methods for diagnosis include both traditional and molecular biological identification.
- These facilities service both the commercial and smallholder sectors of the swine industry in Taiwan.

## The capacity of the government laboratory to monitor and diagnose swine diseases

- Able to monitor and diagnose almost all pathogens that cause swine diseases.
- Possesses equipment for traditional and molecular biological diagnosis, including biosafety cabinets, TEM, florescent microscopes, automated NA extraction machines, PCR & qPCR machines, and Sequencers.
- By applying molecular biological techniques, we have developed several diagnostic methods to differentiate between agents that cause similar syndromes.
- Central government institute: 56 veterinarians; the local disease control centers : over 400 veterinarians.
- For diseases that have a great impact on the economy and are highly contagious, such as CSF, FMD, PR, PRRS, PCV2, APP, Erysipelas and Mycoplasmosis, vaccines are used to control disease outbreaks.
- In addition, antibiotics are also used for therapy during bacterial disease infections. The average price of vaccines range from 0.3 to 6 USD per single dose and the average price for medicines range from 0.2 to 3.5 USD.

## Constraints to swine production and health

- Pig farm workers is not a good job
- Shortage of good stockpersons
- Heat Stress
- Low survival rate caused by diseases

## Disease control

- Production system
- Pig flow- batch production and All in/out
- Vaccination
- Medication
- Biosecurity

## Services for our veterinarians and farmers to optimum pig production

- Establish a website to provide the information of animal health and production management.
- The website is http://203.73.39.83/ which contains production systems, biosecurity, sow management, vaccination, medication, environmental medicine, batch production and all in/all out practice in the pig flow.

## Provide the educational training courses

- Veterinarian and pig producers who are willing to change and uptake the novel concepts to improve the animal welfares and productivity.
- The courses of veterinary medicine which includes disease introduction and prevention through vaccination and correct medication.



## Consultant team

- Organizing a consultant team which is composed of animal husbandry, nutritionists and veterinarians to provide the extension services to the pig producers.



## Model of production system and pig flow

- Set up a model of assisting pig producers to improve their working efficiency in organizing the farm works and labors to achieve optimum profits and humane environments for the farm animals.