LESSONS LEARNT FROM BRUCELLOSIS OUTBREAK:
FROM VETERINARY PERSPECTIVE

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Introduction

• Brucellosis - a contagious disease, zoonotic and can cause abortion in infected herds (MA Soltys, 1979)
• It is cause by a non-motile, gram negative bacteria in the genus Brucella.
• Different species but more specific based on geography and the infected host
• Three common species known
  • Brucella abortus
  • Brucella melitensis and
  • Brucella suis
• (mainly infecting domestic animals)
Brucellosis is among the most important causes
Abortion, Infertility, Stillbirth, poor milk production, Orchitis
Force elimination of the infected herds (Abdul Aziz et al, 1990) and (Blasco, 1990)
Brucellosis in caprine and ovine and cattle – endemic in Malaysia
Among the most important disease by veterinary health and causing a significant economic impact
Case definition:

- Positif herds:
- With clinical signs of
- Still birth, weak offspring, abortion and Orchitis/Epidimydis
- Serologically positive by RBPT/ELISA/ CFT
- Bacteria isolation or
- Combination of the tests
CLINICAL SIGNS FOR BRUCELLOSIS

- Abortion
- Stillbirth
- Retained placenta
- Vaginal discharge
- Mastitis

**Spreading of infection**
Ingestion of
Aborted fetus, fetal membranes, uterine discharges, infected food, uterine licking or the genital organs of infected animals.

- Venereal
  Through artificial insemination
  (Semen from infected bulls or rams)
Transmission to human

• Ingestion of contaminated food or drinks
• Drinking of unpasteurized milk
• Mishandling of infected materials in slaughterhouses, cultures or samples during testing in the labs or during post-mortem in the field.

Undulent fever, abortion and infertile
PVM-Protokol Veterinar Malaysia

• *Strategies to control and eradication of Brucellosis*

  1. *Screening of infection* - RBPT followed by confirmation tests with CFT (survelance - under the Annual Survelance Plan)

  • Clinically suspected animals - will be taken samples for lab testing (bacterial isolation /serology)

  2. *Eradication with compensation* - infected animals will be isolated, culled and disposed off. The farmers will be given compensation accordingly based on the price per kg or per animal.
3. **Quarantine** – positive animals will be isolated, culled and disposed off. The rest of animals will be quarantine, tested periodically until free of infection.

4. **Consultation** – the farmers will be provided with advisory consultation on the control of infection in the farms and workers in the farms will be monitored for brucellosis symptoms and health office nearby will be informed of the positive farms.

5. **Public awareness campaign** - target group (the goats and cattle farmers)
Actions taken for positive goats with *B. melitensis*

- Tested with RBPT followed with CFT

- The positive goats will be isolated, culled and disposed off by buried with disinfectant (e.g.: chlorinated lime). The isolation areas will be thoroughly cleaned, disinfected and left unused for 30 days

- Other goats will be re-tested every 6 months and any positive animals will again follow the same process as above
NEGATIVE HERDS
Herds free of *B. melitensis* after 2x negatively tested within one year period

FREE

POSITIF HERDS
Animals >6 months will be tested every 6 months. If 3x tested consecutively negative, the quarantine will be lifted

FREE

*Based on Protokol Veterinar Malaysia Penyakit Melitensis (No. dokumentasi : PVM 1 (15) : 1/2010)*

**Animal Act 1953 (Revised 2006)**

**Notification under Section 36(1) Perintah Haiwan (Kawalan dan Pembasmian Contagious Abortion serta Penyakit Kuku dan Mulut ) 2003**
Actions taken for positive cattle with *Brucellosis*

- For herds with reactor less than 3%, the infected cattle will be isolated and sent for slaughter.

- The herds will be quarantined and animals more than 4 months old will be tested (ELISA/CFT) for every 4 months. If the test results are negative 3 times consecutively, the quarantine order of the herds will be revoked and allowed for movement to other places.

- PVM (141:2008)
Actions taken for positive cattle with *Brucellosis*

- For herds with reactor more than 3%, the infected cattle will be isolated and sent for slaughter.
- The herd will be quarantined and vaccinated with Brucella vaccine (adults and animals age more than 4 mths old). The vaccinated animals will be tested with RBPT /ELISA 2 mths post vaccination.
- Any positive animals will be isolated and culled, while the negative animals will be re-tested every 4 mths. If the test results are negative 3 times consecutively, the quarantine order will be revoked and allow for movement.
NEGATIVE HERDS
Farms free of *B. abortus* 2x negatively tested within 2 years period

FREE

POSITIF HERDS
Animals >4 months will be tested every 4 months. If negatively tested 3 X consecutively, quarantine order will be lifted

FREE

*Based on Protokol Veterinar Malaysia (PVM) on Brucellosis (No. dokumentasi : PVM (141:2008)*

Animal Act 1953 (Revised 2006)
Brucellosis status in Malaysia

- Endemic in Malaysia
- Prevalence:
  - *B. melitensis* – 0.8%
  - *B. abortus* – 4.8%
Aims for free Brucellosis

- **Free Zone:**
  - Reactor rate <0.2%
  - Not vaccinated for the past 3 years
  - Importation or movement of animals must be from known free herds/zone/countries
  - Known to be tested negative serologically (2x) within 2 years \((B.\text{abortus})\) and 12 months \((B.\text{melitensis})\)

- **Free herds:**
  - Under the monitoring of DVS
  - Not vaccinated for the past 3 years
  - No symptom of infection and tested negative 2x within 2 years period \((B.\text{abortus})\) and 12 months \((B.\text{melitensis})\)
  - Importation or movement of animals from free herds/zone/countries
Brucellosis status in Penang
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<th>KAMBING TENUSU *</th>
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*Sumber: Statistik Ternakan 2014, Jabatan Perkhidmatan Veterinar Negeri Pulau Pinang*
## COMPENSATION STATUS 2010 - 2015
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# Perbandingan Prevalen Penyakit B. Melitensis Berdasarkan Tahun dan Daerah

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<th>BIL Sampel Spt</th>
<th>+VE</th>
<th>Prevalen</th>
<th>BIL Sampel Sps</th>
<th>+VE</th>
<th>Prevalen</th>
<th>BIL Sampel DBD</th>
<th>+VE</th>
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![Graph showing prevalence over time]

- **Prevalen SPU**
- **Prevalen SPT**
- **Prevalen SPS**
- **Prevalen DBD**
- **Prevalen DTL**

20
### PERBANDINGAN PREVALEN PENYAKIT B. Abortus BERDASARKAN TAHUN DAN DAERAH

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[Graph showing prevalence changes over years]
Brusellosis in dairy farm - Perianandy a/l Periaswany (25 Februari 2014)

- Location: Kampung Tok Bedu, SPU, Pulau Pinang
- farm: Dairy
- 28 of 38 animals positive for brucellosis (74%)
- Source of infection – buying of animals without screening and no veterinary health permit from other district
- Source of income: milk

- Compensation RM 1000/animal
- YB Exco Pulau Pinang approved budget of RM 52 000 as an incentive to the farmer for buying of new dairy breeders to lessen the farmer’s burden (RM6500 x 8 dairy)
- Overall state penang compensation: compensation RM 28 000 + incentive RM 52 000 (new animals) = RM 80, 000.00
Brucellosis in Goat Farm - Perda ventures, SPU Penang

- The project was established by Perda Ventures Incorporated Sdn Bhd, one of the company of Lembaga Kemajuan Wilayah P.Pinang and situated in Kubang menerong kepala Batas, Penang.

- The area is about 50 acres with current population of 2414.

- In 2nd Julai 2012, the district health office of Kepala Batas reported that a civilian was positive with Brucella melintesis after drinking fresh milk from the particular farm.
From 2012 until now, the farm is still not free from *B. melitensis* infection. The screening program done every 6 months involving culling and compensation up to RM 59,673.60 (279 animals been culled)
BRUCELLOSIS IN GOAT FARM (NG AH SENG) AT AIR ITAM, PENANG (2011)

Population of 200 Saanen goats. Goat milk production of 60-70 bottles (1 liters) per day sold at rm 25.00/bottle.
Notified Brucellosis on 1st April 2011 of the farm owner getting the infection by drinking the raw milk.
Selling the milk unpasteurised.
The infected goats (100%) were culled and disposed off.
No more in operation.
AFTERMATH ECONOMIC IMPACT
COST FOR DISEASE CONTROL

- The total cost for disease control in Penang for Brucellosis for 2014 were RM 179,236.00.
- Most of the cost covered for surveillance, testing, culling, eradication, decontamination and compensation. (DVS Malaysia and The Penang State budget).
- For *B. melitensis*, no vaccination been done.
- RB51 Vaccine was introduced for the control of *B. abortus* for the positive brucellosis herd in cattle. (Introduced about 2 years ago)
(LOSS OF PRODUCTIONS)

The estimated cost for loss of productions due to brucellosis approximately RM 23,827.34 per month base on the goat milk sales of Ng Ah Seng

(MARKET LOSS)

- Due to the consumers have loss their confidence on food safety and the risk of getting infection.
- Due to insufficient supply of product (loss due to eradication of positive animals)
- Consumers will stop buying or looking for other places for alternative.
COST OF DISEASE CONTROL

Surveillance
Testing
Eradication
Decontamination
Compensation
COST OF DISEASE CONTROL

Survelance
RM 15, 608.00
Eradication

= RM 10,250.00
Testing

= RM 8,300.00
Compensation
RM 137,528.00
Cost for dispose and decontamination
= RM 7550.00
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**TOTAL COST (RM)** 179,236.00
VETERINARY HEALTH

• ANIMAL WELFARE
  • The infected animals suffers from the disease. Abortion, retained placenta and poor body condition.
  • The culling methods must be quick and lesser pain to the animal but balancing with the culling cost (intracardiac injection of Pentobarbitone @ Dotlethal).
VETERINARY HEALTH

- OCCUPATIONAL HAZARDS
  - Zoonotic implication – as frontliners the DVS personnel will be at risk with zoonotic infection from the animals (Health and safety of the personnel, the producers, the workers and public)
  - Many people involved in the activities, movements of people and animals, large equipments, transport and higher chances of having accidents
  - The disposing of carcasses – the area and the method of disposing- (burning with incineration or burying may cause environmental impact).
  - Disposing of efluent from the culling activities: blood, efluent from the houses, and cleaning of equipment may have cause some contamination of the farms area and the water source
VETERINARY HEALTH

- PROFESIONAL AND PERSONAL
  - The responsibility and the role as a vet in handling the crisis management influence the decision and action taken

- SOSIAL ISSUE
  - The impact on relationship with the farmers
  - The control measures taken may be negatively viewed by the public (DVS killing the animals, not supporting the industry, cruelty)
CONCLUSION

Control and eradication of Brucellosis is extremely important since this is a zoonotic disease that caused significant economic impact to the ruminant industry in Malaysia.

- Infected animals caused great loss in production – abortion, still birth, poor fertility, poor birth rate, poor milk production and weak offspring.
- Infection in humans- leads to loss of productivity, health and cost for treatment
- Spreading of infection leads to difficulty in controlling the disease and caused a significant economic impact to the government in terms of controlling and eradication program.
- Supplies of meat and milk will be affected. The farmers income affected and eventually to the ruminant industry and indirectly to the countries economic growth.
Thank you