

# **BIOSECURITY: AN IMPORTANT MECHANISM IN THE CONTROL OF FISH DISEASES**

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## **Abstract**

Aquaculture in Malaysia has developed tremendously since 1920's. It has become an important sector in food security and export revenue through increasing local production. However, intensive aquaculture systems lead to disease outbreaks that threaten to impede the development and production of aquaculture. More and more disease outbreaks were reported in many aquaculture countries, including the emerging and re-emerging diseases. Thus, disease control has become a crucial issue in aquaculture.

There are three mechanisms in animal disease control. They include prevention, eradication and vaccination against diseases. While prevention is the most effective mechanism of disease control, it proved to be most expensive and difficult to implement. On the other hand, vaccination is the least effective but relatively cheaper and easily implemented. Nevertheless, disease prevention must be prioritized at all time, which includes selection of suitable location for fish farm, introduction of fish from disease-free sources, quarantine and disease screening and the biosecurity.

Biosecurity encompasses all measures designed to prevent diseases from occurring and spreading. Thus, the most important issue in biosecurity is isolating, as much as possible, fish farm populations from external contamination or environment. For this reason, non-recirculated aquaculture systems are more difficult to implement biosecurity than closed water systems. Nevertheless, effective biosecurity successfully prevents introduction and spread of diseases into the farm or country.



## CURRICULUM VITAE

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### 1. Name

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### 3. Field of Specialization

Veterinary Pathology

### 4. Research Interest

- Ruminant diseases
- Fish diseases

### 5. Academic Qualification

DVM (UPM); PhD (Liverpool)

### 6. Professional Duties

- **Editor-in-Chief**, *Pertanika Journal of Tropical Agricultural Science*, Universiti Putra Malaysia; 2015-2018
- **Chief Editor**, *Jurnal Veterinar Malaysia*, Journal of the Veterinary Association Malaysia; 1997 - 2000
- **Chief Pathologist**, Faculty of Veterinary Medicine; 1997 – 2002; 2012 to date
- **Editorial Board Member**, *Journal of Animal Health and Production*; Nexus Publication; 2013- date
- **Editorial Board Member**, *Journal of Animal Health and Production*; 2012 – date
- **Panel Member**, MQA Program Accreditation
- **Panel Member**, Malaysia Veterinary Council for Accreditation of Veterinary Programs

## 7. Research Activities

- 7.1 Studies on the treatment of sarcoptic mange in goats
- 7.2 *Brachiaria decumbens* toxicity in small ruminants
- 7.3 Studies on contagious ecthyma of sheep and goats
- 7.4 Pathogenesis of pneumonic pasteurellosis of sheep and goats
- 7.5 Incidence of jaagsiekte retrovirus in sheep pulmonary adenomatosis
- 7.6 Improvements of the pasteurella spray vaccine of sheep and goats
- 7.7 Characterisation and pathogenesis of equine herpesvirus (EHV1 and EHV4) infections in horses and ponies in Malaysia
- 7.8 Alternative Control of Haemorrhagic Septicaemia in Cattle
- 7.9 Characterization of the male reproductive system of lesser mousedeer
- 7.10 Development of rearing protocol for Boer breeder goats in Sabah
- 7.11 Improvement of performance of buffaloes in Sabah
- 7.12 Pathology and immune response of goats infected with *Brucella melitensis*
- 7.13 Pathogenesis and control of streptococcosis in tilapia
- 7.14 Life feed and live feed vaccine for tiger groupers
- 7.15 Epidemiology, pathogenesis and control of vibriosis in seabass

## 9. Recent 5-year Publication [\*Supervision of student]

1. \*Ismail MS, Siti-Zahrah A, Syafiq MRM, Amal AMN, Firdaus-Nawi M, Zamri-Saad M (2016). Feed-based vaccination regime against streptococcosis in red tilapia, *Oreochromis niloticus* x *Oreochromis mossambicus*. *BMC Veterinary Research* 12: 194. DOI 10.1186/s12917-016-0834-1
2. \*Roslindawani MN, Syafiqah AS, Jesse FFA, Effendy AWM, Zamri-Saad M (2016). Recombinant caseous lymphadenitis vaccine with palm oil as adjuvant enhances the humoral and cell-mediated immune responses in rat model. *Journal of Animal Health and Production* 4(1): 22-25
3. Zamri-Saad M, Annas S (2016). Vaccination against haemorrhagic septicaemia of bovines: a review. *Pakistan Veterinary Journal* 36(1): 1-5
4. Abubakar MS, Zamri-Saad M, Jasni S, Zuki ABZ (2016). Immunohistochemical evaluation of lesions of the gastrointestinal tract of buffalo (*Bubalus bubalis*) calves orally exposed to *Pasteurella multocida* B:2. *Sokoto Journal of Veterinary Sciences* 14(1): 21-27
5. \*Ismail-Salihin M, Siti-Zahrah A, Zamri-Saad M, Amal MNA (2016). Outbreak of polycystic liver in red hybrid tilapia, *Oreochromis niloticus* (L.) x *Oreochromis mossambicus* (Peters). *Fish Pathology* 51: S36-S38
6. \*Alif-Zakaria M, Zamri-Saad M, Hasliza AH, Wahid H (2016). Growth and reproductive performance of farmed timorensis deer, *Cervus timorensis*. *Pertanika Journal of Tropical Agricultural Science* 39(1): 79-86
7. \*Zarina M, Zamri-Saad M, Latiffah H, Shahrom MS, Norlida O (2016). Seroprevalence and detection of contagious bovine pleuropneumonia (CBPP) in northeast states of peninsular Malaysia. *Pertanika Journal of Tropical Agricultural Science* 39(2): 257-265
8. \*Othman AM, Abba Y, Jesse FFA, Ilyasu YM, Saharee AA, Haron AW, Zamri-Saad M, Lila MAM (2016). Reproductive pathological changes associated with subchronic *Corynebacterium pseudotuberculosis*

- infection in nonpregnant Boer goats. *Journal of Pathogens*. 2016: 4624509. <http://dx.doi.org/10.1155/2016/4624509>
9. \*Shaqinah NN, Mazlina M, Zamri-Saad M, Hazilawati H, Sabri J (2016). Improving the methods for isolation of monocyte and establishing macrophage cell culture in caprine model. *Cytotechnology* 68(4): 1655-1659. DOI 10.1007/s10616-014-9836-7
  10. \*Syafiqah AS, Zamri-Saad M, Zunita Z, Rozaihan M (2016). Development of recombinant cells encoding surface protein of *Corynebacterium pseudotuberculosis* against caseous lymphadenitis in goats. *International Journal of Bioscience* 9(2): 16-26
  11. Jesse FFA, Nur-Amirah AL, Eric LTC, Adamu L, Sarah SA, Zamri-Saad M, Wahid AH, Mohd-Azmi ML, Zunita Z (2016). Cytokines (IL 1 $\beta$  and IL 6) responses in non-pregnant does infected with *Corynebacterium pseudotuberculosis* following intradermal route of infection in chronic state. *International Journal of Livestock Research* 6(6): 1-8
  12. Nurul Izzatul AI, Amal MNA, Shamarina S, Zamri-Saad M, Siti-Zahrah A (2016). Associations of water quality and bacteria presence in cage cultured red hybrid tilapia, *Oreochromis niloticus* x *Oreochromis mossambicus*. *Aquaculture Reports* 4: 57-65
  13. Chung ELK, Jesse FFA, Hayder HI, Marza AD, Zamri-Saad M, Wahid AH, Mohd-Azmi ML, Norsidin MJ (2016). Clinico-pathology, hematology and biochemistry responses in buffaloes towards *Pasteurella multocida* type B:2 immunogen lipopolysaccharide via oral and intravenous routes of infection. *Microbial Pathogenesis* 91: 141-154
  14. Hayder HI, Abba Y, Ahmed IM, Jesse FFA, Chung ELK, Marza AD, Zamri-Saad M, Omar AR, Zuki ABZ, Saharee AA, Wahid AH, Mohd-Azmi ML (2016). Molecular detection and pathology of *Pasteurella multocida* B:2 in the reproductive system of pre-pubertal buffalo calves (*Bubalus Bubalis*). *Comparative Clinical Pathology* 25(2): 319-326
  15. \*Annas S, Zamri-Saad M, Jesse FFA, Zunita Z (2015). Clinicopathological changes in buffalo and cattle following infection by *Pasteurella multocida* B:2. *Microbial Pathogenesis* 88: 94-102
  16. Aisyah MAS, Amal MNA, Zamri-Saad M, Siti-Zahrah A, Shaqinah NN (2015). *Streptococcus agalactiae* isolates from cultured fishes in Malaysia manifesting low resistance pattern towards selected antibiotics. *Journal of Fish Diseases* 38: 1093-1098
  17. \*Annas S, Abubakar MS, Zamri-Saad M, Jesse FFA, Zunita Z (2015). Pathological changes in the respiratory, gastrointestinal and urinary tracts of buffalo calves following experimental hemorrhagic septicaemia. *Pakistan Veterinary Journal* 35(4): 430-435
  18. Marza AD, Jesse FFA, Ahmed IM, Eric LTC, Hayder HI, Zamri-Saad M, Omar AR, Zuki ABM, Saharee AA, Wahid AH, Mohd-Azmi ML (2015). Involvement of nervous system in cattle and buffaloes due to *Pasteurella multocida* B:2 infection: A review of clinicopathological and pathophysiological changes. *Journal of Advances in Animal Research* 2(3): 252-262
  19. Jesse FFA, Nur-Amirah AL, Eric LTC, Sarah SA, Zamri-Saad M, Wahid AH, Mohd-Azmi ML, Zunita Z, Norsidin MJ (2015). Changes in the reproductive hormones of non-pregnant does infected intradermally with *Corynebacterium pseudotuberculosis* in chronic form. *International Journal of Livestock Research* 5(7): 33-40
  20. Ali OS, Adamu L, Jesse FFA, Abba Y, Hazilawati H, Mohd-Azmi ML, Wahid AH, Zamri-Saad M (2015). Haematological and histopathological vicissitudes following oral inoculation of graded doses of *Pasteurella multocida* type B:2 and its lipopolysaccharide in mice. *Journal of Veterinary Science and Technology* 6(2):1000220. <http://dx.doi.org/10.4172/2157-7579.1000220>
  21. Zamri-Saad M, Azhar K (2015). Issues on cattle integration with oil palm plantation. *Journal of Oil Palm Research* 27(4): 299-305

22. Ali OS, Adamu L, Jesse FFA, Ilyasu Y, Yusuf A, Hazilawati H, Mohd-Azmi ML, Wahid AH, Zamri-Saad M (2015). Alterations in interleukin-1 $\beta$  and interleukin-6 in mice inoculated through the oral routes using graded doses of *P. multocida* type B:2 and its lipopolysaccharides. *American Journal of Animal and Veterinary Advances* 10(1): 1-8
23. Tyagita Hartady, M Zamri-Saad, B Siti-Khairani, MS Shahrom (2014). Clinical human brucellosis in Malaysia: a case report. *Asia Pacific Journal of Tropical Diseases*. doi:10.1016/S2222-1808(14)60332-7
24. Abubakar MS, Zamri-Saad M, Jasni S (2013). Ultrastructural changes and bacterial localization in buffalo calves following oral exposure to *Pasteurella multocida* B:2. *Pakistan Veterinary Journal* 33(1): 101-106
25. Rafidah O, Zamri-Saad M (2013). Effect of dexamethasone on protective efficacy of live *gdhA* derivative *Pasteurella multocida* B:2 vaccine. *Asian Journal of Animal and Veterinary Advances*, 8(3): 548-554
26. Norina L, Noordin MM, Sabri MY, Goh YM, Zamri-Saad M, Sareenasulastri AB, Azizul MO, Norsyahril A, Krishnan M, Salmeah AR, Cheah CP (2013). Pathological changes in embryonated eggs inoculated with *Coxiella burnetti*. *Online Journal of Veterinary Research* 17(1): 26-31
27. Adza Rina MN, Zamri-Saad M, Jesse FFA, Saharee AA, Haron AW, Shahirudin S. (2013) Clinical and pathological changes in goats inoculated *Corynebacterium pseudotuberculosis* by intradermal, intranasal and oral routes. *Online Journal of Veterinary Research*, 17 (2): 73-81
28. Amal MNA, Zamri-Saad M, Siti-Zahrah A, Zulkafli AR (2013). Water quality influences the presence of *Streptococcus agalactiae* in cage cultured red hybrid tilapia, *Oreochromis niloticus* x *Oreochromis mossambicus*. *Aquaculture Research*, ?, 1-11; doi:10.1111/are.12180
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30. Siti-Zahrah A, Zamri-Saad M, Firdaus-Nawi M, Hazreen-Nita MK, Nur-Nazifah M (2013). Detection of channel catfish virus in cage-cultured *Pangasius hypophthalmus* (Sauvage, 1878) in Malaysia. *Journal of Fish Diseases*. DOI: 10.1111/jfd.12185
31. Firdaus N, Zamri-Saad M, Nik-Haiha NY, Zuki ABS, Effendy AWM (2013). Histological assessment of intestinal immuno-morphology of tiger grouper juveniles, *Epinephelus fuscoguttatus*. *SpringerPlus* 2: 611-623
32. Shahrom MS, Zamri-Saad M, Kasim A (2012). Implementation of herd health program to improve survival of Boer goats in Malaysia. *Tropical Animal Health and Production* 44: 207-211 ISSN1573-7438 [IF1.003]
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34. Plumeriastuti H, Zamri-Saad M (2012). Detection of *Brucella melitensis* in seropositive goats. *Online Journal of Veterinary Research* 16(1): 1-7 ISSN 1328-925X [IF1.25]
35. Amal MNA, Zamri-Saad M, Iftikhar AR, Siti-Zahrah A, Aziel S, Fahmi S (2012). An outbreak of *Streptococcus agalactiae* infection in cage-cultured golden pompano, *Trachinotus blochii* (Lacépède, 1801), in Malaysia. *Journal of Fish Diseases* 35: DOI: 10.1111/j.1365-2761.2012.01443.x ISSN 0140-7775 [IF1.603]
36. Rafidah O, Zamri-Saad M, Shahirudin S, Nasip E (2012). Efficacy of intranasal vaccination of field buffalo against haemorrhagic septicaemia with a live *gdhA* derivative *Pasteurella multocida* B:2. *Veterinary Record*, doi: 10.1136/vr.100403 ISSN 2042-7670

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