The 14th CADIC International Symposium

Control Strategies for African Swine Fever ~Learning from the World~

Date 20th November 2024

13:00~17:00(Reception hours12:30)

Venue San San Maru Hall in University of Miyazaki

simultaneous interpretation

Hybrid meeting:Onsite and Online

Onsite capacity 100 / Online capacity (zoom) 150

Free of charge **Reservations required**

※Making a reservation from here ▶▶

Program

Opening Remarks:Prof. Hiroshi Sameshima (President, University of Miyazaki, Japan)

1.Overview of current status of ASF and ASF Research

Dr. Takehiro Kokuho (Division of Transboundary Animal Disease Research, NIAH, NARO, Japan)

2.Crisis management in case of African swine fever in wild boar, the Belgian experience

Prof. Annick Linden (Surveillance Network of Wildlife Diseases, University of Liege, Liege, Belgium.)

3. AVAC ASF live vaccine -An effective solution for prevention of African swine fever

Dr. Nguyen Van Diep (CEO , AVAC Viet Nam., JSC, Viet Nam)

4. Subunit vaccine approaches for African swine fever virus

Prof. Jurrgen Richt

(Center of Excellence for Emerging and Zoonotic Animal Diseases, Kansas State University, USA)

Closing Remarks:Prof. Ayako Yoshida

(Director, Center for Animal Diseases Control, University of Miyazaki, Japan)

Contact

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Sponsor: Center for Animal Diseases Control, University of Miyazaki

Co-sponsor: Faculty of Agriculture, University of Miyazaki
The Consortium of 8 Universities of Animal Diseases Control

Supporter: Ministry of Agriculture, Forestry and Fisheries
: Miyazaki prefecture
Japan Veterinary Medical Association

宮崎大学　第 14 回 CADIC 国際シンポジウム

「世界から学ぶアフリカ豚熱対策」

Control Strategies for African Swine Fever ~Learning from the World~

日時　2024 年 11 月 20 日（水）13：00～17：00（受付開始 12：30）
場所　宮崎大学 330 記念交流会館
言語 日本語/英語（同時通訳あり）

主催：宮崎大学産業動物防疫リサーチセンター
共催：宮崎大学農学部　８大学産業動物防疫コンソーシアム(JRA)
名義後援：農林水産省　宮崎県　日本獣医師会

Nov 20, 2024 (13：00～17：00)
San San Maru Hall in Kibana Campus, University of Miyazaki, Japan

趣旨

現在、我が国を取り囲む諸外国において、養豚業に壊滅的な被害を及ぼすアフリカ豚熱の発生が起こっており、国内への侵入が懸念されています。アフリカ豚熱同様に野生イノシシなどを介してその流行を拡大する豚熱は、2018 年に我が国で 26 年ぶりに発生し、ワクチンがあるにも関わらず、今なお飼養豚・野生イノシシでの発生が続いています。このことからも、未だ有効なワクチンのないアフリカ豚熱の防疫がいかに困難な課題であるか、容易に想像できるでしょう。

そのアフリカ豚熱が、2023 年 12 月に隣国の韓国・釜山の野生イノシシで発生しました。日本と地理的に近く、人や物の往来が多い釜山でのアフリカ豚熱の流行により、国内侵入への警戒レベルを高め、防疫対策にあたる必要性が生じています。

宮崎大学産業動物防疫リサーチセンター(CADIC)では、これまでも口蹄疫などの越境性家畜感染症防疫のために、国際連携を活かした教育・研究に取り組んできました。本シンポジウムにおいても、国内外の専門家に我が国で経験のないアフリカ豚熱に関する現状と課題、野生イノシシを対象とした防疫戦略、そしてワクチン開発を含めた、先端的なアフリカ豚熱防疫戦略についてご紹介いただき、迫り来るアフリカ豚熱の脅威に対するこれからの対策について協議する場となることを期待しております。

宮崎大学産業動物防疫リサーチセンター
センター長　吉田　彩子

OBJECTIVE

Center for Animal Disease Control
Ayako Yoshida, Director

Center for Animal Disease Control
Ayako Yoshida, Director

Currently, outbreaks of African swine fever (ASF), which cause devastating damage to the swine industry, are occurring in the neighboring countries of Japan. There is a growing concern over the potential incursion into Japan. Similar to ASF, swine fever, which spreads through wild boars and others vectors, re-emerged in Japan in 2018 for the first time in 26 years. Despite the availability of a vaccines, outbreaks continue to affect the swine industry and wild boar populations. This brings the awareness of extreme difficulty of preventing the spread of ASF, for which there is still no effective vaccine.

In December 2023, ASF broke out in wild boars in Busan, South Korea, which is geographically close to Japan and has significant exchange of people and goods. This outbreak has raised the alert level to strengthen and take quarantine measures to prevent the invasions into Japan.

The Center for Animal Disease Control (CADIC) at the University of Miyazaki has been engaged in education and research on the prevention of transboundary infectious diseases of livestock, such as foot-and-mouth disease, through international collaboration. In this symposium, we aim to gather domestic and international experts to discuss the current situation and issues related to ASF, which Japan has no experience with, quarantine strategies targeting wild boars, and cutting-edge ASF prevention strategies, including vaccine development. We hope this symposium will provide an opportunity to deliberate future countermeasures against the threat of ASF.

ご挨拶

本日、宮崎大学産業動物防疫リサーチセンター主催の、第 14 回国際シンポジウム「世界から学ぶアフリカ豚熱対策」を開催するにあたり、開会のご挨拶を申し上げます。

宮崎大学は日本有数の畜産県に位置し、国や県、さらには民間の農業団体等と連携して、産業動物関連感染症に基軸を置いた教育・研究に力を入れてきました。宮崎県は、過去に口蹄疫や高病原性鳥インフルエンザの被害に見舞われました。その際に、産業動物感染症に特化した世界水準の感染症教育・研究が不可欠であることを認識し、本学内に学部横断的なエキスパートからなる産業動物防疫リサーチセンター(CADIC)を開設しました。

世界的には、日本の近隣諸国で口蹄疫や高病原性鳥インフルエンザだけでなく、アフリカ豚熱の発生が拡大しています。また、本州には 2018 年に豚熱が侵入し、その猛威は日本の豚産業の中心となる九州へ拡大してきました。宮崎大学では、このような国際的に重要な産業動物関連感染症の防疫に資する教育・研究のネットワークを強化するために、毎年 1 回の国際シンポジウムを開催してきました。

今年度は「世界から学ぶアフリカ豚熱対策」をテーマに、海外ですでに取り組まれているアフリカ豚熱防疫について、様々な視点からの最新情報を提供していただきます。
国内からは、農研機構の國保先生に、アフリカ豚熱の現状、そして国内外の ASF 研究の進展についてご解説いただきます。また、世界で唯一、野生イノシシにおけるアフリカ豚熱の防疫に成功したベルギーの取り組みをベルギー・リエージュ大学の Prof. Annick Linden にご紹介いただきます。そして ASF のワクチン開発については、我が宮崎大学にて獣医学博士学位を取得し、AVAC ベトナムの CEO として活躍する Dr. Nguyen Van をお招きし、現在東南アジアを中心に使用されているワクチンの有効性について、またアメリカ・カンザス州立大学の Prof. Jurrgen Richt には、新しいワクチン開発について、ご紹介いただきます。

最後に、今回のシンポジウムが、ご参加くださった全ての皆様にとって実りある有意義なものとなり、産業動物関連感染症に関する地域および国際的なネットワークがさらに強固されることを期待します。

鮫島　浩
国立大学法人　宮崎大学　学長

GREETINGS

Hiroshi Sameshima, President
University of Miyazaki

It is my sincere pleasure to deliver the opening remarks for the 14th International Symposium, “Learning from the World: Countermeasures against African Swine Fever,” hosted by the Center for Animal Disease Control (CADIC) at the University of Miyazaki.

University of Miyazaki is located in one of Japan's leading livestock producing prefectures. In cooperation with the national and local governments as well as private agricultural organizations, we have been focusing on education and research with a focus on infectious diseases related to livestock animals. Miyazaki Prefecture has suffered from foot-and-mouth disease (FMD) and highly pathogenic avian influenza (HPAI) in the past. During these crises, we recognized that world-class education and research focusing on infectious diseases of livestock was essential. As a result, CADIC was established in our university, consisting of cross-disciplinary experts across various faculties.

Globally, outbreaks of FMD and HPAI as well as African swine fever (ASF) are spreading in countries neighboring Japan. In addition, classical swine fever invaded Honshu in 2018, and has spread to Kyushu, the center of Japan's swine industry. University of Miyazaki has been holding annual international symposiums to strengthen the network of education and research that contributes to the internationally challenges of preventing infectious diseases in livestock.

This year, under the theme of “Learning from the World: Countermeasures against African Swine Fever,” the symposium will offer the latest insights from various perspectives on ASF prevention strategies that has already been implemented overseas.
From Japan, Dr. Kokuho from National Agriculture and Food Research Organization will provide an overview of the current ASF situation and the progress of research both domestically and internationally. From abroad, Prof. Annick Linden of the University of Liege, Belgium, will introduce the efforts of Belgium, the only country in the world to successfully controlled ASF in wild boars. Also, Dr. Nguyen Van, who holds a doctorate in Veterinary Medicine from University of Miyazaki and is CEO of AVAC Vietnam, will talk about the effectiveness of the vaccine currently used mainly in Southeast Asia. In addition, Prof. Jurrgen

Richt of Kansas State University, USA, will present the latest developments in vaccine research.

Finally, I hope this symposium will be fruitful and meaningful to all participants and it will further strengthen the national and international networks on livestock infectious diseases.

PROGRAM

13:00- Opening Remarks

Dr. Hiroshi Sameshima, President, University of Miyazaki.

Master of the symposium; Dr. Hirohisa Mekata, CADIC, UOM

Chairperson: Dr. Ryoko Uemura, Faculty of Agriculture, UOM
Dr. Satoshi Sekiguchi, CADIC, UOM

13:10~ (P: 40min, Q: 10min)

1. Overview of Current Status of ASF and ASF Research
   Dr. Takehiro Kokuho
   Senior Executive Research Scientist/WOAH Reference Laboratory for Rinderpest
   Division of Transboundary Animal Disease Research
   National Institute of Animal Health (NIAH)
   National Agriculture and Food Research Organization (NARO)

14:00~ (P: 40min, Q: 10min)

2. Crisis management in case of African swine fever in wild boar, the Belgian experience
   Dr. Annick Linden
   Surveillance Network of Wildlife Diseases, Department of Infectious Diseases, Faculty of Veterinary Medicine, University of Liege, Liege, Belgium.

14:50~ Group Photo & Coffee Break (20 min)

Chairperson: Dr. Tamaki Okabayashi, CADIC, UOM
Dr. Kousuke Notsu, CADIC, UOM

15:10~ (P: 40min, Q: 10min)

3. AVAC ASF live vaccine -an effective solution for prevention of African swine fever
   Dr. Nguyen Van Diep, CEO | AVAC Viet Nam., JSC

16:00~ (P: 40min, Q: 10min)

4. Subunit Vaccine Approaches for African Swine Fever Virus
   Dr. Jurrgen Richt,
   Director of Center of Excellence for Emerging and Zoonotic Animal Diseases, Kansas State University.

16:50~

Closing Remarks: Dr. Ayako Yoshida, Director & Professor, Center for Animal Diseases Control, University of Miyazaki

19:00~

Reception

ABSTRACTS

Overview of Current Status of African Swine Fever and African Swine Fever Research

Takehiro Kokuho
Division of Transboundary Animal Disease Research, National Institute of Animal Health (NIAH), National Agriculture and Food Research Organization (NARO), Japan
takehiro@affrc.go.jp

In August 2018, African Swine Fever (ASF) hit the heart of Asia's pork industry, with China as the epicenter. The disease then spread throughout the Asia-Pacific region. As of July 2024, only three regions—Japan, Taiwan, and Sri Lanka—remain free from ASF, excluding Brunei where no pork production exists. Meanwhile, ASF is intruding into Western Europe through Russia and Central Europe and reaching the American continent via Caribbean countries.

Due to its severe pathogenicity and impact, ASF virus (ASFV) has drawn significant research interest in developing effective countermeasures, such as vaccines. However, hundreds of previous vaccine trials have failed to demonstrate reliable efficacy in protecting animals from this devastating disease. Recently, two different ASF vaccines composed of attenuated live viruses have been approved for clinical use in Vietnam, with field applications starting in 2022. Extensive scientific knowledge and advanced techniques have continuously been developed and globally invested in combating ASF effectively.

The potential introduction of ASFV into Japan would seriously threaten our pig production industry. Compounding this issue, another severe porcine disease, Classical Swine Fever (CSF), has re-emerged in Japan since September 2018 after 26 years of eradication. Consequently, we must simultaneously address two distinct yet visually similar diseases. To mitigate the risk and potential damage to the livestock industry and public food supply, we are conducting ASF and ASFV research with government support. Our efforts focus on developing rapid and sensitive diagnostic tools for prompt disease detection and establishing new technologies to allow reliable vaccines to be substantialized.

In this lecture, I will discuss the virological and pathological features of ASFV, the current situation of ASF epidemics, and recent research advancements made by our team and other international researchers. Also, I will propose strategies to minimize the impact of ASF on global pork industries.

Crisis management in case of African Swine Fever in wild boar, the Belgian experience

Annick Linden[1*], Alain Licoppe[2] and Marc Herman[2]

[1.] *Fundamental and Applied Research for Animals and Health (FARAH), Faculty of Veterinary Medicine, University of Liège, 4000 Liège, Belgium*

[2.] *Department of Natural and Agricultural Environment Studies, Public Service of Wallonia, 5030 Gembloux, Belgium*

**Presenter, Corresponding author: a.linden@uliege.be*

On September 2018, the presence of African swine fever (ASF) was confirmed in wild boar in Belgium. The positive cases were detected in south-east of the country (region of Wallonia), near the borders with France and Grand Duchy of Luxembourg. While the origin remains unknown, the focal introduction of the virus into the country is most likely linked to human intervention.

Upon confirmation of the first cases, the competent authorities for wild and pig sectors, respectively, the Public Service of Wallonia and the Federal Agency for the Safety of the Food Chain reacted immediately and in close collaboration with the national reference laboratory, the University of Liège and the Civil Protection. Regulated European Union (EU) disease control zones were imposed (an infected zone and non-infected peripheral 'white' zones) and management measures were implemented. The objectives were twofold, to prevent the transmission of the disease to domestic pigs and to limit the spread of the virus in wild boar populations.

The first targeted measure was the preventive culling of domestic pigs in the infected zone with a ban on repopulation. Biosecurity measures were imposed in all Belgian pig farms. At the same time, strict measures were quickly implemented in the wild sector, e.g. biosecurity, complete standstill of any activity in the infected forest, organized searching and removal of the infected carcasses, fencing and depopulating. Hunting associations were involved to reduce wild boar populations in the white zones. The management zoning encompassed 1106 km^2 with a maximum of 598 km^2 of infected area. All these management measures were implemented simultaneously. They were adapted based on the zoning and the epidemiological situation, which was continuously monitored through virological analyses performed on all found dead and culled animals. A total of 5338 wild boar were analysed and 833 cases were detected ASF-positive.

Belgium regained its ASF-free status at EU level in November 2020 (26 months after the first notification). And the World Organization for Animal Health (WOAH) approved the 'all swine' ASF free status of Belgium in December 2020.

AVAC ASF live vaccine

An effective solution for preventing African Swine Fever

Nguyen Van Diep*, Nguyen Van Duc, Vu Xuan Dang, Tran Ngoc Tiep, Bui Thi Tham, Giang Phương Thuy, Nguyen Trung Thanh, Tran Thi Nhan, Nguyen Thi Ngoc

AVAC Viet Nam Joint Stock Company

**Presenter, Corresponding author:* diepnv@avac.com.vn

African swine fever (ASF) poses a significant threat to the global pig industry, causing substantial economic losses. To address this issue, AVAC Viet Nam Joint Stock Company (AVAC) developed the AVAC ASF LIVE vaccine using the attenuated ASF-G-ΔMGF vaccine strain propagated in a macrophage-derived cell line (DMAC). This vaccine was approved for use in Vietnam in July 2022 and is recommended for a single-dose administration to fattening commercial pigs aged 4 weeks and older, offering protective immunity for more than 5 months.

Our series of experiments and field trials showed that the AVAC ASF LIVE vaccine is safe and effective for piglets aged 4 weeks and older. The vaccinated piglets developed protective immunity within two weeks post-vaccination and remained healthy even when given a 25-fold overdose of the vaccine or challenged with a highly virulent virus strain 4 weeks later. Minimal shedding of the vaccine virus was observed in vaccinated pigs, and no virulent reversion occurred in five back passages. The vaccine did not affect the growth performance of pigs or interfere with other vaccines. It was also proved to be safe for gilts, sows, boars, with no vertical transmission of the virus from sow to offspring. Over 2 million doses of AVAC ASF LIVE have been administered to pigs in Vietnam and the Philippines so far. ELISA tests showed 89-100% positivity for anti-ASF antibodies 4 weeks post-vaccination. Mass vaccination programs in certain provinces in Vietnam demonstrated good safety and high effectiveness. Considering the positive results obtained, the AVAC ASF LIVE vaccine is recommended as a key solution for controlling the African Swine Fever Virus.

Subunit Vaccine Approaches for African Swine Fever Virus

Juergen A. Richt, DVM, PhD
Kansas State University, Manhattan, KS 66506, USA

African swine fever (ASF) is a highly contagious viral disease that causes high mortality in domestic swine and wild boar (*Sus scrofa)*. There are currently no commercially available vaccines or therapeutics, except for a live-attenuated vaccine which was recently licensed for use in Vietnam. Currently, outbreaks are mitigated through strict quarantine measures and slaughtering of affected herds, resulting in massive economic losses to the global pork industry and a significant threat to the global food supply. Historically, ASF virus (ASFV) was restricted to Sub-Saharan African countries until outbreaks emerged between 1950s and 1980s in Europe, Russia, and South America; by 1990s ASFV was confined to Africa and Sardinia where it remained endemic. In 2007, an outbreak in the country of Georgia resulted in the spread of ASFV into eastern and western Europe and throughout Russia. In 2018, China reported the first outbreak in Asia. By 2019, ASFV was reported in neighboring countries including Cambodia, Korean Peninsula, Laos, Mongolia, Myanmar, Philippines, and Vietnam. In the past 3 years, ASFV outbreaks have also been reported in India, Thailand, Malaysia, Germany, Sweden, Bangladesh, Albania, and on Hispaniola, an island in the Caribbean. In my presentation, I will discuss: (i) the virus, its epidemiology and mode of spread; (ii) the impact of ASF outbreaks on the global swine industry and on global food security; and (iii) diverse subunit approaches to ASF vaccinology.

第 14 回 CADIC 国際シンポジウム企画・実行委員

鮫島　浩　(大会委員長)

岡林　環樹（実行委員長）

新　竜一郎、井口　純、石井康之、井田隆徳、井上典子、入江隆夫、上村涼子、梅北邦彦、大澤健司、押川絵里、尾之上高哉、河原　聡、北原　豪、小林郁雄、齊藤　暁、坂本信介、佐藤裕之、嶋本　寛、関口　敏、高橋俊浩、田上普美子、田中秀典、谷口喬子、徳永忠昭、西内朝子、野津昴亮、林　康広、日髙勇一、平井卓哉、松井優人、丸山治彦、三澤尚明、目堅博久、山﨑朗子、山田健太郎、山本直之、吉田彩子、HOMBU Amy

（五十音順）