APPENDIX D
SAES-422
Format for Multistate Research Activity
Accomplishments Report

Project/Activity Number: NC-229. Title: PRRSV and other emerging viral diseases of swine

Period Covered: October 1 2014 to December 31 2014

Date of This Report: February 3 2015

Annual Meeting Date: December 7, 2014

Participants:

The following station reps attended the meeting, representing their respective stations:

Eric Nelson South Dakota State U. (SDSU); eric.nelson@sdstate.edu
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Brief summary of minutes of annual meeting: (2,794 characters)

The 2014 NC229 meeting took place on December 7 2015, at the Marriot Downtown Hotel, Chicago Illinois, as part of Pre-CRWAD satellite events. Meeting starts at 1PM with an attendance of 61 persons, being represented the above-mentioned stations (See the list above). The Agenda for the meeting is shown in table 1. After initial informative sessions by Chair Osorio, Administrative Advisor Benfield and USDA NIFA personnel, the topic of possible unification of the North American PRRS Symposium and the NC229 Technical Committee meeting was discussed. The discussion was led by Dr Bob Rowland, Dr David Benfield and Dr. Fernando Osorio. The conclusions reached re. this point are:

- NA PRRS symposium 2015 will be conducted again in the same venue (intercontinental Hotel) on Fri and Saturday.
- The future NA symposium will cite/include NC299 as one of the entities or groups co-organizing the NA PRRS symposium.
- The NA symposium management will invite NC229 to takes part in selecting/organizing the “basic science part” of the NA PRRS symposium.
- NC2229 will conduct its annual meeting for 2015 in the same place as usual (Marriot) and will expand its meeting to Sunday morning and Sunday afternoon pre-CRWAD.

- The conversations will continue next year towards a more complete integration of both entities

Next, started (at 2:35 PM), the individual research presentations (Table 1). At 5:30 PM the meeting is adjourned.

TABLE 1. NC229 meeting Sunday, Dec. 7, 1 PM to 5:30 PM
Denver/Houston/Kansas City Room, 5th Floor
Marriot Hotel Down Town ("Magnificent Mile")

Time	Speaker	Title/content
1:00	F. Osorio(Chair) / D. Benfield (Administrative Adviser), NC229	Welcome and introduction
1:05	P. Johnson/M. Holland, USDA AFRI-NIFA	Animal health funding by AFRI-NIFA announcements and perspectives for FY 2016
1:35	NA symposium/NC229 /CRWAD joint planning	Integrating the North American PRRS Symposium , NC229 and CRWAD in future years
2:35	Dan Rock , UIUC	Prospects for ASF Vaccine Development
2:55 -3:05	Break (10 min)	
3:05	L.G. Giménez-Lirola, ISU	ASFV: rp30 ELISA in serum and/or oral fluid
3:20	S. Ramamoorthy, NDSU	Swine and human torque teno-viruses, possibility of crossing species?
3:35	Y Fang, KSU	PRRSV: Molecular mechanisms for attenuation based on PRRSV-NSp2
3:50	V Hiep, UNL	Synthetic consensus PRRSV type 2 virus that confers heterologous protection
4:05	KJ Yoon, ISU	PEDV pathogenesis studies at ISU
4:25	K Jung OSU Food An Health	Experimental infection of Porcine delta-coronavirus in germ-free pigs
4:40	Crystal Loving, NADC	Flu Live attenuated vaccines: Mucosal correlates of cross-protection in pigs.
4:55	M Khatri OSU Food An Health	Poly I:C adjuvanted inactivated swine influenza vaccine : heterologous protection
5:10-5:30	Osorio & Yoon (Vice Chair NC229)	Round discussion, recommendations for next year, closure

Accomplishments: (maximum 30,000 Characters)

Objective 1. Control of PRRSV

In objective 1, the major areas of achievements by the NC 229 group which was continuation from previous year included:

1.1 Innate immunity against PRRSV. Studying the effect that different NSPs of PRRSv may have on innate immunity mechanisms, on apoptosis, or the capacity for modulating overall immune response by strains that cause stimulation of IFN rather than suppression. The stations focusing in this area were: UCONN, UIUC, KSU, OSU, China Agr U, NADC, SDSU and UMD

1.2 PRRSV immunity and vaccinology. Understanding correlates of immunity and mechanisms to broaden protection, including neutralizing antibodies, developing of naturally occurring or synthetic strains of PRRSV inducing broader protection, DIVA marker systems, etc. The stations that focused studies on this area were: UMN, UMD, VPI, -NADC, UNL, UIUC, UWI, ISU, and KSU

1.3 Virulence of PRRSV. Understanding virulence factors/markers, some including co-infection with bacteria. The stations that focused studies on this area were: NADC and China Agr U

1.4 Genetic mapping of resistance to PRRSV infection: BARC, KSU, and ISU

1.5 Epidemiology of PRRSV transmission and virus evolution: UMN, ISU, and UWI

Objective 2 Developing effective and efficient approaches for detection, prevention and control of pressing viral diseases of swine of recent emergence.

In objective 2, the major areas of achievements by the NC 229 group included:

2.1 ascertaining pathogenesis and transmission of and establishing diagnostics and reagents for PEDV:(ISU, UMN, OSU, KSU)

2.2 genomics and replication of PCV and novel ss DNA viruses of swine (NADC)

2.3 Genetic and antigenic evolution of swine influenza virus (SIV) and epidemiology of transmission of SIV (NADC and UGA) testing of SIV vaccines in vivo (NADC) and in vitro models (UGA) testing of adjuvants for SIV inactivated immunogens (NADC)

Impacts: (500 characters per impact)

During the first two months of the NC-229 (2014-2019) project, most of the participating stations report outcomes of finished or ongoing projects, all of them correspond to year 2014 and carry from the previous NC-229 project (2009-2014). Much of this work has great potential for impact in swine health and economics. A sizable, very positive parameter that permits to anticipate important long term impacts for this next 5 year project is the number of publications submitted by the group in this starting year. As shown in the pdf document attached under Publications (see below) the NC-229 group has published a total of 162 refereed journal publications, 92 abstracts for proceedings and 5 multi-author book chapters. A

non-comprehensive list of impacts related to major swine viral pathogens, consisting only of some examples, follows:

Impacts in vaccinology:

The CLR porcine DC-SIGN of dendritic cells and the SAVE approach studied (VATech)

Role of by PRRSV strain IFN positive on vaccine improvement (UMD)

Advances in PRRSV vaccines inducing broadly neutralizing antibodies and vectored vaccines for ASFV (KSU)

Development of ZMAC cell line and the PRRS virus vaccine strain G16X (UIUC)

A synthetic consensus vaccine PRRSV strain to achieve heterologous protection against PRRSV (UNL)

Impacts in diagnostics :

Diagnostic technology contributing to the improvement and refinement of surveys, detection, and diagnosis PRRSV, PEDV, PCV2, IAV, ASFV, and other emerging viral infections (ISU)

Fluorescent focus neutralization (FFN) assay was developed to assess functional neutralizing antibody responses to PEDV in serum, and other biological fluids (OSU)

A serology ELISA , Mabs and swine coronavirus real time PCR sPEDV diagnosis (SDSU)

Significant advances in swine vaccinology (DIVA and virulence PRRSV) and Influenza vaccine and diagnostic (UNL, NADC)

Contributing to the diagnosis of swine torque tenovirus (TTSuV').. (NDSU) and other ss DNa viruses (NADC)

Impacts in basic pathogenesis and immunogenetics :

Advances in understanding virulence of highly pathogenic PRRSV (CHINA Agr U)

Genetic resistance to PRRSV : a major QTL on SSC4 explaining a substantial proportion of the genetic variance in resistance to PRRSV(BARC)

Advances in swine vaccinology PRRSV virulence and PEDV immune correlates (OSU)

Studying the role of IFN beta in protective immunity against PRRSV. UCONN

Impacts in epidemiology:

Advances in particle size-associated air transport of viruses (UMN)

Swine Health Monitoring Project monitoring PRRSV outbreaks (UMN)

Mathematical modelling and the effect of vaccination, the effect on SIV transmission (UMN)

Publications/funding sources: (maximum 50,000 characters) See attached document (**Publications and funding. Pdf**)

Authorization: Submission by an AES or CES director or administrative advisor through NIMSS constitutes signature authority for this information.

*Limited to three pages or less exclusive of publications, details may be appended.