

Our Latest Research Results - November 2011

Development and Evaluation of One-Step rRT-PCR and Immunohistochemical Methods for Detection of Rift Valley Fever Virus in North American Biosafety Level 2 Diagnostic Laboratories

Authors: B.S. Drolet, H.M. Weingartl, J. Jiang, J. Neufeld, P. Marszal, R. Lindsay, M.M. Miller, M. Czub, W.C. Wilson

Submitted to: Journal of Virological Methods
Spread of Rift Valley fever virus from endemic areas to North America is a serious threat to livestock, wildlife, and people. Currently, regional diagnostic labs do not have the ability to diagnose RVFV because all diagnostics and reagents available must be used in high containment labs. In this study, we developed and evaluated two diagnostic assays to detect virus that can be safely run in typical veterinary diagnostic labs. These assays will give our regional diagnostic labs the capacity to diagnose RVFV in the event of an introduction. Contact Barbara Drolet, telephone 785-537-5569, email Barbara.Drolet@ars.usda.gov

Epizootic Haemorrhagic Disease

Authors: G. Savini, A. Afonso, P. Mellor, I. Aradaib, H. Yadin, M. Sanaa, W.C. Wilson, F. Monico, M.A. Domingo

Submitted to: Research in Veterinary Science
This paper provides a comprehensive review of non contagious viral disease of deer that some strains have also been shown to be associated with disease in cattle. The causative viral agent is epizootic haemorrhagic disease virus that belongs to the same family of viruses as bluetongue and African horse sickness virus. This review includes the most recent information regarding the virus and the disease as well as tools for its diagnosis and control. The authors conclude that more attention should be drawn to both EHDV and factors affecting the disease. Contact William Wilson, telephone 785-537-5570, email William.Wilson@ars.usda.gov

Potential Effects of Rift Valley Fever in the United States

Authors: D.M. Hartley, J. Rinderknecht, T.L. Nipp, N. Clarke, G.D. Snowder

Submitted to: Emerging Infectious Diseases
A panel of U.S. experts was brought together to identify research gaps in the current understanding of a deadly zoonotic disease, Rift Valley fever, found in Africa and

the Arabian peninsula. Heavy economic costs through loss of livestock result when outbreaks occur. The panel's discussions and recommendations are summarized in this report with an emphasis on the information need for computer risk assessment models related to economic and virus spread should the causative agent be introduced into the U.S. Contact William Wilson, telephone 785-537-5570, email William.Wilson@ars.usda.gov

Arthropod Surveillance Programs: Basic Components, Strategies and Analysis

Authors: L.W. Cohnstaedt, K. Rochon, A. Duehl, J. Anderson, R. Barrera, N.-Y. Su, A. Gerry, P. Obenauer, J.F. Campbell, T. Lysyk, S.A. Allan

Submitted to: Annals of the Entomological Society of America
Effective insect monitoring stresses a careful consideration to the way insects are captured, the technology to capture them and the way to analyze the results. The basic principles and technological components of insect monitoring plans are described, as promoted in the symposium "Advancements in arthropod monitoring technology, techniques, and analysis" presented at the 58th annual meeting of the Entomological Society of America in San Diego, California. Interdisciplinary examples of arthropod monitoring for urban, medical and veterinary applications are reviewed. Effective surveillance consists of the three components: 1) sampling method, 2) trap technology, and 3) analysis technique. A sampling method consists of selecting the best device or collection technique for a specific location and collecting at the proper spatial distribution, optimal duration and frequency to achieve the surveillance objective. Optimized sampling methods are discussed for several mosquitoes and ticks. Trap technology refers to modifications to sampling equipment that increases trap capture efficiency for the targeted arthropod. The advantages and limitations of novel terrestrial and aerial insect traps, artificial pheromones and insect odors are presented for the capture of red flour beetles, small hive beetles, bed bugs, and midges respectively. The objective is to determine what is happening in the real world from the sampled information. Therefore a proper analysis technique is necessary.

Contact Lee Cohnstaedt, phone 785-537-5592, email Lee.Cohnstaedt@ars.usda.gov

Review Articles and the Depreciation of Scientific Currency

Authors: L.W. Cohnstaedt, E. Schmelz, J. Poland

Submitted to: Science

Scientific success is often quantified by the number of times the published results are cited by other manuscripts. The more frequently an article is used the greater the impact. However, with the advent of review articles that summarize a large number of manuscripts, citation numbers have started a disturbing trend. Review papers are being cited at a frequency on par with novel discoveries that indicates they revolutionized the field. Although review papers are valuable contributions which summarize previously published data in a novel way or offer a new perspective, they are being cited instead of the original works, which causes a confusing and unusual paradox where the impact of a review article may be higher than the original research cited in the review. Several explanations for the over citation and overreliance of review papers are addressed and authors, reviewers and editors are encouraged and challenged to confront citation misuse. The trend of overcitation of review articles must change because currently if one aspires to be a "citationally successful" scientist, a logical strategy would be to forgo original research and focus on writing review papers summarizing the research of others.

Contact Lee Cohnstaedt, telephone 785-537-5592, email Lee.Cohnstaedt@ars.usda.gov

A 96-Well Microtiter Assay for Determining Total Phenolic Content, Flavonoid Content and DPPH Activity in Sorghum Bran and Flour

Authors: T.J. Herald, P. Gadgil

Submitted to: Journal of Agricultural and Food Chemistry

A method was developed to determine the amount of health promoting compounds in sorghum. The new method proved to be almost three times faster and more cost effective than conventional methods. This method will be ideal for breeders that need to screen large quantities of experimental sorghum lines for health promoting benefits.

Contact Thomas Herald, telephone 785-776-2703, email Tom.Herald@ars.usda.gov

Characterization of Sorghum Grain and Evaluation of Sorghum Flour in a Chinese Egg Noodle System

Authors: L. Liu, T.J. Herald, D. Wang, J.D. Wilson, S. Bean, F. Aramouni

Submitted to: Journal of Cereal Science

Sorghum is a gluten free grain that has the potential to be used as an alternative to wheat flour for the Celiac Sprue market. There are thousands of sorghum lines that have not been characterized for grain, flour or end product quality. The objective of the research was to

gain an understanding among grain sorghum quality factors and Chinese egg noodles quality. Four sorghum hybrids were characterized and evaluated for kernel characteristics, proximate analysis, flour composition and end product in a Chinese egg noodle system. Through control of sorghum grain quality and flour quality characteristics it is possible to manufacture a good quality Chinese egg noodles.

Contact Thomas Herald, telephone 785-776-2703, email Tom.Herald@ars.usda.gov

A Neo-Sex-Chromosome that Drives Post-Zygotic Sex Determination in the Hessian Fly

Authors: T.R. Benatti, R. Valicente, R. Aggarwal, C.Y. Zhao, J.G. Walling, M.S. Chen, S.E. Cambron, B.J. Schemerhorn, J.J. Stuart

Submitted to: Genetics

Hessian fly is a destructive pest of wheat and also a model organism to study genetics and plant/insect interactions. Hessian fly has four different types of sexes: male, female producing only female offspring, female producing only male offspring, and female producing both male and female. The genetics for determining these four types of sexes is not previously known. In this study, we found that two small regions of chromosome A1 are associated with sex determination through inversion. This research provides the foundation for further research that should lead to the cloning of the gene(s) that determine sex types. The finding enriches our understanding of the basic biology on the evolution of sex development from insects to higher organisms. This and future research on this subject may also lead to practical applications such as new pest management technologies based on affecting sex ratio of insects. Contact Ming-Shun Chen, telephone 785-532-4719, email Ming-Shun.Chen@ars.usda.gov

USDA-ARS Center for Grain and Animal Health Research

1515 College Avenue
Manhattan, KS 66502

800-627-0388
ars.usda.gov/npa/cgahr

