

Veterinary Entomology

Special Interest Articles:

- Kissing Bugs
- Lone Star Ticks spreading diseases
- New Ear Tag
- Bovine Anaplasmosis



Individual Highlights:

Insect Updates	1
Pesticides	1
Cattle Care	2
Disease/Health	2
Special Topics	3
Journals	4

Insect Updates

Kissing Bugs - No they are not new, you just didn't know

Kissing bugs are all the new hype these days and that is good and bad. The attention is needed, but it needs to be accurate and correct.

The kissing bug has been here forever, oldest records confirm its presence in the 1800's; you just did not know it until recently.

Chagas disease was first discovered in the gut / feces of kissing bugs of South America in the early 1900's by Carlos Chagas.

So, why all the new found interest? Well that is how the media works. Plus some excellent researchers



started to take notice when canine incidence of Chagas began to rise.

It is true that a human can in fact get Chagas disease in Texas but it is a 1 in 900-4000

chance. There is a greater chance that your canine pals will get it before you and this is because they have a tendency to eat the infected bugs.

If you see a kissing bug, contact your local County Extension agent or Entomology Specialist or kissingbug.tamu.edu. You bug is wanted for questioning. Be careful when handling.

Also go to <http://agrilife.org/next/2015/12/07/kissing-bugs-and-chagas-disease/> to view a presentation on kissing bugs and Chagas.

Lone Star Ticks may be spreading a New Disease across USA

The number of reported Rocky Mountain spotted fever cases has been on a surge since 2000 but many of the individuals reported with it were only having mild symptoms and no fatalities.

This, of course, has been puzzling to RMSF experts since RMSF is a very nasty disease that results in death without treatment.

A recent publication in the Am.

Pesticides

Bayer's new insecticide ear tag - Tolfenpro

Bayer HealthCare Animal Health has a new insecticide ear tag on the market and it has a new active ingredient,

Journal of Topical Medicine and Hygiene reports that this milder RMSF might in fact be an entirely different ailment. This one is caused by *Rickettsia amblyommii* instead of *Rickettsia rickettsii*.

This newly discovered increase in false RMSF (as I'll call it) is due to the recent habitat spread for lone star ticks. They have always been in the south but now they have moved to the

northeast and west. Lone star ticks are aggressive biters of humans and wild-tailed deer. Mild winters have made it possible for them to survive outside their original range.

This is good and bad news. Good because there appears to be some immunity to *R. rickettsii* that comes with contracting *R. amblyommii* but also bad because it makes it harder to find official RMSF outbreaks.

Avermectin scientist awarded Nobel Prize for Medicine

Dr. William Campbell and Dr. Satoshi Omura were awarded a share of the prestigious 2015 Nobel Prize for Medicine for their discovery of avermectin. The

active ingredient has revolutionized the animal-health industry and also led to the treatment of some of the most devastating parasitic diseases, including river

blindness in humans and dog heartworm.

This honor is being share with Youyou Tu for her discovery of a novel therapy against Malaria.



Cattle Care Veterinary Feed Directive

There is no use hiding; it is coming, so you need to be prepared.

VFD drugs are 'new animal drugs' intended for use in or on animal feed which are limited to use under the professional supervision of a licensed veterinarian.

The change comes from the

pushing of outside organizations for more FDA regulations of livestock antibiotic use in the dawn of antibiotic resistance on the human health side.

Medically important antibiotics that have been noted are:

Tetracyclines, Aminoglycosides, Potentiated sulfas, Macrolides

How VFD will work.

VFD is not a prescription per say but more like a permit that specifies the group of animals to be treated and duration of use or time frame to do so.

This does not go into effect until Jan 2017 but you need to develop a veterinarian-client-patient-relationship now so that you are prepared.

"The VFD regulations will shift medically important feed-grade antibiotics into the responsibility of veterinarian," says Dr. Jessica Laurin.

Farmers should test hay to improve cattle health

Due to the wet spring and summer, hay harvest was delayed in many places.

Mature hay has less energy than hay cut earlier.

Only way to know if your hay will meet the nutritional needs is to have it tested.

Mineral needs of cattle throughout the year

Minerals are important building blocks of functional life. A 1,500-pound beef cow may need supplemental minerals during several crucial periods throughout the year.

A beef cow requires both macro minerals and trace elements.

It is important to have proper mineral balance in the forages a cow might be consuming and be aware of the demand the cow has for those minerals.

Management of minerals comes with assessing the needs of the animal. For example, gestating cows have different requirements

than lactating cows.

Have the forage analyzed for mineral content and then work with your veterinarian or beef nutritionist to determine proper supplementations.

Don't put off the minerals, a good mineral program should remain important.

motivation in order to effectively reduce the risk of mastitis.

Mastitis Perspective

In order to combat mastitis, one must follow the practices of post-milking teat disinfection, blanket dry cow therapy, coliform mastitis vaccines and inorganic bedding.

But in addition to these practices a farm must also have a positive attitude for their ability to combat mastitis, effective communication, strict protocols and proper

Human & Animal Disease & Health

4 cases of human plague in New Mexico

Four cases of plague have been confirmed in two counties in New Mexico. All the individuals were over the age of 50 and one passed away from the illness.

Bovine Anaplasmosis

Anaplasmosis has been the buzz this year in the south but many are not sure what it is.

Anaplasmosis is a disease of the blood caused by the parasite *Anaplasma marginale* in cattle. It is seen worldwide and reported in at least 40 states.

Disease outbreaks can lead to death due to anemia of adult cattle, in addition to abortions, decreased weight gain, bull fertility and treatment costs.

A. marginale is transmitted two different ways, mechanically and biologically vectored.

Mechanical can occur via infected needles,

Plague is a potentially fatal illness in people that occurs in many areas of NM. It is caused by a bacteria found in rodents (squirrels, rabbits & pack rats) and transmitted to people through the

dehorners, ear taggers, castration knives or other surgical instruments. Research shows that 6 out of 10 calves exposed to an injected needle used on a carrier calf will become infected.

Another mechanical way of transmission is through the infected mouthparts of biting flies such as horse flies, deer flies and mosquitoes. Mechanical transmission is short lived since the parasite cannot survive long outside the body.

Anaplasma can also be transmitted biologically by winter ticks. The ticks receive the parasite from an infected animal and replicate it for up to a year. In which time they can transmit to other animals.

bite of infected fleas.

Dogs and cats are also susceptible to plague. It is believed the infected fleas are coming into homes by dogs and cats.

Anaplasmosis clinical signs are most severe in adult cattle. Calves less than one year do not show clinical signs but will become carriers for life. Cattle 1-3 yrs old will show increasingly more severe clinical signs. Cattle over 3 yrs old that are newly infected will show the most severe clinical signs and 30-50% will die if not treated early.

First signs of infection for most are death, but if observed frequently cattle will start to fall behind the herd and will not eat or drink.

Treatment is necessary early on and there is a vaccine.

Antibiotic usage and resistance concerns

According to the CDC, antibiotic-resistant bacteria cause at least 2 million human illnesses and 23,000 human deaths in the US every year, costing \$20 billion a year in direct health costs and up to \$35 billion in indirect health costs.

A national task force was created of leading animal agriculture experts to address this worldwide problem.

The task force plans to create university-based collaborative pilot projects on combatting antibiotic resistance, work with Congress & USDA to increase access to veterinary care in rural communities and form a national consortium of researchers to conduct in-depth studies and implement possible solutions.

Overuse and improper use of antibiotics have reduced the effectiveness of many antibiotics and this is making it risky for surgery and cancer patients.

This can be changed with antibiotic stewardship programs, improved hospital infection control, educating physicians and the public on proper use of antibiotics, widespread vaccination.

Vesicular Stomatitis outbreak continues with mild fall weather

This year's summer outbreak of VS has affected 722 premises as of October 28, in 8 states: AZ, CO, NE, NM, SD, TX, UT, and WY.

57 of these cases showed up in the last week of October and this is in part due

to the mild fall season. Freezing temperatures kill off the insect vectors that spread the virus and provide relief in the winter months.

VS is a rhabdovirus with two serotypes. Clinical signs of VS, which can affect

equines, cattle, bison, sheep, goats, pigs and camelids include vesicles, erosions and sloughing of the skin on the muzzle, tongue, teats and above the hooves.

Mycoplasma pneumonia in dairy calves

Mycoplasma pneumonia is caused by *Mycoplasma bovis* and is highly contagious and spreads by respiratory aerosols, respiratory secretions, nose to nose contact, feed, water, bedding material, feeding equipment

and workers.

The highest incidence of disease is usually in calves that are housed in group pens and are suffering from environmental stress.

This organism is able to invade tissue, establish an infection and

cause clinical disease. Pneumonia in dairy calves is usually the most common disease caused by *M. bovis*.

It can be spread from the lungs through the bloodstream to other parts of the body. It also causes mastitis in mama cows.

APHIS proposes rule to update National Scrapie Eradication Program

The proposed changes:

- Aligning the identification requirement for goats with current sheep identification requirements.
- Formalizing the use of genetic testing
- Increasing flexibility for how investigations can be conducted and

allowing the epidemiology in a specific flock to be given more consideration in determining flock and animal status.

- Requiring States to meet surveillance minimums to remain Consistent States
- Moving the following from the regulations to program standards

- List of Consistent States
- Allowed identification devices and methods and restrictions on their use
- Disease status classification procedures for flocks & animals
- Program approved tests for scrapie

France to vaccinate livestock following bluetongue outbreak

France prepared a widespread vaccination campaign for livestock following an outbreak of bluetongue disease on a farm in the center of the country.

France had been declared bluetongue free on the mainland since 2012 and its return could lead to restrictions of live animal exports in another setback for livestock farmers.

Authorities introduced a 150 km wider restriction zone around the farm and ordered 1.3 million doses of vaccine to tackle the disease.

Origin of outbreak is unclear.

K-State research stimulates economic impact of FMD outbreak

FMD is an infectious and highly contagious disease of livestock and one of the most economically important diseases.

Simulation models help prepare for

potential outbreaks.

If a FMD outbreak were to occur in this region and no emergency vaccination program was implemented, the research found

estimated losses to producers & consumers at approx. \$188 billion and gov't losses at \$11 billion. With emergency vaccination this drops to \$56 billion & \$1.1 billion.

Special Topics of Interest

Merck apps help veterinarians and clients develop protocols

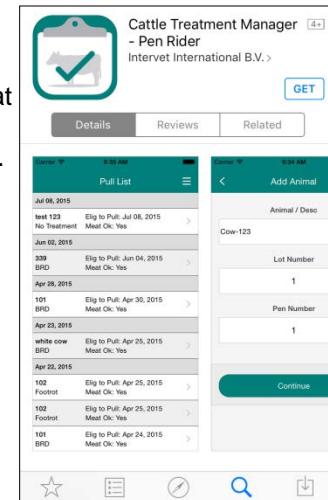
Merck Animal Health has developed a series of apps to help beef producers and dairy operators plan and document comprehensive health protocols for their herds.

The "Herd Health Manager" app is currently available and the "Cattle

Treatment Manager" and "Dairy Herd Health" apps are in final development for early 2016.

Merck veterinarian Kevin Hill says each of the apps is intended to help veterinarians provide expanded herd-

health services to clients and develop veterinarian-client-patient relationships.



Who speaks for the farmer?

Across the US there are people who feel they have the right to speak about the food and fiber industry with no related degree, no agricultural experience and no sound research to support their views.

Most are well-spoken and confident, they spread fear and distrust.

We need to support our industry!

Researchers say eat more animal protein

Nutrition researchers and dieticians are changing their tune about the benefits of increasing protein in our diets.

Valid science shows that higher-protein diets support body weight

Seven things you can do:

- Check local college continuing education classes
- Ask for class syllabus for food & ag courses; if info is inaccurate, question those who can bring about change
- Offer to serve as a resource, or talk to students so they can hear from a real farmer
- Attend seminars offered at the local health food store or community center

- Send replies to friends on social media sites who share inaccurate information
- Write letters to the editor in newspapers and magazines when you disagree with what is written
- Gather information from ag resources so you have brochures or pamphlets on modern agriculture you can share with friends.

control; early research suggests increasing protein intake from middle age forward, together with increased physical activity, may improve retention of muscle mass and reduce frailty

list of variables, such as physical activity and BMI.

Take-away message – researchers can't control for the many variables that affect health and well-being, so a blanket statement quantifying the risk reduction involved in cutting back 5% on saturated fat is ludicrous.

Judge keeps farm data out of activists' hands

In late September, a U.S. District Court judge tossed a lawsuit brought by animal rights and environmental activists over the EPA's withdrawal of a proposed Clean Water Act rule that would have required farmers and ranchers to report information about their livestock operations.

"The Court will not substitute its judgment about how the EPA should go about collecting information for the Administrator's reasonable determination of what is appropriate to effectuate the Agency's statutory mandate," U.S. District Judge Randolph Moss.

I can't believe it's the butter

Harvard reports that butter is unhealthy and would lead to cardiology issues.

The study examined 7,667 people for several years and their results were "replacing 5% of energy intake from saturated fats with polyunsaturated fats, monounsaturated fats, or

carbohydrates from whole grains" would lower risk of CHD by 25%, 15% & 9%.

2 major flaws with the study; 1) relying on dietary recall is notoriously difficult to analyze, people just aren't that accurate and 2) the authors said that they controlled for a

Plus, do the math, 5% of the daily saturated fat is only about 12 – 13 calories, not talking a massive reduction.

Journal Reviews

Persistence and retention of porcine reproductive and respiratory syndrome virus in stable flies (Diptera: Muscidae). 2015. Rochon et al. J Med Entomol. 52: 1117-1123

The researchers fed stable flies blood with porcine reproductive and respiratory syndrome virus (PRRSV). Stable flies acquired the PRRSV from the bloodmeal

and this amount declined with time, indicating that the virus did not replicate in the flies but were capable of transmitting it.

The Impact. PRRSV is an economically important disease of swine transmitted by contact and house flies and mosquitoes, this just verifies another possible means of transmission.

Selection and preliminary mechanism of resistance to profenofos in a field strain of *Musca domestica* (Diptera: Muscidae) from Pakistan. 2015. Khan et al. J Med Entomol. 52: 1013-1017

The authors collected a field strain of house flies that was found to be resistant to profenofos, a heavily used insecticide on dairies in Pakistan. They were able to increase the LC₅₀ values from 50.49 to

176.03 µg/ml within five consecutive generations.

They also found cross resistance occurred to chlorpyrifos and deltamethrin. But if they stopped insecticide usage, the flies were no

longer resistant within 5 generations.

The Impact. Resistance can occur anywhere with over use of pesticides. Always rotate your insecticide classes to prevent it from happening

Trypanosomatids in ornithophilic bloodsucking Diptera. 2015. Svobodova et al. Med Vet Entomol. 29: 444-447

Trypanosomes are known blood parasites found in both birds and mammals. The authors examined 3,270 bloodsucking insects (mosquitoes, black flies and keds) for re-

presence of bird trypanosomes.

All of the insects were found to be infected from 4-8% with one blackfly species reaching 60%.

The Impact. The results of this study provide further proof that blood sucking insects are excellent vectors of blood parasites.

New hosts for the mite *Ornithonyssus bursa* in Argentina. 2015. Santillan et al. Med Vet Entomol. 29: 439-443.

Ornithonyssus bursa is a major pest of poultry and potential vector of arboviruses.

It has rarely been recorded on wild birds but the researchers found it on 11 wild birds, 5 raptors and 6 passerine wild bird species.

Comparison of DNA and carbon and nitrogen stable isotope-based techniques for identification of prior vertebrate hosts of ticks. 2015. Hamer et al. J Med Entomol. 52: 1043-1049

The researchers evaluated DNA-based and stable isotope-based bloodmeal analysis for lone star ticks with chickens as the host.

Ticks of different ages and environmental rearing conditions were

The samples size was too small to make any concrete conclusions but the preliminary presence of these mites on so many different birds is cause for concern.

The Impact. The recorded mite collections on so many different birds

could be economically impacting to the chicken industry and backyard chickens. The presence of these mites is cause for much concern and heartache and if they are able to be spread by wild birds that increases the concerns

Sylvatic infestation of Oklahoma reptiles with immature *Ixodes scapularis* (Acari: Ixodidae). 2015. Garvin et al. J Med Entomol. 52: 873-878.

Reptiles were collected in 9 counties and examined for *Ixodes scapularis* larvae and nymphs to determine seasonal incidence and prevalence.

A total of 209 reptiles, 9 lizards & 7 snakes, were collected. The infestation prevalence of *I. scapularis* collected was 14% for larvae and 25% for nymphs; all from lizards.

The Impact. Successful identification of the vertebrate hosts upon which ticks have fed provides key information to their ecology and transmission of vector-borne diseases.

Rickettsia parkeri transmission to *Amblyomma americanum* by cofeeding with *Amblyomma maculatum* (Acari: Ixodidae) and potential for spillover. 2015. Wright et al. J Med Entomol. 52: 1090-1095

A. maculatum is the recognized vector of *R. parkeri* which causes Tidewater spotted fever but *A. americanum* has been shown to carry it. The researchers wanted to evaluate this more in-depth.

A total of 317 wild collected *A. americanum* ticks were collected and tested for *R. parkeri* (1 positive). This shows a small chance for spillover in nature.

They also fed *A. americanum* nymphs alongside infected *A. maculatum* and got

The Impact. This study just verifies that lizards serve a major role in the survival of *I. scapularis* in the tick's western range, similar to what is seen in the south.

acquisition and maintained infection.

The Impact. This study shows transmission of *R. parkeri* is possible by *A. americanum* and this tick is much more widespread than *A. maculatum*.

American black bears as host of blacklegged ticks (Acari: Ixodida) in the Northeastern United States. 2015. Zolnik et al. J Med Entomol. 52: 1103-1110

Ticks and whole blood samples were collected from American black bears in NJ for a year.

American dog ticks were the most frequently collected but adult and

nymphal blacklegged ticks were found as well.

Bloodmeal quality was analyzed for bears and compared to white-tailed deer. Both were of similar quality and suggest black legged ticks can survive on bears

The Impact. Black bears may help support blacklegged tick populations in areas where they are both present along with *Anaplasma* and *Babesia* pathogens.

Tick abundances in South London parks and the potential risk for Lyme borreliosis to the general public. 2015. Nelson et al. Med Vet Entomol. 29: 448-452

Tick abundances and prevalence of infection with *Borrelia burgdorferi* were investigated in four South London parks.

A total of 360 transects were sampled.

At two parks, 1118 *Ixodes ricinus* were collected and at the other two parks zero ticks were found.

A very low number of collected ticks were found to be positive for *B. burgdorferi* pathogens.

The Impact. This does show the presence of ticks in public parks and a few to be carriers but the take home message is to be mindful of ticks when at public parks, not fearful, the chance of infection was calculated at 0.22.

Widespread *Rickettsia*spp. infections in ticks (Acari: Ixodidae) in Taiwan. 2015. Kuo et al. J Med Entomol. 52: 1096-1102

Recent decades have witnessed the emergence of many novel tick-borne rickettsial diseases, but systematic surveys of ticks and their diseases are generally lacking in Asia.

The researchers collected ticks for 4

years all over Taiwan and identified *Rickettsia* spp. infections at 31.9% from 329 of 2,732 ticks assayed.

Providing evidence that rickettsiae-infected ticks are widespread in Taiwan.

The Impact. This study shows a great lack in understanding of tick-borne diseases and their prevalence in Taiwan and I'm sure other countries. Rickettsial diseases should not be taken lightly.

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Merry Christmas!
&
Happy New Year!

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Factors that influence the transmission of West Nile virus in Florida. 2015. Day et al. J Med Entomol. 52: 743-754

WNV was first detected in the US in 1999 and has since caused extensive epidemics in humans and domestic animals throughout but a comparable epidemic has never materialized in Florida.

The researchers review some reasons why.

Culex nigripalpus is the primary vector in FL and rainfall, drought and temperature are primary factors that regulate populations

The Impact. Environmental factors play a huge influence on the oviposition, blood-feeding behavior and vector competence of all mosquitoes, especially when looking at WNV transmission.

Comparison of the insecticidal characteristics of commercially available plant essential oils against *Ae. aegypti* and *An. Gambiae*. 2015. Norris et al. J Med Entomol. 52: 993-1002
Ae. aegypti & *An. gambiae* were treated with commercially available plant essential oils via topical application.

The LD₅₀ values for any of the essential oils were much higher than all of the synthetic

pyrethroids tested but they may prove to be effective insecticides.

The most toxic for *Ae. aegypti* & *An. gambiae* was patchouli oil; it was found to be ~1700-

and ~685-times less toxic than the least toxic synthetic pyrethroid, respectively.

The Impact. This is provides published results of testing plant essential oils.

Cold season mortality under natural conditions and subsequent hatching response of *Ae. aegypti*/eggs in a subtropical city of Argentina. 2015. Gimenez et al. J Med Entomol. 52: 879-885

Ae. aegypti populations are known to survive unfavorable winter conditions in the egg stage.

mortality of eggs exposed to cold season and their hatching patterns under laboratory conditions. Mortality rate was 48.6%.

The Impact. Knowing more about the survival rates gives health authorities a leg up on control measures.

The researchers analyzed the

Extrinsic incubation rate is not accelerated in recent California strains of West Nile Virus in *Culex tarsalis*. 2015. Danforth et al. J Med Entomol. 52: 1083-1089.

Mosquitoes have an extrinsic incubation period with it comes to transmitting viruses and this can be altered by a variety of factors.

extrinsic incubation periods of *Culex tarsalis* in regards to WNV in California.

more accurately

The researchers looked into the

They determined that a better understanding of the EIP would allow public health agencies to estimate of transmission risk

The Impact. Mosquitoes have an infectious life of only a few days, but its duration expands markedly at warmer temperatures.

Evolution of resistance in *Culex quinquefasciatus* selected with a recombinant *Bacillus thuringiensis* strain-producing Cyt1Aa and Cry1Ba, and the binary toxin, Bin, from *Lysinibacillus sphaericus*. 2015. With et al. J Med Entomol. 52: 1028-1035

The authors conducted a resistance evaluation test where they selected *quinqs* larvae that were to be susceptible.

almost 1000 fold at Generation 12 but then declined dramatically by Generation 19 and never rose again.

The Impact. Take home

message, even selected insects can have resistance issue when over impacted with pesticides, even environmentally friendly ones. Rotate or allow a break in treatment.

Potential for *Psorophora columbiae* and *Psorophora ciliata* mosquitoes to transmit Rift Valley Fever Virus. 2015. Turell et al. J Med Entomol. 52: 1111-1116

Rift Valley fever virus (RVFV) continues to pose a threat to much of the world. Unlike many arboviruses, numerous mosquito species have been demonstrated to be competent vectors.

species were tested here for their competence. Both were susceptible to infection however they had a significant salivary gland barrier and only 2 of 37 were able to transfer the virus by bite.

The Impact. This is the first report of these two species being infected with RVFV. The authors express concern for transmission to animals which is warranted but only 2 of those infected were able to transfer through bite. More research is needed!

Two field-collected *Psorophora*