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NITROUS OXIDE EMISSIONS FROM A COMMERCIAL CATTLE FEEDLOT IN KANSAS

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Nitrous oxide (N_2O) is an important greenhouse gas with a global warming potential of 296 times greater than carbon dioxide. Nitrous oxide is generated from various sources, including soils, livestock and manure management. Nitrous oxide emissions from agricultural soils have been studied extensively; however, limited scientific information is available on emission rates of N_2O from pen surfaces in open beef cattle feedlots. The main objective of this preliminary study was to quantify the N_2O emission rate from a pen surface in a commercial beef cattle feedlot in Kansas. Air sampling was conducted for 10 days from July to November 2010 on a pen surface in a commercial beef cattle feedlot. Static enclosed chambers with a diameter of 30 cm were placed on various locations in the pen surface. Samples of air were collected from the chamber headspace at 0, 5, 10, 15, 20, and 30 min with syringes and then analyzed with a gas chromatograph to determine the N_2O concentration. From the N_2O concentrations, the N_2O emission rates were determined. Results indicated large spatial variability in measured N_2O emission rates. Details of the measurement protocol and analysis of results will be presented. These preliminary results will be useful in designing a sampling scheme to establish the emission rate for the whole feedlot.

PREFERENCES OF U.S. AND

DIETARY INTAKES OF OMEGA-3 FATTY ACIDS AMONG SOLDIERS DEPLOYING TO COMBAT

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Background: Psychological health problems and human error are leading causes of death and disability among military service members. One theory gaining acceptance is the postulation that omega-3 fatty acids are deficient and that ensuring adequate intakes may mitigate the growing psychological health crises in the US military. Objective: To evaluate dietary intakes of omega-3 fatty acids among soldiers prior to deployment to combat areas. Procedure: Two hundred fifty-four soldiers scheduled for deployment to Iraq completed a food frequency questionnaire designed to measure consumption of foods rich in long-chain omega-3 fatty acids. Soldiers were from Ft. Riley, Kansas (n = 95) and the Texas National Guard (n = 159). Results: Intakes of long-chain omega-3 fatty acids ranged from 0 to 2,320 mg/day with a mean of 297.8 mg/day. Overall, 43.7% (n = 111) consumed seafood at least twice per week, 11.8% (n = 30) reported taking an omega-3 supplement, and 16.5% (n = 42) reported they had eaten an omega-3 enriched food. Frequent seafood consumption was more common among the Texas soldiers, with 49.1% (n = 78) consuming seafood at least twice weekly compared to only 34.7% (n = 33) Consumption of omega-3 supplements, omega-3 enriched foods, and sushi did not differ by location. Conclusion: Many deploying soldiers are consuming seafood less frequently than recommended. In addition, soldiers from Ft. Riley consumed seafood less frequently than the soldiers from the Texas National Guard.

COUPLING PYRAZOLE TO PYRIDINE: STEPS TO ENGINEERING

EFFECTS OF CONTROLLED INTERVENTION STRATEGIES ON THE QUANTITIES OF A CEFTIOFUR RESISTANCE GENE (*bla*$_{\text{CMY-2}}$) IN THE FECES OF FEEDLOT CATTLE

Neena Kanwar[1*], *Harvey Morgan Scott*[1], *Bo Norby*[2], *Savvanah Moore*[3], *Javier Vinasco*[1], *& Guy Loneragan*[4]

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Antibiotics are widely used in animal agriculture. They can favor resistance in bacteria. This resistance may spread to humans and pose public health risks. Efforts should be focused to assess the dynamics of antibiotic resistance and evaluate intervention strategies that may mitigate its dissemination in farms. This study investigates the effects of two intervention strategies (i.e., feeding chlortetracycline (CTC) following ceftiofur treatment and mixing of ceftiofur-treated with untreated steers) on ceftiofur resistance

Rapid detection of pathogens like bacteria and viruses is of great importance for monitoring water and food quality, the early detection and diagnosis of diseases, countering bioterrorism attacks, and other applications. Successful detection requires the manipulation and capture pathogenic particles for further analysis. In our study we use alternating current (AC) based dielectrophoresis (DEP) and electrochemical impedance spectroscopy (EIS) techniques using a nanoelectrode array (NEA) in a microfluidic chip for bacteria capture. A nano-DEP device was fabricated using photolithography. This device employs a vertically aligned carbon nanofiber (VACNF) NEA vs. a macroelectrode of indium tin oxide (ITO) coated

-and- -

-DEP) at the tips of exposed CNFs. Enhanced electric field gradient generated at the CNF tips due to reduction in electrode size down to nanometer scale helps to overcome large hydrodynamic drag force on *E. coli* at high flow velocities. A significant number of *E. coli* cells were captured at flow velocity of 1.6 mm/sec. A noticeable change in absolute impedance (|Z|) value at the NEA was observed in EIS experiments. The capturing efficiency is being assessed and optimized for future applications.

AN INVESTIGATION OF WATER USAGE IN CASUAL DINING RESTAURANTS IN KANSAS

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Hospitality operations are considered the heaviest consumers of energy and water per square foot of building space among commercial industries. Water and its processing may make up more than 80% of

demand, and climate change effects. Implementing water efficiency in Kansas restaurants could save two

Sommer L. Amundsen*, *Gustaf M. Van Acker III, William Messamore, Heather M. Hudson, Hongyu Y. Zhang, Carl W. Luchies, Anthony L. Kovac, & Paul D. Cheney*

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This study explores how the brain activates muscles to accomplish desired voluntary movement.

biodiesel is a focus of research aimed at finding a viable fossil fuel replacement. Creating a sustainable biodiesel requires finding a biodiesel feedstock that meets a given set of standards. Specifically, the fuel source must be economical and feasible to produce, not conflict with other ethical issues such as food production, and have minimal environmental impact. At KU thus far, a collection of six different feedstock-

entire spectrum from production to exhaust emissions. Soon, algal biodiesel will also be investigated. Students from Chemical and Petroleum Engineering have provided support to ensure accurate diesel production and emission results and a more complete understanding of the entire biodiesel production, refinement, and analysis process. To successfully test the fuels, significant effort went into design, construction, and automation of a single-cylinder diesel test cell. This test cell is outfitted with proper instrumentation to measure and record parameters needed to determine fuel consumption and engine performance in a high-precision manner. Resulting engine exhaust is analyzed to measure critical exhaust gas emission levels. Initial testing has shown positive outcomes for biodiesel production, performance, and emissions. Additional research and improvements to the biodiesel engine test cell and test strategy will lead to improvement of the analysis and feasibility of biofuels.

SELF ASSSEMBLY OF MERCAPTOAZULENES ON METALLIC AU(111) SURFACES

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In the race to miniaturize electronics such as computers, cellular phones, etc., there is an ever-growing need to create new nanoscale materials that will eventually replace their macroscopic counterparts. Devices based on such materials would consume only a fraction of energy required to operate conventionally constructed equipment. Azulene is an unusual hydrocarbon (C10H8) that comprises an edge sharing combination of 5- and 7-membered carbon rings. In addition to its long-standing medicinal and pharmaceutical relevance, the azulenic motif constitutes an attractive building block in the design of optoelectronic and conductive materials. This presentation will focus on recent developments in the chemistry of hybrid metal/azulene platforms featuring azulene-based monolayer fi1r. leva-1JETQ1 0 0 1ETQ1 he

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but also for predicting social-cultural functions such as crime, transportation, and social segregation. Interestingly, the morhphological parameters of space syntax can easily be integrated with GIS applications. This integration of space syntax with GIS provides a simple methodology to analyze any spatial structure in relation to the GIS datasets that are readily available for many cities in the USA.The proposed study uses this methodological approach to diagnose the urban structure of Topeka, Kansas.

themes that would describe the strategies used to develop and sustain this successful Community Health Center.
Results: Leading with Consideration was identified as the dominant theme in the interviews, field notes and archival data. Four sub-themes: Living the Mission, Fostering Individual Growth, Building a Community, and Encouraging Innovation, emerged from the narratives.
Conclusions: Leadership was the most important theme that emerged from the data, resulting in a work force culture that upholds the mission of the Center and leadership that seeks to inspire the growth of both employees and clients. As a result, there is a sense of community and innovative health care endeavors

We have utilized nanoporous alumina membranes to generate high surface area to volume structures for trapping protein biomolecules. We employ the protein specific capacitance measurement method as the basis for protein biomarker detection. We demonstrate device performance parameters for protein biomarker detection in purified and spiked serum samples to be comparable to the current gold standard: ELISA.

COMPETITION AND ALLELOPATHY IN INVASIVE *LESPEDEZA CUNEATA*

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Department of Biology, Wichita State University

The introduction of non-native species can have a profoundly detrimental effect on native ecosystems composition. This is being seen in the tallgrass prairies of Kansas as a result of the introduction of *Lespedeza cuneata* (sericea). This plant is able to form dense monocultures that greatly reduce native species cover where it invades. One proposed explanation for this invasive success is that sericea produces allelopathic chemicals that suppress native species. We tested this hypothesis in a greenhouse

European model to identify strengths, weaknesses and opportunities for Kansas wind energy wind project development.

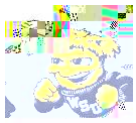
IDENTIFICATION AND IMPROVEMENT OF MEDICAL CARE INEFFICIENCIES AT A RESIDENT PEDIATRIC CLINIC

Brittany Huffman* *& Mehmet B. Yildirim*
Department of Industrial and Manufacturing Engineering, Wichita State University

Health care access and effectiveness is at the forefront of the current national debate and the importance of policy decisions can be seen locally in Kansas. It is a bipartisan agreement that effective and comprehensive health care should be provided to children regardless of parental status. In collaboration with the University Of Kansas School Of Medicine, the Wichita State University Industrial and Manufacturing Engineering healthcare research team have identified a local pediatric teaching facility that serves mostly low income and Medicaid patients. Our goal is to improve the effectiveness of care throughout the clinic using industrial engineering system improvement tools. The Wesley Resident Pediatric Clinic is unique to other local health care clinics because it serves dual purposes. First it serves as a site for pediatric care; second, it is a teaching center for resident physicians to gain clinical experience while being advised by faculty of the local school of medicine. Currently, about 300 patients are seen by residents in the clinic per week. However, waiting times and appointment retention at this clinic are suffering. Observations have been done over a six week period

MIXED INTEGER NON-LINEAR PROGRAMMING (MINLP) FORMULATION OF ENERGY-EFFICIENT LOCATION ROUTING PROBLEM FOR ELECTRIC-POWERED VEHICLES

Shokoufeh



are. Our work is to study and analyze these energy-intensive Spectrum Scanning processes and further propose techniques to make them more energy efficient, thereby making battery constrained portable devices operate for longer durations. Our work also increases the reliability and availability of wireless networks in rural areas of Kansas where opportunity of recharging batteries is limited.

MULTI-SENSOR HEALTH DIAGNOSIS USING DEEP BELIEF NETWORK BASED STATE CLASSIFICATION

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Kansas is one of the headquarters of major aircraft manufacturing industries. Due to large human life risks involved in flight journey, safety and operational reliability of aircraft is more critical. This research proposes a novel multi sensor health monitoring and failure diagnosis for Kansas industries to manufacture most reliable and failure preventive aircrafts to the world. Aircraft reliability depends on continuous monitoring of current system health status and health state detection is a key factor for prevention of performance degradation at different stages of damage. Due to nature of observed data and the available knowledge, health diagnostic methods are often a combination of statistical inference and machine learning. A novel artificial intelligent technique, Deep Belief Networks (DBN), has been quite effective in some applications such as image recognition and audio classification with promised advantages such as fast inference, fast learning, and the ability to encode higher order networks. This paper proposes the use of DBN for structural health monitoring applications of aircraft and develops multi-sensor health diagnosis method. DBN works based on Restricted Boltzmann machine and it learns layer by layer considering priors and network posteriors. Enhanced diagnostic system can be structured in three stages: first, collection of data from different sensors and preprocessing of the data; second, development of DBN classifier model based on nature of the system; third, training of DBN with data for different possible health states of the system. Classification effectiveness of this network is evaluated using experimental data for various real time practical conditions.