POSTER ABSTRACTS

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Biological Sciences

Experimental Insect Vectors Of The Bacterium That Causes Yellow Vine Disease Of Cucurbits.
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Yellow vine (YV) disease, which causes yellowing and rapid wilting in susceptible cucurbits, is caused by the gamma 3-proteobacterium, *Serratia marcescens*. The apparent phloem-restriction of *S. marcescens*, along with the results of insect control trials, suggest possible transmission by phloem feeding insects. Using YV-infected plants or cultured *S. marcescens* in an artificial feeding sachet as acquisition sources, several insect species associated with cucurbits or having haustellate mouthparts were tested for ability to transmit *S. marcescens* to pumpkin test plants or back to artificial feeding sachets. Squash bugs, *Anasa tristis* , were able to acquire *S. marcescens* from infected plants and transmit to pumpkin plants. The leafhopper *Circulifer tenellus* was able to acquire *S. marcescens* from feeding sachets and transmit to sachets, whereas the leafhopper *Dalbulus maidis* and aphids *Aphis nerii* and *Acyrthsiphon pisum* were unable to transmit YV to artificial sachets. These results suggest possible transmission specificity of *S. marcescens* and demonstrate that *A. tristis* and *C. tenellus* are experimental vectors.

The Role Of Wheat Bran In The Prevention Of Colorectal Cancer
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The components in wheat bran play an important role in the prevention of colorectal cancer in laboratory rodents and possibly in humans. The purpose of this project was to review the scientific literature and report progress in elucidating wheat bran's cancer prevention characteristics. Clinical Studies have shown that individuals who consume diets high in wheat bran fiber have lower incidence of colon cancer than those who do not. In 12 of 13 studies, it has been reported that colon cancer risk decreased as consumption of wheat fiber increased. This is because wheat bran has several beneficial effects such as dilution of tumor promoters such as bile salts, promoting a faster transit time in the colon, and fermentation of wheat bran to shorter fatty acid chains like butyric acid which inhibits tumor growth. Cancer researchers estimate that the risk of colon cancer could be reduced by nearly 31 percent if individual consumption of wheat fiber intake was increased to 13 grams per day. Further research is currently under way to determine if different varieties of wheat provide various levels of protection against colon cancer in laboratory animals.

Effects Of Diet Composition & Chromium On Leptin Responses To Glucose Tolerance Tests
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The effects of fat and sugar on leptin response to an oral glucose challenge (1g/kg body weight, GC) were examined. Sixty weanling Sprague-Dawley rats from chromium deficient dams were maintained on low chromium (-Cr) diets to 30 days of age, then randomly assigned to one of 5 diet treatment groups: Diet 1, -Cr, 10% fat; Diet 2, -Cr, 20% fat; Diet 3, -Cr with 1 mg Cr as Cr picolinate/kg, 10% fat; Diet 4, -Cr with 1 mg Cr as CrCl3/kg, 10% fat;

Diet 5, AIN-93G with CrCl3 instead of CrK(SO4)2. Diets 1-4 had 50% sucrose. Treatment diets were given for 4 weeks after which glucose tolerance tests (GC) were performed after an overnight fast. All rats had similar fasting leptin concentrations. After the GC, rats fed the high fat diet had amplified leptin responses compared to the other groups. Two hours post GC, leptin concentrations decreased to levels below fasting in all groups. Glucose and insulin responses to the GC were not significantly different based on diet. Rats fed the high fat diet had significantly greater body fat and lower lean body mass than the rats fed Diets 4 and 5. Rats fed Diet 3 had higher body fat and lower lean than those fed Diet 5.The high fat diet resulted in greater body fat accumulation and hypersecretion of leptin in response to the GC while glucose and insulin responses remained normal. (Supported by the College of Human Environmental Sciences, Oklahoma State University).

A New Evolutionary Theory Deduced Mathematically From Entropy Evolution

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A new evolutionary theory which is able to unite the present evolutionary debates is deduced mathematically from the principle of entropy amplification. It suggests that the extensive evolution is driven by the amplification of entropy,or microscopic diversity, and the biological evolution is driven by the amplification of biodiversity. Forming high hierarchies is the most important way for the amplification and brings out spontaneously three kinds of selection. This theory has some positive cultural meanings.

Trnl-Trnf Intergenic Region Polymorphism Reveals Chloroplast Paternal Inheritance Among Three Pinus Species

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The inheritance patterns of the chloroplast genomes among Pinus echinata, Pinus taeda and Pinus elliottii were investigated through trnL-trnF intergenic spacer polymorphism analysis. The DNA sequences of this spacer are different among the three closely related Pinus species. A modified 'cold' PCR-SSCP (single-strand conformation polymorphism) analysis of this spacer shows that the artificial hybrids (F1) from the cross, Pinus echinata (seed parent) x Pinus taeda (pollen parent), exhibit Pinus taeda profile. The nine putative hybrids between Pinus echinata and Pinus taeda, previously identified by one allozyme marker, presented Pinus echinata profile. The nondenatured polyacrylamide gel electrophoresis of trnL-trnF intergenic spacer demonstrated that the artificial hybrids (F1) from the cross, Pinus elliottii (seed parent) x Pinus echinata (pollen parent), present Pinus echinata profile. We confirmed that the chloroplast genome is paternally inherited in Pinus; Pinus echinata sired all of the putative hybrids between Pinus echinata and Pinus taeda. The significance of trnL-trnF intergenic region polymorphism and our modified 'cold' SSCP protocol for population genetic studies was also discussed.

Different Factors Affect Consumption Of High And Low Folate Foods

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The main purpose of this research was to compare the factors that influence the consumption of foods high and low in folate. Sixty-one randomly selected women of childbearing age (18-44 years old) from Oklahoma completed a Repertory Grid developed from focus groups interviews. Ten foods were rated on 12 constructs (e.g., taste, cost) using a 4-point scale. Independent t-tests and principal component analyses (PCA) were conducted using the SPSS 10.0. High folate foods (broccoli, orange juice, ready-to-eat cereal, beans, bread, and pasta) were perceived to be

significantly more available, less likely to spoil quickly, and more filling than low folate foods (lettuce, fried potatoes, milk, and banana). Using PCA, constructs for high folate foods were grouped in two factors: factor 1: convenience, time to prepare, taste, health, eaten at home and when growing up; and factor 2: availability, cost, spoils quickly, fattening and filling. Both factors were similar for low folate foods except eaten more when growing up, availability, and fattening loaded on the opposite factor. Knowing the factors that affect the consumption of folate containing foods will help nutrition professionals to plan adequate strategies to increase consumption of good sources of folate to prevent neural tube defects. Funding was provided by the Oklahoma Center for the Advancement of Science and Technology.

Soy Isoflavones Dose-Dependently Lower Plasma Cholesterol In Ovarectomized Hamster

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Seventy-two 6-month old female Golden Syrian hamsters were either ovariectomized (ovx) or sham-operated and were randomized to six groups: sham, ovx, ovx+l7β-estradiol (E2, 10μg BW/d, s.c.), ovx+500, 1000, or 2000 mg isoflavones/kg diet (Iso-1, Iso-2, and Iso-4, respectively) for 120 d. Below are means±SE for plasma total- and free-cholesterol concentrations:

	Sham	Ovx	E_2	ISO-1	Iso-2	Iso-4
Plasma Cholesterol, mg/dl						
Total	85.4±5.9^{c}	118.1±5.9^{c}	91.5±5.9^{bc}	107.1±5.7^{ab}	94.7±5.9^{ab}	93.O±6.2^{bc}
Free	17.2±E2.2^{c}	27.9±2.2^{ab}	23.9±2.1^{a}	21.9±2.1^{c}	18.8±2.2^{c}	23.1±2.4^{bc}

In each row, means that do not share the same letters are different ($p< 0.05$)

Soy isoflavones dose-dependently as well as E_2 lowered circulating levels of total-and free-cholesterol. Liver total lipid and cholesterol content were not affected by any of the treatments. The hepatic rates of sterol synthesis were reduced in ovx animals but not in E_2 or Iso-2 and Iso-4, reflecting negative relationship between plasma cholesterol levels and the rates of hepatic sterol synthesis. The cholesterol- lowering modes of action of isoflavones merit further investigation.

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Isolation And Characterization Of Bacteria Capable Of The Biodegradation Of Explosives

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Contamination of the environment by nitroaromatic compounds, including 2,4,6-trinitrotoluene(TNT) and hexahydro-1,3,5-trinitro-1,3,5-triazine(RDX), has generated increasing attention and concern. This study was directed to evaluate the impact of both TNT and RDX contamination on soil biological and microbial properties, and to isolate and identify microorganisms that are involved in the biodegradation of nitroaromatic compounds. Results indicated TNT and RDX accumulation in soil substantially inhibited microbial activity. Dehydrogenase is an enzyme that is only present in viable microbial cells. The activity in the contaminated soils ranged from undetectable to 4.53 mg TPF kg?1 soil, verses 42.4 mg TPF kg?1 soil detected in the uncontaminated soil.

Furthermore, bacteria were not recoverable unless soil suspensions were diluted by a factor of at least 10,000. However, one anaerobic and eight aerobic bacteria were successfully isolated from these soils using TNT or RDX as the sole source of nitrogen. Based on morphological characteristics, gram staining, and 16S rDNA sequence, two of the isolates were identified as Bacillus sp. and Sinorhizobium meliloti.

Flaxseed Improves The Lipid Profile Of Postmenopausal Women

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Flaxseed Improves the Lipid Profile of Postmenopausal Women. L. Hammondl, R.A. Wild2, L. Chandler2, D.A. Khalil1, E.A. Lucas1, B.P. Daggy1, B.J. Stoecker1, and B.H. Arjmandi1. 1Department of Nutritional Sciences, Oklahoma State University, Stillwater, OK 74078; 2Department of Obstetrics and Gynecology, University of Oklahoma Health Sciences Center, Oklahoma City, OK 73190

Fifty-eight postmenopausal women not on hormone replacement therapy were randomly assigned to two groups in a double-blind study. Women were asked to consume 40 g of either ground flaxseed or wheat-based comparative control regimen daily for three months. Overnight fasting blood samples were collected at the beginning and at the end of the study. Women in both treatment groups had similar baseline cholesterol values. Flaxseed consumption significantly lowered serum total cholesterol by 6% and triglycerides by 12% without reducing HDL-cholesterol, while the comparative control regimen had no such effects. Neither of the dietary regimens affected platelet aggregation and blood clotting time. The effects of flaxseed on the hormonal metabolism of these women are currently being investigated. Further studies are warranted to investigate the active hypocholesterolemic components of flaxseed.

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Constraints On Sequences Near Readthrough Stop Codons Revealed By Comparative Analysis

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Molecular genetic studies of readthrough stop codons in selected viruses have revealed that the sequences immediately surrounding the stop codon reduce the fidelity of translation termination. However, exactly how these sequences signal readthrough is still under investigation. To determine to what extent the sequence preferences revealed in those studies apply to readthrough events in other viruses, we examined the distribution of residues surrounding readthrough stop codons. We collected sequence segments from every unique viral sequence that had a readthrough stop codon listed in their GenBank genome annotations. Inspection of the codons immediately following readthrough stop codons led to identification of six groups that accounted for over 90% of the sequences examined. Chi-square analysis of sequence variability in these groups demonstrated that, for five of the six, the sequence immediately 3? of readthrough stop codons is conserved within each group. One group, consisting entirely of members from the genus Tombusviridae, had too low overall sequence divergence to make this assessment. In contrast, for the non-readthrough stop codon for the readthrough product from available viral sequences for each group, no such conservation occurred. In addition, for five of the six groups, there was a preference, though less pronounced, for a specific sequence in the second codon 3? of the readthrough stop codon. The groups were not viral genus specific, host range specific, or stop codon specific. These observations support the hypotheses that translation readthrough is a signaled event and that a limited number of distinct sequences can provide this signal. The observations should aid unraveling readthrough mechanisms. Supported by the Oklahoma Agricultural Experiment Station.

Involvement Of Protein Kinase C (Pkc) And Prostaglandins In The Alpha-2 (A2-) Adrenergic Inhibition Of Water Transport In The Rat Cortical Collecting Duct

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Recent studies have shown that a2 agonists inhibit arginine vasopressin (AVP)-stimulated water transport by inhibition of intracellular cAMP accumulation as well as another cAMP-independent pathway. The purpose of this study was to determine if PKC and prostaglandins act as second messengers in the inhibition of AVP-stimulated water permeability in the rat cortical collecting duct (CCD). Osmotic water permeability (Pf) was measured (in mm/sec) in isolated perfused rat CCDs. AVP (220 pM) was used to stimulate water transport and dexmedetomidine (100 mM) was used as the a2 agonist. Two sets of experiments were performed (n=5 in each set), one using the cyclooxygenase inhibitor indomethacin (5 mM) and the other using indomethacin with the PKC inhibitor staurosporine (10 nM). Experimental agents were added to the bath and experiments were conducted at 37o C. In the indomethacin study, AVP increased Pf from 5±1 (mean±SE) in the control period to 432±54 ($p< .01$). The addition of dexmedetomidine reduced Pf to 138±53 ($p< .01$) and was not affected by the addition of indomethacin. In the indomethacin+staurosporine study, AVP increased Pf from 2±1 in the control period to 468±72 ($p< .01$) and dexmedetomidine reduced Pf to 155±64 ($p< .01$). The dexmedetomidine-induced inhibition was significantly reversed with the addition of indomethacin+staurosporine to 330±76 ($p<.05$). Thus, indomethacin alone did not reverse a2 inhibition of Pf whereas the combination of indomethacin and staurosporine reversed inhibition by 56%. Data indicate that PKC is involved in the a2-mediated inhibition of Pf in the rat CCD. This may or may not be dependent on prostaglandin synthesis.

In Vitro Effects Of Chlorpyrifos (Cpf), Methylparathion (Mps), Parathion (Ps) And Their Oxons On Cardiac Muscarinic Receptor Binding

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Organophosphorus (OP) insecticides elicit toxicity through inhibition of acetylcholinesterase (AChE, EC 3.1.1.7), the enzyme responsible for terminating the effects of the neurotransmitter acetylcholine (ACh). Accumulation of ACh results in overstimulation of cholinergic receptors and consequent signs of "cholinergic" toxicity, e.g., autonomic dysfunction, tremors. Young animals are generally more sensitive to the acute toxicity of OP anticholinesterases. Some OP toxicants have also been reported to bind directly to muscarinic M2 receptors in both heart and brain. We examined the *in vitro* effects of three OP insecticides (CPF, MPS and PS) and their respective oxons on labeling of cardiac muscarinic receptors by the ligands [^{3}H]oxotremorine (OXO) and [^{3}H]quinuclidinyl benzilate (QNB) in tissues from neonatal (7-11 day) and adult (90 day) rats. Membranes were co-incubated with ligand and one of a range of concentrations (50 pM-10 μM) of OP toxicant at 21°C for 1.5 hours prior to harvest by vacuum filtration. Specificity was determined in paired tubes containing atropine (10 μM). In adult membranes, CPFO, MPO and PO (≥ 5 nM) significantly reduced OXO binding (30-55% maximal displacement; CPFO most effective) while MPS (≥ 500 pM) significantly reduced OXO binding (maximal displacement, 35% at 10 μM). In neonatal tissues, no parent compound affected OXO binding but CPFO and MPO both reduced OXO binding (maximal displacement 30-45%; CPFO most effective). No significant reduction in QNB binding was noted with any of the OP toxicants except MePS (≥100 pM, maximal displacement 15%) in adult tissues. Preincubation of adult cardiac membranes with CPFO (10μM) and subsequent washing prior to ligand binding suggested an irreversible interaction. The relatively high potencies of these toxicants at altering muscarinic receptor binding suggest that these direct interactions could contribute to age-related and OP-dependent differences in toxicity.

Functional Responses Of An Introduced And An Indigenous Parasitoid On Greenbug, Schizaphis Graminum, At Four Temperatures

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Functional responses and super-parasitism by the indigenous parasitoid wasp Lysiphlebus testaceipes Cresson (Hymenoptera: Aphidiidae) and the introduced parasitoidAphidius colemani Viereck (Hymenoptera: Aphidiidae) on greenbug, Schizaphis graminum Rondani (Homoptera: Aphididae), were measured at four temperatures (14 , 18 , 22 , and 26 C) during a 24 hour period (12: 12 L:D). At each temperature, densities from 5 to 75 greenbugs were exposed to individual wasp mating pairs for 24 hours. 176 A. colemani females and 204 L. testaceipes females were ultimately evaluated. At all experimental temperatures, attack rates for both wasps fit Type III functional responses. Aphidius colemani functional response, larval numbers and super-parasitism rates were not temperature dependent. However, L. testaceipes functional response, larval numbers, and super-parasitism rates were temperature dependent. Aphidius colemani displayed higher ovipositional activity at lower temperatures than L. testaceipessuggesting that A. colemani may be a good choice for added biological control of greenbug in the Southern Great Plains.

Arp1: Implications Of A Spiroplasma Multigene Family

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While studying the binding of the plant pathogen Spiroplasma citri to cultured cells of its leafhopper vector Circulifer tenellus, an 89 kDa S. citri surface protein-S. citri adhesion related protein P89 (SARP1)-was implicated in the adherence. Since surface proteins have been implicated in mollicute adherence to their host cells, the phylogenetic distribution of arp1, the gene encoding SARP1, was studied in mollicutes including certain spiroplasmas, mycoplasmas and phytoplasmas. Southern analysis of their genomes revealed multiple signals in certain samples suggesting presence of arp1 in multiple copies. BLAST search with arp1 of the current S. kunkelii database also supported these observations. These data give insights in the correlation of pathogenicity of mollicutes with the presence of arp1.

Copper Is Not A Generalized Signal For Alginate Production In P. Syringae

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The algD promoter is a major controlling element in the biosynthesis of alginate. AlgD encodes GDP-mannose dehydrogenase, which is the committed step in alginate biosynthesis. It has been shown that copper ions are a signal for alginate synthesis in Pseudomonas syringae pv. syringae FF5. Here we investigate if copper acts as a signal for alginate production in the P. syringae family. Alginate production was analyzed in Pseudomonas syringae pv. tomato DC3000, Pseudomonas syringae pv. syringae 3525 and Pseudomonas syringae pv. glycinea PG4180 in the presence and absence of copper. It appears that copper does not act as a signal for alginate production in these strains, indicating the evolutionary divergence of the algD promoter in the P. syringae family.

Cloning of the SIP3 homologue in *Aspergillus nidulans*

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In *Saccharomyces cerevisiae*, the Snf1 (sucrose non-fermenting) protein kinase is required for transcription of glucose-repressed genes when glucose is limiting. The Sip3 protein belongs to the Snf1 kinase family and was found to interact "*in vitro*" with Snf1. The aim of this research is to isolate the *sip3* homologue in *A. nidulans* and to determine whether *sip3* is involved in its carbon catabolite repression. We have isolated cosmids that hybridize to a *sip3* probe, and the entire genomic region has been sub-cloned and sequenced. The *sip3* probe used is a clone that contains a fragment of the *sip3* homologue in *A. nidulans* rescued in a different study. A *sip3* deletion mutant will be created by transformation-mediated gene replacement and the growth in various carbon-sources like glucose, sucrose and pectin studied and compared to wild type.

Plant Cell Wall Degradation by Aspergillus nidulans.

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Little is known about the plant cell wall degrading enzymes produced by A. nidulans while growing on plant cell walls. Our study is based on a molecular negative screening method, specifically directed to recover cDNA clones from ALL transcripts A. nidulans induces when shifted from growth on glucose to a range of cell wall polysaccharides including pectins, cellulose and xylan. cDNAs prepared from mRNA of tissues grown in glucose were labeled and used to probe a cDNA-plasmid library made from mRNAs extracted from tissues grown on cell wall polysaccharides. Transcripts present in both, the probe and the plasmid library, appear as positives whereas transcripts expressed only in the plasmid library are the negatives (not labeled). A two-staged screening method was devised to allow the survey of a large number of clones for identification of putative negatives in the initial stage followed by reliable confirmation of clones that are not expressed or present in low abundance in the probe originating condition. A statistically significant collection of negatives has been isolated and sequenced for a digital gene expression profiling and functional annotation analysis. Genes recognized through this method, are the ones upregulated as a result of the physiological shift (change in carbon source). Thus, the suggested approach is comprehensive because one can identify whole gene sets activated by a special physiological condition.

Application Of Fluorescent-Tagged Primers For Non-Gel Detection Of *Listeria spp*. By PCR

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Listeria monocytogenes is an important food-borne pathogen that has been responsible for numerous outbreaks and deaths. It is an intracellular microorganism that can survive in macrophages and in professional phagocytic cells and can ultimately lead to septicemia and meningoencephalitis. *Listeria spp.* are commonly carried and shed by animals (including animals used in food production, like cattle, swine, sheep, goats etc.) and avian species. They can easily spread from contaminated animals to carcasses during slaughter, and further onto raw meat that is used for manufacturing ready-to-eat processed food products. Because of the ability of *Listeria spp.* to form biofilms, to survive and grow at refrigeration temperatures, at high salt concentrations and at high temperatures, it has been difficult to eliminate them from food processing environments once they become established. The high morbidity and mortality caused by the major outbreaks of listeriosis have raised the need for reliable and rapid detection of the pathogen. Though, in the recent years, molecular techniques like PCR have revolutionized all fields of biology, it has not been used to its full potential by the food industry. The need to run agarose gels to assay the products of traditional PCR has been regarded as cumbersome by labs testing for food-borne pathogens. Recent advances in the application of fluorescent labeled primers have provided new prospects for 'user-friendly' PCR analysis of the target microorganisms (i.e. non-gel PCR). Several proprietary methods have been developed, including the TaqMan^{Tm}, Lightcyler^{Tm}, and Molecular Beacons^{Tm}, that require addition of chemical fluorophores and molecular

quenchers onto the target specific probes. However, Amplifluor has developed a technique using energy-transfer hairpin primers (i.e. Uniprimer^{Tm}) that allow universal application of the same primer for different targets. The Uniprimer^{Tm} has a 3' oligonucleotide tail (Z-sequence) and a 5' intracomplementary sequence that forms hairpins, placing the fluorophore and the quencher moieties on the 5' end in close proximity. The Z- Sequence was added to the 5' end of a *Listeria* specific primer. When used in PCR reactions, the Z- sequence of the Uniprimer^{Tm} anneals to the complement of the Z-sequence on the initial product and consequently initiates priming. As the Uniprimer^{Tm} is incorporated into the PCR product, the quencher becomes distant from the fluorophore and allows greatly increased fluorescence, which could be read on a fluorescent plate reader. The unincorporated hairpin primer emits low background fluorescence, eliminating the need to purify the PCR product prior to the signal detection, Therefore, PCR reaction and signal detection can be done in the same reaction vessel. This rapid detection technique will be examined for use with mixed enrichment cultures so as to further reduce the detection time for *Listeria spp.* in environmental and/or food samples.

Age-Related Effects Of Chlorpyrifos On High Affinity Choline Uptake In Rat Brain.

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Organophosphorus (OP) insecticides elicit toxicity through inhibition of acetylcholinesterase (AChE), allowing accumulation of acetylcholine (ACh) and consequent cholinergic toxicity. High affinity choline uptake (HACU), the rate-limiting step in ACh synthesis, is modulated in adult rat brain in vivo by some OP toxicants. Young rats are generally more sensitive than adults to the acute toxicity of OP pesticides, but little is known regarding age-related effects of OP toxicants on HACU. AChE inhibition and changes in HACU in cortex of neonatal (7 days), juvenile (21 days) and adult (90 days) rats (n=8-15/treatment group) were evaluated at 4, 24 or 96 hr after oral exposure to chlorpyrifos (0, 0.5 or 1 x LD10: 15, 47 and 136 mg/kg). LD10 dosages generally elicited similar levels of maximal AChE inhibition in all age groups, but inhibition was highest at 4 hr in neonates and juveniles but not until 24 hr in adults. In general, HACU was reduced in a time-dependent manner by LD10 exposure, i.e., uptake was maximally reduced (43%) in neonates at 4 hr, moderately reduced (22%) in juveniles at 24 hr and least affected (18% reduction) in adults at 96 hr. No significant changes in HACU were noted with the lower dosages at any timepoint in either age group. An early reduction in HACU following high-dose exposure could potentially modulate the toxic effects of AChE inhibition by limiting the amount of ACh released into the synapse, whereas later changes in HACU noted in adults may be an adaptive response to altered cholinergic neurotransmission. A reduction in HACU, in particular in a system having relatively little acetylcholine synthesis and release (neonatal brain), could also lead to neurotoxic consequences on its own. Changes in HACU may therefore differentially contribute to age-related neurotoxicity following AChE inhibition. (Supported by GR825811 from U.S. EPA).

Disomic Inheritance Of Allozyme Markers In Switchgrass

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Switchgrass, Panicum virgatum (L.), has several levels (2x to 12x reported) of ploidy, with 2n=4x=36 and 2n=8x=72 being the most prevalent. However, there is no definitive information on whether the species is an autopolyploid or an allopolyploid, or whether it exhibits disomic or polysomic inheritance. Segregation of allozymes at Adh-1 and Got-2 in tetraploid self progenies conformed to expected disomic ratios, and significantly differed from tetrasomic ratios. These results support specific bivalent pairing in meiosis as opposed to random bivalent pairing among four copies of chromosomes in tetraploid plants. Progeny analysis of PGM, LAP, and PGI indicated the presence of duplicate genes for these enzyme systems, each gene having only one allozymic form that is paired with a null allele. For most of these duplicate genes, one pair of chromosome in tetraploids is probably permanently silenced. Comparison of isoenzyme patterns among tetraploid (2n=4x=36), hexaploid (2n=6x=54), and

octoploid (2n=8x=72) cultivars suggests that gene duplications leading to different isozymic forms occurred mainly at a low ploidy level or in the common ancestral genome.

Suppression Subtractive Hybridization To Survey Genes Expressed For An Effective Hypersensitive Resistance Response

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Bacterial blight of cotton is a leaf spot disease caused by Xanthomonas campestris pv malvacearum (Xcm) that affects crops all over the world. Losses in the U.S. have been reduced to 1-2% in most recent years through the widespread cultivation of resistant varieties that display a hypersensitive resistance response (HR). HR is a resistance response by the plant, where host cells in the immediate vicinity of the pathogen die and factors associated with their death prevent the growth and spread of the pathogen. Features of HR include induced synthesis of antimicrobial compounds, synthesis of enzymes that are harmful to the pathogen and reinforcement of plant cell walls in the infected area. We have initiated a study to survey the genes induced and necessary for an effective hypersensitive resistance response. Suppression subtractive hybridization (SSH) is a procedure used to selectively amplify differentially expressed transcripts and at the same time suppress the amplification of those transcripts that are not differentially expressed. A normalization step included in the protocol overcomes differences in transcript abundance. SSH was used to prepare a subtracted cDNA library enriched in genes that are induced during the hypersensitive response in cotton line Im216 to Xcm. Im 216 is known for its superior resistance to bacterial blight. The gene fragments were cloned. Cloned inserts were isolated by restriction digestion and electrophoresis. Duplicate Southern blots were probed with cDNAs obtained from forward subtraction (enriched in infection-induced transcripts) and from reverse subtraction (enriched in transcripts that are down-regulated after infection). From an initial screening of 16 clones with inserts, 14 contained inserts that hybridized much more strongly to the forward-subtracted probe than to the reverse-subtracted probe. Deduced protein sequences of these clones were very similar to proteins known to be associated with pathogen-induced defense responses in other plant species, indicating that the SSH procedure worked. Some sequences have shown little similarity to any known genes. These preliminary findings of both well-known defense transcripts and unknown ones suggest that our differential library will lead to the discovery of new genes important to resistance. Northern blot analysis using the clones as probes confirmed that most of them were upregulated during a hypersensitive resistance response. A large-scale screening of cloned cDNA fragments has begun. Bacterial clones are spotted in triplicate on nylon membranes, cultured, lysed, and hybridized with fluorescent labeled probes made from forward and reverse-subtracted cotton cDNAs. The membranes will also be screened for clones previously identified to avoid repeated sequencing of cDNAs that are abundant in our library. Clones identified as being differential are being sequenced and analyzed using the software PipeOnline developed by P. Ayoubi and R. A. Prade of the OSU Department of Microbiology and Molecular Genetics.

Chromium Depletion Decreases Femur Density Of Lactating Rats

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This study evaluated effects of chromium depletion on bone retention during lactation in rats. Three-month-old Harlan Sprague Dawley virgin female rats were fed adequate chromium (AIN-93M) diets for 2 wk and then randomly assigned to three experimental groups. One group (Non-P) was not mated and was fed the AIN-G diet for the duration of the experiment. One group was fed the AIN-G diet throughout one cycle of gestation and lactation (P-Adeq) and one group was fed the AIN-G diet with no chromium (P-LowCr) added for the same period. There was no effect of the dietary treatment on pup outcomes and litters were reduced to ten by the second day of lactation. Adult animals were given an oral glucose challenge (2 g glucose/kg body wt) on the 19th

day of lactation and necropsied at two hours after the glucose load. Chromium depletion did not significantly affect glucose, insulin, or fructosamine. Body weight and percent body fat were significantly higher in the non-pregnant females than the lactating dams but were not affected by chromium treatment. Liver, kidney and spleen weights of the lactating animals were significantly higher than in Non-P groups but there was no difference between the P-Adeq and P-LowCr groups. The isolated right femur was scanned using the high-resolution software available with the Hologic QDR4500A DXA. Bone mineral density was reduced ($p<0.0001$) in the animals that had lactated compared to the non-pregnant controls (0.2337+0.0031 g/cm2). In the lactating groups, chromium depletion significantly decreased femur bone mineral density (0.1722 +0.0029 g/cm2) compared to the group fed 1 mg chromium/kg diet as chromium chloride (0.1849+0.0033 g/cm2). The effects of chromium chloride on bone mineral composition and density require further study. (Supported by Oklahoma Agricultural Experiment Station Project #OKL02375.)

Feasibility Of Using Remote Sensing To Detect And Quantify Transient Herbicide Injury In Hard Red Winter

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Wheat (Triticum aestivum) is an economically significant crop for Oklahoma growers. One of the biggest detriments to wheat yield is the presence of the weed cheat (Bromus secalinus L.).Maverick® (MON37500) is a sulfonylurea herbicide developed by Monsanto that targets bromus species weeds in wheat. It has been observed that application of Maverick® can lead to yellowing injury in green wheat after application. Our objective was to determine if transient injury from Maverick® could be detected and quantified using satellite imagery.

The study area consists of 4500 acres planted to wheat located in Kingfisher County, Oklahoma. Each of these fields was treated with Maverick® under a Section 18 permit. Information regarding field location, application date, and formulations applied was obtained from custom applicator records. Digital Orthophoto Quadrangles were used to establish a spatially correct field boundary that could be loaded into SSToolbox©, a Geographic Information System designed specifically for agriculture.

Red and Near Infrared bands from Landsat TM images were used to calculate a Normalized Difference Vegetation Index (NDVI) for each field on 8 separate dates over a single growing season. NDVI is widely used to examine the extent of vegetative coverage. Additionally, NDVI can be used as an indirect measure of plant health. Injury will be identified by reviewing these NDVI progressions for each field, and determining what adverse effects if any occurred from application of Maverick®.

EFFECTS OF SKELETAL UNLOADING AND VITAMIN E ON BONE IN AGED RATS

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This study investigated whether vitamin E dose dependently reduces bone loss associated with skeletal unloading in aged animals. In a 2 x 3 experimental design, eight and one-half month-old rats (n=96) were randomly assigned to one of three semi-purified diets containing 15, 75, or 500 IU dl-alpha tocopherol (low, adequate, or high), and ambulatory or suspension groups. Diets were fed for 9 wk prior to suspension. Subsequently, rats were either suspended or ambulatory for 4 wk. At 11 months animals were anesthetized with ketamine/xylazine for scanning (Hologic QDR4500A DXA) and then exsanguinated. Serum and tissue samples were appropriately stored for analyses. Both serum vitamin E and ferric reducing ability ($p<0.0001$), indicators of antioxidant potential, were dose-dependently elevated by dietary vitamin E. Bone resorption, as indicated by serum tartrate resistant acid phosphatase ($p < 0.0001$), was elevated by suspension but unaltered by diet. Neither serum alkaline phosphatase

(ALP) nor bone ALP activities were affected by diet or suspension. Skeletally unloaded animals experienced loss of femoral ($p< 0.0001$) and 5th vertebral ($p< 0.0001$) bone mineral density and a reduction in ultimate force ($p <0.05$) of the femur. However, analyses to date on bone mineral density and mechanical strength in regions of highly cortical bone do not show protective effects of vitamin E. Bone histomorphometry revealed decreased trabecular thickness and bone surface ($p <0.05$) in suspended animals. Suspended animals also had decreased labeled surface ($p < 0.001$) and reduced rate of bone formation ($p < 0.05$). Four weeks of tail suspension produced significant bone loss in aged animals lending support to use of this model of osteopenia for studying the effects of skeletal unloading. Further analyses are underway to evaluate apparent differential effects of vitamin E in ambulatory and suspended animals.

(Supported by NASA NAG 9-1159, Oklahoma Agricultural Experimental Station OKL 02375, and collaboration from Mayo Clinic.)

***Aspergillus nidulans* EST Microarrays**

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The northern blot has been the standard for transcript monitoring for many years; however, with finished and current genome sequencing projects mounting, new large-scale gene expression analysis tools are needed. Microarrays are DNA/DNA hybridization devices in which ALL or a large number of gene-specific targets (DNA fragments) derived from a genome, have been cross-linked to a support (e.g., glass) and hybridized against labeled probes of high degree of complexity - e.g., reverse transcribed and labeled mRNA populations. DNA microarray gene expression monitoring has been useful in various applications including drug discovery, transcriptional regulated gene expression studies, and gene discovery. Here, we describe the construction of a glass-based microarray containing approximately 4,600 cross-linked targets derived from the *A. nidulans* expressed sequence tag (EST) collection. PCR amplified targets were copied from a cDNA library, primed by an EST-specific and a vector-common oligonucleotide set. Template targeted regions for amplification were chosen, whenever possible, to map to the 3"-end of the EST (ORF) and produce a 500 bp fragment. Multiple bands amplified with a single EST primer could in theory be utilized, if in the majority of cases they correspond to alternate 3' end terminations. However, we have determined that under our laboratory conditions, alternate 3'-end termination could not be established in PCR reactions showing two or more bands. Thus, PCR reaction which did not result in a single band, were redone using a secondary and/or a tertiary PCR cycling protocol. Finally, new primers for non-validated PCR products were designed. All PCR-products were filter purified, targets validated by agarose gel electrophoresis and printed onto glass-slides. Microarrays will be made available upon request by Genencor International and Oklahoma State University.

The Wheat Underground: Functional Genomics At The Root-Fungus Interface

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We have assembled a multidisciplinary team to study the molecular responses of wheat roots to infection by soilborne fungi. A systematic characterization is being initiated to define transcription profiles between the interactions of wheat roots and 1) take-all (Gaeumannomyces graminis var. tritici), 2) Rhizoctonia spp. and 3) Pythium spp.. These three species represent a complex of soilborne fungi that are endemic to all wheat producing regions in the Great Plains and much of the world. The severity of infection, and subsequent yield loss, can vary greatly between years and even within a given field. These diseases represent a largely under-researched class of diseases because of the difficulty in studying roots. As a result of this out-of-sight/out-of-mind phenomenon, the chronic loss due to these soilborne fungi is probably grossly underestimated. The most dramatic illustration of the

chronic stress due to soilborne pathogens is the dramatic increased in wheat yields, nearly two-fold, associated with sterilizing soil in replicated field plots with methyl bromide.

Our objective is to identify unique and common defense responses of wheat roots to these fungi. Normalized subtraction libraries between infected and non-infected root tissues will be constructed for use in microarray analysis of gene expression profiles for each species. Since host-plant resistance to these fungi has yet to be identified, we have decided to use the cultivar Jagger since it is the leading hard red winter wheat grown in the U.S. Time-course sampling will be used to construct subtractive cDNA libraries between infected (tester) and non-infected (driver) roots. Results from sequencing and expression profiling will be compared to libraries being constructed by other groups within the Great Plains Cereals Biotechnology Consortium for leaf rust, Fusarium head blight, and elicitors of plant defense responses.

The Effects Of Phenobarbital On Bifidobacterium Strains

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A diverse number of bacteria regularly inhabit the human intestinal tract. These bacteria are part of the normal microbial flora and are required to maintain a healthy existence. Little is known of the role certain strains play in the metabolism of some xenobiotics. Of crucial interest is the manner in which these microbes toxify or detoxify particular pharmaceuticals. In order to better understand these metabolic processes, two intestinal microbial strains (Bifidobacterium adolescentis and Bifidobacterium bifidum) were grown in the presence of phenobarbital at various concentrations (0, 5, 10, 20, 40, and 80 mM). From these samples, it was possible to determine two things. First, the growth curve gave valuable information about the growth phase response of the bacteria to the xenobiotic. Second, bacterial growth was stopped in order to analyze the protein profiles of the exposed bacteria in relation to the profiles of the control culture. Techniques utilized: 1-D and 2-D gel electrophoresis, protein extraction, preparation of anaerobic media, anaerobic techniques, and spectrophotometry.

Effects Of Restraint And Treadmill Running Stress On Pyridostigmine Toxicity And Acetylcholinesterase Inhibition

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Pyridostigmine (PYR), a carbamate and relatively short-acting AChE inhibitor, is used prophylactically to protect soldiers from possible organophosphate (OP) nerve agent exposure. PYR is a quaternary compound and thus not expected to enter the central nervous system. Some studies suggest, however, that stress may alter blood brain barrier integrity and allow PYR to enter and affect central nervous system functions. To evaluate the interaction between physical stress and PYR, we first estimated the maximum tolerated dosage (MTD) of PYR in 6 week-old Sprague Dawley rats following dosing (oral gavage in saline, 1 ml/kg), the time to peak effect of PYR on AChE activity, and the dose-response relationship between PYR and blood and brain AChE activity. Two models, physical restraint and treadmill running stress, were compared. AChE activity was measured by the radiometric method, with minimal dilution of tissue (1:5) and minimal time between dilution and assay. The MTD for PYR was estimated at 30 mg/kg. Peak inhibition of whole blood AChE activity (>80%) occurred from 30 min to 4 hr hour after exposure. No significant inhibition of brain AChE was noted at any timepoint, however. Groups of rats (n=6/treatment) were either stressed by restraint (90 min) or treadmill running (90 min, 15 m/min) or not stressed and then challenged with vehicle or PYR (30 mg/kg). Other groups (n=6/treatment) were simultaneously treated with vehicle or PYR and stressed (restraint, 60 min; treadmill running, 20 min). In all cases, animals were observed for signs of toxicity (SLUD, involuntary movements) and then sacrificed 1 hour after PYR challenge. None of the stressor conditions altered the functional toxicity of PYR. Brain AChE activity following PYR exposure was not

affected with either model of treadmill running or restraint stress. The results suggest that two accepted models of stress in rats do not alter the ability of PYR to enter the CNS. (Supported by DAMD17-00-1-0070 from U.S. Army).

Analysis Of 50 Most Commonly Eaten Foods Among Oklahoma Native American Women.

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Diabetes is a major public health concern in the Native American population. It is a multi-factorial disease that can be strongly related to diet. Little is known about the dietary habits of Oklahoma Native Americans. 50 women from two Oklahoma tribal health clinics were interviewed to obtain one-day food lists. Data was analyzed to generate the 50 most commonly consumed foods. Coffee and tea, table fats, regular soda, diet soda, and white bread were the top 5 most commonly reported foods. The findings were consistent with data collected by the United States Department of Agriculture's (USDA) Continuing Survey Of Food Intakes by Individuals (CSFII) 1994-1996. The data compiled from the one-day food lists will be used to assess perceptions of food among Oklahoma Native American Women. This project has received support from the Oklahoma Center for the Advancement of Science and Technology.

Programmed Cell Death In A Murine Mastocytoma Cell Line

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Programmed cell death (PCD) is natural means of controlling cell growth. Lack of control can give rise to overproduction of cells and cancer. We are studying PCD among cells of the murine mastocytoma cell line, P815, in response to different agents. We first examined the death of P815 cells by means of a colorimetric assay which measures cell viability. Results of these studies showed that exposure to vitamin A and its derivatives or the cytokine, interleukin 1 beta led to the death of these cells. Subsequent studies suggested that this death involves PCD and that intracellular calcium may be involved in this process.

A Rapid Method To Describe Unsaturated Soil Properties

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As groundwater models become more sophisticated, modelers require hydraulic parameters from an increasing number of soil samples to more fully describe a setting. Current methods to determine unsaturated soil properties are expensive, difficult, and time consuming. A method is presented that quickly estimates the unsaturated hydraulic conductivity, diffusivity, water retention, and sorptivity functions by way of a Bruce-Klute test. Saturated hydraulic conductivity and a single measurement of water potential versus saturation may be independently determined to increase the accuracy of the method. The method compares favorably to direct measurement of unsaturated soil functions since a Bruce-Klute test can be conducted with little overhead in less than an hour. It also compares favorably to estimating soil properties from a water retention curve since a Bruce-Klute test is dynamic, thereby removing the abstraction from static measurements to fluid resistance. The method is described theoretically and is applied to a silt loam soil. Strengths and weaknesses of the method are discussed and the sensitivity to various parameters is presented.

Expression Of Messenger Ribonucleic Acids Of Insulin-Like Growth Factor-Binding Proteins-2, -3, -4, And -5 In Fresh Versus Cultured Bovine Granulosa And Theca Cells.

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The objective of this study was to determine the presence of messenger ribonucleic acids (mRNA) for insulin-like growth factor-binding proteins (IGFBP)-2, -3, -4, and -5 in fresh versus cultured bovine granulosa and theca cells. Granulosa cells from small follicles (1-5 mm) and theca cells from large follicles (>7.9 mm) were collected from cattle and RNA isolated either before or after in vitro culture. For in vitro derived RNA, granulosa and theca cells were cultured for 2 d in medium with 10% fetal calf serum and an additional 2 d in serum-free medium. RNA from fresh and cultured cells was isolated using the Trizol extraction method. The presence of mRNAs for IGFBP-2, -3, -4, and -5 was assessed by reverse transcriptase- polymerase chain reaction (RT-PCR). IGFBP-2 mRNA was detected in 2 of 2 fresh and 4 of 5 cultured granulosa samples, and in 2 of 2 fresh and 4 of 6 cultured theca cells. IGFBP-3 mRNA was not found in either fresh or cultured granulosa cells. In contrast, IGFBP-3 mRNAs were detectable in all fresh and cultured theca samples. IGFBP-4 mRNA was expressed in 1 of 2 fresh granulosa samples and 3 of 5 cultured granulosa samples. IGFBP-4 mRNA expression was found in all fresh theca samples and in 4 of 6 cultured theca samples. IGFBP-5 mRNA was detected in 1 of 2 of the fresh and 3 of 5 of the cultured granulosa cells. All of fresh theca and 4 of 6 cultured theca samples had IGFBP-5 mRNA. These results would indicate that IGFBP-3 may be produced by theca and not granulosa cells, whereas IGFBP-2, -4, and -5 are produced by both theca and granulosa cells. Furthermore, in vitro culture had no effect on whether or not IGFBP-2, -3, -4, or -5 mRNA was expressed in small granulosa or large theca cells.

Photosynthetic Response Of Wheat To Leaf Rust Infection.

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Infection of wheat (*Triticum aestivum* L.) with leaf rust (*Puccinia triticina*) causes annual grain losses. The effects of rust infection were studied in the susceptible spring wheat cultivar Thatcher and its near-isoline carrying the leaf rust resistance gene Lr19. Photosynthesis measurements on intact leaves started prior to rust inoculation when the plants were four weeks of age and continued every two days following infection for the next 14 days. In the susceptible line, leaf rust infection caused large decreases in the maximum photosynthesis rate and slope of both CO_2 and light response curves, whereas in the line containing Lr19 both maximum rate and slope were much less affected. The large decrease in initial slope of both curves for the susceptible line indicated that the efficiency of photosynthesis had decreased. Photosynthesis at ambient CO_2 (350 μmol mol^{-1}) decreased by about half in susceptible plants in the 14 day period, but the decrease was much less for plants carrying the resistance gene.

EDUCATION

Michel Serres: The Multiplicity of Reading; the Mathematicity of Reading and Readability of math

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Michel Serres challenges us with a new form of seeing: the dichotomy witch exists between arts and sciences, in the educational system has no base in actual life. For Serres the methods of life are the methods of learning. With

advent of information science, a new model of representing science becomes accessible: this model is "communication" accordingly, we have three elements: a message, a channel for transmitting it, and the noise, or interference, that accompanies the transmission. Noise for Serres plays an important role because it calls for decipherment; it makes the reading of message more challenging and difficult. And yet without it, there would be no message. There is in short, no message without resistance.

For Serres unity dissolves in multiplicity that forms another unity in an ongoing process; these pockets of unity are islands of order in a sea of multiplicity. From this notion of multiplicity the tree of knowledge encompasses many forms of reading events, what I call multiplicity of reading is an endeavor of deciphering the message of math, poetry, physics, dance, etc., in a meaningful events through the messages they carry, the channel they transfer through, and the noise they make.

The purpose of this paper is to shed light on Serres' philosophy which has great implications for reading.

Educational Needs of Gifted and Talented Students: A Comprehensive Review

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This study provides an analytical review of literature describing the psychological and educational needs of gifted students. This comprehensive look begins by clarifying the definition of what qualifies students as being gifted and/or talented. A review of programming for gifted students follows. Finally, literature is presented on individual needs that should be addressed for our brightest youth to reach their potential.

In the area of identification, historical and currently accepted definitions are considered. By establishing the foundation of best practice in what characterizes this population, criteria for identifying gifted students in the areas of intellectual, academic, leadership, creativity, and the fine and performing arts will be delineated. Criteria will include proper assessment techniques by qualified professionals.

Next, the review will present programming options for gifted children. These include full inclusion where all children receive the programming, pull-out programs where gifted children receive part-time separate services, full-time advanced programming within regular schools, and programming at separate schools designed for gifted students. A review will be presented of programming according to content, such as enrichment units, academic acceleration, talent, critical thinking, and research skills. Frameworks for gifted programming will also be presented. Furthermore, we will discuss the literature on gifted and talented program development, content, and evaluation indicating that many gifted education plans may not meet the needs of all exceptional learners, especially minority students and those with special education or social/emotional needs in addition to their giftedness.

Finally, research is presented that demonstrates characteristics and special needs of the gifted population should be addressed in psychological and counseling services for students to reach their full potential. These include interpersonal skill development, emotional adjustment, motivation, and career/life planning. The involvement of related service personnel such as school psychologists in these services will also be discussed.

Gifted and talented programs, when implemented with careful consideration of empirical studies within the field, have an excellent and unique opportunity to be catalysts for student success. This research summary will benefit those who work directly with the gifted and talented population and those who interact with them in the educational setting.

Universal Newborn Hearing Screening: An Evaluation Of The Performance, Protocol, And Referral Rate Of Neonatal Intensive Care Units At Unmhsc.

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In the United States, the frequency of a significant congenital bilateral hearing loss is 1 per 500. An appropriate hearing level is the necessary prerequisite for a cognitive, linguistic and emotional maturation of an individual. Development in the hearing-impaired child is improved when the diagnosis is made early and intervention is begun before 6 months of age. The research investigated observed the screener's performance of newborn hearing screenings to determine the effect on the referral rate. Two different time periods of screenings were observed with a revised protocol in the latter group. From the data analyzed thus far, the study presents evidence that the revised protocol has no significant effect on referral rate.

The Relationship Between Self-Concept And Test Anxiety In Predicting Performance On Mathematic Achievement Test

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Test anxiety and self-concept have been identified as major variables impacting academic achievement (see Tryon, 1980). Therefore, the purpose of this study was to explore the ability to predict high school students' mathematics achievement on the basis of the students' scores on self-concept and test anxiety measures. Public high school students (N=50) who were attending a daylong university sponsored ACT preparation workshop across Oklahoma were administered an American College Testing Program (ACT) assessment, a test anxiety inventory (the worry component of the Test Anxiety Inventory), and a self-concept measure (the competence component of the Multidimensional Test of Self-Concept). Results indicated that the combination of self-concept and test anxiety scores accounted for by approximately 14% of the variance in the mathematic achievement scores. Additionally when assessed individually, it was determined that only self-concept was necessary in predicting students' mathematic achievement. Moreover self-concept was the most powerful predictor. Therefore, the importance of self-concept and test anxiety variables in a student's academic success should be emphasized. The results suggested that intervention programs are needed to build feelings of competence.

Why Johnnie Can't Coach A C.D.E.

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The spring semester is a busy time for student teachers. Student recruiting, training and practicing with FFA Career Development Event (CDE) teams is one of many activities a student teacher has the opportunity to look forward to during their 12-week internship. Unfortunately, student teachers going out in the fall semester have less of an opportunity to gain experience recruiting, training and practicing with students for FFA CDE's than do their spring student teaching colleagues due to the scheduling of career development events during the spring of the year. Competitive events can serve as a mechanism for agricultural educators to motivate students to perfect and advance their occupational skills (Gamble, 1986). However, Gamble (1986) noted no significant relationship existed between contest preparation and occupational preparation. Can Career Development Events prepare students for careers in Agriculture?

Deeds and Thomas (1999) found the advisor was considered to be the key factor for students in deciding which CDE to choose to participate and that teachers should engage in activities that enhance classroom instruction and career opportunities.

The purpose of this activity was to provide the fall 1999 student teaching class with an opportunity to train and coach a FFA career development team for competition during their 12-week student teaching experience. A goal was to expose more students and FFA chapters in Oklahoma to the Agricultural Issues Career Development Event.

At the completion of the four-week block, student teachers were challenged to go out to their cooperating centers and recruit and train an Agricultural Issues CDE Team for a special invitational contest to be held later in the fall semester on the OSU campus. The OSU Collegiate FFA Chapter was charged with coordination and sponsorship of the event. Since this was an invitational contest, and no student teachers had coached an Agricultural Issues team prior to this activity, nor had any of the cooperating centers fielded an Agricultural Issues team, previous experience was not a factor or an advantage for any team participating in the contest. All student teachers indicated a willingness to train and bring teams to the contest. Over half of the student teachers in the fall class brought student teams to compete. Undergraduate agricultural education students and Collegiate FFA members served as official judges. The Collegiate FFA Chapter provided plaques to the first and second place teams and a barbecue lunch for all participants.

1. Student teachers going out in the fall were provided the opportunity to recruit and train a career development event team from their cooperating center during their 12-week internship.

2. Evidence of coaching a student CDE can be included in the student teacher portfolio.

3. FFA members were exposed to a new CDE.

4. More Oklahoma FFA chapters have been exposed to the Agricultural Issues CDE.

5. It is expected the FFA members will encourage their advisors to continue training for the Agricultural Issues contest and participate in the State FFA Oklahoma State University Interscholastic Field Day in spring 2000.

Counseling Psychology's Presence In The Federal Gear-Up Grant.

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The Gaining Early Awareness and Readiness for Undergraduate Programs (GEAR-UP) partnership grant and Oklahoma State University's Counseling Psychology Department has developed a program aimed at helping middle and secondary school, low income, and challenged students and their families succeed. This program represents an example of counseling psychologist's presence in public schools and in helping make a difference in the lives of young people who are striving to achieve their post-secondary school and vocational goals. The goal of this program is to accelerate the academic achievement of these students so that increasing numbers will graduate from high school, enroll in college or a technical program. Oklahoma State University's Counseling Psychology program began its involvement with GEAR-UP through a partnership with a south-central metropolitan public school district.

One aspect of Oklahoma State's involvement in the grant is to provide counseling opportunities in the areas of career exploration, psycho educational interventions, communications and study skills, parental and community participation and general support for the student's future endeavors.

Data was collected from participants, parents, and school facilitators and program personnel. The data reflected anticipated outcome. Positive feedback was received via questionnaires that were given to the students on the last day of camp asking program specific questions on student's satisfaction with the program. This questionnaire allowed the students to include input that they felt would enhance the programs future endeavors. Positive feedback was also received from parents, educators, and grant coordinators.

The program would like to see continued improvement in student's academics, listening and communication skills, social skills and further interest and exploration of career development. A higher percent of parental and community participation is an important goal of the program as representation and support from these sources is essential in the student's success and growth; therefore, programs to inform and support students as well as their parents have been devised and are presently being implemented.

This program represents a collaboration of Counseling Psychology with community and education leaders in working to make a difference in the lives of at-risk students.

Moral Decision-Making, Codes Of Ethics And Implications For C.H.R.I.E.

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In the past, profit was the primary mission and goal for most businesses. However, management in today's society must deal with legal and ethical dilemmas on a regular basis. As a result, many profit-oriented firms have begun to adjust their business strategies and decision-making processes to emphasize business ethics. In addition, many non-profit organizations such as The International Council on Hotel, Restaurant, and Institutional Education (C.H.R.I.E.) may also have the need to clearly articulate and emphasize their business ethics. This presentation explores that possibility. This poster presentation will explore business obstacles and business principles related to ethics for professional associations such as C.H.R.I.E. For several years, the membership of C.H.R.I.E. has discussed the possibility of a code of ethics for the organization. This presentation will give an overview of the success of current corporate codes of ethics as well as other associations codes of ethics. The results will be presented and discussed relative to the need to strongly articulate ethical policies and clearly communicate ethical statements and codes.

Feel The Burn! Electronic Portfolios In Agricultural Education

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Teaching portfolios are being used in teacher education programs providing students with a personal tool for reflecting on their teaching ability, knowledge and understandings. Hurst, Wilson, and Cramer (1998) defined portfolios as reflective summaries of self-reflected artifacts, representations of teaching credentials and competencies, holistic views of teachers and documentation for strengthening interviews. Artifacts typically include the teacher candidate's resume, personal philosophy statement, professional goal statement, and self-reflections, examples of lesson plans and unit plans, current grade report, and letters of recommendation. The artifacts are compiled by the teacher and placed in a binder. However, problems exist regarding portfolio binders. Teacher candidates perceive the portfolio to be costly to produce. In an interview, it is awkward to utilize and difficult for the administrator to examine in the time allowed. (Irby, B.J., & Brown, G., 1998).

An alternative to the traditional portfolio is the electronic portfolio. Electronic portfolios document video, photos, and text available within one form of media. According to Sheingold (1992), through using technology to store student portfolios, we can make their work portable, accessible, and more easily and widely distributed. We can

also replay performance works anytime. A research study by McKinney (1998), showed creating electronic portfolios allowed students to be reflective, and participants viewed the experience as positive and useful. (McKinney, M., 1998).

In Spring 2000, the Agricultural Education Program at OSU secured funding through the OSU Assessment Office to hire a Portfolio Assistant to aide agricultural education teacher candidates with preparation of student portfolios. Additionally, the Portfolio Assistant was assigned the responsibility of piloting an electronic portfolio. A goal was established that in Fall 2000 every teacher candidate would have an electronic portfolio to supplement his or her paper portfolio. Teacher candidates were responsible to submit artifacts in the form of videotapes, lesson plans, goal statement, philosophy statement, SAE policy statement, grade report and resume to the student assistant. This portfolio assistant then organized and recorded the information on a compact disc (cd). In the interview setting, the teacher candidate could leave the compact disk (cd) with the administrator. The advantage would be the administrator could view another dimension of the teacher educator?s credential, and by leaving the electronic portfolio with the administrator, he or she may view the electronic portfolio at a later date and in more depth.

The Agricultural Education program at Oklahoma State University has seen direct benefits by having its teacher candidates complete an electronic portfolio. All students in the Fall 2000 student teacher class submitted materials to be recorded in the document. Artifacts demonstrated were a resume, grade reports, lesson plans, philosophy statements and goal statement, photos and 15 second video excerpts from teaching experience. The Portfolio Assistant utilized a html format in creating the electronic portfolio and burned it onto a compact disk. Teacher candidates also submitted a portfolio as in the past. The electronic portfolio should not replace the written portfolio; rather it should supplement it.

Helping Students FIT In: Pilot Study of a Living-Learning Community

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An important goal of colleges of agriculture is to promote student learning and personal development. Barriers to accomplishing this goal include retention of high quality students, demographic shifts, lack of public support, and greater demands for colleges and universities to accept more responsibility for student learning (Schroeder, et al., 1994). In an effort to provide a comprehensive environment for student learning and personal growth, Oklahoma State University, College of Agriculture Science and Natural Resources (CASNR) created a living-learning community for freshmen called Freshmen In Transition (FIT).

How Does the FIT Program Work?

The FIT program was created to challenge first time freshmen to "reach beyond their personal expectations and achieve a significant level of excellence in several areas" and to "provide CASNR freshmen with opportunities to excel in the university, community, and life" (W. Holley, personal communication, September 19, 2000). The goal of the FIT program is to develop strong academic, social, leadership, and service skills that will increase students ability to succeed in college.

The FIT program allows freshmen students with agricultural-related majors to live and learn together in a residential community for one academic year. The program requires participants (N=72) to reside on the third and fourth floors of Jones Hall (a.k.a. Ag House) along side the nine Student Academic Mentors (SAMs) who serve in a support role to students. Although the floors are co-educational, each suite houses four students of the same gender. A full kitchen, laundry room, and commons area are available to the students along with a community dining cart located on the first floor commons area of Jones Hall.

What is unique about the FIT program is that in addition to living in theme housing, students must participate in thirteen pre-determined activities including the allied arts, faculty discussions, Homecoming, wellness programs,

academic excellence workshops, career development, social functions, university and college clubs and/or associations, leadership, community service, intramurals, and Camp Cowboy. They must also maintain a 2.5 GPA their first semester and 3.0 GPA their second semester.

Students are allowed to choose the activities that they wish to participate in as long as they fall within the 13 categories. In order to help students fulfill the expectations, a FIT web page was created and includes information about the program, news, a monthly calendar, student, faculty, and guest articles, pictures of the FIT students and SAMs, and an area for SAM discussion groups (http://fit.okstate.edu/). In the living-learning community, the FIT students have access to two white dry-erase boards that include the activities for the present week.

FIT students are also actively engaged in local democracy. They have established an Advisory Council, a Judiciary Board, and small groups where eight FIT students and one SAM gather to reflect on their weekly activities and opportunities. The Advisory Council has proved to be invaluable in providing formative evaluative information to the program director and coordinator as well as allowing students to voice concerns regarding the program.

Many people have contributed to helping the FIT program succeed. Faculty and staff within CASNR, student affairs, and residential life have participated in the Advisory Board, as well as interacted with FIT participants in a variety of way. A program coordinator was hired for 10 hours per week to train and manage the SAM team as well as to act as intermediary among all parties involved. CASNR is highly committed to the program and has institutionalized positions and resources to ensure the success of the FIT program, including an evaluation study currently underway.

Potholes to Avoid In Developing A Living-Learning Community

As with any new program, there are lessons to be learned and potholes to be avoided. Through numerous informal conversations with the students, we have learned that the FIT program is a good program, but students suggested that the expectations are too structured and did not allow them meet their personal goals. Additionally, they felt that the SAMs had assumed a "policing" role, rather than the mentoring role conceptualized by the project director. During the October Advisory Council meeting it was recommended that students be allowed to structure their own list of activities in conjunction with their SAM and other students. Also, SAMs should not be involved with rule enforcement, but rather should align themselves as true mentors and support people.

Does the FIT Program Help Students FIT In? Plans for Evaluation

As the FIT program is unique in requiring a variety of activities for students to complete throughout the year, the impact of the program on students' intellectual and psychosocial development is unknown. Therefore, an evaluation study will seek to determine the impact of the program on student learning and psychosocial development. The research design to be used by the evaluation team is a quasi-experimental pretest-posttest, equivalent group.

R1	O1	X1	O2	O3
R2	O1		O2	O3
R3	O1		O2	O3

Both quantitative and qualitative data will be collected to better understand the factors that affect the participants' academic achievement, retention rates, involvement, and psychosocial development, and the overall effectiveness of the FIT program in influencing these domains.

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Pre-Service Teachers' Attitudes About Technology
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With the increase in technology available in schools today it is important that pre-service teachers leave the university setting with positive feelings about technology. This positive attitude and feelings of expertise could translate into these teachers facilitating the use of technology in their classrooms. Fifty pre-service teachers completed a survey rating their expertise in using technology, their attitudes about the importance of using technology in their classrooms and their beliefs about how they anticipate their future use of technology in the classroom. The study looked at differences in major fields of study and the perceptions of these pre-service teachers concerning their use of technology in their future classrooms.

The Influence Of Self-Efficacy Beliefs On Academic Achievement In English, Math, Reading And Science
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Perceived self-efficacy beliefs can be a significant predictor of academic achievement. The multidimensional nature of the self-efficacy construct warrants investigation of the influence of self-efficacy beliefs in specific academic domains. Bandura (1989) has identified nine separate realms of self-efficacy beliefs that may influence academic achievement. The current study explores the influence of these nine realms of self-efficacy beliefs on performance in four academic domains: English, math, reading, and science. Subjects were 49 high school students participating in an ACT preparation workshop; instruments were the Multidimensional Scales of Perceived Self-Efficacy and the ACT Program achievement test. Standard multiple regression was conducted to determine how well this set of predictors estimated performance in each domain, and which individual variable was the best predictor of performance in each domain. The full set of predictors accounted for a significant amount of the variance in English performance, but not in math, reading or science performance. Perceived self-efficacy for academic achievement was the single best predictor of English performance, while self-efficacy for meeting others' expectations was the single best predictor of math performance. Implications and suggestions for future research are discussed.

HUMANITIES

What matters in a business web site?
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This paper examines the factors that contribute towards the effectiveness of a web site. While past research has examined the factors affecting the attitude toward a consumer site, there is a lacuna for such research in the business-to-business area. Typically business-to-business sites have objectives quite different from those of business-to-consumer sites, which makes it difficult to extrapolate the results from business-to-consumer sites.

More importantly by using a field survey method instead of the more commonly used student surveys, this study overcomes the criticism of being low on external validity. Based on an extensive search of offline business-to-business and marketing literature, the following constructs were hypothesized to affect attitude toward a site: product information, general information, relationship building (e.g. recognizes return visitors, customization of content), transaction (e.g. ability to make payments, ability to see in-stock availability of items), entertainment, organization, and privacy/security. At this point the web-based survey is being administered and results are expected in a few weeks.

Since most of the items were obtained from other studies, a factor analysis will be run to ensure that the items used load onto the constructs they are expected to measure. A multiple regression of Attitude toward the site as dependent variable against the independent variables identified above would not only offer information on the constructs that affect the evaluation of a site but also their relative importance. This paper will help business-to-business sites in developing effective web sites by guiding them in allocation of funds to the things that matter.

"THE FLYING TIGERS" A Map and Historic Account of the American Volunteer Group
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The American Volunteer Group was created by a secret executive order signed by President Franklin D. Roosevelt in April, 1941. The Group's mission was top secret due to the fact that the United States was providing China with a mercenary air force, consisting of 300 American pilots and ground crew and 100 modern American pursuit planes. Their mission was to protect China's only supply line to the outside world - the "Burma Road", and to engage the Japanese in air combat, on behalf of the Chinese. This, before the United States was at war with the empire of Japan! The purpose of my poster is to provide a historic account of the American Volunteer Group (popularly known as the Flying Tigers). Using computer cartography, I have created a historic map of China to illustrate the location of AVG activity and the changes that have occurred in this region over the last half-century. Through the use of photographs, personal interviews and correspondence with AVG members, I have provided an account of what I believe to be the most interesting aspect of American assistance to the allied powers before our own involvement in World War II.

PHYSICAL SCIENCES & TECHNOLOGY

Melp Over Ip And The Future Narrowband Digital Terminal
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This study describes the design and implementation of a voice over packet-switched network, Voice over Internet Protocol (VoIP), system using the new proposed Federal standard Mixed-Excitation Linear Prediction (MELP) 2400 bits per second voice coder developed by Texas Instruments. This implementation simulates one application of the Future NarrowBand Digital Terminal (FNBDT), being developed by the government to provide secure digital multimedia communication between users over a concatenation of possibly dissimilar communication networks (internet, cellular, wireless, satellite, public switched telephone network, etc.). FNBDT will provide a framework for supporting the communication of a wide variety of media (data, voice, images, video, etc.) in a secure manner. This design and implementation provides a detailed look at the various system components of an

end-to-end VoIP system and illustrates the Quality of Service (QoS) issues involved in transmitting low-rate voice (i.e. MELP) over the Internet using the FNBDT operational modes. The factors that affect the QoS of a VoIP system include end-to-end delay, packet loss, packet inter-arrival time, out-of-order packets and jitter. End-to-End delay is the most constraining factor, and has the greatest impact on other system design constraints such as packet length, number of frames per packet, loss recovery schemes, etc. This implementation provides a mechanism for studying the various QoS issues relating to overall VoIP system performance. It provides a framework for the integration of MELP into the proposed Future Narrow Band Digital Terminal. Finally, it provides a framework for investigating the performance of FNBDT as well as MELP over a concatenation of dissimilar networks.

Economic Impact Of Phosphine Fumigant Regulations On The Grain Industry And Technology Adoption

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Phosphine is a colorless, odorless gas that is used to eliminate insects in stored food products. It is purchased in the form of pellets or tablets and applied to grain in storage. The pellets or tablets mix with the grain moisture and temperature to form a deadly gas. The gas is a respiratory poison. Insects breathe the poison in, causing their internal organs to cease functioning. Phosphine will be the most used stored grain fumigant by the year 2005. At that time the Environmental Protection Agency (EPA) will ban the number one fumigant, methyl bromide.

Phosphine, the number two fumigant, is also on EPA?s watch list. The EPA has passed new restrictions on phosphine this year. One of the new restrictions requires phosphine users to monitor gas levels around the facility during and after fumigation. They are requiring this data collection so that they will know the gas concentration that workers, bystanders, and nearby residents are being exposed to. If the gas levels are high, the EPA may then place further restrictions on the gas.

The choice of the monitoring device used is up to the applicator and there are many options available. The two main types of devices are the electronic and tube-type monitors. The tube-type models are relatively inexpensive and provide adequate reliability. However, each reading takes a lot of time, so labor costs are high. The electronic models require minimal time to operate, but are quite expensive. There are opposing viewpoints on which is the best monitoring system. Some people believe that the capital cost of the electronic equipment is too high to be economically feasible. Others believe that human error and labor costs of the tube-type monitors exceed the capital cost of electronic equipment. In addition, several different brands of electronic monitoring devices are available. Each uses a unique technology, so each has its own set of advantages and disadvantages.

My research question is, Which phosphine gas monitoring device is the most cost-effective for grain storage facilities to use in protecting workers? Safety and in measuring fumigation effectiveness?? An economic cost/benefit model is used to select the best monitoring device most appropriate for various types of grain storage facilities.

Modeling The Adsorption Of Co2, Methane And Nitrogen In Coalbeds

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Efforts are underway to extend the equation-of-state (EOS) framework to render it useful for multilayer adsorption by (a) using solid-fluid site characterization based on characteristic curves similar to those generated by the Polanyi potential theory [see, e.g., 1], and (b) combining a fluid-solid potential with an improved EOS phase description to predict the near-critical adsorption behavior, in a manner similar to the simplified-local-density (SLD) model [see,

e.g., 2]. Such developments could facilitate the use of highly efficient EOS computational frameworks for representing adsorption behavior, as well as improving our understanding of the phenomenon.

The purpose of present study is to evaluate the predictive capability of the SLD model for supercritical adsorption systems of the type encountered in coalbed methane recovery and CO2 sequestration. Specifically, we have correlated experimental data on the adsorption of methane, nitrogen and carbon dioxide on wet Fruitland and Illinois-6 coals. The SLD model predictions were then compared to the predictions obtained from the Langmuir, the loading-ratio correlation, and two-dimensional (2-D) EOS models.

Our results indicate that the SLD model may be an appropriate choice for modeling the adsorption of methane, nitrogen and CO2 at coalbed conditions. Calculations based on a flat-surface structure yield results superior to those of the 2-D EOS model by Zhou et al. [3]. The flat homogeneous surface model exhibits good predictive capability for the nitrogen system, with errors of about 2%, and it yields errors of about 4% and 6% for methane and carbon dioxide, respectively.

This study also indicates that future SLD models need to account for coal heterogeneity and structure complexity, as well as address the competitive adsorption of mixed gases on coal.

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Epic-View: A Spatial Tool For Sustainable Farming

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This project aims at developing model calibration and validation tools for EPIC-View. EPIC-View is a user-friendly integrated modeling system developed by integrating EPIC (Erosion Productivity Impact Calculator), a hydrologic/crop growth model with ArcView, a desktop Geographic Information System (GIS). This modeling system will function as a planning tool in implementing sustainable farm management practices. This project utilizes the true analytical power of GIS and computer simulation models. The use of GIS makes possible the integration of diverse spatial data into a comprehensive spatial database. The integrated modeling system holds immense potential as a farm management tool. This modeling system is an application that can be embedded as a tool in Arcview GIS. Using this tool, various components of a sustainable agricultural system including irrigation management, crop management, soil management and pest management can be efficiently simulated and managed, making farms more economically and ecologically sound. The user-friendly Graphical User Interface (GUI) developed using Visual Basic and Avenue programming languages allows the user to manipulate various model components from ArcView, to simulate soil erosion, plant growth and related processes. The simulation output for various variables such as soil loss from water erosion (AOF), runoff (Q) and nitrogen volatilization (AVOL) etc. can be viewed in the form of thematic maps, charts and tables. Currently, model calibration and validation tools are being developed to make EPIC-View more robust in its simulations. This will involve comparing real-world data with the simulated results. Field level data pertaining to soil properties and yield are already available from a cooperative farmer in Cherokee county, Oklahoma. Scatter plot tools to visualize and compare the observed data with the simulated data are already developed. Specific tools to modify the variables in the calibration and validation procedures are in a developmental stage.

Key words: EPIC, GIS modeling, integration, sustainable farming, management tool.

Viability Of A Landscape-Generated Et Index For Predicting 'Point' Reference Evapotranspiration

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The evapotranspiration (ET) process represents water being lost due to evaporation from the soil and through the transpiration of plants. It is the largest consumer of water on Earth. Therefore the estimation of ET is a valuable tool for water management. Actual ET is difficult to measure. Reference ET is often used to help estimate the rate of actual ET at a single location. Reference ET is derived from a formula requiring many measured weather variables, several of which are not widely measured. This paper represents an initial assessment of the viability of using landscape-generated ET index values for the estimation of Reference ET.

Oklahoma's Mesonet weather station network provided weather data and Penman-Monteith equation estimates of Reference ET during the case study days chosen for this project. ArcView GIS software was used to delineate areas of three widely separated Mesonet weather stations as study sites within buffered zones that radiated 10km from the selected stations. These circular study sites were divided into 16 polygons representing 16 wind directions and were projected onto digital, 30m resolution land-cover data. ET Index values were used to quantify the various spatial combinations of landcovers found in the polygons. Each ET Index value was derived by multiplying the literature-based estimates of crop coefficients for the polygon's land covers by the calculated percentages of each landcover type found within the polygon. Mesonet-estimated daily reference ET values were compared with the landscape-generated ET Index for study days across the three sites**.**

Nondestructive Evaluation Of Colvin Center Annex Decayed Timber Arches

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The Oklahoma State University Colvin Center Annex, built in 1974, has been exposed to many adverse environmental conditions, which have caused decay in the glued laminated (glulam) arches stabilizing the building. The research conducted will help evaluate the extent of this degradation. Stress wave technology was employed to determine the condition of the beams. The velocity of a stress wave is dependent upon
the density and elastic modulus of the material it is traveling through. Locations containing decay will have both lower density and modulus of elasticity. Stress waves were sent through each lamination of the individual glulams at every four inches using "through-transmission" techniques. The travel time from one side of the beam to the other was found for each of these waves, and all times were compiled into SigmaPlot 2000, where color contour diagrams of each beam were created showing locations of decay. These contour diagrams were compared with photographs of the beams, as seen below, and direct correlations were seen between the areas of higher concern. Oklahoma State University officials can use these results to form a final decision whether to repair the existing building or to rebuild an entirely new structure.

The Homeomorphism Problem: Two-Dimensional Insight

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Every surface can be thought of as being constructed from collections of triangles. They can be represented as such in infinitely many ways. However, we know that there are only finitely many ways to do this using a minimal collection of triangles. For example, the surface of genus two can be constructed using six triangles and there are eight such combinatorially distinct ways to triangulate the surface of genus two. Each of these triangulations may

give some invariant information about the surface of genus two. One way to get such information is through the study of "normal curves." Given one of these triangulations, each family of disjoint curves can be represented as an ordered 18-tuple of nonnegative rational numbers. While not all 18-tuples of nonnegative rationals represents a family of curves on the surface of genus two, there is a system of equations whose solution space is a nine-dimensional compact, convex linear cell, where the rational points do correspond to the family of curves on the surface of genus two. We are seeking information about these polyhedra for the eight minimal triangulations of the surface of genus two; Specifically, we are interested in the vertex set and the number (and shape) of the faces of each dimension.

A New Method For Structural Characterization Of Biomolecules

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Structural characterization of biomolecules is the first step toward understanding the functional mechanism of proteins. We characterize the structures of amino acid side chain groups and protein chromophores based on combined applications of Fourier transform infrared (FTIR) spectroscopy and ab initio calculation based on fundamental quantum mechanics (Gaussian98). The vibrational frequencies of a chemical group are the fingerprints for identification of the molecular structure and charge state of the group and its interactions with solvent molecules. Such vibrational frequencies are fully determined by the force constants of chemical bonds and atomic weights. The vibrational spectra of a protein chromophore model compounds and a few amino acid monomers are measured using FTIR spectrometer. We have tested a number of ab initio methods to find a method that provides accurate calculations of vibrational frequencies of these groups using Gaussian98. We will report that comparisons of various methods and excellent agreements between the frequencies from experimental measurements and theoretical calculations. This method offers a great advantage for structural determination of a chemical group in proteins that does not require the costly and difficult procedure of isotopic labeling.

Geographical Information Systems And Their Applications In Environmental Engineering And Management

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Geographical Information System (GIS) is a computer system for assembling, analyzing and displaying geographically referenced data. GIS has emerged as a powerful tool for data integration and is used in various fields like environmental and natural resources management, business, transportation, health and defense etc. Present poster gives an overview of GIS describing in brief about the functional elements of GIS like data acquisition, preprocessing, data storage and management, manipulation and analysis, and product generation. The poster is an attempt to acquaint the reader about the applications of GIS in the field of environment, which constitute a large chunk of GIS applications. GIS has been used successfully for nonpoint source pollution assessment and water resources management, air quality management, environmental impact assessment and ecological risk assessment etc. The poster presents a review of the research done in the above-mentioned fields along with discussion of short case studies to bring forth the utility of GIS and to enhance general understanding

A General Framework for Enterprise Modeling and Process Specification

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We present preliminary results of an NSF-funded effort to derive a user-friendly modeling language for enterprise modeling. The focus of our effort is to create a framework supported by a formal internal representation like Petri Nets that balances the needs of rigor with ease of use, to aid in the design, study, and redesign of enterprise systems supported by analytical tools. The strengths and weaknesses of existing process modeling paradigms like IDEF, CIMOSA, IEM, DFD, etc., are evaluated and presented herein.

Finite Element Analysis Of Shear Slitting Of Aluminium
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Generally during Slitting it is required to slit the web in such a way so as to minimise defects such as burr height etc. This presentation deals with 2-Dimensional Finite Element Analysis of shear Slitting of Aluminium webs. The effect of clearance, Blade Radius on burr height are studied. The analysis results are compared with experimental results. ABAQUS, a Finite Element Software, has been used to carry out all the analysis.

SOCIAL SCIENCES

An Analysis of the Development of Auditing Standards in China and the United States
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Auditing is a process of obtaining and evaluating evidence regarding assertions about economic actions and events to ascertain the degree of correspondence between those assertions and established criteria, and communicating the results to interested parties. To measure the quality of the auditor's performance, auditing standards have been promulgated. In 1947, Generally Accepted Auditing Standards (GAAS) were issued in the United States. Chinese Independent Auditing Standards (CIAS) were published in 1995. This paper will analyze the economic, cultural, and governmental factors that influence the development of auditing standards. The sources of information are academic journals, news publications, and regulatory rules and standards. This study is significant due to the globalization of business, litigation against auditors, and the interested parties dependence upon audited financial statements their expectations of auditors.

Landing Flare Accident Reports and Pilot Perception Analysis
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Pilots and authors provide anecdotal evidence to the difficulty of the flare maneuver but the scientific literature has generally failed to address the issues of flare accident frequencies and probable causes for improper flares. Measures included the analysis of 6676 aircraft accident reports published by the National Traffic Safety Board (NTSB) and a 23-item pilot perception questionnaire. One-hundred-and-thirty-four pilots (novice=55, intermediate=45, expert=34) from three flight schools in Oklahoma completed the questionnaire. Findings suggested that the flare is a significant factor in general aviation. In reference to probable causes of flare accidents the authors propose the "proper flare - experience paradox".

High Turnover Of The Diverse Workforce In The Hospitality Industry

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The trend of globalization is impacting workforce diversity. The hospitality industry is one example of an industry that employs a multicultural/diverse workforce (Eddystone, 1991). Employees come from different ethnic backgrounds, different genders, ages, and with different physical abilities, sexual orientations and values making the hospitality industry very heterogeneous (Harvey, 1995).

High turnover of the workforce in the hospitality industry is linked to managing diversity (Quek, 1997). This study looks at various diversity programs utilized by different companies.

Diversity Awareness Training Programs:

Around the country numerous hotels have aggressively developed diversity awareness training programs. These programs provide education to hotel management and staff in ways to provide access, inclusion, and opportunity for all people, regardless of age, sex, race, or disability. Diversity awareness programs teach people to accept and value diversity (Chon and Sparrowe, 1995).

Reward and Recognition Programs:

By implementing effective reward and recognition programs, companies can create a positive environment that motivates and encourages workers to thrive, while improving employee retention rates (Khan, 1990). Unique alternative benefits may include company-purchased tickets to sporting or cultural events, health and fitness programs, and personal services such as dry cleaning, massage therapy, and self-defense training. Tuition reimbursement and continuing education also are frequently used incentives (Misek, 2001).

Flexibility Programs:

To continue to attract women, the industry must approach staffing needs with greater flexibility and creativity. Encouraging flexible work schedules and job sharing will appeal to many working mothers. Providing child care facilities or financial assistance for child care expenses will be another employment draw.

For the purpose of recruitment and retention of employees in the future, management should be willing to assess some of the model employment programs that are in place at various operations. These programs need to be geared toward the composition of the work force expected for the year 2000 and beyond. This workforce will include increased numbers of women, older persons, minority workers, and handicapped workers (Khan, 1990).

In conclusion, this poster presentation will give examples of hospitality companies that are implementing these types of programs.

Socioeconomic Change In Tulsa's Greenwood District, 1950-1960: Assessing The Impacts Of Desegregation

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This research examines socioeconomic change in Tulsa's Greenwood District during the 1950s. "Greenwood" was the unofficial name of Tulsa's African-American community at that time. The core of the neighborhood consisted

of homes and businesses that had been rebuilt after the devastating race riot of 1921. During and immediately following World War II the district underwent an economic boom, but by the mid-1950s the neighborhood had fallen into the first stages of a gradual economic decline. Some authors have postulated that the Civil Rights movement and desegregation efforts of the late 1950s led to the socioeconomic decline of African-American neighborhoods across America. This research assesses the validity of that belief in regard to Tulsa's Greenwood District. Data from the United States Census Bureau is utilized to demonstrate population changes in the neighborhood from 1950-1960. Additionally, business patterns within the community are examined, and the integration of neighborhood schools is discussed. Preliminary research indicates that school integration was a driving force behind changes in the socioeconomic structure of the community during the 1950s.

Sqol- Seniors' For Quality Of Life

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HES
Oklahoma State University

With today's aging population increasing in large numbers, researchers need to continually search for ways to maintain or increase the aging person's quality of life. Through leisure education and quality of life programs, researchers can gain much insight into the ever changing aging population.

A Qualitative Investigation Of Clinical Supervision: How Supervisors And Trainees Adapt To Video Teleconferencing

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The learning and acquisition of clinical skills is one of the most important functions of graduate training in counseling psychology. Advances in technology are now greatly influencing this extensive training process. A specific advancement is the use of video teleconferencing to provide mental health services. Services being provided via video teleconferencing include assessment, diagnosis, intervention, consultation, and supervision. The use of video teleconferencing in training and service delivery of psychologists appears to be on the rise throughout the world. Public and private agencies in mental health have already incorporated this format in their training of psychologists. Universities with counseling psychology training programs may have satellite campuses or practicum placements that have the option of transitioning toward a distance supervision format just as other class instruction has already. This transition from a face-to-face format to a distance format is occurring with limited research studies examining the effectiveness of this model of supervision and the impact on the relationship between supervisor and trainee. To ensure appropriate development of video teleconferencing applications, psychologists must have a clear understanding of the opportunities and a strategy framework in place to manage the challenges it will provide professional training and practice. This qualitative study addresses ways in which videoconferencing impacted interaction patterns among supervisors and trainees involved in a semester long clinical supervision relationship. Results from the study will be presented along with suggestions for conducting further research incorporating the use of videoconferencing technology in clincal supervision.

Every surface can be thought of as being constructed from collections of triangles. They can be represented as such in infinitely many ways. However, we know that there are only finitely many ways to do this using a minimal collection of triangles. For example, the surface of genus two can be constructed using six triangles and there are eight such combinatorially distinct ways to triangulate the surface of genus two. Each of these triangulations may give some invariant information about the surface of genus two. One way to get such information is through the study of "normal curves." Given one of these triangulations, each family of disjoint curves can be represented as an ordered 18-tuple of nonnegative rational numbers. While not all 18-tuples of nonnegative rationals represents a family of curves on the surface of genus two, there is a system of equations whose solution space is a nine-

dimensional compact, convex linear cell, where the rational points do correspond to the family of curves on the surface of genus two. We are seeking information about these polyhedra for the eight minimal triangulations of the surface of genus two; Specifically, we are interested in the vertex set and the number (and shape) of the faces of each dimension.

Predictors Related To Attendance At The Intervention Component Of Phase I In The Penn Family Care H.E.L.P.* Weight Management Study *Healthy Eating Lifestyle Program

Tambra R. Stevenson (Department of Nutritional Sciences, Oklahoma State University, Stillwater, OK 74078) Shiriki K. Kumanyika, PhD, MPH, Melicia C. Whitt, PhD, Jennifer Cunningham, MS, and Gwendolyn Fougy, MS (Center for Clinical Epidemiology & Biostatistics, University of Pennsylvania School of Medicine, Philadelphia, PA 19143)

OBJECTIVE: To determine factors that predict attendance at intervention classes among patients enrolled in the H.E.L.P. Study. In addition solutions to decrease low attendance are suggested.

RESEARCH DESIGN & METHODS: Thirty-eight obese African-Americans between 25-70 years of age with BMI ³ 30 and £ 50 kg/m2 who are under the care of a University of Pennsylvania Health System primary care physician were enrolled in the Phase I of the study. The intervention consisted of 10 weekly sessions, seven of which have been completed at the time of these analyses.

MAIN OUTCOME MEASURES: Age, BMI, number of medical conditions, number living in household and staff satisfaction were evaluated as predictors of attendance at weekly intervention classes. Attendance records and patient information were used to determine rate of participation and predictors.

STATISTICAL ANALYSES: Data from 35 participants with complete records were used in these analyses. Univariate analyses were used to describe the distribution of study variables. Spearman rank-order correlations were used to determine predictor variables associated with class attendance and logistic regression was used to confirm the results.

RESULTS: Spearman rank-order correlations exhibited that age and number of medical conditions were associated with attendance at weekly intervention classes for patients enrolled in the H.E.L.P. Study. Other predictor variables were not significantly associated with class attendance. Regression analysis also showed that age and number of medical conditions were associated with class attendance.

APPLICATIONS & CONCLUSIONS: Our findings suggest that interventions programs that are age-specific may increase attendance. The number of medical conditions can be addressed during the baseline visit through patient education. In addition, the implementing of contingency contracts may prove to enhance attendance rates.

Influence Of Food Stamp Participation On Nutritional And Health Status Of Low-Income Elderly

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Reciprocal relationships among poverty, food intake, and health status influence nutritional status of the elderly. The food stamp program is designed to improve nutritional status of low income Americans. However, nationally many eligible elderly do not participate in this program. The purpose of this study was to compare nutritional status and health problems of low-income elderly that participate and do not participate in the food stamp program. A subset of 1,506 low-income (less than 130% of poverty) elderly (65 years and older) from the Third National Health and Nutrition Examination Survey (NHANES III) was divided into groups by self-reported food stamp

participation in the past 12 months. t-tests, chi-square, and regression were used to analyze the data; p-values were considered significant at $p<0.05$. Food stamp recipients (n=368) were significantly older, more likely to be non-white, lower income, and they lived in households with more occupants than low-income elders who did not participate in food stamps (n=1138). Significantly higher rates of arthritis, congestive heart failure, diabetes, hypertension, and hypercholesterolemia were reported in the elderly food stamp population, and they took more prescription medications. Food stamps participants had lower hemoglobin values, RBC folate, serum cholesterol, and serum vitamin C, and higher glycated hemoglobin than non participants. Food stamp recipients consumed significantly less energy and they had lower Healthy Eating Index (HEI) scores for grains, fruits, vegetables, dietary variety and overall diet quality. Food stamp participation did not ensure better nutritional status in low-income elders.

Image Analysis Of The Pearl River Delta Travel Destination

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This study is discussing about the destination image analysis of the Pearl River Delta (PRD) subregional travel destination, which comprises Hong Kong, Macao and Guangdong. Literature review in the fields of destination attractiveness study and tourists' motivation study indicates that both research tools are important to image study of travel destinations. Quite a few of previous image analyses were conducted based either on destination attributes (pull factors) or motivational attributes (push factors). Very few, however, had ever attempted to integrate these two skills into one. The lack of empirical research with regard to whether there is a relationship between destination attributes and motivational attributes forms the basis for this study. In this study, it is assumed that push factors and pull factors may react with each other in a reciprocal way. A good understanding of the relationship between travel destination attributes and motivational attributes may be useful to destination image analysis.

This is a descriptive cross-sectional research study which aims at describing the images of the PRD sub-regional travel destination perceived by international pleasure tourists. A questionnaire survey was designed and employed to measure: 1) tourists' perceived attractiveness of the PRD travel destination, and 2) tourists' perceived importance of motivational attributes. As a result, a total of 303 questionnaire were collected. Statistical analysis techniques used in this study include mean score ratings, factor analysis and canonical correlation analysis. Mean score ratings were computed for the perceived destination attributes of the PRD area and tourists' perceived motivational attributes. Factor analysis using varimax rotation was used 1) to group the PRD destination attributes into a smaller set of new composite dimensions, and 2) to identify the underlying dimensions of tourists' motivations when choosing the Pearl River Delta area as a travel destination. Canonical correlation analysis was employed to examine the relationship between the destination attributes and motivational attributes. As a result, Canonical correlation analysis of both destination and motivation dimensions indicated that there did exist some relationship between the destination attributes and motivational attributes.

The results of the canonical correlation analysis confirmed that destination attributes were positively related to the motivational attributes. This finding suggests that a successful matching of destination and motivation factors may help to identify a more integrated destination image. The main practical implication of this study for the tourism marketers of the PRD area is that, on one hand, they should try to portray or develop favorable images of the PRD sub-regional travel destination on the bases of their favorable destination attractions, in order to enhance tourists' choices. On the other hand, marketers should have accurate and reliable information about potential tourists' needs in order to successfully market their tour products. This study further implies that image analysis with an approach of using two sets of variables (destination and motivational attributes) could help to assess destination images more accurately and completely.

Key Words: Travel Destination; Image analysis; Canonical Correlation; Pearl River Delta