rrence of *Salmonella* species in raw and ready to eat turkey meat products from retail ts in the Midwestern United States. R. Kegode[1], M. L. Khaitsa[1*], D. Doetkott[1]. [1]Dept. of erinary and Microbiological Sciences, North Dakota State University, Fargo, ND.

w studies in the United States have addressed turkey meat as a potential vehicle of an Salmonellosis. To fill this information gap, we investigated the occurrence of *nonella* in raw and ready to eat turkey meat products, and factors associated with its rrence. *Salmonella* isolates were also tested for antimicrobial resistance. A total of 959 ey meat products (raw, n =345 (36%); and ready to eat (RTE), n = 614 (64%) were chased in 6 months (January to June, 2006) from four retail outlets in one city in the western United States. Chi-Square analysis and logistic regression were used to test for ciations of microbial contamination with product type and brand, expiration date, pling time and retail store. Overall, 2.3% (22/959) of the samples were contaminated *Salmonella*; with 5% (15/345), and 1.1% (7/614) of the raw and RTE meat samples ng positive for *Salmonella*, respectively. There was a significant difference in recovery *almonella* (P = 0.0015, OR =3.9, 95% CI= 1.6, 9.8), between meat type (raw vs RTE), month of sampling (P = 0.0003). Retail store and product brand did not affect *nonella* recovery. The twenty two *Salmonella* isolates recovered belonged to 6 serotypes; predominant one being *S.* Hadar followed by *S.* Heidelberg. *S.* Typhimurium var enhagen, *S.* Newport, *S.* Saintpaul and *S.* Agona. Overall, *Salmonella* isolates from raw ey products exhibited a higher antimicrobial resistance rate (53%) compared to those RTE products (33%). Multi-drug resistance (resistance to 2 or more antimicrobials) was bited by 54% of the *Salmonella* isolates with the majority (62%) originating from RTE ts compared to 45% from raw ones. This study established that raw and RTE retail ey meat products may often be contaminated with antimicrobial-resistant *Salmonella* lighting the need for continued surveillance of this pathogen in order to ensure a safe l supply.

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oint Pattern Analysis of *Salmonella* in a Dairy Milk Shed. W.M. Sischo*, M.L. scott, D.A. Moore. Dept of Population Health and Reproduction, School of erinary Medicine, VMTRC, University of California, Davis.

almonella enterica subspecies enterica (S. enterica) on dairy farms is a common ing in both cows and in their environment. It is often viewed as a premise-by-nise problem rather than as a part of a complex ecosystem dynamic. The objective his study was to describe the point pattern distribution of *Salmonella* in a large system and determine if the point pattern was serotype dependent. The *Salmonella* ıs of dairy farms within a well-described but complex agricultural ecosystem was rmined using bulk tank milk collected on a quarterly basis over a 2-year period. hin a sampling period, bulk tank milk was sampled serially over a 14-day period to in 5 samples for culture. From each bulk tank sample, a 1ml sample was taken for ure. Standard methods for detecting, verifying, and serotyping *Salmonella* were l. Locations of all dairy operations were determined and input into a geographic rmation system. These data were related to the culture results along with basic herd date information. Three hundred and ninety premises from two milk receivers e included in the analysis. Of these, 185 were positive at least once during the pling period with approximately 50% positive more than one sampling period. re was some evidence that *Salmonella* was more common from dairies belonging ne of the milk receivers. Within the study area, dairy farms were highly clustered. clustering of farms was greater than the clustering of *Salmonella* positive farms. ough, stratifying the farms by milk receiver demonstrated that positive farms from of the milk receivers were highly clustered. This clustering process was most ıounced at approximately 2500 meters. Using this distance as the unit of analyses, e were several areas of intense *Salmonella* activity suggesting an ecosystem ımic for the presence of *Salmonella*.

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ed Antimicrobial Drug Use and Susceptibility of *Enterococcus* spp. and *Salmonella*. Platt[1*], L.A. Branham[2], G.H. Loneragan[1], M.J. Engler[3], D.U. Thomson[4], R.S. Singer[5], . Brashears[2]. [1]West Texas A&M University, Canyon, TX. [2] Texas Tech University, ock, TX. [3]Cactus Feeders, Amarillo, TX. [4]Kansas State University, Manhattan, KS. versity of Minnesota, St. Paul, MN.

ECTIVE: To evaluate the impact of metaphylactic use of in-feed antimicrobials on the ptibility of *Enterococcus* spp. and *Salmonella* in healthy feedlot cattle.

HODS: 1760 animals were randomly assigned to one of 16, 110-head pens. Each pen randomized to one of four treatments including normal ration supplemented with 1) nsin(29.8 mg/kg) and tylosin(9.7 mg/kg), 2) tylosin(9.7 mg/kg), 3) monensin(29.8 g), and 4) no supplement. Fecal samples were collected from 40 animals per pen at al and re-implant. At harvest, fecal and hide samples were collected directly prior to nent. At the abbitor hide and carcass (pre-evisceration-post-hide removal; post-vention), samples were collected on a sub-set of ten animals per pen. All samples were ierated and isolated for speciation and susceptibility.

JLTS: Preliminary results indicate that *Enterococcus* was prevalent in 97.5% of les at an average concentration of 3.77 $\log_{10}$ CFU/gm and at arrival 80.1% were ant to at least one antimicrobial. The most common species were *E. hirae* (37.2%), *E. ıarum* (33.8%) and *E. faecium* (16.0%). *Salmonella* prevalence was 12.0%, 10.8%, %, 39.9%, and 60.0%, for arrival, re-implant, fecal (feedlot), hides (feedlot), and hides or) respectively. The most common serotypes were *S.* Anatum, *S.* Orion var. 15+, 34+, . Montivideo. Analysis of isolates is on-going and further results will be presented.

CLUSIONS: Recovery of *Enterococcus* species associated with nosocomial infections are and VRE even more so. *Salmonella* was readily recovered from feces and hides; ver, few serotypes of concern in human health were present and no isolates were ered from carcasses.

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Food Handling and Hygiene Associated Risk Factors for Bacterial Contamination of Meat at the Retail Grocery Outlet. Myint, M.S. [1]*, Johnson, Y.J. [1], Lyons, L.A. [1], Cohen, J. [1], Bird, G [2] [1]University of Illinois at Urbana-Champaign, College of Veterinary Medicine. [2] Champaign-Urbana Public Health District.

The objectives of this study were to: 1) determine the prevalence of *E. coli* and *Salmonella* contamination of raw meat, poultry and seafood at the retail grocery outlet 2) to identify risk factors for bacterial contamination and 3) to determine the awareness and efficacy of the recent federal HACCP guidelines for retail grocery stores. A cross-sectional study was conducted from retail grocery stores in Illinois. A total of 240 raw retail meat samples were collected from 14 randomly selected stores in Champaign County from May through July of 2006 and cultured for *Salmonella spp.* and *E. coli spp.* using standard methods. A questionnaire on food handling and hygiene procedures was also administered. Overall prevalence of *E. coli* was 30% and *Salmonella* was 6.3%. Chi-Square and multivariate regression modeling techniques were used to identify significant associations with *Salmonella* and *E. coli* contamination. Poultry products had the highest level of both *Salmonella* and *E. coli* contamination (20.6% and 44% respectively). Ground meat products were more likely to be contaminated with *E. coli* (OR=2.16 $p<0.05$) and *Salmonella* (OR=4.75 $p<0.05$) when compared to non-ground meat products. Pre-packaged products were more likely to be contaminated with *E. coli* (OR=2.7 $p<0.05$) and *Salmonella* (OR=6.12 $p<0.05$) than meat counter packaged products. The results of the food handling and hygiene questionnaire, and antibiotic resistance patterns of the isolates will also be presented. The results of this study indicate that there is potential contamination of retail meat occurring at the retail grocery outlet. The lack of uniform surveillance and HACCP protocols at the retail grocery outlet constitutes a gap in the farm-to-fork continuum of food safety that poses a risk to public health.

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Methodological quality of review articles evaluating interventions to improve microbial food safety. J.M. Sargeant [1, 2,*], M.E. Torrence [3], A. Rajić [2], A.M. O'Connor [4], J. Williams [3]. [1] Clinical Epidemiology and Biostatistics, McMaster University, Hamilton, Ontario, [2] Public Health Agency of Canada, Guelph, Ontario, [3] USDA-CSREES, Washington, DC, [4] Veterinary Diagnostic and Production Animal Medicine, Iowa State University, Ames, IA.

Criteria for evaluating the methodological soundness of review articles have been developed and validated in the medical literature. We used these criteria to evaluate the methodological soundness of 65 review articles published between 2000 and 2005 that addressed the effectiveness of microbial food safety interventions. Generally, the methodological quality of the review articles was poor. None of the reviews provided information on the method of locating primary research studies or the inclusion / exclusion criteria for selecting primary studies. None of the reviews included a critical appraisal of the methodological quality of the primary studies. Less than half of the reviews stated a focused research question, explored possible reasons for differences in the results of primary studies, discussed the generalizability of results, or proposed directions for future research. There is a need to improve the methodological quality of review articles on microbial food safety interventions if they are to be of use in policy and decision-making.

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RIA analysis for estradiol, testosterone and cortisol in feedyard playa lakes and non-feedyard playa lakes. Charles W. Purdy[1*], David C. Straus[2], Reid L. Norman[3]. [1] USDA-ARS, Bushland, TX. [2] Dept. Microbiology & Immunology, & [3] Dept. Pharmacology & Neurosciences, Texas Tech University Health Science Center, Lubbock, TX.

The objective of the study was to compare the levels of 17β-estradiol, testosterone, and cortisol hormones in bottom sediment (muck) and water of seven feedyard (FY) playas and three non-feedyard playas. Four liters of water and 500 grams of muck were collected from 4 equal distant sites from each playa shallow lake. The water was freeze-dried. The water residue and the muck were extracted with ether and analyzed for hormones by specific radioimmunoassays. The hormone mean concentrations are reported in ng/g of muck and ng/100 ml of water. Statistical analysis was done by Proc GLM and Dunnett's paired *t*-analysis. Differences were considered significant at $P < 0.05$. The mean hormone concentrations of the three non-feedyard playas were averaged and compared to each of the seven feedyard playas. The mean concentrations of the three hormones for all seven feedyard playas were larger than the mean concentration of the 3 non-feedyard playas [muck: estradiol, 0.45 (Standard Error 0.04), testosterone, 0.43 (0.01) and cortisol, 0.12 (0.03), water: estradiol, 0.56 (0.13), testosterone, 0.33 (0.18) and cortisol, 0.53 (0.27)]. In the muck: Estradiol was significantly larger in FY3, 8.14 (2.63), & FY11, 10.8 (1.32); cortisol was larger in Fy2, 7.1 (4.09); and testosterone was larger in FY3, 8, & 11, ranged from 3.7 (0.49) to 10.7 (1.43). In the water: Estradiol was significantly larger in FY5, 7, 8, and 11, ranged from 12.65 (3.17) to 60.56 (7.47); cortisol was larger in FY3, 17.25 (1.7) and FY11, 7.25 (0.47); testosterone was significantly larger in FY3, 5, 7, 8, and 11, ranged from 27.8 (7.6) to 48.6 (11.6). The significance of these hormone concentrations in wastewater on wildlife is unknown and their effect on calves sprayed to settle the dust in calf pens is also unknown.

PURDY

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