**Extension and Instruction**

**356P  Educating future food professionals in food defense: Are food safety educational models a good fit?** Emefa Monu* and Robert Norton, Auburn University, Auburn, AL.

Food Defense Plans are now mandatory for food processors due to changes in the Food Safety Modernization Act. To prepare our students for their roles in the food industry it is vital that they receive training in this area. This presentation will outline a plan for Food Defense education of undergraduate and graduate students using existing Food Safety lesson plans as a model. Food Safety classes have not traditionally included Food Defense, necessitating its incorporation into the curriculum. Both areas cover the possible hazards in food and how to mitigate those hazards, but Food Defense deals with intentional contamination and other possible ways (e.g., cyber attacks) in which the food supply could be tampered. Since both Food Safety and Defense deal with the range of risks and hazards the former can be used as a model for the latter. Food Safety classes often include the construction of a practical HACCP plan by students. Utilizing the same model where students receive information on potential threats and hazards then are given a group project to create a Food Defense Plan on a designated food product would be utilized. HACCP points are often those points vulnerable to intentional contamination. Food Safety classes also introduce students to the rules and regulations pertaining to the US food supply, and this course would do the same with Food Defense regulations. Food Safety classes are often taught by one individual, but the multifaceted nature of Food Defense lends itself to a more multidisciplinary approach involving several instructors in addition to talks by industry members.

Auburn University has established a Food Defense Working Group that includes faculty from Agriculture, Engineering and Veterinary Medicine. These individuals would be an asset to the course. Although Food Safety education alone does not adequately prepare students, when combined with Food Defense, it better prepare students to enter the workforce with more advanced skill sets, necessary to the tasks they will encounter.

**Key Words:** sustainable agriculture, education, free-range poultry

**358P  Economic-productive evaluation of the cleaning and disinfection of facilities of broilers challenged with Campylobacter jejuni.** Maria Fernanda Burbarelli*1, Gustavo Polycarpo1, Carlos Alexandre Granghelli1, Karoline Lelis1, Lívia Maria Soares Queiroz1, Esther Ramalho Affonso1, Viviane Ferrari1, Roberto Bordin3, Andrezza Fernandes2, and Ricardo de Albuquerque1, 1University of São Paulo, Pirassununga, São Paulo, Brazil, 2University of São Paulo, Pirassununga, SP, Brazil, 3Fatec, Mogi das Cruzes, Brazil.

The economic impact of diseases is crucial for poultry, due to reduced performance and high mortality. Cleaning and disinfection are practices aiming to reduce infection pressure in broiler facilities. To evaluate the economic viability of these practices, through the calculation of the gross market margins of 2 different protocols, the present study was developed. Two subsequent flocks, with 960 birds each, were divided into 32 boxes with 30 birds. In the first, all birds were orally inoculated with 10^7 cfu/ml Campylobacter jejuni strain atcc 33560 to create the sanitary challenge. In the second, 2 cleaning and disinfection programs were realized before the arrival of the birds: Proposed program (washing with acid and alkaline detergent at 4%, application of glutaraldehyde disinfectant 250g/L + formaldehyde 185g/L at 0.5% and disinfectant parachlorometacresol 210 g/L) and Common program (washing with 4% neutral detergent) in 16 boxes of each protocols. In this plot, the productive performance was evaluated, and the birds housed in the facilities submitted to the proposed protocol obtained greater live weight (2,717 vs 2,532 kg), weight gain (2,610 vs 2,447 kg), feed intake (4,903 vs 4,760 Kg) and greater feed conversion (1.88 vs 1.95). These data were used to perform the economic analyzes. Considering each of the boxes as an experimental unit, the economic analysis of gross margin of commercialization was based on the total costs of each of the cleaning and disinfection protocols and on the estimated revenue from the sales of the animal carcasses. The data were submitted to ANOVA using the Mixed procedure (PROC MIXED of the SAS). The total income for the proposed treatment was greater than that of the Common treatment (US$ 90.42 vs. 84.77, P = 0.0096), the total cost for the Common treatment was lower than the Proposed treatment (US$ 8.74 vs 0.49, P < 0.001), however the gross margin or the bird commercialization did not differ between protocols (US$ 81.68 vs 84.27, P = 0.2021). The proposed protocol is economically feasible, because despite the lower cost of the Common protocol, the gross margins of the commercialization are similar between both protocols.

**Key Words:** poultry, economic, infection pressure, disinfectants, gross margin

**357P  Innovative poultry teaching and research: Appalachian State University case study.** Anne Fanatico*, Appalachian State University, Boone, NC.

There is a strong need for agricultural education in the United States. The number of farmers has declined over time and many are aging. New farmers may not be from conventional agricultural backgrounds. In fact, many have an interest in ecological methods of production, which focus on maintaining soil, air, and water resources and reducing synthetic inputs. While land-grant institutions provide much of the agricultural education, non-conventional institutions increasingly do so as well, often with low-budget agricultural programs. App State University is an example and has grown an innovative farm-based program over the last 5 years in the Sustainable Development Department (agroecology concentration). We have a teaching and research farm where we established integrated farming enterprises to teach applied concepts. Monogastrics (free-range poultry and swine) are raised with beef cattle on rotationally grazed pastures incorporating agroforestry practices. The farm includes a mobile processing unit for poultry slaughter, as well as horticultural, row crops, and forestry operations. Feed crops for poultry are grown on the farm and their manure is composted and used to fertilize crops. Our IACUC-approved protocols are innovative, featuring heritage livestock breeds, portable poultry housing and solar technology. Alternative poultry feeding systems are used that incorporate high-moisture feeds, such as root crops, and novel protein feeds, with no synthetic amino acids. We also established a unique 12-pen pastured poultry research facility. We typically teach 7 farm courses and 3 forestry courses each year directly at the farm, graduating 70 agroecology students each year. Students (24) have also lived on-site in a residential farm learning community. Limited support is provided for the farm as supplemental funds allow and a small amount of revenue is also generated for operations. The program is highly integrated with informal education in the area, including cooperative extension, nonprofit organizations, and local community, where students do internships with farmers. There are many challenges in teaching sustainable agriculture and ecological poultry production at non land grant institutions; however, students have the opportunity to learn in integrated and innovative ways.

**Key Words:** sustainable agriculture, education, free-range poultry