North Carolina Cooperative Extension Service

NC STATE UNIVERSITY

North Carolina Poultry Industry Newsletter

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On-Farm Food Safety Regulations, Fact or Fiction

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To assist poultry producers in delivering safer flocks to the processor, NC State University's Poultry Coordinating Committee recently banded together to develop a special topics World Wide Web Internet course (PO-495) "Poultry Product Safety: An On-Farm Model". The Committee is composed of faculty from five departments in the College of Agriculture and Life Sciences (Agricultural and Resource Economics, Biological and Agricultural Engineering, Entomology, Food Science, and Poultry Science), a faculty member from the College of Veterinary Medicine (Farm Animal Health and Resource Management Department), and five NC Cooperative Extension field faculty (area poultry agents). An alphabetical listing of the contributing campus and field faculty involved in developing this course is summarized in the table at the conclusion of this article. Funding to support this effort came from the North Carolina Cooperative Extension Service, North Carolina Agriculture Research Service, North Carolina Agriculture Foundation, Distance Education & Learning Technology Applications (DELTA), and the United States Department of Agriculture Initiative for Future Agricultural Food Systems.

The necessity for this course arose in response to the ever increasing need for the U.S. food industry, and specifically the poultry industry, to produce safer and healthier products. Among the desirable qualities that should be inherent in all foods is freedom from chemical and physical contaminants and infectious foodborne disease organisms. To illustrate the magnitude of the problem, the Centers for Disease Control and Prevention in Atlanta have estimated an annual incidence of 76 million cases of foodborne disease in the U.S. resulting in 325,000 hospitalizations and 5,000 deaths. These occurrences translate into an estimated $6 billion dollar annual lost in

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New Phosphorous Rules

James Cochran, Area Specialized Agent, Poultry

Why all the fuss over phosphorous and more government regulations? There is sound scientific evidence that farmers need to be concerned about phosphorous in their fields in order to continue being good stewards of the land.

When nitrogen and/or phosphorous get into streams and bodies of water, the excess nutrients does cause polluting algae growth. Over the past decade the focus has been on nitrogen because we know it is readily carried by water through the soil profile into groundwater and/or surface water. But traditional thought was that phosphorous stuck to soil particles and was only moved offsite when the soil was – erosion. So, if we controlled erosion, we could prevent phosphorous from leaving a field. Phosphorous has been largely ignored since no known detriments occur to crops with high phosphorous soil levels.

Poultry manure has similar amounts of nitrogen and phosphorous content. But crops can use three to five times the amount of nitrogen during a growing season than phosphorous. As a result, phosphorous is applied at three to five times the rate and then builds-up in the soil in just a few years. This would be sort of like purchasing and applying 18-46-0 (DAP) commercial fertilizer when only 16-0-0 is needed. Year after year.

Like adding sugar to a cold glass of iced tea, controlled experiments showed that soil can indeed become saturated with phosphorous and move through the soil profile like nitrogen. This is now called "soluable" phosphorous and

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worker productivity and medical costs, not counting the price of human suffering and resulting litigation that may ensue. Stated another way, about 1 in 4 consumers will suffer a foodborne illness this year. Of the outbreaks that occur, 10% are linked to the consumption of contaminated poultry products and eggs leading to an estimated 500 deaths and 7.5 million cases. Although it may not be possible to assure complete freedom from these hazards using good manufacturing practices (GMP) or best management/production practices (BMP), the production of foods with the lowest possible level of contamination is a desirable goal.

Today's consumers choose among a wide variety of ultra-fresh food products shipped from across the nation and often from around the world. These products are typically minimally processed with few to no added preservatives. Thus, new approaches are needed to ensure food safety. One approach, the Hazard Analysis Critical Control Point (HACCP) program, was first introduced in 1971 by its founders, the Pillsbury Company, the National Aeronautics and Space Administration (NASA), and the U.S. Army Natick Laboratories, as a systematic plan for producing foods with a high degree of assurance of safety for use in the space program.

On July 25, 1996 the FSIS issued a final rule termed the "Pathogen Reduction and Hazard Analysis Critical Control Point System". Under this final rule that was phased in between 1997 and 2000, each meat and poultry processing plant was required to develop a written HACCP plan to systematically address all significant hazards associated with its products. Regulatory performance standards were also introduced to reduce *Salmonella* in raw meat and poultry. In addition to the establishment of written plant Sanitation Standard Operating Procedures (SSOPs), microbial testing for generic *Escherichia coli* was also required to monitor process control and verify the effectiveness of reducing fecal contamination during slaughter operations. Since its implementation into large and small poultry processing plants for the fiscal year ending June 30, 2000, there has been around a 50% reduction in the prevalence of *Salmonella* contamination on broiler carcasses from 20% before HACCP to 9.9 % under HACCP.

Combined test results in large and small processing plants over the same time frame indicate that the percentage of plants meeting the HACCP *Salmonella* performance standard was 92% for broilers and 82% for ground turkey. Although the percentage of plants in compliance appear high, these statistics indicate that 8% and 18% of the broiler and ground turkey producing plants, respectively, were not in compliance and faced regulatory action. Based on the positive results following the implementation of HACCP into poultry processing plants, USDA/FSIS officials are considering lowering the *Salmonella* Performance Standard from 20% positive broiler carcasses to some lower value. Moreover, consideration is also being given to developing a second performance standard for *Campylobacter*, another foodborne pathogen that presents considerable challenge for poultry and red meat processors. Although these moves are likely to be viewed by regulators and consumers as necessary for further reducing the risk of foodborne illness, their impact on the poultry and red meat industry has and will continue to be very significant.

What can poultry processors do to ensure compliance with HACCP regulations given the likelihood that more stringent regulations are on the way? One approach is to share the burden with poultry producers. The existing problem for most poultry processors is that they bear the entire burden for HACCP regulation compliance. Because of the widespread nature and complex ecology of different bacterial pathogens, it appears that attaining significant control will require comprehensive, multifaceted interventions from the farm to the consumer. Only by delivering chickens, turkeys, and eggs to the processing plant with no or significantly reduced levels of human enteric pathogens and chemical contaminants can we be assured of providing consumers with fresh processed poultry products with no or reduced levels of pathogens and chemical contaminants.

In preparation of that day when food safety regulations are proposed for poultry producers, our Committee embarked on a project to pro-actively develop a pre-harvest ("on-farm") food safety best management practices Web-based training course for use by poultry producers. Although this course has many features similar to HACCP food processing training programs, the course is structured around on-farm food safety best management practices. Some of the course contents (i.e., feed production module) have been developed using the seven basic steps of HACCP. Besides having the opportunity to train poultry farmers via a WEB course, this course has been designed using a module format of specific topics that can be utilized as individual stand alone training packages for growers, poultry integrators, extension agents, and can be easily modified based on the individual needs of the poultry industry. For more information contact Brian Sheldon (919-515-5407, brian_sheldon@ncsu.edu) or Donna Carver (919-515-5526, donna_carver@ncsu.edu).

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New Phosphorous Rules

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results when the soil particles "fill up" with attached phosphorous and can no longer hold anymore. Depending on soil type, repeated manure applications to a field results in rising phosphorous levels and eventually some "soluable" phosphorous that can move offsite without the phosphorous being attached to eroding soil particles.

Extensive field soil sampling also showed soluable phosphorous can move through the soil. In more clay type soils, phosphorous can move laterally across the soil profile into surface water. In sandy types of soil phosphorous can actually be soil tested 30 inches down. This is getting below the depth of most crops' feeder roots.

As a result, a computer program was developed in North Carolina to be part of an overall waste management plan for both swine and poultry manure application fields. The computer program is called PLAT which is Phosphorous Loss Assessment Tool – emphasis on the LOSS. By inputing field data such as soil type, test results, tillage and crop practices, the program will identify fields most likely to loose solubable phosphorous offsite. So, soil test phosphorous levels can be high, but if a field has a low P loss rating, then the field may still be used for manure applications.

PLAT identifies to the farmer which fields to avoid applying manure or rotate litter applications to every other year/crop to lengthen the "life" of a field. BMPs (Best Management Practices) can also be used to lengthen the litter application life of a field.

More information on PLAT and it's field ratings and impact to farmers in upcoming issues.

Animal Welfare Concerns

Kenneth E. Anderson, Ph.D., Dept. Poultry Science

Animal welfare concerns are continuing to expand and gain favor among the general population throughout the world. This is primarily due to the disconnect that exists between the 98 % of the population in the U.S.A. that lives in urban areas, and the 2 % of the population in production agriculture that feed them. Many of the urbanites equate all animals with the pets that they keep in their homes, and in some cases treat better than their children (Pollan, 2002). Non-companion animals and the reality of animals living and dying, especially to provide meat for human consumption, are no longer a component of our everyday lives. This in turn appears to have led a number of people to the viewpoint that our food-animal production practices are less than humane. Some people who espouse this viewpoint have used it to convince a number of food organizations to adopt the view that animals have the same rights and freedoms that humans (*Homo sapiens)* have. The president of the organization titled "People for the Ethical Treatment of Animals" (PETA) has been quoted as saying that a Pig=Dog=Rat=Boy. I must point out at this point that I have a bias that there is no equality between the different species. Yes, we share the same cellular building blocks of nature (DNA), but so do clams and soybeans. Within this argument I must pose the question, "If we are equal in nature then why, within the last million years have not the animals evolved out of sitting in trees, eating fruit, or scratching in the dirt for meals? The conclusion is that equality of the different plant and animal species does not exist, and no matter how you may decide that it happened, humans hold sway over all other species. This does not mean that there is no moral responsibility associated with man's status, because there is. Mankind certainly has the moral obligation to ensure that the animals under our control are provided a protective environment and adequate care to ensure their welfare throughout their lifetime.

Animal rightists and animal rights advocacy groups are constantly talking about natural behaviors, and how those of

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Animal Welfare Concerns

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us in animal production are forcing animals into environments that are not natural, and which are, therefore, detrimental to the animal's health and wellbeing. I would counter that in reality there is no such thing as a natural behavior left in most of the domesticate animals we use for the production of food and fiber. Domestication and the genetic selection of animals to be more highly adaptable to intensive agriculture is a fairly recent event in the history of man (Craig, 1981). If the amount of time since the first *Homo sapiens* appeared on earth is equated with 1 minute of time, the time involved for the domestication of animals for food, fiber, and companionship only amounts to 3.2 sec, and for the domestication of the chicken even less time. Ever since chickens came under the influence and subsequent domestication by humans, i.e. approximately 4000 years ago, man has selected them for improved productivity within confinement systems (Craig, 1981). Parenthetically, selection and domestication has allowed man to choose chickens that were adapted to the husbandry practices and confinement systems of the day (Craig and Muir, 1998). In addition, Muir and Craig (1998) have shown that selection against the specific behaviors of feather pecking and cannibalism is actually one means by which the hen's well being can be improved. Chickens have the ability to learn what components of their environment are self-benefiting using a cognitive process (Ewing et al., 1999). However, the level of development of the cognitive process and how it is intertwined with the instinctive responses of the hen are still in question and can be altered by selection and the environments to which the hen is exposed (Zayan and Duncan, 1987). The rapid changes that have taken place over the years in husbandry practices for egg-type stocks including the use of cages and high density, light control, and feeding programs have raised questions as to whether genetic selection in chickens has impacted their behavior and compromised their welfare (Craig and Muir, 1998). Yes, domestic animal behavior began changing the moment man began raising them and selecting them to fit within the housing and management they employed. Not only that, it is very easy to observe that the various strains of chickens are different in their general behavioral response to management. The question is, "Are the behaviors that we see in confinement operations natural?" I would venture to say that they are not natural behaviors. Theoretically these are instinctive behaviors, which through selection have been modified and are displayed by the birds as behavioral releases.

The concern for animal welfare has permeated all levels of society, and I am not talking about all of our concern for the animals that we care for every day. This is the Animal Welfare philosophy that stands for the concept that your broilers, layers, dog and cat have the same unalienable rights, as do you and your children. These groups hide behind the guise of Animal Welfare when there objective is to force a legal status of rights coverage to our animals that we raise for food, fiber, and companionship. The public needs to understand this and those of us in production agriculture need to tell the public about our concern for the welfare of our animals and the care that we provide to them.

Fly Management for Poultry Farmers

James Parsons, Area Specialized Agent, Poultry

Warm weather is finally here, but warm weather also means an increase in fly populations around poultry farms. With the ever increasing rural population explosion, poultry farmers must do a better job with their fly control management programs. A good fly management control program should decrease the number of fly complaints from neighbors.

According to Mike Stringham, Extension Entomologist at NC State University, a number of factors can be controlled in managing fly populations. They include moisture and manure management, biological control, and pesticide use. The key to fly management is knowing what your enemy is doing. The only sure method of accomplishing this is to have a monitoring program. Speck cards are one of the easiest and most effective monitoring tools at your disposal.

Speck cards are as simple as 3 by 5 inch, unlined index cards placed at regular intervals inside buildings where animals are contained or in protected areas outside of, by or near, animal housing. House flies rest on the cards and deposit specks of feces or regurgitated food that can be counted each week to estimate fly numbers. The recommended placement density is 1 card per 1,000 square feet of fly breeding substrate (anywhere manure is deposited). For example, an 18,000 sq. ft. horse barn would need a minimum of 18 speck cards.

House flies spend a large amount of time on overhead surfaces, so the correct placement of the cards is important. Use tacks or staples to attach cards to support posts or rafters just above eye level. Flies readily congregate at these locations, and cards are easy to place or collect as needed. You may have to vary locations at first to find the best locations based on the presence of flies and ease of placement. However, once the final locations have been selected, do not change them. Fixed speck card locations make it possible to build a profile of fly numbers over time. This can be a good relative measure of how well your fly management efforts are working, help identify outbreaks early, and plan management options.

Change cards once a week. Examine the week-old cards under sufficient light and count the number of light brown to black specks on the exposed surface. Counting will be tedious at first (especially if fly numbers are high), but you will be able to estimate the number of specks with practice. Average the counts for all of the cards and record that number by the appropriate date. The action threshold for fly control is variable depending on local needs and tolerances, but a good practice is to begin isolating and controlling fly outbreaks when the averages exceed 50 specks per card.