

HACCP

What Is It, and Why Should I Care?

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Introduction. We claim we have the safest food supply in the world, and I believe this is a true statement. However, when any child dies from eating a hamburger, we obviously have not done all that we can to ensure the food that is produced, which goes through many hands before it reaches the person who eats it, is properly handled at every step on the journey. We must admit that we have an unacceptable level of food borne illness in this country. According to the Centers for Disease Control and Prevention (CDC) in Atlanta, at least 9,000 people die each year from food borne disease. CDC also estimates that almost 94 percent of food borne disease is linked to bacteria, while less than four percent is linked to chemicals. The beef industry has done an excellent job over the past few decades in preventing diseased meat from animals, physically contaminated meat, and meat with violative levels of chemicals from entering the food chain. It is now time to address the issue of bacteria. It is time to declare war on pathogens!

The death of four children and subsequent events in 1993 and 1994 have triggered activities that will change meat and poultry inspection forever. Change can be a bonus if you are ready for it and are a part of the driving force behind these changes. It is time to admit that we are dealing with three outdated statutes that address food inspection—the Federal Meat Inspection Act, the Poultry Products

Inspection Act, and the Food, Drug and Cosmetics Act. These acts could not be more different about the approach they take in regard to food safety. A good example is the intensity of inspection for meat and poultry versus all other food. USDA has 7,400 inspectors providing daily inspections to over 7,000 plants, while FDA has 253 inspector equivalents inspecting over 50,000 plants. What is needed is inspection reform based on the principles of risk analysis and HACCP, Hazard Analysis and Critical Control Points. We, the government, and the industry must admit that we cannot "inspect out" the problem. We must admit that the only way to effectively control pathogens is through farm-to-table prevention programs that use effective interventions.

Food safety has rapidly emerged as a major consumer issue. The dramatic achievements in agriculture and food production in this century have caused consumers to expect a bountiful, appealing, nutritious, economic, convenient, and safe food supply. The '90s has become the decade of food safety and environmental awareness, and consumers are demanding a safe, environmentally sensitive food supply and production system. An integrated food-safety system is needed for beef products. Perceived and/or real safety hazards may enter beef products at any phase (see flow chart) from conception to consumption. A loss of control at any point may increase risk and potentially compromise safety of the food.

Hazard Analysis and Critical Control Point (HACCP) systems allow control of food production to assure that contaminants, pathogenic microorganisms, processes, distribution, storage, or consumer usage that could contribute to a perceived or real hazard are controlled. A comprehensive system employing these concepts is needed to enhance beef safety.

In production of beef, hazards may enter from any component of the base production systems through delivery to the consumer. The only way to provide beef with less potential hazards is to institute sufficient controls throughout the production chain to prevent them from entering or occurring and to monitor each component sufficiently to ensure that any problems that do develop are discovered and addressed prior to delivery of the beef as food products. In essence, to enhance production of beef with less risk of safety hazards, we must control hazards through all phases, as opposed to analyzing to determine the magnitude at some endpoint, where it is too late to correct and/or prevent a problem. Since residues can enter at any segment,

i.e., calf grazing through feeding, slaughter, and at the retail level, appropriate critical control points must be developed and monitored at each level. The surrounding production/processing environment must be assessed in each segment, because history has told us that these are common sources of inadvertent residue or microbial entry in meat production systems. A comprehensive control program is the only way in which a successful HACCP can be implemented. Because of the decentralized and segmented nature of the beef production enterprise where cattle and beef products change hands as much as a half dozen times from inception to consumer, all segments must be closely controlled and monitored to produce a safe final product.

While the E. coli incident in the Northwest focused attention on the issue, this was not the first or the last incident involving beef. It was simply the one that triggered a watershed change in the way we will approach beef safety.

ANSWERS TO SPECIFIC QUESTIONS REGARDING HACCP AND MEAT INSPECTION:

What is HACCP? HACCP is an acronym for Hazard Analysis Critical Control Point. HACCP is a production control system for the industry. It is a process that identifies where potential contamination can occur (the critical control points or CCPs) and strictly monitors these points as a way of ensuring the process is in control and that the safest product possible is being produced. HACCP is designed to "prevent" rather than to "catch" potential hazards. HACCP was developed by Pillsbury in cooperation with NASA in the 1960s because they realized that you could not "inspect" safety into food. Both NASA and Pillsbury felt that HACCP, using the prevention philosophy, would be the most effective system to prevent hazards from entering the food chain. HACCP is designed to deal with biological, chemical, and physicals and has been accepted by the international scientific community.

Further, HACCP is a science and management by objective based approach to control production to produce products meeting specific design specifications. It includes many aspects of current Quality Control, Total Quality Management, and Good Manufacturing Practices already in place at feedyards but does so in a more organized way with specific objectives for all information collected and samples taken.

It is simply a better way of doing business that will give us fewer surprises in our products.

- **What is the specific process used to identify "critical control points" for pathogen reduction in a feedyard or packing plant?**

An experienced science and management based HACCP team conducts a stem-to-stern audit of everything that happens at a feedyard or packing plant then and makes a complete listing of procedures, vectors, and processes that are critical to limiting entry and/or reducing/eliminating a hazard, in this case pathogens. This is comparable to much of what we already do to prevent chemical residues in beef from feed and animal production chemicals used, except we have not called it HACCP; we could do that much better with a HACCP approach.

A critical control point has been defined as a point, step or procedure at which control can be applied and a food safety hazard can be prevented, eliminated, or reduced to safe levels (NACMCF HACCP document, 1992). The identification of critical control points should take into account all hazards which reasonably could be expected to occur (identified during hazard analysis). The NACMCF document suggests the use of a "decision tree" to determine if steps in a process are critical control points. The decision tree includes four questions as follows:

Question 1: Do preventative measure(s) exist for the identified hazard:

Yes: Proceed to Question 2.

No: Is control at this step necessary for safety?

Yes: Modify step, process, or product. Then return to Question 1.

No: Not a CCP. Stop.

Question 2: Does this step eliminate or reduce the likely occurrence of a hazard to an acceptable level?

Yes: Step is a **Critical Control Point**.

No: Proceed to Question 3.

Question 3. Could contamination with identified hazard(s) occur in excess of acceptable level(s) or could these increase to unacceptable level(s)?

Yes: Proceed to Question 4.

No: Not a CCP. Stop.

Question 4. Will a subsequent step eliminate identified hazard(s) or reduce the likely occurrence to an acceptable level?

Yes: Not a CCP. Stop. (Proceed to next step in the described process).

No: Step is a **Critical Control Point**.

- **Specific examples of changing current feedyard practices to implement a HACCP program to prevent microbial contamination.**

A HACCP program is records-intensive. We depend on charts and graphs of historical information to quickly determine whether a process is in or out of control to make immediate decisions on how to handle a process when it goes out of control. Feedyards now collect, for example, information on pesticides in feed ingredients and bury that information in a file somewhere; under a HACCP program, that information would be analyzed, plotted, and made available to the organizational decision-makers for the next segment of production. A similar scenario would unfold for dealing with pathogens, such as Salmonella or E. coli, where feed ingredients would be one vector monitored and feeds that are potential contamination sources would arrive at the feedlot with records of treatment and contamination levels, and, if appropriate, feeds would be handled and processed to bring levels of indicator organisms into tolerance accordingly. At the end of the feeding period, cattle would leave the feedlot with records documenting exposure and control strategies employed during their production. While this is a major mode shift for segmented beef industry operations, this will soon be the standard operating procedure for integrated systems, and others must be positioned to ensure production of safe products with similar approaches.

The NACMCF HACCP for beef document establishes that live animal practices have an impact on microbial safety but does not include them in the generic HACCP plan. This is likely because critical control points are difficult to pinpoint in live animal practices. A possible critical control point could be the use of feeds from bonded suppliers who utilize processes that can assure the absence of enteric pathogens such as Salmonella. The use of clean water, the prevention of the fecal contamination

of water and feedstuffs, cleaning and sanitizing of equipment, pens, feedbunks, and water troughs, avoidance of overcrowding, avoidance of commingling of sick and healthy animals, etc. can all influence the presence of pathogens in animals and might be considered control points but would not be considered CCPs. The effectiveness of live animal practices are very important, however, since they can significantly influence the effectiveness of the CCPs involved in production practices.

Elements of HACCP could be utilized in the feedlot, for example, monitoring and record keeping on frequency of cleaning and sanitation, animal density, or isolation of sick animals. Records on the health and history of individual animals could be helpful if problems occur farther along the food chain.

- **Will HACCP require feedyards to produce feed free of microbial contamination?**

Yes and no. It will probably not be possible to deliver feeds to cattle with high levels of pathogenic E. coli and/or Salmonella and still produce carcass beef without these pathogens being present, but it will also be difficult to guarantee that feeds are "free" of these pathogens. Tolerance levels for pathogens will need to be developed and implemented. Further, one element of control strategies will likely include addition and/or cultivation of nonpathogens to or in feeds. For other reasons, we now use microbials in feeds in the U.S. and Europe, and fermented feeds with live cultures are commonly fed. In fact, a very effective HACCP method to control pathogens involves competitive inhibition with desirable organisms. Man has practiced this method of food preservation for centuries. HACCP may require microbes in feeds for some systems.

- **Can today's scientific knowledge provide a productive, and cost-effective means of implementing a microbial control program in feedyards?**

Yes/No. This should be considered in two phases.

First. Procedures and practices providing microbial control. Scientific information on these pathogens exists upon which an effective microbial control program could be developed and implemented for feedyards today. This program has not yet been developed and obviously needs to be before one can be implemented. Technologies and management practices that will provide control in some systems exist and are inexpensive and beneficial in other ways. Others are expensive and will provide control at more cost.

Second. Cost-effective systems. Cost and effectiveness are matters of degree, and cost-effectiveness depends on the discount the market will impose for contaminated (adulterated-FSIS) beef products vs the cost of achieving pathogen safe beef products. Research investment is now urgently required to yield lower cost and more effective management and technical control strategies which can then be included in HACCP systems. The ground work for this has been put in place, and state-of-the-art genetic engineering technology, when developed, will certainly yield low cost, highly effective control strategies.

- **What specific microbial reduction/elimination practices can producers implement today?**

Perhaps quite surprisingly, since this has received minimal attention, several strategies are available which when developed into a HACCP program will be effective components in producing beef with reduced pathogen loads. Some can be applied at any time; others are best implemented at specific times in specific phases of production. Some will conflict with other management objectives, and decisions will need to be made in favor of safety vs convenience or logistics. A couple of these include:

Management strategies:

1. Feed cattle so they have feed at all times and are not nutritionally stressed. This seems too obvious and is not as simple as it seems. Very recent USDA and older Australian research indicates a dramatic pathogen (E. coli, Salmonella) explosion in the digestive tract of cattle and sheep following a period of short feed restriction or withdrawal. The E. coli and Salmonella are usually present in very small

numbers and literally explode in numbers when feed is withdrawn. The relevance for fed cattle is several fold: we remove feed from all cattle as a matter of practice the day before slaughter to reduce fill at slaughter, setting up ideal conditions for a pathogen bloom; some feedlots are practicing restricted feeding, i.e., 90-95% of full feed throughout the feeding period, setting up ideal conditions for E. coli often during the feeding phase; and in transit from ranch through sales and buyers and finally to feedlots, we live with shipping-stressed, nutritionally restricted calves that have not eaten for some time and where pathogens have been given an excellent opportunity to establish.

2. Eliminate feeds with high pathogen loads. For example, refuse to use any feed ingredients with a history of pathogen contamination, i.e., meat and bone, tankage, etc., unless the lot is certified as pathogen free.

Technology:

1. Competitive exclusion. Deliver a microbial culture to inoculate the lower GI tract to prevent E. coli or Salmonella from colonizing there and shedding in the feces and contaminating the animal at slaughter. These are currently used for animal efficiency and provide other benefits in the form of competitive exclusion. For some inoculums, the best time would be shortly after birth and before pathogens get a chance to colonize the digestive tract; whereas, others may displace pathogens with certain conditions and could be applied/delivered at other times, i.e., on arrival or pre-slaughter.

2. Fermented feeds. Common in many animal systems, even swine in Europe. A high moisture fermented feed contains acids, and this diet reduces E. coli and Salmonella in the feed and growth in the digestive tract. Many cattle receive some fermented feed; this could be standardized and minimal levels/types determined.

- **If USDA or Congress mandates HACCP for the processing and retailing industries, do you anticipate the initiation of microbial purchasing criteria for live cattle by packers? Will feedyards initiate**

the same criteria for purchasing feeder cattle? How can cow/calf and stocker producers prevent/reduce microbial contamination?

Without question, yes; they simply will be forced by the marketplace. Packers will have no real choice. Control at any segment in our food production chain rests on control in the previous step; for HACCP to work at all, all steps must be in compliance. A failure in one step means a failure of the whole process. Feedlot certification of low pathogen loads through a transferred HACCP program will be an important component (but not the only component) of the packers HACCP program. Feedyards will need to accept only cattle that are documented to have been produced with required technology and management practices to preclude the presence of pathogens. The cow/calf and stocker operators will have several important contributions to make as key links in the total HACCP program. They both will need to certify that the cattle have never been restricted from feed and that necessary culture inoculation(s) has been administered at the required times, i.e., birth, branding, weaning, etc., as appropriate for the technology and management conditions under which they were raised. Permanent electronic ID (i.e., eartags) carrying animal treatment history which becomes updated and a part of the record in the subsequent segment of production each time technology (cultures, vaccines, etc., are delivered) is a given in this system.

- **Is irradiation a reasonable alternative for microbial reduction? What is the cost? What will be the impact on foreign demand?**

Irradiation of foods is not a reasonable alternative to effective management and sanitation practices, but it does provide a very good pathogen kill step. The initial loads of bacteria on a food will influence the effectiveness of the irradiation process (it takes longer treatments to eliminate greater numbers of organisms). Adequate handling of food, even following irradiation, is essential for the prevention of food borne illness (examples: prevention of cross-contamination from non-processed products or food handling, adequate temperature control).

What is the cost? Costs for products will vary depending on such factors as: dosage to be applied, the density of the product, handling, and conditions of the

process. Some examples of prices charged by a company in the Netherlands called *Gammaster* in 1992 are:

Frozen poultry (dose: 1kGY)	0.034 \$/lb
Dried vegetables (dose: 4 kGY)	0.209 \$/lb
Spices (dose: 4 kGY)	0.052 \$/lb
Spices (dose: 8 kGH)	0.074 \$/lb

Cost to the consumer would likely include added costs to the producer, such as transportation to and from the irradiation facility.

What will be the impact on foreign demand? Since the use of irradiation has been endorsed by international organizations, such as the WHO, technically there should be no impact on foreign demand. For animal foods, lowered bacterial numbers in irradiated products could lead to products with longer shelf lives, an advantage considering lengthy shipping to foreign markets. However, since the approved usages of irradiation vary from country to country, the ability to ship irradiated products to foreign markets may vary with the product and the market country.

- **Why should the production segment be concerned with HACCP?**

We produce foods, not cattle, in the whole of the food production system. We need to produce foods that are helpful to consumers and at least do not kill them. HACCP is a system of food production, a better way of doing business than those we now use, to assure production of safe foods at a lower cost. For HACCP to be truly effective, the principles of HACCP must be applied throughout the food chain—from the farm to food service and retail. At present, HACCP is mainly being focused at the slaughter and processing levels. The federal regulatory agencies—FDA and FSIS—will soon implement or propose major regulatory changes regarding HACCP. FDA will likely finalize its rule regarding mandatory HACCP for seafood, and FSIS will publish its proposed mandatory rule for federal and state inspected meat and poultry plants this month. Both FDA and FSIS will also be taking steps to move HACCP back to the production segment (voluntary or mandatory?) and forward to the food service and retail segments. HACCP is coming, and it is time to get ready. The most serious mistake that industry can make is to embrace HACCP because it is told by the federal government to do so. HACCP should be embraced because it is the correct thing to

do, to produce a safe and high quality product. Effective HACCP programs will assist in removing the inefficiencies in the system. Many feedyards have been practicing the "prevention" concepts of HACCP for years. Consider the success of the residue avoidance programs, herd health programs, sorting programs, etc. While not exactly HACCP, the concepts used in these programs are very close to HACCP.

- **Will the government mandate HACCP on the farm?**

Indirectly, if not directly, FDA will mandate HACCP for foods, and many in FDA consider feeds as foods for animals which will become foods for people. The FDA food HACCP proposal was introduced in August of '94. Feed will probably not be far behind. I believe that the federal agencies would prefer that the industry embrace HACCP on a voluntary basis as they have done with residue avoidance programs. This does not mean that the government will not impose key regulations on the live sector to complete the farm to table HACCP chain. If the industry waits on the government to act, then it will too late. It is imperative that the industry take the initiative in this area so that the government will not have to impose these regulations. A glance at the "Pathogen Reduction Act of 1994" with its trace-back authority and its quarantine authority will give you a hint as to what could happen. This act will be considered in the 104th Congress, and hopefully some reason, with scientific backing, will shape the next version of the bill.

- **Will HACCP help promote quality as well as wholesomeness?**

HACCP was developed to deal with safety, and dealing with safety concerns should be the primary reason for implementing HACCP. However, implementing HACCP will mean greater control and closer scrutiny of the entire production process, both of which will undoubtedly result in improvements in quality as well as safety. I believe that HACCP systems can be applied to control inconsistencies in quality, such as tenderness, injection site problems, etc. If implemented effectively, HACCP should increase profitability.

- **Will feedyard operations have to coordinate HACCP programs with their suppliers?**

Customer demands for implementing HACCP could be a more significant driving force than mandatory requirements from the federal government. This trend is already evident from food service back to the slaughter plant. This is a key principle of HACCP, that all segments control for production of a safe product. We cannot produce a pesticide free beef product if we feed diets loaded with pesticides. The same applies for pathogens. We simply cannot expect the next segment of the food production chain to fix our mistakes. Feed yards will have to require documentation of HACCP programs from feed, animal health products, feed biotechnology and animal suppliers along with transportation and other service providers as well. All of this will have to be transferred forward to packers to provide integrated HACCP programs. Science now has some of the technology and management needed to begin implementing HACCP programs in preharvest systems to reduce pathogen loads in cattle and transfer to beef products; as further technology is developed, you can be certain that its use will be required. I encourage you to begin now to practice the principles of HACCP on the chemical and physical hazards. This will position you to be able to implement pathogen HACCP interventions when the science is available.

- **How can feedyard operators learn about HACCP?**

When the federal government mandates HACCP in inspected parts of the food industry over the next three years, there will be a need to train 15,000-25,000 industry personnel in the principles of HACCP. We realize that we are not equipped to deal with this massive training requirement. That is why the International Meat and Poultry HACCP Alliance has been formed. The alliance is based in Texas A&M's Center for Food Safety. It is an industry-driven organization that has 21 industry association members, 31 universities, and regulatory agencies from six countries. The Texas Cattle Feeders Association was one of the charter members. The goal of the alliance is to establish standardized training opportunities at universities and private companies throughout the U.S. Texas A&M will have many training opportunities for TCFA members in College Station or on-site by request. Eventually, each feedyard should have at least one HACCP certified person on its staff.

- **How do rapid methods, HACCP, and end-product testing relate?**

These topics have caused considerable confusion over the past few months. This confusion is due, in part, because many are looking for the "silver bullet" as a quick fix to food safety problems. When I was Administrator of FSIS, I struggled with the day-to-day pressures to find the "silver bullet" that would ensure that our nation's food supply is 100 percent safe. As a scientist, I realize that there is no "silver bullet" for food safety and there is no "total" safety with perishable products of animal origin. A farm-to-table safety agenda relies on some powerful ammunition but not on a "silver bullet." To do so is a dangerous proposition, because this approach creates a false sense of security. Tests that quickly identify harmful bacteria on foods have been touted as this "silver bullet" to ensure safe food. While rapid microbial tests are important tools in a mix of food safety strategies, they cannot ensure that food is safe. A recent, but key policy change by FSIS, which was upheld recently in the U.S. District Court, considers E. coli O157:H7 to be an adulterant in raw ground beef. FSIS is presently sampling for this pathogen in raw ground beef at the processing and the retail level. Unfortunately, the scientific community cannot support FSIS in this type of end-product testing because of the statistical sampling problems inherent with bacteria. Good science supports the use of HACCP with all interventions that science can provide. In a November 1 letter to Patrick Boyle (President of the American Meat Institute) and other industry groups, FSIS Administrator Michael Taylor indicated that FSIS would allow the use of anti-bacterial rinses after the final wash. That is the good news; unfortunately, the policy that requires that fecal material be trimmed prior to washing has not been changed. There is no evidence that the current fecal policy has reduced the number of pathogens in the meat product. A significant amount of evidence coming from industry indicates the numbers of bacteria have actually increased due to excessive handling during trimming. The trimming policy has effectively stopped the previously approved post-hide removal rinsing of carcasses with organic acids—one of the few pathogen interventions available other than cooking.

- **Is end-product testing supported by the scientific community? How does it relate to HACCP?**

No. End-product testing and HACCP do not go together. HACCP embraces the prevention philosophy, while end-product testing embraces the concept of trying to "inspect out" the problem. Pillsbury and NASA knew that end-product testing would not work, and that is why they used HACCP to make certain that the food used in the space program was safe. Let us look at the hamburger and the now-famous E. coli O157:H7 bacteria that caused the food poisoning tragedy in 1993. This harmful bacteria that contaminated the hamburgers is found in less than 0.2 percent of beef carcasses sampled by USDA. No reasonable sampling plan would be sensitive enough to effectively detect this organism at such low frequencies. For example, if 10,000 pounds of ground beef were to be statistically sampled to have 99 percent confidence that the pathogen would be detected if present, over 3,000 samples would have to be taken. This would cost in excess of \$150,000 for laboratory analysis. USDA is presently sampling ground beef for E. coli O157:H7, and its sample size is one per lot, when it should be sampling in excess of 3,000 per lot to be statistically valid.

It is time for the beef industry to draw the line on end-product testing. It is not scientifically valid and does not improve public health protection. Industry has a better way--it is called HACCP, which uses pathogen kill steps (interventions) as science provides them. There are valid uses of microbial sampling. Microbial testing should be employed to verify that the HACCP interventions are working effectively, and microbial baseline surveys should be conducted by USDA to measure progress over time. The recent USDA steer and heifer baseline survey is a good example, and USDA should be encouraged to continue these types of surveys for all meat and poultry. These results can be our "yardstick" to see if we are making progress and to identify areas that need improvement. Rather than spending public dollars on an end-product test and condemnation system that science cannot support, USDA should allow the use of interventions such as anti-bacterial rinses.

- **What inequities exist today between beef and poultry inspection at federally inspected plants?**

In late 1992, FSIS contracted with an outside research group to look at potential inequities between the meat and poultry inspection acts. The project identified several different areas where differences are evident. They are listed below:

- **Mechanically Separated Product.** Present regulations do not require poultry products to be labeled nor is there a limit on the amount that can be used in the finished product.

Economic advantage: Very Significant.

Resolution: USDA has recently proposed that poultry products be labeled the same as meat products.

- **Humane slaughter.** The Meat Inspection Act requires humane slaughter while the Poultry Products Inspection Act does not. Although not required by Congress, the slaughter process used by most poultry processors is parallel to that used for livestock.

Economic advantage: little or none.

Resolution: Ignore the issue or support new legislation for humane poultry slaughter that is parallel to that for livestock. New legislation would help FSIS settle disputes if it finds a plant is not using industry-accepted standards.

- **Use of skin.** USDA regulations permit the use of detached poultry skin in poultry products at levels ranging from 8% for raw boneless turkey thighs to 25% for cooked chicken rolls. Poultry processors are not required to label skin as a separate ingredient. Detached skin may not be added to meat products.

Economic Advantage: Significant advantage to poultry.

Resolution: No action to date.

- **Standards of composition or identify.** Some meat products have a poultry counterpart. For example, chili with beef is paralleled by poultry chili, meat stew by poultry stew, and so on. USDA standards of identify are not

the same. For example, "beef stew" must contain at least 25% beef while "poultry stew" must contain only 12% poultry etc.

Economic Advantage: Significant advantage to poultry.

Resolution: No action to date.

- **Sanitation--water temperature.** The meat and poultry requirements on the use of hot water in sanitation differ in that the meat regulations specify how hot the water must be, while the poultry regulations do not.

Economic Advantage: Advantage to poultry.

Resolution: No action to date.

- **Slaughter Inspection Modernization.** Current poultry regulations provide for the use of statistical quality control procedures known as "Finished Product Standards" in some aspects of poultry slaughter and processing, but these procedures are not yet used in meat inspection. These statistical quality control procedures can increase the efficiency of the production line.

Economic Advantage: Advantage to poultry.

Resolution: No action to date.

- **Removal of Contamination.** Meat and poultry carcasses contaminated with ingesta or fecal material are considered adulterated and are to be condemned, unless they can be reprocessed to remove the contamination. While meat carcasses can only be trimmed, poultry carcasses can be trimmed or washed.

Economic Advantage: Significant Advantage to poultry.

Resolution: No action to date.

- **Carcass Chilling Procedures.** USDA has long considered any weight gain in meat carcasses attributable to added water and to be "economically adulterated". This includes any water that may be added during carcass chilling. Poultry carcasses, on the other hand, are expressly permitted to gain as much as 8% added water as a result of chilling by immersion in water.

Economic Significance: Very significant advantage to poultry.

Resolution: No action to date.

- **Moisture limitations in processed products.** Processed products include products such as sausages, roasts, or cured products prepared from one or more kinds of meat, added water, and/or other ingredients. The federal meat inspection regulations restrict the amount of water that can be added to many such processed meat products, but the poultry products inspection regulations have few such restrictions for comparable poultry products.

Economic Advantage: Significant advantage to poultry.

Resolution: No action to date.

- **How do these inequities translate to increased costs or reduced returns to cattlemen?**

The National Live Stock and Meat Board has estimated that these and other differences give the poultry industry a \$3 billion/year advantage over the meat industry.

- **What specific changes should be made in the Federal Meat Inspection Act and Poultry Products Inspection Act to "level" the playing field and eliminate inequities between beef and poultry inspection? Will these changes require legislation and/or regulatory changes?**

The two acts should be rewritten and combined to eliminate these differences and thus create a level playing field. Some of these changes can be handled under the existing acts by changing the regulations.

Summary. It is time for the beef industry to take charge of the food safety agenda. It is time for you to step out with a strong plan of action. It is time for you to work together. This is not the time to worry about who gets credit for what. You know what needs to be done. You know what type of safety program is going to make your products safer for the consumer. It is time for you to stop being on the defensive. Significant steps were taken this past year by industry. The first step was the formation and actions of the Meat Board's Blue Ribbon task force on E. coli O157:H7. This task force outlines the key research areas from the farm to the table. The second event occurred this summer when NCA hosted a think-tank to develop more specific research needs for food safety, building on the Blue Ribbon report's recommendations. The food safety program of the future will be predicated on good science and will have a foundation based on the principles of risk analysis and HACCP. The program of the future must be a farm-to-table program with everyone doing its part—the private sector, government, scientists, and consumers. With the Meat Board's Blue Ribbon report on E. coli O157:H7 and NCA's "National Food Safety Agenda," now is the time for coordinated action. To delay will be very costly to you and your customer.

To summarize, the industry should be prepared to take the following minimum steps in regard to food safety if it is going to step out in front:

- The entire industry, from the farm through food service and retail, should begin to embrace strong HACCP programs. USDA should be encouraged to mandate HACCP as science and interventions make it possible. HACCP will not be totally effective if there is a broken link in the marketing chain.
- Industry should insist that the current meat and poultry inspection system be totally revised to reflect a federal agency operating in a risk-based/HACCP mode. The current system of carcass-by-carcass/bird-by-bird organoleptic inspection has no place in a risk-based food safety program. We need more legislation to improve the system, not make it more punitive.

- Industry should insist that the food safety agenda be driven by good science and not politics or the media. If that science is not available, the industry should play a leadership role in making certain that the highest priority questions are answered and that the resources are available to conduct the research.
- Industry should strongly support the use of pathogen interventions from the farm to the table. If the technology is available and supported by scientific data, it should be used aggressively.

Further, industry must work together to ensure that good science and not political science provides the foundation for the future meat and poultry inspection system.