

ingredients in meat food products, for example, became important, because vegetable proteins can mask the addition of water to a product. The development of equipment to salvage formerly discarded high-protein tissue from bones and fatty tissue made time-temperature requirements necessary to guard against the growth of spoilage organisms. Standards had to be set for the use of these ingredients and the labeling of products containing them.

Meanwhile, better animal husbandry practices had improved animal health and reduced the public health risk from diseased carcasses. The Agency's extensive, statutorily mandated carcass-by-carcass inspection continued, however, with the important objective of eliminating from commerce the unpalatable signs of disease (such as tumors and lesions), meat from animals with diseases that could pose a human health risk (such as salmonellosis or cysticercosis), fecal contamination of meat and poultry carcasses, and visible damage (such as bruises). Establishment sanitation also remained an important object of inspection in both slaughter and processing facilities.

The Poultry Products Inspection Act (PPIA) of 1957 made inspection mandatory for all poultry products intended for distribution in interstate commerce. It was modeled after the Federal Meat Inspection Act.

The potential for unseen health hazards in the food supply also attracted increasing regulatory attention. In 1962, Rachel Carson's *Silent Spring* raised public awareness of the possible harmful effects of pesticides and other chemical contaminants in food. In 1967, the Agency established the National Residue Program, the Federal Government's principal regulatory mechanism for determining and controlling the presence and level of those chemicals in meat and poultry that may present a public health concern.

Because of the increasing volume and complexity of food production and the potential for various forms of adulteration that consumers could not, by themselves, determine, Congress enacted new legislation during this period to assure the safety and wholesomeness of all foods, including meat and poultry products. The 1958 Food Additives Amendment of the Federal Food, Drug, and Cosmetic Act (FFDCA) provided for FDA approval of new food additives and their conditions and levels of use.

The Wholesome Meat Act of 1967 and the Wholesome Poultry Products Act of 1968 amended the basic laws governing mandatory meat and poultry inspection

to assure uniformity in the regulation of products shipped in interstate, intrastate, and foreign commerce. These Acts provide the statutory basis for the current meat and poultry inspection system. Both Acts gave USDA new regulatory authority over allied industries, including renderers, food brokers, animal food manufacturers, freezer storage concerns, transporters, retailers, and other entities. Both Acts incorporated adulteration and misbranding prohibitions tied to important provisions of the FFDCA relating to food and color additives, animal drugs, and pesticide chemicals. Both Acts provided stronger enforcement tools to USDA, including withdrawal or refusal of inspection services, detention, injunctions, and investigations. Both Acts extended Federal standards to intrastate operations, provided for State-Federal cooperative inspection programs, and required that State inspection systems be "at least equal to" the Federal system.

Also, under these Acts, meat and poultry products from foreign countries that are sold in the United States must have been inspected under systems that are equivalent to that of USDA.

1970s–Present: Increasing Demand for Inspection

By the 1970s, the need to focus on "invisible" hazards to public health had raised the ratio of analytical to organoleptic activities, and the ratio of out-of-plant to in-plant activities. The bulk of the Agency's resources continued to be allocated, however, to in-plant activities addressing the issues of animal disease and establishment sanitation. During the 1970s, national budget constraints reduced the funds available for inspection throughout the United States. As individual States exercised their right to request that the Agency take over their inspection programs, FSIS had either to eliminate some inspection activities or change the way they were performed, to provide the additional coverage.

The driving force behind FSIS's program changes from the 1970s on was the need to keep up with industry's expansion and its productivity gains, including the incorporation of automation in the slaughter process that increased the rate at which carcasses could move through the slaughter facility (typically referred to as "line speed"). Automation has had a particularly great impact on poultry operations, where inspectors have had to face faster and faster line speeds, which today can be as high as 91 birds per minute.

The industry changed in many ways during this period. The poultry industry became, to a large extent, vertically integrated, with large companies controlling each step of the process from production of birds to slaughter, processing, distribution, and marketing of chicken and turkey products under brand names. The beef and pork industries grew, but generally did not become vertically integrated. Beef cattle and swine continued to be produced by a large number of independent farming businesses. Consolidation occurred in slaughter and processing operations, and production increased. Increased production meant more meat and poultry products awaited inspection by FSIS inspectors.

The Agency strained to keep pace with an industry radically different in scale and scope from what it had been in 1906. In September 1976, the Agency hired the management consulting firm of Booz, Allen and Hamilton, Inc., to perform an in-depth study to find less costly ways to inspect meat and poultry that would not reduce the level of consumer protection. The study recommended, among other things, that FSIS:

- Use quality control mechanisms to shift responsibilities from inspectors to the establishment, giving inspectors a verification responsibility.
- Establish microbiological criteria for finished products.
- Explore substitution of air chilling for water chilling of poultry carcasses.
- Require chlorination of chiller water for poultry.
- Expand food safety education for consumers and food handlers.

The study elicited a generally negative response from consumer groups and some members of FSIS's workforce, who interpreted the recommended role changes as an abdication of Agency responsibility. Anticipating higher costs and concomitant price hikes, industry also objected to the recommendations. FSIS decided to pursue only some of the recommendations.

One that it did pursue in processing establishments, the voluntary Total Quality Control (TQC) program, was implemented in 1980. The General Accounting Office (GAO) had recommended a TQC-type program in December 1977, to afford the Agency flexibility to tailor inspection frequency to individual establishments' needs. This program applied a different kind of inspection to establishments that FSIS approved for a self-monitored production control program designed to assure that processed products would meet regulatory requirements. In those