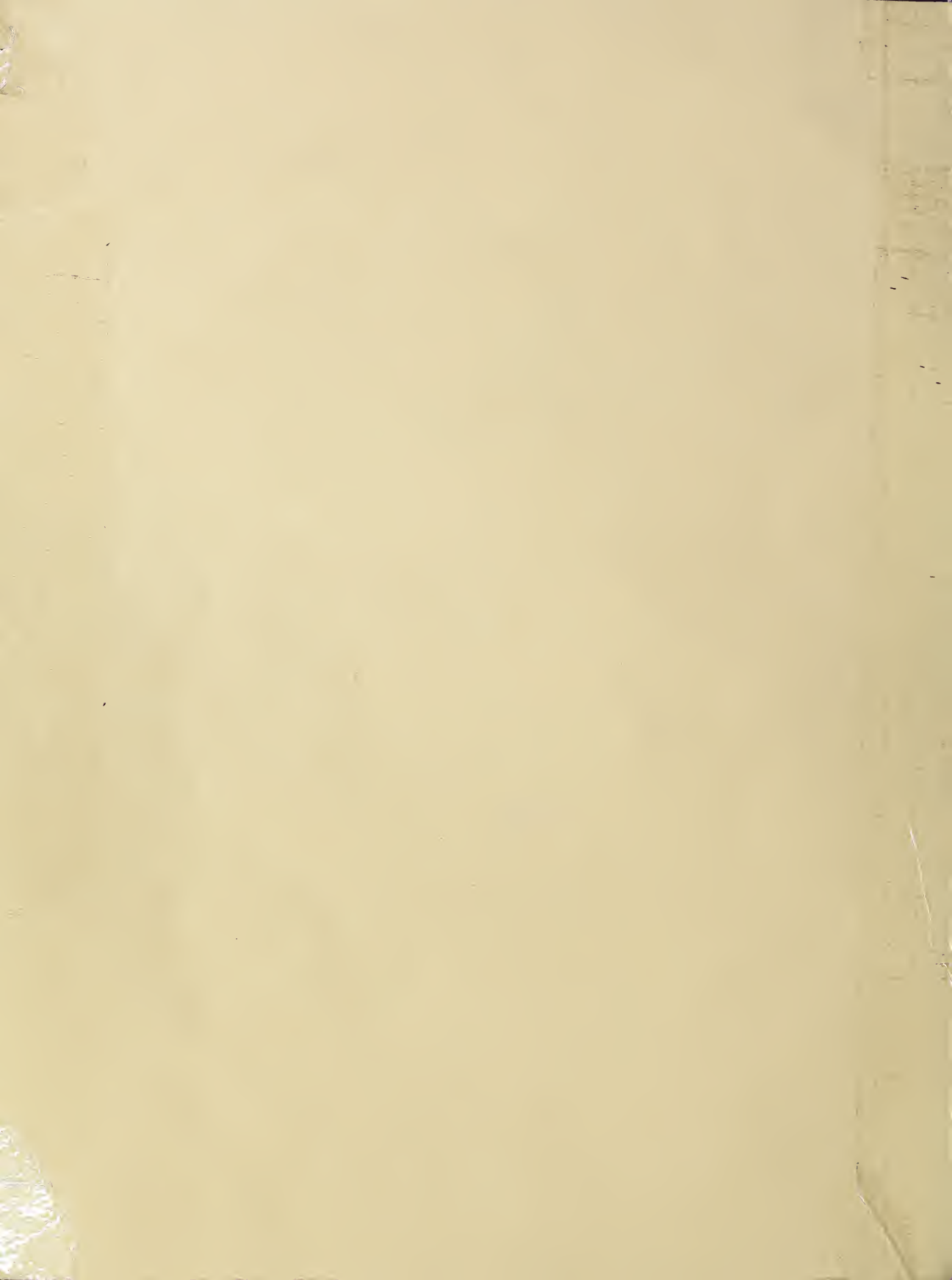


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FOOD NEWS

FOR CONSUMERS

Volume 6 Number 4 Winter 1990

United States Department of Agriculture
Food Safety and Inspection Service

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**Special Issue—
The State of
Food Safety**

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FOOD NEWS

FOR CONSUMERS

Winter 1990
Vol. 6, No. 4

Food News for Consumers is published by USDA's Food Safety and Inspection Service, the agency charged with ensuring the safety, wholesomeness and proper labeling of the nation's meat and poultry supply. The magazine reports how FSIS acts to protect public safety, reporting research findings and regulatory efforts important in understanding how the agency works and how consumers can protect themselves against foodborne illness.

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THE STATE OF FOOD SAFETY

An introduction to this special issue by USDA's Deputy Secretary Jack Parnell



A California rancher who served as director of the California Department of Food and Agriculture before coming to Washington, Jack Parnell is now charged with oversight on food safety issues and coordinating public health protection on a department-wide basis.

Since I was sworn in as Deputy Secretary of Agriculture last year, I've been asked repeatedly about the safety of the U.S. food supply. People used to take the safety of their food for granted, but in recent years consumers have been barraged with alarming reports—hormones in beef, listeria in cheese, Alar in apples, toxins in seafood and salmonella in chickens and eggs. Understandably, public confidence in the food supply has suffered somewhat as has confidence in government regulation.

Still, some of this skepticism is justified. People should know that, while the U.S. food supply is the safest in the world, it isn't risk-free nor will it ever be. The possibility of contamination exists despite the best efforts of producers, processors, retailers and the government agencies that regulate the food industry.

Often, though, public fears are misdirected. Scientists agree that pesticide residues are *not* a major public health problem, yet pesticides top the list of consumer fears about food. In contrast, bacteria cause millions of cases of foodborne illness each year, yet many consumers fail to recognize this potential threat. And that is unfortunate, since bacterial hazards can easily be controlled by proper food handling.

An important goal at the Department of Agriculture is to educate people so they gain perspective on actual food safety risks and can react sensibly rather than over-react to media reports of problems. We are also expanding our efforts to make consumers aware of the safe food-handling practices they should follow to avoid foodborne illness. Those of us charged with getting that information out—Assistant Secretary Jo Ann Smith and I, among others—also want them to have a better understanding of the interlocking network of government agencies that work to protect the food supply.

To that end, we hope this special issue of *Food News for Consumers* will aid a more realistic public understanding of the real state of food safety.

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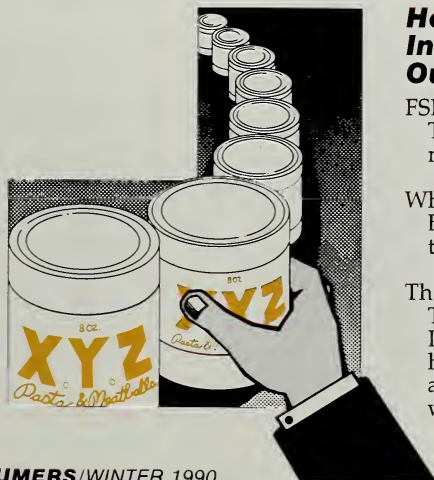
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THE NATION'S FOOD PROTECTORS—

Who Are They? What Do They Do?

by Herb Gantz

Americans consume mountains of food every day. Behind this enormous food supply is an army of food inspectors and support personnel at all levels of government—federal, state and local—monitoring our food to ensure it is safe and wholesome. This includes not only what we eat at home but what we eat out at fast-food spots and other restaurants.

Who are the players and how does it all work? Read on.

The Federal Level

The U.S. Department of Agriculture

The Food Safety and Inspection Service (FSIS)—Within the U.S. Department of Agriculture, FSIS is responsible for inspecting meat and poultry products sold in interstate and international commerce. This includes meat and poultry products imported for sale here, which must be produced under inspection systems that meet U.S. standards.

A mandatory program, FSIS inspection works to supply the public with safe, wholesome and

accurately labeled products. The agency can also *recall* unsafe or suspect products after they've reached the grocery shelf.

The FSIS inspection staff—over 7,500 meat and poultry inspectors, food technologists and veterinarians working in some 7,000 slaughter and processing plants across the country—constitute the largest food inspection force in the federal government. In fact, meat and poultry products are more intensively inspected than any other foods.

Plus, FSIS works closely with the food industry on product labels for consumer information. And, at the plant level, FSIS monitors facilities and equipment to assure they meet federal sanitation standards.

FSIS also runs a nationwide consumer education program to inform the public about proper care and handling of food. An important part of this effort is our tollfree Meat and Poultry Hotline. For help, callers nationwide have only to dial 1-800-535-4555. For Washington, D.C. area residents, the number is 447-3333.

The Agricultural Marketing Service (AMS)—AMS inspects egg products for both domestic and foreign sale.

AMS inspectors keep certain kinds of restricted or "problem" eggs from being sold in the wholesale market. Thus, food processors like the makers of mayonnaise, egg noodles and ice cream and institutions like hospitals and nursing homes receive acceptable egg supplies.

Currently, AMS is coordinating USDA's public awareness campaign in response to the problem of the existence of salmonella bacteria inside some fresh, unbroken shell eggs. AMS is providing information on the proper storage and cooking of eggs in the home and in institutional settings like hospitals and nursing homes.

Other Federal Agencies

The Food and Drug Administration (FDA)—Part of the U.S. Department of Health and Human Services, FDA ensures the safety and wholesomeness of all foods sold in interstate commerce *except* meat, poultry and some egg products. The program is based on unannounced inspections and sampling of foods.

FDA also monitors for unsafe pesticide levels in food, and re-

searches and develops standards on the composition, quality, nutrition and safety of food, including the safety of food and color additives.

There are approximately 60,000 food processing plants, warehouses, etc., subject to FDA inspection. Of the agency's some 7,000 full-time employees, 910 are inspectors and investigators whose duties cover domestic and imported food, as well as drugs and medical devices.

National Marine Fisheries Service—Located in the U.S. Department of Commerce, this agency offers a voluntary, fee-for-service inspection program for fish products. Some 155 fish processors, brokers, retail and food service operations are now enrolled in the inspection program full time. In addition, some 400 spot inspections are currently carried out each year.

Some 325 Commerce Department and cross-licensed federal and local inspectors provide the service.

Inspection services include vessel and plant sanitation, product evaluation (including inspection, grading and certification for domestic, import and export products), laboratory analyses and review of product labels.

The Environmental Protection Agency (EPA)—EPA regulates the manufacture, labeling and use of all pesticides. Through its Office of Pesticides and Toxic Substances, the agency is responsible for approving or "registering" pesticides to ensure that, when used according to label directions, they will not pose significant risks to human health or the environment.

EPA also sets tolerance levels, or maximum legal limits, for pesticide residues in foods marketed in the U.S. to ensure that consumers are not exposed to unsafe pesticide residue levels.

In addition, EPA works cooper-

atively with the states to investigate incidents of potential pesticide misuse and to prevent such occurrences.

EPA sets national drinking water standards for all public drinking water supplies currently numbered at about 200,000. FDA standards for bottled water sold nationwide must be modeled closely on these standards.

State and Local Governments

Adding their muscle to federal efforts, state and local governments put considerable energy into food inspection. Some of this

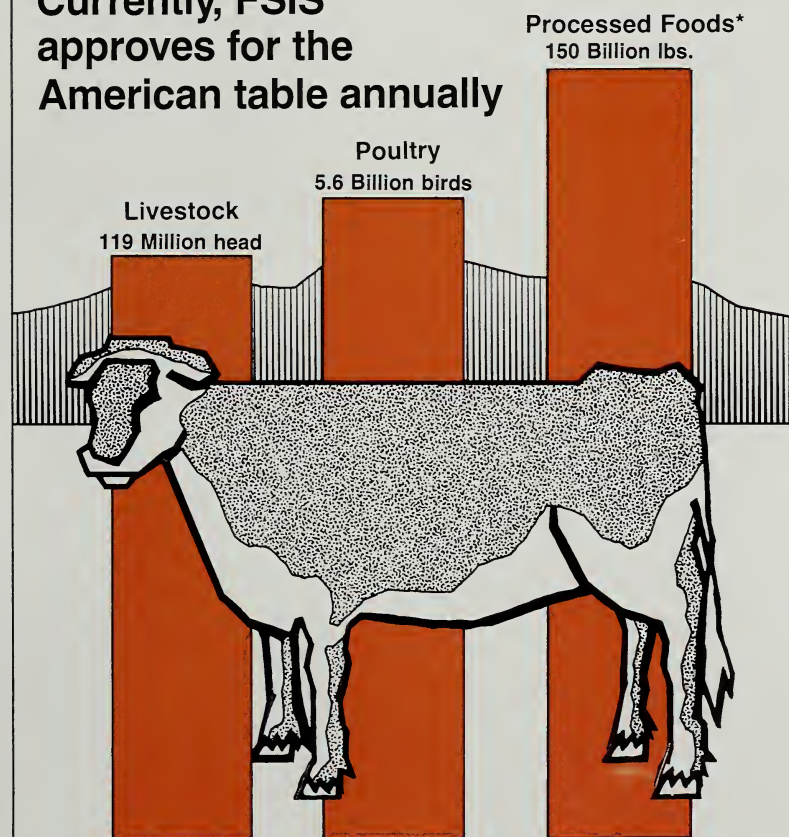
is done cooperatively with federal agencies, both to maximize staff effectiveness and to ensure that state standards meet federal rules.

There are cooperative federal and state programs for fish, dairy and other food product inspection.

Roughly half the states have their own meat and poultry inspection programs. State-inspected meat and poultry products may only be sold within that state's boundaries.

Local governments inspect restaurants, fast food spots and similar outlets. They can close establishments for sanitary violations.

Currently, FSIS approves for the American table annually



*TV dinners, ham, meat soups, stews, and other processed products.

What's Ahead in Food Inspection – 1990 and Beyond

AN INTERVIEW WITH Dr. Lester Crawford

Dr. Lester Crawford, administrator of USDA's Food Safety and Inspection Service, is a veterinarian with a doctorate in pharmacology.

Dr. Crawford serves as the U.S. coordinator of the Codex Alimentarius Commission, a United Nations group that sets standards for food safety around the world.

He was previously director of FDA's Center for Veterinary Medicine.

Food News spoke with him recently on directions he sees the agency taking in the upcoming decade.

Q. First, how do you assess the present state of food safety?

A. The food supply has never been safer. We know more than ever about contaminants, and that doesn't mean these are things we've just discovered. They existed—and probably were more dangerous—before we started monitoring for them.

The difference now is that, while microbial problems persist, FSIS has virtually eliminated chemical residues and has controlled threats from parasites, tumors and diseases of food animals.

Q. What emerging food safety issues face FSIS?

A. New organisms and new strains of existing organisms have, in some cases, increased pathogenicity—they're harder to control.

Viruses are the next frontier. As we control foodborne bacteria,

viruses like Norwalk may gain momentum. We need to know more about their sources and modes of transmission as well as their resistance to heat, freezing and other critical factors in food safety.

The last few years have seen more packaging innovation than in all of recorded history. Two areas bear watching—the possible migration of harmful chemicals from packaging into food and the potential for bacteria to proliferate in some newly-developed packages.

Q. How will FSIS address these new concerns?

A. With the steady advance of science, not just in this country, but around the world, we're becoming increasingly adept at detecting "unseen" microbial hazards. Plus, we're using the latest risk-assessment techniques to put our scarce inspection resources to the best use—at the points of greatest risk to public health. And scientific advances in rapid tests are providing better tools for our on-line inspectors.

The new Donald L. Houston Center at Texas A&M University is broadening the scope of scientific and technical training for our work-force. And we're adding to our inspection force increasing numbers of trained food technologists.

Q. The term HACCP is often heard in connection with food safety. Is this a new concept?

A. No. The Hazard Analysis and Critical Control Points (HACCP)



method of controlling risks was developed for use in some processed foods about 20 years ago. It's new to FSIS operations, however.

In simplest terms, HACCP is a careful, systematic approach to food safety. You simply do a careful, step-by-step analysis of how a certain food will be processed. Then you designate the steps—the critical control points—where, should something go wrong, the product could become unfit to eat. Finally, you set up systems to



monitor and quickly correct any problems at those control points.

Since the HACCP approach is the best way to provide consumers with a safe meat and poultry supply, we are moving to incorporate it at every phase of FSIS inspection.

Q. What other changes are on the horizon for FSIS inspection?

A. Science will soon provide our inspectors with new tools to use in the inspection process. We may soon be using imaging techniques like ultrasound, computer imaging and nuclear magnetic resonance. These techniques are non-invasive—you don't have to cut into a carcass or an organ to detect tumors and lesions. Rather, it's like opening a "window" to check inside the product.

For the detection of microbial organisms, we may have gene or DNA probes, monoclonal antibodies and other biosensors. Ultrasound could be used.

We'll see progress in raising animals less likely to carry bacteria. For example, scientists are working to bioengineer salmonella-resistant chicks.

They're looking at competitive exclusion methods, too, where chicks, only a few days old, receive measured doses of harmless bacteria that exclude the growth of salmonella in the intestine.

Q. Should FSIS be doing more testing for microbiological contamination—by bacteria and

other agents—in meat and poultry?

A. We've more than tripled microbiological testing in the last 8 years, and it appears we're now testing at about the right intensity.

Rather than more testing, we need to develop new, faster test methods.

Here I really mean we should build on our success. FSIS researchers have led the way in rapid testing. Our tests for the foodborne bacteria *Listeria monocytogenes*, *Yersinia enterocolitica* and *Clostridium botulinum* are used around the world.

And, courtesy of FDA, we now have a DNA test for the virulent hemorrhagic *Escherichia coli*.

Q. Polls show consumers are worried about chemical contaminants in food. Any comment?

A. One of FSIS's real successes has been the virtual elimination of chemical contaminants from meat and poultry. Today less than ¼ of 1 percent of inspected product contains illegal levels of residues.

We've been using faster, more reliable tests, including many FSIS-developed quick tests which can be used right on the plant floor.

Our inspectors are also trained to recognize other signals of possible residue problems like atypical injection sites on a carcass.

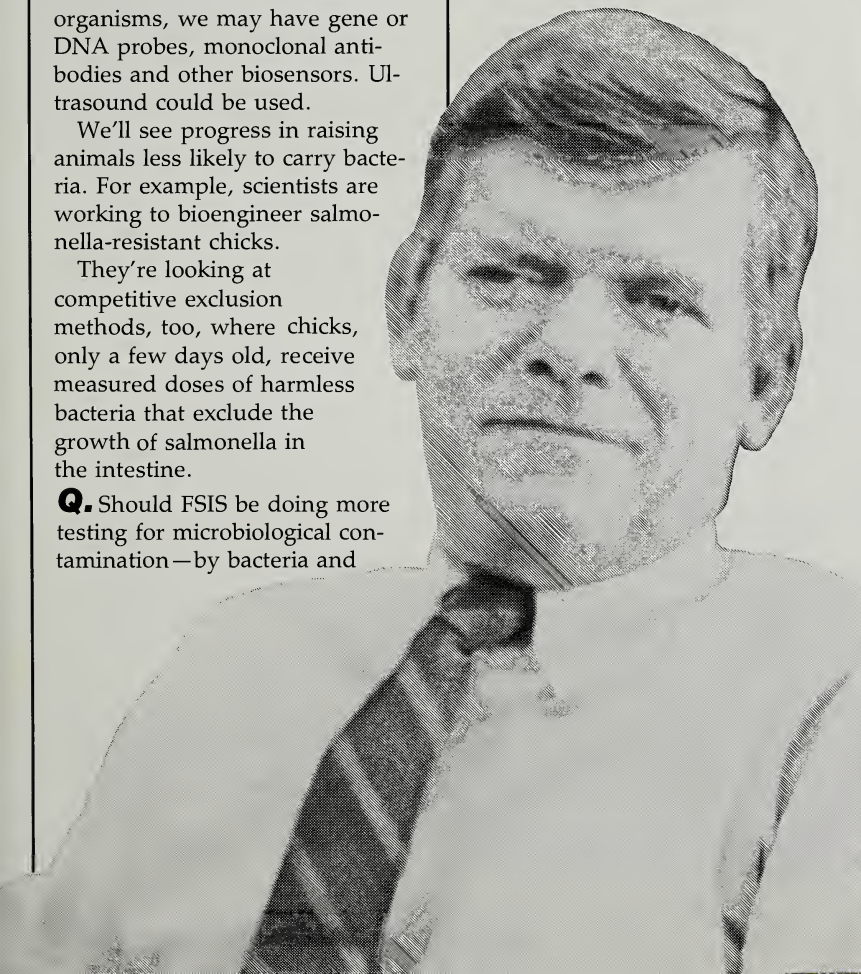
And we now share information with other regulatory agencies through a new computer system that compiles data on residue violators operating anywhere in the country.

Yet the public remains concerned, so we're considering the formation of the National Committee on Chemical Residue Contamination. Members would be drawn from government and non-government experts and would advise us on residue control and set up standard practices for residue control governmentwide.

Q. What role should FSIS be playing in the world food safety picture?

A. Since food safety issues are not bounded by geography, other countries face pretty much the same problems we do. FSIS is recognized as the world leader in meat and poultry inspection, so we intend to maintain that lead and help other nations develop improved inspection systems.

Currently, we are working through the United Nation's Codex Alimentarius Commission and the General Agreement on Tariffs and Trade (GATT) to encourage worldwide acceptance—or harmonization—of sanitary food standards that will boost international trade.



The FSIS Science Challenge— Keeping Pace with New Products, New Microbes

by Danielle Schor

While thousands of employees at the U.S. Department of Agriculture check meat and poultry to ensure it's safe for consumers, a much smaller group of employees is looking for new ways to do the job faster and better. It's a never-ending struggle that requires substantial funding and enormous creativity and patience.

What spurs them on? The rapidly changing food industry is pushing much of the need for new science. The race to get new convenience foods on the market has produced a wide variety of food items that pose new problems.

The problems with these new products are twofold. Dr. Marvin Norcross, deputy administrator for science in USDA's Food Safety and Inspection Service, explains: "First, with new packaging and good processing controls, spoilage bacteria that used to signal us when a food had gone bad just aren't as prevalent. Second, food poisoning bacteria that can grow well even at refrigerator temperatures thrive." This is a serious concern, since many of the new products are designed for extended refrigerator storage.

Both difficulties underscore Dr. Norcross's central thesis that "the greatest hazards in today's food supply are invisible (from pathogens you can only see with a mi-

croscope). You need advanced technology to detect these pathogens, and to be stopped, they must be detected early in the food production process."

Other problems exist as well—the occasional episode of chemical contamination from pesticides and animal drugs, or the substitution of less expensive for more expensive ingredients. FSIS must verify for consumers, for example, that the beef hotdog they're paying a few pennies more for is really beef and not chicken or some other substance.

There are no simple answers to these complex problems, but solutions can be found in basic scientific research.

Then the findings must be adapted to the real world. A quick test for use in a slaughter plant must be easy to perform with limited equipment and space. A rinse to wash bacteria off chicken must be adapted to equipment already in use across the country.

Recent Breakthroughs

A project underway in USDA's research arm, the Agricultural Research Service (ARS), is looking for "real-world" solutions to the salmonella-in-poultry problem.

According to ARS's Dr. John DeLoach, they've found that lactose—simple milk sugar—added to chicks' drinking water blocks *Salmonella typhimurium*, a common infective strain. This can be

done for only ½ cent per bird. So they're also exploring using the lactose additive in the chicks' feed.

In other instances, FSIS just needs *faster* ways to get the *same* answer. Thus, the big push is for truly rapid tests. The big benefit here is that you have answers in minutes, hours or overnight while the products remain in the plant.

Examples? There are the quick tests for antibiotic residues, which can result if animals are not properly medicated or a drug is not withdrawn far enough in advance before slaughter. They're based on "inhibition"—if antibiotic residue is present in the tissue, no test bacteria will grow. Tests that show residues are sent on to a lab for confirmation. This is still a big time-and-money saver, since only positive tests need further analysis.

A real success story is the new in-plant test for sulfamethazine in hogs. The test gives producers added incentive to exercise greater care in treating animals, and has brought sulfamethazine violations down from levels that formerly hit 13 percent, to current 1.4 percent violation levels.

Future Needs

Dr. William Dubbert, with FSIS's science program, feels that one of the agency's most critical

needs is for “really rapid” tests to detect microbial contamination—bacteria and other microscopic organisms—in food.

“Present tests take a minimum of 48 hours, and none are sensitive enough to rely on without lab confirmation,” Dubbert says.

But not only is it difficult to develop and prove the efficacy of microbial tests, you can never really keep up with the new food pathogens science keeps uncovering.

For instance, we now have a DNA probe for a virulent strain of *E. coli* which causes severe, bloody diarrhea. The probe works when genetic material in the test links up with genetic material in the toxin this *E. coli* produces.

But tests are badly needed for two other bacteria now providing us with increasing problems—*Campylobacter jejuni*, a major cause of foodborne diarrhea, and *Yersinia enterocolitica*, which produces fever, diarrhea and abdominal pain and is often confused with appendicitis in young children.

FSIS will also need better ways to test for other potential contaminants—pesticides and drugs. Present quick tests usually only identify one substance at a time.

So the agency is exploring a system developed by Toxi-lab in California that uses thin-layer chromatography—identification of substances based on their chemical profiles—to simultaneously test for over 100 drugs in human blood, saliva and urine. Adapting that approach to veterinary drugs and pesticides would be a tremendous stride forward.

Sharing Information Is Essential

FSIS tries to adapt as much research as possible from other

sources. “It’s much less expensive to use a commercially developed test,” says Dr. David Berkowitz, head of the FSIS office that tracks new technology.

Recent “acquisitions” are the card tests developed by Environmental Diagnostics, Burlington, N.C., that screen for drug residues (see photo). The easy-to-use tests, about the size of a credit card, show the presence of a residue in about 7 minutes by registering a color change.

To prompt better technology transfer in the future, FSIS is setting up a centralized review system to expedite the approval of new rapid tests.

Public Perception—Can We Ever Move Quickly Enough?

Inevitably, no matter how much progress science makes, re-

searchers may never be able to provide the kind of certainty the general public wants.

“The public expects us to be able to test for every known contaminant and to do it quickly and cheaply,” says Dr. Norcross, “while the truth is that real scientific progress nearly always proceeds by small, nearly imperceptible steps.”

Norcross also feels that consumers often mistakenly equate new tests with new science.

“Tests are important certainly, but they only confirm problems that already exist. As scientists, we must focus our efforts on prevention—how to keep foodborne problems from happening,” he said.

That probably defines FSIS’s real challenge for the future—to anticipate tomorrow’s food safety problems today and be ready with practical scientific solutions.

Keeping Pace

(Below) Flock testing of chickens to reduce the spread of salmonella



(Left) The money-saving, quick card test for residues of the animal drug sulfamethazine



(Right) New packaging for convenience and longer shelf-life poses food safety concerns

Consumers Face Little Danger from Residues in Meat and Poultry

by Linda Russell

Consumers are concerned, according to recent surveys, about the danger of drug, chemical and pesticide residues in their food. The concern is compounded by the fact that consumers cannot see these residues or test for them.

Little Danger from Residues

Yet scientific tests have shown that consumers run little risk of health effects from residues in meat or poultry. The Food Safety and Inspection Service (FSIS), a public health agency of USDA, is vigilant in testing for residues. "Each year, FSIS conducts more than 1 1/2 million analyses for residues," said Dr. Richard Carnevale, assistant deputy administrator for Science at FSIS, and previously deputy director of the Center for Veterinary Medicine's Office of New Animal Drug Evaluation (FDA). "Less than 1 percent of all these tests show illegal residues," he said. And the violation rate has been steadily declining over the last decade.

Who Sets the Standards?

Some drugs and chemicals are not allowed at all in food animals. For others, very low—and safe—levels are allowed. These tolerances may be in parts-per-million or parts-per-billion.

The Food and Drug Administration (FDA) approves animal drugs, specifies their uses, and sets tolerances for their residues in food, Dr. Carnevale said. "The Environmental Protection Agency (EPA) does the same for pesticides and environmental contaminants.

"These agencies are very conservative in setting tolerances. Usually, they provide a safety margin that is at least 100 to 1,000 times lower than the level which might harm people," he continued.

How Illegal Residues Happen

Illegal residues can result from animal drugs being used improperly, from crop pesticides or from environmental contaminants that accidentally enter the food supply.

As they are being raised, some animals may need drugs to combat a specific problem. Some producers also administer drugs at low, "sub-therapeutic" levels to prevent disease. For instance, if cattle are going to be shipped across several states in cold weather, they may require antibiotics to help prevent pneumonia.

Some drugs are administered in feed and can produce illegal residues if producers aren't careful with label directions.

Pesticides or other chemicals can accidentally be introduced into animal feed or can be ingested when an animal chews on a fence post, for example. Animals such as chickens or hogs may transfer certain residues to each other through their feces.

How FSIS Tests for Residues

In point of fact, meat and poultry are the most thoroughly inspected foods in the United States—perhaps in the world. FSIS inspects meat and poultry for safety, wholesomeness and accurate labeling. It would be impossible—and prohibitively expensive—to test each piece of meat or poultry for residues. So, FSIS tests using scientifically-based random sampling.

The process begins when food inspectors at slaughter and processing plants take meat and poultry samples to be analyzed for residues. FSIS considers about 400 compounds that could potentially be found in food animals. Each year, FSIS tests for 100 to 150 of these compounds, based on the greatest risks.

Risk is looked at in two ways—the potential toxicity to humans of a certain compound and the likelihood of residues of that compound being in a particular animal species.

For instance, the drug DES (diethylstilbestrol), which causes birth defects, is banned in the U.S. and highly unlikely to be in meat and poultry. Yet, since it is

dangerous to humans, FSIS tests for it. Antibiotics, while less harmful to humans, have a greater potential to leave illegal residues. So the agency conducts extensive tests for them.

On the other hand, aflatoxin, which is produced by fungus on corn and other crops, can be dangerous to humans and animals. However, residues rarely occur in

pretty good odds.

The actual test may take 15 minutes right in the slaughter plant, or it may take a week or two in a laboratory and require sophisticated equipment.

When a Problem Occurs

When a problem does occur, FSIS, in cooperation with FDA

FSIS then began extensive testing of poultry and swine throughout Arkansas and in nine surrounding states to see if other problem areas existed. After extensive testing—on almost 3,900 samples—only one sample showed heptachlor residues.

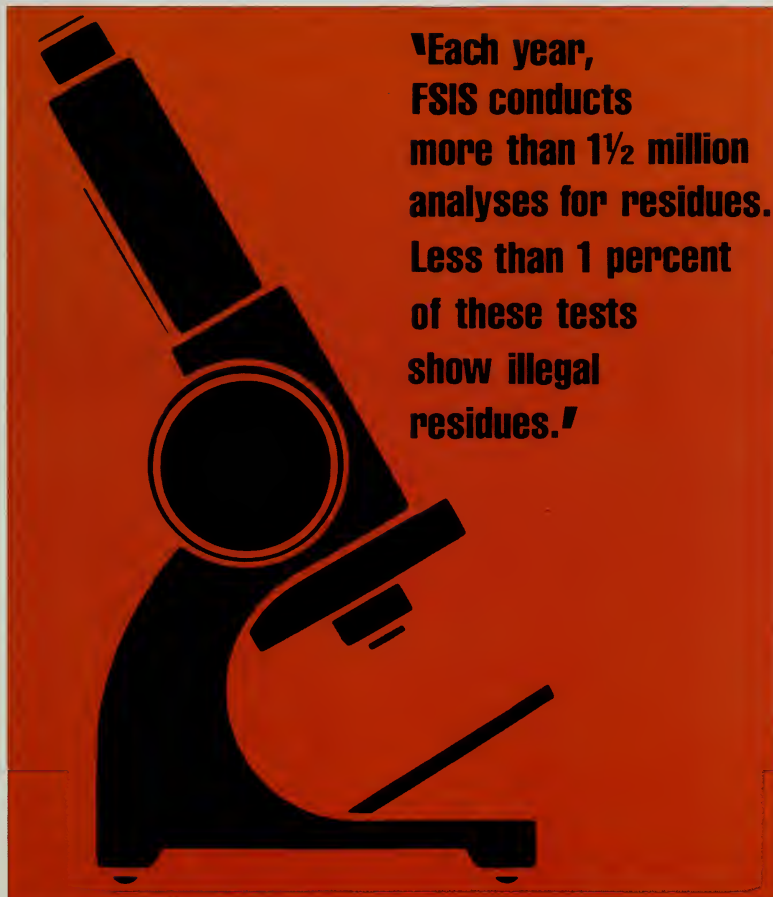
Hormones in Beef

In addition to chemical residues, some consumers are also concerned about the presence of hormones in meat. To begin with, no meat or poultry is “hormone free.” All animals, including humans, naturally produce hormones. Even plants such as soybeans contain natural hormones.

Some producers give hormones to cattle—by implants in the ears—to help the animals grow more quickly on less feed. The additional hormones remain at very low levels and are not dangerous to human health. In fact, a 16-ounce steak from a treated animal contains fewer hormones than those naturally present in a pat of butter!

Hormones, like drugs and other chemicals, are not visible in meat and poultry. Nor are there home tests that consumers can use to detect illegal levels of these compounds. How, then, can consumers be certain that the meat and poultry they eat are safe?

Dr. Carnevale said, “Consumers can be assured that FSIS is testing the U.S. meat and poultry supply for drug and chemical contaminants. Any problems are dealt with quickly. Where consumers can be most effective is in controlling conditions in their own kitchens that might allow growth of *bacteria* that can lead to illness.”



**'Each year,
FSIS conducts
more than 1½ million
analyses for residues.
Less than 1 percent
of these tests
show illegal
residues.'**

meat and poultry, so FSIS does not routinely test for aflatoxin.

Once FSIS decides to test for a particular residue, enough samples are taken to ensure a 95-percent probability of finding a residue if it is in 1 percent or more of that species. These are

and/or EPA, moves to correct it quickly.

Last year, for instance, the pesticide heptachlor was discovered in poultry at one plant in Arkansas. Ultimately, 700,000 chickens and another 182,000 pounds of raw poultry were destroyed. FDA determined that the probable cause was contaminated feed.

Informing Consumers About Food Risks—

How Can We Get A More Accurate Message Across?

The (Mad) Hatter spoke again on the subject at length, and although she could not catch the thought, it was certainly, Alice felt, English that he spoke.

Alice's Adventures in Wonderland

In the Lewis Carroll story, Alice falls down a rabbit hole into a topsy-turvy world where they seem to speak English, but she has great trouble finding out what's going on. She is out of her element.

Consumers today, understandably, may feel a certain kinship with Alice as they try to sort through conflicting messages about the food supply.

"It's perfectly safe," says one group. "Not so," says another. "It's safe except for elements F, X and Q," says a third.

This great babble of information, with all kinds of groups speaking nearly a different language, is at the heart of the risk communication problem.

How do you solve it? The first step is to bring consumers up to a level of "rational alertness" where they can make independent decisions about risk information, says Peter Sandman, director of Environmental Communication Research at Rutgers, New Brunswick, N.J. To achieve that kind of objectivity,



it's important that consumers know more about how different messages originate.

After all, scientists, government officials, the media, activist groups and consumers themselves are prone to view risks quite differently.

How Scientists Report Their Findings. The reports of new problems often start with the scientists, who view risk differently than most laymen. They see it in terms of probability and try to quantify any danger in objective, statistical terms. Practically speaking, this means they can almost never say that something poses *zero-risk*.

Scientists not only view such problems differently, they also write about them in their own unique style.

In the Fall 1989 *Consumer Magazine Digest*, editor Kristen McNutt printed this chart showing how lay-readers often misinterpret scientific prose. It's a classic example of how scientists make meas-

ured projections from their work, while readers are looking for simple, cut-and-dried answers.

When It Says	It Does NOT Mean
contributes to	causes
suggests	means
indicates	proves
is associated with	is causally related to
some scientists believe	all scientists agree
at least in some people	probably in all people
animal studies show	human studies would show
in people with high Y	in people with normal Y
elevates blood cholesterol	increases heart disease
high intakes elevate X	low intakes decrease X



From the Government Official's Office. Government managers have no choice but to view risk pragmatically. Their job is to protect consumers by using the best scientific judgment on what poses a significant risk and defining proper safeguards.

Nearly always, of course, these managers are working with limited staff and budget, and must also confront changing political realities.

How the Media Play "Risk" News. The media's job is news on deadline, not risk education. Reporters are called upon to balance a number of different—often "hot"—viewpoints. And what may happen is that savvy spokespersons who make the short, vivid statements are likely to get the best coverage.

Activist Groups and Their Role. While the positions these groups advance vary from well-intended goals to the sometimes puzzling agenda, they have a definite role to play in societal change.

It's good to remember that the beginning of responsible meat inspection in this country was prompted by the efforts of the "muckraker" journalists and activists who first exposed problems in turn-of-the-century packing houses.

Through Consumer Eyes. Consumers, finally, add to their own difficulty in risk interpretation, according to Paul Slovic of

Decision Research, Eugene, Ore., by viewing reality through the filter of their personal beliefs.

In risk communication as elsewhere, says Slovic, "evidence appears reliable if it is consistent with one's original beliefs. Contrary evidence tends to be dismissed." In other words, people hear what they believe.

USDA Begins A Risk Communication Study. To help consumers distinguish between perceived and actual concerns about the safety of the food supply, two USDA agencies—our own Food Safety and Inspection Service and the Extension Service—are starting a new study.

Colorado State University researchers carrying out the work

will look at how people make decisions about food use and what sort of messages communicate to them most accurately.

Beth Branthaver, project coordinator for the Extension Service, says, "Colorado will use focus groups to see how risk messages are understood in different formats—such as a newspaper story, video news release and so forth."

This effort will help us reach the day when consumers feel less like Carroll's Alice and are better prepared to make informed choices about food.

—Senior staff writers Sharin Sachs and Mary Ann Parmley contributed to this report

Defining Risks—Where Experts and the Public Disagree.

To scientists, risk means expected annual mortality. To the public, risk is more than that. It's the actual threat plus what risk scholars call "outrage" factors. Consider these outrage factors.

- **Voluntariness:** A voluntary risk is more acceptable to people than a coerced risk and causes no outrage. Consider the difference between being pushed down a hill on slippery sticks and going skiing.

- **Fairness:** When a risk impacts any group—firemen, the elderly or redheaded people—disproportionately, outrage boosts the perceived risk.

- **Process:** How a government agency handles a risk situation is more important, nearly, than what it does. Does the agency appear trustworthy and concerned or arrogant and dishonest? Is the community informed on the problem from the begin-

ning? Do others listen and respond to them?

- **Familiarity:** Odd-sounding substances, new technologies and unfamiliar risks, including chemicals and bacteria, have historically caused more outrage than familiar risks, like the home, car, and high-fat diet items like peanut butter.

- **Memorability:** Love Canal, Chernobyl. High-impact names make a risk easier to imagine and thus more risky. A potent symbol—the 55-gallon drum of toxic waste—does the same thing.

- **Diffusion in time and space:** Hazard A kills 50 anonymous people a year nationwide. Hazard B has one chance in 10 of wiping out 5,000 people in the immediate vicinity in the next 10 years. Mathematically, both scenarios produce the same annual mortality: 50. Outrage assessment ranks A as acceptable risk; B, not.

Adapted from the *EPA Journal* 13 (9): 21-22, 1987.

F S I S

INSPECTION STORY

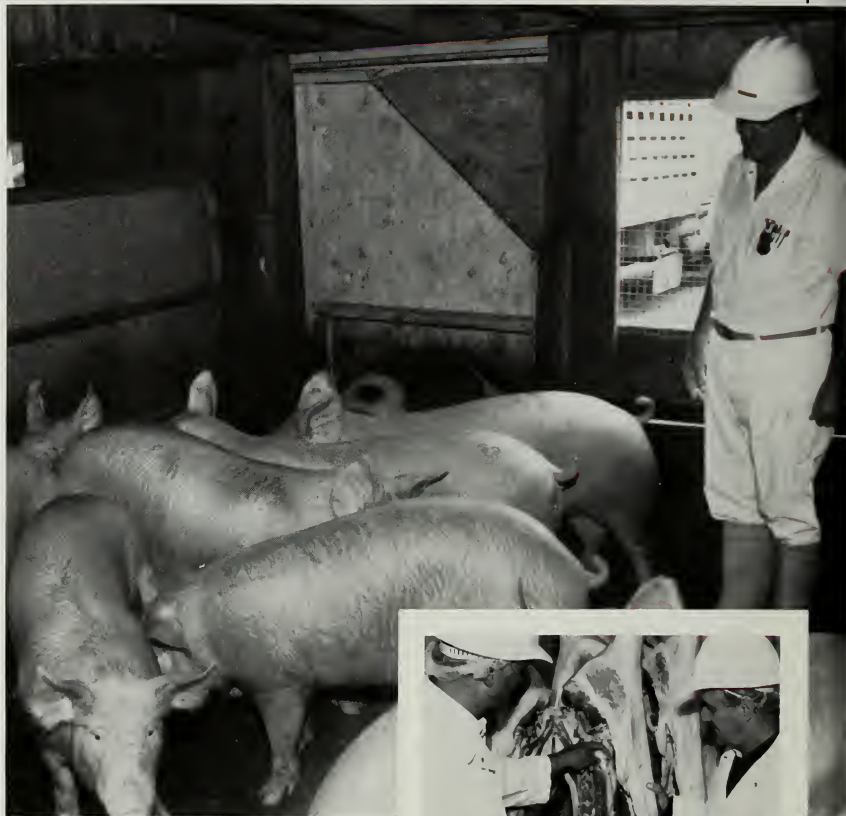
by Irene Goins

When consumers see the inspection stamp on sausage and other meat and poultry products, they may know these products have been inspected by USDA's Food Safety and Inspection Service. But they may not know what is behind the inspection stamp. That is, they may not know the efforts FSIS makes to ensure the products are worthy of the stamp.

Each year, FSIS inspectors examine more than 5 billion chickens and turkeys, and 120 million hogs, cows and other livestock. This inspection makes the meat and poultry supply in this country among the safest in the world.

This photo feature takes you on-the-job with our inspectors to see step-by-step what they do to make sure safe, wholesome and accurately labeled products reach consumers.

U.S.
INSPECTED
AND PASSED BY
DEPARTMENT OF
AGRICULTURE
EST. 38



1 The first step to producing safe products is starting with healthy animals. At the plant, inspectors examine live animals for disease and other conditions, ensuring that only healthy animals are used for food.

2 After slaughter, inspectors examine every carcass and organ. If there is any indication of disease or other abnormalities that would result in unwholesome product, the carcass or organ is condemned. FSIS veterinarians make final decisions on whether a carcass should be condemned. Veterinarians know what conditions would make food animals unfit for consumption.



3 Carcasses that pass inspection are stamped with the federal mark of inspection.



4 Inspection includes checking for drug and chemical residues in animal tissues. Residues can result from the improper use of pesticides and animal drugs as well as industrial and environmental accidents. In some cases, quick tests are used in the plant to check for residues. This veterinarian is using the Sulfa-On-Site quick test to check the animal's urine for a sulfa drug. It can detect the drug within 45 minutes.



5 Some meat and poultry that pass inspection are further processed into sausages, canned soups and other foods. These processed products must also be inspected, but the inspection is different from slaughter inspection. Because large numbers of products are produced at one time, it is impossible for inspectors to examine each item. Instead they monitor the plant's processing procedures. Thus, FSIS checks the percentage of ingredients used in the products, cooking times and temperatures and other data to ensure the product will be safe to eat.

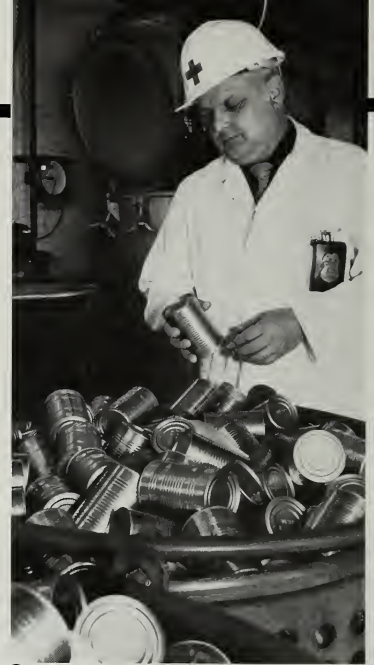


6 Canned chili and soups are often made in high-tech processing operations. Equipment like this retort or pressure cooker is used to cook products to high temperatures, destroying any foodborne pathogens that may be present. Botulism is a major concern because botulinum bacteria form spores that only high temperatures kill. In addition to making sure products are cooked at proper temperatures, food technologists check a number of other safety factors....



7like the temperature of meat ingredients, which should be stored at cold temperatures that control bacterial growth.

8 ...the facility and equipment to make sure they are clean before production begins,



9 ...and the seams in the cans to see that they seal properly. Flaws may cause the contents to spoil.



10 As an additional test, a sample can from each batch of product produced is placed in an incubator for about 10 days. Then the cans are checked for swells or leaks before finished products can be released for sale. Any "bad" cans are analyzed by laboratory tests to help determine what went wrong in production. If there are no swells or leaks, the net weight of the product is checked. The content in the can must reflect the net weight shown on the label.



11 In addition to the net weight, the labels on all products produced under federal inspection are checked before products can be released for sale.



12 Inspection does not stop when the product leaves the plant. FSIS compliance officers ensure that products in various stages of distribution remain safe and wholesome. They check products in storage, on the supermarket shelves and in other areas in commerce.

WHEN USDA ISSUES A



by Laura Fox

Scene: On the TV news the reporter is saying, "The U.S. Department of Agriculture today announced a voluntary recall of XYZ pasta and meat balls in 8 ounce cans . . ."

That's a product recall. On average, USDA now issues 10 to 20 recalls each year.

As Patrick Clerkin, on USDA's compliance staff, explains, "With the volume of food coming out of plants today, a few production line problems are probably inevitable."

So how does the recall system work to protect public health?

Primarily, the recall machinery is always up and running. Emergency programs staff at headquarters, plant inspectors, lab personnel and compliance staff are always on call.

You'll see them at work in this mock recall based on actual cases.

Monday noon. An anxious caller explains to a home economist on FSIS's Meat and Poultry Hotline that she just opened a

can of XYZ pasta and meatballs for lunch and found metal fragments in the meat.

Finding that none of the product has been eaten and the caller is in no immediate danger, the hotline staffer takes the woman's name, address and phone number and gets the name of the company that produced the meatballs.

The staffer refers the complaint to Bessie Berry, hotline complaint coordinator. Berry decides which program within FSIS should follow up.

Were the caller ill, the FSIS Meatborne Hazard Analysis Control Center in Beltsville, Md., would investigate the product.

Since there is no illness, Berry refers the call to Wayne Bossler in the FSIS compliance program.

Compliance staff handle problems beyond the in-plant inspection conducted by FSIS inspectors. They monitor meat and poultry products through the retail distribution chain.

"Each consumer complaint is evaluated from a health-risk viewpoint," says Bossler. "Cases where illness or injury has resulted from eating a meat or poultry product get top priority."

Since the consumer lives in Minneapolis, Bossler refers the complaint to Don Burrigh, a supervisory compliance officer in South St. Paul, Minn. Burrigh is one of 130 FSIS compliance officers.

Burrigh, a compliance officer for 17 years, likens his work to that of an investigator. "I put the pieces of the puzzle together to figure out what happened," he says.

Within hours, Burrigh calls the consumer and arranges to go to her home that afternoon to view the problem product.

At her home, Burrigh confirms the presence of metal pieces in the pasta and meatballs. He gets permission to send the product in for lab analysis. Then he stops by the grocery where she bought the can and buys several cans with the same lot* number to send to the lab as well. (A lot* or batch number is given to the group of products produced on a certain shift on a particular day.)

The opened sample is frozen, then packed for mailing. A fluorescent orange tape seal is fixed on the package to give proof later that no tampering occurred in mailing. All samples are sent to the FSIS laboratory in St. Louis, which specializes in analysis of extraneous materials—things not supposed to be in food products.

Tuesday morning. The samples arrive at the lab. Since they may eventually be used in legal action, it is essential that they be logged in and examined to verify

that the contents were not altered in mailing. The fluorescent orange tape seal is scanned to make sure there was no tampering.

Once the samples are entered on the computer, microbiologist James Eye starts to work.

The unopened cans are x-rayed to verify the presence of metal pieces. As Eye explains, "The goal is to identify the type of metal found and to determine where in the plant it originated. We need to get to the source to prevent further occurrences."

In addition to the x-ray, an enzymatic digestion test of the product will verify that the objects observed during the x-ray were, in fact, metal pieces. The process breaks down the meatball but leaves the metal pieces intact. The metal pieces can then be analyzed to help in determining their origin.

Tuesday afternoon. The results of the tests confirm sharp metal pieces, one-half inch in length from both the consumer sample and those retrieved from the grocery store.

James Eye telexes his findings to FSIS's microbiology division in Washington, D.C., where they are reviewed by deputy director Jerry Carosella.

Wednesday morning. Carosella calls Dr. Earl Montgomery, head of FSIS's emergency programs, on the lab confirmation of metal pieces in the product.

Montgomery's staff makes the decision on when recalls are necessary. He now assembles a team of experts from within FSIS to evaluate whether to request that the manufacturer begin a voluntary recall. While FSIS can't order a product recalled, it can seek a detention or seizure action to remove hazardous product from the marketplace.

Once assembled, the team debates the case. Is a recall necessary? There is no report of injury from consumption of the product, but the potential exists for an injury to occur, given the size and sharpness of the metal pieces

and the thousands of cans involved in the production run.

After an intense discussion, a consensus is reached—recommend to the administrator of FSIS that a recall be requested.

But FSIS's protective functions don't end there. Now the agency must try to trace how the metal pieces got into the product.

An inspector at the plant works through their records to pinpoint when the accident occurred. Based on the size of the metal fragments and the fact they were found in the meatballs, the inspector thinks metal bands from boxes of beef may have slipped off as the meat was put through the grinder.

Wednesday afternoon. Montgomery meets with Dr. Lester Crawford, head of FSIS, who concurs that a recall is necessary.

The next step is to notify the company. "No company has ever refused our request to recall a product," Montgomery says.

The company provides product distribution records and appoints a recall coordinator who works with the compliance staff in Washington to ensure that warehouses, wholesalers and retailers are notified of the recall.

Thursday morning. USDA issues a press release advising consumers to return the pasta and meatball product from the suspect lot to the store where they bought it.

Since the product was distributed nationwide, compliance officers across the country will monitor grocery store shelves and other distribution points to assure that all product is removed and destroyed.

"Obviously, not all recall situations are wrapped up as easily or quickly as this mock exercise," says Montgomery. "But FSIS does have the people and the labs in place to handle emergencies when they arise."



The Opening of the Houston Center Heralds A New Day in Inspection Training



Donald L. Houston, D.V.M.
1934-1988

"Always, he stressed the need to equip employees with the managerial and technical expertise necessary to meet the demands of the future. His contributions strengthened public health protection in the United States and serve as a model for all employees of the inspection service."

From the dedication on the Memorial Plaque to Donald L. Houston, administrator of USDA's Food Safety and Inspection Service, 1979-1987

On the rolling plains of the Texas A&M campus in College Station, sits a modern brick complex that represents a dream come true. Today the Food Safety and Inspection Service boasts a "thoroughly modern" training center for its meat and poultry inspection staff where the latest scientific training is available on a continuous basis.

Three men dreamed the dream that gave rise to the Donald L. Houston Center for Meat and Poultry Inspection Sciences that opened April 1989. Dr. Houston envisioned the need for such a center. The late Dr. Moses Simmons, director of program training until his retirement in 1984, shared that educational hope. And the late Dr. Warren Babcock, director of program training until his death in 1988, also eagerly looked forward to this day.

Now, says proud director Dr. Rex Maddox, "We can offer the inspection force the latest training in biotechnology, hazard analysis and risk assessment, microbiology, food chemistry, toxicology, statistics and computer sciences."

Jo Ann R. Smith, USDA's Assistant Secretary for Marketing and Inspection Services, says, "You might say this placement of the FSIS training center on the A&M campus offers the ideal marriage of academic resources with the great wealth of work experience our inspection team brings to class. We see the Houston Center embodying the forward-focused, scientifically rigorous direction the entire Food Safety and Inspection Service is taking."



