



California Poultry Letter

March 1996

What's New in Poultry Meat Quality Assurance and Food Safety

The **12th** European Symposium on the Quality of Poultry Meat was held in **Zaragoza**, Spain, together with the Egg and Egg Product Symposium. The poultry meat symposium focused on the following subjects:

1. Influence of production factors on broiler carcasses and meat quality.
2. Meat quality of other domesticated birds.
3. The influence of processing methods.
4. Functional properties of poultry meats.
5. Improving shelf life and nutritive value.
6. Quality assessment techniques.
7. Quality assurance systems for poultry meats.

The following are but a few papers reviewed **from** this exceptionally interesting conference.

The Identification of Critical Control Points in Broiler Production by the Use of Epidemiological Markers (Brown, et al. Denmark).

Salmonella is brought into the processing plant **from** the **farm** by the birds. **Cross-contamination** points within the plant during processing can be identified through

the isolation and identification of the bacteria by serotyping and **plasmid** profiling. Critical control points were identified so that action could be taken to reduce or stop the microbial **cross-contamination**. The work was conducted on *S. enteritis* in a large broiler processing plant.

The Microbial Contamination of Turkey and Turkey Meat with Salmonella and Campylobacter (Hafez, et al. Germany).

Weekly fecal samples were collected from German turkey flocks during 1 to 21 weeks of age (slaughter time) and through processing. Thirty-three percent of all flocks tested were negative for Salmonella at all times, 30% were infected with one serotype only, and the rest had two or more **serotypes**. All flocks were found to be positive for Campylobacter, 30% were infected with one serotype, the rest had two or more.

The most important source of Salmonella infection in turkeys appeared to be vertical transmission through infected eggs laid by an infected breeder. Some infections occurred through true ovarian transmission,

but most infections were carried out through fecal contamination of the egg's shell with penetration into the egg. Lateral spread to healthy poult took place through shipping boxes, contaminated feed, water, equipment and through the environment.

Routes of infection for *Campylobacter* are not fully known, but the organism had been found in the intestines of slaughtered birds. No vertical or horizontal contamination of *Campylobacter* were found, instead the transmission came **from** the environment.

In processing plants, *Salmonella* was found in every flock, including the previously clean birds. Feces, scalding, evisceration and cut-up areas contributed to increased bacterial counts. Chilling areas did not. *Campylobacter* was found in feces, evisceration and cut-up areas and highly increased skin and liver contamination was observed where monitored. The scalding area had little effect on counts.

Improving Microbial Quality of Poultry Carcasses (Klinger, et al. Israel).

Poultry meat is considered to be one of the most microbiologically contaminated foods. Raw poultry meat can also cause secondary contamination **by** spreading microorganisms to food preparation areas and contaminating other food prepared on the premises. *Salmonella* is the most important microorganism in causing foodborne disease outbreaks associated with poultry. **In** infected birds with high levels of *Salmonella*, high levels of spoilage bacteria were also found, which reduced the shelf life of unrefrigerated meat to a few days only. Therefore, the total microbial load of bacteria needs **to** be reduced (both spoilage and pathogenic bacteria). In addition to contact with the traditional sanitizer, chlorine (40 to 50

ppm), ozone, organic acids and polyphosphates are also effective for decontamination. However, the most effective means of reduction of pathogens from poultry carcasses is found to be irradiation, which is also easy to apply and economically feasible (increasing the production cost by only **1-2%**).

Surface Pasteurization of Raw Poultry Meat by Steam (Morgan, et al. U.S.A.)

A device was built for the pasteurization of poultry meat surfaces without producing a cooked appearance. The process used thermo-saturated steam at **284°F**, which was applied to the meat under a vacuum for 50 milliseconds. Evaporating the steam's condensate from the meat surface, the meat cooled rapidly and was then sterile-packaged. Steam treatment has advantages over liquids because of better penetration throughout the entire body cavity of the bird, due to the elimination of surface tension problems. However, steam works best under a vacuum, otherwise, air is pushed against the meat surface, creating an isolation layer where steam cannot flow. During the process, the meat is inserted into a rotateable chamber, which is then subjected to evacuation, steam treatment, flushing, closing under a vacuum and then releasing of the finished product. The process time enables the unit to operate at processing-line speed. This process reduced the bacterial count of inoculated meat from about 10 million to 1,000 cells.

Effect of High Hydrostatic Pressure Treatment on Bacterial Count Reduction in Mechanically Deboned Meat (Yuste, et al. Spain).

Mechanically de-boned poultry meat (**MDPM**) was exposed to high-pressures of

up to 67,000 psi and temperatures ranging from 68°F to -4°F for the duration of 5 to 30 minutes. MDPM is a highly perishable product that contains an initial microbial load of on the average about 50 million bacteria per gram. Cold-loving bacteria were found to be more sensitive to high pressures than moderate temperature bacteria and their count was reduced to less than one thousand when treatment was conducted for 15-30 minutes.

Gideon Zeidler, D.Sc/MBA
University of California
Riverside Campus
Phone (909) 787-5038
FAX (909) 787-5091

**University of California Cooperative
Extension Publishes New Computer
Software Directory for Poultry
Applications**

FEBRUARY 16, 1996: The second edition of "Computer Software Directory for Poultry" has just been published by the University of California Poultry Extension office in Riverside. Don Bell, Extension Poultry Specialist has assembled a list of 90 programs from 16 different sources which have been written to perform a wide variety of tasks for the poultry industry. These include: flock records for layer, replacement pullet, broiler and breeder flocks; feed formulation programs; egg and feed inventory controls; egg processing plant records; replacement programs and flock projection analyses; payroll; flock modeling; and various financial analysis programs.

Bell says "The computerization of the poultry industry has extended to almost every producer and allied company during

the past several years. Even though some companies have been actively engaged in applying computer technology for more than 20 years, during this last few years we've experienced a dramatic increase in its acceptance and the variety of applications. Not only do we see computers in practically every office, but market news for egg and feed price information is now being transmitted instantaneously as it occurs, poultry house temperatures are being monitored at long distances, and alternative courses of action for the producer, processor and supplier are being analyzed with the assistance of sophisticated software programs."

Single copies of the directory may be purchased for \$10. Please make checks payable to: **THE REGENTS OF THE UNIVERSITY OF CALIFORNIA** and send to:

Mr. Donald Bell, Poultry Specialist
Cooperative Extension
Highlander Hall
University of California
Riverside, CA 92521

**Douglas R. Kuney, March Editor
Area Poultry Farm Advisor
Southern California Region
Riverside**

**Ralph A. Ernst, Technical Editor
Extension Poultry Specialist
UC Davis**