

# **Meat Inspection Food Service/Retail**

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The observations I cover here span about 20 years. It is clear that there are a number of factors which can improve the safety of our food supply and the government definitely has a role to play in these. We are addressing the question of how can we improve the safety of our food supply, not what kind of a stamp appears on the package but instead how are we going to improve upon the safety of food presented to consumers.

To begin with, I refer back 30 years to the time of my entry into the food safety arena in the meat world. Table 1 shows a historical perspective of 30 years of meat plant microbial control capabilities. What was the microbiological plant level control capability and what was even available 30 years ago? What did we know about microbes, what did we know about sanitation and what did we know about simply doing a better job? In 1970, it was actually pretty minimal. We had some good ideas, but our knowledge and abilities weren't as good as today. You heard about some great new technologies at this conference that were non-existent in 1970. By 1980, we understood a lot more about microbes and what their role was in plants and I think there was a heightened awareness of microbes in food, though it was still not great. By 1990 this level of awareness was high and the industry had some really good technologies available, even though they were not widely used. By the year 2000, I would expect some of the technology you have heard about at this conference, will be common practice.

Addressing plant level microbiological performance, I am going to divide performance into thirds, a top third, middle third, and a lower third. I will use this classification to show how companies perform in terms of microbial quality of their products. The reference points could be APC's, coliforms, and/or generic *E. coli*. Some plants do a good job controlling microbes, some are in the middle, and some are not doing such a good job. This is true now, was true in 1970 and will probably still be true in the future. In 1970,

the top third were performing about equal to those who by today's standards would rate medium. By 1980, this top third was doing a good job and by 1990, a very good job. I will share some numbers with you which I think you will find surprising in raw ground beef. By 1990, the middle third were doing pretty good in improving their micro performance with this being driven by requests and customer specifications. The lower third were simply continuing to produce product. Where will we be in the year 2000? And how do we get better are really the key questions. The top third will continue to aggressively use the new technologies and techniques you have heard about. The middle third will continue to improve and will see compelling reasons to do so. The lower third seems to be a tough group to motivate and the question is what will be their performance level and how should this group be regulated, since our greatest food safety risk lies with the products produced by this group.

What will drive improvement? What will make things better? These are listed in table 2. Will that be new regulations? Recently California raised the speed limit to 70 which means it is now less illegal to drive 90 than it was before the change in regulations. This illustrates that new regulations will not improve things by themselves. New technology can work well, but only if installed and operated properly. Technology by itself will not drive improvement, instead, the desire to make things better drives improvement. It also causes new technology to be developed, installed and used correctly. The media has certainly done a good job of informing and in most instances scaring consumers about food safety today. The media definitely plays a role in shaping and in forming public opinion. Ten years ago, if people had been presented with a list of today's top 10 pathogens, *Salmonella*, *Listeria*, *E. coli*, etc., they would have believed it to be a listing of a foreign Olympic hockey team. Today people recognize those bacteria and in many cases they can tell you the kind of illness' each causes and many people will say "I had a friend that had that". The fact is consumers are more informed. Recent data indicates that foodborne illnesses caused by *E. coli* O157:H7 have decreased.

What is most likely to drive improvements? Typically incentives will drive improvement faster than will regulations. What are incentives? They are reasons which cause people to want to get better. They provide either an intrinsic

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**TABLE 1. Historical Perspective - 30 Years.**

	1970	1980	1990	2000
Microbiological Plant Level Control Capability	Low	Medium	High	High +
<b>Plant Level Performance</b>				
Top 1/3	Medium	High	High	High +
Middle 1/3	Low	Low	Medium	?
Lower 1/3	Low	Low	Low	Low ?

reason for them to improve and a desire to do it themselves, or an extrinsic reason which means that an external force causes them to improve. In either case, incentives work and have been proven to work over time. What type of incentives are possible? Currently, there is a lot of discussion about standards and new HACCP Regs. I have been involved in the national micro committee and we have had numerous discussions about micro standards in foods over time. Table 3 shows composite micro results representing operations that produce about 50 million lb. of hamburger a year. This is not a pilot plant, this represents multiple plants and multiple suppliers of ground hamburger. Their APC's are less than 15,000 per gram, coliforms less than 30, *E. coli* (generic) less than 5, *Salmonella* positives, a fraction of 1 percent and Listeria M. is generally trending under 1 percent. These numbers demonstrate what is possible in a commercial ground beef production operation. The numbers of the fresh chicken producer shown in table 3 represents a production of about 5 million broilers a week. This producer has APC's averaging less than 100 cells per square inch on whole carcass washes, *Salmonella* prevalence under 5 percent and when recovered cells are enumerated they show 1 to 5 cells per bird. Again, this represents a commercial operation. The cost of the total micro program to the ground beef producer, including considerable O157:H7 testing is approximately 7/10 of a cent per pound.

New technologies that help are carcass washes, rinses and steam vacuums and steam pasteurization which you have heard about. Bactericidal treatments and conceivably competitive exclusion will become a thing that is talked about in poultry. New physical removal techniques and carcass mapping which identifies the locations of contamination helps control things. New rapid microbial tests are available and are allowing real time control procedures where in the past we used to have to look today, and know the results two days later. Now, you can sample in the morning and take action in the afternoon. In all probability, it will evolve that we will be able to sample and take action within the hour to control microbial contamination. Lastly, there is a huge debate over cold pasteurization, regardless if it is a directed energy type system or whether it is from a radioactive source. Five years ago I would have stated that I did not think irradiated foods would be a practical reality by the year 2000. Today, I will state that I wouldn't be surprised if some commercially available retail irradiated food will be on the shelf in the year 2000.

**TABLE 2. What Is Likely To Drive Improvement?**

- New Regulations
- New Technology
- Media
- Incentives

What are the benefits of companies improving the microbial quality of their products. First, one we all recognize is improved shelf life. In addition, improved microbial quality should reduce product spoilage, quality related claims and other cost of quality issues. Secondly, there can also be brand awareness and consumer confidence developed on product quality freshness issues. In some cases, this has already occurred. Some examples include Foster Farms which is well recognized on the west coast as being a leader in product quality. Perdue on the east coast, Sheltons, Coleman Natural Meats, and Harris Ranch are all examples of branded programs. Many consumers choose these brands because they recognize them as being leaders in product quality and they purchase them with confidence. This is the type of brand awareness and brand confidence that everyone is trying to create. Lastly, the government, whether federal, state or local, is a partner in producing safe food. Private industry and government as partners have a mandate to produce safe food, whether it is the health department or whether it is the federal regulatory agency. The governments role in this partnership is to keep track of what companies are doing and to set standards, but it is the companies ultimate responsibility to produce safe foods for consumers.

What are the end user benefits of microbial improvement of the system? *E. coli* O157:H7 presented the meat industry with a new challenge. Prior to 1993, a few *Salmonella* floated around and the likelihood of the low exposure causing illness seemed to be relatively low. However, O157:H7 seems to infect at very low doses which means that cross contamination control is also critical. Illnesses have been identified where just a few cells (5 to 20 total cells of O157:H7) have caused sickness and deaths in children. Thus, cross contamination and reduction of cross contamination potential is critical. As cross contamination and cross contamination potential is reduced, food safety in the home, in the restaurant, and in all places where food is consumed is improved and fewer illnesses will result. This should also result in a reduction of the total scope and level of pathogens to which people are exposed and as postulated by the CDC there should be a resulting improvement in consumer safety.

Currently, what can consumers use to identify product produced under superior micro control programs? First, they can use their God given senses of sight, smell and touch, to evaluate raw products. Second, they can rely on branded identity. Lastly, for food service and retail companies, they

**TABLE 3. Setting the Stage - What's Possible Today?**

	SPC	Coliforms	E. coli	Salmonella	Listeria
Hamburger	<15,000/g	<30/g	<5/g	0.1%	<1%
Fresh Chicken	<100/sq in			<5% with 1 to 5 cells/bird	

can institute a micro surveillance program which allows the testing of vendors and the subsequent selection of those that have better microbial performance. Today however, none of us are any more qualified than 3 or 4 children picked at random off the school ground to stand in front of the meat counter and identify ground beef produced under superior microbial conditions. There are no indicators other than sight, smell and touch that can help us identify microbially better products.

Are there ways that packaging labels or identifiers could be used to identify products? This, in reality, amounts to grading of facilities and processes according to product microbial quality. Grading occurs in many areas today. If you pick up an electrical appliance most will have an Underwriters Laboratory seal of approval. There are restaurant rating systems where even the smallest communities have either scores or grades. In many communities, the grades are even published in the paper. In California, the restaurant rating is actually placed in the window. Those with the best ratings get an A placed in their windows, changing the name of a restaurant from Mr. A to Mr. B's is a very bad sign. The purpose of these rating systems and grades is to provide an incentive. No one wants to be a B restaurant because people can and will make a choice when properly informed and grades or ratings help them to do that.

Let's suppose microbial grading of meat producers were to be made a reality today. What criteria could be used? One could be an evaluation of each companies food safety system, for example, whether they have a HACCP or process control system in place and how well is it working. Additional criteria might include identifying what technologies are being used in the facility and if multiple microbial preventative strategies are in place, product grades are higher. Microbial performance using the key indicators of APC, coliforms or generic *E. coli* and the plants performance in

relation to the industry average should be a major determinant of microbial grades. What might be the benefits of product microbial grading programs? One benefit would be that consumers could make a more informed choice on the microbial quality of ground beef. Realistically, a large retail grocery chain, or food service company isn't going to buy B or C quality grade products. In all probability, most consumers also would avoid B or C quality products. Companies with superior products will be recognized for their efforts and those who aren't good performers also would likely be recognized for their efforts. The free market would provide a powerful incentive to improve. Most B restaurants do not stay in business. Adopting such a grading system poses considerable challenges and controversies which include:

1. Establishing the grading criteria. These criteria would include micro standards as well as the in plant food safety systems used to produce the product.
2. Developing a monitoring system. The system could be a partnership system involving the industry and an independent auditing agency that would verify system integrity.
3. Assessment mechanism. This potentially could be done by government but it could also be done by private accredited laboratories.

Not surprisingly, good performers support this type of microbiological grading system today while marginal performers do not.

## Summary

Level of performance under the type of microbial grading system proposed does not relate to size of plant. Good does not equal large nor does bad equal small. Performance level under this type system relates to how plants are managed. In looking at performance today, the top third of ground beef producers are doing an excellent job, the middle third doing reasonably well, with the bottom third needing to improve. All are currently inspected under the same laws and regulations and all have access to the same technology and yet large differences in performance exist. A grading program like that proposed here with some help from the government could allow the free market to drive an overall improvement in microbial product quality and eventually an improvement in the safety of the products available to the consumer.