

product to deal with. It can be argued that developments in technology are likely to make classification progressively more difficult and also less relevant. For example, as more and more cutting, boning and trimming takes place at the meat plant in conjunction with a degree of automation and the computerization of records, then it should become possible to advise producers of the actual yields of saleable meat from the carcasses they supply, rather than estimates, and to

pay accordingly. However, down-stream moves towards more cut and boxed meat, possibly in some cases following hot-boning, create a greater need for the purchaser to have an accurate idea of the type of carcass from which the cuts come.

All this adds up in our view to a data capture, transfer and analysis problem for the years ahead, rather than carrying us into fundamentally new areas of carcass evaluation.

## Discussion

*John Forrest:* One area you mentioned that hits us pretty hard when we think of our system was the question of whether or not the assessment of quality is really valid, whether it is something we put too much emphasis on. Therefore, it is something we need to explore just a little bit more fully. If we are going to look at where our grading system ought to be, that is a question we are going to have to face directly and answer, and then move ahead. Do we think this is very important and the consumer does not?

I am reminded that we have been merchandising pork in this country for quite some time without a quality grade other than "acceptable" or "unacceptable," really without even any grading in the first place. At one time, I used to think that beef had a major advantage over pork simply because it had a grade. Today I am not so sure if it is still doing as good of a job or whether it has become a rock around our neck at times. It depends on your point of view, what you are trying to merchandise and how you are trying to merchandise it. It is something that we have to grapple with and think about.

You question the validity of quality values, then come back and say that maybe one of the things we need to do is add fat as they are doing in the poultry industry with turkeys. Yet we have animals that have marbling naturally, so aren't we still concerned about fat that we need for juiciness?

*Dave Sim:* I think that is a valid point. The point I was trying to make was this. Do we worry about measuring quality or add it and control it? I think we should put our effort into doing what we can with carcasses or meat in terms of controlling it. Maybe you can still produce the fat inside the animal at least cost. But maybe the simplest and best way would be to produce a very youthful, fast-growing animal that would have relatively tender meat with no fat in it. Then we could do everything with the carcass subsequently to control cold shortening. We handle it with tender loving care, and add what fat is necessary in controlled amounts to give us the juiciness and palatability we are looking for.

The other thing in terms of your comments that I think has been a disservice to the industry, and I think it applies equally to the U.S. and Canada, is that the grading systems and people using them have tended to promote this concept of superiority. I think that is a disservice. It creates a niche for one grade; then no one wants the rest so we can not find a way to market it. It creates sort of an aura which may not be valid. This is the epitome of eating quality — an organoleptic orgasm, if you will — something that we just can't do without. As a result, your grading system becomes inflexible. It should be left to the merchandisers and the marketers to create that aura; let the grading system sort things out. I think that we should be striving to try and control quality as opposed to

assessing and differentiating it. And I am not convinced there is that wide a range of quality differences manifested by differences in production systems that are beyond our control, say at post-mortem or by pre-slaughter handling. Obviously, we are going to have to assess those that are or, preferably, measure them. But let's differentiate between which ones we need to measure and which ones we can control; then get on with the job of controlling those we can and develop measuring systems for the ones we can't.

*Forrest:* Are you suggesting that the post-mortem route for quality control in terms of different systems, such as controlled chilling rate or electrical stimulation, as methods of reducing quality variation is the right way to go?

*Sim:* Right. Let's take PSE for an example. I don't know how many of you have been to Denmark. Regardless of how far the farm is away from the packing plant, they truck their hogs for an hour. They found that this pre-slaughter handling process helps them control PSE. They figure it is cheaper than changing their genetics completely. We probably need to do some more things in these areas.

*Forrest:* I would like to hear from those who are working in this area. Are we to a point where we are ready to forget about quality in our grading systems? I am not ready to give up myself.

*Harold Dupuy:* What impact does health and the emphasis on leanness have on our grading system?

*Sim:* I can't speak for the U.S. because I think there are people here more cognizant of the situation in the U.S. than me. In Canada, it is a pretty fundamental part of our thinking as we move into the future. For example, our consumers are exposed to American information constantly. Most of our magazines for homemakers are American publications. Most of them talk about marbling. This year we threw marbling out of the grading system and everyone seems to like meat with a lot of lean. We sure haven't heard any responses. Nobody is complaining. Our standard trim specification at retail probably is less than 0.2 inch now, and I gather that is a lot less than the American specification. For example, we could not sell in Canada some of the product that shows up in your retail cases because it would have too much marbling in it. People see it as being fat. Whether that is going to happen in the U.S. or not, I don't know.

*Forrest:* Fatness is actually a perception, because the actual amount of fat probably isn't much greater in some of the well-marbled beef as compared to the lower-marbled beef.

*Sim:* I agree, but perception equals reality. Regardless of how rational you are with consumers, what they perceive as being fat becomes fat in their minds. Even if we could

convince them that abundantly marbled beef only had two or three percent more fat in the lean than slightly marbled beef at maximum, what they see is what they react to, and they will react to that fat.

*Dell Allen:* You say you effectively threw marbling out this last year. You effectively threw it out in the early 70's.

*Sim:* I agree. It is just not on the books any more.

*Allen:* What has beef consumption in Canada, with the trend toward lean, done? Has it gone up? Down?

*Sim:* It has gone down, mirroring pretty much what has happened here in the U.S. Is there a correlation between leanness and decreased consumption? No because, like you in 1976-77, we had a glut of beef. We ate it all. We hit our maximum consumption in 1978 at about 110 pounds, and since then it has gone to the low 80's. It went up after we changed the grading system to a leaner product and it has come down without very many changes in the grading system since then. So you can't draw any conclusions from that. I believe it is due to a whole bunch of other factors – socioeconomic, etc., – as opposed to the fact that the standards were changed. If you looked from 1972-76, you would say the people loved this product. Then you look at 1978-84 and it has gone down, but the grading system did not change. I think there is a lot more going into those kind of consumption trends than just grading systems. Grading systems tend to get blamed – they never get the accolades. I don't think relating consumption trends to changes in the grading system tells you a thing, unless you have a lot more data.

*Allen:* I agree with that. It is always in times like we are going through now that people want to change the grading system to solve their problems.

*Sim:* If you talk about marketing problems and you accept my definition of the objective of a grading system, marketing is something that occurs beyond grading. I don't know about your retailers here, but in Canada our retailers are not doing much of a job with red meats, and beef in particular. I think our merchandisers have got an awful lot to learn from other commodities. I know of no commodity that has so little data on the psychology of its buying public as meat and its industry. No other industry would even think of trying to merchandise product without trying to understand its consumers.

*Paul Berg:* Looking at the U.S. grading system, if we look back all the way to 1968 to some Iowa State data, to some later data out of Texas A&M and to some things we have done recently, marbling does a pretty good job of categorizing beef nutritionally. It is almost a linear relationship – as marbling goes up, protein decreases; fat increases; and if grading serves a function, that may be one.

*Sim:* I think that is true as long as you have a high degree of consistency and uniformity in the assessment of the characteristic. I don't know about U.S. graders but we could never train ours to do it consistently.

*J.W. Carpenter:* You showed some very impressive slides, but you did not quite have the cause-and-effect relationship that I would like to see brought out. If we believe the slide that you have up there and that the trend will remain the same for the next 20 or 30 years, it appears that we are going to grind up everything, with a tremendous increase in the amount of ground beef and a decrease in roasts. Something I think we should pull out of here, is this: The main reason that we are

eating less roasts and more ground beef is because people like it and actually desire it. Or what is the effect of all these people eating out in fast-food restaurants? How many people eating in a fast-food restaurant will order a pot roast to eat? What is the percentage in the home itself rather than the overall picture? We know the fast-food market is really holding its own or is even going up.

*Sim:* The data is in-home consumption. You made a good point, in that I am drawing some conclusions. I use that data mainly to make you think. The conclusions that I would draw from it, more than relation to grading, would perhaps be a convenience factor. I am still single. I am getting awfully tired of going to supermarkets and not being able to buy single-service portions. They are just not catering to me. They are still hung up on the nuclear family, with four in the family. Some place along the line, our meat merchandisers are going to have to realize that about 30% of the population are living by themselves. I can buy a lot of other items besides meats that are prepared for me in a convenient quick form, but not meat.

*Curtis Melton:* I tend to think that what you said about the consumer wanting leaner product today is probably true. But I think that is based on some false assumptions that they have about highly marbled meat having more total fat in it after it is cooked and also, particularly, cholesterol. One of the big misconceptions in the medical industry today, and amongst consumers, is that Prime and Choice beef have more cholesterol. There was a paper just given at the IFT where they looked at ground beef that had 9.7% fat up to about 30% fat. Of course, in the raw state it had more fat and more cholesterol; but when it was cooked, the difference was wiped out. That has been proven in a lot of studies, including one that I think Dutson did at Texas A&M. So what we need to do, rather than changing the grading system and messing up all the high-quality meat in the nation (and we are about the only ones who still have any left), is to inform the public that Choice meat is not necessarily more harmful than say Standard grade meat. I would suggest that we get busy and get a good educational program started, rather than dropping the grading system that we have today.

*Sim:* I have one comment on that. My ideas and my perception of the world have changed a lot since I was a researcher. Now I work with the Minister of Agriculture. In the political realm, perception is all you deal with. Facts don't really matter because the people you are dealing with don't look at facts. We, as scientists, tend to look at facts and think that facts are going to carry the day for us. Gentlemen, they won't!

We can harp at the consumer all we want about the fact that abundantly marbled beef is only slightly fatter in a cooked form than small or slightly marbled beef. But the perception is still going to be that "it is fatter and I don't want it." If facts carry the day, every one of our advertisements and commercials on television would be factual. You don't see any facts in commercials, you see perceptions created.

*Michael May:* A point I would like to make is a little bit of building on what Dell Allen had to say. I don't say this in defense of the grading system, because I think people would feel that is what I would be saying anyway. But, somebody has to be blamed for everything, and our shoulders are probably as broad as anyone's. We will take our share of the

blame for why beef is not selling to the degree that most of us would like. But I think we have to understand that the question and the problem is a lot more complex than many of us would like to think that it is. We like to think that it is a simple one-two situation – it is not that! We have the medical factors that – right, wrong or indifferent – people are concerned about. We have personal preferences; a very, very big problem that I would like to elaborate on just a little further in a minute. We have some of the problems that people encounter in trying to find the kind of product that they want. We talk about what is in the supermarket. We talk about having graded product and lean product. If your supermarket offers you graded product and consistently lean product, you have a lot better supermarkets than we have in our part of the country. Ours offer you two choices – you have graded and ungraded – and most of you know what you can find in the ungraded. I will find just as many Choice, Yield Grade 4's as I will Goods or Standards. If you know what you are looking for, you can find it. But the opportunity for a choice between the two items is not generally there, as a lot of people think it is.

The other side, personal preferences; fast food has been referred to. We have a situation that we are almost all into; all of us with little ones make our regular trips to McDonald's, Wendy's, etc. I took a little trip with 8 and 9-year old soccer team members recently to McDonald's for an after-the-season party, and said "You can have hamburgers, french fries, cheeseburger, drink – whatever you want." The first little guy said "I want a cheeseburger." The second said "I don't like hamburgers, I want chicken McNuggets." When we finished, 10 of the 12 wanted chicken McNuggets, rather than a cheeseburger or hamburger. The frustrating part to me was that two of the 10 were my own!

So I think we have something to learn from this: There is some advertising, there is some selling, there is some hype from some other sides that we haven't had from our side. And until we can do that, combined with the other problems we have, unfortunately, we may continue to see the decline in beef consumption that we see right now. We talk about the grading system; one says "Change it so we can meet some of these peoples' needs." I think if we had a nomenclature system for categorizing to uses or what Dave alluded to in his beginning, (I agree with his philosophy), that is what a system is for, for anyone to use that product however they see fit and how it best fits their needs. But, unfortunately, I don't think any of us have been ingenious enough to come up with a nomenclature system that does not have some name that is first-best, another name that is second-best, etc.

*Forrest:* Mike, you have uncovered a couple of areas that I have been concerned about. First of all, the nomenclature. In terms of the beef industry, Prime and Choice probably was one of the things that helped to sell beef for many, many years. Now some would feel that it is tending to work against the industry because of the change in times. The other is this: You say that when you have a choice, you either have graded or ungraded. Is there anything that you see that the grading system can do to stay out of the box of the nomenclature problem and still offer a choice without having this problem in the ungraded area, where you have such a wide variety that you really have no quality control? For those people who really want the lean meat, what are we going to do to get the product to them, if that is what they really want and are willing

to pay for?

I think that is why some of the merchandising systems that have been tried have not been as successful as they might have been, because of the tremendous variation in the no-roll beef that they have available. Is there something that the grading system can do to help that?

*May:* Personally, I think the system is in place. If a particular chain of supermarkets feels that there is a price advantage to them to sell a certain kind of product, that is the product they are going to sell. At this point in time, the price is right and the market is right so they can buy the product that falls out of the Choice grade – whether it be Yield Grade 3 or better or whether it be worse than Yield Grade 3 – they can merchandise it and make money on it; and that is what they want to do. If they like their store or housebrand name so well, obviously, it is very possible that they can go in and buy Good, Yield Grade 3 or better product and merchandise that as a lean product under the store name, not support the USDA label, and come up with the kind of lean product they are looking for. Right now, evidently, the money is not there for them to want to do that. The people are buying, in my personal opinion, no-roll product *not* because they like it better but because it is cheaper or they think it is cheaper. The supermarket is selling it because there is a better profit margin for them. In my opinion, it all comes down to dollars and cents. I think the product can be put out there under the structure of the existing system to give you that lean product. I am not convinced, even though we say we want it and our neighbors say they want it, that they are willing to pay for that lean product.

*Forrest:* Do you have any explanation for why the merchandisers continue to resist using the Good grade even though they could take that product and put their own brand on it and merchandise it that way? Why did they go no-roll? Is it simply just the economics of getting it cheaper than even if they bought it as Good?

*May:* Sure. That is my opinion. I guess I have a feeling that there is possibly a little bit of concern (and if there are any merchandisers here, they may want to speak up) that they may create a market for themselves that they would not necessarily like to create from the standpoint of supply and demand. If they get enough demand for a certain product, you are going to create a market for it. I think that it is advantageous to them, pricewise, to buy no-roll product and they are making a good profit on it, I shouldn't say "a good profit" because I don't know what they are making, but it is sufficient to them or they wouldn't still be merchandising the product. If they can make money, they are going to merchandise it. There is no way that you are going to get people to merchandise Good grade beef as Good grade product. They can buy it and merchandise it for something else, under a different name or under their own house brand. I think they would be doing that if they thought they could make the kind of profits that they want to make.

*Bob Rogers:* As I see it, in the definition that was already given today, grading is putting like with like. That is a shorter way of saying what he did. Then you have that option, don't grade it at all, or pull something out at random and call it a grade.

*Forrest:* What we have talked about up to now, most of us have argued about for a long time and we are probably not

going to come with an answer for quite some time. I think the question of quality at some point in time needs an answer so that if we want to directly measure quality, we know what quality characteristics to measure. If we don't have to measure quality, then where do we go in starting to develop direct measuring systems?

As meat scientists we need to be looking into the future. I want to ask Dave, because I know that he knows a little about what has been tried up to now, where we go from here in developing those systems and getting away from the assessment by proxy and the questions about validity of visual assessment. What is our next step? What should we be doing, from a research standpoint, in order to make this a reality in a short time down the road?

*Sim:* Short time? I don't have any simple solutions. I have questions. I am too far away from meat science, having received my degree ten years ago and not having worked in it in the last seven or eight years, to really know the state of the art.

However, I look at two things from outside now. The first question we have to answer is what we can do, in my opinion, to add quality or to keep quality problems from arising in our handling systems, rather than just measuring or looking at them and saying, "Yeah; it is a dark cutter – son-of-a-gun." Let's do something about it.

Myofibrillar tenderness; if you look at the old concept of two components – background and myofibrillar – that myofibrillar component looks to me that maybe it can be licked with some of our handling systems. We may have to measure background tenderness. How do we do it? You tell me!

In terms of instrumentation, the only things we have been able to work with in Canada in terms of quality are the sorts of things that Howard Swatland was talking about this morning which are PSE-related – color, water-holding capacity, etc. Yes, to some extent they are organoleptic because if it can't hold water, you are going to have a dry product, but they are not directly related, and certainly not related to what is probably the most important component, tenderness.

I think we need to define those things we can do something about. The other thing we have to get away from is trying to define something that is the be-all and end-all for everyone. The meat industry is one industry that I don't care very much to talk about regarding market segmentation. Proctor and Gamble markets something like eight different lines of soap and each one is geared to a different segment of the market. We are still hung up on something that suits everyone. I don't think that is valid. I think we have to figure out what needs to be marketed to whom, and get out there and market it.

*Forrest:* If you follow that philosophy, then we probably even need more grades instead of fewer. If we are going to segment the market, we have to get those carcasses identified to go into those markets. And again, I think we may be talking primarily about steaks and roasts and chops rather than the other products.

*Sim:* Maybe we need to deliver what the segments desire rather than try and peddle what we have to them. Maybe there are niches out there that can be created, to which specialized product could be sold. I think perhaps we need more effort into this than trying to figure out whether a slight

degree of marbling versus a small degree of marbling makes any difference, because I think 90 percent of the people out there couldn't tell the difference anyway. Take it off the kill floor, put it through the cooler, and send it out. That was meat marketing and it still is meat marketing. I think we have a long way to go there.

*Forrest:* This is a complex problem – there is not one single answer and yet, we, as a group, have to be in a position to offer some leadership, offer some answers to the industry down the road. Perhaps we need to change our thinking in terms of where we look in order to provide these answers because, as I look at society today, one of the things that practically every product that goes on the market has is quality control. Basically, the grading system is a quality control system where we can reduce the variability so that when the consumer comes in to buy our products, they are at least not surprised by what they get. I think that is what creates more problems than anything.

When we were talking earlier today, it was pointed out that it may hurt us just as much when the consumer buys a Choice grade steak that is extremely tender and compares it to a Choice grade steak that is on the low end of the scale. In either case, it creates an image for beef and if they get it once and they are unable to get it every time, they tend to move away from the market and go someplace else.

We need to know what the market is in the first place – define what the consumer wants – then decide how to go after it. We need the technology and new ideas to fit into this system; our research needs to be involved in this particular area. I was hoping that maybe we would get some ideas of what we should be doing in order to assess quality, and do it quickly and easily.

Another problem we run into in the industry is that we don't have a lot of resources that can be put into this aspect out there on the line. It has to be done quickly. It can't disrupt operations. We need to look at automation, computers, robotics, and fit these together. I know that we got started but it seems to me that we have currently backed off in the area of machine grading. It has been put on the back burner. I know some of you are still working on it but we are not spending the time and effort that we did at one time.

*Gordon Davis:* We have always had a magic word for marketing quality beef – Choice. I am wondering, since our experiences since 1968 with trying to market lean cattle through our yield grade system, if we just haven't sold the consumer on what a 1 or a 2 means. Is it time for some magic word that might be well recognized by consumers for lean beef that might be accepted even by affluent consumers? The Yankelovich study of 1983 seems to show that affluent consumers prefer lean beef – your health-oriented and active-lifestyle people. Price is not a factor, yet we still go with reduced price, lean beef and market it some way as a loss leader or something. Should we have a key word such as "lite" or some other term that might be widely recognized on a similar level as Choice? Does someone have a better word?

*Sim:* I think you are on the right track. The point I would like to make is that I don't think that should be a part of your grading system. I think that the retailer should create that aura, and merchandise that product. The grading system should get back to the basics and sort it out. What you do

with it then becomes your job. The question I have to ask when I talk to various people, is the demand out there for the kind of product the Choice grade is or is the demand for the Choice grade? If the demand is for the Choice grade, as I perceive it, then you lock yourself in and you can't get out of it as a grading system. It is up to the merchandisers to do that sort of thing, to create that aura. Then your grading system just continues to sort and is flexible enough to change. When you tie the whole marketing approach over the top of it and link them so that a grade equals a market base, you can't change the system. You are seeing that now. There should be room for everybody in a grading system, but here in the U.S. there doesn't seem to be. Why? Everyone is hung up on one word – Choice – because it is so closely tied to what marketers are doing that they don't want to give it up. How do you get away from that? My solution is to let them tie themselves to a marketing name or image instead of to a grade and let the grade just sort it out. They can buy "Grade X" as long as it meets their marketing requirements and then when they sell it, they call it "lite" or whatever.

*Davis:* What evidence have you seen that the packers are even buying cattle on anything other than dressing percent? When are we ever going to get that licked?

*Sim:* That is another good point. We are seeing close to 70% of our cattle going direct now. Since they are going direct on a rail-grade basis, we are getting away from dressing percentages. Eliminate the packer buyer buying live and you eliminate the "I have to hang X number of pounds on the rail" approach to buying.

*Davis:* I think you are ahead of our country. In West Texas in recent years, I don't have any data, but I haven't seen any incidence at all of the coolers looking like cattle are leaner. It just seems that you have no problem finding Yield Grade 4's and 5's. Maybe other parts of the country are different but I just don't see the incentive there to produce lean beef.

*Sim:* We almost went last year to an A-0 grade, instead of A-1, etc. We almost took our B-1's, which are 4mm of fat or less, and called them A-0 to try and create that even leaner product so that if consumers wanted it, they could have it. I foresee in another year or two that it will go through. A lot of people were just not so sure about that one. Our percentage of A-1's has certainly gone up. We are close to 40%.

*Michael Dikeman:* Looking at the title of this session, it seems as if maybe we have only addressed half of the topic. The topic was grading and classifying meat. It seems that what we have been focused on is a grading concept, which I think can be different than a classification concept. You said that perhaps we need something that fits the needs of everybody who is consuming our product, whether it be purveyors, hotels and restaurants, McDonalds, housewives, whatever. I would like to have you and maybe Mike May comment about the concept of a classification system where carcasses are either measured or assessed for the kind of characteristics that they possess; not force those characteristics into some kind of grade or grade term, but just describe them for what is there – whether that be weight, fat thickness, maturity, lean color, whether they have been electrically stimulated, marbling, or whatever the case might be.

*Sim:* That would be the ideal. That is, in my opinion, the perfect grading system. Sure, it is classification, but it sorts carcasses out in this manner and classification becomes

grading when you start saying that one is better than another. That is how I separate the two. I would like to see things go in the direction that you are talking about. Before we do, I think we have to get better at measuring what we are looking for, and measure what we are looking for instead of looking at proxies. We are too far away from what is important. The problem I see, certainly in North America, is that the marketers don't like it, because then they don't have a gimmick that government gives them that they can run with; they have to come up with their own. So I see some problems of acceptance by the marketing intermediaries. We are talking about it but it is still a long way away.

*Jim Wise:* I might add one other thing. I think one of the real problems that we have had an indication of here in the U.S., is that there are just too many categories for the packers. They don't want to mess with that many. If they don't even want to mess with two working grades, they sure don't want 5 or 10 or 15 different variables and then all the combinations you may get. I think one of our real problems is that we don't know what people want – it is hard to measure something when we don't know what they want. We are sitting here as an industry trying to take our production and put it in some form that we think the consumer wants, and we don't know.

One of my pet peeves for the last several years has been, what is lean beef? We keep saying that the consumer wants lean beef, but do they want beef with a very limited amount of marbling or do they want outside fat off? I contend they basically want the external fat off and then they want maybe the marbling that will make it eat like Choice beef today. I don't think we can get any agreement in this room on what lean beef is, much less how we are going to measure it. Are we going to measure it through a quality system or through a yield system? I think we have a long way to go. There was a statement in Mr. Harrington's paper (included in the proceedings) on the politics of grading that I can relate to. I think that is one of the real problems that we have. No matter what we as scientists feel may be right, we still have to go out and work within the trade and the political climate that we have to work with. I think, whether we are talking domestically or internationally, that is one thing we are going to have to consider – we have to take that in along with all the technical aspects of whatever system we are trying to work with.

*Ray Field:* Under assessment of maturity, you listed dentition. What is it? How is it measured? Are you doing this in Canada?

*Sim:* Dentition – you count the teeth and, depending on the number of incisors, you can relate to chronological age or maturity. It is reasonably precise. It is being done in Australia and New Zealand. There has been some pressure to go to dentition in Canada. We finally got the researchers to admit that you could predict chronological age better than with ossification, but it still did not tell you any more about the tenderness or toughness of meat.

*Field:* I was wondering if anyone had tried to measure hardness of skeletal bone? Such as shaft of the femur, for instance. How much pressure it actually takes to indent so far into it. A Rockwell score or something like that.

*Sim:* I am not familiar with the Rockwell score. We did some work with the University of Alberta, trying to come up with a hand-held force measurement device that would mea-

sure the force necessary to penetrate the bone. The preliminary work we did with the engineers did not come up with anything that appeared practical, so we dropped it.

*Ron Usborne:* I think it was a number of years ago that Bull Durham tried to pump marbling into meat. I don't know how well that worked but I think there were some problems. I know, in Canada, our marbling requirement is just about nil and I suppose we try to put some quality into the meat by saying we have a minimum backfat and keeping our cattle as young as possible. I think that is working a little better now that we are boxing beef and aging it for a specified period of time. The variation in tenderness, I believe, has gone down, the juiciness and flavor still vary some, but as long as we have some fat on the outside, it helps to keep variation minimal.

The question is, to change direction a bit, in Canada we are on the verge of going to electronic grading of hogs. Supposedly, this is to come in January of 1986. I think you had something to do with the decision to go in that direction. At the present time there are two instruments on the market, the Hennessey from New Zealand and the Fat-O-Meter from Denmark. I have seen the Fat-O-Meter in a couple of plants in Denmark and I understand that other countries have chosen to go with the Hennessey. I wondered if you would review some of the factors that were taken into consideration, first of all to go into electronic grading in Canada, but more importantly, in choosing the Hennessey over the Fat-O-Meter?

*Sim:* For the benefit of those people not familiar with the Canadian pork grading system, all hogs in Canada are sold on a dressed basis – weight and grade. The grading system is set up in such a way that the leaner the hog within certain weight categories, the more money the producer gets. There is no such thing as live buying of slaughter hogs. Consequently, packers and producers through their national associations have always been very concerned and very interested in developing grading systems that do a better job in terms of assessing the cutability of the hogs. They both view it to be in the interest of the industry to proceed in that direction. Our current system uses a ruler-backfat measurement, which at 600 hogs per hour obviously is prone to error. The desire was to get to a more sophisticated, more precise system of sorting pork carcasses.

It was on that basis that an industry committee was set up in 1980. So we spent five years assessing available equipment, doing cutouts, and developing prediction equations. That was the technical side. We then put the equipment in the hands of the graders and had it used in the packing plants for a period of time. The assessment in this case was to look at the various operational characteristics. How often did it fail? How often did it work? How difficult was it to use? On the basis of those two tests, we decided to go with the Hennessey equipment. Largely because it had a few more bells and whistles on it and secondly because it was a stand-alone model. The Danish equipment had to have a computer terminal right with the piece of equipment.

Subsequently, we did a broad spectrum test on 150,000 carcasses across Canada, comparing the Hennessey equipment to our current grading system to see how much movement there would be in the distribution of carcasses between one and the other. Based on this, the Canadian Pork Council

and the Canadian Meat Council are in the process of negotiating a final settlement system.

The other thing that is interesting is that, with some modifications, it appears that this light-reflection type of probe will potentially be capable of providing a PSE assessment fairly accurately at the grading stand, which is approximately 45 minutes after sticking.

*Forrest:* In testing those pieces of equipment, what did you use as the endpoint – were you measuring that with cutout or were you just associating that with fat depth measurements?

*Sim:* We have set up a protocol where we are going back to cutout. Otherwise you are not measuring what you are really interested in. There is no sense regressing an electronic fat measurement against a manual fat measurement and saying it works or it doesn't, because a manual measurement is simply another predictor. The real thing you are interested in is cutability and that is what we are going back to. We have a standard cutout that we use. It is percent salable cuts with the skinned belly included. The belly is thrown in just because the packers want it. That is where the politics of grading comes in.

*Forrest:* You were satisfied with the accuracy you were getting?

*Sim:* Yes, we got about a 15% to 18% improvement going to electronic equipment, as opposed to the prediction of cutability based on a ruler measurement. Part of that is due to more accurate fat measurement and part is due to the fact that you can measure the muscle depth and plug it into your equation. It is not terribly significant in the equation, but it does add a little bit, and that gives a little higher predictive value.

*Forrest:* One of the things I have heard from some of the larger packers is the problem of ruggedness of the equipment. Were you able to assess that and determine whether it will stand up under 600 to 700 head-per-hour conditions?

*Sim:* We had it in the plants a month or more and we had consistency in the area of 98% to 99%. It didn't break down very frequently; usually, it was due to something simple like an electrical connection, nothing to do with the actual physical durability of the equipment. That is the equipment we have now. With the first prototypes, one of our stronger graders was able to bend the probe about two degrees within about two hours. So they had to redesign the probe and put thicker steel in it. We have not had any similar problems since then.

*Charlie Cook:* I am rather intrigued by the definition of this amorphous term "quality." Really, quality is in the eye of the beholder. We hear this term bandied around a lot but we don't really get a good comprehensive understanding of it. From what I am hearing today, we are looking at terms of quality in the perception of how the raw meat eats – as a steak or a roast or something like that. I was rather intrigued to see some of the data there – the consumption of roasts and steaks is declining significantly. From our perspective, we are looking at a raw material supply and how it best fits our needs in terms of manufacture of an emulsion-type product or manufacture of a processed meat product.

When we talk about ham or lean-to-fat ratio, I think we look at the economic consequences of that. From a producer's standpoint, what he is trying to do is convert feed to a

salable item. From a manufacturer's standpoint, we have to reduce whatever that fat thickness is down to a standard thickness. We have to look at it in terms of the amount of labor component we have to put into that unit – the cost we have to put in – to bring it down to a standard component. As we see the trends in the meat industry going, we are going to see more and more of this raw material converted to a total food component; Lean Cuisine, Armour Classics, etc. I think it is important, when we are defining quality, that we have to have a little broader understanding in terms of the end application for this product.

*Cook:* I am intrigued by the concept of "provide the lean and the processor will do something with it." I would like to correct one fallacy: Not all turkey processors pump fat into their product. Because we are trying to merchandise that product as a low-fat item, the last thing we want to do is to pump fat into it. Some processors do; others don't. I think you are right in saying that there is a lot of technology available we can use to convert that to the end product that we want to merchandise. We have to have a wider perspective and look at the needs of the end product, rather than just focusing on just whether we are consumers of steaks, roasts, etc.

*Sim:* I see what I would call more and more market segmentation. In that context, is it possible for a grading system on a national basis to address the differences and the variations in quality that those –

*Cook:* Please don't use the word "quality" because I don't know what it means. If we are looking to something to standardize uniformity, yes, what we would like is a classification system. I don't know what it should be based on, because it is based on a segment of the target audience. This is where we get hung up because quality to us is something completely different than quality to a supermarket chain, and what we are trying to do is fit one definition to suit all purposes. I don't think we can.

*Sim:* What you are looking for is manufacturing quality and what they are looking for is organoleptic quality. We can't even get together on a definition of quality. What equates to quality in terms of a chop, roast, or steak versus what you use in manufacturing becomes two different things.

*Cook:* Right. We would like every hog to be exactly the same size so we can use automatic eviscerating and slaughtering equipment. Right now, that is what we would like to have. In terms that I think I have heard alluded to, today's consumer is more health conscious. I think we have to deliver specifically those items which fit today's modern lifestyles in terms of today's modern health consequences, whatever they are. I am still very fuzzy about those, but right now they have a perception that it has got to be lean. I don't feel tenderness is such a concern any more as it used to be in terms of the real needs.

If one looks at the Yankelovich studies and sees what the consumers' concerns are today, they are all health-related. They are food additives-related. They are residue-related. They are sodium-related. They are cholesterol-related. They are fat-related. These are the negatives and we have got some tremendous negatives in this industry. If we pick up any paper any day of the week, we see the meat industry getting a lot of negative criticism – last week's 20-20 Show on TV is an example. These are the real problems that we as an industry are confronted with.

*Sim:* Do you foresee down the road, because of the market segmentation that is going to occur and because of the need for different characteristics in the product to meet those different market segments and the fact that certain packers and certain retailers will be pushing toward the market segment, that we may see production contracts being set up? Whereby, if you have certain specifications for hogs for Oscar Mayer, you are going to contract with producers to produce them a certain way to meet your requirements?

*Cook:* We are seeing this already in the turkey and the broiler industry where producers are producing birds for further processing. They are trying to produce a 30-pound tom where if you go to a retail market you are looking for a hen. You are seeing some of this market segmentation already occurring. From a cost efficiency standpoint, we would rather slaughter a 30-pound tom than an 18-pound hen, and I think this is the way we have to go in terms of the needs. I think what we have to do is get the genetic engineers, the bioengineers, and all these people involved in trying to tailor-make the product. We in the processing industry are looking at demographic studies; we are producing to meet specific demographic demands. The animal producing industry will have to do exactly the same in the near future.

*Forrest:* If they are going to do that, then it becomes important that we have a means of communicating that information to them through specifications or classification, some of the things you have alluded to, or through contracts.

*Cook:* Absolutely. But we have to define what those needs are right now. We all seem to be talking in generalities of quality. What we are really talking about is establishment of specification guidelines.

*Sim:* I agree with you. Doing it precisely. Measuring – not assessing.

*Forrest:* Someone talked about classification earlier as being the way to go, or perhaps one of the solutions, I won't say the way to go necessarily. Before that is going to happen, I think we have a lot of areas that have to be cleared up. First, we have to have good means of assessment. We need that in order to have a system that has enough flexibility in it so you can write sets of specifications and have those delivered to you. Whether you are in the market that Charlie brought out here, which I think we have kind of ignored, so I am glad you mentioned it. It is true for all segments. It is difficult, whichever segment you are in, at times to get exactly what you need to serve the clientele or the purpose that you have for the meat that you buy. We have a real challenge in developing a system there. Somehow, we need inputs from a large area, not only in the technology but in what should go into it; a specification system, if that would ever work. Jimmy, I will call on you to make a comment or rebuttal, because there are some problems with a classification or a specification system. There are real problems that we have to worry about and you might at least point those out before we go on very much further.

*Sim:* Australia used to have an export grade somewhat like Choice and Good. They have gone to an export classification system. Sex – bull, cow, steer, etc. Different fat levels. It will be interesting to see what happens with that because they visited every country they export to; they even came and saw us and wanted to know how we grade. They went back home and said that classification is the name of the game,

not grading. When you buy boneless from Australia now, there is a grading spec or a classification spec, and you just pick what you want in terms of the choices for that particular parameter. It will be interesting to see what kind of penetration they get, if it is any bigger than they have already have in terms of their export classification system.

*Wise:* As mentioned earlier, part of the problem some of our packers have indicated with a classification system is the myriad of characteristics you can get and then the combinations of these characteristics. They really don't want to even handle two or three grades at two or three different yield grades right now, due to inventory problems and this type of thing. We get back to the specification, they are pretty well handling that through the specification end of their boxing. They are maintaining maximum fat thicknesses, etc., so they are doing a lot of this. We have had the feeling that most packers and other users still, from our concept of quality, are wanting to get a combination of maturity, marbling, whatever, presented in one grade name rather than being told that it is A maturity, certain color, certain marbling level, etc. through a classification system.

I think another problem, whether we go to a classification and/or a grading scheme, is that we still don't know what people want. What is good for manufacturing is not good for the restaurant trade, isn't good for the retail trade necessarily – everybody has a different expectation. Even if we all agreed pretty much that flavor, juiciness, and tenderness are criteria that we want to look at, what my perception is of tender piece of meat is probably somewhat different from everyone else's in this room. We can not guarantee that a certain shear value is going to be perceived at the same level of tenderness by all of us. It gets to be a very complicated problem when you are working with biological product and a biological person consuming the product.

I don't know what lean meat is. We have been hearing lean meat for the last 5 to 10 to 20 years. What is lean to me may not be lean to you. Are we talking internal fat, external fat? We can control external fat right now if we just trim it before we put it out in the store, but we are not doing it. Go in a retail store and see how much fat is left on product. People appear to be willing to pay for so much fat rather than pay the higher price for trimmed product, so it is a trade-off between price, quality, and whatever other considerations go into the purchasing decision. The retailers may not be presenting the right product, we are not giving them the right product, and it just follows all the way through.

*Sim:* In terms of classification, let's dream a little. Suppose we could assess the criteria we are looking for on the kill floor, relatively automatically, and the plant was reasonably automated and we had a chip in the hook that went with each carcass so that at any point in the plant we could identify the carcass. We categorize six or seven parameters on the carcass – color, fat, etc. – and this and the number are in the computer. That way, you have eliminated some of the inventory handling problems. Do you think that would not get people more interested in classification as opposed to grading, now that electronic tools have been provided to overcome some of the objections they have been voicing?

*Wise:* Dave and I get mean with each other at times. I am going to throw something back that he said earlier. When was the last time anybody bought a carcass? You are going to

break them and put them in a box. How many boxes are you going to use for one carcass? Controlling and breaking under our system, if you have 15 or more types under a classification system, how are you going to get them all broken at the same time, put in the right box, and not get them all mixed up? I think it is an almost impossible situation. Inventory is a greater problem for boxed beef than it would have been for carcass beef. Under the carcass beef system, I think we could have come nearer realizing a classification system and we never did. We are past that stage in the industry today, and I just don't foresee a classification system working when carcasses are going into a break. It is a real effort just to distinguish between and separate Choice and no-rolls. Packers are disappointed in the ten minute clear-out time just to get that accomplished to label product correctly under what is really a two-grade system.

*Sim:* Maybe that means we assess, evaluate, grade, or classify them, not as carcasses, but as meat products coming off the end of the table somehow. In that respect, in terms of the ability to do some of these things automatically, we spent some money last year in Canada to look at the possibility of developing a robot to grade hogs. Our problem right now (but I think it will be resolved with time) is to get some sort of sensing equipment that will allow us, with a product as biologically variable as it is, to measure backfat and lean depth at the location we want to measure – to guide the robot arm in such a way that it will move into the carcass at the exact place you want. The engineers said they could build us a robot that will do all the probing we want but they can't build one yet that will have the feed forward, feed back system to control it. That is the same problem you are talking about in the breaking operation. I am hoping we will see some breakthroughs in this technology that certainly would be applicable.

*Forrest:* The last issue you had on your list is the issue of superiority/inferiority. I really agree with you on this, but how do we get around that in a grading system or a classification system? I can envision how it would be easier to get around in a classification system, because in that case you put together a group of parameters that fit your needs as you purchase and then you merchandise those the way you want. I would think that, even in your system in Canada, you still have the superiority/inferiority aspect to the grading system. What would you recommend that we use to get around that, assuming we don't go to a classification system?

*Sim:* Really, that is the best way of doing it – through a classification system. I don't know how else you would do it. The very term "grading" means superiority/inferiority. From the time you went to kindergarten or grade one, we all knew that a grade was a certain set of levels and one was better than the others. A was always better than B. The problem, as I see it, is that should not be part of a grading system. Ireland, for example, uses I, R, E, L, A, N, D, as their grades. I think A is cow beef. So they have grades but there is no connotation of inferiority/superiority. The EEC uses, E, U, R, O, and P for their system. One of them is going to command a premium price but it is not necessarily going to be the highest letter. That is one way of getting around the problem. The problem in North America is that there are so many vested interests in the terminology we use because the grading system has been used as a marketing gimmick, as opposed to a classifi-

cation or sorting process. There are options, but I don't think many of them are politically palatable.

*Charlie Murphey:* I was going to bring up this same point that Dave just brought up. There is a nondiscriminatory system, such as the Irish system, that might have application in the U.S. Have the specifications or standards develop around just wholesale trading; then let the retailers and distributors distribute and identify in any way that they feel is the best way for their particular clientele.

*Sim:* I agree. Then you have the merchandisers doing all they can to create that image or aura for their particular product and not piggy-backing on something that is put in place by the government. They would be doing it themselves, which is what they should all be doing instead of saying the government has given us this lovely term "Choice" and we

are going to beat it to death.

*Murphey:* I don't think there is any question that everybody here is agreeing that having grade nomenclature that people conceive of as being better or best or worst is a deterrent. This other approach, I think, would help in that connection very greatly because I can't see any retailers handling U.S. grade S if we would have used something like U, S, A. But it would still mean something in terms of the marketplace. For the wholesale trading, it would mean just as much as any other nomenclature.

*Sim:* Now, how do we get it done?

*Forrest:* I think our discussion has been very good. Jimmy is slipping back to the microphone.

*Wise:* I think as usual, Charlie had the last word on grading. (Laughter)