I would like to emphasize that I do not intend, nor was I expected, to answer the question asked by this topic title.

The quality of pork carcasses, as with other meats, is defined in terms of firmness, color, marbling and texture. We have emphasized these points in appraising meat because they are believed to be indexes to tenderness, juiciness and flavor. How accurate are these factors in predicting palatability?

We do know that the firmness of the lean cuts of pork is directly related to their moisture content and the amount and kind of fat within or around the cut. Those cuts which are relatively high in fat and low in moisture have more eye appeal to the meats man and are known to show less shrinkage and cooking losses. I feel, however, and I am sure others agree, that the housewife looks first at the lean to fat ratio and only secondly at the firmness.

Long chain fatty acids and more particularly saturated fatty acids are present in greater amounts in hard fat than in soft. Because of this difference in structure hard fat is less susceptible to rancidity and for this reason the fresh or frozen storage life of firm cuts is, theoretically at least, longer than that of soft cuts. Little work has been done of the effect of the curing process on pork of various degrees of firmness. Supposedly the soft fresh pork would likewise result in a soft cured product. However, I am not prepared to say to what extent the small differences in firmness observed in a representative group of carcasses is reflected in the cooking and eating qualities of cured pork.

A number of years ago soft pork fat produced soft lard. Today by the use of hardening flakes and other manufacturing advancements, soft fat is much less of a problem to the packer.

With these factors in mind, how much value should be placed on firmness? Have modern merchandising methods influenced the importance of these factors to any extent? Perhaps they have, since prepacked meats remain in the case a relatively short time. Does the increased use of home freezers and locker plants bear any relationship to this question of firmness? Is the incidence of rancid pork fat any greater or less with these modern methods of handling the family meat supply?

Have any studies been made relative to the shelf time of cured meats as influenced by the character of the fat? These are questions which have not been adequately answered. These and many others must be answered before we can objectively evaluate firmness.

The color of meat is directly related to its hemoglobin content. Pork, in comparison with lamb or beef, is much lighter in color, and a greyish-pink is set up as an ideal. This characteristic color has eye appeal.
because we have a preconceived idea that meat of a particular color will be more palatable. It has been demonstrated that the color of pork is related to the pH and in beef at least, pH has been related to tenderness. Our knowledge of these interrelationships is certainly not great, especially in pork. The so-called problem of two-toning in hams is not new, but to my knowledge the extent to which this condition affects the final cured product is not known. It would appear that a good survey of consumer reaction to color variations in fresh and cured pork is needed. Our limited knowledge of pork color and the association of color with other such factors as tenderness and flavor, indicates some fundamental research on these problems would be a worth while endeavor.

The degree of marbling or extent of intramuscular fat is associated with flavor, juiciness and tenderness. If the work which has been done with beef animals can be applied to pork, then the extent of the marbling may bear little relationship to tenderness. The Carver press has been used rather widely to determine the juiciness of meat. How closely is this juiciness associated with that determined by a palatability committee? Are there other factors besides marbling which have a significant influence on the juiciness of meat? Perhaps the first question should have been -- is the amount of marbling in pork significant?

It would appear that there is a need for a critical study of this problem. Such an investigation might involve different aged animals, under different management conditions and which have a wide variation in the amount of intramuscular fat. This in turn brings up the matter of breeding. How much is marbling or any of these other quality factors influenced by breeding?

With such a plan the relationship between marbling and quality factors could be established as well as providing much needed information in regard to some of the other factors I have mentioned.

The texture of meat, or the relative size of the muscle bundles is associated with tenderness. This statement has been made in respect to beef and there is still some question as to its validity. We have, however, transferred our ideas regarding tenderness from the beef carcass to the pork carcass. There are species differences in color, character of fat and flavor. Are we justified then in assuming that texture is of the same significance in pork as in beef?

Instead of answering the question on how important is quality in pork, I have only raised further questions, which in some cases, may have been overstated to make a point. The point is, that our knowledge concerning the value of pork quality factors in relationship to juiciness, flavor and tenderness is very inadequate.

In the light of the latter statement, I should like to propose that a project be set up to thoroughly investigate this problem. In this way it may be possible at future meetings to answer, at least in part, the title of this paper. As I have already indicated, such a problem would have many aspects and each would require a well organized program of research. At the same time the project would require close cooperation between those involved. I would further suggest then, that the program be limited to a few stations -- perhaps two. Such a project might well be handled through this Conference by members of the Pork Carcass Evaluation Committee or someone under their direction.
Any project of this magnitude not only requires personnel and facilities, but funds as well for its effective administration. If this project is worthy and is of significant importance to the swine industry, then we should not have any trouble soliciting aid for such a study from the industry. The National Live Stock and Meat Board might also be asked to contribute to this program.

---

MR. KLINE: Mr. Stillwell of the Ontario Agricultural Experiment Station will lead the discussion on this paper.

MR. STILLWELL: "What is quality?" Before I came to these meetings, I went to some of my friends to get a definition of what quality is in pork. I went to some nutrition specialists and I went to some graders and buyers. It would take me a long time even to read their definition of quality. To get out of a rather difficult situation I didn't invent one, but I have a definition of quality. It is perfection. I lay emphasis on firmness and attractiveness in a pork carcass. If we compare the pork of 20 or 25 years ago with the pork of today we have improved the quality.

One way to keep this quality up, of course, is competition with other meats. Today with the prices of things as they are, it is generally true that the housewife selects according to her pocketbook. But all else being equal, if pork quality drops the housewife possibly is going to turn to some other kind of meat.

A number of years ago the pork that was produced in Canada was more or less nondescript. The export pork market forced the Canadian producer into a position where he had to produce pork to meet certain specifications. I don't say that all of his pork reached the highest point with regard to quality, but the export market forced him into it along with the premium that was paid if he reached a point of excellence. Today we don't have the export market, and it will be rather interesting to see what happens in our domestic market.

MR. KERR: Perhaps we are a little concerned over a statement that Professor Stillwell just made. They are getting pork to a certain degree of excellence. Is it a question of getting that pork to a certain degree of excellence or to a point of desirability, which is consumer preference. We have not educated our people to the point where that consumer preference may meet desirability from the standpoint of quality. Whether we will ever do that I do not know.

It is a perishable product. It has to move, so we have to go along with consumer preference to some extent at least. Now can we tie the two together and get quality along with consumer preference?

MR. FARWELL: One thing that irritates me in associating with some of our economists in their studies of consumer preference is the fact that we are satisfied to let them run consumer preference tests and to accept their definition of quality. If you will attend a workshop on quality you will find, as Mr. Stillwell has brought out, differences in interpretation or definitions of the work all the way from the economists' standpoint to what the consumers think is quality and what we think is quality.
We in the meat industry do not do enough to educate the consumer on what these inherent characteristics of quality are. Why don't we try to run some tests, taking a small group of people as a panel, consumers -- average people -- and try to educate them on what the superior quality product might be, and see if we cannot change their opinion rather than just take their opinion and try to change the producer?

MR. KASTELIC: I have been confronted with the same problem of seeking a definition for quality. I have one that I should like you to consider. Quality is a rather nebulous term involving some objective estimations, a considerable amount of subjectiveness, and many intangibles.

What is the optimum amount of fat in pork? There is no other statement that is so widely used and engenders as much argument as this statement. Is it not time that we embarked upon research endeavors to answer this question in the hope that we might come up with something that does not include the complete universe? We talk about 1.5 inches of back fat and somebody else about 1.2. I cannot accept your statement, Professor Ziegler, and I am a connoisseur of meats, that fat, any amount of it, is necessary for quality. Let's just think about the picnics that are being sold on the average market today. I have learned not to buy them because while some of them are of high quality and contain a reasonable amount of fat, there are others that contain as much as 40 per cent fat. We intend a five-year study, at least, concerned with the amount of intramuscular fat as compared to the adipose tissue which you find along the back. I have just been amazed at the amount of fat you find among the muscles in certain cuts of pork derived from certain types of animals.

Bellies as high as 78 per cent fat as compared with some of these so-called meat type hogs that will yield bellies with 45 per cent. We have hams after close trimming that have a fat content as low as 6 or 8 per cent. I am a little worried about that amount of fat. When you get up to 35 per cent I am going to argue with you about the quality, because I refuse to buy a pork chop at 85 cents, which I must take home and render down to 50 per cent or 35 per cent leftover and then have grease that nobody wants to buy.

MR. KEMP: Has anybody run any studies on pork correlating visible marbling with actual fat content? I know of some work that was done on beef in which they ran ether extractions on the rib eyes, and there was no correlation between visible marbling and ether extraction content.

MR. ZIEGLER: When you made that remark about the per cent of fat in these cuts were you referring to one or two of our breeds of swine? I know that it is a characteristic of some of our purebreds. I am talking strictly from the standpoint of quality and the factors that were mentioned by Wilson. I don't have any time for intramuscular fat. That is something bad and in certain breeds of swine, the rib end of the loin and pork shoulder and the belly you might as well put in a rendering plant. It is almost impossible to sell them because of that excessive amount of fat you mentioned -- about 40 per cent. I think the word quality is too inclusive if it takes that into consideration.
MR. STILLWELL: About twenty years ago or more, we had carcasses with fat backs or strips down the back of over two inches. With those carcasses we talked about quality. Even with the amount of fat that was on those carcasses, we could talk about quality. If we go to the other extreme and we pick out a carcass that has, say, less than 1 inch of fat, it is likely immature or it has not been fed properly. No matter how bright and attractive the skin and the color of the carcass might be, I don't think you can call that a quality carcass.

MR. WILSON: You referred to the improvement that has been made in Canadian hogs. Both you and I might be prejudiced, but you referred to the improvement which had been made to meet the export trade. If I remember correctly, most of the things that were judged were conformation and finish and not quality.

MR. STILLWELL: They called it quality when they talked about it, but the carcass was put in partial cure and would have to stand the trip overseas, which meant that if there wasn't sufficient substance and maturity to the carcass when it reached its destination it could not be smoked. Smoking was done there. I didn't mean to imply that Canadian Yorkshire carcasses are excellent in quality because we run into this quality problem maybe from a little different angle. I still maintain that from my angle at least it is possible to have a quality carcass even with what we might consider our standards today having excessive fat.

MR. ZIEGLER: Unfortunately I find that in your No. 2 and No. 3 choice you can strike many hogs that don't have the marbling. Marbling to me is the acme of quality. That is the only way I could agree with Cole. If you don't get quality in those No. 2 and No. 3 hogs you might just as well have a medium hog.

MR. COLE: On this question of how important is quality, we have tried to cover too broad a subject. Maybe we should have refined it to something more like how important firmness is or how important marbling is. I don't believe we have any real evidence to prove that slightly soft -- I am not talking about oily pork -- pork is not as good nutritionally, won't eat as well, won't be as juicy, won't shrink any more, than really firm pork.

We have a lot of evidence that scybean feeding will produce slightly soft pork, with some palatability studies, and there is conflicting data. Some say it is just as good; some say it is better; and some say it may not be quite as good. It still is a pretty pertinent fact, especially with our different kinds of feeding, including some pastures, etc., that we will hear about this afternoon, that may produce not a hard pork nor a soft pork but something sort of in between, and just as good.

With this increase in quality that we talk about, we also have to consider that there has been some improvement in processing practices and that sometimes these processing practices hide some of the things that we consider poor quality features. This is particularly true with our studies on bacons, that slightly soft bacons come out just as well, in fact from an eating quality, better than any choice hogs if you put a monetary value on them or if you grade them as to Nos. 1, 2 and 3 ends of bacon.
We have to listen to the consumers because they are the ones buying this pork, I don't have any trouble selling hogs, medium hogs, but I have a difficult time selling choice 2 and 3. I am sure it is the same way in your laboratories and the same way with beef. I have a pretty hard time selling prime beef at the same price as choice, as contrasted to something with some quality marbling, with less fat.

MR. MACKINTOSH: From time to time we ask ourselves at these conferences, "What are the objectives?" or we ask the question, "Are we accomplishing those things for which we intended the conference?" I happen to be one of those who have felt since the beginning that out of these conferences should come constructive work, I mean the throwing out of questions and as a result of those questions drawing up specific programs or projects. At a succeeding conference we should endeavor to bring the answers to those questions as a result of the findings from the projects.

This morning we raised a number of questions. I think that as individuals we should have gotten quite a number of ideas for specific projects. There is also the possibility of this conference drawing up projects. I have always felt that it could and should. I would say the discussion this morning alone has justified the conference. We should go home and draw up some projects to try to answer some of these questions, otherwise we are not getting out of the conference that which it was intended to supply.

CHAIRMAN COLE: That is something that the new Executive Committee can consider. I do not know any reason why the conference cannot sponsor projects. We may be able to get some of the Research and Marketing funds to do some work as a conference.

Lowell Walters is your new Chairman for next year. Lowell, do you have anything to say at this time?

MR. WALTERS: The Executive Committee for next year would like to start next year's activities off with some suggestions from this group. We would like you to give us two major suggestions. One of these is to deal with committee appointments and your preference of the committee to work on. We do not intend to reshuffle committees completely. We do, however, think that there may be some chance for interchange of committee members, and wherever that is feasible and possible in the minds of the members of the Executive Committee we would like to do it. Obviously, we cannot put every one on the same committee and possibly we will not be able to give you your first choice. But we would like for you to list your first, second, and third committee preferences in order that your Executive Committee can use that information in making the committee assignments.

The other thing that we feel is needed are your suggestions as to what the trend, or the topic, or the theme, or the general program for next year should include. We solicit your suggestions, as we always shall in the coming year, and any suggestions you have as to things that should be added to our program or deleted from our program, we would like to have.
MR. KLINE: We are going to focus our attention for the next few minutes on the effects of nutrition on the pork carcass.

We are going to start with a paper by Burdette Breidenstein, of the University of Illinois, on the effects of proteins on pork carcass characteristics.

###