factors and symptoms of CTD will increase the chances of reducing its incidence. If workers and management know the etiology of CTD, they will be better prepared to deal with the problem early such that permanent disabilities are avoided. An active tracking of workers who develop CTD symptoms should be developed and maintained. Those who develop symptoms should be temporarily moved to jobs that have been found and designated to have low risks for CTD. Upon being symptom free, these workers can be tried back in the original job. If symptoms redevelop, the process may be tried again; however, at some point, a decision will have to be made for some individuals that they not go back to the high-stress job.

Pace

After all is said and done, there are some jobs that will respond only to slowing the work pace or administrative controls (usually a temporary solution), such as worker rotation.

Summary

There are many jobs in meat processing plants that are fast paced, highly repetitive and very strenuous. On some of these jobs, the fact that anyone is able to do them is probably due to the "healthy worker syndrome" or survival of the fittest. That is, that only the very strongest can withstand the rigors of the job. The less strong are simply used until they become unable to continue and they quit or move to a less strenuous job. In the process, they often become disabled. At this time, and for the foreseeable future, there is no testing to determine who will survive and who will become disabled. Therefore, when a person is put into one of these jobs, there is an unacceptable risk that that person will become disabled. To eliminate this, changes in the workstation, work methods, tools and the pace will have to be made.

References

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Discussion
Safety Standards and Concerns

G. Wilson: Gary, the recent cigarette decision that was based on some theory, that some lawyers I guess have in relation to who is responsible. In that case, what implications does that have on the meat industry relative to cholesterol, which some people think causes all our heart attacks, or saturated fatty acids, are we in the same boat as Liggett?

G. Kushner: I should have known I was looking for trouble when my colleague, George Wilson, was in the audience. I used to work at AMI, and these are the kinds of questions we talked about at 4:00 in the afternoon. George, that is a very difficult question and I don't know if it has any implication for the food industry right now. Frankly I'm not even sure what the implications are for the tobacco and cigarette industry. There are a lot of theories out there, I've listened to National Public radio and to cigarette companies who are saying there are no implications for them. There are many, many differences obviously, between the evidence that's available, the evidence that's been bandied about for many years, that the implications of cigarette smoking to lung cancer.

Many differences have been discussed in that level of evidence and the level of evidence that seems to change on a monthly, certainly annual, basis of relating diet to health and diseases. There are also warnings on cigarettes, we don't have those kinds of warnings on food products. Congress has not seen fit with the exception of saccharine, and the warnings there as a way of getting around the law that otherwise would require the substance be banned, strictly speaking.

I think that in the food industry, there are just too many scientific questions that remain unanswered at this time, for anyone to be able to make such a strong case that has been made, or at least a prima-facie case that has been made for the implications of cigarette smoking. I don't know if such a case could be made and I hope such a case will never be made for food products. It's a little way of getting around your question, but I don't know if I can answer it beyond that, it's a good question.

Next question inaudible.

Kushner: Well to extend your hypothesis, you're right! A jury sits down and listens to testimony, to expert testimony, presumably of scientists who are willing to say that the use of smoking cigarettes, or a particular brand of cigarettes over a period of time could induce, or does induce cancer. Coupled with that, were apparently some product promotionals by Liggett 30 years ago, I just heard this on the radio recently, that said it would be safe to smoke these cigarettes. So the jury is not listening to just scientific evidence, but to a promotional campaign that is inviting consumers to believe that this is a safe thing for them to do. On the other hand, the jury sits there and listens to scientific testimony, makes its own decision whether or not to believe the testimony, once the judge has certified an expert as an expert, then the jury has a right to conclude that the expert testimony is accurate; to judge the veracity of that expert. If it would be of that testimony, they would look at the people sitting there, who have been harmed, for one reason or another, who have

suffered grievously and they make their own decision. Every law suit is like that. The jurors accept the facts, and the facts include scientific evidence.

It is conceivable, although from my standpoint quite disturbing, that the jury could determine that a person died of cancer after drinking soft drinks for 30 years. It is conceivable that a jury could decide that a person who lived on bacon and eggs every single day for 30 years and consumed nitrites, that that person died of cancer somehow related to nitrosoamines. I think it is a big leap from food to cigarettes if for no other reason than the amount of controversy that has surrounded cigarettes, and the amount of focus that has been on cigarettes over the years. And that is not me saying that I believe that cigarette smoking causes cancer, I'm not a scientist, I don't know, I also don't smoke.

D. Kropf: Would you remark on the inconsistency of an oat brand cereal product that has 35% of its calories from fat, we found this!

J. Vanderveen: Making claims as a health food, are you implying?

Kropf: It didn't make claims, but oat bran is supposed to be a good product.

Vanderveen: I understand.

Kropf: It was delicious, but when you look on the label, we found that 35% of the calories were from fat.

Vanderveen: Well, not only would I comment on that, but if you looked at the Kellogg box, it had the claim it was high in fiber and would prevent cancer. If you look on the side, it had a recipe for muffins that were at least 30% fat. And that is the inconsistency that we're worried about. For that matter, the problem is whether we should be making health claims on foods and implying to the consumer that certain foods are useful in prevention or care of disease, we had better be sure of the science base. I think now we have five reports that say the link between fiber and cancer is just not even there. On the epidemiology basis, and of course when we get our regulations in place, we hope to deal with that issue.

But I agree, these things are very misleading. In fact, the reason the consumer organizations originally embraced the idea of the health messages on food, they thought that it could do what we call "crate the labeling on the food supply." A term of course for the lawyers. Which means it requires the manufacturer to embold the negative aspects of his food on the label. We don't have that type of authority. We couldn't even propagate a regulation on regulating the nutrient additions to foods because of the lack of authority in the law, and so as a consequence, these are really limitations. So that is the reason we are going very cautiously in this area, but I think really it can be misleading.

D. Schafer: Just this morning at a breakfast meeting, we heard some very interesting information on the status of research related to dietary cholesterol and maybe the nonrelationship to serum cholesterol or any other things related to heart disease. Will we come to a point if that holds up, and the research base is there, where there will be no basis for putting anything related to cholesterol on the label as you've demonstrated with several of the slides and products here? It obviously is in the marketplace, if that data holds up, will we come to that point?

Vanderveen: Well, the cholesterol issue is a very complex one. Indeed, you can feed lots of eggs to some individuals and not get a cholesterol rise, and that is why the emphasis is being put on fatty acids, and I will talk just briefly on fatty acids. The whole area is still needing better science and it will come, and again, we are anxious to be cautious in this area. In fact, for a while we were on the fence, because the statement was only there because your physician wanted it, and we are proposing to remove that because it is becoming patently ridiculous to tell consumers that is the only reason it is there.

There are responders and there are nonresponders in the areas of cholesterol and that is part of the science base in this point in time. Some people respond to cholesterol and do raise their cholesterol levels and other people don't. We don't know what the situation is there. We are also learning now that even the saturated fatty acids may not be alike, and there is a published paper in the *New England Journal of Medicine* approximately a few months ago now, in which the author shows thioric acid, of all things, seems to be metabolized quickly into uric acid and thereby not being a factor in raising the cholesterol levels. We do know that some saturated fatty acids which is problematic however, do raise blood cholesterol. Even more complicated than that, we are seeing the soluble fibers which are metabolized into all the fatty acids apparently have a lowering effect on blood cholesterol levels, and so the picture is quite complicated. Nevertheless, the blood issue of blood cholesterol levels seems to be very, very critical and I think we need to worry about the total fat that is being marketed in the products of today.

R. Kelly: You remark about the fact that the greatest killer in the United States (which is a rather high meat-eating country) is heart disease. I think you are also aware of the fact that heart disease is also a leading killer in countries which eat about 6 lbs. of meat per person per year.

Vanderveen: That's true, fat can come from various areas and there are many issues at the multifactorial disease, there is no doubt about it.

R. Mandigo: John, the speakers this morning are being given a copy of something I'm sure you have not seen before. (Laughter). Since we have decided to give one to each of our guests, John, we want you to have another copy.

Vanderveen: It is the first bound copy I've had, so thank you very much.

Question inaudible.

D. Cochran: It's not apparent, one of the things is we have what OSHA calls "healthy worker syndrome", which I call "survival of the fittest." Only those who are very hardy and really can survive this type of job will survive to old age. There aren't a lot of old workers in meat processing. They "go through" workers, to put it real bluntly, and they are constantly recruiting workers. So, to my knowledge of aging in meat processing, I don't think it's there. It may be in other areas, there are also other things that are indicated like gender, women tend to get it more, taking of oral contraceptives and there are other things totally unrelated to the work site and any time you start going through the records you need to separate those things and find out if this person has been in an auto accident and had a wrist injury, because that would predispose them towards that. But aging, I'm not sure about that.

A. Kotula: It seems like Carpel-tunnel syndrome is the one area in which you've been focusing but you haven't said

much about the operation that is involved, which is a $7,000 operation and the fact that Carl Folkers in 1981, at the Wisconsin Food Institute Symposium indicated that those operations may not be necessary. It is as simple as a vitamin B_6 deficiency and he's proven this with double-blind tests. Could you comment on that?

Cochran: There are those who advocate exercise and hardening of individuals and Vitamin B_6. Everything I see, for every study that says double blind and Vitamin B_6 works, there are two that says it doesn't. The last thing I saw, a nutritionist came in to talk and had done extensive research himself, he did the exhaustive searching of the literature, and everything he found was very pessimistic, he said there were some studies that show it might, but there was a lot of evidence that really, it may be witchcraft.

Kotula: I might advise anyone who is in the meat industry to get copies of Carl's papers, because I think they're excellent and think it's worth a try before you take the painful and many times unnecessary operation. And then if you continue to work after you've had the operation, you have to go back and get another one. And as long as Carl has this work published in scientific pure journals it's worth a look at that before they can be in for an operation.

Cochran: Oh, I certainly think you should! There is another thing that I didn't mention, is there should be a track team system in any company. That if someone gets symptoms of carpel-tunnel syndrome or any of the other repetitive diseases, that they should be taken off that job for a period of time until they're symptom-free and tried again and go through this cycle maybe 2 or 3 times, and if that person keeps getting the symptoms, get them out of that job, find another job or do something because if you spot it early enough, you're not going to have a permanent disability. If you don't do anything, and you say "oh, work through it, everybody gets that!" Then two months later, or however long they can stand it, you have a permanent disability, and that's much more expensive, that's where you talk about the operation. Conservative treatment, and I'm not a physician, is always advised. And certainly if the Vitamin B_6 helps, try it.

Kropf: Have you had any successes with meat plants switching people from one job to the other, at maybe at break time, half a day, and along with that I'd also ask what is the maximum number or maximum time, can a person do a job for two hours maybe and be okay? Or longer on some of these tough other jobs?

Cochran: My opinion is, and I didn't mention administrative controls, the predominant one is to rotate your people. If you have a job that you can't redesign or you can't do anything about, then you try to rotate and have them do it. My opinion is, and I think my colleagues in this area would agree, rotation doesn't mean every half day. Probably every hour, it would be even better more frequently, but that could be totally out of the realm of reason, but there is a time in there and if you go over an hour, you've got a problem. And so rotation is definitely a requirement.

Kropf: Have you had any success in selling this to the industry? It would be good if we had some successes and plants could see what money might be saved if it is.

Cochran: I am a consultant for OSHA, and I have to be real careful here. It's not documented, let's put it that way. There are other industries where they have made changes and they have certainly documented what's been done. They go in and really change the jobs, absolutely documented. In meat processing, I don't think it's going to be any different than any other industries, but in case studies meat processing isn't there.

V. Powell: In our country, knives are a tool of the trade, and in the interests the operatives concern, I have seen ergonomic knives designed for binding and slicing operations, but because they are not popular, they are very expensive to produce and workers by tradition use the knives that daddy used, etc. And if we are going to get this message across, to use redesigned tools, I'd be interested in how we can do it.

Cochran: I don't know. I think it needs to be done. We did a study 8 or 9 years ago, and looked at knives and knife handles and it was a very limited study, and in our opinion, my colleagues at Nebraska, the handles were too small. They needed to be made a little larger, both in width and length because the people dealing with them had large hands. I don't know that anybody has really adopted that, although the plastic handles designed now have a much better design than the wooden handled knives of that time. As far as getting things done, and getting the knife manufacturers and the big companies together to redesign and develop new knives, I'm not sure how it's done and I think it has to be done. I've got a fellow in Lincoln, Nebraska that's chomping at the bit to start a specialty knife company. I think it can be done, I think it can be done profitably, in this country, I don't know in Australia. It's the company that supplies the knives, most places, unless it's a small operation, where people bring their own knives and even in some large operations they bring their own knives, but I think there has to be a lot of work and I don't think I have a good answer. But anyway, I'd like to talk to you after this, I'm going to Australia in a month.

J. Regenstein: There has been mention from a number of the speakers of the role of education, and though many of us are involved in education, at times with the complexity with some of the issues we are dealing with, it's very frustrating to try to explain these complex issues to the consumer in a way. Are we unfortunately, barking up the wrong alley, in hoping that education will solve many of our problems?

J. Filer: I don't think as an educator, I would think that we're barking up the wrong alley, I know that Doug Archer is on record as indicating that he thought the government pamphlets and booklets aimed at educating food handlers and processors about the problems of food-borne disease are outdated and you know, not very effective. I certainly can concur with him on that. I think also as he has pointed out, that the curricular materials for use in the lower grades of schools are terribly out of date. So I think it falls upon all of us, is for some groups or group to decide what the message is they want to convey and as you all know, there's a whole industry out there called communications, that really knows how to sell concepts and ideas and I think we can sell good food safety by these same techniques. I'd just like to add one thing to that and that is education, especially in the area of nutrition, food handling and food product development, is a shared responsibility and I think the government, food manufacturers and people in academic life, the medical community and food retailers, all have to share in this responsibility of

education. The one caution is, we can't over-simplify and assume the food label is an educational vehicle. The food label serves many different purposes, one of them being informational, educational, one of them being product promotional. And in the past, I've seen efforts by government agencies to try to make the food label into the educational vehicle. I think that's fraught with peril.

J. Hodges: Obviously, we're concerned about the worker's safety issue, and if embarked on, a relatively extensive program to do as many of the things that you've outlined. One of the things I think that needs a little bit of clarification, you indicated that "pace" is a stress factor, which we obviously agree with, but we often make the firm believe that "pace" translates into "line speed." If you have but one person and double the line speed, put 2 people on and you have the same pace. Would you care to comment on that?

Cochran: Oh, I agree 100%, and that's why I put "pace" here, I tend to talk in terms of line speed, because sometimes, a lot of times, we will try to change the line speed without changing the man. But we're talking about the number of products for a person, per hour, per man, whatever, so line speed is not really base variable. Pace of the individual is base variable.