FATS AND FADS IN EATING PORK

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MISS CAMPBELL: Mr. Chairman and Members of the Reciprocal Meat Conference: It is a real pleasure to be a part of your program.

I did not realize that I was going to be the only lady taking part in the program and commenting on fats and fads in eating pork.

I am not doing it entirely from a feminine viewpoint. I am considering it principally from the viewpoint of a nutritionist, and I am also referring principally to the work of the National Live Stock and Meat Board and its research program. I will begin the discussion with the mention of fats and misconceptions in connection with pork, and then conclude with a review of the value of pork and lard and fat in the diet.

For many years there has been an unconfirmed idea that pork is less digestible than other meats, that its keeping quality is limited, and that it is high in calories and therefore fattening. Because of these factors, the erroneous idea developed that pork should not be fed to young babies; that senior citizens and calorie-conscious individuals should definitely limit the amount of pork in their meals.

Its use in the postoperative diet has been frequently restricted, largely based on these ideas.

The fear of trichinosis has also accounted for some prejudice against pork.

Definitely we need more basic information on the subject of digestibility. We need it on the subject of the digestibility of all foods, including pork.

Probably, too, a clearer definition of the term digestibility is needed. What is digestibility? Is it the length of time that a food is in the stomach or in the gastro-intestinal tract, or is it the time when a food is broken down and the amino acids appear in the bloodstream and are ready for utilization? Actually, pork when consumed with the fat trimmed is digested a little more slowly than other meats. According to Hawkins' digestibility studies the length of time that pork is in a rapid stomach is two hours and forty-five minutes compared with beef two hours and thirty-five minutes. So that it is actually in the stomach only ten minutes longer. Vegetables are in this type of stomach two hours, whereas cake is in the stomach three hours and two minutes. So the statement is made that pork is not digestible or that it is slowly digested, but when you compare it with certain other foods on this basis it is not true.

In certain cases this slower emptying time of the stomach may be desirable. It certainly makes pork a more satisfying food. It is possible that digestibility and the satiating value of food is sometimes confused.
According to statements made by authorities in the field, fat is as well digested as carbohydrate and protein and possibly even better digested.

The variability that is available in the calorie value of pork I think is an important consideration. The fact that one can have a trimmed product which is relatively low in calories and certainly comparable with other meat in calorie value or if desirable the fat trimming can be included in the diet, so that it is a valuable food for the person who wants to gain weight. Pork has this variability probably greater than any other meat.

Pork today, as we had evidence in the previous talk is markedly different than the product was 30 or 40 years ago. You men in the meat merchandising field have contributed much to improved packing, merchandising and distribution, and through your educational work in giving the consumer the type of product she wants. The pork, of course, is from leaner, meatier hogs, showing less fat. Actually, in addition to the fact that the pork on the market is leaner, many weight-conscious individuals are trimming the excess fat.

At the present time an extensive study is being undertaken at Oklahoma A. and M. College on the protein, fat and calorie value of pork as well as of beef and lamb. It is expected that at the conclusion of this study we will have information on the actual calorie value of meat as consumed. Much of the erroneous information that has been distributed has been based on the fact that we have not had studies on the lean portion only of a pork chop. The calorie value or the protein value in previous data have included the fat trimming of a pork loin roast, for instance, or a pork chop. But this study will bring us the latest data and should be valuable in publications used widely, including the Department of Agriculture information and consumer information. We frequently criticize diet booklets that give a high calorie value for pork but there isn't any data on lean pork only.

I also should like to mention briefly a little about pork in the weight control diet. For a long time the tendency was to think that the best type of reducing diet was one that was high in protein. Now we are maintaining the high protein level but also a moderate amount of fat in the diet has been found to be very satisfactory as far as weight reduction is concerned. One of the outstanding studies is that being done by Dr. Charlotte Young, of Cornell University. She has found that by including a moderate amount of fat in the weight reduction diet it is more satisfying, and a person is able to stay on it until the desired weight loss has been obtained. She has given 50 per cent of the calories from fat in her diet and has used it on both men and women at Cornell and found it very satisfactory. We will have to check with Jerry Wanderstock on the details, I guess. But I do think that this diet is one that the meat industry should be highly interested in, because some of the diets in the past have limited fat so considerably that only lean meat has been recommended and available.

Another reason that pork is particularly good in the weight reduction diet is because it supplies thiamine and, of course, energy that is needed during this period of weight reduction.
It might be said that at the present time pork is being fed to young babies. Research has indicated that it is a food that can be digested and it is a desirable food for young babies. It is popular with young children and an ideal food for teenagers. During the prenatal period when nutritive needs are increased, pork is highly recommended as a source of protein, B vitamins, iron and phosphorus.

Any discussion of pork, of course, must emphasize the importance of proper and thorough cookery. When pork is cooked to the well done stage there will be no danger of trichinosis or toxoplasmosis. Unfortunately, misleading articles on trichinosis have appeared in the newspapers and magazines and they have tended to reduce the consumption of pork. Also an isolated case of trichinosis is frequently given widespread publicity. From our clipping service some times we will receive dozens of clippings on one isolated incident of trichinosis. It is an indication of the publicity that this type of thing seems to have. But undoubtedly the progress that is being made in the radiation of pork is going to be the solution of this major problem for the swine industry. Recently in the Journal of the American Medical Association there was a report relating the disease, toxoplasmosis, to the consumption of underdone pork. You probably heard about this. Toxoplasmosis has no fixed incubation period, however, and it is not possible to trace a mass outbreak to the consumption of food at a common meal. The incidence of this disease, according to this article in the AMA Journal, is said to be from 30 to 70 per cent of the population from the ages of 40 to 60 years. Like trichinosis, it can be contracted from eating under-cooked infected pork. Nearly every case of trichinellla is contracted from pork. However, there seem to be other sources of toxoplasmosis.

According to Dr. Jensen, at Swift and Company, with whom I have discussed this briefly, again much more publicity is being given to the condition. Also it is not as serious as has been estimated by this particular article, and emphasis should be placed on the fact that it is possible to contract this infection in many ways other than consuming under-cooked pork.

This disease or condition is one that needs further research, and it is another reason that we should continually emphasize the importance of cooking pork to the well-done stage, since any danger would then be overcome.

At the present time our No. 1 health problem which is very significantly related to diet -- it is the No. 1 health problem particularly in the middle age man -- is atherosclerosis. Here again diet, and fat particularly, is frequently implicated. As you know, this disease is characterized by an accumulation of a cholesterol-containing substance in the arteries which eventually may cause blocking and reduced circulation and quite often fatality. Researchers throughout the country are working on the cause of this accumulation and methods of dislodging it.

I am going to dwell particularly on the projects that the Board is interested in.

Another problem in connection with this condition is the level of the cholesterol which is circulating in the blood and its relation to
diet. Several experimental animals are being used in these studies including the chick, the rat, the guinea pig, the dog and the monkey. One theory of the disease is that protein or certain essential amino acids, particularly the ones that contain sulfur, may prevent this accumulation in the arteries. Many believe that fat is implicated and that this disease may be the result of too much fat. Another theory is that it is the type of fat rather than the amount of fat in the diet. Some believe that hard fats, such as the hydrogenated fats, may possibly be more damaging than soft fats such as lard and oils. However, several researchers are concentrating on the role of fat and I should like to refer to their work particularly today.

Dr. Holman, of the Hormel Institute, has indicated that when there is a high cholesterol level in the diet, the intake of essential fatty acids may help prevent any damage. He has found that a high blood cholesterol level seems to increase the need for the essential fatty acids. Of course, lard is one of our important sources of essential fatty acids and may, therefore, possibly offer some protective value.

Dr. Kummerow, of the University of Illinois, has emphasized the fact that cholesterol is manufactured in the body and that the amount consumed normally in food is not a hazard. However, cholesterol in the body may be manufactured by dietary carbohydrate. Dr. Kummerow has investigated the possibility that a high protein diet may reduce cholesterol synthesis in the body. He has reported that hydrogenation of fats results in the formation of trans-acid forms which may not be as readily metabolized as lard and natural fats. These trans-acid forms have developed when hydrogenated fats have appeared in the atherosclerotic tissues which they have examined in persons that have died of coronary disease. They have found that these trans-acid forms are present in about 10 per cent. They make up about 10 per cent of the fat. It is possible then that more of the hydrogenated fats may be retained in the body and be deposited in the arteries and, therefore, be a hazard to health. He has emphasized, too, that the essential fatty acids which are present in animal fats cannot be synthesized by the body, that they must be present in the food, and if they are essential then the fact that they cannot be synthesized is an important reason for including them in the diet.

Dr. Stare is another researcher who has done a great deal of work in this field, and he has developed atherosclerosis in monkeys by feeding a diet which contained insufficient amounts of sulfur-containing amino acids. After developing this condition in the monkey he has operated on the artery and removed part of the artery, and he is now feeding it a so-called protective diet or a curative type of diet to see if he can clear up the lesions in the artery that still exist. After developing the condition he has removed some of the tissue, and he is now feeding a curative diet to see if the remaining lesions can be cleared up through diet.

Dr. Stare has emphasized the role of certain types of fat in increasing the level of blood cholesterol. His report indicated that hydrogenated fat may be more damaging than soft fats, such as lard and oils.

Dr. Stare has reported that he has given injections of fat emulsions to patients who have cardiovascular disease and abnormally high blood fat levels. Although the blood levels were slower in returning to normal
in these patients that had high blood fat levels after being given infusions of fat, they returned to normal eventually and he finds that he is unable to explain why the fat infusions resulted in a lower blood fat level after they were given these injections of fat emulsions. In one case he found a decrease of 60 per cent in the blood fat level in seven days. After giving an infusion of fat to the patient who had a very high fat level there was a drop of 60 per cent in the blood fat level in seven days. Dr. Stare reported this just recently at the American Chemical Society meeting in New York.

Dr. Stare has continually emphasized, as have other researchers, the importance of maintaining normal weight and the role of exercise. In addition he believes that the B vitamins, choline and pyridoxine, may play a role in this condition.

The indications are that we need more information on the subject of pyridoxine, and Dr. Schweigert, of the American Meat Institute Foundation, is one of the researchers who is working in this field.

On the positive side as far as meat and fat in the diet are concerned, we are getting more and more evidence of the value of the essential fatty acids in human nutrition.

Dr. Hansen, at the University of Texas, Medical Branch, is continuing to study the role of essential fatty acids in the health of skin. He has recently reported that more calories may be needed on a low fat diet than one which contains a moderate amount of fat. Thus the moderate fat level being recommended by Dr. Young and others seems logical.

Studies on experimental animals have indicated that unsaturated fats, such as lard and oils, may have a protective effect when animals are exposed to radiation. This is from some of the work that Dr. Duo and his group at California have done.

Reports from the American Meat Institute Foundation and from Dr. Doty and his group suggest that fat may have a protective effect against the development of off-odors during the irradiation of meat, and may help to explain why there is less objection and organoleptic changes in pork than in beef.

It seems that fat supplies in many parts of the world are extremely limited. Few studies of fat-deficiency conditions have been made, but we know that during wartime in certain parts of the world they reported inefficiency of workers, and that there was a craving for fat in areas where people were seriously restricted in the amount of fat available, and skin conditions, too, occurred widely. Whether this was entirely due to the fat-deficiency, of course, is not definite.

Dr. Stare has reported that, in contrast to the fat deficiency and the lack of fat in many parts of the world, in the United States the per capita fat intake has increased from 135 to 148 grams per day from 1935 to 1955. This may be partially due to increased consumption of meat, milk and eggs, and a decrease in cereal and potato consumption. The average American diet supplies from 36 to 46 per cent of the total calories in
the form of fat. Of this amount, approximately 70 per cent is from animal sources and 30 per cent is from vegetable sources.

In general fat increases the palatability of food and insures the intake of nutritious food. It gives value to a meal. A meal which contains fat stays with a person longer than one which supplies less fat. This may be due to its slower digestibility, but although it is digested more slowly, it is almost completely digested.

One of the advantages, too, of lard is that it has a lower melting point. Its melting point is closer to that of body temperature, which explains why it is probably more readily emulsified in the digestive process, and its over-all digestibility is something that is very important.

Researchers recently have warned against the dangers of a too low fat diet. Many people are recommending a low fat, low cholesterol type of diet, and yet Dr. Irvine Page, who is one of our outstanding authorities on cardiovascular disease, has said that he has seen symptoms such as stomach and intestinal upsets, depression and irritability follow severe fat restriction. This is the type of fat restriction that many people undertake in cases of heart disease. The trend toward reduced fat and lower protein intake may produce undesirable nutritional deficiencies.

As yet the significance of a higher blood cholesterol level is not known. Whether a higher level in the blood may mean that less cholesterol is deposited in the arteries has not as yet been determined. Pork has long been known to be an important source of thiamine and, of course, it is recognized as one of our outstanding sources of this important B vitamin.

Recently another factor has been discovered in pork under the direction of Dr. Elvehjem, at the University of Wisconsin. Research has indicated that pork muscle protein has a protective effect in animals that have been exposed to stress. This protective factor in pork has not as yet been identified. Pork is superior to casein in this connection. Animals fed as high as 42 per cent pork protein survived the 60-day period whereas basal animals fed casein died after an average of 30 days.

Pork muscle has a favorable effect on the liver enzyme system which may be altered during hypothyroidism. More research is needed to isolate this protective factor in pork and investigation of its action.

We all know that pork liver is an outstanding source of iron and that actually it contains almost three times as much as beef liver and about one and two-thirds times as much as the more expensive calf liver. I think that nutritionists and dietitians would do well to emphasize more the importance of pork liver as a nutritious food.

In summary, the role of pork and fat in nutrition is very much in the limelight today. Further research into the problem of atherosclerosis with regard to diets, and fat particularly, may actually strengthen the role of high quality protein foods such as pork which also provides other dietary essentials. More and more research is needed as to the role of pork as the source of essential unsaturated fatty acids and of lard,
its by-product. Many of the fads and misconceptions which formerly existed with regard to pork have definitely been overcome, but education is continually needed to correct and counteract much of the misinformation about pork and fat in general.

More emphasis should be placed on the positive value of fat as an essential nutrient and as our most efficient source of energy.

I should also like to refer in closing to an article concerning the problem of pork and fat in coronary disease which appeared in the Journal of the American Medical Association which is called, "Eat, Drink and Be Coronary." It gives a little humor to the situation, and it refers to an Englishman who has been dieting to cut down his weight. Then he reads an article saying that fat is not really the menace but cholesterol. It goes on to say:

"He has never head of cholesterol which sounds to him like some kind of motor oil. This is the unhappy difference between himself and the more progressive American hypochondriac. Instead of shuffling around hopefully eating nothing, the American sweeps through the door of his doctor's office, bears his arm, and demands, 'Say, doc, take my blood cholesterol, will you, and if it is over 220 milligrams, boy, am I for the high jump.'

"The British dieter has to read down the column to discover that, whatever cholesterol is, eggs are full of it. Despair at last overcomes him. The boiled egg is his last connection with the world of sane gastronomy, and now his breakfast looks as dangerous as a hand grenade. He breaks down and weeps and is shortly afterwards taken by ambulance to a psychiatric hospital as a case of anorexia nervosa.

"It is unsporting of Fleet street never to mention the two most important facts about heart disease -- that coronary thrombosis is uncommon in Italy and alcohol has an excellent pharmaceutical effect on the coronary arteries. So if you remain permanently bottled in a vial in Sorento you won't have anything to worry about as long as you don't read the papers."

Thank you very much.

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CHAIRMAN PEARSON: We wish to thank you for your appearance on our program, Rita, and we certainly enjoyed your talk.

The Chairman of the Pork Carcass Evaluation Committee reminds me that we have one other person listed on the program to speak and unfortunately that person cannot be present. As a result of this, we have a substitution for this speaker and a substitution of the subject. Our next speaker will discuss the preparation and freezing of pork carcasses for demonstration purposes. To present the subject we have Dr. L. E. Walters of Oklahoma A. and M. Lowell.

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