The Dietary Goals for the United States published by the Senate Select Committee on Nutrition and Human Needs essentially state that Americans eat too much—they eat too much meat, too much fat, especially saturated fat, too much cholesterol, too much sugar and too much salt. They should eat more fruits, vegetables, grain products, especially whole grain products, and unsaturated fat. It is clear that a statement of this kind is not very useful, even if you agree with the generalities, unless some quantitative estimates are provided. You cannot translate the statement into a dietary pattern without at least suggesting what is meant by too much and what might be a reasonable intake. The report suggests a reduction of fat from the current level estimated to be between 40 and 45% of calories to about 30% and that one-third of this should be saturated and one-third polyunsaturated fatty acids; that the diet should not contain more than 15% of calories as sugar. These changes would result in an increase of total carbohydrate consumption to 55-60% of calories of which 40-45% would be starchy materials. It is recommended that protein should provide 12% of calories; that cholesterol intake should be of the order of 300 mg/day and salt about 3 g/day.

It is important to emphasize that such a diet does not represent an ideal diet. We do not know what an ideal diet is. The Dietary Goals are an attempt to arrive at a more reasonable dietary pattern than the diet of most Americans. I cannot review much of the evidence upon which the Dietary Goals are based, but the major health problems of the United States and other affluent countries are coronary artery disease, stroke, cancer, diabetes, hypertension and obesity. These are the diseases which kill Americans and extract a tremendous toll in medical costs, disability, and premature death. Treatment of these diseases is ineffective. There must be increasing efforts toward their prevention or amelioration. All of these diseases are clearly associated with the diet we eat and many other countries with less rich diets do not have this disease pattern. In addition to the epidemiologic evidence there is extensive animal experimentation which supports the proposition that diet is an important causal factor in all of these diseases.

The best experimental evidence is available for coronary heart disease. This disease alone kills something of the order of 600,000 Americans, many of them before age 65 or whatever a suitable retirement age may be. There is sufficient evidence demonstrating a causal relationship between diet and this disease alone to recommend that Americans change their diet. There are abundant data showing that:

Inappropriate diet → elevated serum lipids → atherosclerosis → heart attack

It is certain that the dietary factors primarily responsible for this sequence of events are the amount and composition of dietary fat and the cholesterol content of the diet. It is important to emphasize that in American men the serum lipid levels rise during the late teens and 20's, many have extensive atherosclerosis in the 20's, yet coronary heart disease begins to become significant in the 30's and 40's and progressively more men have heart attacks as they become older. Thus, it is certain that the early atherosclerotic lesion which develops in young men does not induce heart attacks directly. It is also certain that the severe atherosclerotic lesions

*The views expressed in this paper are those of the author and not necessarily those of the USDA.
which occur later are nearly irreversible. It is important to emphasize this since it means that dietary modification in middle-aged atherosclerotic men cannot be expected to have much effect on this process. As many of you are aware, a number of current dietary trials are now underway. These may be worthwhile but they cannot demonstrate the ultimate effect of diet upon coronary heart disease. A truly definitive experiment is beyond our capabilities. It would involve the recruitment of a cohort of teenage boys, feeding them a diet which would prevent the development of hypercholesterolemia and determining the disease pattern over the next 20 or 30 years or longer. This is essentially an impossible experiment. Many people have optimistic and unwarranted expectations about what the current studies may or may not show.

I would also emphasize that if we considered the data available and were truly interested in minimizing the occurrence of heart disease, it is certain that the dietary recommendation would be much more severe than that suggested by the Dietary Goals. Populations that have very little atherosclerosis, and almost no heart attacks, consume extremely low fat and otherwise restricted diets by our standards. Quite frankly, most of us will probably opt for the heart attack, cancer, diabetes or hypertension--which are going to get almost all of us--rather than consume such a diet for a lifetime. Once we are sick--as has been emphasized by a recent television report--we may then be willing to submit to such a diet. It is interesting, incidentally, that the television report indicated, as I have already, that the severe diet did not appreciably modify the underlying atherosclerotic lesion--the electrocardiogram of the patients did not change. A considerable number of smaller dietary trials have already been reported. These have generally shown a modest reduction in heart attacks. More severe dietary restriction may produce more favorable results. We must assume, however, that these improvements are explained, not by modification of the atherosclerosis process but by other mechanisms, possibly by changes in blood pressure and by a reduction in the thrombotic process which is the terminal event in many heart attacks. Whatever improvement can be obtained, it would seem quite certain that the earlier the dietary change is achieved, the greater the effect will be.

It is important also to emphasize that our overall objective is probably not to eliminate heart attacks. It is not likely that immortality will be achieved by good dietary practice. Our objective is to have people die young as late as possible. It would be a tremendous accomplishment if we could delay heart attacks, cancer, stroke, diabetes and hypertension so that they were not prominent causes of death or disability before age 65. Of course, many of us are old enough so that delay to 65 does not seem much of an accomplishment.

What we must search for is some dietary pattern that is "reasonable." Recommendations for dietary changes that are too severe will be ignored by most of us. Some people will establish Goals that are more than we can reasonably expect to achieve--to be President of the company, to make a million, to live to be a hundred, etc. This kind of goal does not mean that we consider that we have accomplished nothing unless we achieve it. Excessive expectation, however, can be discouraging and I believe we are searching for something that we can expect Americans to do.

It is important to emphasize that the nutrition strategy which has been developed in the United States and elsewhere over the past 50 years has been aimed almost totally at the prevention of nutritional deficiency. With the discovery of the vitamins about 75 years ago and the recognition that pellagra, scurvy, xerophthalmia,
beriberi and rickets were important causes of death and disability, the primary
goal of nutrition became and has been since that time to assure an adequate intake
of all essential nutrients. This was tempered slightly by the recognition that
obesity was undesirable but the essential message that we have promoted has been
and is "Eat more meat, more milk, more eggs, more fruits and vegetables, more
cereal products--more of everything--but don't get fat." This message was devel­
oped when we had no idea about the ultimate effects of such a diet and essentially
no knowledge of the relationship between diet and the chronic diseases which now
beset affluent societies.

Nutritionists have often pointed out, correctly, that the great advances
which flowed from Pasteur's discoveries demonstrating that disease was caused by
infective organisms greatly retarded the acceptance of the fact that disease could
also be caused by a deficiency or lack of something in the diet. The theory of
infectious disease caused practically everyone to search for a positive causal
agent and the associations between poverty, poor hygiene, and deficiency disease
made it extremely difficult to eliminate infection as a possible cause of pellagra,
for example.

To a considerable degree, nutrition is now faced with a similar problem. We
have devoted nearly all of our efforts to assuring an adequate diet--defined as
one which contains enough protein, vitamins and minerals. The proposition that
much of our ill health is due to overnutrition--not only simply eating too much
but eating too much of specific materials--is not easy to accept. It will require
a substantial revision of nutritional thought and the nutritional education mes­
ages. I should point out that nutritionists cannot claim very much of the credit
or blame for our current situation. What we eat is largely the result of our
affluence, the agricultural system and the sum of the effects of the food industry.
The message, however, has been the same wherever you heard it.

No one is suggesting, of course, that it is no longer important to maintain
an adequate intake of essential nutrients. Clearly, it is. We do have some under­
nourished people in the country but, fortunately, the number is small. They must
continue to receive appropriate attention. The only relatively prevalent defi­
ciency disease that we can identify is iron deficiency. This is not limited to
poverty groups. Severe iron deficiency, however, is not common and generally
requires medical attention. Nearly all nutritionists will agree that we should
minimize iron deficiency and we could certainly do it. The problem has been, and
continues to be, that we have not been able to convince the medical establishment
that it was a sufficient problem to require preventive efforts. It is certainly
not in the same league as heart disease and the other killer diseases. It is also
certain that we do not have to overeat to avoid iron deficiency.

Most of us have seen a recent report which indicates that deaths from heart
disease have declined in the past 10 years or so. This is great. The cause is not
clear but it is what we should expect. The American Heart Association has for
several years been advising a diet similar to that of the Dietary Goals. The
American public has certainly heard of cholesterol--both dietary and serum choles­
terol. Consumption of eggs and butter is down; consumption of unsaturated margarine
is up. Many more people are jogging and exercising in various ways. Treatment of
hypertension and diabetes which often cause heart disease is better. A considerable
portion of the public has gotten the message about obesity and has done something
about it. The severe hyperlipidemias are now clearly recognized as a health hazard
and dietary treatment is prescribed. Both medical and surgical treatment have improved. We should expect an improvement in the situation. But we must also be aware that this improvement leaves a long way to go. There are at least 200,000 premature deaths from heart disease and as we improve the situation our definition of premature will be later and later. We must continue to do what we have been doing but with more vigor at every level.

It has been argued that a dietary pattern such as that suggested by the Dietary Goals is not appropriate for children, pregnant women and others of the population. There is no nutritional basis for this. The protein intakes of Americans are so high that they greatly exceed all reasonable estimates of requirement. The diet suggested would not necessarily reduce the intakes of vitamins and minerals. Indeed, it may very well increase the intake of most. It should also be emphasized that in a technological society of the kind we have the provision of vitamins and minerals is technologically easy. Fortification of foods can be expanded or restricted as we see fit. You simply cannot justify a diet which produces chronic disease in order to obtain sufficient vitamins and minerals.

Nobody expects the American diet to change overnight. Nutrition education, fortunately or unfortunately, whichever way you view it, does not appear to be very effective. But it is clear that the public is demanding better and more explicit information all of the time. As I have already indicated, whatever you may think, the Dietary Goals proposed by the McGovern Committee are relatively moderate recommendations. What the Dietary Goals mean in terms of food is something like this: Less meat and leaner meat and some substitution with poultry and fish. The protein consumption of the American public is now excessively high. It has no nutritional justification and my guess, for what it is worth, is that evidence will continue to accumulate to show that the high protein consumption is undesirable in itself and not only because meat is a primary source of saturated fat. It means less eggs and butterfat. The dairy industry should begin to look at the restrictions it has imposed upon itself that inhibit the production and marketing of low-fat products and modified dairy products. It means less sugar of all kinds. Products are going to have to be labeled with sugar content and saturated fat content. Sugar, whether deserved or not, has caught the public's eye and there is essentially no nutritional defense of products high in sugar. Products will almost certainly have to be labeled with cholesterol and salt content and, again, there is no positive argument for high consumption levels. It means increased consumption of polyunsaturated vegetable oils in all forms. It means increased consumption of all kinds of fruits and vegetables. This should mean an expansion of the areas producing these nearer to the consumers. It means increased consumption of breads, cereals, and potatoes. These have been the whipping boys since obesity became a popular subject but unjustifiably so. The calories in bread, pasta, and potatoes are not more likely to produce obesity than other sources of calories. Indeed, a leaner diet with less fat and sugar is likely to be helpful in controlling excessive intake of energy.

Some people have argued, of course, that we do not know enough to recommend a change in the American diet. I believe that we know so much that we cannot afford to ignore what we do know. We are dealing with the most important medical problems of our time. Many countries now have a better health record than we do. Sweden which has one of the best has already adopted national nutrition goals similar to the ones we are discussing. The issue is not have we proven that a change in diet will be beneficial or can we predict the results of a moderation in the diet. As I have indicated we do not have the technical capability to answer some of the
questions we can easily ask. We can, however, ask what are the proven benefits of the American diet. There are no positive arguments for a diet which is high in fat, sugar and cholesterol and there are a host of arguments against it. The real issue is how soon, by what mechanisms, and how rapidly we move to encourage consumption of a more moderate diet.