

retaries of State, Labor, Transportation, etc., would serve but chaired by the Food Administrator. The policy so determined would be carried out by the various departments and agencies.

Mr. BROWN. Thank you very much, Mr. Jaenke. Your presentation has contributed a great deal to my own understanding of this situation, as I am sure it would every Member of Congress, and we appreciate it very much.

I am going to defer questioning until we hear the additional presentations and hopefully Senator Humphrey will be here also to participate in the questioning by that time.

I understand the next presentation represents a joint paper prepared by Professor Cochrane and Mr. Seth.

If I am correct in that, Dr. Cochrane, you may proceed and make your statement.

STATEMENT OF WILLARD W. COCHRANE PROFESSOR OF AGRICULTURE ECONOMICS, UNIVERSITY OF MINNESOTA, MINNEAPOLIS, MINN.

Dr. COCHRANE. Thank you.

We are going to divide the paper in the following way. I am going to talk about what we think are two great problems and what the policy solutions to them are.

Mr. Seth is going to talk or focus more on what the Government organizational needs of these problems would be.

Chairman BROWN. Do you have copies of your papers there?

Dr. COCHRANE. Yes.

Chairman BROWN. You may proceed.

Dr. COCHRANE. As I said, I would like to talk about what I consider to be two great problems confronting U.S. consumers and reducers of food. To an important degree, these problems arise in the United States from developments taking place around the world and, hence, make the policy confronting U.S. consumers and producers of food different from what we have been used to in the past and these problems are somewhat more difficult to deal with.

9 The first problem I would mention is what I call the food price trend problem. I expect the real price of food to increase over the next 25 years. This is in somewhat contradiction to the summary of reports that Ed Jaenke reported, and it is somewhat different than Professor Tweeten is going to say.

e The other problem is the price variability problem, particularly the grains that Mr. Jaenke emphasized.

I think the position of Mr. Seth and myself on this variability problem and grains is almost exactly as our colleagues see it.

The price elasticity of demand for grains is very inelastic. We have weather fluctuations and fluctuations in growing conditions around the world. Small changes in supply create very great price movements. Since the United States is linked to this world market—I read where now we are supplying 50 percent of the grain moving in international trade—anything that happens in the Soviet Union or India in the way of variation in production is immediately reflected in price movements in the United States.

It seems to me that there is an increasing agreement that the problem is here, and it is not going to go away because *weather* is not going to become more stable. It is generally reed that private trade cannot deal with this kind of problem and the elasticity of demand is not likely to change.

So, although we cannot predict within any certainty whether the prices are going to go up or down next year, we can predict with almost certainty that this short-run variability problem will be with us and prices can and will move in the extreme.

I will not say more about this problem.

With regard to the long-run price problem, trends problem, there is a great deal more disagreement in this area.

We argue in our paper that the real price of food is likely to increase in the long run. We have not, in our paper, done elaborate econometric analysis of this. I am greatly impressed with the ones I see around the world because, basically, what everybody is doing is assuming that what happened in the 1960's is going to continue in the 1970's and 1980's. If you put into your econometric model the growth trends of the 1960's, you get out of it as results in the 1970's the same as you had in the 1960%.

So if per capita food consumption around the world remained almost constant as it did in the 1960's, and if that is the stuff you put into your estimating models, that is what you get out in the 1970's and 1980's.

I will argue that the real price of food is going to increase for three different kinds of reasons. Two, I think, are certain as the sun coming up--well, not quite that certain, but pretty certain--and one quite conjectural, but I would like to raise it.

The first consideration are the supply considerations. It is commonly said there is plenty of land around the world.

With that I would agree, there is a lot of land around the world. The problem is that there is damn little land around the world that is readily available for cultivation. Even in our own country, when we bring in any new land, it is typically going to be low-yielding land or we have got to invest heavily. into it to make it high-yielding land, which means lands will come into production, if and only if product rices rise. The price of the product must rise enough to bring the poor land into production. You can make any acre productive if you will spend enough money on it.

The same holds true with regard to water. In I@@ you have got to pump it from lower depths. Here., you have got to move it longer . distances.

Water is short. It can be obtained. You can convert sea water into fresh water if you want to spend enough money on it.

The point I wish to make is that both of those resources are becoming increasingly scarce and are going to be scarce, and the only way you can bring more of them into production is to pay more for them.

Turning to the demand considerations. In the 1960's we were all surprised, impressed, and pleased with the great increase in the demand for grains in Western Europe. and in Japan to produce more meat in those areas. So our commercial exports of grains increased significantly in that period.

During the early 1970's, we have seen Eastern Europe and the Soviet Union moved from exporters in grain to very large importers

of grain. Why? For the reasons Mr. Jaenke said, they want to maintain their livestock herds. They want to increase their per capita meat consumption.

What many people do not realize is that as development is occurring in the developed world, what is happening is that people in the developed world want to eat like people in the United States eat. They want to eat more meat) and they are importing grains from North America to do it.

This has been a very important factor, tightening the international grain market. And as long as development occurs in the Western World, there is going to be increased demand for our grains to produce that meat.

The other demand factor is that the world population is going to double in the next 25 years. The young people who are already *on* the Earth are going to reduce the babies. So we are going to have to double our food production in the next 25 to 27 years. These factors are going to be very important demand factors, increasing demands for grain.

The two conjectural considerations that I would mention that make the future tenuous are as follows: Farm technological advance is sputtering. I use that word "sputtering" advisedly. We have had no technological development recently comparable to hybrid seed corn in the United States of two decades ago.

What is going on around the world now is that we are refining many, many things. All of these refinements are helping to increase production. These refinements are slowly increasing food production per acre. But there has been no dramatic breakthroughs in the last 5 years. Maybe one will occur next year.

Maybe we will learn how to double the yield of soybeans. I will not say we will not. All I am saying is that farm technological advance is presently sputtering.

It is not pushing yields up with the regularity and persistence that occurred in the 1950's or the 1960's. That is one conjectural element of the future.

The second conjectural element is with regard to the weather. The Northern Hemisphere is cooling. It has been cooling for the last 25 years. These trends can run anywhere from 50 to 200 years in duration. I do not know whether the Northern Hemisphere is going to continue to cool, and a little ice age is going to come along in the next 100 years or not. All I know is it has been cooling for the last 25 years.

History suggests that these waves go in long movements. We also know that with the cooling of the Northern Hemisphere, that weather and crop growing conditions become more variable in the monsoon areas—where the rains come in off the ocean. My guess is, or my judgment is, that on the basis of changing climate, that crop growing conditions over the next 10 or 20 years are not going to be any better than the last 10 or 20 years. And they could be a lot worse.

I admit these last two points are conjectural.

But I think there is enough substance to them that they need to be taken into consideration. They do not lend credence to the fact that you predict by just projecting the trends of the 1960's into the 1970's and 1980's and expect development to be the same.

Now, how do you deal with these problems?

With regard to the variability problem—there has been enough work in the last 5 years to suggest how you deal with a shortrun variability problem. We need to develop an international grain reserve program to deal with this problem. It can be done by the United States alone. The quantities involved are no more than we held in 1960. It could be done by the U.N. if the U.N. had the administrative capacity to do it, which I doubt.

And, as Senator Humphrey has heard me say in the past, I think it will most likely be done, if it is going to be done, by four, five, or six of the leading importing and exporting nations of the world getting together and forming an international agreement to stabilize grain prices.

How would this occur ?

One formulation could involve the stability of grain prices within a plus or minus 10 percent of trend. I am going to publish a document in the near future, probably within the next 2 months, which is going to suggest that we can stabilize world grain prices within 10 percent, plus or minus of trend, with an average reserve grain stock of 60 to 70 million tons, with 90 percent probability of achieving the stabilization objective.

You cannot make sure that you always hold the prices within a range, plus or minus 10 percent, without carrying a very large stock. This means that in 1972 or 1973 if such a program had been in operation, it would not have completely held prices within 10 percent of trend, but it would have kept prices from rising in the extreme fashion that they did.

So my first point is that we need an international reserve stock program. It is feasible in terms of the quantities. It is feasible in terms of achieving reasonable prices stability. The only thing that is lacking is wise and strong leadership from some of the leading nations.

If we can get some wise leadership from countries like Japan, United States, Germany, Australia, and Canada, such a program can be brought into being.

It seems to me that the United States, in light of our key position in the world, should provide the leading part of that wise leadership. And we are not getting the kind of leadership that I think we need to deal with this problem.

Mechanically, it is feasible. That is the point I want to make. It is not, out of the question. The people around this table could provide the administrative and type of economic advice that is needed to run such a thing. It is the leadership that is lacking.

With regard to the long-term problem—we have a very much more difficult problem. To deal with it two things must happen. Or we must make them happen.

One is we have got to have a worldwide research and development program, an R. & D. program, with the capacity to bring about rapid technological advance again, not only in agriculture, but also in energy.

Because much of the technological advance in the last 30 or 40 years has been the substitution of cheap energy for human labor, we must have an effective worldwide research and development program that can step up the rate of technological advance in the energy field.