Future of Soy Protein Foods in the Marketplace

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ABSTRACT

The food and commodity markets of 1973 signal a fundamental change in values of foods and agricultural products in relation to other goods and services. By 1985 non-traditional protein sources will be depended upon to supply a greater share of world demand for all proteins. By that time use of soy proteins for feeds and specialty foods can be expected to take 2 1/2-3% of an estimated world production of 81 million metric tons/year.

INTRODUCTION

Like the Gaul of Julius Ceasar, the world market for food is divided into three parts. The oldest and often the most underrated sector is the food people produce for themselves. In our urbanized societies, home-produced food fades into the background. In low income countries with large rural populations, it is a major or even predominant factor. In time of war, or sharply higher prices, home-produced food becomes more important in the developed countries as well. (The war-sponsored backyard gardens of World War II are being revived today as "inflation gardens" in many areas.) Second is the commercial market where consumers buy their own foods with their own money at free market prices. This includes the food-service market where there is a choice of menu. The most important characteristic of this market is that people buy what they like within the framework of what they can afford. Except for their small children, only a tiny fraction of the people buy food for its nutritional values. The third market, which has been in operation since World War I with only a brief respite in the late 1920's, is the public sector market where governments buy food or subsidize foods for various classes of people for various reasons. This includes the world-wide school lunch and school breakfast programs, the relief feeding programs for low-income families, government-sponsored industrial feeding programs, the military, and the public institutions. In this sector, nutritional and budgetary considerations loom large. Personal preferences tend to be less important.

In considering the future markets for soy proteins, the first sector, home-produced foods, can be quickly eliminated. Outside of the Orient, few people, if any, will produce soybeans for home consumption. Other foods produced will not affect markets for soy proteins except as they either de-commercialize potential demand or release purchasing power into the commercial market.

In the commercial market, one popular bit of recent mythology should be laid to rest. Rising meat prices and meat shortages have led to considerable talk about gradually moving the human diet away from livestock and poultry products as a whole and using our global land resources for more aesthetic purposes. The evidence of the ages is that nothing of the sort will happen. The races of man who have survived on this planet for more than a million years as hunters and fishermen will not be cajoled into giving up their taste for meat, fish, poultry, eggs, and milk. On the contrary, human preference for these foods will continue to be the dominant factor in the food markets of the world for many years to come. Those vegetable proteins or other non-livestock protein foods which find success in the commercial marketplace will be the ones which relate in one way or another to the traditional protein foods as extenders, analogues, and enrichment additives.

THE WORLD'S SUPPLY AND DEMAND FOR FOOD

In 1973 the commercial markets for foods appeared to go berserk. Nothing from past experience seemed to explain $10-12/bushel soybeans, $400-600/ton soybean meal, $5-6/bushel wheat, or the wildly erratic prices for meats. In the back of everyone's minds at this Conference is one vital question: what are these markets telling us about the world's supply and demand for food—and especially proteins—in the future?

One thing they tell us is that world markets can react more dramatically than we ever dreamed to temporary shortages caused by the weather. As we all know so well, 1972 crops were reduced by drought or by excessive and untimely rainfall in Russia, China, India, Thailand, Indonesia, Australia, the Philippines, Canada, the U.S., Mexico, Central America, sub-Sahara Africa, and South Africa. At the same time, the anchoveta disappeared from the Humbolt current along the West Coast of South America, and Peruvian fish meal production stopped.

This world-wide shortfall in production was largely met by drawing on the historic surplus stocks of feed grains in North America, Argentina, and Australia, and of certain dairy products in Europe. The surprise comes when we learn that 1972 world agricultural production was only 1% below the record production of 1971, and was the second largest production year in history. In Russia the grain harvest of 1972 was just 10.2% below their peak production of 1970. It was not as severe as the 23.5% drop in 1963 or the 13.5% drop in 1967. India's crop losses in 1972 were less drastic than the droughts of the 1960's. And it is well known that the anchoveta disappear from the Humbolt current for one season ca. every 7 years. This time they seem to be slower to return, presumably because of over-fishing in 1970-71.

Bad weather, short crops, and even poor fishing at times are not new. But runaway markets fired by unrelenting demands for food and feed are new. They point to a new and different world food market situation which has been developing for some time. The factors are fairly fundamental.

First our capacity to increase production of traditional proteins is becoming limited. From the oceans of the world, our annual production of seafoods apparently has reached its maximum potential in the last few years. World fish harvests increased ca. 5%/year from 21 million tons in 1950 to 69 million tons in 1970. Since then harvests have dropped from 64 million tons with reduced catches not only in the Humbolt current but in all the major fishing beds of the world. Oceanographers generally agree that many species are already being overharvested, and that future total production is more likely to plateau or decrease slightly than it is to increase. If their conclusion is true, on-going increases in production of proteins for both foods and feeds will depend on land-based resources.

As for agricultural land, the reserve acres which have been held out of production in North America since the 1930's (except for times of war) largely have been put back to use. Twenty-five million U.S. acres went back into cultivation in 1973. Nineteen million acres are presumably available for 1974, although best estimates are that only 6-7 million additional acres will be seeded to crops. The North

American continent is approaching its maximum acreage utilization for agricultural production. Other areas of the world offer limited opportunities to increase the land areas already being used for agriculture.

Second, the long-standing reserves of "surplus" grains in the major exporting countries—Canada, the U.S., Australia, Argentina—have been reduced in the last few years to "working" or "pipeline" supplies (ca. 100 million tons of grain, equivalent to about one month's world utilization).

Third, carefully detailed elasticity studies of world demand for grain for human consumption, for livestock and poultry products, and for feedstuffs indicate that higher per capita incomes in any country generate greatly increased demand for the animal proteins. This shift in demand requires substantially more grain to feed the same population. Per capita grain requirements range from 180 k/year in the low-income countries where it is directly consumed by humans to ca. 900 k/year in North America where it is mostly fed to livestock.

The world's population growth, ca. 2%/year, is being rapidly outpaced by the growth of real income, which now averages 3-4%/year. In many countries, such as Korea, Taiwan, Japan, the Crown Colonies, France, and others, real income per capita has been increasing at 5-12%/year. This means that large portions of these populations are entering an income level where they demand more meat, milk, and eggs along with their rice, bread, or potatoes and, they have the money to pay for it. While the normal 2.92% annual increase in agricultural production can keep ahead of the population, it is not able to stay ahead of this increased demand for protein foods generated by the present rate of infectious prosperity.

U.S. Secretary of Agriculture Earl Butz has said: "Economic growth and rising personal incomes around the world are being translated into effective demand (for food) at a rate that is difficult to comprehend and impossible to predict."

Another big factor in this year's commercial markets has been the dramatic change in monetary values, especially devaluation of the dollar. Rather than being a primary cause of commodity market movements, however, we see both the new monetary values and the higher commodity markets as dual results of the world's shifting allocations of both human and natural resources.

Regardless of their location, the millions of people who have been low-level consumers of traditional proteins are the world's unemployed and the underemployed whose time and talents are not being used productively in the agricultural, manufacturing, and service industries. Agriculture everywhere is losing population as land-bound peasants and farmers leave the countrysides for the cities and for greater economic opportunity. In all countries to some degree, and in many countries to a high degree, these labor resources and talents have been incompletely or inefficiently employed—or both—for lack of capital, technology, and management. But as one generation of relative peace extends into another, and the world's capital resources are not devoured by the maws of war, development capital becomes available in huge quantities. Today's Euro-dollar supply alone represents a $100 billion slush fund which can be moved from one area to another at the click of a telex.

WORLD-WIDE DEVELOPMENT

The development of both production and marketing technology and management skills in the emerging countries around the world is perhaps the real miracle of the 20th century.

Devaluations of the pound sterling, the dollar, and certain other currencies in recent years reflect the changing competitive advantage that these economies have in relation to the newly emerging and the reemerging producers of manufactured products in other countries. The convulsions of both the monetary and commodity markets this year are the result of pressures which have been building during years of population growth and economic progress around the world.

This suggests that the world's proliferating manufacturing industries are generating a new relationship in the relative values of manufactured goods as compared with commodities taken from the earth's resources. Competition for metals, lumber, paper, even for plastic and cement, has been reflected in shortages and increased prices as more of the world's population devotes its time and energies to making things from these substances.

Increased use of energy for producing manufactured goods—and for using them—has created a world-wide shortage of energy fuels which promises to grow more severe before new sources of supply can be developed. Increased use of manpower in productive enterprise throughout the world, with increased personal incomes and food demands, is now beginning to strain the world's productive capacity for high protein foods from traditional sources. Because of record 1973 harvests the next two years may present the appearance of return to the old normalacy. But by 1976 or soon thereafter, a new price relationship between agricultural commodities and manufactured products should become established. Affluent populations in the developed countries will spend a higher percentage of their income for food and energy. Manufacturers will use a higher percentage of their returns for raw materials. And many more people, earning higher incomes, will be sharing in the good foods and the good life through normal commercial activities and channels.

Meantime extra strains and demands will be put on the public sector, the third market for foods. As the prosperity level of the working population of the world increases, greater and greater pressures also will be experienced by governments at all levels to provide at least minimum nutrition to those who are still unemployed, underemployed and underprivileged. Although prices are higher and the grains and proteins used are in their less refined form, national and international efforts to protect against undernutrition and malnutrition—especially among the children of the world—will be increased. In the new price context, cash requirements for these activities will grow much faster than will the tonnages involved, but financing will be found to carry out the programs since few governments will be prepared to countenance the alternatives.

NEW ROLE OF SOY PROTEIN

Such is the context for food and protein markets in the future. Within it, the new role of soy proteins becomes self-evident. No one needs a crystal ball to see that more and more of the rising world demand for protein foods must be met from non-traditional sources. As the proceedings of this Conference have shown, soy protein has a marked advantage over most other protein sources as a base for foods the human family requires. The abundance, uniform quality, nutritional value, and technological development of soy protein make it clear that the great burden of extending and supplementing traditional protein foods will fall upon the golden bean.

After the discussions of the last three days, the applications for specialized soy proteins also are apparent. They are: (A.) Cow's milk will be used much less for animal feed. In the future, modified soy and other non-animal proteins will be used almost exclusively for calf milk replacers, pig milk replacers, and related products; (B.) Soy and other vegetable proteins will be used to extend and to supplement liquid milk for human consumption in many parts of the world where fresh milk is in short supply; (C.) Use of soy proteins in other dairy-type products such as whipping agents, coffee whiteners, frozen desserts, and

meringues will be extended rapidly in the more developed, high-income countries; (D.) World demand for meat, poultry, and fish will hold prices at high levels against the limited supplies. Soy products in many forms will be extensively employed to extend and supplement these products in the various ways you have heard discussed here; (E.) Increased use of baked goods in the low-income countries of the world, and their greater diversification to fancy breads, sweet pastries, and cake mixes in other countries also will lead to increased use of soy protein products for both their functional and nutritional characteristics—and even sometimes for the nut-like flavors they impart; and (F.) Soy will continue to be the preeminent protein source for the weaning foods, cereals, and beverages used by the public sector for the underprivileged.

In total we expect world soybean production to increase to ca. 81 million tons/year by 1985, with U.S. production at 2.25 billion bushels/year or 61 million tons, as compared with present level of ca. 59 million tons of world production and 43 million tons from the U.S. Exclusive of the traditional soy foods in the Orient, we expect food and selected feed uses of specialty soy products to account for 2.5-3.0% of world production by 1985 as against ca. 1% at present. Thus we would anticipate a four to fivefold increase in use of soy proteins for these purposes by 1985. While these figures may seem to project an unrealistic growth rate in coming years, I must confess that our projections in the past, like those of most others in the industry, have tended to fall short of eventual results.

Estimating future markets for particular types of product in a given country or market area is necessarily a matter for special and separate study. No two market potentials are alike. The most serious mistake is to assume that market experiences in one part of the world can be duplicated in another if the same products are made available. Correctly evaluating the actual or realizable demand in a given area for a new set of food products or food ingredients can only be done through careful study by persons with knowledge, experience, and wisdom in the industry. The sands of business history are strewn with the bones of those who attempted this type of projection with inadequate expertise.

I would like to conclude by referring to remarks made by President W.B. Tilson at the opening of this Conference. Most often those few who stand in the very center of great world change do not realize the far-reaching impact of their own actions and their own decisions of the time. In view of the new world economy which is now emerging, the new relationships being established between fundamental groups of products, the new and critical role of food proteins, you who are attending this Conference are, indeed, at the very center of one of the most significant developments in our century. I feel sure that the protein future of the world is in good hands.

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