Spring 1959

A Report on the Seminar on Demand for Farm Products

Center for Agricultural Adjustment, Iowa State College

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A report of the Seminar on

DEMAND FOR FARM PRODUCTS

Spring Quarter, 1959

Sponsored by
THE CENTER FOR AGRICULTURAL ADJUSTMENT
Division of Agriculture
Iowa State College
Ames, Iowa

CAA REPORT 2
Seminar on

THE DEMAND FOR

FARM PRODUCTS

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Sponsored by

THE CENTER FOR AGRICULTURAL ADJUSTMENT

Iowa State College

Division of Agriculture

Spring Quarter, 1959

Ames, Iowa
This report includes papers presented and discussed at a seminar on demand for farm products. The seminar was sponsored by the Center for Agricultural Adjustment of the Division of Agriculture, Iowa State College. The seminar met for two hours per week for three months during the spring quarter. The seminar was organized to include about 60 members formally designated by the committee. These seminar members, as well as a formal discussant for each topic, evaluated the presentation at each session.

The subject of demand was selected for the seminar because of its importance to the income and adjustment problems of agriculture. Demand for farm products has grown less rapidly, relative to supply, than demand for many non-farm goods and services. This is true even though farm and non-farm industries exist in a common environment of growth in population and national income. What are the factual prospects for increasing demand for agricultural products under further national economic growth? What are the prospects in foreign markets?

Many persons have expressed the hypothesis or hope that the surplus and farm income problems might be solved through expansion of demand. The papers presented at the seminars represent an attempt to summarize current knowledge in respect to demand magnitudes and prospects for farm products. Given the current situation in respect to surplus stocks and income prospects, it is important that demand opportunities be evaluated objectively. Only then can an appropriate choice between courses of action be taken for sound alleviation of the commercial farm problem.

The papers presented at the seminar represent an attempt to summarize current knowledge in respect to demand and to interpret opportunities in expanding markets for farm products. The papers represent a fairly comprehensive coverage of the subject. Hence, it seemed desirable that they be published as a group. The report or collection of papers should be useful to educators, farm leaders, research workers, legislators and other persons concerned with problems of demand for farm products.

The seminar committee which formulated the program and designated speakers included:

John Ayres
Francis Carlin
Leonard Eggleton
Karl Fox
Iver Johnson
Edwin Kline
George Ladd
Wilbur Maki
Richard Phillips
Geoffrey Shepherd

Earl O. Heady, Director
Center for Agricultural Adjustment
Geoffrey Shepherd, Chairman
Seminar Committee
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I. Existing and projected pattern of demand for agricultural output in relation to supply
   A. Current domestic utilization: food use, industrial uses, government purchases.
   B. Exports
   C. Imports.
   D. Trends in each of the above and causes.
   E. Prospective supplies including CCC stocks.
   F. What are the prospects or projections if nothing is done beyond present programs? Population, per capita income, price-elasticity of demand, etc.
   G. List of types of programs for expanding demand, setting the stage for the later papers.

Chairman: Louis Thompson, Associate Dean of Agriculture, ISC
Speaker: Harold Breimyer, USDA
Discussant: Francis Kutish, Economics and Sociology Department, ISC

II. Increasing the domestic demand for farm products by government programs.
   A. Can we eat our way out of the surplus?
   B. Subsidized consumption: food stamp plans, relief distributions, school lunch programs, etc. Present size of programs and prospects, and effects.
   C. Effects of nutritional education; effects if low-income families' incomes were increased; effects if all families had adequate diets or liberal diets.

Chairman: Leonard Eggleton, Poultry Husbandry Department, ISC
Speaker: Herman Southworth, Pennsylvania State College
Discussant: Margaret Liston, Head, Home Management Department, ISC

III. Increasing the domestic demand for farm products by advertising and promotion.
   A. Consumer sovereignty - how real?
   B. Current expenditures on advertising and other forms of promotion.
   C. Effects: Does "eat more pork" mean "eat less beef"? Informational advertising; predatory advertising. Who gets the benefit, and how much?

Chairman: George Ladd, Economics and Sociology Department, ISC.
Speaker: Robert Walsh, USDA
Discussant: Lee Kolmer, Economics and Sociology Department, ISC.
IV. Increasing the demand for farm products by improving quality to meet consumer demand.
   A. Example: Broilers replacing farm hens.
   B. Beef: What is quality, for household consumption and for the restaurant trade?
      Are the answers different for these two groups? How to satisfy them both.
   C. Pork: What is quality in pork? How much fat, what size, etc? Are the answers different for the different cuts?
   D. Problems of reflecting quality price differentials through the trade.
   E. Sale on the basis of carcass weight and grade.

Chairman: Emmit Haynes, Animal Husbandry Department, ISC
Speaker: V. James Rhodes, University of Missouri.
Discussant: Wilbur Maki, Economics and Sociology Department, ISC.

V. Increasing the foreign demand for farm products by government export programs - P. L. 480, etc.
   A. Existing and prospective size of programs.
   B. Effects on patterns of international trade in farm products.
   C. Effects upon recipient countries - on consumption, economic development, economic and political stability, local producers of the commodity, attitude toward the United States.
   D. Effects on competing exporting countries.
   E. Effects on our own domestic agriculture. Does it solve problems, or only postpone solutions?

Chairman: Donald Kaldor, Economics and Sociology Department, ISC
Speaker: Lawrence Witt, Michigan State University.
Discussant: Erik Thorbecke, Economics and Sociology Department, ISC.

VI. Changes in the percentage of consumer income spent for food.
   A. Income-elasticity of expenditures for food in the United States.
      Engel's law.
   B. Income-elasticity for different foods.
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   E. Recent changes in the farmer's share of consumer expenditures for food.

Chairman: Gordon Bivens, Economics and Sociology Department, ISC
Speaker: Geoffrey Shepherd, Economics and Sociology Department, ISC
Discussant: Elizabeth Hoyt, Economics and Sociology Department, ISC.
VII. Farm vs. factory: Effects of chemical industry on the demand for farm products - plus or minus?
   A. Trends in the use of farm products for industrial purposes.
   B. Competition from non-farm raw materials - petrochemical, synthetic fibers, detergents, etc.
   C. Depletion of natural resources.
   D. The farm as a factory.
   E. Integration of farm and chemical industry.

Speaker: Morton Smutz, Head, Chemical Engineering Department, ISC.

Potentials for new crops to meet new and existing demands.
   A. Pulp and cordage fibers.
   B. Non-food oils.
   C. Waxes, tanning agents, insecticides, etc.
   D. Need for research.

Speaker: Iver Johnson, In Charge of Farm Crops, Agronomy Department, ISC.

Chairman: Joseph Walkup, Head, Industrial Engineering Department, ISC.
Discussant: J. C. Ayres, Dairy and Food Industry Department, ISC.

VIII. Effects of Point IV on our exports of farm and industrial products.
   A. Short-run and long-run effects.
   B. Are we creating future competition for our own agriculture, or increasing the foreign demand for our farm products?

Chairman: R. E. Buchanan, Dean Emeritus, Graduate College, ISC
Speaker: Sherwood Berg, University of Minnesota.
Discussant: Carl Malone, Economics and Sociology Department, ISC.

IX. Effects of institutional changes in market structure and marketing procedures on marketing margins and the demand for farm products.
   A. Changes in productivity in agriculture.
   B. Changes in productivity in the food processing and distributing industries.
   C. Changes in the structure of the market - number and size of supermarkets, voluntary and other chains, etc., and their effects on buying practices and demand.

Chairman: Gene Futrell, Economics and Sociology Department, ISC
Speaker: Bob Holdren, Economics and Sociology Department, ISC
Discussant: Richard Phillips, Economics and Sociology Department, ISC.
X. Summary of seminar. Supply - demand balance for agriculture under different alternative conditions.
A. Production and consumption projected from past trends.
B. Estimated consumption on optimistic assumptions.
C. Estimated consumption on pessimistic assumptions.

Chairman: Verner Nielsen, Economics and Sociology, ISC
Speaker: Karl Fox, Head, Economics and Sociology Department, ISC
EXISTING AND PROJECTED PATTERN OF DEMAND FOR
AGRICULTURAL OUTPUT IN RELATION TO SUPPLY

Harold F. Breimyer

I am pleased to have been invited to present this first lecture in a series scheduled by the Agricultural Adjustment Center.

The title can be paraphrased in simple terms: "How do demand and supply in agriculture match up, now and for the future?"

But first, why do we concern ourselves with the question?

Values in economics. The study of economics always concerns two sets of values. The first is impersonal, aggregative, materialistic. It is directed toward obtaining the largest total production of goods and services of which the economy is capable. The second is just the opposite. It is personal, individual, non-materialistic. It has to do with achieving equity in the economic system. Strangely, many economists seem to avoid facing these latter values and their implication. Some take equity for granted. They do so by assuming absolute equality in pricing of the factors of production. But it is precisely the lack of equality between certain farm factors and comparable non-farm factors that is the occasion for this seminar. For the charge that disturbs and motivates us all is that labor and management on farms is rewarded less well than that of other employments. Inadequate and unequal labor incomes in agriculture are the substance of the farm problem.

Yet it is pointless to address ourselves to a subject, aside from the value of intellectual exercise, unless we feel we can do something about it. There must be an avenue for improvement. Specifically, our hopes are two: that demand for farm products can be expanded; and that supply will not be so readily expansible as to offset all the gain in demand, but rather that a benefit from greater demand will accrue to farm people.

Demand: Definition. Demand as a concept is hard to define and to understand. This is especially true of demand in the aggregate.

Demand was not a conspicuous concept in early evolution of economic doctrine. Smith and Malthus wrote chiefly about factors of production. Demand came to the fore when social reformers observed imperfections in economic affairs. They pointed an accusing finger at it, alleging that it was the misbehaving agent in business crises. J. B. Say set the record straight insofar as aggregate demand was concerned when he introduced the idea of a codeterminancy of demand and supply. Keynes declared Say held full employment

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to be implicit in his law, and he disagreed. Yet Keynes also thought in terms of a production base to aggregate demand.

Later scholars developed the idea of demand in dollar terms. There still is conflict between the schools that prefer the 'real product' and those that favor the money income approach to measurement of demand. The monetary group usually dominates during a time of a sharply swinging business cycle. When gradual growth is the major trend, the real product analysts tend to thrive. They are in the ascendency just now. These scholars who nowaday sketch demand as derived from the real product of the economy are essentially of the same school as Say and Keynes.

Clearly, the real product approach has the advantage that it is free of the price level factor. It is a purer methodology. The current dollar income approach is more complex. For when, for instance, a demand analysis is built on an increase in national income that is due in whole or in part to inflation of the price level, its results must be corrected immediately for the higher price level. The higher prices for the product being analyzed must be related to the higher price for all competing products; and the higher income indicated must be adjusted for rising cost of living. Blessing of a high price from such an origin are gossamer indeed. Increase of national income that only reflects price inflation is specious and deceiving.

This is not to deny two weaknesses in use of the real-product technique:

(1) Modern money is credit and is even more subject to hoarding than was the specie of old. Money does introduce a significant variant to the real-income concept of demand. Disregarding the monetary and price level factor can be misleading for a shorter run.

(2) Price level changes do not influence all kinds of commodities alike. Farm product prices especially are subject to the impact of inflation or deflation. However, the significance of marked price level change had best be treated as a phenomenon of its own. Demand analysis should not be relied on to accommodate all convulsions in the economy.

Demand Versus Utilization. Let's now turn away from the question of monetary vs. real aspects of demand, even though we have left it largely unanswered.

Whenever a choice must be made, the real approach is the better one, at least as a starting point.

Although "real" data usually are thought of as dollar values deflated by a price level index, a great many analyses related to agriculture employ physical quantity data. Sometimes they are in terms of common physical
units, as feed units or animal units. At other times they are price weighted—a calculation that does not entirely escape the influence of price.

One such physical quantity series is that of aggregate utilization of farm products. An ingeniously devised series, constructed from supply and distribution data for individual products as weighted by farm-level prices, it adds a lot to our kit of tools for analysis. Data from this series will be presented later.

Nevertheless, utilization is not demand. That it is far from an identity with demand is seen from this proposition: that except as there is provision for exceptional year-end storage, utilization in any year equals supply for that year. Thus time-series utilization analysis would constitute supply analysis fully as much as demand analysis. The one exception occurs when government storage is afforded to all takers. When this is done, Uncle Sam presents the clearest case of pure demand to be found in our economy. (The issue of whether U.S. government storage demand is itself to be subject to the influence of supply has dominated farm policy debate for 20 years, and is not yet fully resolved.)

Supply Itself Helps to Make Demand. The popular term 'demand' often brings the image of a housewife buying her weekly supply of groceries, or selecting a dress or hat somewhat less frequently (all husbands hope). Demand in this sense is conceived as a psychic entity, so personal as to represent the ultimate in expression of individual rights in an economically free society. Madison Avenue long ago disabused us of the purest form of this notion, for consumer wants are surely subject to influence if not manipulation. This subject will be dealt with at a later seminar. Suffice it to be said here that demand even in the psychic sense is not formed entirely independently of supply. The mere availability of a good or service has an effect on the demand for it. "Invention is the mother of necessity" is a juxtaposition of an adage that is meaningful to analysis of economic development. We needed cake mixes and vitamin tablets aluminum baking foil only after they became available.

Demand at Successive Distribution Levels. One of the most serious problems facing all analysts of demand for farm products is that of the distribution level of demand formation. Consumer sovereignty, however perfect or imperfect, is exclusively a retail-level function. Not long ago farmers sold an appreciable part of their produce directly to final consumers. They sell very little now. Almost all "demand" at the point of farm sale is now that of a marketing intermediary.

How to translate demand at retail to demand at the farm is a question that haunts all responsible analysts. Often a certain behavior of farm-to-retail

2/ It would include foreign supply analysis. However, the great bulk of supply that exerts economic influence in the U.S. is of domestic origin.
margins is assumed. Inasmuch as those margins represent 60 percent of the retail food dollar, the practice is questionable.3/

Some of the foods that have grown most in popularity are those for which distribution channels are shortest, and the percentage of consumer's dollar returned to farmers is highest. This applies especially to the meats. Nevertheless, increasing specialization in marketing, processing and distribution, and increasing amount of processing applied to foods, serve to remove the producer ever farther from the final consumer. The economic links between producer and consumer are becoming longer and more complex.

That is to say, the farmer is becoming more and more a producer of raw materials. And the economics of raw materials are distinctly different from the economics of consumer goods.

Demand for farm products at the farm is a derived demand. It is "a long way" derived.

It is no coincidence that most of the farm products that have consistently received price support are those which are more clearly of the nature of raw materials -- ones for which the percentage of consumer's dollar returned to farmers is low. Detailed speculation on indifference curves of final consumers has little application to farm-level demand for them.

Demand Subject to Price-Making Mechanism. It follows that effective demand at the farm is not a clear and perfect reflection of the foibles, fancies and felicitations of consumers, but is affected to high degree by the institutional arrangements in which demand is expressed. Not even the most naive traditionalist would assert that prices are now made in the milieu of the perfect competition that was a conceptual model for theorists some years ago. Prices simply are not arrived at that way. Monopolistic competition is the key word in a description of the present pricing mechanism.

As every student of Chamberlin knows, monopolistic competition affects not only the price at which (differentiated) products are sold, but also the kind of product produced and sold. It leads both to prices that are different than would exist under perfect competition, and to expenditure of resources in devising differentiated products and in promoting demand for them.

These characteristics of monopolistic competition cannot be disregarded in an appraisal of demand.

Demand and Engel's Law. In these days of universal optimism, all projections of demand for farm products are made in the context of arising national income. But even this sanguineness leaves farm partisans chilled. For, according to the precept of Engel, only a pittance of the marginal buying power of consumers goes to products that are farm-produced.

Professor Boulding finds this a cause for gloom. "...in a progressive society, ...agriculture must always be declining relative to the other occupations ... (It) must always be in the uncomfortable position of being 'squeezed'." (Economic Analysis, second edition, p. 219.)

Events of the last few years have given little occasion to dispute this view. The vibrant industrial prosperity of the 1950's passed agriculture by, except as the U. S. government lent an expensive hand. Economic analysts found their farm income analysis to be faulty; current income data consistently fell below their regression value.

Findings of the 1955 household food consumption survey reinforce the generalization of Engel's law. Data for meat are relevant. Taken in a year of plentiful meat supplies, the survey showed that higher income consumers failed to use their buying power to buy much more meat. To large extent they use it to buy better meat -- or at least to pay a higher price per pound. The following are the percentage changes in meat price and use associated with a 10 percent difference in income. Data for beef are given by regions.

<table>
<thead>
<tr>
<th>Meat</th>
<th>Quantity per person</th>
<th>Price per pound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pork</td>
<td>-0.3</td>
<td>1.6</td>
</tr>
<tr>
<td>Beef</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Northeast</td>
<td>1.2</td>
</tr>
<tr>
<td></td>
<td>North Central</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>South</td>
<td>3.8</td>
</tr>
<tr>
<td></td>
<td>West</td>
<td>2.1</td>
</tr>
<tr>
<td>Veal</td>
<td>2.7</td>
<td>0.3</td>
</tr>
<tr>
<td>Lamb and mutton</td>
<td>6.2</td>
<td>1.2</td>
</tr>
</tbody>
</table>

For pork, high income consumers ate less but paid higher prices. For beef, Northeastern and North Central consumers gave more attention to price than quantity. Southern and Western consumers, however, used extra income more for added quantity. Veal and lamb consumption is still largely associated with income.

The higher price per pound probably reflected in part a higher quality of meat, and therefore embodied a larger use of agricultural resources. Another part may have involved only more associated service, or even higher retailer profits.
Income Elasticity Of Demand. Barton and Daly, in a paper given here at Ames, set forth some coefficients of income elasticity of demand for farm products. The authors show contrasts in results of demand studies:

"Statistical analyses covering the long run as a whole indicate an elasticity of expenditures (for food) with respect to income around 0.9... But for the prewar years alone (1929-1941), this elasticity was around 0.7 and in the postwar years (1948-1957) it may be as low as 0.35." They also derived coefficients at the farm level using the farm-price-weighted supply and utilization series referred to on page 3. "For farm-produced food, price elasticity of demand is indicated around -0.15 to -0.2 and a positive income elasticity of about the same size. During the post-War II years, 1948 to 1957, these elasticities may be even smaller."

Of course, for individual commodities or commodity groups, the income elasticities are much higher.

As is demonstrated by the data for meat given above, much of the effect of higher consumer incomes appears in a greater demand for high quality food than for more food. Agriculture has adjusted quite well to changing consumers' wishes as to kind and quality of food. Resources have been shifted within agriculture to produce more livestock products and less potatoes, for instance. The success story of beef is not only that consumption per person has been stepped up 25 pounds in the last 25 years but also that older, grass-fattened beef has been substantially replaced by a younger, grain-fattened product.

Food Major Output of Agriculture. Historical growth in United States agriculture has not been spectacular. It has been substantial, but certainly not extremely large. As is well known, growth in output during the 1950's has exceeded demand at support price, and stocks have accumulated despite vigorous export programs.

A chief reason is that the more expansive parts of the economy do not touch greatly on agriculture. U. S. agriculture continues to be devoted primarily to production of food for the domestic population. Only cotton and wool rank very high among nonfood uses, and exports are relatively not large except when expanded by government action. Moreover, those two fibers have not enjoyed any big increase in popularity. Tobacco, being habit-forming, has done better, but it accounts for only a small part of farm resources.

5/ Ibid., p. 6.
In 1957, for example, utilization of all farm products was as follows:

<table>
<thead>
<tr>
<th></th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food</td>
<td>75.5</td>
</tr>
<tr>
<td>Feed for workstock</td>
<td>0.7</td>
</tr>
<tr>
<td>Fibers and leather</td>
<td>5.6</td>
</tr>
<tr>
<td>Tobacco</td>
<td>2.0</td>
</tr>
<tr>
<td>Alcoholic beverages</td>
<td>0.8</td>
</tr>
<tr>
<td>Industrial oils and soap</td>
<td>1.2</td>
</tr>
<tr>
<td>Other nonfood use</td>
<td>0.6</td>
</tr>
<tr>
<td>Commercial exports and shipments</td>
<td>12.8</td>
</tr>
<tr>
<td>USDA exports</td>
<td>0.8</td>
</tr>
</tbody>
</table>

|                      | 100.0   |

The table on page 8 sketches trends in these proportions since 1925.

Chief observations from the table are that the big increases in share of total utilization have been in food use and in tobacco. Tobacco, however, is a small part of the total; and its quantity has not increased further since 1952. Most other nonfood uses of farm products have not covered themselves with glory, for they have generally declined relative to food use.

The biggest reduction has been in feed for workstock. Disappearance of horses and mules has increased to a sizable degree the resources within agriculture available to produce food and fiber. This trend is now almost ended -- a fact that could be one of the hopeful signs for the future. On the other hand, entry of tractors and gasoline into agriculture was merely one item in a long run displacement of farm by non-farm resources in agriculture. This displacement continues.

Prospects for the future. Based on the foregoing, prospects may be outlined as follows:

1. Demand for farm products is hardly likely to expand at a fast pace. Its increase will be determined more by the growth in population than in income per person. Barton and Daly estimate a 41 percent increase in farm output in 1975 compared with 1956-57. Most of the increase results from a projected gain of 35 percent in population. Output of farm products per capita is calculated at only 4 to 5 percent higher than in 1956-57, despite a 40 percent increase in real income per capita.

Utilization of farm commodities, selected periods, 1925 to date\(^1\)

<table>
<thead>
<tr>
<th>Period</th>
<th>Feed</th>
<th>Fibers</th>
<th>Tobacco</th>
<th>Alcoholic beverages</th>
<th>Industrial non-food use</th>
<th>Exports and shipments</th>
<th>Commer-</th>
<th>USDA</th>
<th>Total utilization</th>
</tr>
</thead>
<tbody>
<tr>
<td>1925-29</td>
<td>68.4</td>
<td>9.6</td>
<td>6.8</td>
<td>1.6</td>
<td>0.2</td>
<td>1.9</td>
<td>0.2</td>
<td>11.3</td>
<td>--</td>
</tr>
<tr>
<td>1930-34</td>
<td>73.6</td>
<td>7.8</td>
<td>6.0</td>
<td>1.6</td>
<td>0.4</td>
<td>1.7</td>
<td>0.2</td>
<td>8.6</td>
<td>0.1</td>
</tr>
<tr>
<td>1935-39</td>
<td>74.7</td>
<td>6.4</td>
<td>7.2</td>
<td>1.9</td>
<td>1.0</td>
<td>1.8</td>
<td>0.3</td>
<td>6.7</td>
<td>--</td>
</tr>
<tr>
<td>1940-44</td>
<td>74.7</td>
<td>4.7</td>
<td>8.6</td>
<td>2.0</td>
<td>1.3</td>
<td>1.8</td>
<td>0.5</td>
<td>2.6</td>
<td>3.8</td>
</tr>
<tr>
<td>1945-49</td>
<td>75.3</td>
<td>3.0</td>
<td>7.3</td>
<td>2.2</td>
<td>1.2</td>
<td>1.7</td>
<td>0.4</td>
<td>5.5</td>
<td>3.4</td>
</tr>
<tr>
<td>1950</td>
<td>74.9</td>
<td>2.2</td>
<td>7.9</td>
<td>2.3</td>
<td>1.1</td>
<td>1.8</td>
<td>0.6</td>
<td>7.6</td>
<td>1.6</td>
</tr>
<tr>
<td>1951</td>
<td>74.2</td>
<td>1.9</td>
<td>7.2</td>
<td>2.3</td>
<td>1.1</td>
<td>1.7</td>
<td>0.6</td>
<td>9.1</td>
<td>1.9</td>
</tr>
<tr>
<td>1952</td>
<td>76.8</td>
<td>1.5</td>
<td>6.9</td>
<td>2.4</td>
<td>0.9</td>
<td>1.5</td>
<td>0.5</td>
<td>9.1</td>
<td>1.4</td>
</tr>
<tr>
<td>1953</td>
<td>77.9</td>
<td>1.4</td>
<td>7.1</td>
<td>2.4</td>
<td>0.8</td>
<td>1.5</td>
<td>0.5</td>
<td>7.8</td>
<td>0.6</td>
</tr>
<tr>
<td>1954</td>
<td>78.2</td>
<td>1.2</td>
<td>6.2</td>
<td>2.3</td>
<td>0.8</td>
<td>1.4</td>
<td>0.5</td>
<td>8.9</td>
<td>0.5</td>
</tr>
<tr>
<td>1955</td>
<td>77.9</td>
<td>1.0</td>
<td>6.5</td>
<td>2.0</td>
<td>0.9</td>
<td>1.4</td>
<td>0.5</td>
<td>8.9</td>
<td>0.9</td>
</tr>
<tr>
<td>1956</td>
<td>76.1</td>
<td>0.9</td>
<td>6.2</td>
<td>2.1</td>
<td>0.8</td>
<td>1.3</td>
<td>0.5</td>
<td>11.2</td>
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</tr>
<tr>
<td>1957</td>
<td>75.5</td>
<td>0.7</td>
<td>5.6</td>
<td>2.0</td>
<td>0.8</td>
<td>1.2</td>
<td>0.6</td>
<td>12.8</td>
<td>0.8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Percentage of total utilization in 1947-49</th>
</tr>
</thead>
<tbody>
<tr>
<td>------</td>
</tr>
<tr>
<td>1925-29</td>
</tr>
<tr>
<td>1930-34</td>
</tr>
<tr>
<td>1935-39</td>
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<tr>
<td>1940-44</td>
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<tr>
<td>1945-49</td>
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<td>1950</td>
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<td>1951</td>
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<tr>
<td>1955</td>
</tr>
<tr>
<td>1956</td>
</tr>
<tr>
<td>1957</td>
</tr>
</tbody>
</table>

\(^1\) Net, excluding pasture. This concept differs from gross value used in Agr. Handbook No. 91 by exclusion of feed fed to productive livestock and seed.
2. Potential production appears large enough to provide the necessary output without difficulty. Barton and Daly data are as follows:

<table>
<thead>
<tr>
<th></th>
<th>Relative to 1956-57</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1965</td>
</tr>
<tr>
<td>Use of farm products</td>
<td>+18%</td>
</tr>
<tr>
<td>Necessary output</td>
<td>+13%</td>
</tr>
<tr>
<td>Potential yield per acre</td>
<td></td>
</tr>
<tr>
<td>Best use of presently known practices</td>
<td>+50%</td>
</tr>
<tr>
<td>Economically attainable use of</td>
<td></td>
</tr>
<tr>
<td>presently known practices</td>
<td>+25% or more</td>
</tr>
<tr>
<td>To be added from new practices</td>
<td></td>
</tr>
<tr>
<td>Potential increase in feed conversion</td>
<td>+10%</td>
</tr>
</tbody>
</table>

The economically attainable increase in yields combined with increase in efficiency in use of feed would virtually meet the full necessary rise in output, without any new achievements in technology. New achievements are certain. Hence, Barton and Daly conclude, "1975 production needs can be met without any great difficulty. Moreover, there is a strong possibility that major problems of adjustment in production and in resource use may continue to face agriculture over the longer run period ahead."  

3. Notwithstanding the above, any progress in expanding demand would be highly beneficial. After all, the difference between rate of growth in demand and in supply is narrow. Only a slight gain in demand might be sufficient to close the gap, or at least to narrow it to a point that is manageable.

Brightest prospects are in stepping up demand for products of high quality. An example is the possible benefit from selling pork by a quality or grade distinction. To do so would tap the market for highest quality (and highest priced) pork better than is done now.

4. On the other hand, some of the benefits of increased demand are fleeting -- more so than previously. Increasingly, productive capacity in agriculture is not fixed and predetermined, but is responsive to current conditions. Land alone is not the controlling factor it once was. Non-farm inputs have become more important, and they are more mobile, more elastic, than inputs of farm origin.

Moreover, while supply of farm products has thereby become more elastic, demand for them has become more inelastic. Inelastic demand -- characteristic of a period of high consumer incomes -- creates a severe penalty for over-production in agriculture. It provides a bonus for well ordered production.

Consequently, the policy decisions as to where relief will be sought fall into these three categories:

(a) how much to depend on measures to expand demand,

(b) whether to control the quantity of mobile non-farm inputs used in agriculture (presumably through allotments or quotas on quantity of farm products produced);

(c) or whether to rely on making farm labor more mobile.

Summary and Conclusion. In focusing a cold eye on economic projections this article may appear somewhat more negative and pessimistic than is intended. It is a sign of boundless confidence in our ability to increase farm output that we look forward to the future in agriculture with something less than unqualified enthusiasm. Food will continue to be the main use of farm products. Aggregate food demand is not easily lifted. Any larger percentage gains in nonfood outlets, although more spectacular, would not require large resources. And although food and nonfood needs will increase, resources are becoming ever more fully available to agriculture from non-farm sources.

Yet most surplus problems involve marginal quantities -- relatively small ones. Consequently, marginal achievements in stepping up demand could have significant results.

Any measures to tap the high-income market for high quality foods that hold promise of success should be undertaken. At the other income extreme, our still great unmet needs for food -- needs largely outside the commercial market -- could perhaps be converted to demand through devices such as a food allotment or food stamp plan. We can only hope for and support all effort toward building a larger demand, and applaud all positive achievements.

Beyond that, I have only two general concluding observations:

(1) Agriculture remains highly concerned with how successful we are as a nation in achieving steady real economic growth, as the extent of that growth is more important than any narrow
concern with agriculture's share of it; and rate of growth of population is of primary consideration.

(2) Expansion of demand for farm products will not be of a scale to relieve agriculture of its own economic problems. As our economic society becomes more and more complex; as more and more marketing functions interpose between the farmer and consumer; as farm and non-farm resources become more freely interchangeable in farm production; as our pricing system becomes more distant from one of free competition: as all these happen, farm problems of the day will need to be dealt with daily, not postponed to a millenium described at the right hand edge of our charts.
The first part of Mr. Breimyer's paper is concerned with a definition of Demand. With this, there can be little quarrel.

Mr. Breimyer then launches into an evaluation of prospects for the future on the last three pages of his paper. His evaluation of both the agricultural production potential and demand potential follow the lines of most of the thinking of today -- and again there can be no quarrel.

There are one or two points I would like to raise however: The percentage of the consumer's income spent for meat has remained between five and six percent. Income elasticities are low, and income has been rising. This might lead us to expect that the percentage spent for meat would have been declining. What is the prospective increase in demand for meat in the future? Is it proportional to income as in the past, or is it much less than this as indicated by your income elasticities? I would like also to ask what is the estimate of rapidity of the decline in the per capita demand for pork? Is it as rapid as the increase in the population in the United States? Is the total demand for pork in the United States increasing, stationary, or decreasing?

While presenting the paper, Mr. Breimyer strayed from the printed copy to make the observation that the ability to improve quality and to separate products into different products as a result, might offer a means by which farm income could be increased. Mr. Breimyer referred to the case of General Motors: The demand for automobiles could be satisfied by constructing nothing but Chevrolet automobiles. But by separating the market into demands for Buick, Cadillac, Oldsmobile, Pontiac automobiles as well as for Chevrolets, General Motors has been able to extract more money in total from consumers. Much of the improvement in quality in farm products might likewise result in possibilities of separating into different markets.

The question is this: how much of the improved quality in agricultural products would involve additional non-farm resources and how much would involve the production of a higher quality product from the farm? If the improved quality is largely the former, most of the additional income that is brought in will accrue to the providers of non-farm resources who incorporate this additional quality. If it is a result of higher quality products

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coming from the farm, this then would result in more of the returns reverting back to the farmers. For example, prime beef sells to a different market and for more money than does good beef. The farmer is the beneficiary of the higher price obtained for the higher quality product. But steel producers do not get any more returns from the steel which goes into Cadillacs than they do for the steel that goes into Chevrolets. The main difference is the result of changes which are made in the manufacturing process (the addition of chrome and a few other coverings of this nature). Benefits from the separation of the market and the production of the higher quality market here go entirely to the processor of the product. Much the same result prevails when market agencies process meat and other farm products into higher quality products. On the other hand, if farmers produce a higher quality product and the market expands as a result of this, then the producer is more apt to benefit.
Our topic this morning is government programs to increase domestic demand for farm products. However, I understand that next week's speaker will discuss advertising and other forms of promotion for farm products, and a later speaker new and expanded industrial uses. This limits us this morning chiefly to what have been referred to as "distribution programs": actual purchase and distribution of commodities by the Government, sometimes referred to as "direct distribution"; and subsidies to their movement through ordinary marketing channels, like the present School Lunch Program and the former Food Stamp Plan.

With regard to such programs, I shall argue that they do not appear to me likely under present conditions to contribute importantly to solution of the farm surplus problem -- a conclusion in which I agree with the position taken by Willard Cochrane in his paper given here last fall.

In this connection, I recommend to you the study by Cochrane's group at Minnesota, a report of the first part of which is nearing publication. An advance draft of this report was made available to me. You will find in it a much more rigorous and searching analysis of this morning's topic than I am able to present.

As background for today's discussion, however, I should like first to summarize briefly our experience with programs of this kind in the United States: the chief types that have been used or proposed, and the circumstances that gave rise to them. Then I should like to suggest certain economic characteristics that seem to me important for understanding how they operate and what effects they accomplish.

Historical Origins of Distribution Programs. Historically, the so-called "distribution programs" were a phenomenon of the Great Depression of the thirties -- a response to the paradox of unmarketable surpluses of foods at the same time that large numbers of people were hungry. With nearly 25 percent of the labor force unemployed in 1933, the federal government bought
up surplus foods and gave them to the people in the bread lines and on the relief rolls. This emergency purchase and distribution program was initially carried out by the Federal Emergency Relief Administration. In 1935, Section 32 of Public Law 320 made available 30 percent of customs revenues as a continuing appropriation to be used to encourage the exportation and the domestic consumption of agricultural commodities, and operation of distribution programs was shifted into the Department of Agriculture as the Federal Surplus Commodities Corporation.

Unemployment in the late thirties continued chronically in the neighborhood of 8 to 10 million. Farm prices continued low in spite of production controls, and efforts to support farm prices continued to require removing substantial surpluses from the market. Considerable interest and ingenuity in the Department was directed towards devising broader and better approaches to the problem of subsidizing the consumption of farm surpluses by people of low income. The two most important programs adopted were the School Lunch Program and the Food Stamp Plan.

The School Lunch Program began as a special outlet for the surplus foods that were taken off the market by the federal government. During the war it was made a permanent program with the basis of operation shifted partly to cash grants instead of direct allotments of surplus foods. It continues as a separate program today.

The Food Stamp Plan was designed from the start as a means of subsidizing food purchases through regular commercial channels, rather than the purchase of surpluses and their distribution through public welfare agencies. Initiated in 1939 as an experiment, it received wide public acceptance and spread rapidly, but in 1943 it was discontinued as wartime conditions largely abolished the need for it.

A number of minor programs also were undertaken before the war for the expansion of domestic consumption, including a low-cost milk program, a cotton mattress program, and a Cotton Stamp Plan. Of these, the low-cost milk program has its counterpart today in the Special Milk Program conducted in connection with school lunches. It is the one of chief interest for our present analysis from the standpoint of its mechanics of operation.

Operations under the various food distribution programs at the start of the war are summarized in table 1, along with costs in a recent year for comparison. The prewar programs included in addition various cotton distribution programs, estimated to have cost in 1941 around $40 million. Inclusion of this amount would bring total expenditures at that time to around $200 million, or about half of the current-dollar amount of the 1957 programs.

The Food Stamp Plan at its height replaced much of the direct purchase and distribution of surpluses. The latter program was kept in operation throughout
the war, however, as a market support device, especially for perishables, and continues in this role today. The dominant importance of school lunches among the present programs is evident from the table, both in its right and as an outlet for surplus purchases.

Economic Analysis of Distribution Programs. How does one go about the comparative analysis and appraisal of these various measures for subsidizing increased consumption of agricultural commodities, or of new proposals that may be offered along similar lines? We should recognize at the start three aspects of them that are relevant: the political, the administrative, and the economic. My direct concern here will be with the economic; to the extent that I do turn to the other two aspects it will be chiefly as they condition or limit the operation from an economic standpoint.

From an economic standpoint, a chief distinguishing characteristic is how alternative programs deal with what has been called the "problem of substitution." To what extent does consumption under the program really

Table 1. Food Distribution and School Lunch Programs: Federal cost, fiscal years 1941-42 and 1957.

<table>
<thead>
<tr>
<th>Program</th>
<th>Year ending June --</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1941</td>
</tr>
<tr>
<td>(million dollars)</td>
<td></td>
</tr>
<tr>
<td>Direct distribution to institutions</td>
<td>66.7</td>
</tr>
<tr>
<td>and welfare cases</td>
<td></td>
</tr>
<tr>
<td>Food stamp</td>
<td>82.8</td>
</tr>
<tr>
<td>School Lunch</td>
<td>13.1</td>
</tr>
<tr>
<td>Direct distribution</td>
<td>-</td>
</tr>
<tr>
<td>Indemnity plan</td>
<td>-</td>
</tr>
<tr>
<td>Low cost milk</td>
<td>1.5</td>
</tr>
<tr>
<td>Relief milk</td>
<td>0.6</td>
</tr>
<tr>
<td>School milk</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>164.7</td>
</tr>
</tbody>
</table>

1/ Special Milk Program

Source: Agricultural Statistics
constitute an increase? To what extent do the beneficiaries merely substitute it for what they would have consumed anyway in the absence of a program?

The same question is argued currently in connection with some of our foreign-aid programs. What assurance do we have that wheat supplied to India, for example, free or at a reduced price, is actually over and above the wheat that India would have bought from us without such a program? An analogy closer to home is provided by the Soil Bank. It is often asserted that acreage put into the Soil Bank is in land that the farmer did not intend to plant anyway, or is at least in his poorest land, or in land that seemed doomed to crop failure; so that the program does not begin to achieve its objective of cutting down production until it passes the size at which such land has been taken out. Similarly, a program that distributes surplus apples or grapefruit to people is not likely actually to increase consumption much until they are given more apples or grapefruit than they would have bought anyway.

A program that consists simply of Government purchase of commodities and distribution of them to people has no adequate means of dealing with this "substitution problem." Recipients can be required to swear or certify that the commodities will not be substituted for "normal" purchases. This is perhaps most likely to be effective in the case of distribution to eleemosynary institutions and the like. We customarily require assurances of this sort in connection with the foreign aid programs referred to. But even with institutional outlets it is difficult to set up realistic tests of what the "normal" purchases would be.

Particularly is this true with a continuing program under which the distributions through the program are received year after year and come to be, as a practical matter, part of the "normal" source of supply of the recipients. To determine in such a case what consumption would have been without the program becomes not only difficult but somewhat irrelevant -- it does not involve a realistic alternative. (Unless, of course, discontinuance of the program is actually contemplated, in which case the shoe is on the other foot.)

School Lunch Program. Analysis of the School Lunch Program reveals the difficulties that arise. School lunches were originally promoted, as previously indicated, through making foods available under the direct distribution program. Since at the start schools serving lunches were the exception rather than the rule, most of the distribution was to new lunch programs, in schools where lunches had not been served before. Hence there was an a priori case that the distributions constituted an increase in consumption of the foods that were supplied -- and, even, indeed, that they brought about increased consumption of other foods, in that a satisfactory lunch program could hardly be operated solely with the free surplus foods.

The question was raised, of course, to what extent the lunches at school merely substituted for lunches that the children would otherwise have been provided by their families. But the program began in a time of economic depression, when it was evident that quite a number of children simply had no lunch at home, and that for many others lunch was most meager. Emphasis was placed upon requiring that the lunches be served free or at a reduced price to children lacking the money to pay the regular price. And it was, I think, generally agreed that the expenditure under the program did represent at least in large part an increase rather than a substitution in consumption.

Meanwhile, the lunch program fit in with the current educational trends. With larger schools, and especially with consolidated schools serving children from an extensive district, many of whom come by bus, organized provision for the children's lunches is obviously a necessity. The program that helped meet this necessity was immensely popular. It grew rapidly, and it came soon to be looked upon not just as a means for disposing of surplus foods but more as a program important to the general social welfare.

With the onset of the war, the problem of surpluses diminished, and the decline of unemployment did away with the free WPA Labor that State Welfare agencies had depended upon to man their food distribution facilities. Beginning in 1943, the program was shifted increasingly to a cash indemnity basis, and in 1946 it was given independent legislative authority in the National School Lunch Act (P.L. 396, 79th Cong.), with responsibility for it shared between the Department of Agriculture and the Federal Office of Education.

Eligibility for payments was made dependent upon serving lunches meeting specified quality standards, thus making the federal aid an incentive to a higher level of food consumption that might otherwise prevail. But basically the program has become an integral part of an accepted and enduring institutional pattern, within which the question of continuing it is not, in my judgement, likely to turn on its effectiveness in expanding the consumption of agricultural commodities.

Low-Cost Milk Program. Associated with the School Lunch Program currently is the Special Milk Program, initiated in 1954, through which extra milk is made available to children at a reduced price, either at lunch or at "milk breaks" at other times during the day. This is a revival of the prewar Low-Cost Milk Program. That plan, operated from 1940 to 1943 in several large cities under Federal Milk Marketing Orders, made milk available at a reduced price both to school children and to public assistance families - the

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latter, in most cities, through special depots. The reduced price was made possible by producers' accepting less than the established Class I price for milk, by dealers' contracting to handle it at less than their customary margin, and by a federal subsidy to close the remaining gap.

In such a program the "substitution problem" turns upon the extent to which participants increase consumption in response to the lower price -- in economic language, upon the "elasticity with respect to price" of their demand. Most studies have indicated that the general demand for fluid milk is relatively inelastic with respect to price -- that the chief response to price reduction is reduced expenditure rather than increased consumption. Surveys made in connection with the low-cost milk program, however, found substantial increase in participants' consumption in most cities. Many people who previously bought no milk were induced to buy it at the low price. The results suggested that demand among the low-income group was perhaps elastic, and certainly much less inelastic than for the population at large.

General Price Subsidies. If this is generally true, it is a significant fact for programs to increase consumption. The simplest way, of course, to subsidize consumption of a product is for the government to make payments at some convenient point in the marketing channel that permit a reduction in the price to all buyers. Such subsidies were used for a number of foods during the war as an adjunct of price control or as an incentive to increased production. The much-argued Brannan Plan, likewise, involved essentially this approach.

Such a plan has the great merit of administrative simplicity. But from the standpoint of the increase in consumption that can be achieved with a given government expenditure, a general price subsidy is quite inefficient for any commodity or group of commodities with highly inelastic demand. The subsidy will result chiefly in consumers' saving on expenditures, rather than increasing their consumption. (The similarity of this to the "substitution problem" is apparent.) The domestic demand for all farm products, or for all food products, as well as for many individual farm products -- including some of those in serious surplus, like wheat -- is probably in this category. A large supply brings less in the market than a small supply.

But if one can separate out particular groups of consumers -- such as those of low income -- whose demand is more elastic than the average, and can devise a subsidy that reduces the price to them only, the government money is much more efficiently spent. The advantage works in two ways. The beneficiaries of the reduced price will respond chiefly by consuming more, thus increasing the market demand. And in the process they will be helping bid up the price to the rest of the consuming public, who (their demand being inelastic) will respond chiefly by spending more rather than curtailing consumption. Through this effect upon the general market,
a well designed discriminative pricing scheme can increase returns (including subsidy) by more than the amount spent on subsidizing the reduced price to the favored group.

**Food Stamp Plan.** This was the aim of the low-cost milk program. It was likewise, in essence, the basic principle of the Food Stamp Plan.

The idea of the low-cost milk program was originally suggested not just for milk but as a general plan for use with any surplus commodities. It was proposed that persons on relief or other public assistance be permitted to buy such products at a reduced price, the difference to be made up through government reimbursement of the sellers. This "two-price" proposal met a hostile public reception, and was quietly dropped. Some months later the Food Stamp Plan was proposed, and apparently was popular from the start.

The Stamp Plan was not a "two-price" plan as such. But it had, to the economist, striking similarity. At any rate, it was designed specifically to deal with the "substitution" problem.

In fact, persons whose chief interest in it was as a welfare, rather than an agricultural, measure objected to it for this very reason. The plan undertook, through a device that I shall describe in a moment, to make sure that the subsidy made available to participants should be spent solely for food, and indeed for specific foods designated as being in surplus. Social welfare people objected that for many of the recipients increased food consumption was not the only crying need, and that cash grants that recipients would be free to use also for better housing, better clothing, or more of other necessities would make a greater contribution to their welfare. The likelihood that comparable appropriations could be obtained for a system of cash grants appeared small at that time, however, whereas the Stamp Plan had the tangible support of agriculture and the food trades. So such objections were largely ignored -- a case, perhaps, of political considerations over-riding economic ones.

The essence of the Food Stamp Plan was the following device. Persons eligible for participation were offered the opportunity to obtain, free of charge, blue-colored stamps good for the purchase of specified foods at their local grocery store. To avail themselves of this opportunity, however, they had to buy orange-colored stamps, likewise redeemable in foods (in this case any foods) at their grocery. Only people of low income -- usually those on public relief or WPA employment rolls -- were eligible.

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to participate. And the amount they were required to invest in the orange stamps was calculated to correspond to the amount of money that persons of low income would normally spend for food.

The orange-and-blue-stamp device provided means of assuring that participants in the program would continue to spend money out of their own pockets for food - an amount as near to their previous level of expenditures as could be specified through the orange-stamp purchase requirement. Thus participants were prevented from substituting the grants for their own "normal" purchases. (This was reinforced by requiring communities in which the Plan was introduced to guarantee that their own relief allowances would not be curtailed.)

The restriction on the commodities that could be bought with the free blue stamps was further intended to direct the subsidy chiefly to those foods specified as being in surplus. Here, however, politics again intruded upon economics. For such a restriction to be effective, obviously, the list of foods purchaseable with the blue stamps would have needed to be kept small, else recipients would be able to spend all their blue stamps without going over the quantities of the specified commodities that they would have chosen to buy anyway without the restriction. But a great many industry groups were successful in insisting that their products be declared in surplus, with the result that during much of the Plan's operation so many different foods could be bought with the blue stamps that it is doubtful the restriction had much effect.

The Food Stamp Plan was initiated in Rochester, New York, in May of 1939. Within three years it had expanded to areas that included over half the population of the United States, and expenditures on it had come to exceed those for direct distribution, including the distribution to school lunches (see again table 1).

There was some experimentation with variations of it. One involved varying the orange-stamp purchase requirement to more closely represent "normal" expenditure levels of different classes of participants -- taking account especially of family size -- with a view to closer control of the "substitution problem". Another was to offer participants additional free blue stamps if they bought more than the minimum requirement of orange stamps -- with the object of multiplying the increase in consumption. I have mentioned that participation was in general limited to persons on relief or other public assistance. Another experiment was to open it to all persons below a specified standard of income.

A proposal discussed but never attempted was to redeem the stamps to retailers at less than face value -- on the ground that the stamp business represented an increase in volume that the retailer should find it worth his
while to handle at less than his regular margin. Such an arrangement was used, as I indicated, in the low-cost milk program, as a device to make the government expenditure go farther.

Growth of the program, and elaboration of it along lines such as I have indicated, brought administrative headaches. Ingenious persons found ways of chiseling, requiring a policy system. Managing the stamps presented increasing problems as their volume grew. Banks became less gracious about handling them without making a special service charge.

Furthermore, some agricultural people suspected that the program was more a welfare than an agricultural device, and as such should not be charged wholly against the agricultural appropriation. Not all of them were convinced by the economists' explanations that the Plan was an efficient use of funds for expanding markets and supporting prices. Actual purchase of a farm product by a government buyer in a primary market is a tangible act that a farmer can see and believe -- regardless of arguments that the price effect of the purchase may be largely nullified because of the "substitution problem."

Food Allotment Plan. Wartime disappearance both of food surpluses and of unemployment, however, was the reason for discontinuance of the program in 1943. There simply was no longer sufficient need for it.

Following the war, the question was raised of reviving the Food Stamp Plan, and an improved version of it was proposed: the National Food Allotment Plan, legislation for which was recurrently introduced by Senator Aiken, of Vermont, and others. This proposal was designed to enable everyone to afford an adequate diet at a cost commensurate with his means. It provided, first, that the cost of such a diet be determined periodically, on the basis of the nutritive standards of the National Research Council interpreted in terms of customary consumption patterns, which might be varied by locality. Then it provided that any person should be permitted to buy stamps or certificates, good for the purchase of foods, equal in value to the cost thus determined, but paying for them a specified percentage of his income. This got away from the necessity under the Food Stamp Plan of requiring a means test as the basis of participation. Obviously, participation would have no appeal to people whose income was high enough that they were already buying an adequate diet for less than the certificates would cost them. But for lower-income people it would offer an opportunity to increase their food consumption. And at the same time it offered similar protection to that of the Stamp Plan against the substitution of grants for the participant's normal expenditure.

5/ See S. 1151, 79th Cong., 1st Sess. (June, 1945) and similar bills in subsequent sessions.
The Allotment Plan would also be self-adjusting to changing economic conditions. With spreading unemployment, such as was experienced last year, more people would find it worthwhile to participate, and the program would automatically expand to cushion the reduction in food-purchasing power. (It might also, of course, tend to accentuate inflationary forces pushing up food prices, in that the level of benefits under the program would go up correspondingly; but such an "escalator" arrangement can be argued for in terms of the need to protect the diets of low-income people against the impact of inflation.)

The proposal was intended chiefly as a general expander of food consumption, rather than a device for moving specific surpluses. But it could obviously be made to serve the latter end by earmarking certain of the certificates for specific commodities, to the extent that forced increase in consumption of them could be reconciled with the nutritional objectives. Dairy products, for example, would seem a likely candidate for such favored treatment.

A program of this kind would appear in principle to have considerable merit, both from the standpoint of agriculture and from the standpoint of general welfare. Yet it has never, so far as I know, been in imminent prospect of enactment. Even proposals for limited experimentation with such a plan have not been considered seriously.

The first reason why the proposal has aroused little interest was indicated by Cochrane in his presentation last fall: at the levels of consumer income and food consumption that have prevailed since the war, it is hard to make out a convincing case for it on welfare grounds. Cochrane stated last fall, and the study that his group is about to publish will further document, that the people of the United States could all be provided an adequate diet at a "moderate-cost" level -- one using "food combinations consistent with food expenditures and preference of middle income families" -- without increasing the index of all food consumption, nor the demand for farm resources to produce the food. In fact, his calculations result in some decrease in both these items. This finding is consoling for the longer view that anticipates population growth as ultimately outrunning food supplies. But it is hardly promising as offering short-run hope for demand expansion through programs to improve nutrition.

If everyone ate a "liberal-cost diet", Cochrane's group finds, this would "come close to eliminating the current level of agricultural surplus." This, however, is not a "better" diet from a nutritive standpoint. It means getting the same nutritional intake as with the moderate-cost diet, but from sources higher on the hog. Educating the public to a luxurious standard of food consumption might be an acceptable goal of advertising and promotion, which you may wish to discuss next week. But in the present state of public morals it would hardly be acceptable as the goal of public subsidies to food distribution that are justified in the name of welfare needs, which is what we are concerned with this afternoon.
Here we have, I think, the basic difficulty with programs to subsidize food consumption as solutions to the present agricultural problem. These programs were born in depression, and in depression they made sense. Large numbers of people were hungry, yet farm products were going begging in the markets. Distribution had broken down. The situation cried out for ways of bridging this gap, of getting the food into the hands of the people who needed it. Welfare aims and agricultural aims went hand in hand. Restricting farm production could be justified only as a temporizing measure. Increasing consumption obviously was the basic need.

Since the war, this has not been the situation. We have surpluses. But we do not have any large number of hungry people in the United States who are in obvious urgent need of them.

And even in case depression should again strike there would not be the justification for food distribution programs that there was in the thirties. We now have extensive programs of benefits to cushion the effects of unemployment. How effective they are was demonstrated last year, when consumer purchasing power remained high in spite of a sharp increase in unemployment. And politically it seemed clear that had the recession been prolonged additional and more vigorous measures would have been adopted for supporting the purchasing power of consumers.

The social workers who, back in 1940, futilely objected to the Food Stamp Plan on the grounds that the poor should have cash grants rather than subsidies earmarked for foods seem to have won their point in the final outcome.
INCREASING DOMESTIC DEMAND FOR FARM PRODUCTS
BY ADVERTISING AND PROMOTION

Robert M. Walsh

I. Two questions immediately are raised by the topic, "Increasing the Domestic Demand for Farm Products by Advertising and Promotion." The first question is, can demand be increased by promotional activities? The second, can such increase in demand, if any, be measured precisely?

On the basis of evidence now available, the answer to both questions is a qualified and partial yes. For single commodities, and for short-term promotional activities, as will be demonstrated later, a positive but fairly short-lived response can be shown. But little evidence is available on the effects of sustained promotional activity on the demand for farm products, either singly or in the aggregate.

One phase of the problem may be defined as that of shifting the demand curve to the right; that is, increasing demand, either for a short time or for a longer period through advertising and other promotion. Some economists have stated an alternative requirement -- making the demand for a product more inelastic, so that consumers will make repeat purchases almost without regard to the price and income situation. The latter requirement appears to have particular application to brand products where unique product differentiation is sought. But complete product differentiation is rarely achieved, except for very short periods.

A second phase of the problem is to determine the magnitude of costs in relationship to the benefits of advertising and other promotional activities. Even this phase is more complicated than it sounds. There is a real possibility that expenditures for advertising and other promotion may bring social gains in addition to gains in sales -- social gains measured not solely in terms of employment but in terms of improvement in living standards for society as a whole.

As a special case to the general requirement of inducing a shift in the demand curve to the right, we may have no apparent shift in the demand curve, or a negative one, where the force of advertising and other promotion for competing products may be as great as or greater than that for the product or product group being studied. Yet, even under these circumstances, the advertising and other promotion for product A, let's say, may have been quite successful.

for without it the demand curve for A might well have shifted to the left, even disastrously so. Our domestic society is highly competitive, and the special case may occur so frequently that it tends to become the general rule. This is primarily what makes the determination of advertising effectiveness so difficult. Either we must accept the benefits on faith, as most adherents do, or we must diligently seek out and measure all the demand factors and counterfactors operating in the domestic market on the product or product group with which we are concerned.

Let's pause for a moment to define what we mean when we talk about advertising and other promotional activities. We mean to include every phase of promotion. Thus we include paid advertising for newspapers, magazines, radio, television, billboards, car posters, direct mail, and so on. We also include public relations activities with handouts to such media as newspapers, radio and television, and the creation of newsworthy events. Further, we include the use of dealer-service agents to contact and assist retailers in pushing products or product groups; and the furnishing of in-store promotional materials such as display cards and banners, recipes, and shelf-talkers. Educational groups, such as agricultural extension agents, home economists, and human nutritionists, frequently are found in supporting roles, though not included in our definition of advertising and other promotion.

The development of new or improved products for introduction in the market is definitely a dynamic merchandising activity. The demand for citrus products, to cite an example, probably has been increased in the past several years, particularly during the 1940's, fully as much by the introduction of frozen concentrated orange juice, frozen concentrated lemonade, and other processed products as by all promotional activities combined. In fact, it would be almost impossible to segregate the effects of advertising and innovation.

For simplicity, let's refer to advertising and other promotion as "advertising," "promotion," or "promotional activities," including everything above except new-product introductions and strictly educational efforts.

II. So, we talk about "advertising" or "promotion." How important is it in the domestic economy? According to the magazine Printers' Ink1/, the total advertising bill in the United States was $10.3 billion in 1957, and in 1958 it was 1 to 2 percent less, or in round numbers about $10 billion.

These figures purport to cover all advertising expense, including the cost of advertising departments and point-of-purchase promotional materials, as well as amounts paid to agencies for advertising through newspapers.

magazines, farm publications, business or trade papers, radio, television, direct mail, outdoor signs, car posters, and other media. The figures apparently do not, however, include expenditures for dealer-service agents (not salesmen) or for public-relations activities. No firm estimates are available as to the total cost of dealer-service and public-relations activities, but, if an additional 10 percent can be accepted as a reasonable guess, another billion dollars would be added to the annual advertising bill.

Printers' Ink gives a breakdown of the approximately $10-billion advertising bill for 1957 (excluding dealer service and public relations) as follows: Newspapers, 32 percent; direct mail, 14 percent; television, 13 percent; national magazines, 8 percent; radio, 6 percent; business papers, 5 percent; and outdoor, 2 percent. An additional 20 percent is grouped under the heading, "miscellaneous." This evidently includes expenditures in some of the minor media and, more importantly, cost of advertising departments and point-of-purchase materials.

Significantly, no estimate is available of the cost of developing and introducing new consumer products into the market. This cost must run into several billion dollars annually.

Expenditures for promotion of agricultural products, including those by manufacturers, distributors, and farm groups, represent a substantial part of the total bill. Food and food products accounted for 21 percent of the total media expenditures by "millionaire advertisers" in 1957, according to Printers' Ink. Advertising firms or groups spending a million dollars a year or more probably are not completely representative of all advertisers, but in 1957 they did account for nearly two-thirds of total time and space costs in major media. Consequently, it may be said that total advertising expenditures for foods, food beverages, and confections in 1957 were in the neighborhood of $2 billion. Nonfood agricultural products, such as textiles, tobacco products, alcoholic beverages, and soaps, would boost this total by at least a billion dollars.

The bulk of agricultural-product advertising is sponsored by manufacturers and distributors. However, farmers themselves are taking an increasing interest in the advertising game. The Agricultural Marketing Service of USDA is now tabulating results of a survey covering 1958 advertising expenditures of farmer-sponsored groups, such as volunteer promotional associations, farmer cooperative marketing associations, and State advertising commissions and boards. Preliminary and unofficial returns at this time indicate a total advertising expenditure for all agricultural products by such groups of around 74 million dollars in 1958. Included in this total were sums spent by agricultural groups for dealer-service and public-relations activities, amounting in the aggregate to about 42 million dollars. These rough indications are based on returns from over 900
respondents, representing possibly 85 percent of total expenditures by farmer-supported groups. The final tabulations will include returns from some additional respondents, and the estimated expenditures may be revised somewhat in the official report from those given here.

Here, then, are the magnitudes of the advertising venture, expressed in dollars. Total advertising, as reported annually in Printers' Ink, has increased twice as rapidly as the Gross National Product since 1940. Advertising is an established institution in our economy.

III. Manufacturers and distributors of brand items obviously must continue to advertise if they are to survive. What is not obvious is the position of agricultural groups wishing to enter the advertising field. Can it be said, either on theoretical or on factual grounds, that product advertising on a broad scale, as for beef, lamb, apples, grapefruit, or potatoes—without brand-name differentiation—is necessary or desirable?

Advertising may be separated into two broad categories: brand-name and product. It is possible to measure the effects of brand-name advertising through such simple devices as the cash register (where the company keeps close watch of sales); through retail sales reports such as those furnished by the Nielsen service; and through consumer purchase reports. In the last two, it is possible to compare sales results for brand A, for example, with results for other leading brands of the same commodity. Ups and downs in brand A's share of the market can usually be measured and compared with advertising activity.

Product advertising, without brand or other major differentiation, is primarily what we are concerned with in this discussion. Not many studies have been made in this field, although two recent papers illustrate an awakening interest in it. One paper has to do with consumer attitudes toward food advertising, and the other is a mathematical treatment of the subject of sales response to advertising. In the latter, three concepts are used to build a mathematical model. These are (1) the sales decay constant, (2) the sales saturation level, and (3) the sales response constant. The authors state that test promotions, under specified conditions, give results that are significant and reproducible, though the degree of accuracy attainable, they state, is smaller than ordinarily considered acceptable in many other fields of research. This is an interesting report, but unfortunately it fails to give results of the experimental work described. Much additional work combining theoretical and statistical approaches would appear desirable.

The Market Development Branch of the Agricultural Marketing Service, USDA, is doing some work in this area. For purposes of discussion, that work is described in some detail below.

IV. Such work has been going on for three to four years. Yet the surface has barely been scratched. One could hardly expect broad principles to emerge in that time, particularly where many factors other than supply, price, income, advertising, and competitive forces must be considered. Such other factors might include the number, kind, and quantities of substitutable products available, the newness or oldness of the product, past and current trends in consumption, the effects of innovations (as changing the form of the product), retail merchandising practices, and variations in quality factors and their effects on consumer preferences.

Such surrounding, or ecological, factors often condition the effectiveness of advertising, and it is evident that a given advertising effort may have quite different results on different products or at different times. Trend, for example, can have an important influence. If consumption is trending upward, advertising may have more influence in shifting the demand curve to the right than if consumption is static or trending downward. It may not be possible, in general, to say why this is so; each case must be examined in detail before conclusions can be reached. So it is probable that a large number of cases must be studied before general principles will begin to emerge.

Five cases will be described. Three of these relate to advertising in connection with new agricultural-product introductions, and two relate to intensified advertising efforts for established products. In each case, the advertising is essentially a "one-shot deal," representing a single promotional effort without sustained followup. This is not to say that the agencies sponsoring the advertising did not conduct followup campaigns; in some cases they did. But the study effort, in each case, was cut off following the initial promotion. There is no doubt in the minds of those conducting the studies that evaluation of sustained programs is equally as important, if not more so, and as time goes on it should be possible to make such evaluations. One such followup study is now being undertaken. It must be remembered, however, that results will not come quickly, since observations covering many months and perhaps years will be needed.

Essentially the same study techniques were used in the three cases concerned with testing market acceptance of new forms of agricultural products. The study techniques combined retail-store audits of sales and prices of the new and closely associated products with followup homemaker interviews to determine the incidence of awareness, purchase, and repeat purchase of the new product as well as like-and-dislike attitudes toward it.
The introductory campaigns also were conducted essentially in the same way in each case. A city of 100,000 to 200,000 population was chosen; retail stores were "saturated" with the new product (that is, as many stores as possible were induced to carry it, usually representing 90 percent or more of the total retail food trade of the city); a fairly intensive advertising campaign of 4 weeks was carried out, using newspaper ads, radio announcements, television demonstrations, in-store promotional materials and displays, store demonstrators in a few of the test stores, and publicity materials for newspapers, radio, and television. The advertising and merchandising activities were the responsibility of the trade and not of the study group. Nevertheless, the advertising and merchandising efforts were coordinated with the study plan.

The new products studied were frozen grapefruit sections\(^3\), canned precooked short-grain rice\(^4\), and dehydrated potato flakes.\(^5\) The first of these products was developed by the citrus processing industry, and the last two by utilization researchers of the U. S. Department of Agriculture.

One result of the promotional campaign was clearly and abundantly demonstrated. And that was the phenomenal effect on sales of using in-store demonstrators. In every store where a demonstrator was present, even only one or two days a week, sales of the new products were several times higher than in other test stores. And the higher sales tended to persist in such stores in the post-promotional periods studied. The use of demonstrators, obviously, is expensive. But under certain circumstances, where high initial consumer acceptance is desired, at least in a limited number of markets, the extra cost may be justified.

There was no doubt that advertising aided in gaining consumer awareness of and initial acceptance of the new products. Sales of all 3 products shot up during the advertising period, but tapered off during succeeding weeks. Nevertheless sales were in "commercial quantities" during the post-promotional period studied.

By commercial quantities we mean sales per store equal to or better than the average of other frozen-food or grocery items. Sales of precooked rice in 22 nondemonstration stores, having no special in-store displays, for example, were about as large as sales of other grocery items over the 19-week study period, including the 4 weeks of citywide promotion. That is, sales averaged

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about one-third case (of 24 cans) per store per week, which was nearly the same as the average sales reported by Progressive Grocer for over 4,000 items in 6 supermarkets in Super Valu stores in the North Central region in 1957.6/ Average sales of the precooked rice in Fresno were almost identically equal to average sales for 11 dry-rice items in Super Valu stores in the North Central region.

In the case of potato flakes, the entire quantity available was sold out in the fifth week, 1 week following promotion.

The household surveys showed that consumer awareness of the product amounted to 50 percent in the case of frozen grapefruit sections, in Erie, Pa., in a period following the promotion campaign; 27 percent in the case of canned precooked rice in Fresno, Calif.; and 50 percent in the case of potato flakes in Binghamton-Endicott-Johnson City, N. Y.

At the time of the surveys, about 30 percent of the aware consumers had bought frozen grapefruit sections, and about 70 percent of those had made 1 or more repeat purchases. A third of the aware respondents had purchased precooked rice, and about 40 percent of those had made repeat purchases. And nearly 30 percent of the aware consumers had bought potato flakes, with a 60-percent repeat-purchase pattern. Potato flakes were on the market for only 5 weeks, whereas frozen grapefruit and precooked rice were available for considerably longer periods. Potato flakes were not available to consumers for a period of 3 weeks prior to interviewing. This probably explains the slightly lower incidence of purchases for potato flakes compared with the other 2 products.

The primary purpose of the advertising including the in-store demonstrations, was to make consumers quickly aware of the availability of the new product, so that the commercial feasibility might be evaluated in a comparatively short study period. About half of the householders were made aware of the new products in a period of 8 weeks from their introduction in the market, except for precooked rice, where only slightly more than a fourth were aware. This indicates that the advertising, generally speaking, was successfully used as a study tool.

In fact, one might say that advertising is an absolute essential in new product introductions. Retailers as a rule are reluctant to stock new products without assurance that the distributor will promote the products in an effective way.

It may be of interest to note that frozen grapefruit sections are now being produced and distributed commercially, in competition with hot-pack canned sections and with chilled sections. The precooked rice tested is not in

commercial production; further work to improve the product is under way at the Western Utilization Research and Development Division of USDA. About 8 firms are producing potato flakes, using a number of varieties of raw potatoes. One firm is distributing the product -- a new form of instant, dehydrated mashed potatoes -- on a national basis. Another national distributor is making further market tests of the product.

Additional studies of the effect of advertising on demand for farm products have been conducted by USDA, on sour cream and on lamb. The so-called surplus of dairy products has been concentrated chiefly in butter, evaporated milk, and nonfat milk solids. As shown in the accompanying slide -- AMS 6506-58 (1) -- consumption per person of evaporated milk, cream, and butter declined significantly in a recent 10-year period. Consumption per person of cottage cheese, nonfat dry milk, cheese other than American, and condensed milk, on the other hand, increased by a third to three-quarters. Little change per person was shown in use of fresh whole milk, American cheese, and frozen desserts.

In cooperation with the American Dairy Association, the Milk Industry Foundation, and local dairies, a study of the effectiveness of special promotion in increasing sales of cultured sour cream was carried out in Des Moines, Iowa, in August 1957. As shown in the slide -- AMS 4713-57 (12) -- sales of sour cream attained a peak 59 percent higher than the base week in 1 of the 4 promotion weeks, and averaged perhaps 40 percent higher for the entire period. Subsequently, part of the gain was maintained, but it appears that much of this increase resulted from secular trend. After adjustment for trend effect, the net gain attributable to advertising in August 1957 was approximately 33 percent, and there apparently was a slight net gain in subsequent months.

We may conclude that special promotional efforts will move additional quantities of good-quality, cultured sour cream. But what is the cost? And what is the longer-term effect on consumer demand?

The dollar cost of the special promotion in the Des Moines metropolitan area in August 1957 apparently was between $5,000 and $6,000. On the other hand, the gross value of additional product sold was under $1,000. Therefore, if the promotional program is to be considered a financial success, it must be in terms of consumer education in developing new tastes and new ways of usage, and hence in terms of long-run effects. Unfortunately, measurement of the long-run effects is a difficult undertaking for which analytical tools are not yet perfected.
Considerable effort has been expended to date in evaluating the effectiveness of promotional programs for lamb and mutton, both in Sacramento and in Cleveland. The promotional effort in Sacramento occurred at a time when lamb supplies were unexpectedly short -- both locally and nationally -- and prices of lamb were high in relation to prices of other meats. This is shown in the slide -- AMS 4380-57 (7). As a consequence sales of lamb declined. In the evaluation it was concluded that sales would have declined more than they did if it had not been for the promotion. This was based on an imputed price-elasticity of demand ranging from -4.0 to -2.0. As indicated in the slide -- AMS 4381-57 (7) -- sales might have been expected to decline around 60 percent, with an elasticity of demand for lamb of -4.0, attributed to Ezekiel in the late 1920's, or to decline around 30 percent, with an elasticity of demand of -2.0, attributed to Fox, 1953. Retail-store sales, as audited, actually declined about 20 percent during the promotion period from a pre-promotion benchmark. The promotion, therefore, was judged to be successful in shifting the demand curve for lamb.

We can still have doubts, however. New methods of statistical analysis, in particular the method of simultaneous equations, might well yield different elasticities of demand for lamb, which possibly is in the neighborhood of -1.0 rather than ranging from -2 to -4. Moreover, one cannot be sure that a measure of elasticity for the country as a whole can be applied without misgiving to a single community.

A different analytical technique was used in evaluating the special promotional campaign for lamb in Cleveland, carried out by the American Sheep Producers Council in July and August 1956. As in Sacramento, retail audits were made, as well as surveys of household consumers. These yielded interesting pieces of information. But the chief reliance was placed on a multiple correlation analysis based on 40 months of data covering the period before the special promotion. This analysis included wholesale sales of lamb in Cleveland as the dependent variable, and retail price of lamb, composite retail price of other meats and poultry, consumer earnings, seasonality, and retailers' newspaper advertising activities for lamb relative to all meats, as independent variables. The composite retail price of other meats and poultry was found not to contribute significantly to the results.

8/ Promotion of Lamb, Results of a Campaign in Cleveland, Ohio, AMS, MRR No. 292, Dec. 1958.
The equation was used to predict sales, as may be seen in the next slide -- AMS 8534-58 (9). Sales beyond the correlation period, those in May, June, July, August, September, and October, also were predicted.

Actual sales and predicted values were compared for May and June 1956, the pre-promotional months, with good results; and as indicated in the next slide, for the two promotional months, July and August, and the first two post-promotional months, September and October -- AMS 6525-58 (9).

The results were rather curious. July, the first full month of special promotional activities, showed no significant difference between estimated and actual sales, at the 95 percent confidence level. August, the second month of promotion, showed a significant increase of 14 percent of actual over estimated sales. In September, the first post-promotional month, an offsetting decrease in sales took place. But in October actual and estimated sales were again not significantly different. It was concluded that temporary large supplies of lamb might be disposed of profitably by an intensive promotional campaign. It is evident nevertheless that heavier-than-usual consumption, or purchasing, in one month was followed by lighter-than-usual consumption in the following month. Possibly this is a characteristic of the demand pattern for lamb, but the evidence is rather thin for even this conclusion.

It is possible that the effects of the special promotion were underestimated. This arises from the fact that the newspaper ads of retailers were considered in developing "estimated sales," on the assumption that such activity was normal and was not influenced by the special program. Retailer advertising was heavier than usual during the special promotional period, and this may in fact have been associated with the special program.

Today over 2 1/2 years later, the USDA is undertaking a followup study in the Cleveland market. It is planned to bring the monthly sales and related data up to date in an effort to appraise the longer-term effects of the special advertising efforts for lamb, which have been continued by the American Sheep Producers Council.

It is obvious that, in making studies of advertising effectiveness, the problem of method or technique is paramount. Before concluding, we might describe another technique which is presently under test.

The USDA, in cooperation with the Washington State Apple Commission, is carrying on an experimental study of the effectiveness of advertising in 6 midwestern cities. Three "treatments" are being tested, (a) a general health advertising theme, (b) an apple use advertising theme, and (c) no advertising. These three treatments are being tested in each of the 6 cities over 4-week periods, with an experimental rotational design in such manner that each city will receive each treatment at least once, and all 3 treatments
will be conducted simultaneously in 3 pairs of the 6 cities. It will be possible to analyze for significance of difference between treatments, and for carryover effects at least in the short run. For measurement purposes, audits of apple sales and prices, and related data including volume and prices of competing fruits and extent of competitive advertising efforts, are being made in 10 or 12 retail food stores in each of the 6 cities.

In conclusion, we refer again to the general theme of this seminar paper -- that, right now, it is difficult if not impossible to say what effect advertising and other promotional efforts may have on the demand for specific farm products, and for farm products as a whole. Further, it is necessary, in developing a body of general principles, or theory, to test out a fairly large number of specific advertising programs so as to develop a broad basis of factual information. Some studies have been described, but it is evident, at least to this writer, that much more work needs to be done before conclusive evidence may be set forth.
INCREASING THE DEMAND FOR FARM PRODUCTS BY IMPROVING QUALITY TO MEET CONSUMER DEMAND

V. James Rhodes

The impact upon aggregate demand of improving the quality of various farm products is not likely to be large. However, impacts of such quality improvements upon particular products may be of consequence and may have considerable regional significance. The brief topic outline provided by Professor Shepherd emphasizes improvement of animal products. I suppose that emphasis assumes some validity in the "multiplier analysis" that animal products require more resource expenditures than cereals, vegetables and fruits.

The phraseology of the title is worthy of examination. "To increase demand" means to shift the demand curve to the right. Merchandisers of manufactured consumer products talk knowingly about the complementary roles of price, product and package in projecting a "product image." Quality improvements in this context must be accompanied by prices which testify as to the validity of the quality promoted. In the roller-coaster world of farm product prices, it is an important question whether increases in demand through quality improvement represent movement of the entire demand curve to the right or only certain portions of it.

What does it mean to improve quality? These four definitions as applied to a product each have their proponents.

1. "Cost" -- quality is measured by the amount of resources expended in production.
2. "Standards" -- quality is measured by absolute standard applied by experts in nutrition or husbandry or technology.
3. "Sales" -- ceteris paribus, the better quality product is, the inferior one.
4. "Preferences" -- ceteris paribus, the better quality product is, in some sense, "preferred" to the inferior one.

It should be apparent that these definitions may sometimes conflict.

An examination of the broiler case illustrates the type of definitional conflicts which can arise. Consumption of broilers in 1958 greatly exceeded the consumption of farm chickens for, say, 1940. By the sales definition the

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broiler is a quality improvement although the relative decline in price violates the ceteris paribus proviso. I rather suspect the standards of the nutritionist and poultry husbandryman might differ as to whether the broiler is a quality improvement. The "costs" definition would not describe the broiler as a quality improvement. What about preferences? I feel confident that the cut-up, tray-packed broiler is visually preferred to the New York dressed fryer. I doubt that for equivalent sized birds, there is any pronounced difference in eating quality as perceived by consumers. Thus, we have observed a tremendous increase in the sale of broilers which is associated -- depending upon your definition -- to a great or small degree with a quality improvement.

I shall generally adhere to the preferences definition. I interpret the seminar topics to mean that I should be concerned with farm products as such and not with packaging or promotional changes.

**Product Design and Grading.** The improvement of quality of farm products -- by whichever definition -- is related to the problems of grading and product design. The diversity in quality of many agricultural products has very often been considered a positive benefit to consumers and/or producers. Diverse qualities are supposed to match the supposedly diverse preference maps of consumers, so that community satisfaction exceeds that which would prevail with a uniform quality. Other authors emphasize -- also, or instead -- the potentialities of dividing markets and practicing effective price discrimination by means of natural diversity in quality.

Since farmers are rarely in a position to benefit from price discrimination we shall be little concerned with that argument.

I think it useful to our thinking -- and no farther from the truth -- to argue that wide diversity in quality is not of benefit to consumers nor producers. Corollaries are these propositions:

1. Grading is the process of making the best of a poor situation;
2. Design of "an optimum product" of general acceptability will satisfy more consumers and sell more units than the best possible grading of units into "Good", "Pretty Good," "Almost Good" and "Poor".

These propositions appear to be true for milk sold to consumers in fluid form. I suspect that they are true for eggs and broilers. On the one hand, modern production and distribution methods promise to so reduce the cost differential between egg grades as to threaten the price appeal of the inferior grades. On the other hand, broiler grades appear to be based on rather inconsequential factors and can hardly be expected to be superior to a simple USDA "Quality Approved" label. As technological innovations and good product design bring increasing product homogeneity in other farm products, these propositions will apply to them.
The case for beef may appear much stronger than for milk or broilers. The argument for the usefulness of beef grades was recently stated as follows:

"One of the principal functions of grades is to channel each unit of a commodity into its highest valued use, that is into the form and use for which it is best suited. The Federal grades for beef appear to have contributed to the effectiveness and precision of this channeling and distributing process. The Prime grade, for instance, is channeled into high valued use in the restaurant trade; Choice is sold predominately by retailers in medium and high income areas; the Good and Standard grades are sold principally to retailers in low and medium income areas and to highly price conscious customers while the remaining grades are directed primarily to processors and manufacturers of prepared meats." 1/

While this socially desirable process of channeling each unit into its highest use is similar to price discrimination, it is not price discrimination because the production costs of these units vary widely and, in the same direction as their prices. Suppose that some tremendous feat of processing (at nominal costs) could make uniformly acceptable all the beef from the various grades. On the demand side, the more elastic segments would no longer have to accept beef of widely varying and sometime unsatisfactory quality. Surely, quality improvement would increase sales in these important market segments. On the other hand, as a consequence of our assumption, the more inelastic segments could continue to receive the same quality.

The greater impact would be on supply and upon its regional and specialized components. Within a generally free market, 2/ we would not expect vertical competition between product qualities to persist without a difference in cost matching the difference in quality (as both cost and quality differentials are perceived by the buyers). Therefore, a leveling of the quality of beef would place the production of the more expensive beef at a disadvantage. I will argue later that this complete leveling of quality is not at hand but that some leveling is more than a wild dream. I need not spell out the implications for the corn belt.

Recapitulating, I have questioned whether the present natural quality diversity of even so heterogeneous a product as beef is better for producers and consumers than homogeneous quality. I believe that in a day when

2/ It must be admitted that present market imperfections are substantial and that imaginary differences in quality may for a long period influence the market.
standardization and repeatability are the watch-words, that it can be plausibly argued that beef producers and consumers would benefit from homogeneous quality to the extent that can be obtained. In any case, we need more emphasis on product design of agricultural products. Whether there are multiple qualities or one quality, these "products" of this "product" should be designed to suit the buyers. Such design will often transgress the "cost" and/or the "standards" definitions of quality. Compromises with "standards" may sometimes be advisable, but the designer must not become entrapped by cowboy lore nor the ideals of technical perfectionism.

For a number of important agricultural products, "quality" is what the grading service says it is. This identity of grades and quality indicates the accepted usefulness of the grades. At the same time, the grading service assumes a heavy responsibility in the case of products in which its definitions could be considerably wide of the mark without being generally realized by the trade. Economists have paid too little attention to the defining of grades and to the long run performance and structure of an industry of the substitution of more price competition for less quality competition.

I shall briefly summarize a few concepts concerning grading which Professor Kiehl and I have previously specified.

(1) The assumption that all consumers' preference maps are identical is a necessary but not a sufficient condition for the justification of rank-ordered grade names. To state or imply by grade names that the grade preferred by one group is superior to the grade preferred by another group is misleading.

(2) An unwillingness of some consumers to exchange some units of a product for other units at an equal substitutionary rate is a necessary but not a sufficient condition for grading.

(3) Sensory differences (eating and/or visual) would appear to be a necessary but not a sufficient condition for consumers to place differing economic values on differing product units.

(4) "An optimum grading system should classify as alike or as 'in a grade' all those products consumers value the same."4/

In retrospect, I do not consider these conditions unduly severe, unless one gratuitously interprets the "optimum" goal as a necessary condition. Their shortcoming appears to lie in the omission of sufficient conditions for grading. The sufficient situation seems to me to involve so many judgmental

4/ Ibid, page 45
factors concerning the social benefits and costs of grading as to be impossible of simple statement.

**Some Research Results and Interpretations.** What is beef quality to consumers? What grades do consumers prefer? There have been numerous publications of preference results of various types. There have been even more numerous "interpretations" given by the researchers and interested observers. Under such conditions, a brief summary may be useful.

The early studies of visual preferences indicated that consumers' preferences were, indeed, diverse. The least popular grade usually came up with at least one-sixth of the first-place votes and the most popular with only one-third or, in some cases of only three grades, one-half. Much ado was made about the most popular grade (characteristically chosen by ranking three or four grades of loin steaks in a display under an explicit assumption of no difference in price). In our own study,\(^5\) Prime had a slight edge in popularity, while Good was definitely more popular in studies in each of three western states.\(^6\) In all cases, the popularity of the leaner grades was sufficient to cause surprise and even concern on the part of some observers. These visual preference results suggested widely differing preference patterns of consumers. Of the several factors affecting consumer's choices, the most important were amount and color of lean and assumed eating characteristics. It was readily apparent that consumers differed widely with each other and with "experts" as to the visual indications of eating quality. This disagreement led us into research concerning eating preferences. At this point, we were forced to make a shift in our attack with important implications which often are not understood. The visual studies tested the preferences of people for given, standardized products. The eating studies have never gotten much beyond the stage of testing products in terms of a composite preference of consumers. The difference arises from the amount of available product of known homogeneity. In a large laboratory eating test, we learned that judges could discriminate between loin steaks from two animals within one third of a grade with almost the same accuracy as they could discriminate between two animals in non-adjacent grades.\(^7\) Accurate testing of eating preferences for grades or for any products requires homogeneity in each product tested. Since that homogeneity does not exist in present beef grades, our preference tests describe mainly the distribution of

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\(^7\) V. James Rhodes, et. al., Consumer Preferences and Beef Grades, Mo. Res. Bul. 612, 1956.
carcasses within a grade. It is true that we have paired off a number of carcasses from two grades and have reported the total number of preferences. The so-called higher grades have obtained a majority of the preferences, although individual carcass pairings have not been as consistent. 8/ It should be apparent, however, that the preference totals depend upon the particular pairings. 9/

This diagram shows the range and distribution of carcass ratings given short loins from 84 carcasses by a panel of 266 St. Louis men (Figure 1). The mean general acceptability rating of each carcass (obtained twice from 12 to 14 men in as many neighborhoods) is shown on the ordinate after being translated from a descriptive, hedonic scale to a numerical one. Number 1 is equivalent to "like extremely" and number 9 is equivalent to "dislike extremely". The range of carcass means is broken into thirds by shading to indicate more clearly the intra-grade distributions. The experimental design and internal evidence indicate that most of the variation stems from differences in carcasses and not from differences in consumers' preferences. Note that in the region above a rating of four are the means of all 42 Prime and Choice carcasses, more than two-thirds of the Good grade and almost one-third of the Standard grade. This tremendous over-lapping of grades as to carcass acceptability has been the result most difficult to accept. The greater intra-grade heterogeneity of carcasses as one proceeds toward the leaner grades is also larger than expected. We have found the same results with short loins from 80 more carcasses and are now embarked upon a similar test which will eventually involve over 500 more carcasses. If these results are again confirmed, then very serious attention must be given to the problem of improving grades. The best third of Standard and the best two-thirds of the Good grade were premium products which were "wrongly" labeled as inferior products. One of the claims now being made for Choice is that its greater homogeneity as compared with Good reduces the risks to the merchandiser of disgruntled customers. The social cost of this reduction of risk is the extra pounds of fat placed in the retail tallow barrel or, more properly, the resources which produced that excess "rind". Please note that these decisions of retail merchandisers are relatively immune from the constraints of consumers because of the current lack of knowledge in this area.

If and when beef can be graded according to its acceptability, how many grades should we have? Any answer must be based considerably upon judgment even though we apply the theoretical conditions for grading stated above. I would

9/ "The simple fact is that adjoining grades so over-lap that preference results can be greatly affected by chance pairings." V. James Rhodes, "Relationship of Physical Product and General Acceptability Ratings," in Conference on Consumer Preferences, University of Missouri, Mimeo, September, 1957.
Figure 1

Federal Grades of Beef

Distribution of Carcasses (Loins) by grade, St. Louis panel

University of Missouri
say two grades with the dividing line at about 3.5 on this scale and the lower limit of the second grade at 5.0. Products below 5.0 might better be improved by tenderizing techniques or be sold as processed meats. For a time perhaps, we should continue to separate out Prime as a special grade to protect the show circuit, although the perennial divergence of carcass and live animal show-ring results should be sufficient warning.

Would two grades be sufficient for the diversity of consumer eating preferences? Our admittedly incomplete evidence suggests that eating preferences are not terribly diverse. For example, in one test we had pairs of families compare several steaks from pairs of loins. Preferences of families were considerably different for only 24 of 60 comparisons. 10/

What about the potentialities of tenderization by enzymes, by high temperature aging or by other means? Each of these methods show promise, but no real break-through has as yet been accomplished. The apparent success of several well-known steak houses with tenderized, leaner grades suggests that tenderizer may be used most effectively in a carefully controlled commercial environment. Lack of tenderness is frequently a limiting characteristic in beef. We have reason to believe that the natural variation in juiciness, texture and flavor is small. Moreover, most roasts and many steaks undergo severe cooking treatment and often receive additives during or after cooking which rather effectively mask natural variations in juiciness, texture and flavor. Therefore, a break-through in tenderization could have a great impact upon the acceptability of leaner grade carcasses. The consumer ideal of tasty, tender and lean beef would be obtained.

Another change in the beef industry may be nearer at hand. The Grading Service has been discussing the possibilities of adding "cutability" (retail yield of trimmed, salable, popular cuts) as a grading factor. As is usually the case, the idea is being received with mixed emotions by the trade, and its ultimate acceptance is uncertain.

The importance of the idea for our discussion is that retail yield is inversely related to the degree of finish. The Grading Service reports that these yield variations are of considerable importance. Pierce has reported that a difference of 4.05 percent was found between average yields for the high and low yielding groups within the Choice grade, 500-600 pound group. Individual carcass variations are reported of as much as 9 percent yield of preferred cuts in the Choice grade, which at present prices he valued at about ten dollars per hundred weight. 11/ Pierce indicated his belief that the

10/ Rhodes, et. al., Bul 676, page 15
11/ John C. Pierce, Jr., "Beef Grading Studies", Ams Mimeo of talk given at College Station, Texas, August, 1958. Yield is slightly related to conformation also.
industry has not yet recognized the total impact of yield upon carcass value, although many buyers will reject an especially "wastey" carcass.\textsuperscript{12} I know of a few instances where buyers pay a premium to enter the packer cooler to select carcasses and they choose not the Choice most like Prime but the lean, high-yield Choice carcasses most like Good. The wide recognition of these yield results would likely make lean Choice carcasses (mostly "low Choice") more valuable than any other Choice carcasses. Such recognition should also cause a re-evaluation of the merits of the higher yielding, leaner grades. However, the fact that about four times as many low Choice as high Good carcasses are being rolled with the federal grade indicates something of the retailer demand for that U. S. Choice government grade label.\textsuperscript{13}

Perhaps I have dealt too specifically with one commodity. I hope that this discussion does indicate the importance of forces at work in one industry as they bear upon the problem at hand.

What is quality in pork as viewed by the consumer buyer? Can we find an additional retail value for lean pork that can be added to its already recognized cut-out advantage?

Several attempts to answer those questions have been made, and none have produced really conclusive results.

Ordinary interviewing studies of visual preferences for pork cuts confirmed the overwhelming preference for lean cuts.\textsuperscript{14} Some small-scale sales tests at Iowa and Illinois indicated that lean cuts would sell materially better than fat cuts.\textsuperscript{15} However, investigators generally found a visual sorting for leanness superior to the use of Federal grades in selecting "lean" products. These very promising beginnings have not yet been verified with similar large scale results. Trotter's Pittsburg sales test in eight stores found that lean and fat pork cuts (center cut chope and pork steaks) sold equally well regardless of the price differential. Part of this buyer insensitivity to fat/lean differences may have been due to some experimental control problems and to the fact that a large proportion of buyers never perceived the full range of alternatives in the displays.\textsuperscript{16}

\begin{thebibliography}{16}
\bibitem{12} Ibid.
\bibitem{13} Williams, et. al, op. cit., page 45
\end{thebibliography}
Our own sales test involving hams and loins from 9,000 hogs sold through 14 chain supermarkets for eight weeks found that lean cuts sold as well as regular cuts at a four cents a pound premium for the lean. Lean cuts sold somewhat better than regular cuts almost 3:2 when priced the same. I participated in this Kansas City test; I am confident as to the adequacy of the experimental procedures: I quietly watched many consumers select from the displays; I expected the sales ratios to be more favorable. The cooperating packer and chain were apparently not sufficiently impressed to push the idea further.

Certainly pork has low prestige relative to beef. Recently I asked a sample of 150 Jefferson City households which they would probably serve a special guest at an evening meal: beef, pork, or chicken. There were 115 answers of beef, 30 of chicken, and 7 of pork.

However during the Kansas City sales test, the sales of hams soared in test stores during the very warm summer months when pork is supposed to be a drug on the market. Presumably, the combination of fresh product and adequate displays had a tremendous impact upon pork sales.

We have been exploring the possibilities of solving much of the fat problem by marketing hogs at 175 pounds or lighter. About 90 hogs ranging in slaughter weight from 125 to 175 pounds have been compared as to eating acceptability with conventional weight hogs. Except for some enthusiasm with the bacon from lighter weights, consumers response was much the same for all weights. There were a few carcass with mean ratings quite different from the mass, but in general there was surprisingly little difference in ratings.

Slaughtering hogs at lighter weights would materially increase the meat/lard ratio at the packing house and apparently would not impair the consumer acceptability of the meat. We do not have adequate data to compare the increment in costs of feeding hogs from, say, 175 to 200 pounds with the increment in cut-out value. Zobrisky has shown that fat is put on at a rapidly increasing rate as carcass weight increases, so that cut-out value increases less rapidly than weight. However, little more than feed might be charged against the last 25 pounds weight increment by many producers, so that total production costs may be computed as rising less rapidly than weight between 175 and 200 pounds. It is tempting to project the impact of lightweight hog slaughter via a slightly better feed efficiency and a considerably higher meat/lard ratio. However, research results are so preliminary as to make the projection premature.

17/ Unpublished data, University of Missouri.
18/ I have not commented upon the results of a recent Purdue study as I do not have the details necessary to evaluate them.
To summarize, I believe as do many others that leaner pork represents an improvement in pork quality. At the same time eating preference and sales evidence is not entirely conclusive. It is possible that retail grading or branding of pork cuts will demonstrate the sales appeal of lean pork and encourage its production.

It would be a mistake to assume that such successful grading and merchandising is certain to be obtained by the first innovator who attempts it. I suspect that fat is not the only important obstacle to the consumption of pork. The Jefferson City panel ranked ham after round steak, swiss steak, charcoal steak and pot roast as usually having a delicious flavor, mentioned it most often of those 5 cuts as excluded from diet for health reasons, checked it most often as being "fattening", and ranked it fourth of the five as far as being economical. I do not foresee any total eclipse of pork, but neither can I detect any latent consumer demand which -- properly exploited -- could bring pork back to its pre-war consumption relationship with beef.

In stressing grading and quality improvement of fresh meats, I do not wish to underemphasize the importance of quality improvement via processing -- grinding, curing, etc. The 1955 Household Food Consumption Survey indicates that processed meats made up 50 percent of the weight and 46 percent of the value of all meat consumed. Ground beef, pork sausage and luncheon meats made up respectively, 13, 3, and 12 percent of total meat consumption. This strikingly large volume of ground meats testifies to the importance of a demand which has persisted in spite of varying product quality, arising from problems of freshness and occasional inclusion of excessive amounts of fat and other low value inputs. Standardization of quality could probably increase consumption considerably. Surely, entirely new products will be developed which will tickle the palate of Americans. While most ground meats require some fat for optimum palatability, the production of "wastey" cattle and hogs will not be required.

It would be expecting too much of preference research and of this preference researcher to anticipate a full-blown answer to the major question with which this seminar is concerned. Improvements in beef quality mean a movement toward leanness as soon as innovations in sorting, processing and/or breeding obtain more consistent tenderness in lean beef. Improvements in pork quality likewise mean a movement toward leanness, although major changes in processing might also provide quality improvements. In general, movements toward leanness mean higher feed efficiencies and less inputs per unit of output. On the other hand, improvements in meat quality which continue

20/ Luby has raised some interesting and plausible hypotheses concerning other obstacles. Patrick J. Luby, "Declining Demand for Pork - Reconsideration of Causes and Suggested Prescription for Remedy", JFE, December, 1958, pp. 1832-1838.
or accelerate the trend toward higher meat diets will require more agricultural inputs. The events may be expected to be slow moving and of little consequence for solving the farm income problem of 1959 or 1961.
INCREASING THE FOREIGN DEMAND FOR FARM PRODUCTS

Lawrence Witt

Surplus production has grown to some eight percent of total agricultural production, and threatens to increase still more. While the surplus has been growing, we have turned in desperation from one device to another in an effort to match production and consumption at acceptable prices. After the efforts of the twenties in strengthening the competitive process of reaching an equilibrium had failed, more direct methods were used. Efforts were made to control supply, then to expand domestic demand, each with a variety of techniques. Even as these programs floundered, the war and post-war experience demonstrated that a strong export market (even though dependent on dollar gifts and loans), would strengthen agricultural prices and reduce stockpiles. Hence it was both logical and with a sense of frustration that a massive export program came into being in 1954.

This program puts substantial emphasis on sales for local currency, but also includes barter, loans, gift provisions. The export program combines two values close to hearts of most farmers (and many agricultural economists). These are that the farmer's product should be used usefully, not destroyed, and that there should be no hungry people in the world while there is surplus food available. The program is made more appealing by its buoyant influence upon farm prices and its success in reducing stockpiles below what they might have been. The ignorance of the foreign exchange mechanism, of the real worth of foreign currency to the United States (especially when deposited in the other country's central bank), and the nebulous link with economic development all help to confuse the issue. The impression is left that the large quantities of wheat, cotton, tobacco, etc, shipped abroad must somehow do some good.

As we discuss this topic, I should like to have you think of it in a broader context -- as a part of a broad international challenge appropriate to agricultural economists and social scientists at Iowa State and other agricultural colleges and universities. Despite five years of a program costing the economy over one billion dollars per year, there is no solid research dealing with this program. Is this because it is a foreign rather than a domestic program? Have we failed to see the full importance of this program to the national economy?

Lawrence Witt is Professor of agricultural economics, Michigan State University.
Moreover, with regard to the mass of world problems which involve farm people -- tenure problems, development problems, instabilities of world commodity prices, and a variety of other agricultural and economic problems -- agricultural economists have had little to say. A few have been drawn into action programs overseas; still they have not written much about the problems spread out before them and of which they are so much a part. Clearly we have been seriously ethnocentric in our United States-based research and other activities, leaving to others the formulation of the proper interrelations of domestic and foreign policy.

Furthermore, we tend to reject involvement in value formation -- in partially specifying important values for society or at least strongly arguing for a set of values. No one should know better than we the amount of subsidy which has been involved in our education and training. Why should not our trained minds contribute more fully in posing and resolving the value conflicts of the society which has made these investments? To continue to ignore value issues, particularly in the international field where the vast majority of the people are unable to even articulate the relevant values, is morally irresponsible and a complete dereliction of duty -- as well as physically suicidal. Look over the bulletins and articles of any experiment station and the articles in the Journal based upon real research. How much has been contributed to an understanding of the interrelations between foreign and domestic policy? Multiply this by 50, and the result is still unsatisfactory.

The General Situation. All this is really an introduction to an apology for the inability to provide precise answers to the problem posed by the title. Almost the only reports that can be drawn upon are either a generalized policy statement based upon the values implicitly assumed in classical economics, or a description of what has been done in carrying out the Congressional mandate. On the one hand, the tensions created by deviating from traditional trading patterns lead some economists and political scientists to a thorough damnation of the program. On the other hand, the easing of the surplus burden, and its consequent presumed effect on the price and income position of American farmers is lauded as a material accomplishment. My view is that the truth lies somewhere in between. I should like to make a tentative approach, largely by showing the complications of the program and possible differential impact.

First, what is the general export situation? During the past four and a half years we have shipped or contracted to ship about $7 billion worth of farm products under special programs. Current farm export levels are close to $4 billion per year. Some 30 to 40 percent of this total represents directly subsidized exports, with an additional amount, perhaps 20 to 30 percent being sold for dollars at special prices. The remainder are commercial exports for dollars. Most of the special exports have been under Public Law 480 -- The Agricultural Trade Development and Assistance Act -- but
additional quantities have gone under Section 402 of the I.C.A. program, under the International Wheat Agreement, special dollar loans, and under legally reduced prices of the CCC program. Not all of the P. L. 480 are sales for local currency; significant amounts have gone as grants and donations, or have been bartered for strategic materials. Wheat, cotton, and fats and oils (soybean oil), are major commodities. Tables 1 and 2 provide some total figures.

In the aggregate, aside from military equipment, this program has become the largest transfer of "wealth" between the United States and other countries since the Marshall Plan -- and the program is far from over. In fact its very place in your program suggests that it is being considered as a more or less permanent alternative to efforts to stuff more food down the throats of domestic consumers. Why do we have this program? What is it intended to accomplish? Two serious questions immediately arise. Who decides where, how much, and for how long such an export program is desirable? Secondly, suppose foreign countries were to say, "We want no more wheat, cotton, or soybeans, but we will accept great quantities of tobacco, feed grains, and dairy products under these special provisions." Would and should agriculture adjust its commodity mix to these needs, or are we so concerned with preserving traditional patterns, values, and institutions that such measures cannot be considered?

**Goals of the Program.** It is necessary to inquire more specifically into the goals of the program, and the extent to which they have been accomplished. To do either of these is far from a simple task. Values are not given; they must be untangled, related, reviewed and compromised. Moreover, this must be done not only relative to United States values, but also interrelated with the values of each of the other countries affected. It is accurate and all too easy to say "We know not what we do". We do not have a clear statement of the national purposes of the program, less so than when it began. Certainly we do not know the impacts upon other countries, except in a superficial and fragmentary fashion. Perhaps it will be mutually beneficial to think together this afternoon about these programs. Take first the United States' objectives.

The early and clear objective is the disposal of supplies of farm products overseas -- supplies which have accumulated or are likely to accumulate at prevailing prices and production levels. To some this is the sole objective of the program, and all other considerations are incidental. It appears, however, that a somewhat contrary view should be held and that several other objectives are becoming more significant.

Time and again the values of the American society have shone forth clearly in an organized effort of giving -- the relief program under Herbert Hoover after the first World War, help for the Japanese earthquake victims, U.N.R.R.A., the Marshall Plan, U.N.I.C.E.F., the CARE packages and
Table 1. Exports of U. S. Farm Products Under Public Law 480 with Comparisons

<table>
<thead>
<tr>
<th>Program</th>
<th>1956-57</th>
<th>1957-58</th>
<th>Total 1954-58</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Law 480</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foreign currency sales</td>
<td>902</td>
<td>650</td>
<td>2,065</td>
</tr>
<tr>
<td>Grants and donations</td>
<td>250</td>
<td>267</td>
<td>1,001</td>
</tr>
<tr>
<td>Barter</td>
<td>401</td>
<td>99</td>
<td>924</td>
</tr>
<tr>
<td>Other exports</td>
<td>3,171</td>
<td>2,984</td>
<td>11,371</td>
</tr>
<tr>
<td>Total exports</td>
<td>4,724</td>
<td>4,000</td>
<td>15,361</td>
</tr>
</tbody>
</table>


Table 2. Commodity Composition of all P. L. 480 Agreements signed through June 30, 1958

<table>
<thead>
<tr>
<th>Commodity</th>
<th>Export Market Value</th>
<th>Estimated CCC Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wheat and wheat flour (bu.)</td>
<td>1,028.0</td>
<td>1,732.1</td>
</tr>
<tr>
<td>Feed grains (bu.)</td>
<td>192.8</td>
<td>335.6</td>
</tr>
<tr>
<td>Rice (Cwt.)</td>
<td>181.8</td>
<td>288.8</td>
</tr>
<tr>
<td>Cotton (bale)</td>
<td>509.9</td>
<td>681.4</td>
</tr>
<tr>
<td>Cotton linters (bale)</td>
<td>.3</td>
<td>.3</td>
</tr>
<tr>
<td>Meat products (lb.)</td>
<td>39.2</td>
<td>39.2</td>
</tr>
<tr>
<td>Tobacco (lb.)</td>
<td>142.3</td>
<td>142.3</td>
</tr>
<tr>
<td>Dairy products (lb.)</td>
<td>43.8</td>
<td>74.2</td>
</tr>
<tr>
<td>Fats and oils (lb.)</td>
<td>384.7</td>
<td>391.0</td>
</tr>
<tr>
<td>Poultry (lb.)</td>
<td>1.7</td>
<td>1.7</td>
</tr>
<tr>
<td>Dry edible beans (cwt.)</td>
<td>.4</td>
<td>.4</td>
</tr>
<tr>
<td>Fruits and vegetables (lb.)</td>
<td>15.2</td>
<td>15.2</td>
</tr>
<tr>
<td>Seeds (cwt.)</td>
<td>.4</td>
<td>.4</td>
</tr>
<tr>
<td>Total</td>
<td>2,540.5</td>
<td>3,702.6</td>
</tr>
<tr>
<td>Ocean transportation</td>
<td>301.8</td>
<td>301.8</td>
</tr>
<tr>
<td>Total, including ocean trans.</td>
<td>2,842.3</td>
<td>4,004.4</td>
</tr>
</tbody>
</table>

Source: Ibid, p. 4
and similar programs. The legislation for P. R. 480 (and Section 402 of I.C.A.) clearly provides that food may be given under emergency conditions, without waiting for special legislation (as was necessary earlier in providing a gift of wheat to India). Beyond this there is an element of humanitarism in the sale of local currency which justifies such special export programs as an effort to match "underfed people" with excess supplies. If there had been no P. L. 480 program, there still would have been donations, possibly more than in this category now.

A third objective has come into greater prominence as the program began to operate. It is partly implied by the title "Trade Development and Assistance Act", and is more than a rationalization. This is the desire to use the surplus farm products as an instrument of economic development. As efforts to develop new large markets for farm products got underway, it was logical to look carefully at the low income, high population areas of the world. In today's international arena, development is a key symbol for these areas; hence the U.S.D.A. must be concerned with development. Moreover, the competition and politico-economic relations with other exporting areas are such that the program is more defensible if many of the products are channeled into new, non-commercial markets.

There are a number of other possible accomplishments which appear to be congruous with the American value system. These will become clearer by looking at individual programs. Among these goals are political stability; greater internal competition, and support of anti-communist efforts through strengthening the military forces.

The Individual Programs. In turning now to individual countries, it should be stressed that these suggestions are little more than tentative hypotheses — hypotheses which suggest the complexity of the effects and the necessity for more careful studies of the program impacts.

Pakistan: The program in Pakistan comes close to being built in as an integral part of the nation's resources. A number of observers question whether it would be possible to stop the program. (About $186 million at market value was shipped or programmed through June, 1958). The rupee cost of the imported wheat is higher than the price paid local producers. Since the price charged to consumers is intermediate, losses on imported wheat are offset by government profits on locally produced wheat. Internal farm prices, however, are being increased slowly.

Internally it appears that the government has been more influenced by the political pressures of the refugees, migrants and squatters in the principal cities than by the agricultural groups. Thus, an adequate supply of low cost food becomes an important element in lessening political instability, while the nation tries to stimulate local production and marketings by non-price means. A major share of the rupees accumulated have been allocated to the
support of the Pakistani military build-up as a member of the Baghdad Pact. Some of this military effort does have economic development significance, both in the training of soldiers to handle machines, and in the improvement of communication. The quantitative importance of this aspect of the program is not clear.

Japan: In the case of Japan it appears that the Ministry of Agriculture is a major local supporter of P.L. 480 agreements. (Some $150 million of commodities are involved.) Most of the accumulated yen are used for agricultural development, or for U.S. Government expenditures which save dollars (such as housing for military dependents). The ministry of Agriculture appears to be able to induce the Ministry of Finance to permit the use of some of these funds outside the regular government budget. In this way irrigation and drainage programs are implemented which were planned for a later date. Thus, despite a decrease in dollar earnings, the program has contributed to development, and to an earlier reduction in food imports. On the other hand, there appears to be a change in dietary patterns from sweet potatoes to rice, and from rice to wheat, which has the reverse effect. Much of this is due to the rising levels of living within Japan, and not solely to the availability of P.L. 480 commodities -- which really do not bulk large in the total Japanese trade.

The Philippines: For the Philippines (with a small program involving some $15 million) it is necessary to enter into more speculation. General monetary and exchange problems make it clear that a limited amount of exchange would have been allocated to cotton. Many observers suggest that only a few textile manufacturers would have received allocations for the importation of cotton. Consequently the majority would have been squeezed out of the textile industry, with substantial profits possible for the successful applicants. With P.L. 480 cotton entering the country, there was cotton for everyone, enabling the industry to remain competitive. Hence, those textile manufacturers less close to the government become internal supporters of the program.

Indonesia: In this country, the local currency (from a $100 million program) has been accumulated. However, in an effort to control inflation, the Indonesian government has directed that almost none of the funds be spent. Thus, it becomes necessary to look at the general monetary and fiscal program, and identify the marginal reductions in expenditures had special import programs not been available -- admittedly a difficult problem. The foreign exchange crisis and/or the local food problem probably would have been more severe. More should be said, but I am unable to do so.

India: The largest single program is in India (attaining $425 million of farm products). It appears that the imports went largely to feed the major port cities of Bombay, Madras, and Calcutta. Shipments from the interior to these areas were blocked to avoid cross shipments, but probably also with some
impacts on the internal price structure. It appears that prices are lower than they would have been with no program -- however, a series of donations is probably the real alternative. It appears that the large income elasticity for food and semi-subsistence level of production may have held greater food supplies in the villages in recent years -- thus contributing to urban shortages. Both price policies and the distribution of income between sectors appear to have affected in consequence.

Under the agreements, a major part of the rupee balances were allotted to economic development. These funds were deposited in the central bank. There is reason to believe that the Indian Government, with sophistication, issued other currency to support its development program. It avoided the use of P. L. 480 currency accounts, and in this way was able to support local programs without having to clear programs with U. S. officials. Again the identification of this extra program is an exceedingly difficult task.

Brazil: Wheat is a major part of the program in Brazil ($180 million of agricultural products are involved). Part of the United States' supplies replaced wheat normally purchased from Argentina, but not available because of production and price policies there. While the funds presumably were used for economic development, there are indications that the first agreement was an exceedingly loose document. Brazilian authorities appear to have had great discretion in the use of the funds, and have added substantial fuel to the already roaring inflationary fire. In effect they spent the local currency twice.

Canada: Finally we turn to Canada, where many people feel that the United States' program has cut in on Canada's wheat export prospects. Mr. G. D. Howe, Minister of Trade and Commerce in 1955 stated:

"I think there is no doubt that by their (U.S.) disposal policies they have displaced our products in certain markets. What we can do about it, I do not know. The policies of the United States are their policies and are not ours. We follow our own policies. As I say, we protest where we think a protest is warranted, and we have protested in connection with certain recent transactions."

In a recent document published jointly by the National Planning Association and the Private Planning Association of Canada, the statement is made.1/

"Canadian protests have gone much further than simply criticizing the disposal of surplus wheat. They also have been concerned with the particular methods of disposal -- for example, the barter program which has been used to tie the disposal of wheat to the acquisition of minerals for U. S. stockpiles."

One newspaper article reported: "The cards are stacked against us in our economic poker game with the United States. It now has become clear that the only reason we may be able to sell more wheat in the world market is because we will soon be selling a lot less lead and zinc. This tie-up between lead and zinc and wheat is an intriguing one and the strings attached to it all lead back of Washington -- Washington has been stockpiling lead and zinc, taking a lot of the minerals in exchange for surplus wheat ............. This buoyed up the world market and kept prices relatively stable. With United States suddenly cutting off this heavy buying for the stockpiles, the bottom fell out of the market..."

One Canadian official commented ... this week: "We haven't had a chance in this thing. The only reason we were able to sell our lead and zinc was because we couldn't sell our wheat. Now, the only reason we may be able to sell more wheat is because we can't sell our lead and zinc."

At the G.A.T.T. meeting on November 21, 1957, the Canadian view included the following statement:

"The Canadian delegate pointed out that his delegation did not object to genuine United States' aid programs and the extension of help to needy countries; indeed, within the limits of its capabilities Canada had also extended aid of this kind. Further, in more general terms his delegation had no objection to United States disposal programs which had the effect of increasing consumption of the commodity in question by the amount of the disposal. The main objection was that, by a variety of techniques such as export subsidization, sales for local currencies, barter deals and tied-sales, the United States was promoting exports of wheat and flour with such determination and in such volume that it caused great damage to Canada's normal commercial marketing of these products. This was evidenced in export statistics from the United States and Canada in 1955-56 and 1956-57; while United States exports rose from 347 to 547 million bushels, in the same period Canada's exports fell from 309 to 261 million bushels."2/

The Canadians themselves by these figures say that total North American wheat exports have expanded by some 150 million bushels. However, an additional 50 million of exports are a non-pareto transfer of Canadian exports to American exports. Their objections center on the barter phase of the program.

2/ Ibid, p.4
Putting More Emphasis on Development. A little over 20 years ago Fred Waugh led a seminar on this campus in which he outlined the basic idea of the "stamp plan". One of the questions on which he was probed repeatedly was "Why not preserve consumer sovereignty by giving the low-income families cash and letting them buy food directly?" The answer was along this line. "You cannot get many dollars for such a program from Congress. However, you can do a lot to bring about a better income distribution, if you tie it to an agricultural surplus program. This blending of values makes it more acceptable politically."

There is an analogy with the special export programs even in the discussions in 1954 as the original Act was passed. Congress will appropriate a certain amount of dollars and authorize loan funds which contribute directly to economic development. It appears to be willing, at least in the short run, to appropriate additional money to a program which blends two objectives -- namely, surplus disposal and aid to poorly fed people.

Certainly in these programs Congress is limiting the area of decision available to other countries, in the same way as the "stamp plan" limited consumer decisions.

In its present form, it is clear that the P. L. 480 has no chance of being hailed as another monument in the tradition of Len Lease and the Marshall Plan. It is necessary to search for new dynamic and thrilling ideas appropriate to the leadership role the United States should be playing. Just as reconstruction was the major goal in Europe after the war, so economic development is the major goal in the countries receiving much of the surplus food. An appealing and dynamic program could be developed if economic development were blended in as a major goal -- rather than as something to be edged into sideways. Famine relief would then be a subsidiary but legitimate part of a program which focused on the twin goals of economic development and surplus disposal. What would such a program look like?

1. It would be a long time program which would make food and fiber available to countries with development programs requiring such supplies. This would permit a country to restructure its economy without the necessity to look at its domestic food supplies crop year by crop year. Once the United States had committed itself to a five or 10-year program of agricultural exports, these amounts would become full-fledged claimants to our production in the same way as the domestic consumer.

2. Realistic long time development programs in other countries would be needed which contemplated training, investment, population transfers, public and private facilities, etc., as necessary parts of the program. Some countries will need help in
formulating such a program. Imported farm products could offset some of the short term production declines that follow in some countries, or offset inflationary pressures as people in other countries increased food consumption. Training programs for farm people probably would involve increased consumption by those participating, and some decrease in production on the farms they left.

3. Dollar loans and grants would be needed in association with farm products. It appears that in many of the countries the range of likely projects would require that 40 to 60 percent of the extra needs be in food and fiber, but some non-farm commodities would be required. (Road building with a low state of the arts would depend heavily on food and fiber.)

4. A number of projects, particularly strategic in economic development, might not be given proper cognizance unless the United States was willing to provide additional farm products and dollar supplies contingent upon the inclusion of such programs.

5. The United States would by itself or with other nations absorb the risk of flood or drouth disaster, through world or United States reserves earmarked for this purpose.

6. Presumably as individual countries define their programs and compare local needs with local production, the gaps will add up to a total combination of commodities which is different from the commodity mix now in surplus. Adjustments will be needed in U. S. domestic policies to induce the requisite flow of production. Exports might decline somewhat, particularly while the development programs were being formulated.

7. It will desirable to induce other developed countries to participate in the program -- in an international transfer of resources -- so as to utilize the wheat surplus of Canada, the coffee surplus of Brazil and Latin America, and the industrial talents of Western Europe in this effort. The degree of multilateral effort certainly should be increased.

8. Considerable study is needed as to the amount and type of investment, both physical and human, that is needed to enable a particular economy to take off on a self-sustaining cycle of economic growth. Every effort should be made to insure that this level of effort is attained and maintained. Agricultural
export programs should be fully integrated with development programs. To do so in our "sectorist" government is difficult. Interested, sympathetic, and competent non-government efforts are clearly needed.

**Final Statement.** There are a number of positive elements in the present program. Additional ones could be incorporated into the operations. Unfortunately, many of the positive elements are slipping away because the program is viewed as temporary. Others slip away because we are not giving sufficient attention to the requisites of sustained economic growth, and as economists we do not know enough about how to engineer development. Much of the difficulty derives from the emphasis on United States derived values, and insufficient attention to how our values and those of other countries might be blended and compromised so as to attain a larger value satisfaction.

With this, I turn once more to the role which agricultural economists should play. With their training in economics, their knowledge of agriculture, and their familiarity with quantitative methods, agricultural economists have much to contribute to an understanding of economic growth. In the domestic scene we find ourselves concerned with aggregate responses -- supply curves, market adjustments, national control programs, etc. Yet, we hesitate to move one step further and inquire into similar relationships overseas. Some of the puzzling relationships might be clarified if we had the benefit of the perspective of another economy.

Secondly, we should stress the importance of value formulation as a vital contribution of our work. We cannot expect the general population to urge upon Congress the importance and validity of certain values which Americans have respecting other peoples, unless we, ourselves, as professional social scientists give a part of our effort to the study of values in the interrelationships of foreign and domestic policy. If you believe, as I do, that the lack of a positive foreign policy is a major criticism of America's world position, then the creation and advocating of such a program is fundamental. Against the alternative of thermonuclear war, or even the threat of it, any economic development effort is small change. Surely when the history of the 1960's is written (assuming there is someone to write it), it should not be said that the trained minds stood aside when these human values should have been discussed.
DISCUSSION OF THE WITT PAPER

Erik Thorbecke

I am in general agreement with the tone of the paper. More specifically I endorse strongly the following two recommendations made by Dr. Witt:

1. The need for research on the quantitative impact of surplus disposal programs on the U.S. as well as on the world economy. The F.A.O. has made pilot studies of the effects of these programs on the economic development and growth of India. This type of research should be pushed much further before any long-run policy decision is arrived at in Washington with respect to these various agricultural disposal schemes;

2. Tying the objective of surplus disposal to the objective of economic development - if this is the best feasible alternative from a political standpoint - subject to a certain number of qualifications which are incorporated in some of the subsequent points of this discussion.

Many of the advantages of the recent surplus disposal programs under P.L. 480 and other acts were brought out clearly by Dr. Witt. While recognizing that any program will have to be a compromise between economic desirability and political feasibility I would, nevertheless, like to point out some of the possible disadvantages of the present surplus disposal programs from the standpoint of the best possible allocation of resources in the world, as a whole.

First, it has become customary to compare the so-called "trade-creating" effects to the "trade-diverting" effects of any shifts in trade flows in order to determine whether or not an improvement in world-wide economic welfare had taken place. Any shift in the source of supply from a low cost producer to a high cost producer represents trade diversion and worsens the allocation of resources in the world whereas any shift in the source of supply in the opposite direction improves the allocation of resources in the world. Title 1 of P.L. 480 requires that reasonable precautions shall be taken to safeguard usual marketingss of the U.S. and to assure that foreign currency sales under this Act will not unduly disrupt world prices of agricultural commodities and will not lead to undue impairment of the traditional competitive positions of friendly foreign countries.

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To the extent that the U. S. government subsidized programs infringe upon the commercial demand which had been previously satisfied by other agricultural producers, trade diversion occurs. It is true that according to P.L. 480, recipient countries are asked to absorb only additional amounts of surplus commodities over and above what they normally import. If this rule were vigorously followed, trade disruption would not take place, but trade diversion could still occur whenever imports of surplus commodities displaced competitive agricultural commodities produced locally. It is, of course, extremely difficult to determine whether the increase in the demand for U. S. surplus commodities abroad is caused by a substitution in the source of supply or by "additional demand."

Second, as long as the U. S. government refuses to commit itself to a long run continuation of surplus disposal programs there exists a risk that the economics of the importing countries could become so dependent on U. S. surpluses that a sudden decision to abandon these programs would lead to serious distortions in the latter countries' economies. It would appear from Dr. Witt's comments that Pakistan offers a good example of an economy which would be seriously damaged in the event U. S. surplus commodities were no longer available under the present terms.

Third, the objective of economic development, as such, would be best served if the developing countries received U. S. aid with no strings attached. This would make it possible for these countries to buy not only the kind of commodities they need most but also to purchase them in the cheapest markets. It seems likely that many underdeveloped areas would buy a number of capital goods in Western Europe, rather than in the U. S., in view of the greater affinity which exists between the resource structures (labor-intensive) of these two groups of countries. This phenomenon would tend to increase the flow of dollars to Western Europe, which would in turn alleviate Europe's dollar shortage with the U. S. Unconditional aid by the U. S. would, thus, help restore a system of multilateral trade which would indirectly benefit the latter since either the amount of U. S. aid to Europe could be reduced, or Western Europe, with a larger supply of dollars from the lesser developed areas, could import more from the U. S., thereby stimulating American export industries.

It would be unreasonable to expect Congress to formulate policies which would be based on purely economic factors; however, the advantages which can be gained from a policy which is politically acceptable (such as linking surplus disposals to economic development) should always be weighed against the purely economic disadvantages of politically expedient policies.

In conclusion I can only reiterate Dr. Witt's recommendation for more empirical research dealing with the overall effects here and abroad of surplus disposal programs.
CHANGES IN CONSUMER EXPENDITURES FOR FOOD

Goeffrey Shepherd

Consumer disposable income and expenditures in the United States have risen every year since 1939. The data are given in Table 1. The table shows expenditures for food, for other goods, and for services. The changes from 1945 to 1958 are shown in Figure 1.

The chart and table show that expenditures for food have been rising; but they have not been rising as rapidly as consumer disposable income. This income rose from $170 billion in 1947, just after World War II, to $311 billion in 1958; this was a rise of 84 percent. But over the same period, consumer expenditures for food rose only 51 percent.

This situation can be put another way: In 1947, consumers spent 27 percent of their disposable income for food; but in 1958, they spent only 22 percent. Food has been losing ground in the competition for the consumers' dollar.

Farmer's Share of Food Dollar Declining. But this shows only a part of the picture. A breakdown of the food expenditure data shows that not only have consumers been spending a smaller percentage of their incomes for food; in addition, farmers have been getting a smaller percentage of consumers' expenditures for food. They have been getting a smaller percentage of a smaller percentage.

The total retail cost of the domestic farm products sold by farmers and consumed by civilian consumers in the United States is shown in Figure 2 and Table 2. The figure also shows the farm-to-retail marketing bill

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1/ The total expenditures for all food in the United States shown in Figure 1 are compiled and published by the U. S. Department of Commerce. The total retail cost, for domestic farm food products only, is compiled by the USDA. This total retail cost is smaller than the total expenditures for food shown in Figure 1, because it does not include imports, seafoods, food consumed on farms where produced, nor food for the Armed Forces.

The USDA also compiles another series, similar to its retail cost series, but including the estimated extra cost of food consumed in restaurants (over what their cost would be if the food had been purchased in retail stores) and the estimated lower cost of food for institutions, etc., bought at less than retail price. This series is entitled "civilian expenditures for food." The
Table 1. Consumer income and expenditure, United States, 1939-58

<table>
<thead>
<tr>
<th>Year</th>
<th>Disposable personal income</th>
<th>Million dollars</th>
<th>Total personal consumption expenditure</th>
<th>Million dollars</th>
<th>Food</th>
<th>Million dollars</th>
<th>Million dollars</th>
</tr>
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<tbody>
<tr>
<td>1939</td>
<td></td>
<td>70.4</td>
<td>15.7</td>
<td>26.1</td>
<td></td>
<td>50.4</td>
<td>25.5</td>
</tr>
<tr>
<td>1940</td>
<td></td>
<td>76.1</td>
<td>16.7</td>
<td>28.2</td>
<td></td>
<td>49.3</td>
<td>29.8</td>
</tr>
<tr>
<td>1941</td>
<td></td>
<td>83.0</td>
<td>19.4</td>
<td>33.4</td>
<td></td>
<td>49.5</td>
<td>30.0</td>
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<td>1942</td>
<td></td>
<td>113.5</td>
<td>23.7</td>
<td>38.0</td>
<td></td>
<td>44.8</td>
<td>31.2</td>
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<td>1943</td>
<td></td>
<td>135.5</td>
<td>27.6</td>
<td>43.8</td>
<td></td>
<td>41.7</td>
<td>34.1</td>
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<tr>
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<td></td>
<td>140.8</td>
<td>30.6</td>
<td>48.0</td>
<td></td>
<td>37.9</td>
<td>37.7</td>
</tr>
<tr>
<td>1945</td>
<td></td>
<td>150.4</td>
<td>33.1</td>
<td>52.2</td>
<td></td>
<td>34.3</td>
<td>40.4</td>
</tr>
<tr>
<td>1946</td>
<td></td>
<td>160.6</td>
<td>40.7</td>
<td>60.0</td>
<td></td>
<td>34.7</td>
<td>46.9</td>
</tr>
<tr>
<td>1947</td>
<td></td>
<td>170.1</td>
<td>49.1</td>
<td>66.0</td>
<td></td>
<td>32.0</td>
<td>51.4</td>
</tr>
<tr>
<td>1948</td>
<td></td>
<td>189.3</td>
<td>56.2</td>
<td>73.2</td>
<td></td>
<td>29.4</td>
<td>56.5</td>
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<tr>
<td>1949</td>
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<td>189.7</td>
<td>61.4</td>
<td>78.8</td>
<td></td>
<td>26.9</td>
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<td>67.6</td>
<td>86.7</td>
<td></td>
<td>24.5</td>
<td>69.9</td>
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<td>1951</td>
<td></td>
<td>227.5</td>
<td>74.3</td>
<td>96.8</td>
<td></td>
<td>22.1</td>
<td>75.2</td>
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<td>1952</td>
<td></td>
<td>236.7</td>
<td>85.8</td>
<td>105.6</td>
<td></td>
<td>20.0</td>
<td>85.5</td>
</tr>
<tr>
<td>1953</td>
<td></td>
<td>268.5</td>
<td>95.8</td>
<td>115.6</td>
<td></td>
<td>18.2</td>
<td>93.8</td>
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<tr>
<td>1954</td>
<td></td>
<td>276.9</td>
<td>107.7</td>
<td>127.4</td>
<td></td>
<td>17.4</td>
<td>106.5</td>
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<tr>
<td>1955</td>
<td></td>
<td>294.4</td>
<td>120.9</td>
<td>139.6</td>
<td></td>
<td>16.6</td>
<td>116.7</td>
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<tr>
<td>1956</td>
<td></td>
<td>309.4</td>
<td>127.2</td>
<td>146.0</td>
<td></td>
<td>16.0</td>
<td>127.3</td>
</tr>
<tr>
<td>1957</td>
<td></td>
<td>321.0</td>
<td>130.4</td>
<td>151.6</td>
<td></td>
<td>15.6</td>
<td>135.5</td>
</tr>
<tr>
<td>1958</td>
<td></td>
<td>331.0</td>
<td>130.7</td>
<td>151.4</td>
<td></td>
<td>15.4</td>
<td>135.9</td>
</tr>
</tbody>
</table>

1/ Estimated.

Data published quarterly in Survey of Current Business (Department of Commerce).
DOMESTIC FARM FOOD PRODUCTS

$ BILLION

Fig. 2

DOMESTIC FARM FOODS PURCHASED BY CIVILIANS IN THE UNITED STATES
AT RETAIL FOOD STORE PRICES 1958 DATA PRELIMINARY

U.S. DEPARTMENT OF AGRICULTURE NEG. 3663-58 (10) AGRICULTURAL MARKETING SERVICE

Table 2: Retail cost, payment to farmers, and marketing bill for farm food products purchased by domestic civilian consumers, United States, 1947-58

<table>
<thead>
<tr>
<th>Year</th>
<th>Retail cost</th>
<th>Payment to farmers</th>
<th>Marketing bill</th>
</tr>
</thead>
<tbody>
<tr>
<td>1947</td>
<td>18.7</td>
<td>17.8</td>
<td>11.3</td>
</tr>
<tr>
<td>1948</td>
<td>21.2</td>
<td>20.0</td>
<td>14.7</td>
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<tr>
<td>1949</td>
<td>22.8</td>
<td>21.6</td>
<td>19.1</td>
</tr>
<tr>
<td>1950</td>
<td>23.5</td>
<td>22.4</td>
<td>20.7</td>
</tr>
<tr>
<td>1951</td>
<td>24.2</td>
<td>23.0</td>
<td>21.2</td>
</tr>
</tbody>
</table>

1/ Estimated cost at retail-store prices of all domestic food products sold by farmers and bought by civilian consumers in this country. Farm food products sold in the form of meals are valued at what the food would have cost in retail food stores.

2/ Payment to farmers for equivalent farm products, adjusted to eliminate imputed value of nonfood by-products.

3/ Difference between retail cost and payment to farmers.

* Preliminary.
for this food, and the payment to farmers (the money that farmers received) for this food.

The figure shows that the farm-to-retail marketing bill nearly doubled from 1947 to 1958, while the payment to farmers rose only 10 percent.

In summary, then: Consumers' disposable income from 1947 to 1958 rose 84 percent; their expenditures for food, however, rose only 51 percent; and farmers' receipts for the food rose only 10 percent.

Why did these things happen? And is the same sort of thing likely to continue in the future?

**Reasons for the Decline in the Percentage of Consumers' Income Spent for Food**

First, why has the percentage of the consumer's income spent for food been declining?

The chief reason is the influence of what is known as Engel's law.

About the middle of the nineteenth century, Ernst Engel studied consumer's budgets in Belgium and Saxony to determine the relation between income and expenditures for food. His work showed that the high income groups spent more money per capita for food than the low income groups; but the high income groups spent a smaller proportion of their incomes for food than the low income groups. A number of statistical studies since Engel's time have revealed similar relations between income and expenditures for food in other countries.

An income-food expenditure curve for urban consumers in the United States, based on the data given in Table 3, is shown in Figure 3.1/ The upper part of the chart (Section A) shows that high income urban groups spend more money for food per family than low income groups. The straight line drawn

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1/ Basic data from Food Consumption of Households in the United States, Household Food Consumption Survey, 1955, Report No. 1, USDA, p. 11. The data for urban consumers are selected for illustration here because urban consumers are more homogeneous in their food expenditure behavior than all consumers.
through the dots shows that, on the average, a family with 1 percent more
income than another did not spend 1 percent more money for food; it spent
only 0.44 percent more. The income-elasticity of family expenditures for
food, then, was 0.44

The lower part of Figure 3 (Section B) shows that, although high-income
groups spend more money for food per family than low-income groups,
what they spend is a smaller percentage of their incomes. The general
rule is this: The bigger the family income, the smaller is the percentage
of the income that is spent on food.

The percentage spent on food per family by the high-income groups would be
still lower than it is, were it not for the fact that families in the high-income
groups are larger than families than the low-income groups, as Table 3
shows. The average family size of the highest-income group ($10,000 and
over) is 3.80 persons; this is larger than the size of the lowest-income
group family, 2.88 persons. It used to be said that "the rich get rich and
the poor get children." This does not appear to be borne out by Table 3.
The high-income groups have large families, however, not only because
high incomes are conducive to fertility, but also because income and family
size both increase with the passage of time. Normally a young couple begin
their married life at the bottom of the ladder with a small income and a
small family. Bigger pay checks and more children come along together
with the passage of time. If income and family size were not positively
correlated, the income-elasticity of expenditures for food would be lower
than the actual figure, 0.44.

The influence of family size can be removed by expressing the urban data in
the form of expenditures for food per person instead of per family. When
this is done, the income-elasticity per person is shown to be only 0.29. For
the United States as a whole, it is 0.37.1/ This is the figure used in the
rest of this report.

The income-elasticity of the consumption of farm produced food measured at
the farm level is much lower than the income-elasticity of expenditures for
food given above. It is about 0.12. This is the figure for food from all
sources. The figure for purchased farm food, however, is about 0.24.2/

1/ See the fifth and eighth lines up from the bottom of Table 915, M. C.
2/ Burk, op. cit., p. 915.
TABLE 3
Average Income and Family Size, Average Expenditures Per Urban Family in the U.S., for Purchased Food Used at Home and Away From Home, and Percent of Income Spent for Food, in a Week, April-June, 1955; by Family Size and Income

<table>
<thead>
<tr>
<th>Family Groups According to Money Income After Income Taxes for Families of 2 or More Members (1)</th>
<th>Average Money Income After Income Taxes (1954) (2)</th>
<th>Average Family Size (Count) (3)</th>
<th>Money Value of Food* Per Family in Week† Purchased</th>
<th>Meals and Other Food Eaten Away From Home</th>
<th>Percent of Income Spent For Food (9)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(dollars)</td>
<td>(persons)</td>
<td>(dollars)</td>
<td>(dollars)</td>
<td>(dollars)</td>
</tr>
<tr>
<td>All urban families</td>
<td>4,826</td>
<td>3.26</td>
<td>29.99</td>
<td>24.23</td>
<td>5.76</td>
</tr>
<tr>
<td>under 2,000</td>
<td>1,250</td>
<td>2.88</td>
<td>17.49</td>
<td>15.28</td>
<td>2.22</td>
</tr>
<tr>
<td>2,000-2,999</td>
<td>2,511</td>
<td>3.28</td>
<td>23.20</td>
<td>20.24</td>
<td>2.96</td>
</tr>
<tr>
<td>3,000-3,999</td>
<td>3,517</td>
<td>3.60</td>
<td>28.63</td>
<td>24.51</td>
<td>4.11</td>
</tr>
<tr>
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<td>3.65</td>
<td>31.63</td>
<td>26.17</td>
<td>5.46</td>
</tr>
<tr>
<td>5,000-5,999</td>
<td>5,444</td>
<td>3.62</td>
<td>33.92</td>
<td>28.64</td>
<td>5.28</td>
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<tr>
<td>6,000-7,999</td>
<td>6,766</td>
<td>3.62</td>
<td>37.52</td>
<td>29.35</td>
<td>8.17</td>
</tr>
<tr>
<td>8,000-9,999</td>
<td>8,860</td>
<td>3.77</td>
<td>39.44</td>
<td>30.39</td>
<td>9.04</td>
</tr>
<tr>
<td>10,000 and over</td>
<td>16,050</td>
<td>3.80</td>
<td>54.73</td>
<td>38.37</td>
<td>16.37</td>
</tr>
</tbody>
</table>

*Includes alcoholic beverages.
†Adjusted to exclude value food used at home by boarders, farm help, and members of secondary families. No inf. requested of respondents on expenditures for food away from home by these nonfamily members of households.
‡Includes packed lunches and other food carried from home.
§Between-meal snacks and beverages; supplements to packed lunches.
FIG. 3  – Weekly family food expense, April–June, 1955, by income groups: (A) in dollars; (B) as per cent of income.
Engel's law probably does not have exactly the same effect when incomes change over a period of time as the effect it has on different incomes at a given point of time, especially when other things are changing as well as incomes. Let us see.

If Engel's law had the same effect over periods of time that it has at a given point of time, then from 1947 to 1958, consumers' expenditures for food would have risen 84 x 0.37 percent, or 31 percent. But actually, they rose more than this; they rose 51 percent.

That is to say: Consumers' expenditures for food rose more from 1947 to 1958 than Engel's law could explain if it applied to changes in income over periods of time as it does to differences in income at a given point of time.

The question, then, is not, why did the percentage of consumers' income spent for food decline so much from 1947 to 1958, but, why did it decline so little?

There are several reasons:

(1) One reason is that part of the rise in consumers income from 1947 to 1958 was not a rise in real income, but only a rise in monetary income, the result of inflation. From 1947 to 1958, the consumers' price index rose from 99 to 124, a rise of 25 percent. Thus, consumers' real income rose not 84 percent as the dollar figures along show, but only 84-25 = 59 percent. So the percentage spent on food declined less than it would have declined if the rise in consumers' money income had all been a rise in real income.

(2) Another reason is that another part of the rise in consumers' income was the result simply of an increase in the number of consumers. The population of the United States grew 20 percent from 1947 to 1958. If all the increase in consumers' income had been due to the increase in population, one would not have expected the percentage of income spent for food to decline at all. Engel's law applies to per capita income, not to total national income.

Table 4 and Figure 4 show the data in per capita form. They show that per capita money income rose only 53 percent from 1947 to 1958. This is only a little more than the rise in per capita expenditures for food, which was 47 percent.

(3) Figure 4 and Table 4 also show another reason why the percentage of consumers' income spent for food declined only a small amount. The percentage actually spent declined from 26.9 percent in 1947 to about 22 percent in 1958. This is a decline of 18 percent. But the quantity and composition
Fig. 4

FOOD COSTS & CONSUMER INCOMES

$ PER PERSON

Total personal income
Disposable income

PERCENT

FOOD COSTS AS % OF DISPOSABLE INCOME

Actual expenditures
Cost of fixed quantities of foods

1930 1935 1940 1945 1950 1955
Table 4 -- Per capita food cost and expenditure related to disposable personal income, United States, average 1935-39, annual 1946-58

<table>
<thead>
<tr>
<th>Year</th>
<th>Total</th>
<th>Disposable expenditure</th>
<th>Food expenditure</th>
<th>Percentage of disposable expenditure</th>
<th>Total 1935-39 average annual expenditure</th>
<th>Disposable expenditure for person</th>
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</thead>
<tbody>
<tr>
<td>1935-39</td>
<td>514</td>
<td>493</td>
<td>118.6</td>
<td>23.1</td>
<td>24.0</td>
<td>118.6</td>
</tr>
<tr>
<td>1946</td>
<td>1,136</td>
<td>1,040</td>
<td>288</td>
<td>25.4</td>
<td>27.7</td>
<td>201</td>
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<tr>
<td>1947</td>
<td>1,180</td>
<td>1,148</td>
<td>318</td>
<td>26.9</td>
<td>27.7</td>
<td>244</td>
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<tr>
<td>1948</td>
<td>1,291</td>
<td>1,216</td>
<td>328</td>
<td>25.4</td>
<td>27.0</td>
<td>256</td>
</tr>
<tr>
<td>1949</td>
<td>1,271</td>
<td>1,214</td>
<td>311</td>
<td>24.5</td>
<td>25.6</td>
<td>243</td>
</tr>
<tr>
<td>1950</td>
<td>1,369</td>
<td>1,286</td>
<td>313</td>
<td>22.9</td>
<td>24.3</td>
<td>245</td>
</tr>
<tr>
<td>1951</td>
<td>1,474</td>
<td>1,359</td>
<td>346</td>
<td>23.5</td>
<td>25.5</td>
<td>274</td>
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<tr>
<td>1952</td>
<td>1,521</td>
<td>1,400</td>
<td>356</td>
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<td>1,582</td>
<td>1,457</td>
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<td>1,582</td>
<td>1,466</td>
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<td>24.2</td>
<td>270</td>
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<td>1,660</td>
<td>1,554</td>
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<td>1,602</td>
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<td>267</td>
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<tr>
<td>1957</td>
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<td>1,661</td>
<td>388</td>
<td>21.8</td>
<td>23.4</td>
<td>276</td>
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<tr>
<td>1958</td>
<td>1,790</td>
<td>1,669</td>
<td>393</td>
<td>22.0</td>
<td>23.5</td>
<td>287</td>
</tr>
</tbody>
</table>

Annual rates, seasonally adjusted

<table>
<thead>
<tr>
<th>Year</th>
<th>1st quar.</th>
<th>2nd quar.</th>
<th>3rd quar.</th>
<th>4th quar.</th>
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<tbody>
<tr>
<td>1958</td>
<td>1,768</td>
<td>1,779</td>
<td>1,806</td>
<td>1,803</td>
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<td>1,653</td>
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<td>1,689</td>
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<td>22.3</td>
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<td>23.8</td>
<td>24.0</td>
<td>23.7</td>
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<td></td>
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<tr>
<td></td>
<td>16.2</td>
<td>16.4</td>
<td>15.9</td>
<td>15.8</td>
</tr>
</tbody>
</table>

1/ Most data for 1946-57 have been revised; see August 1954 issue of this Situation (MTS-114) for 1929-45 data.
2/ Computed from data of the Department of Commerce.
3/ Cost to consumers of quantities of food representing average annual consumption per person during 1935-39; calculated by applying to the actual 1935-39 expenditure for food ($118.60) a consumer food price index which is a weighted average of indexes representing (a) retail food prices in urban areas (Bur. Labor Statistics), (b) retail food prices in rural areas (Agr. Market. Serv.), and (c) prices received by producers applied to foods consumed on farms where produced.
4/ Quarterly data are estimates by the Agr. Market. Serv. from expenditures for food and alcoholic beverages reported by the Dept. of Commerce. Alcoholic beverages are not included in food expenditures.
of the food increased over this period. If it had remained unchanged from the 1935-39 period, the percentage would have declined from 20.7 in 1947 to about 16 percent in 1958. This is a decline of 22 percent.  

(4) Another reason is that the percentage of farmers in the population has been declining, from 18.2 in 1947 to about 11 in 1958. People spend more for food when they take an urban job than they spent when they were on the farm; their home-produced food on the farm is valued in the series used above at farm prices, but when farmers take a job in town they pay retail prices, which are more than twice as high as farm prices.  

(5) In recent years, a considerable amount of "built-in maid service" was included in many foods. Apparently, however, this did not increase expenditures for foods much. A recent pilot study indicates that the average housewife pays less than 1 percent more for these convenience foods than for the less processed kind.  

(6) Another force was acting in the opposite direction to those listed above. It was the rate of increase in the demand for food relative to the rate of increase in supply. If everything else remained constant, but the demand for food increased relative to the supply for food, the percentage of consumers' disposable income spent for food would rise, because the demand and supply of food are both inelastic.

1/ This is only a little larger than the figure of 19 percent given above. The change from 1935-39 to 1958, however, was much greater.  
2/ "Since the mid-1930's, the use of purchased farm foods has risen almost twice as much as the use of farm foods from all sources. In the mid-1930's home production supplied about 20 percent of civilian consumption of all farm foods, but in 1957 the proportion was down to about 8 percent. Most of the change has occurred since 1941." (The National Food Situation, Agricultural Marketing Service, United States Department of Agriculture. February 1959. p.23.)  
What actually has been happening in recent years? Has the population been pressing on the food supply, or has the food supply been pressing on the population?

Table 5 shows the per capita consumption of food from 1910 to 1957. This table shows that per capita consumption has been increasing; the food supply has been pressing on the population. This in itself would reduce the percentage of consumers' income spent on food.

The six reasons given above are the chief reasons why the percentage of consumers' income spent for food changed differently over time, in relation to consumer income, from the way it differed among income classes at the one point of time in 1955. Not only are the rates different in themselves, other things being equal; in addition, other things did not remain equal; half a dozen other things were changing with the passage of time, and still other changes, too numerous to mention, were also taking place. 1/

**Different elasticities for different foods.** We would like to make one final point in concluding this section: That point is that Engel's law has different effects on different foods.

Expenditures for most foods are higher for high-income groups than for low-income groups. But how much higher they are differs for different foods; for some foods, indeed, (called "inferior goods") expenditures by high-income groups are lower than for low-income groups.

One food of great interest to us here in the middle west is meat. The relation between income and expenditures by urban families on each of the four "red meats" is shown in Figure 5. 2/

This figure shows that on the average, for each 10 percent higher income the expenditures for beef were 2.8 percent higher. For pork, they were 1.3 percent higher; for lamb, 7.8 percent, and for veal, 2.8. The income elasticities for each of these meats were one tenth of these figures.

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2/ This figure (and the next figure) are taken from Harold F. Breimyer and Charlotte A. Kause, Consumption Patterns For Meat, AMS, USDA, May, 1958.
### TABLE 5

<table>
<thead>
<tr>
<th>Year</th>
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<th>Year</th>
<th>Index</th>
</tr>
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<tbody>
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<td>1910</td>
<td>88</td>
<td>1947</td>
<td>102</td>
</tr>
<tr>
<td>1920</td>
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<td>1930</td>
<td>91</td>
<td>1949</td>
<td>99</td>
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<tr>
<td>1935-39</td>
<td>91</td>
<td>1950</td>
<td>100</td>
</tr>
<tr>
<td>1940</td>
<td>95</td>
<td>1951</td>
<td>98</td>
</tr>
<tr>
<td>1941</td>
<td>97</td>
<td>1952</td>
<td>100</td>
</tr>
<tr>
<td>1942</td>
<td>97</td>
<td>1953</td>
<td>101</td>
</tr>
<tr>
<td>1943</td>
<td>98</td>
<td>1954</td>
<td>101</td>
</tr>
<tr>
<td>1944</td>
<td>101</td>
<td>1955</td>
<td>102</td>
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<td>1945</td>
<td>102</td>
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<td>1946</td>
<td>104</td>
<td>1957</td>
<td>102</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1958</td>
<td>101</td>
</tr>
</tbody>
</table>

*Preliminary.*

The next figure (Figure 6) is based on pounds purchased, rather than on expenditures, for beef and pork. It shows these amounts at three different times.

The elasticities here for 1955 are lower than the corresponding elasticities of expenditures shown in the preceding figure, because people with higher incomes buy more of the higher priced cuts as well as more pounds.

Perhaps the most startling thing shown in Figure 6 is the decline in the income-quantity elasticity for pork since 1942. The elasticity in 1955 in fact was slightly negative.

Reasons for the Decline in the Farmer's Share of the Consumer's Expenditures for Food

Why did the farmer's share of the consumer's expenditures for food decline from 1947 to 1958? Why did food expenditures and marketing costs rise so much, and payments to farmers rise so little?

The chief components of the rise in marketing costs are shown in Figure 7 and Table 6. This figure and table show that the chief reason for the rise in marketing costs was the rise in labor, transportation, and other costs. Profits were only a small item, and they did not change much in any case.

Further light is thrown on this matter by Figure 8. The data in this figure are expressed in index form, and the chart is a little hard to read on that account. But the lower part of the chart is similar to the lower part of Figure 2 shown earlier, and it goes back farther. This provides more perspective.

The chart shows that the farmer's share of the consumer's retail-store food dollar did not decline from normal during the 1950's; it declined to normal. It is running now at about 39 percent -- just about the same as it was in the 1930's before World War II.\[1\]

We will keep this in mind in the next section when we try to forecast the future.

---

1/ A somewhat different series, entitled "civilian expenditures for food," includes with the retail store cost of food, an addition for the extra cost of food consumed in restaurants and a subtraction for food bought at less than retail store prices. The percentage of the consumer's expenditures for food measured by this series is running a little lower now than it was before World War II. It decline from 38 percent in 1939 to 36 percent in 1957. (The Marketing and Transportation Situation, AMS, USDA, Nov. 1958, pp. 20-25.)
**Fig. 5**

**VALUE OF MEAT USED, URBAN FAMILIES**

*Average at Home per Person, One Week, Spring 1955*

DOL. 4.00 2.00 1.00 .80 .60 .40 .20

1954 MONEY INCOME OF FAMILY AFTER INCOME TAXES ($ THOUS.)

DATA FROM 1955 HOUSEHOLD FOOD CONSUMPTION SURVEY

U.S. DEPARTMENT OF AGRICULTURE NEG. 6046-58(3) AGRICULTURAL MARKETING SERVICE

**Fig. 6**

**URBAN USE OF BEEF AND PORK RELATED TO INCOME, 3 YEARS**

Lb. per Person

MONEY INCOME OF FAMILY AFTER INCOME TAXES (THOUS. 1954 DOLLARS)

CONSUMPTION IN ONE WEEK, AS REPORTED IN HOUSEHOLD CONSUMPTION SURVEYS

U.S. DEPARTMENT OF AGRICULTURE NEG. 6045-58(3) AGRICULTURAL MARKETING SERVICE
Table 6. Corporate profits, labor, transportation, and other costs in marketing farm food products sold to civilian consumers, United States, 1939-57

<table>
<thead>
<tr>
<th>Year</th>
<th>Corporate profits **/ Before taxes</th>
<th>Corporate profits **/ After taxes</th>
<th>Rail and truck **/ taxes</th>
<th>Other transportation **/ taxes</th>
<th>Farm-retail marketing bill</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Billion dollars</td>
<td>Billion dollars</td>
<td>Billion dollars</td>
<td>Billion dollars</td>
<td>Billion dollars</td>
</tr>
<tr>
<td>1939</td>
<td>0.4</td>
<td>0.3</td>
<td>3.7</td>
<td>1.0</td>
<td>3.1</td>
</tr>
<tr>
<td>1940</td>
<td>0.6</td>
<td>0.4</td>
<td>3.9</td>
<td>1.0</td>
<td>3.0</td>
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<tr>
<td>1941</td>
<td>0.8</td>
<td>0.6</td>
<td>4.1</td>
<td>1.2</td>
<td>3.1</td>
</tr>
<tr>
<td>1942</td>
<td>1.0</td>
<td>0.5</td>
<td>4.6</td>
<td>1.0</td>
<td>4.5</td>
</tr>
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<td>5.0</td>
<td>1.1</td>
<td>4.3</td>
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<td>5.5</td>
<td>1.3</td>
<td>4.7</td>
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<td>1.6</td>
<td>5.0</td>
</tr>
<tr>
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<td>0.9</td>
<td>7.9</td>
<td>2.0</td>
<td>6.4</td>
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<td>1947</td>
<td>1.8</td>
<td>0.7</td>
<td>8.5</td>
<td>2.2</td>
<td>7.5</td>
</tr>
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<td>1948</td>
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<td>0.6</td>
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<td>2.4</td>
<td>7.7</td>
</tr>
<tr>
<td>1949</td>
<td>1.3</td>
<td>0.8</td>
<td>8.7</td>
<td>2.2</td>
<td>7.3</td>
</tr>
<tr>
<td>1947-49 average</td>
<td>1.3</td>
<td>0.8</td>
<td>8.7</td>
<td>2.2</td>
<td>7.3</td>
</tr>
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<td>3.7</td>
<td>11.0</td>
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</tbody>
</table>

**/ Relates only to food from American farms sold to civilian consumers and not to that sold to the Armed Forces or exported.
2/ Includes profits received by incorporated marketing firms only and not those of unincorporated firms or of firms engaged in intercity transportation.
3/ Does not include the cost of labor in restaurants and other eating places but includes the estimated cost of additional retail-store labor that would be required to handle the food sold in eating places. These adjustments are made because the food served in these places is valued at retail-store prices in the retail coat estimates from which the marketing bill is derived. The cost of labor employed in intercity transportation is included in charges for transportation.
4/ Difference between sum of items in preceding columns and marketing bill; includes other costs and noncorporate profits.
5/ Preliminary.

**Fig. 7**

**FARM FOOD MARKETING BILL**

*TOTAL MARKETING CHARGES TO RETAIL STORE LEVEL FOR FARM FOODS BOUGHT BY DOMESTIC CIVILIAN CONSUMERS

**OTHER COSTS AND NONCORPORATE PROFITS** **EXCLUDING TRANSPORTATION LABOR COSTS

**CORPORATE PROFITS (BEFORE TAXES): EXCLUDES PROFITS OF INTERCITY TRANSPORTATION FIRMS**

U. S. DEPARTMENT OF AGRICULTURE NEG. 3371-58 (10) AGRICULTURAL MARKETING SERVICE
MARKETING CHARGES AND FARM VALUES FOR MARKET BASKET

% OF 1947-49

Marketing charges

Farm value

FARMER'S SHARE OF CONSUMER'S DOLLAR

DATA ARE FOR MARKET BASKET OF FARM FOODS BASED ON AY. 1952 PURCHASES BY URBAN FAMILIES

U.S. DEPARTMENT OF AGRICULTURE
NEG. (45245-5811) AGRICULTURAL MARKETING SERVICE
Prospects for the Future

What is likely to happen in the future?

There are two questions to be answered. (1) Is the percentage of consumer's income spent for food likely to continue to decline, slowly as it has in the past, or more rapidly, or not at all? (2) Is the farmer's share of the consumer's food dollar likely to continue to decline, as it has declined in recent years, or is the present 40 percent level something of a bed-rock bottom?

We will consider these two questions in order.

1. Percentage of consumers' income spent for food
   It seems likely that consumers' per capita and total expenditures for food will continue to increase in the future as in the recent past, but that the percentage of the income spent for food will continue to decline. The question is, how rapid will be the rate of the decline?
   
The same reasons that caused the percentage of consumers' income spent for food to decline in the past probably will be operating in the future -- Engel's law, mild inflation, population growth increasing the demand for food, and technology increasing the supply of food at about the same rate or slightly faster.
   
   We cannot assert that reasons will continue to exert their effects at the same rates in the future as in the past. And even a small change in the rate of any one of them could have a large influence on the percentage of consumers' income spent for food. For instance, a small increase in food production relative to the increase in population growth could depress the prices of farm products drastically, because the demand for food is highly inelastic.
   
   Here we can only point out what the reasons for the changes were in the past, and ask the experts in those fields to tell us what the possibilities for the future are in each case. As laymen in those fields, we can merely say that it seems to us to be likely that the rates of change in the different factors will be about the same over the next few years in the future as they were in the recent past. If they are, then the percentage of consumers' income spent for food is likely to continue to decline in the near future at about the same rate as it declined in the past, or a little faster. The reason why the decline
may be a little faster is that the income-elasticity curve is convex from above. A detailed study of individual households rather than averages from groups of households, in three separate income groups, reveals that the relationship between income and the value of food and beverages consumed differs at different levels of incomes. Among nonfarm households, the average value of all food and beverages consumed per person during a week was $6.70 in low-income households, $8.06 in medium-, and $9.46 in high-income households. The income elasticities at these means were 0.25, 0.21, and 0.15, respectively. These findings show that the effects of a change in income on value of food consumed at home are more pronounced when they occur at low levels of income than when they take place at higher levels of income. This seems to be in accord with expectations since high income people probably already are eating the foods they prefer and would have little incentive to change their consumption patterns if their incomes go up.\(^1\)

This means that as incomes continue to rise in the future, reaching higher levels than they attained in the past, the effects of this rise on expenditures for food are likely to be smaller than they were in the past.

2. Farmers' share of consumers' expenditure for food

The question here is whether the farmer's share of the consumer's expenditures for food will continue to decline as it did from 1947 to 1958, or remain at about the same percentage (40 percent) that it reached in 1958, which is about the same as it was during the period 1935-1940 before World War II.

The income-elasticity of the demand for marketing services is estimated to be about 5 times as high as the elasticity for food products at the farm level (0.7 compared with 0.15).\(^2\) If per capita incomes continue to rise, as most economists predict they will, then the demand for marketing services will expand more than the demand for food as such. In that

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1/ Letter from George R. Rockwell, SHR, AMS, USDA, May 12, 1959.
case, the number of workers employed in marketing, and
the total resources used by marketing firms, will increase
relative to workers and resources in agriculture, and
marketing costs will make up an increasing share of
consumers' expenditures for food. This means that the
share of consumers' expenditures for food going to farmers
will decline.

These things will happen unless new technological improve­
ments increase efficiency in food marketing more rapidly
than in agricultural food production. This is possible. As
G. T. Barton and R. F. Daly said here last fall:

"There is no doubt that the consumer demands more of the
highly processed, packaged and trimmed foods such as canned,
frozen and concentrated foods and juices; prepared mixed;
packaged meats and vegetables; prepared meals; parking space;
big modern efficient display stores. But it is not so clear
how much more services the consumer is getting in the form
of man-hours of work, use of transportation facilities, and use
of materials in marketing and processing. Recent studies
show, notably for citrus fruits, that fresh fruit is more
expensive at retail than highly processed frozen juices.
Prepared mixes apparently cost only a little more than the
separate ingredients, and in some instances less." 1/

Thus it may be possible for the food marketing industry to provide the in­
creasing quantity of services demanded by consumers so efficiently that
marketing costs do not increase. It seems hardly likely, however, that this
increase in marketing efficiency can proceed so rapidly that marketing costs
will decrease relative to farm food production costs.

1/ Barton, G. T. and R. F. Daly, "Prospects for Agriculture in a Growing
DISCUSSION OF THE SHEPHERD TALK

Elizabeth E. Hoyt

1. Engel's law. It is unfortunate that we ever came to use the term Engel's law for what is really nothing more than the inelasticity of the human stomach. Anybody in this room could have produced Engel's law. But giving the fact a name of a person suggests that maybe it is not a permanent law, and may be superseded or modified, in somewhat the same way as Newtonian physics was modified by Einstein and the newer theories of today.

2. The Harris and Dwoskin study referred to on page 75 of the Shepherd report is misleading, and puts us on our guard against the use of other studies which appear to have been produced to give certain desired evidence rather than to make an objective investigation. It is subject to criticism on four counts:
   a. Some foods the cost of which diminished by processing are included several times (oranges come in four times, lemons and limes four times) whereas some foods the cost of which increases by processing (breakfast cereals) are not included at all.
   b. The units used for unprocessed and for processed foods are not always the same. The chief example of this is tea; in order to get the advantage of tea processing, which reduces the price, the tea is to be bought in units costing $7.84 each.
   c. Season of the year at which comparisons were made. Comparisons of cost of fruit and vegetables, fresh as contrasted with processed, were made in December, when the cost of fresh vegetables would naturally be at its high point. It is very misleading to compare cost of fresh corn on the cob with the cost of canned corn in December. There are 11 other similar examples.
   d. There is no weighting of items in relation to their use in family food consumption. Shrimp, the cost of which was reduced by processing, comes into these figures twice, whereas bread, the cost of which is increased, comes in only once.

3. On page 82 the question is raised of predictions for the future; what is likely to be the course of the percentage of consumers' income spent for food? I should like to emphasize the conclusion that we cannot predict it. Demand

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for particular foods is influenced by many things, including research (which may or may not be objectively presented at the time it is made); fashion; advertising and promotion, as well as factors of price, income, availability, etc.

4. There is a tendency in American life, not limited to food, to look down on anything inexpensive; in food this is illustrated by calling inexpensive foods, such as bread, "inferior goods." (Paper, p. 76)
THE RELATIONSHIP BETWEEN THE
AGRICULTURAL AND CHEMICAL INDUSTRIES

Morton Smutz

There is a complex relationship between the agricultural and chemical industries. The chemical companies sell many products to the farmer, and the chemical companies buy many products from the farmer. Frequently the chemical industries improve the properties of agricultural products before using them or reselling them. In a number of cases, the chemical industry and the agricultural industry are in direct competition. This paper discusses each of these facets of the relationship and attempts to predict the future relationship between these two important segments of our society.

A Consumer of Chemicals: The availability of chemical fertilizers, feed supplements, herbicides, insecticides, fungicides, rodenticides, etc. makes it possible to farm more efficiently and produce farm products at a lower cost. In most cases, these improvements have been joint efforts between agricultural scientists and representatives from the chemical industry. For reasons best known to you, farm efficiency does not seem to be as important as it once did. Some economists have suggested that a tax be levied on chemical fertilizers to discourage their use. Although this might be effective in reducing production, there must be more direct methods of making agriculture less efficient and adding to production costs.

The phosphate fertilizer manufacturers provide more than 10,000,000 tons of product annually, and this is now the fastest growing branch of the inorganic chemical industry. Present trends indicate that this growth rate will continue for quite some time.

Because the annual loss by agricultural pests is about $10,000,000,000 and the amount spent for pesticides is only a small fraction of that, one can expect a continued growth of chemical pesticides.

Raw Materials for the Chemical Industry: The chemical industry has used various agricultural products as raw materials for many years. About 2,000,000,000 pounds of starch are produced from cereal products each year. Almost 70 percent is used in the various chemical industries.

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Large quantities of cellulose are obtained from cotton and wood. Over 100,000 tons of cotton linters are processed annually to produce the cellulose needed to make rayon, cellulose acetate (60,000,000 lbs. per year for cigarette filters), plastics, etc.

Large quantities of grains are used in the production of various alcoholic beverages such as beer and whiskey. Large quantities of vegetable and animal oils are used in the soap and paint industries.

Improvement of Agricultural Products: Many examples could be cited showing how the chemical industry improves the quality of agricultural products. The hydrogenation of fats and oils has had a big impact on the industry. Over 3,000,000,000 pounds of hydrogenated oils are produced in the United States each year.

The application of solvent extraction as a processing technique has resulted in more and better soybean oil at a lower price. The Solexol process is used to split soybean oil into two fractions. One fraction is a better drying oil and the other is a better edible oil. Various "fat splitting" techniques have made fatty acids available. The Emersol process makes it possible to separate the fatty acids on the basis of saturation. Vacuum distillation techniques separate fatty acids according to molecular weight.

Competitors: Many examples can be cited showing how the chemical industry has reduced the demand for agricultural products by providing a better product or a more economical product for the consumer. One example is that of industrial alcohol manufacture. For many centuries, ethyl alcohol has been made by the fermentation of starch or sugar. Until recently, very large quantities of corn and sugar were used to produce our alcohol requirements. During the past few years, almost all of the non-beverage alcohol has been made by the chemical industry using ethylene from natural gas as the starting material. In this process, ethylene is reacted with water to produce low cost high purity alcohol. Although estimates vary, corn would have to cost less than 50 cents per bushel to be seriously considered as a raw material for non-beverage industrial alcohol manufacture.

During World War I, one of the remarkable contributions of the chemical industry was the manufacture of acetone and butyl alcohol by the fermentation of starch containing grains. The petrochemical industry now produces almost all of the acetone required.

We are all familiar with the popularity of the synthetic fibers such as nylon, orlon, dacron, dynel, etc. Although cotton still reigns supreme, the growth of the synthetic fibers has been spectacular. Recent predictions (March 30, 1959 Chemical and Engineering News) indicate that the sale of noncellulosic
synthetic fibers will increase by 145 percent between now and 1965.

Latex based paints were introduced commercially in 1948 and grew very rapidly. In 1953 latex paint sales amounted to over 40,000,000 gallons. You and I enjoy using this type of paint because it is almost "streak proof", dries quickly, has low odor and is durable. This type of paint has increased the demand for butadienestyrene copolymer and reduced the demand for vegetable, animal and fish oils.

Chemurgy Research: Many capable scientists and engineers have devoted their lives to research hoping to find more industrial uses for agricultural products and byproducts. The research work by industry, the four Regional Laboratories, and by universities have developed some successful processes. In recent years, however, developments in the chemical industry have reduced the demand for agricultural products rather than stimulated new uses.

It is possible to make hundreds of chemical substances from agricultural products and byproducts. In most cases it is possible to make the same products more economically by simpler direct chemical reactions using products from natural gas or crude oil as starting materials.

The greatest potential in finding new industrial uses for agricultural products would seem to be to find the most economical way to isolate the most complex chemicals present and to seek new uses for them. The chemical industry would develop alternate ways of producing some of these compounds, but some would survive the competition. Too little research of this kind is now being done.

The Future: 1. The farmer will continue to buy chemical fertilizers, pesticides and feed supplements in ever increasing quantities.

2. Over a period of years we will gradually exhaust our non-renewable sources of organic chemicals; natural gas, crude oil and coal. We will gradually become more dependent on renewable sources.

3. The amount of agricultural products used for industrial purposes will depend upon the cost of these products to the chemical industry, the amount of research done to develop new uses, and unpredictable new technical developments.

4. As advances are made in fundamental chemistry and chemical engineering science, the chemical industry will be able to produce more complex chemicals economically on a large scale. It is possible to foresee the possibility of direct competition between the chemical industry and the agricultural industry in the food market.
5. The same vertical integration developments taking place in poultry and meat processing will take place in supplying raw materials to the chemical industry. The possibility of more stable prices would encourage the use of agricultural products as raw materials.
POTENTIALS FOR NEW CROPS TO MEET
NEW EXISTING DEMANDS

I. J. Johnson

Approximately two years ago, the Congress authorized the appointment of a commission 1/ to study the possibilities for greater industrial utilization of agricultural products. Major objectives of this study were to determine if possible expansion of industrial uses might serve to utilize surplus products now in storage and to find new agricultural crops having unique industrial uses that could be grown as a replacement for those crops now produced in surplus. This commission under the chairmanship of S. Leroy Welsh with Mr. Wheeler McMillan as Executive Director established "task groups", each to deal with a specific aspect of the entire problem.

After study of the problem, among other recommendations, this commission recommended that appropriate steps should be taken to enact legislation by the congress to provide appropriations for research and for such other programs related to industrial utilization as was deemed necessary to carry out its recommendations. A bill was introduced in 1958 requesting appropriations to implement these recommendations.

Emphasis on programs to find new uses for agricultural products is not new. Surplus of crops in the 1930's became an important factor in the decision to establish four regional research laboratories in the U. S. Department of Agriculture; the one for this region located at Peoria, Illinois. According to the original mandate, nearly all research at these laboratories was to be directed toward finding new, improved or expanded uses for existing commodities. This is in sharp contrast to the present proposed program (for crops) to find new crops to replace those in surplus.

That opportunities exist for the establishment of new crops can hardly be denied. About 50 years ago, soybeans were grown on only a very limited scale (less than 50,000 acres); today this crop is grown on nearly 25 million acres. Ten years ago the acreage of safflower was essentially none, while now the acreage is over 100,000. Among the 250,000 species of higher plants, less than 100 have an annual value of $1,000,000 each in the U.S.A.

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1/ Public Law 540 -- 84th Congress, Sec. 209.
Very few crops can be called "new crops" in the most strict sense. Nearly all crops now grown were important in some parts of the world long before they were introduced into American agriculture.

For purposes of this seminar, a "new crop" will be defined as one not currently in domestic use, or if so, on such a limited scale that its importance has not yet enabled it to find its potential place in culture and one whose use fills a new need. In an economy of surplus feed crops a new crop thus cannot be one which only serves as a substitute for uses of existing crops. For example, grain sorghum, although relatively new in many parts of the U.S.A., is in reality only a substitution crop for corn and other feed grains. Hence, it serves no real function in a new crops program designed to establish new uses for agricultural products. In contrast, if a new use can be found for an existing crop this expanded use may make possible the absorption of a surplus. In this discussion, major emphasis will be given to finding new crops whose potential use does not become a substitute for an existing crop.

The logical starting point in a new crops program is to determine needs based on the end-point uses of plant products and from these needs to determine which new species might best fulfill them. This process has been described as "an educated fishing expedition" by Wolff and Jones.² The task force on New and Special Crops under the President's Commission has outlined the major new and expanded needs for crop products in the following categories:

1. Pulp and Cordage Fibers
   a. Paper and paper products - 30 million tons, much of which is imported.
   b. Dissolving pulps (cellophane and cellulose derivatives - 800,000 tons).
   c. Hard fibers - 200,000 tons imported.
   d. Soft fibers - 850,000 tons imported.

2. Gum-like products
   Carbohydrate gums and mucilages used in textile printing, paper coating, etc. - 40 million pounds imported.

3. Proteins for industrial and feed uses.
   Industrial use of protein now at 100 million pounds annually. More economical plant source needed.

²/ Chemurgic Digest, September, 1958.
4. Industrial Vegetable oils
   Present use of synthetic chemicals at 3 billion pounds.
   New oils needed with specific properties.

5. Waxes
   Present import 30 million pounds.

6. Pharmaceuticals
   Present and potential acreage for obtaining drugs from plants is small.

7. Tanning agents
   Present import about 64,000 tons annually.

8. Insecticides
   About 100 million pounds used annually of which 7.2 million pounds from plant sources.

9. Antioxidants
   Used in petroleum products, paints, etc. Present use 88 million pounds. Many plant products have antioxygenic properties.

10. Films and Fibers
    In 1954 over 350 million pounds of cellulose film produced. Markets are expanding.

11. Soil conditioners

12. New Foods

13. Seeds
    Estimate needs of 450,000 acres to produce crop seed now imported.

On the basis of the above information, the New Crops Research Branch in the Crops Research Division and comparable units in the Utilization Research and Development Divisions have jointly undertaken a research program to procure promising new crops and to screen them for their unique chemical components that would economically fill these needs. Although this program has been in operation for only a very short period of time, a few promising leads have been found in the following specific categories:
1. Oilseeds
   a. Species high in erucic acid (Brassica family)
      Brassica campestris, crambe abyssinica, Eruca sativa, etc.
   b. Species high in petrosilinic acid. Daucus carota, Foeniculum vulgare, Apium graveolens, etc.
   c. Species high in diene-containing oils. Rudbeckia bicolor, Helianthus maxmiliana, Helianthus annus, etc.
   d. Species high in triene-containing oils. Monarda fistulosa, Margorana hortensis, Euphorbia marginata, etc.

2. Pulp crops
   Crotolaria juncea, Sesbania sp., Sorghum album

3. Non-starch carbohydrate gums
   Guar

The above is only a partial list of plant species that have potential new industrial uses. In certain cases, especially in the oil seeds, the residue also is high in protein.

From prior exploratory work on new crops, another group of species appear to have industrial usefulness. Certain of these species are now grown to a limited extent, but the industrial development of their products has not progressed to a large enough scale to provide important replacements for existing crops. These crops include:

   Potential use in 3 years; 120,000 acres, in 13 years 500,000 acres, in 23 years, 1,000,000 acres. At present only 5,000 acres grown in southwest.

2. Canaigre - a source of tannin.
   Present acreage, essentially none; potential 100,000 acres. A root crop, harvested in second year from seed. Largely adapted to southwest.

   Present acreage small; potential 1,000,000 acres. Largely adapted to southeastern states.

4. Jojoba - a source for wax.
   Present acreage none; potential 150,000 acres. Largely adapted to southwest. A shrub growing to maturity in 8-9 years. Liquid wax obtained from nuts.
5. Kenaf - a source for soft fiber.
   Present acreage almost none; potential 200,000 acres.
   Largely adapted to cotton belt and southern part of corn belt. An annual crop.

   Present acreage very small; potential 100,000 acres.
   Largely adapted to southeast. Crop established from cuttings and harvested 3-4 years later.

There are many problems associated with the development of a new crop in American agriculture. First, from the viewpoint of production, it must be adapted to mechanization. With farm labor supplies dwindling, any new crop that requires excessive hand labor in planting and harvesting can hardly be expected to find acceptance. Second, production practices must be determined to attain optimum procedures for growing the crop. Present crop plants widely grown have passed through a long transition period (and still subject to change) in this respect. Third, development of superior strains by breeding will surely be necessary to improve agronomic, chemical, disease and insect resistance. American farmers have come to expect their crops to be improved in these respects. Fourth, industry utilizing the product derived from the crop must be assured of a stable outlet for the product to justify investment in plant facilities. Fifth, the competitive position of the industrial product must be favorable either to a synthetic source or to imports from abroad where the product might be produced at a lower cost. The implications of producing at home, rather than importing, to the balance in trade for those crops which we export to other countries may in the long run be disadvantageous to our own economy.

The discussion thus far has been concerned largely with "new crops" for industrial uses. Perhaps equally important is an analysis of the potentials from modification of existing crops to meet new industrial demands. The advantages of this approach are obvious, since the know-how of producing the crop has been established. Two examples may be cited to illustrate this point.

1. Development of waxy endosperm in maize. This type of starch provided a replacement for a similar type previously obtained from the cassava root imported from the Dutch East Indies. This type of starch is used in food products (tapioca and instant puddings) and for glue and other adhesives. Approximately 100,000 acres of waxy corn are grown to provide this type of starch.
2. Development of high amylose starch in corn. Current research suggests the possibility of adding these genetic factors for high amylose to existing lines of corn. The straight-chain starch molecule of this type offers promise for use in films and fibers.

General Summary: The development of new crops to replace those now in surplus should not be considered as a short-time research and development program. Establishment of a new crop (for crops) requires a coordinated program among several agencies to firmly establish the demand for its product, the competitive relationships of the product with alternative sources of supply and the potentials for its economic production as a crop under present day mechanized agriculture.
POINT FOUR AND ITS EFFECT
ON UNITED STATES TRADE

Sherwood O. Berg *

Introduction. An analogy between Karl Marx's nineteenth century gas-light London and the twentieth century "tail-finned" United States was made by Gunnar Myrdal in the International Economy. In his comparison, Dr. Myrdal substituted countries for classes and concluded that as wealthier nations increase their wealth, poorer nations become poorer.

One clear lesson of the opposite movements of rich and poor nations was that the security of our nation would be further threatened. But, perhaps more importantly, it would add to the further political instability and economic and social frustrations of the millions of peoples of the lesser developed countries of the world.

The overwhelming majority of the peoples in the underdeveloped countries are illiterate; many live at the borderline of adequate nourishment. They have a life expectancy of a little over 30 years, or less than one-half of that in this country. They produce, on a per capita basis, less than one-tenth the goods and services of the countries of Western Europe or approximately one-twentieth of the United States. The things they share in common are: low productivity; low income, low levels of living; a high rate of population increase; and in most instances, a recently-kindled, intense desire to shake themselves of this poverty.

Some of this newly fermented zeal for economic progress and social reform has been merely blunted in a vague and nebulous resentment against conditions as they now exist; in other cases, it has served to fire a quest for growing knowledge and outside resources to initiate and accelerate economic growth. Thus, the changing status and aspirations of people in the less developed countries have opened new paths leading to expanded economic relations and general contacts in the world. In this general stiring and awakening, a new and untested world balance of power is being created.

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*The author wishes to acknowledge the contributions of Mr. Turner Oyloe, research assistant, University of Minnesota, and the helpful suggestions of Dr. Arthur F. Hanau, University of Goettingen, West German, presently visiting professor, University of Minnesota.
Moreover, the arousing of the underdeveloped nation's desire for progress, coupled with the developments of a bi-polar international power struggle between East and West, has precipitated a world-wide ideological struggle for men's minds. The rise of Russia from a backward country to the world's second greatest industrial power in 40 years can be a powerful incentive for underdeveloped nations to attempt development by communistic methods. A situation has been created in which the millions of people, searching for the touchstone of economic progress with desperate determination, are weighing two systems: the communist system and our system. Which will lead to the fulfillment of goals of betterment more quickly?

The current power struggle can be witnessed in many areas, but perhaps it is being waged most dramatically in the Near and Far East. All of the small nations of Southeastern Asia and the Near East are watching to see if the economic development programs currently pursued are more successful within the working democracy in India or under the totalitarian communistic system of Federated People's Republic of China. The destiny of our free society, the ideals we cherish and the world balance of power is at stake. The success of the United States in its efforts to encourage, aid and abet these important areas of the world might, in the long run, spell victory or defeat of the so-called Western way of life.

The present international situation has lead us to accept three rather broad postulates in the conduct or guidance of our foreign affairs: firstly, that economic growth of the underdeveloped world is essential to our own national security; secondly, that economic development will increase our trade with foreign nations and thereby permit a more economical use of resources by promoting specialization of production; and, thirdly, that the humanitarian principle dictates that we should help our fellow men.2/

It is the second postulate that we wish to examine most closely in this presentation. Moreover, we shall confine ourselves to the operation of Point IV activities as differentiated from other economic development programs and their effect on the exports of the United States agricultural and industrial exports. And, furthermore, we shall attempt to explore the effects in the short and long run or through various stages of development.

The Objectives of Point IV. The basic intent and purposes of Point IV has been stated clearly by the Congress of the United States. The following

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objectives were encompassed in the initial legislation:

To aid the efforts of the peoples of economically underdeveloped areas to develop their resources and improve their working and living conditions by encouraging the exchange of technical knowledge and skills and the flow of investment capital to countries which provide conditions under which such technical assistance and capital can effectively and constructively contribute to raising standards of living, creating new sources of wealth, increasing productivity and expanding purchasing power.

The expenditures to carry out the specific objectives of Point IV have not been large. Our total foreign aid outlays have been large but not our Point IV expenditures. In recent years, from $3.8 to $5.0 billions of foreign grants and credit have been extended annually by the United States. Most of these funds have been spent on our direct military or defense support efforts. Other than for emergency relief or famine, only $1.0 to $1.5 billions has been for economic aid to the underdeveloped countries. Of this latter sum, only $100 to $135 million have been allocated to Point IV purposes. For a program touching more than a billion of population, covering three continents, it is of very modest cost compared with other programs. Its annual cost is about one-third of our total defense and economic assistance support to the one country of South Korea.

In addition to being a relatively small program, Point IV differs from other aid programs in that it is a technical assistance program engaged, first and foremost, in the development and transfer of skills and related knowledge. However, the initiation of technical progress, as so clearly spelled out in the Congressional mandate cited above, is intricately interwoven with effective utilization of capital. In fact, the interdependence of knowledge and capital as related to economic development demand further exploration.

The Transfer of Knowledge. Looking initially at the problem of transfer of knowledge, economic growth depends upon both technological knowledge about things and living creatures and upon social knowledge about man and his relationships with fellowmen. The former is often emphasized in the context of Point IV. However, the latter is just as important since growth depends as much upon such matters as learning how to administer large scale organizations, or creating institutions which favor economizing efforts, as it does upon breeding new seeds or learning how to build bigger dams.

For example, the potential increased productivity from the dissemination and the use of available information in some underdeveloped communities is profound. This is especially important when we consider that increased productivity of the soil in most underdeveloped areas is one of the quickest methods of raising national income. Admittedly, in many areas, considerable research must be carried out before extension recommendations can be made; in fact, research is a pre-requisite to extension. However, once knowledge becomes available the need for dissemination through extension type programs becomes of primary importance.

The costs of the extension of knowledge are part of the overall plan of economic development that must be borne by the general economy. According to W. Arthur Lewis' study, *The Theory of Economic Growth*, a general rule of thumb for the allocation of funds for agricultural extension and research purposes varies between 3/4 and one percent of the national farm income. This proportion has, for example, been spent by the United States, Great Britain, and Japan.

Mr. Lewis also cites some rough estimates of the returns on this type of investment and these estimates underscore the high marginal rates of return that have been experienced. An example of increased productivity through application of technical knowledge involves Japan where agricultural productivity increased at a cumulative annual rate of 1.3 percent per annum during the period 1880-1920. Rates of one percent were attained by Great Britain and the United States during the same period. 4/

The Need for Capital Formation. In addition to the transfer of knowledge, capital investments are associated with increased economic growth. Moreover, we must emphasize again that it is not merely a matter of making capital funds available but a suitable institutional framework for its utilization must be provided. In a sense, this establishes a condition that knowledge and capital go hand in hand.

In the experience of most industrial countries, capital investments of 9 to 12 percent of national income have resulted in growth in the economies of about 3 percent. Thus, the ratio of the value of added capital and value of additional output has been roughly three or four to one. 5/

These estimates of growth rates in developed nations are generally predicated on increased investments in direct production equipment. For these nations in which there are large investments in buildings and public works, increased capital investment does mean direct productive goods. However, for

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underdeveloped nations the structure of investments is substantially different. There must be investments on the farms in the form of permanent land improvements, livestock, farm buildings, fertilizer and so forth; in specific service to agricultural production and marketing, such as water control works, storage and processing; in services shared by the farm and non-farm sectors, as transportation, communication, electrification, education and health service; and in urban development and industrialization in general.  

In other words, little improvement in national welfare is possible without a progressive shift from a predominantly subsistence agriculture to production for the market. Markets, in turn, are dependent upon the expansion of transportation and communications, upon the growth of industrialization and urbanization, and the development of trade on an international as well as a national scale -- all of which hinges, of course, on capital investment and the acquiring of technical "know'how". Agriculture is never developed for agriculture's sake, but only if, through the industrialization process, urban populations are expanded in the country or in other parts of the world and if, as a result, the demand for food and other farm products increases.

With a large segment of capital expenditures earmarked for basic construction purposes, the immediate utilization of capital for increasing the real income of the people will likely be lower in underdeveloped countries than what we have come to accept as normal in more advanced nations. Also wastage of capital will have to be tolerated due to lack of talent in organization, maintenance, and skill in use of productive assets.

Because of the expense involved in purchasing capital goods, every available means should be utilized in substituting labor for capital. In the early stages, progress in production is achieved primarily by the use of surplus rural labor and simple working tools in improvement work. Studies from the Far East regarding the labor needed to maintain draft animals have demonstrated that such beasts of burden are essentially accumulators of human energy. In other words, over a period of time, the human labor expended in caring and maintaining an animal were roughly equivalent to the animal's power contribution. This was explained in part by the fact that human labor is spread over the year. However, with economic development, work animals were being used more days in the year and their net contribution in power value exceeded the human labor invested.

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7/ Ibid.
In spite of the efforts of capital substitution, savings in the form of accumulated funds are invariably needed to carry out economic development. The problem always seemed to resolve itself to the question: from whence cometh the money?

If we grant that some of the investment in high productivity ventures will be undertaken by international developmental agencies, foreign governments and private investors, then the low return investment will be largely the responsibility of domestic financing. History has demonstrated that a high activity in capital formation and economic growth has taken place where income is distributed more favorably in the direction of capital and less favorably toward labor. Stated in another manner, given the goal of rapid economic development, increased productivity in a given economy can not be passed back to labor, for then the surplus would go toward consumption expenditure rather than capital investment.

Moreover, productivity gains of an economy to be used for reinvestment can be drained off in two general ways. One is by inflation; the other, taxation. A combination of inflation and taxation may also be employed. The manner in which development has taken place in the past using inflation and taxation are rather interesting. Japan is a case in point. The state gained control of the feudal lands of the nobility by first heavily taxing the land and then taking over the debts of the nobility and issuing government bonds in payment. The nobility finding themselves with government bonds turned to banking and were allowed to purchase factories whose establishment the government was encouraging. Clearly, the cost of industrialization initially was borne by agriculture in the early period of economic development.

This pattern of capital accumulation has been the rule in the development of other countries, including our own. European capital, which immensely aided this country in its development, was initially serviced or paid for by agricultural exports.

Point IV and Trade Patterns. As a young, expanding nation, we were nurtured in our growth by a reliance on export markets as outlets for our domestically raised farm products and as sources of much-needed capital. Today, as a developed economy, much questioning and pointed criticism is directed at our national policies which in any way might encourage the production in underdeveloped nations of farm products that are directly competitive with ours. Thus, some persons and some groups would remove or severely curtail the opportunities for economic growth among underdeveloped countries by methods which we in our early history once enjoyed.

This attitude, I feel, is symptomatic and symbolic of our times. It springs from a growing anxiety spawned in the shadow of a pyramiding stock of $7 to $8 billion of farm surpluses; it reflects the cross-currents and conflicts which ensue when organized special groups are willing to sacrifice the nation's general welfare for their own interest; and it underscores the need of public understanding of international economic problems.

Admittedly, the impact of Point IV on our pattern of trade is difficult to assess. The interdependence of technical assistance and economic aid when applied to economic development should by now be apparent and defies differentiation. The two are hand and glove. Moreover, the time lag from the introduction of a new technique or new capital to fruition in terms of improved productivity, the availability of exportable surpluses, and their appearances on the world commodity markets shows a highly irregular pattern among nations and through periods of time. However, some attempt must be made to put this problem in its prospective.

It may be pointed out that the United States imports less than $35 million worth of farm commodities that are regarded as materially interfering with any domestic price support or other agricultural program undertaken by the Department of Agriculture. These products account for only about one percent of our total imports of foreign agricultural goods. The import restrictions our government imposes under Section 22 of the Agricultural Adjustment Act, as amended, holds most of these imports at token levels. The majority of our agricultural imports, roughly $3.9 billion annually, are either complementary or supplementary to our agricultural economy.9/ Of course, we are interested in the degree to which our foreign markets may have been displaced due to technical aid extended to nations which compete with us for export outlets. But, here again, we should not overlook the influence of other important factors: namely, the impact of our farm price support program; and the actions of private U.S. corporations and investment firms abroad.

Factors other than Point IV may contribute to competition. The United States adherence to a system of farm price supports considerably above world market levels has served as a protective umbrella for prices of many farm commodities entering international commerce. As a consequence, at least in part, the response among producers of other nations, many of them in underdeveloped countries, has been to expand production under the favorable price conditions.10/ In cotton, for example, at the same time that the

9/ Gastineau, R.L., "The Other Half," Foreign Agriculture, USDA, FAS, July 1957, p.6
10/ It must be recognized that price supports programs have also stimulated the production of synthetic materials, such as synthetic fibers and detergents, which are competitive to both domestic and foreign farm products.
United States, in the face of a cotton surplus, reduced its output by almost three million bales as a result of an acreage cut of 25 percent, other cotton producing countries increased their production by 1.3 million bales.

Likewise, private investors have influenced agricultural production and trade patterns. Private investments leading to the production of competitive agricultural products have been made by United States private firms, particularly in Latin America. In these countries many United States companies, individuals and financial institutions have either directly or indirectly through subsidiaries and affiliated concerns, brought about large increases in cotton production and exports by establishing cotton gins and markets, furnishing technical and management assistance and providing financial aids to growers, cotton ginners and cotton cooperative. United States capital to a lesser degree has promoted increased production of other basic commodities and dairy products in these countries.

The role of such private investments has been seen in Latin America where United States investments were largely credited with the very great increase in cotton production since 1950-51. According to the findings of a Congressional Subcommittee, United States corporations interested in such operations have invested millions of dollars in plant and equipment in Latin America. Thus, while criticism has been frequently directed at governmental Point IV operations, there is considerable evidence that a number of United States owned companies are engaged in helping through financial and technical aid to stimulate production of agricultural commodities which are in surplus in the United States.

Stages of Development Affect Trade Pattern. The further evaluation of Point IV policies on trade patterns must take into account certain short and long run aspects. In the short run, the application of a simple technical assistance program would have extremely limited effects on the United States exports of either industrial or agricultural goods. Training programs take time to establish and administer, and only small changes would flow from programs so limited in scope.

However, if technical assistance were packaged with economic aid, a different impact can be expected. In carrying out such a program, it is highly probable that a recipient country operating on an industrial base which has exhibited some growth will choose to use its relatively meager hoard of aid dollars to

purchase capital goods to accelerate its industrialization rather than spend them on consumption items, such as food. Under such circumstances, the market for United States industrial goods tend to expand, while those for agricultural commodities are relatively unaffected. In fact, they might be reduced if purchases of needed foods could now be made from soft currency areas.

Recently, much interest has been generated for the direct use of surplus agricultural products in economic development. In fact, President Eisenhower's "Food for Peace" program is based upon this thesis. Much of the discussion in implementing this program give recognition to the proposition that labor to a degree can be substituted for capital.

In the early stages of economic development, large outlays are required for elementary public facilities such as roads, housing, harbors, electrical power, reclamation, public hygiene and education, without which there would be no industrial or agricultural advancement. The erection of this basic substructure has been estimated to account for about one-half of the initial development costs. That is the type of investment that requires relatively little outside economic aid for "overhead costs" of development, but requires large quantities of indigenous material and local labor. It is the type of basic groundwork that has been frequently lacking, and this lack has led to an ineffective absorption of our economic assistance.

Although the establishment of the substructure is essential to economic growth, the investments made produce no consumer goods in the first instance. An underdeveloped country could resort to deficit financing of the building of the required substructure. In most nations, however, this would result in tremendous inflationary pressure. The people added to the working force would spend most of their wages on food and clothing and, since those are not likely to be available, prices would rise. Moreover, the consumption among rural people is currently at such a low level that much of any increase in food output would be absorbed within the rural sector and would not be available for the new members of the industrial labor force. Thus, it is apparent that under circumstances of this nature, increased United States agricultural exports could be used to bring about more rapid employment to bolster a program of deficit financing in economic development.

In a pilot study carried out in India there appeared to be a large number of projects potentially suitable for financing, in whole or in part, through surpluses, either as individual projects or as part of the general development program. It was further concluded that the longer the period for which the project could be assured surplus financing, usually the greater the proportion of total cost which can be financed by agricultural surpluses. On a four-year program basis, the average proportion of the costs covered by surpluses
varied from a low of 46 percent for industrial and semi-industrial projects; to 75 percent for roads, irrigation, and hydroelectric projects; and to 100 percent for education and social development.\textsuperscript{12}

Clearly, the results of this study tended to be optimistic in regard to utilization of surplus foods for economic development. It is also interesting to observe that the category where utilization of agricultural products could cover most all the cost was education. The importance of education and individual training to economic growth has been emphasized previously in this paper.

If history chooses to repeat itself, the long-run effects of technical assistance will stimulate foreign trade. For historically, economic development has been an important factor in stimulating trade in both agricultural and industrial commodities. Contemporary events have shown how economic development played an important role in increased foreign trade. The Marshall Plan aid to Western Europe stimulated economic growth and consequently, U. S. exports to this sector of the world.

Moreover -- and this appears fairly important -- the countries with the highest per capita incomes are always our best customers. A country with a developed economy, such as the Netherlands, for example, spends $40 per person per year for American goods. Figures for other industrial nations are Belgium and Luxembourg, $35; United Kingdom, $16; West Germany, $14; and Japan, $9. This heavy volume of trade can be compared with that of underdeveloped countries: Ceylon, $2.32 per person per year; Pakistan, $1.31; India, 77 cents; and Burma, 36 cents.\textsuperscript{13} The economic betterment of the latter nations would result in greater trade and prosperity for the United States.

\textbf{Summary and Conclusions.} The United States technical assistance program, known as Point IV, is a relatively small portion dollar-wise of our foreign operations, but it is an important dimension of our foreign economic policy. Point IV is a major instrument through which millions of people in underdeveloped countries hope and aspire to the fruits of economic growth. It is a means of promoting stability in regions vital to our own nation's security; it is a vehicle to carry out a humanitarian program between wealth and dire need.

The tapestry of economic development is shaped by the warp of transfer of knowledge and the woof of capital formation. As an underdeveloped country

\textsuperscript{13} "Aid Builds Markets, Congressmen Say," Minneapolis Tribune, April 17, 1959.
moves through its stages of development, its trade patterns may change to cause conflicts of interest with producer groups in the United States. But in the long run, historically, economic development has stimulated trade in both agricultural and industrial commodities.

The future of our country as a world power depends to a large degree upon how well the general public understands our stake in the development of the economies of the nations in Asia, Africa and Latin America. We must recognize the difference between being a leader in economic development and dominant in economic development. The first term implies high interest, high activity and responsibility; the second implies a tendency to exploit every advantage to its limits.

We must carefully assess our economic needs for the future and also the needs of the rest of the world and then arrive at a policy which will benefit as many people as possible. Our programs must be aimed at both national and world economic expansion.
This paper cannot be said to have a modest set of objectives. On the other hand, it can easily be seen by the reader that this paper cannot be said to be definitive.

First, the margin behavior of wholesalers and retailers in the short run will be determined, and second, the long run behavior of margins will be predicted.

**Food Wholesaler in the Short Run.** By "Food Wholesalers" we shall mean the agencies from which food retailers obtain merchandise for resale. Food wholesaling thus includes merchant wholesalers; the distributive organizations of some food manufacturers; meat packers; dairies; and the district warehouses of integrated retailers. All of these agencies have one characteristic in common: more than 90 percent of their total cost is represented by the "cost of goods sold". Thus, even a 10 percent increase in wages of labor could not increase the costs of food wholesalers by as much as one percent. In the short run, however, labor does not vary proportionately with sales (a large part of labor costs are fixed costs) and thus only a minuscule proportion of any increase in labor cost can enter pricing. For all practical purposes, we can assume that wholesaling agencies have horizontal marginal cost functions and that these marginal cost functions differ little from the "cost of goods sold". On the other hand, it is well-known that merchant wholesalers, produce jobbers, and the like customarily practice average cost pricing (that is, they customarily add a fixed percentage margin to the "cost of goods sold"). Thus, the short run pricing behavior of such firms can be described by:

1) \[ I = (W_C + F) (1 + m) \]

where \( I \) is invoice cost to the retailer, \( W_C \) is wholesale list price in primary markets (or manufacturer's list price to wholesaler as the case may be), \( F \) is "freight inward", and \( m \) is the wholesaler's percentage markup. In the short run a change in freight rates or a variation in \( W_C \) can affect \( I \). We shall (somewhat tautologically) define the short run as the period in which there is no variation in \( m \).

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Food Retailers in the Short Run: Food retailing has been variously described as competitive, monopolistic, monopolistically competitive, oligopolistic, or larcenous (especially by farmers and/or consumers). The case for oligopoly appears very good on the surface. In any given competitive group of stores, "fewness" dominates. The cross elasticities of demand between firms are substantial.\(^1\) For a number of reasons, however, oligopoly agreement, and thus oligopoly behavior, does not eventuate. First, entry is relatively easy and less than optimal size firms enter and nibble away at the supermarkets trading area if price is established at a high level. Thus, price competition may not be a zero sum game. Second, losses may be imposed on outgroup retailers who cannot retaliate. Third, retail complementarity makes price cuts very attractive. Thus, any agreement is almost impossible to maintain. Fourth, differences in product line width make for differential pressures on entrepreneurs for price competition and make it impossible to establish any one price level and structure which is satisfactory to all participants. Fifth, the transgressor's offer cannot be duplicated except at prohibitive cost because of the omnipresent spatial differentiation. Sixth, the multidimensional character of response paths and the presence of consumer ignorance mean that there is a long lag between the initiation of action and the time when the results of the action are felt by competitors. In the interim, many parameters have changed and the competitors are never sure just what caused their change in sales. Seventh, marginal costs are subject to frequent changes and may be different for different stores. Thus, oligopoly agreement is virtually impossible and we are left with a market from which is best described as monopolistically competitive with substantial cross elasticities of demand, but which is subject to many other imperfections which preclude a long run adjustment to a zero profit equilibrium.

For the moment let us aggregate over-all the products sold by a retailer and consider only the short run movement of the aggregate gross margin in response to movements in parameters. First, we must determine the shape and composition of the firm's marginal cost curve. In a study done by the writer, it was found that 98.6 percent of the variable costs of supermarkets are represented by "cost of goods sold" (I). Of the remaining 1.4

\(^1\) The writer has calculated the Bishop measure of oligopoly (price elasticity \(E_{ii}\) divided by cross elasticity \(E_{ij}\)) in one case between two supermarkets about one mile apart and found it to be 1.6, which would of course be an oligopolistic relationship. See: Robert L. Bishop, "Elasticities, Cross Elasticities and Market Relationships", American Economic Review, XVII, No. 5 (December, 1952), 780.
percent, 0.9 percent is supplies and 0.5 percent is labor cost. Supplies (primarily wrapping materials) vary in constant proportion to real output. Thus, the retail marginal cost function is horizontal and virtually unaffected by any change other than movements in \( I \). A comparison of columns 5 and 6 of Table 1 confirms the conclusion that labor cost changes have little to do with retail price changes. Houston, Texas, a city with an already high level of wages, experienced the greatest increase in hourly earnings of any city in the group. Yet in roughly the same period Houston's food price index increased by very nearly the smallest amount experienced in any city. Throughout columns 5 and 6 there seems to be almost an inverse correlation between wage changes and retail price index changes.

If we define the short run as the time period in which no major movements of the retail store's demand curve occurs, then it can be seen from Figure 1 that the optimum change in retail price is one-half the change in \( I \). This hypothesis competes with another formulated precisely, by Professor Fox. That is \( p_r = (p_w + d_r) \bar{r}_r \), where \( p_r \) is retail price, \( p_w = I \), \( d_r \) is store handling cost and \( \bar{r}_r \) is a factor greater than one. In the Fox hypothesis:

\[
2) \quad dp = \bar{r}_r \, dI, \quad \bar{r}_r > 1.
\]

Now equations (1) and (2) are seemingly quite incompatible and at this point it seems wise to appeal to some data. Unfortunately only price index series and not price series are available so that some manipulation of equations (1) and (2) is essential. Let \( Y_t \) equal the month to month change in the retail price index and \( X_t \) equal the month to month change in the wholesale price index for processed foods.

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2/ Actually in a regression of labor cost on sales, "b" was not found to be significantly different from zero at the ten percent confidence level. See: Bob R. Holdren, "The Structure of a Retail Market and the Market Behavior of Retail Units". (Unpublished Ph.D. Dissertation, Yale University, pp. 51-52).

3/ In equilibrium \( dp = 1/2 \, dI \). This result is dependent only upon the existance of a horizontal marginal cost curve and a linear demand curve. It is independent of the elasticity of demand.


5/ Ibid., p. 50.
Figure 1
3) \[ Y_t = \frac{\Delta pt}{p_0} \]

4) \[ X_t = \frac{\Delta W_{ct}}{W_{co}} \]

5) \[ \Delta p_t = Y_t p_0 \]

6) \[ \Delta W_{ct} = X_t W_{co} \]

and from equation (1):

7) \[ \Delta I_t = X_t W_{co} (1 + m). \]

Applying note (3) and equation (5)

8) \[ Y_t p_0 = \frac{1}{2} X_t W_{co} (1 + m) \]

and

9) \[ Y_t = \frac{1}{2} X_t (1 + m) \frac{W_{co}}{p_0} \]

The Fox hypothesis leads to:

10) \[ Y_t = \bar{r}_r X_t (1 + m) \frac{W_{co}}{p_0} \]

m equals approximately .06 and \( W_{co} (1.06) \) probably equals about .83. Thus under my hypothesis:

11) \[ Y_t = .41 X_t. \]

Under the Fox hypothesis:

12) \[ Y_t = .83 \bar{r}_r X_t, \bar{r}_r > 1. \]

Consider the last column of Table 1. It seems unlikely that the Fox hypothesis is applicable in recent years. This conclusion is borne out by the regressions recorded in Table 2. (Admittedly, the writer chose two cities for computations which seemed most favorable to the writer's hypothesis.) At any rate, the results suggest that a more extensive analysis of the available data should prove interesting.

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6/ \( \bar{r}_r = 1 \) is the hypothesis that retailers maintain a constant percentage margin and in such case, \( Y_t = .83 X_t. \).
The observed inverse relationship between hourly wage rate changes and changes in the price index, together with the results of the regression analysis, are compatible with a monopolistically competitive market afflicted with imperfections in knowledge on the part of both buyers and sellers and with different retail demand elasticities in different cities.

(The elasticity of demand would not affect the seller's optimum response to a change in $I$ in a "perfect" monopolistically competitive market, but in a market in which the seller is imperfectly informed, a low elasticity allows non-optimising behavior to go unpunished. It is well known that there is a bias towards too high a price in such markets. Thus we would expect the observed price increase to be greater than optimal and the less elastic the demand, the larger is the departure from optimal behavior.)

The foregoing statement concerning elasticities in different cities is in part tautological. A precondition for a high price elasticity is the existence of informed buyers. It is possible, however, to make the statement other than totally tautological.

First, retail demand elasticities would vary directly with mobility or the ease of travel within the shopping area. Cities which exhibit relatively large increases in their price index in Table 1 seem to be cities which experienced a large part of their growth prior to the advent of the automobile or are quite hilly cities. Pittsburgh and Scranton are doubly cursed. On the other hand, if we assume that hourly earnings in manufacturing are a reasonably good indicator of disposable income, the level of disposable income seems to vary inversely with changes in the retail index. (See Table 1). In the other words, high labor costs may reduce, rather than increase, retail margins. High income consumers are on the average better informed, more mobile, and have more leisure to shop around. Thus, the optimum number of stores is smaller and the optimum width of product line is wider in cities where per capita disposable income is relatively high. It may seem surprising that a low density of stores relative to population should lead to highly competitive retail markets. A large trading radius, however, gives the retail store a higher marginal revenue curve.

Other things being equal, the number of households attracted by a given finite price change is proportional to:

$$13) \Delta A = \pi (r + \Delta r)^2 - r^2 = (2r \Delta r + \Delta r^2).$$

7/ For the circle $dA = \frac{1}{2} r$.

\[ \text{dr} \]
### TABLE 1

<table>
<thead>
<tr>
<th>City</th>
<th>Sales per G Store</th>
<th>Average number persons served by each store 1954</th>
<th>Hourly earnings in Manufacturing 1956</th>
<th>1957</th>
</tr>
</thead>
<tbody>
<tr>
<td>New York, N.Y.</td>
<td>163,862</td>
<td>470</td>
<td>1.97</td>
<td>2.04</td>
</tr>
<tr>
<td>Chicago, Ill.</td>
<td>167,656</td>
<td>459</td>
<td>2.20</td>
<td>2.30</td>
</tr>
<tr>
<td>Los Angeles, Calif.</td>
<td>327,268</td>
<td>500</td>
<td>2.20</td>
<td>2.31</td>
</tr>
<tr>
<td>Detroit, Mich.</td>
<td>181,856</td>
<td>414</td>
<td>2.46</td>
<td>2.59</td>
</tr>
<tr>
<td>Philadelphia, Pa.</td>
<td>119,738</td>
<td>317</td>
<td>2.06</td>
<td>2.15</td>
</tr>
<tr>
<td>Boston, Mass.</td>
<td>207,914</td>
<td>214</td>
<td>1.88</td>
<td>2.00</td>
</tr>
<tr>
<td>Pittsburgh, Pa.</td>
<td>129,467</td>
<td>171</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Cleveland, Ohio</td>
<td>192,561</td>
<td>506</td>
<td>2.28</td>
<td>2.37</td>
</tr>
<tr>
<td>Washington, D.C.</td>
<td>270,159</td>
<td>---</td>
<td>2.11</td>
<td>2.21</td>
</tr>
<tr>
<td>Baltimore, Md.</td>
<td>126,668</td>
<td>395</td>
<td>2.04</td>
<td>2.16</td>
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<tr>
<td>St. Louis, Mo.</td>
<td>172,486</td>
<td>328</td>
<td>2.07</td>
<td>2.17</td>
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<tr>
<td>San Francisco, Calif.</td>
<td>174,865</td>
<td>231</td>
<td>2.32</td>
<td>2.44</td>
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<tr>
<td>Atlanta, Ga.</td>
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<td>1.78</td>
<td>1.88</td>
</tr>
<tr>
<td>Cincinnati, Ohio</td>
<td>---</td>
<td>---</td>
<td>2.03</td>
<td>2.13</td>
</tr>
<tr>
<td>Houston, Texas</td>
<td>---</td>
<td>---</td>
<td>2.19</td>
<td>2.33</td>
</tr>
<tr>
<td>Kansas City, Mo.</td>
<td>---</td>
<td>---</td>
<td>2.02</td>
<td>2.15</td>
</tr>
<tr>
<td>Minneapolis, Minn.</td>
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<td>---</td>
<td>2.05</td>
<td>2.15</td>
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<tr>
<td>Portland, Oregon</td>
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<td>2.21</td>
<td>2.28</td>
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<tr>
<td>Seattle, Wash.</td>
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<td>---</td>
<td>2.23</td>
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<tr>
<td>Scranton, Pa.</td>
<td>---</td>
<td>---</td>
<td>1.55</td>
<td>1.60</td>
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### 5 6 7

<table>
<thead>
<tr>
<th>( \Delta R )</th>
<th>( \Delta ) Hourly Earnings Dec. 1955-June 1958</th>
<th>( \Delta ) Retail Index on Foods from Dec. 1955 Total over the period, June 1958</th>
<th>( \Delta ) Wholesale Index Total over the period, June 1958</th>
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</thead>
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<tr>
<td>10.5</td>
<td>.19</td>
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<td>.59</td>
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<tr>
<td>9.1</td>
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</tr>
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<td>10.2</td>
<td>.27</td>
<td>.89</td>
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<td>13.6</td>
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<td>.89</td>
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<tr>
<td>9.5</td>
<td>.18</td>
<td>.59</td>
<td>.62</td>
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<tr>
<td>11.8</td>
<td>---</td>
<td>.54</td>
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<td>9.7</td>
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<td>.54</td>
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<td>.28</td>
<td>.63</td>
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<td>10.9</td>
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<tr>
<td>10.5</td>
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<td>12.9</td>
<td>.21</td>
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<td>8.5</td>
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</tr>
<tr>
<td>15.1</td>
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<td>.63</td>
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</table>

Sources: Census of Business and Monthly Labor Review
TABLE 2
Price Index Linear Regression
A Linear Regression of the Change in Retail Price Index of Processed Foods on the Wholesale Price Index of Processed Foods

The results of this regression are arrived at from 24 observations taken from the period July, 1956, to June, 1958. (One observation per month during this two year interval.)

**National Figures:**
1. \( Y_t = .13 \pm .623 X_t \)
2. Sample Standard Deviation from Regression: \( S_{Y,X} = .663 \)
3. Sample Standard Deviation of the Regression Coefficient: \( S_b = .150 \)
4. 5% Confidence Interval of \( \beta \): \( .312 \leq B \leq .934 \)
5. 20% Confidence Interval of \( \beta \): \( .425 \leq B \leq .821 \)

**Kansas City**
1. \( Y_t = .002 \pm .553 X_t \)
2. Sample Standard Deviation from Regression: \( S_{Y,X} = .743 \)
3. Sample Standard Deviation of the Regression Coefficient: \( S_b = .195 \)
4. 5% Confidence Interval of \( \beta \): \( .149 \leq B \leq .957 \)
5. 20% Confidence Interval of \( \beta \): \( .396 \leq B \leq .810 \)

**Minneapolis:**
1. \( Y_t = .144 \pm .362 X_t \)
2. Sample Standard Deviation from Regression: \( S_{Y,X} = .194 \)
3. Sample Standard Deviation of the Regression Coefficient: \( S_b = .044 \)
4. 5% Confidence Interval of \( \beta \): \( .271 \leq B \leq .453 \)
5. 20% Confidence Interval of \( \beta \): \( .304 \leq B \leq .420 \)
Thus the larger is the trading radius (within tolerable limits), the higher is marginal revenue at any given sales level. Finally if large trading radii occur in high income areas, and they frequently do, then marginal revenue is increased by still another factor. The worth of each household captured by the store is enhanced since the income elasticity of the demand for food is greater than zero.

One further factor must be considered. The larger the optimum trading radius, the wider is the optimum product line. Since retail complementarities operate in favor of most foods, then the marginal revenue function for most foods contains not only their "own" marginal revenue but is enhanced by the sum of the profit margins on all other commodities stocked.

Two further factors must be mentioned. The foregoing results could not be obtained if retailing were afflicted with decreasing returns to scale or if marginal costs rise at a finite output level. The second factor is the most easily resolved of the two. In the relevant output range, marginal costs never rise for retail stores since capacity is determined by the crowding and inconvenience which customers are willing to undergo (in the short run capacity restrictions may reduce the elasticity of demand for crowded stores). This capacity limitation is reached long before the marginal cost curve turns up. There is considerable, but fragmentary, evidence that within the range of store sizes which have been utilized, increasing returns to scale are the rule. Lot size economies, greater degree of specialization of labor, and the substitution of capital for labor are available as store size increases. It makes little difference whether increased size and sales are obtained by a widening of the product line or by an increase in store traffic with an unchanged product line.

Thus as farm prices fall relative to other prices, the behavior of retail and wholesale firms results in a drop in the farmer's share of the food dollar. As farm prices rise, the opposite result obtains. The magnitude of the retailer's contribution to this movement has probably been magnified heretofore, however.

Retailing in the Long Run: Given the existence of scale economies, the future behavior of retail margins depends largely upon our estimate of movements in variables which affect retail demand elasticities. The record of the past 25 years is very encouraging. In the early thirties, supermarkets pointed with pride to a gross margin of 12 percent in their grocery departments. Within the past year, this writer has observed several stores

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9/ Ibid., pp. 190-196
10/Ibid., pp. 62-86.
with gross margins as low as 5 percent in their grocery departments (even though many non-foods with higher average margins are "keyed" on the grocery key) and 10 percent would be considered a rather high gross margin in the grocery department for all but "Mom and Pop" stores. Margins on meat and produce seem to be about the same (19 percent and 23 percent respectively) as they were in the early thirties. Even this comparison is deceptive however, since the margins in these departments have probably narrowed on the items which were commonly stocked in the "thirties".

The only elasticity enhancing variable, which one might fear a decrease in, is that of mobility. That is, as our streets become more crowded, the disutility of travel within population centers may increase sufficiently to negate the effects of increased per capita income. Given the present patterns of urban development, such a result does not seem at all likely, however.

One cannot be quite so optimistic concerning the supply side of the market, however. The retailer is the offer maker and the market is sufficiently imperfect to allow the continued existence of non-optimizing behavior. In the writer's knowledge, non-optimising behavior never takes the form of a lower than optimum price. The existence of uninformed sellers makes the market less competitive and prices higher than they need be. For example, there is one group of 124 "loosely affiliated" supermarkets who operate on over-all gross margins of 13 to 14 percent, show expense rates of about 11 percent and enjoy a rate of return on capital of 50 percent or better. They operate in competition with chains who report a gross margin of 17 to 19 percent and a 15 percent rate of return on capital. Not only could the non-optimizing stores be led to reduce their margins, but in so doing they would force a reduction in the profit rate of the more efficient stores. Even the more efficient stores can probably reduce their expense rates. A 9 percent expense rate seems to be obtainable (with no change in sales volume per store) within the present technology and with no change in distribution systems. In one such store with a $4 millions annual sales level, it was estimated that a 9 percent expense rate is obtainable with an additional investment of approximately $125,000. This indicates that even the most efficient stores are not sufficiently capital intensive. Thus, in my optimistic moments, I envision a saving in food distribution cost of 4 percent to 7 percent resulting from improving the management of food stores. The social benefits from reducing the number of redundant food stores and releasing socially valuable urban space would not be a negligible additional blessing.

If we consider changes in the distributive system, the obtainable cost reductions are even larger. Almost all food processing operations carried on "on premises" in retail stores fail to exhaust scale economies in even
the largest stores. The processing of produce, poultry and pork is gradually being moved out of the retail store. Lunch meats are rarely packaged "on premises", in the more efficient stores. The remaining high cost operation on which little progress has been made is that of the "on premises" processing of beef carcasses. The shelf life of "cut and packaged beef" is too short to permit off premises cutting and packaging under present technology.

If we are very conservative and estimate the obtainable price reduction to be only 5 percent, the effect on the agricultural surplus would be quite substantial. (I'll leave it to the members of the seminar, who are much more skilled than I in this area, to estimate the impact of this price reduction.) Further, such a price reduction would benefit both consumers and farmers, impose no additional tax burden and injure only the redundant retailers.

It is not to be inferred that retailers willfully fail to optimize. In spite of the fact that retailing is one of our most important industries, not enough research has been done to provide retailers with anything approaching an adequate basis for decision making. Retailers lack market information, but more importantly they have little or no idea what information is needed nor how to use it if it were provided. I can conceive of no other place in the economy where research money would have more welfare leverage than in retail management.

Wholesaling in the Long Run. Like retailing, wholesaling is subject to scale economies. If an individual wholesaler enlarges operations by selling to more stores of a given size, the attendant scale economies are reasonably substantial. However, if this enlargement is obtained by selling to fewer but larger retailers, the scale economies available can more than halve present average wholesale expense rates. Between 1948 and 1954, the number of grocery wholesalers declined from 4,253 establishments to 3,320 establishments.\(^1\) In the same period, as indicated by Table 3, the number of retail grocery stores decreased substantially and were the only type of retail store to do so in spite of the fact that their relative importance increased by a very large amount. During the same period wholesalers' operating expenses decreased from 8.2 to 7.5 percent of sales.\(^2\)

These averages conceal the extent to which wholesaling costs may be reduced. For example, one Chicago wholesaler, operating on a 3 percent margin (including discounts), services stores within a radius of 300 miles. He achieves this low margin by servicing only stores with a minimum of

\(^2\) Ibid.
### TABLE 3

**RETAIL SALES BY TYPE OF STORE**  
**U. S. SUMMARY**

<table>
<thead>
<tr>
<th>Retail stores by type</th>
<th>Sales&lt;sup&gt;a&lt;/sup&gt; (000)</th>
<th>Sales as percentage of Total Retail Sales&lt;sup&gt;1948&lt;/sup&gt;</th>
<th>Sales in 1948 Prices</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1948</td>
<td>1954</td>
<td>1948</td>
</tr>
<tr>
<td>Grocery</td>
<td>377,939</td>
<td>279,440</td>
<td>24,770,123</td>
</tr>
<tr>
<td>Other food</td>
<td>114,773</td>
<td>105,176</td>
<td>4,308,589</td>
</tr>
<tr>
<td>General merchandise</td>
<td>74,111</td>
<td>76,198</td>
<td>17,134,718</td>
</tr>
<tr>
<td>Apparel &amp; Accessories</td>
<td>115,246</td>
<td>119,743</td>
<td>9,803,218</td>
</tr>
<tr>
<td>Appliances &amp; Furniture</td>
<td>85,585</td>
<td>91,797</td>
<td>6,914,179</td>
</tr>
<tr>
<td>Farm Equipment &amp; Hardware</td>
<td>52,289</td>
<td>53,547</td>
<td>4,879,841</td>
</tr>
<tr>
<td>Drug &amp; Proprietary</td>
<td>55,796</td>
<td>56,009</td>
<td>4,013,231</td>
</tr>
<tr>
<td>Other&lt;sup&gt;c&lt;/sup&gt;</td>
<td>158,372</td>
<td>199,833</td>
<td>8,263,475</td>
</tr>
<tr>
<td>Total</td>
<td>1,034,111</td>
<td>981,743</td>
<td>80,087,374</td>
</tr>
</tbody>
</table>

<sup>a</sup>Three indexes were used: Food Price Index, Durables Index and Non-Durables Index. Source: Department of Labor.

<sup>b</sup>Total wage costs = payrolls corrected for wage rate change plus \[(\text{number of proprietors times 50 (estimated working hours) times 1.088 (average hourly wage in retailing for 1948)})\]. Source: Census of Business, 1948 and 1954.

<sup>c</sup>Does not include eating and rinking places, the auto group, fuel and ice dealers or lumber and building supply dealers.
<table>
<thead>
<tr>
<th>Sales as percentage of Total Retail Sales</th>
<th>Average Sales per Store in 1948 Prices (000)</th>
<th>Total Wage Cost In 1948 Wages (000)</th>
<th>Total Wages as Percentage of Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>1954</td>
<td>1948</td>
<td>1954</td>
<td>1948</td>
</tr>
<tr>
<td>33.8</td>
<td>66</td>
<td>114</td>
<td>2,293,153</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2,341,783</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>9.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>7.4</td>
</tr>
<tr>
<td>5.2</td>
<td>38</td>
<td>47</td>
<td>1,281,601</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>689,835</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>29.7</td>
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<td></td>
<td></td>
<td></td>
<td>14.0</td>
</tr>
<tr>
<td>17.7</td>
<td>231</td>
<td>219</td>
<td>2,511,115</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2,176,979</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>14.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>13.1</td>
</tr>
<tr>
<td>11.0</td>
<td>85</td>
<td>86</td>
<td>1,449,332</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1,390,278</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>8.6</td>
<td>81</td>
<td>88</td>
<td>1,152,885</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>1,117,657</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>16.8</td>
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<td></td>
<td></td>
<td></td>
<td>18.8</td>
</tr>
<tr>
<td>5.5</td>
<td>93</td>
<td>97</td>
<td>1,331,908</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1,280,920</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>27.3</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>24.8</td>
</tr>
<tr>
<td>5.2</td>
<td>72</td>
<td>87</td>
<td>609,449</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>641,144</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>15.2</td>
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<td></td>
<td>13.1</td>
</tr>
<tr>
<td>13.0</td>
<td>52</td>
<td>61</td>
<td>1,380,453</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1,414,412</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>16.7</td>
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<td></td>
<td></td>
<td></td>
<td>11.5</td>
</tr>
<tr>
<td>100.0</td>
<td>77</td>
<td>96</td>
<td>12,009,896</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>11,053,008</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>15.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>11.7</td>
</tr>
</tbody>
</table>
$2 millions annual sales volume. In addition these stores must have manage-
ments sufficiently skilled to require a minimum of wholesaler services, no
wholesale salesmen, and no credit. The combined operating expenses of
wholesaler cum retailer in this case is less than 14 percent of retail sales
(the best chains seldom show less than a 16 percent cost ratio). Thus, as
we increase the scale and efficiency of retail stores, we almost automatically
increase the scale and efficiency of wholesaling operations.

Some question might arise as to whether such savings will be delivered to the
retailer or whether they will only enhance wholesaler's profits. Historically,
wholesalers and food processors, who distribute directly to retailers, bought
in relatively perfect markets and sold in markets in which they possessed
considerable monopsony power. 13/ However, when faced with a large
retailer (say a single store with $2,000,000 annual sales volume) the market
situation approximates that of bilateral monopoly with the wholesaler in a
comparatively weak bargaining position. The market, in such a case,
approximates competitive results (although chaotic price discrimination is
rampant). 14/ The writer knows of one case in which a medium size meat
packer, in return for full line forcing on the part of a large single store
retailer, was forced to allow a 30-day payment period on all meat invoices
(this is equivalent to an interest free loan of $80,000) and guarantee that the
invoice prices to the store in question were as low as those given to any
chain in the area. Thus as the average size of retail stores increase, whole-
sale economies will be possible and will be delivered to the retail store who
in turn can be forced to deliver the resulting savings to the consumer. The
key to setting this chain of developments in motion is obviously that of im-
proving management decision making in retail trade.

13/ The single important exception to this is probably A&P which seems to
have been able to manipulate price of produce in primary markets.
14/ See for example: Tibor Scitovsky, Welfare and Competition (Chicago:
DEMAND EXPANSION AND AGRICULTURAL ADJUSTMENT

Karl A. Fox

I. Introduction. When the Seminar Committee made up its program last February, it intended that this paper would summarize results from the preceding ones and if possible place them in a quantitative framework so that the relative importance of different methods of expanding demand might be made clear. I have not been able to do a neat job of either recapitulation or quantification in this draft, though my emphasis has been upon the latter.

A. Demand expansion in a policy framework. Various economists have estimated that farm output is currently exceeding commercial demand at "satisfactory" prices by about 6 to 8 percent. The object of attempts at demand expansion is to shift demand curves to the right, so that larger quantities of farm products will be consumed at a given price or that the same quantities will be consumed at a higher price. (see, for example, Table 1, page 126.)

The simplest measure of the effectiveness of a demand expansion program may be obtained as follows: multiply the appropriate "base period" quantity of consumption by the increase in price that would occur as a result of the demand expansion program if the quantity consumed were kept at the base period level. For example, if a demand expansion program results in consumers being willing to pay one dollar more per unit for a fixed supply of 100 million units, the effect of the program will be valued at 100 million dollars.

In an agricultural adjustment context, the effects we are interested in should be manifested at the farm price level. The farm price for a given quantity of a commodity could be increased either by raising the consumer demand curve or by reducing marketing charges. In the latter case the derived demand curve at the farm level rises relative to the fixed consumer demand curve.

The 100 million dollar effect of our example might in some cases prove to be a gross rather than a net gain. If farmers have paid 20 million dollars for an advertising program that has the indicated gross effect, the net benefit of the program to farmers is 80 million dollars. Furthermore, some programs may have negative side-effects on other farmers or even the same farmers. If

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the program just mentioned has raised the demand curve for beef, it may have lowered the demand curves for pork, lamb, and poultry by smaller but still significant amounts. Also, if we are thinking in terms of the national interest rather than that of a particular commodity group, a program may be found to have negative effects on domestic taxpayers and/or consumers and upon various groups in foreign countries. Assuming that the dollar effects of a program upon each of these domestic and foreign groups could be measured, different policy makers could arrive at their own estimates of the overall net benefits of the program by assigning appropriate weights (including zero weights in some cases) to each of the side-effects.

In this paper I shall assume that our primary interest is in achieving a net increase in demand for farm products in the aggregate. Consequently, I shall not say much about effects on consumers and taxpayers, but shall pay attention to possible effects of programs applied to one farm product upon the demand for substitute or competing farm products.

B. Classification of variables for policy purposes. Some important variables affecting the demand for United States farm products are not subject to control or even influence by policy measures specifically directed toward demand expansion. Such variables would include population growth in the United States, changes in the age and sex composition of the population, changes in the average level and distribution of national income, changes in population, income, and other variables in foreign countries, and the intercorrelations among these various average levels and distributions. These may be called non-controlled variables.

Variables which we wish to influence by means of demand expansion programs, primarily the farm prices of individual products, groups of products, or farm products in the aggregate, may be referred to as target variables.

Variables which we can control or manipulate in order to influence target variables in the desired directions and by the desired amounts may be referred to as instrument variables or instruments.

Our analyses will be difficult enough even if we assume that values of all non-controlled variables remain fixed at their 1959 levels. By making this assumption, we can concentrate on estimating the net effects of different instruments upon different target variables, without facing the complication of time trends in the non-controlled variables.

For a full-dress analysis of demand expansion policies, we would need to know the existing values of all relevant variables, whether non-controlled, instruments, or targets, and also the structural coefficients that tell us how much particular target variables will increase as a result of unit increases in given instrument variables. These coefficients include demand elasticities, measures of the
responsiveness of sales to increases in advertising expenditures, and so on.

The combination of time and knowledge available to me has not permitted a consistent application of this policy framework. Nevertheless, I think it is well to have such a framework in mind as a goal for further work in evaluating demand expansion (and other) programs.

C. Background information. Table 1 divides total utilization of farm products in 1956 among various utilization categories. Some 88 percent of total utilization took place domestically, 76 percent as food and 12 percent as non-food products. An additional 12 percent of total utilization took the form of exports to foreign countries and shipments to United States territories. Each possible demand expansion program could be "tried on for size" initially in terms of the percentage of total utilization to which it might apply. For example, new industrial uses of farm products would affect some part of the fibers and leather, industrial oils and soap, and other non-food use categories, totaling about 8 percent of all utilization.

Table 2 shows changes from 1950 to 1956 in various types of utilization. Most of the domestic non-food utilization categories declined between the two years. Domestic food use increased at least in line with population growth. Exports and shipments rose substantially from 1950 to 1956. Attempts at demand expansion might be regarded as successful if they either accelerated an expanding utilization category or slowed the decline of a contracting category relative to what would have happened in the absence of such attempts.

Figure 1 gives a rough impression of the relative magnitudes of different utilization categories and of the demand functions that limit their expansibility in the short run. The demand function that conditions the success of our export programs is that of all other countries combined for farm products produced both in the United States and in other nations. The elasticity of this foreign demand curve, measured at the United States farm price level, is probably small -- around -0.2, perhaps. United States' exports of the sorts of commodities other countries are likely to buy are equivalent to not more than 10 percent of the total consumption of such commodities in the rest of the world. Thus, the export portion of Figure 1 implies an elasticity of demand for United States exports of farm products of about -2.0. This figure does not allow for exchange problems -- that is, problems confronted by foreign countries in earning additional dollars to pay for more imports from the United States -- and may exaggerate the short-run responsiveness of our exports to subsidy and related programs.
Table 1. Final (net) Utilization of farm commodities, United States, 1956.

<table>
<thead>
<tr>
<th>Item</th>
<th>(1) Percent of total utilization 1956</th>
<th>(2) Approximate farm value 1956</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Percent</td>
<td>Bil. dol.</td>
</tr>
<tr>
<td>Total, all types of final (net) utilization 1/</td>
<td>100.0</td>
<td>29.0</td>
</tr>
<tr>
<td>Domestic use, total</td>
<td>87.9</td>
<td>25.4</td>
</tr>
<tr>
<td>Food</td>
<td>76.1</td>
<td>22.2</td>
</tr>
<tr>
<td>Nonfood</td>
<td>11.8</td>
<td>3.2</td>
</tr>
<tr>
<td>Feed for workstock</td>
<td>0.9</td>
<td>0.2</td>
</tr>
<tr>
<td>Fibers and leather</td>
<td>6.2</td>
<td>1.8</td>
</tr>
<tr>
<td>Tobacco</td>
<td>2.1</td>
<td>0.6</td>
</tr>
<tr>
<td>Alcoholic beverages</td>
<td>0.8</td>
<td>0.2</td>
</tr>
<tr>
<td>Industrial oils and soap</td>
<td>1.3</td>
<td>0.3</td>
</tr>
<tr>
<td>Other nonfood use</td>
<td>0.5</td>
<td>0.1</td>
</tr>
<tr>
<td>Exports and shipments</td>
<td>12.1</td>
<td>3.6</td>
</tr>
<tr>
<td>Commercial</td>
<td>11.2</td>
<td>3.3</td>
</tr>
<tr>
<td>USDA</td>
<td>0.9</td>
<td>0.3</td>
</tr>
</tbody>
</table>

1/ Net, excluding pasture. Also excludes feed fed to livestock (other than farm workstock) and seed, as these are "intermediate" uses, and their value is included in that of final utilization. Taken from AAC seminar paper by Harold F. Breimyer, March 9, 1959, page 9 (in preliminary draft).

2/ Based on Supplement for 1956 to: Measuring the Supply and Utilization of Farm Commodities (Agriculture Handbook No. 91), USDA-AMS, October 1957. Major subtotals are adjusted from the 1947-49 farm price level used in this publication to the 1956 farm price level, using the Index of Prices Received by Farmers for all commodities (1956 level is about 87 percent of the 1947-49 average).
Table 2. Changes in utilization of farm commodities, United States 1950-1956 (As percentages of total utilization in 1947-49 -- annual average.)

<table>
<thead>
<tr>
<th>Item</th>
<th>Utilization in 1950</th>
<th>Utilization in 1956</th>
<th>Change 1950 to 1956</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total utilization</strong></td>
<td>101.5</td>
<td>114.8</td>
<td>13.3</td>
</tr>
<tr>
<td><strong>Domestic use</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food</td>
<td>76.0</td>
<td>87.4</td>
<td>11.4</td>
</tr>
<tr>
<td>Nonfood</td>
<td>16.1</td>
<td>13.5</td>
<td>-2.6</td>
</tr>
<tr>
<td>Feed for workstock</td>
<td>2.2</td>
<td>1.0</td>
<td>-1.2</td>
</tr>
<tr>
<td>Fibers and leather</td>
<td>8.0</td>
<td>7.1</td>
<td>-0.9</td>
</tr>
<tr>
<td>Tobacco</td>
<td>2.3</td>
<td>2.4</td>
<td>0.1</td>
</tr>
<tr>
<td>Alcoholic beverages</td>
<td>1.1</td>
<td>0.9</td>
<td>-0.2</td>
</tr>
<tr>
<td>Industrial oils, soap</td>
<td>1.9</td>
<td>1.5</td>
<td>-0.4</td>
</tr>
<tr>
<td>Other nonfood use</td>
<td>0.6</td>
<td>0.6</td>
<td>0.0</td>
</tr>
<tr>
<td><strong>Exports and shipments</strong></td>
<td>9.4</td>
<td>13.9</td>
<td>4.5</td>
</tr>
<tr>
<td>Commercial</td>
<td>7.7</td>
<td>12.9</td>
<td>5.2</td>
</tr>
<tr>
<td>USDA</td>
<td>1.7</td>
<td>1.0</td>
<td>-0.7</td>
</tr>
</tbody>
</table>

Source: Breimyer AAC paper, page 9, as cited in Table 1, footnote 1/.
Figure 1. Demand curves affecting utilization of United States farm products by major utilization categories.*

A: Domestic Food Use

Price

Retail
Price → 100

Marketing
Charges

Df
Farm
Level
Demand

Dc
Consumer
Demand

Farm Price (1959) →

0

50

100

Quantity

B. Exports†

Price

Dw
World demand
(excl. U.S.)

U.S. farm
price (1959)

0

50

100

150

C. Industrial Use

Price

Di

U.S. farm
price (1959)

0

50

100

Q

* Slopes, relative quantities and marketing charges are believed to be roughly descriptive of the actual demand situation as of 1959.
† U.S. exports without P. L. 480 or price subsidies are indicated by the distance SQ; those with P. L. 480 and existing price subsidies are indicated by the distance SQ2.
II. Expanding the Domestic Demand for Food.

A. Background information. Table 3 deals exclusively with the 76 percent of total 1956 utilization which was consumed domestically as food. The percentages in Column 1 include fish, imported as well as domestic quantities of sugar, and perhaps some other imported items. However, the figures in the remaining columns deal only with domestically produced farm products used for food. The value of such food at retail store prices in 1956 was approximately 50 billion dollars; marketing charges amounted to about 30 billion dollars, leaving a net farm value of about 20 billion dollars. (see Table 3, footnote 2.)

The figures in Table 3 are displayed graphically in Figure 2. In this figure, an area of 0.5 square inch represents 1 billion dollars. A one percent rise in the demand curve for meat at the consumer level would increase farm income from meat animals (other things equal) by 128 million dollars; a one percent rise in the consumer demand curve for poultry and eggs would increase the farm value of a given quantity of poultry and eggs by 47 million dollars. More generally, the effect of a one percent reduction in marketing charges or a one percent increase in the level of a consumer demand curve will be proportional to the corresponding area shown in Figure 2.

Although marketing research has not prevented the farmers' share of the consumers' dollar from declining substantially during the last 10 years, increased marketing efficiency is a perfectly legitimate instrument for increasing the farm-level demand for farm products. As observed before, one dollar decrease in the marketing margin for a food product has the same net effect upon its farm price as does a one dollar increase in the level of the consumer demand curve.

Consumption of different food products responds differently to given percentage changes in their prices or in consumer income. The first column of Table 4 shows estimated price elasticities of demand at retail for a number of major food groups and for all food. (The elasticity of demand for eggs is, according to my analyses, more like - 0.3 than - 0.58; however, the other figures in Column 1 are reasonably close to my own estimates and are partly based upon them.) Column 5 gives income elasticities of demand for the same food groups -- specifically, the percent increase in the number of pounds of a given commodity group purchased per 21 meals consumed at home associated with a one percent increase in disposable personal income per family member. This column is based on a 1948 food consumption survey for urban families; however, it embodies substantially the same concept as that used by Wetmore and his colleagues in the recent publication noted in Table 4, footnote 1.

See Wetmore et al (cited below) page 66, footnote.
Table 3. Background information on domestic food consumption and on retail cost, farm value, and marketing charges for food products of United States farm origin, 1956.

<table>
<thead>
<tr>
<th></th>
<th>(1) Relative importance in index of per capita food consumption</th>
<th>(2) Relative importance in the &quot;food&quot; Market basket, July-Sept. 1956</th>
<th>Aggregate values, 1956 $/\text{bil. dol.}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meat products</td>
<td>25.0</td>
<td>24.9</td>
<td>12.8</td>
</tr>
<tr>
<td>Beef</td>
<td>10.2</td>
<td>--</td>
<td>8.9</td>
</tr>
<tr>
<td>Pork</td>
<td>10.4</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Other meats</td>
<td>4.4</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Dairy products</td>
<td>19.5</td>
<td>18.8</td>
<td>4.7</td>
</tr>
<tr>
<td>Butter</td>
<td>2.5</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>All other</td>
<td>17.0</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Poultry and eggs</td>
<td>11.5</td>
<td>10.0</td>
<td>10.8</td>
</tr>
<tr>
<td>Poultry</td>
<td>5.0</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Eggs</td>
<td>6.5</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Fruits and vegetables</td>
<td>21.0</td>
<td>22.5</td>
<td>6.7</td>
</tr>
<tr>
<td>Bakery and cereal prod.</td>
<td>7.6</td>
<td>15.2</td>
<td>4.4</td>
</tr>
<tr>
<td>Miscellaneous products</td>
<td>15.4</td>
<td>8.6</td>
<td></td>
</tr>
<tr>
<td>Fats and oils</td>
<td>4.2</td>
<td>4.4</td>
<td></td>
</tr>
<tr>
<td>Dry beans, peas, and nuts</td>
<td>2.2</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Sugars and sweets</td>
<td>6.5</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Fish</td>
<td>2.5</td>
<td>0.0</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>100.0</td>
<td>100.0</td>
<td>48.3 $/\text{bil. dol.}$</td>
</tr>
</tbody>
</table>

1/ Includes some quantities of foods that are imported or are shipped in from U.S. territories -- notably sugar -- as well as foods consumed on the farm where grown, and foods of nonfarm origin (fish).

2/ Includes all domestic farm foods that were both sold by farmers and bought by civilian consumers in this country. Excludes food consumed on the farm where grown -- valued at 1.7 billion dollars in 1956 measured at farm price level. Hence, farm value of U.S. farm foods consumed in 1956 was 20.4 billion dollars (18.7 plus 1.7) and the "retail" value was 50.0 billion dollars (48.3 plus 1.7), or slightly more if farm home use is valued at more than the farm price equivalent.

3/ Crude estimates of retail values of beef or other items listed in the stub of the table could be obtained by using the percentages in Column (1) as weights.

Sources: Column (1) from Wetmore et al, op.cit., page 54, left hand column; Column (2) from The Marketing and Transportation Situation (MTS-124), January 30, 1957, page 50; Columns (3), (4) and (5) from The Marketing and Transportation Situation (MTS-130), July 30, 1958, page 11.
Figure 2. Farm food products: Retail cost, farm value, and marketing bill, by major commodity groups, United States, 1956.

1/ Allocation of transportation bill (3.6 billion dollars in 1956) among commodity groups based upon table 11.3 in Fox, *Econometric Analysis for Public Policy*, page 216.
Wetmore et al have relied on logic (rather than statistics) in estimating the cross-elasticities of demand between various food groups. Many other economists have noted that calories consumed per person remain almost constant from one year to the next even though an index of per capita food consumption weighted by retail prices may show changes of as much as 3 to 4 percent. Per capita consumption of a particular important food, such as beef, has sometimes increased by as much as 25 percent between two adjacent years; while it seems perfectly clear on an intuitive basis that consumption of some other foods had to fall to keep calorie intake within bounds, statistical analyses have given significant measures for only a few of the substitution effects that must logically exist. (I have found statistically significant cross-elasticities only between such obvious competitors as beef, pork, lamb, chicken, and turkey.) Wetmore fills in, on a logical basis, approximate values for the whole array of cross-elasticities between food groups that must exist if we are to explain the almost constant level of per capita calorie intake. I believe that the price elasticity of demand for all food at retail may be nearer 0.30 than 0.20 used by Wetmore; other than that, and the own-price elasticity shown for eggs, I think Wetmore has done a reasonable and possibly definitive job.

The figures in Column 1 of Table 4 are the only ones that an individual producer group might think of as important. For example, a decrease of one percent in the retail price of meat would in itself increase the consumption of meat by 0.6 percent and the index of per capita food consumption by 0.2 percent. But it would also decrease the consumption of other foods (if their prices remained constant) by an amount equivalent to 0.1 percent of the index of per capita food consumption.

Table 5 shows other examples, real and hypothetical, of the relation between the positive or direct effect of a program beamed at a particular commodity and its negative or side-effects upon other commodities. In Set A, a one percent decrease in the price of beef would increase beef consumption by 0.83 percent, but it would reduce consumption of other meats (in this example) by 0.25 percent, so that the adverse effects upon other meats are about a third as large as the direct effect on consumption of beef. This extends inside of the meat group the same substitution phenomenon just noted. Set B in Table 5 applies them to competition among three grades of beef, and Set D to competition among three hypothetical brands of soap which we assume to be almost identical in chemical and physical composition.

In passing, we might note that popular conceptions of the effectiveness of advertising and promotion may well be based on the Set D situation, in which the elasticity of demand for "Brand " may be extremely large. At the same time, the elasticity of demand for "all soap" might be as small or smaller than the elasticity of demand for all beef, all meat, or even all livestock products as an aggregate.
Table 4. Coefficients for appraising the effects of price, income and other programs upon domestic consumption of individual food groups and the aggregate of all foods, United States, 1955.

<table>
<thead>
<tr>
<th>Food Group</th>
<th>&quot;Own-price&quot; Elasticity at retail (1)</th>
<th>Average cross elasticities with respect to other foods (2)</th>
<th>Effect of 1 percent increase in prices of all foods (3)</th>
<th>Expenditure (4)</th>
<th>Quantity purchased (5)</th>
<th>&quot;Product mix&quot; (6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meat</td>
<td>-0.60</td>
<td>0.31</td>
<td>-0.29</td>
<td>0.36</td>
<td>0.23</td>
<td>0.13</td>
</tr>
<tr>
<td>Dairy products</td>
<td>-0.50</td>
<td>0.32</td>
<td>-0.18</td>
<td>0.32</td>
<td>0.23</td>
<td>0.09</td>
</tr>
<tr>
<td>Eggs</td>
<td>-0.58</td>
<td>0.42</td>
<td>-0.16</td>
<td>0.22</td>
<td>0.20</td>
<td>0.02</td>
</tr>
<tr>
<td>Fruits</td>
<td>-1.00</td>
<td>0.56</td>
<td>-0.44</td>
<td>0.42</td>
<td>0.33</td>
<td>0.09</td>
</tr>
<tr>
<td>Vegetables</td>
<td>-0.70</td>
<td>0.52</td>
<td>-0.18</td>
<td>[0.42, 0.33]</td>
<td>0.09</td>
<td></td>
</tr>
<tr>
<td>&quot;Other&quot;</td>
<td>-0.10</td>
<td>0.10</td>
<td>0</td>
<td>0.08</td>
<td>-0.12</td>
<td>0.20</td>
</tr>
<tr>
<td>All foods</td>
<td>-0.20</td>
<td>--</td>
<td>-0.20</td>
<td>0.28</td>
<td>0.14</td>
<td>0.14</td>
</tr>
</tbody>
</table>

1/ From Table 18, page 71 of Wetmore, et al., Policies for Expanding the Demand for Farm Food Products in the United States. Part I. History and Potentials. April 1959.

2. From Fox, Econometric Analysis for Public Policy, Table 6.5, page 127. The concept used by Wetmore in appraising income programs, though not specified by him in this form, is essentially that of Column (5) but based on 1955 data rather than 1948.

3/ Includes effects of shifting from one major food product to another as incomes rise, as well as effects of purchasing higher qualities of rather narrowly defined commodities (for example, beef or butter) as incomes rise.
Table 5. Demand functions used to illustrate direct and indirect effects of programs aimed at one member of a group of competing commodities.

A. Beef, pork and other meats\(^1\)

<table>
<thead>
<tr>
<th>Equation</th>
<th>Relative importance (1)</th>
<th>Consumption (2)</th>
<th>Price of</th>
<th>Price of</th>
<th>Price of</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>beef (3)</td>
<td>pork (4)</td>
<td>other meats (5)</td>
</tr>
<tr>
<td>(1) 0.5</td>
<td>( q_b = -0.83p_b )</td>
<td></td>
<td>( +0.25p_p )</td>
<td>( +0.05p_o )</td>
<td></td>
</tr>
<tr>
<td>(2) 0.4</td>
<td>( q_p = 0.25p_b )</td>
<td></td>
<td>( -0.73p_p )</td>
<td>( +0.05p_o )</td>
<td></td>
</tr>
<tr>
<td>(3) 0.1</td>
<td>( q_o = 0.25p_b )</td>
<td>( +0.25p_p )</td>
<td>( -2.00p_o )</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Weighted averages: \( Q_m = -0.290 \) 

Resulting elasticity of demand for all meat= -0.587

B. Three grades of beef (hypothetical)\(^2\)

<table>
<thead>
<tr>
<th>Equation</th>
<th>Initial relative importance (1)</th>
<th>Price (2)</th>
<th>Grade 1 (3)</th>
<th>Grade 2 (4)</th>
<th>Grade 3 (5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) 0.3</td>
<td>( p_1 = -0.6q_1 )</td>
<td></td>
<td>-0.3q_2</td>
<td>-0.3q_3</td>
<td></td>
</tr>
<tr>
<td>(2) 0.3</td>
<td>( p_2 = -0.3q_1 )</td>
<td></td>
<td>-0.6q_2</td>
<td>-0.3q_3</td>
<td></td>
</tr>
<tr>
<td>(3) 0.4</td>
<td>( p_3 = -0.3q_1 )</td>
<td></td>
<td>-0.6q_2</td>
<td>-0.6q_3</td>
<td></td>
</tr>
</tbody>
</table>

Weighted averages: \( p_B = -0.39 \)

Resulting price-flexibility for all beef = -1.20 (equivalent to demand elasticity for all beef= -0.83, as in Set A.)

1/ Approximated on the basis of empirical demand analyses in Fox, op. cit., for 1922-41 period.
2/ Hypothetical figures assuming own-elasticities for each grade of about -1.7 and cross elasticities between grades of beef somewhat larger (relative to own-elasticities) than for competition between beef and pork in Set A.
Table 5 (continued)

C. Meat in relation to other food groups

<table>
<thead>
<tr>
<th>Effect of one percent change in the price of:</th>
<th>Meat</th>
<th>Dairy</th>
<th>Eggs</th>
<th>Fruits</th>
<th>Vegetables</th>
<th>&quot;Other&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>q_m = -0.60p_m + 0.10p_d + 0.04p_e + 0.08p_f + 0.06p_v + 0.03p_o</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Effect on meat consumption of one percent increase in prices of all foods = -0.29.

D. Three brands of soap (hypothetical)

<table>
<thead>
<tr>
<th>Equation</th>
<th>Weights</th>
<th>Quantity sold</th>
<th>Effects of 1-percent increase in price of:</th>
<th>Effects of 1-percent increase in advertising expense for:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Brand 1</td>
<td>Brand 2</td>
</tr>
<tr>
<td>(1)</td>
<td>.33</td>
<td>q_1 = -20p_1 + 9.8p_2 + 9.8p_3</td>
<td>k</td>
<td>-0.49k</td>
</tr>
<tr>
<td>(2)</td>
<td>.34</td>
<td>q_2 = 9.8p_1 -20p_2 + 9.8p_3</td>
<td>-0.49k</td>
<td>k</td>
</tr>
<tr>
<td>(3)</td>
<td>.33</td>
<td>q_3 = 9.8p_1 + 9.8p_2 -20p_3</td>
<td>-0.49k</td>
<td>-0.49k</td>
</tr>
</tbody>
</table>

Weighted averages: -0.133 -0.133 -0.133

Resulting price elasticity of demand for all soap = -0.4

Own-price elasticity of demand for each brand of soap = -20.0

Resulting elasticity of total quantity sold with respect to total advertising expense = 0.02k

3/ From Wetmore, et al. op. cit. Row (1) of Table 18, page 71.
B. Results of various measures for expanding domestic consumption of food.

The recent (April 1959) publication by Wetmore, Abel, Learn, and Cochrane, *Policies for Expanding the Demand for Farm Food Products in the United States, Part I. History and Potentials* presents careful estimates of the effects on food consumption of several demand expansion programs. Their alternatives embrace programs to increase food consumption by low income groups; general price subsidy programs; and calculations based on the achievement of various alternative diets, each of which meets all nutritional requirements but involves a consumption pattern appropriate to a different consumer income level. For a highly technical audience, a few of the coefficients estimated or assumed by Wetmore et al, might be called into question. But these questions are not at all serious, in my opinion, in terms of yielding realistic estimates of the probable effects on food consumption of the programs they analyze.

1. Programs to raise food consumption among low income groups. According to a 1954 survey, about 9 percent of all persons in the United States were in families or spending units with per capita incomes of $250 a year or less. An additional 9 percent of all persons were in spending units with per capita incomes ranging from $250 to $499. The relationship between food consumption and family income displayed in Dr. Shepherd's AAC Seminar paper (Figure 3) indicates clearly that expenditures for food by such families would increase if their incomes were raised to (say) $500 per capita -- presumably by means of government payments.

Wetmore estimates that, if all persons in the United States were to receive a minimum of $500 income per capita, the total quantity of food consumed in the United States (at constant prices) would increase by 2.4 percent. If per capita incomes were raised to a minimum of $750, the estimated increase in food consumption would be 6.1 percent and if to $1,000 the increase would be 7.3 percent. However, these higher income figures are not realistic in terms of other policy guidelines. For example, the federal minimum wage as of May, 1959 is $1.00 an hour. This amounts to approximately $2,000 per year for a full-time job, so that a family consisting of man, wife, and two children, with a single breadwinner working at the minimum wage, would be realizing a per capita income of $500. The federal income tax exemption of $600 per person, or $2400 for a family of four, suggests a slightly more liberal concept of minimum income. But for programs requiring expenditures of public funds, it

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4/ Technical Bulletin 231, University of Minnesota Agricultural Experiment Station, April, 1959.
5/ Wetmore, op. cit., page 54.
6/ Note that quantity here is an index of pounds of various foods weighted by their retail prices -- this index can rise without implying an increase in calory intake.
still seems to me that the $500 per capita level is about as far as the Congress might realistically go under current conditions. (Another guideline might be maximum rates of unemployment compensation, which, in most States, seem to be less than $1.00 an hour -- during the 1957-58 recession, average unemployment compensation payments per unemployed worker were about $130 a month, and most of the workers had been employed in high wage, durable goods manufacturing industries.)

If we stay with the $500 minimum income level, then, the potential of an income supplement program is about 2.4 percent in terms of quantity of food purchased. 7/

2. Programs based on (subsidized) reductions in retail prices. Figure 3 A provides a framework for comparing the income supplement program of the preceding paragraph with the effects (a) of a price subsidy to low income consumers and (b) of a food stamp or food allotment program for the same group. The solid-line demand curve shows the approximate relationship between retail price of food and per capita expenditures for food for persons with per capita incomes of $250. The income supplement program of the preceding paragraph would present these persons with $250 additional cash per person; they would then presumably increase their food expenditures to the level characteristic of other families who receive incomes of $500 per person. In our example, such a family would increase its food expenditures from $150 up to $200 per person, so that an income payment of $250 would increase food expenditures by about $50.

One might achieve the same increase in food expenditures (which should also represent an increase in food consumption, as the retail price of food is assumed constant at 100) by reducing the price of food to low-income families by 50 percent. In this case, the government might pay retail stores 50 percent of the value of all food purchased by authorized low-income families, so that the retail value of food purchased by these families would be $200 per person even though the net cost to the families would be only $100.

Finally, a food stamp or food allotment plan might require families with incomes of $240 per person to lay out at least $150 per capita for stamps as a condition for participating in the program. The government would then issue them additional stamps worth $50 per person. If there were no dilution of the program (for example, through bartering food for shoes, beer, and so forth), a "blend price" of 75 for families participating in the program would result -- they would get $200 worth of food for an outlay of $150.

7/ See Wetmore, table 5, page 55, and table 6, page 56. If we assume a quantity-price elasticity of -0.3, such a program would raise the retail price of a fixed quantity of food by about 8 percent (2.4 divided by 0.3).
Figure 3. Framework for analyzing the effects of income supplements, price subsidies, and "food allotment" plans upon food consumption by low income families, United States (approximate 1955 conditions).  

A. 

Expenditure for Food (measured at constant retail price, \( p_r = 100 \))

B. 

1/ See text for explanation of symbols.
by these particular low-income families. Not more than 18 percent of all families could possibly be involved in these special programs (under our assumptions) so the demand-increasing effect averaged over all consumers would be a small fraction of that than suggested by Figure 3 A.

Figure 3 B presents one of the more esoteric arguments for special price, income, or food allotment programs for low-income families. This particular argument depends upon the assumption that the total supply of food available for consumption in a given year is fixed, so that any increase in the domestic demand for food by any population group will immediately increase the retail price of food paid by all consumers. Assuming such a fixed supply of 100 units, the intersection of Dn and I1 gives the initial allocation of food between low-income consumers (I1) and other consumers (Dn) who will not be participating in a special program. If through some special program the demand curve for food on the part of low income groups is shifted over from I1 to I2, these low-income families will "compete away" part of the existing food supply from the more prosperous consumers, thus forcing them to move upward along their demand curve, Dn, paying a higher price for a smaller quantity of food. In this example, a program costing somewhere between 20 percent and 100 percent of the original total incomes of low-income families might increase expenditures for food in the aggregate by 8 to 10 percent of the initial food expenditures of all families in the United States. If we are trying to separate out the net effects of demand expansion programs, this is a reasonable argument -- it is not overthrown by the fact that farm output may in fact be increasing so rapidly that the net effect on demand may be much more than offset by downward pressure on prices from the supply side.

In brief, it appears that the maximum potential for increasing food consumption by special programs for low-income groups is on the order of 2.4 percent. Various practical problems would reduce this potential. For example, among the 19 percent of United States families in 1954 who received incomes of less than $500 per capita, about two-fifths lived on farms. Programs involving government money tend to be hedged around with provisions for ensuring that the funds are used as intended. There would be real difficulties in administering a food allotment plan affectively in the cases of farm families who could readily expand their production of food for home use, thereby releasing purchasing power (obtained from government checks) to buy other things. Also, two-thirds of the 18 percent were resident in the South, and within the South two-thirds of all farm families and one-fourth of all nonfarm families would have been eligible to participate. Important groups in the South might well oppose such a massive introduction of personalized subsidies from the Federal government. Allowing also for regional and farm-nonfarm complications, for the barter of food stamps for other commodities, and for other slippages, the practical potential of price, income, and food allotment programs for low-income groups probably does not exceed one percent of total food consumption. Moreover, this net increase would be a "one-shot"
affair -- i.e., The demand curve would be shifted to the right by one percent in (say) 1960, but the year-to-year changes in demand from 1960 on would not be affected.

3. Quality improvement and advertising.

a. Quality improvements. If quality improvement is to contribute to agricultural adjustment in a short-run context, it must raise the level of a demand curve (such as I in Figure 3 A) without increasing by an equal or greater amount the cost to farmers of producing the improved quality.

The equations constituting Set B of Table 5 may be used to suggest the effects of increasing the proportion of cattle of "Grade 1" and reducing the proportion of "Grade 3." Suppose that, with the initial distribution of slaughter cattle by grades indicated in Table 5 (0.3, 0.3, and 0.4 for Grades 1, 2, and 3, respectively) the market prices for these grades are respectively 5, 4, and 3 units. What happens if we reduce the proportion of Grade 3 from 0.4 to 0.3 and raise the proportion of Grade 1 from 0.3 to 0.4? The coefficients in Set B suggest that the result would be a decrease of 10 percent in the price of Grade 1, an increase of 10 percent in the price of Grade 3 and no change in the price of Grade 2. The weighted average price of all cattle sold for slaughter would rise from 3.6 to 4.0, or a little over 10 percent.

This would mean a very handsome increase in returns to beef producers if it were pure gain. If, however, the original price differentials were quite closely in line with differentials in production costs, this gross advantage could be largely or even fully offset by the increase in cost (as from longer and more expensive grain feeding of low-grade range stock). A careful reworking of this example, using actual market prices for cattle and actual costs associated with raising the average grade at time of sale, might considerably reduce the estimated gross gain -- my figures are hypothetical, though perhaps not completely unrealistic.

The narrow price differentials between grades for certain commodities, such as butter, suggest that the economic potential in terms of price and income gains to farmers resulting from further quality improvement may be small. I would guess also that improvements in quality of eggs and fluid milk over and above the minimum levels enjoined by public health authorities will not bring substantial price premiums from consumers. Column 6 of Table 4 suggests that there is practically no correlation between family income level

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8/ On a national average basis. I believe that, until two or three years ago, Iowa had lagged behind most other States in setting minimum standards for eggs. Iowa egg producers might therefore derive significant benefits from improvements in egg grading but producers in (say) Connecticut might well have reached the point of "diminishing returns to quality."
and the price per pound paid for eggs. The same may be true for fluid milk. (The other figures in Column 6, Table 4, are probably influenced more by differences in the proportions of distinct commodities -- for example, more beef and less pork -- consumed at different income levels within the large food aggregates listed in the stub. A finer breakdown of the fruits aggregate in Table 4 shows virtually no increase in price paid per pound for citrus fruits and tomatoes as family income rises; for a more heterogeneous sub-group the "product mix and/or quality elasticity with respect to income" was greater than 0.09).

Certainly life is pleasanter and more healthful as a result of the many things that have been done to improve the quality of foods. But I wonder whether the improvements yet to come will have such dramatic appeal to consumers as those that have already been achieved. As a layman, I get the impression that our sanitary standards in food processing are high and that practically all units of food actually displayed in retail stores are in sound condition.9/ I believe that careful research could arrive at reasonable estimates as to the probable effects of further quality improvement on consumer demand curves and net farm income. These effects may be very large relative to the amount of research and development work going on in this field. However, the effects upon aggregate demand for food may be quite small -- possibly on the order of 0.1 percent per year in terms of a retail-price weighted index of food consumption.10/

Promotion and advertising (advertising, for short) sound very promising indeed to some producer groups. As in the case of quality improvement, I have no solid quantitative basis for estimating the effects of food advertising. I can, however, offer some possible aids to our reasoning about them.11/

9/ The individual food processor and food retailer may not share my complacency -- he may experience this rather as a constant struggle to avoid off-flavors, spoilage, and inadequate culling of batches or individual items that are in unsound conditions. Any processor or retailer who became careless and allowed his product to fall much below the general standard would be risking bankruptcy. I am simply arguing that the great majority of food handlers are already maintaining such high standards of quality control that the returns to still higher standards may be small.

10/ In his AAC seminar paper, James Rhodes concluded that "events associated with quality improvements in beef and pork. K.F. may be expected to be slow-moving and of little consequence for solving the farm income problem of 1959 or 1961." Note, however, that the effects (if any) of quality improvement could be cumulative over the years, whereas the programs discussed for low-income families would have only "one-shot"impacts (as mentioned on page 12 above).

11/ Wetmore et al comment (page 44, footnote) that "The authors would very much have liked to have investigated the potential for increasing food consumption through advertising and sales promotion, but they were unable to develop a line of work that would yield any useful estimates."
In his AAC Seminar paper, Robert Walsh pointed out that advertising expenditures in 1957 amounted to more than 10 billion dollars. This was equivalent to about 2 1/2 percent of the gross national product and about three percent of disposable personal income. Approximately 2.1 billion dollars was spent upon advertising for "food and food beverages." This proportion, about 20 percent of all advertising expense, is almost equal to the proportion of disposable personal income that is spent for food. On the surface, at least, it would appear that food is getting a fair share of attention in the form of advertising.

Figure 4 suggests a basic problem of advertising directed at consumers. In any given year, the total disposable income of consumers is pretty much independent of the efforts of any one advertiser. Ordinarily consumers in the aggregate save 6 or 7 percent of their disposable incomes; the other 93 or 94 percent is expended for consumer goods and services, including food. Manufacturers and distributors of different commodities try, by means of advertising pressure, to expand the inner circle of "personal consumption expenditures" in a direction favoring purchases of their particular products; this involves a reduction in personal saving, in expenditures for other goods and services, or in both. Similarly, we might describe the objective of advertising on food as that of moving the inner circle of Figure 4 "Northwest" at the cost of smaller consumer expenditures for non-food items.

If advertising expenditures on behalf of food were raised from 2 billion to (say) 4 billion dollars while advertising expenditures for other goods remained constant, there might well be some increase in consumer expenditures for food. It is not clear, however, that the increase in expenditures would exceed or even equal the 2 billion dollars of additional cost.

From Figure 4, it would appear intuitively that "all food" is a rather difficult aggregate to manipulate by means of advertising. This does not preclude the possibility that advertising might have important effects upon the demand for individual foods that take up very small fractions of the consumer's budget.

The various sets of equations in Table 5, which indicate that a decrease in price of one commodity results in increased consumption of competing commodities, raise a question in my mind as to whether a similar effect exists in the case of advertising. Sets A, B, and C suggest that anywhere from one-fourth to one-half of the effect of a reduced price for commodity 1 upon its own consumption may be offset by opposite changes in consumption of the other commodities. If we succeeded (through advertising) in raising the
Figure 4. Diagram for considering the effectiveness of advertising in expanding the aggregate demand for food.¹

¹ A physical analogy to bring out the intent of the diagram would be that of a nonstretchable or very slightly stretchable cord around Consumption Expenditures, with all firms and commodity groups engaged in a "push-of-war" to force this cord outward in a manner favorable to their own sales.
demand curve for meat, a minimum offset would be a reduction in purchases of the lower cost foods sufficient to offset the increase in calories obtained from meat. It seems intuitively plausible that "cross-elasticities with respect to advertising effort" may bear about the same relationship to "own-elasticities with respect to advertising effort" as do corresponding cross-elasticities and own-elasticities with respect to price.

Some optimism with respect to the effectiveness of advertising may stem from stories of successful promotion of a particular brand in competition with other brands having identical physical and chemical properties once the packaging is removed. Set D suggests on a hypothetical level a situation in which sales of any one brand of soap are highly sensitive -- to changes in their relative prices and also to changes in their relative advertising expenditures. The coefficients are chosen in such a way that the price elasticity of demand for "all soap" as an aggregate is about -0.4, a little larger than the price elasticity of demand for all food. If through advertising pressure the demand function for Brand 1 were raised by one percent, it appears that sales of Brand 1 at the original price would increase by 20 percent, but that sales of Brand 2 and Brand 3 would each decrease by 9.8 percent. This "battle of the brands" is doubtless highly exciting to the participants and the advantage to Brand 1 of choosing a more expensive, but more popular, cast for its soap opera may be substantial. If there were only one soap manufacturer and one brand of soap, however, the effectiveness of advertising in expanding his total sales might be suggested more realistically by the price elasticity of demand for all soap (around -0.4 in my hypothetical example) rather than the elasticity of demand for Brand 1 (around -20).

I suspect that advertising programs with respect to a particular major product, such as beef, may encounter a sluggishness of consumer response analogous to the aggregate demand for soap rather than the demand for some particular brand. Further, by analogy with equation C in Table 5, it seems reasonable to expect that, if advertising were successful in raising the demand curve for beef by 10 percent, there would be offsetting decreases of about half this amount for competing farm products.

It seems quite reasonable to me that, inasmuch as food manufacturers and distributors have been advertising their products for many years, and paying in the aggregate around 2 billion dollars per year recently for such efforts, many food manufacturers and distributors may have arrived at a sort of equilibrium level of advertising expense. Walsh's figure suggests that food advertising expense is equivalent to about 3 percent of the retail price of food (see Table 6). If this is an average, the marginal advertising cost of expanding sales by the last unit is probably higher than 3 percent. If I relate this figure to, for example, Holdren's estimate of 14 to 17 percent as the grossmargin taken by supermarkets, I find it hard to believe that an increase of one percent in total advertising expense for food will be likely to increase
gross farm income by more than 1 or 2 or 3 times the cost of the additional advertising.

This is not to say that advertising of food products is worthless or could be abandoned with impunity. Such "unilateral disarmament" might well see expenditures for automobiles and other things expanding at the expense of an absolute reduction in expenditures for food.

4. Programs with nutritional objectives. Wetmore presents data on the incidence of deficiencies of particular nutrients among particular income and residence groups of the population as of 1955 but does not estimate the costs of eliminating such deficiencies. It is hard to conceive of an effective national program for remedying the specific dietary deficiencies of individual consumers, particularly consumers who have plenty of money to buy the foods in question but may not happen to like them. Perhaps the nearest approach to such a program would be free distribution of vitamin and mineral tablets to the entire population, assuming that no dangers were likely to result from overconsumption of such nutrients. 12/ Wetmore does, however, estimate the effects on food consumption of achieving various dietary levels each of which satisfies minimum nutritional requirements. If all consumers followed a "liberal cost" diet plan, the net increase in aggregate food consumption would be about 2.3 percent. A "moderate cost" diet would result in a net decrease of 5.5 percent, and a "low cost" diet in a net decrease of about 22 percent!

These estimates suggest that, where food is concerned, in the United States we are indeed members of an "affluent society." There are few compelling moral values or even slogans supporting our attempts to induce people to consume more food. We cannot reasonably advocate overeating to the point of obesity. We cannot press for much increase in food consumption by the higher income groups without appearing to advocate gluttony and conspicuous waste. The "one-third of a nation" that was ill-fed in the mid-1930's has shrunk to 5 or 10 percent of a nation if we use the same real income standard to define poverty as was used in Roosevelt's famous statement. This undermines both the economic potential and the political attractiveness of special programs for low-income groups.

12/ This assumption may not be justified. Recently there were newspaper reports of research tending to show that calcium intake substantially above National Research Council requirements could have undesirable consequences.
Table 6. Advertising expenditures for food relative to retail food prices, profits and other food costs, approximate 1956-1957 percentages.

<table>
<thead>
<tr>
<th>Item</th>
<th>Percent of retail food price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retail price of food</td>
<td>100</td>
</tr>
<tr>
<td>Profits (before taxes)</td>
<td>4¹/</td>
</tr>
<tr>
<td>Advertising expense</td>
<td>3²/</td>
</tr>
<tr>
<td>All other costs</td>
<td>93</td>
</tr>
<tr>
<td>Net farm value</td>
<td>40</td>
</tr>
<tr>
<td>Transportation (inter-city)</td>
<td>7</td>
</tr>
<tr>
<td>Processing and trade</td>
<td>46</td>
</tr>
</tbody>
</table>

¹/ Based on corporate profit figure for 1956 in Table 6 of Shepherd's AAC Demand Seminar paper.
²/ Based on figures cited on pages 2 and 3 of Walsh's AAC Demand Seminar paper.
It has been pointed out by Wetmore and others that increases in consumer income tend to reduce deficiencies in the consumption of particular food nutrients. Hence, special price and income plans for low-income families, or general food subsidy programs for all consumers, would contribute significantly to reducing the incidence of nutritional deficiencies. The soundness of these latter measures as targets for public policy depends to some extent upon the size of the "safety factors" built into the minimum requirement figures of the National Research Council. It seems reasonable to believe that these figures were not absolute minima and that the welfare loss resulting from a 10 percent "shortage" of Vitamin A relative to the NRC standard might be rather small.

In discussing programs for low-income families, we said practically nothing concerning costs of price and income programs to non-participants in their roles of consumers and taxpayers. However vaguely and inadequately, effects upon these groups are weighed by the Congress along with benefits and costs to farmers themselves.

III. Expanding Domestic Non-Food Uses of Domestically Produced Farm Products. I can add little to Morton Smutz's paper on agriculture and the chemical industry. The main categories (in Table 1) in which the chemical industry might increase domestic use of farm products appear to be fibers and leather, industrial oils and soap, and "other non-food use." Table 2 indicates that domestic consumption of the first two categories decreased somewhat from 1950 to 1956 while the third remained about constant. Dr. Smutz points out that some of the more familiar chemurgic programs (such as conversion of grain into alcohol for use as a motor fuel) really involve taking rather complex molecules, produced at considerable expense, and breaking them down into simpler and inherently less valuable components. Some of these simpler components can be synthesized from petroleum, natural gas, or "coal, air, and water" at much lower cost than they can be grown on the farm. Corn would have to priced at less than 50 cents a bushel to qualify as a "commercial" raw material for industrial alcohol. I form the impression that during the next generation or two, we may make more progress in finding industrial uses (most of them of small volume relative to the total farm surplus) for the more complex and expensive molecules derivable from farm products than for the "lowest common denominators" -- alcohol and starch -- that have received most attention in the past.

The equivalent farm value of fibers and leather, industrial oils and soap, and "other non-food use" as of 1956 was on the order of 2 billion dollars, compared with a total farm value of all products utilized (other than feed and seed) of about 29 billion dollars. Over the next few years, positive effects of the chemical industries in finding new uses for farm products will, in my opinion, probably not offset the effects of new and fiercer competitors based on materials of nonfarm origin.
Iver Johnson in his AAC seminar paper presented some encouraging statements, as well as some discouraging ones, with respect to the possibility of expanding domestic industrial uses of new or improved crops. However, it appears that one of the chief criteria used in classifying crops for possible introduction is the fact that they or their derivatives are imported. Some of these imports may be strategic to us from a military standpoint in the event of war; if so, we may be justified in growing some quantities of these crops in the United States (subsidized if necessary) or at least in assuring ourselves of supplies of adapted seed so that, in an emergency, we can be growing our minimum requirements of these strategic crops within a year or so.

Apart from military considerations, which I believe would involve crops using a very small total acreage, there are some dangers in concentrating our research efforts upon crops that are currently imported. These imports are important sources of dollar exchange for friendly foreign countries who in turn import other farm products as well as non-farm goods from us.

Sherwood Berg in his AAC seminar paper stated that the United States imports less than 37 million dollars worth of farm commodities that are regarded as strictly competitive to our agriculture. "These products account for only about one percent of our total imports of foreign agricultural goods." While this figure leaves out one or two items such as sugar, domestic production of which could be expanded at less than fantastic prices, Berg's statement suggests that we should not pin high hopes on relieving domestic surpluses by excluding imports and "growing our own." On page 93 of his paper, Iver Johnson listed acreage potentials for new crops aggregating 2 1/2 million acres, equivalent to about 0.7 percent of our current total crop acreage.

Dr. Johnson also pointed out that a number of years are required for adapting new crops to growing conditions in appropriate regions of the United States. It seems to me that most research and experimentation in this area has a relatively long-term payoff, the value of which is largely independent of the short-run problems of agricultural adjustment.

IV. Expanding Exports. Drs. Witt and Berg had important messages for us but it is difficult to quantify their effects. Both emphasized that the United States could and should make important contributions to the economic development of friendly foreign nations. Dr. Witt in particular appealed to us to make some value judgments concerning our role in economic development and stop thinking of our food export programs as temporary devices for our own immediate convenience. I believe it was the Seminar Committee's intent that Dr. Witt would deal primarily with short-run effects of food export programs and Dr. Berg with the long-run effects of economic development in foreign countries upon our own agricultural situation.
1. Short-term effects of export programs. We have little difficulty in recognizing the existence of competition between states and regions within the United States. If Iowa increases its production of hogs by 20 percent, we know that almost all of the increase will be "exported" either live or processed to other states and that our "exports" will depress the prices of hogs and pork in all parts of the nation. While we may suspect on an intuitive basis that the same thing happens in international markets, few of us (including myself) are familiar enough with data on world production, consumption, and trade in agricultural commodities to have a real "feel" for the effects of our special export programs. (However, they have brought serious complaints from Canada and from other nations that export farm products).

Even a very rough order of magnitude may be of value. As I recall the figures on world production of wheat, rice, and cotton, and the approximate calorie intake levels of peoples around the world, it seems to me that the quantities of wheat, feed grains, cotton, rice, tobacco and other products exported from the United States currently amount to less than 10 percent of the total consumption requirements for these and similar commodities in the rest of the world. Ten percent, of course, is by no means a negligible quantity. As suggested in the lower left hand section of Figure 1, an increase of exports from the United States, if production in other countries remains constant, necessarily results in a decline in world prices of the exported commodities in the absence of government intervention of various kinds. For example, unless there are food price ceilings and food rationing programs in a foreign country, it seems to me that any increase in the volume of (say) wheat made available for sale inside the country must lead to price reductions for flour and bread at retail and for wheat grown inside the country in question. (Some of these countries, of course, do have domestic price support programs, food subsidy programs, and other forms of intervention to cushion any undesired shocks that might result from our export programs). Also, it is difficult to increase United States exports without having some effects on the prices obtained and the quantities sold by other exporting nations.\(^{13}\) The demand curve in Figure 1, lower left-hand section, assumes a world demand elasticity of about -0.2,

\(^{13}\) An exception might arise in the case of a country that was extremely short of foreign exchange and could buy little or no more wheat even to relieve famine. Here the effects of a gift or foreign currency sale of wheat upon other exporters might be small -- and the recipient government would take responsibility for any adverse effects within its borders -- for example, lower prices to its own wheat producers.
measured at the United States farm price level, for the sorts of products we export. If we supply only 10 percent or less of the total consumption requirements of the rest of the world, the apparent elasticity of the demand for our own exports may be greater than -1 (in absolute value) but probably no higher than -2.

Table 2 of Dr. Witt's paper indicated that the cost to the Commodity Credit Corporation of commodities shipped under P.L. 480 agreements signed through June 30, 1958 was 4,004.4 million dollars, whereas the amount paid (in local currency) by the importing countries was 2,842.3 million dollars -- about 70 percent of the CCC cost. This 30 percent "subsidy" is of about the order of magnitude that might reasonably be required to obtain such an increase in United States exports of farm products as has actually been achieved under P.L. 480.

This increase in the volume of exports since 1950 has enabled us to siphon off a sizeable fraction of the surplus that would otherwise have piled up still higher in CCC bins. However, I believe we are already pushing our food exports hard and will have difficulty increasing them very materially under current types of programs. If we are to increase them materially without alienating friendly foreign countries, I believe we must, as Drs. Witt and Berg imply, tie them in with the economic development programs of particular foreign countries and also recognize some of the legitimate complaints of other commercial exporters of farm products. However, if we are to contribute most effectively to the economic development of friendly countries, for humanitarian, military, and other reasons, we are confronted with a sudden reversal of the ends and means of our present export program. Most of us have been preoccupied with the surplus disposal aspects of P.L. 480. One might argue that we have, in effect, looked at impoverished foreigners not in terms of their needs as human beings but in terms of their probable capacity to consume surplus food. If we value people for their own sakes, for their moral support around the international bargaining table, and for their moral support in case of dire need, not only must we view our surpluses (at least some part of them) as things of value but we must be willing to insure the continued production over a number of years of agricultural products needed to support economic development programs in friendly countries.

I would not pretend to estimate the long-term effects of our technical assistance programs upon our exports of farm products. Dr. Berg did not give us any help here of a quantitative nature. It seems to me that the possible gains to us in terms of world leadership and national security are so great as to overshadow any possible long-term consequences, good or bad, that they may hold for agricultural adjustment in the United States.
V. Recapitulation. It may be helpful to members of the seminar to have a quantitative statement of some of the possible demand expansion effects suggested above, even though some of them are based on judgment rather than real research.

1. Programs for low-income families might have a "one-shot" effect on demand equivalent to as much as one percent of farm output. They would offset perhaps 1/6 or 1/8 of the current imbalance between supply and demand at "satisfactory" prices. The cost of achieving a one percent increase in demand through "low-income programs" would range from $0.5 billion to $2.0 billion a year.

2. A general food price subsidy to all consumers of $5 billion a year could increase food consumption by about 2 percent -- depending on how the $5 billion was obtained. Unless it was obtained through perpetual deficit financing, part of the $5 billion expense would be paid by consumers, so that the net increase in food consumption would probably be less than 2 percent. And the increase would be a "one-shot" affair.

If a general price subsidy were used, the potential additional effects of programs for low-income families would be reduced.

3. It seems to me that the potential increase in aggregate demand resulting from quality improvement efforts can hardly exceed 0.1 percent a year -- though in principle gains from this source are cumulative.

4. If advertising is on a self-help basis by producer groups, it is hard for me to anticipate an additional advertising budget of more than about $0.1 billion (equivalent to less than 0.5 percent of the net farm value of food products) or a net benefit to farmers of more than $0.1 billion. The full potential of such producer-financed advertising programs by the end of a 10-year period might approach a one percent increase in utilization at the farm level, accumulating at the rate of not more than 0.1 to 0.2 percent a year.

It is difficult to visualize a program under which food retailers and processors would make a coordinated effort to expand food consumption as such rather than to achieve individual competitive advantage. In fact, farmers and consumers may be better served if retailers and processors simply continue to concentrate on competitive advantage, which in some contexts is an effective spur to marketing efficiency.

5. As to special export programs, our P.L.480 programs are already a source of considerable friction with other countries, and it is questionable whether such exports can be expanded or even fully maintained.
To give a rough notion as to the orders of magnitude that could be involved in exports to aid economic development in friendly foreign countries, the following arithmetic may be useful:

a. Our exports of wheat from the United States in the 1957-58 crop year amount to 400 million bushels. This would provide enough calories to maintain about 60 million people at the consumption levels prevailing in Southeast Asia.

b. The population of India is expected to grow at the rate of about 10 million a year during the next few years -- or by 60 million people between 1960 and 1966.

c. Our 1957-58 wheat exports of 400 million bushels were equivalent to about 3 percent of the value of our total farm output of all products -- or equivalent to 3/8 to 1/2 or our surplus production. While most of the increased food requirement in India should come from her own production, the increase in total need between 1960 and 1966 would be equivalent to another 400 million bushels of wheat (annual consumption rate).

The increase in needs during a six-year period in all friendly or neutral underdeveloped countries could hardly be more than double the figure for India alone. Thus, if underdeveloped countries having a combined population of about a billion people were to get all of their increased calories from the United States during the next six to eight years, the increased exports would probably not wipe out our surplus problem, though they might bring total demand very nearly in line with total supply.

d. The main points of this exercise are as follows:

(1) Exports (over and above, say, the 1950 level) were our biggest potential outlet for farm surpluses, but we may already have achieved two-thirds or more of the potential actually existing as of 1959. The remaining potential that might be developed over the next 5 or 10 years is perhaps comparable in size with the remaining rate of surplus production in this country.

(2) The marginal calorie requirements of the peoples of underdeveloped countries would not provide a "bottomless pit" for the absorption of United States surpluses even if there were no economic, political, transportation, or storage problems involved.
6. It is hard for me to visualize domestic industrial uses of farm products expanding by more than $100 million a year (0.3 or 0.4 percent of net farm output) over the next five years as a result of special subsidies or newly-discovered uses. The net effect of chemical discoveries over the next few years may well be to reduce industrial utilization of farm products somewhat.

7. I doubt that strong military reasons could be found for increasing domestic farm output in the form of new crops by more than 0.2 or 0.3 percent within a 5 or 10 year period. A net expansion of domestic farm output as a result of restriction of imports on "economic" grounds could hardly exceed 0.2 to 0.3 percent during such a period.

8. Of the domestic programs discussed, a general food price subsidy would have a bigger initial "bite" than any other, but it would involve a tax cost of $2.5 billion or more for each one percent increase in total utilization of our farm output.

A program of exports geared to economic development would have a comparable or conceivably even larger "bite", and might cost only $0.5 billion or so for each additional one percent of total farm output exported. It would have, therefore, a much lower tax cost than would a domestic price subsidy and a greater humanitarian (and national security) value.

9. In the first seminar paper of this series, Harold Breimyer enjoined us not to leap-frog over the problems of the 1960's for the deferred pleasure of long-range economic projections. There is no guarantee that population growth and rising standards of living will overtake farm production by 1970, 1980 or any other set time. In the short-run -- say the next 5 years -- the most promising prospect for purposeful demand expansion appears to lie in using some of our output to aid in the development of economically backward nations.