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Policy Choices for a Changing Agriculture

CONSUMER DEMAND FOR AGRICULTURAL PRODUCTS:  
A MOVING TARGET?

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INTRODUCTION

The way Americans live, work and consume food has changed dramatically over the past 30 years. Thirty percent of meals are eaten alone. Sixteen percent of dinners and 41 percent of lunches are eaten away from home. New lifestyles and new information about linkages between diet, health and longevity have changed consumers' preferences for various types of food. Changing preferences, rising incomes and changing relative prices have resulted in consumers demanding more variety and convenience, fewer calories, less animal fat, more lean proteins, and more fruits and vegetables.

This paper discusses changes in domestic food consumption patterns and explores possible implications for agricultural producers, processors and consumers/taxpayers. Policy issues and options are presented for the reader's consideration; policy choices will be made by politicians and their constituents. Key policy issues addressed include: (1) The role of government in encouraging diets of high nutritional quality as well as maintaining an abundant, safe and healthy food supply; (2) the role of government in balancing supply and demand including: (a) the impacts of agricultural price and income policies on consumers' food and tax costs; and (b) the impacts of subsidizing production of foodstuffs already in excess supply.

## CHANGES IN DOMESTIC FOOD AND FIBER CONSUMPTION

Changes in income and relative prices, as well as demographic, social, and educational trends influence consumption patterns of food and fiber. Changes in consumption patterns influence the total demand in diverse ways.

Figure 1 illustrates the change in per capita consumption of major food and fiber groups between 1960 and 1984. These long-term trends reveal little change in cereals and grains, or fresh fruits, but significant declines in animal fats especially in the form of eggs and dairy products. The consumption of the natural fibers, cotton and wool, declined dramatically. Large increases are shown for vegetable fats, processed vegetables and poultry. Within each category there are some very diverse trends. For example, beef increased 22.3 percent over the 24 year period, but has declined 16.7 percent from its peak consumption in 1976. Refined cane and beet sugars declined 31 percent while corn syrups increased 658 percent. Counteracting a general decline in dairy is a 161 percent increase in the per capita consumption of cheese and a 1700 percent increase in yogurt. A widespread perception that the consumption of fresh fruits and vegetables is increasing is based on a 23 percent increase in fresh fruit and a 66 percent increase in fresh vegetables since 1972 when their per capita consumption was at an all-time low.

Figure 2, prepared by USDA, may not seem to imply dramatic changes in food patterns between 1960 and 1980. However, a 1.9 percent decrease in the share of total food consumption attributable to eggs means a decrease of about 63 eggs per person per year. Given the growth in the population between 1960 and 1980, this translates into 1.2 billion dozen fewer eggs demanded in 1980 than would have been the case had the pattern of food consumption not changed.

For poultry a 2.4 percent increase in the share of total food consumed translated into an increase of 7.7 billion pounds more chicken and turkey being consumed in 1980 than 1960. Hence, small percentage changes in the mix of foods being consumed generally imply large changes in the quantities of foods sold.

#### DEMOGRAPHIC FORCES CHANGING THE CONSUMPTION MIX

Demographic trends believed to be important for changing the demand for various types of food include income and population growth, age structure, household size, mobility, ethnicity, labor force participation, access to information and enhanced health expectations.

#### Income

A well known law of food economics says that as households' incomes increase a smaller and smaller proportion of the increase is spent for food. Furthermore, rising incomes tend to decrease the responsiveness of the quantity demanded to changes in price. Middle and upper income people purchase about the same quantity (though not the same quality) of food regardless of small price changes. They also spend a significantly smaller proportion of their incomes for food. For example, upper income households in the United States spend about 11 percent of their incomes on food, while lower income households spend 40 percent or more.

Real per capita disposable income rose about 2.5 percent per year over the past 30 years in the United States. A 2.5 percent increase in aggregate income leads to about a 0.70 percent increase in food expenditures. During the 1980s income growth slowed. One factor was the relative growth in low paying service sector jobs versus higher paying manufacturing and professional

jobs. As aggregate real incomes rise more slowly, factors other than income will be increasingly important for explaining and predicting changes in food demand.

In those households where incomes do rise, however, consumers will demand a greater variety of foods and more convenience in their delivery and preparation. Forty-two percent of the food dollars spent by U.S. households is for food prepared and eaten away from home (FAFH). Since 1954 real expenditures on FAFH increased twice as fast as expenditures for food prepared at home (2.7 vs. 1.3 percent per year). While the rate of increase in FAFH expenditures is expected to slow in the next decade, FAFH consumption will continue to be popular. The types of food eaten in restaurants and the specific food characteristics required by various types of food service establishments will affect the magnitude and nature of farm level procurement.

Although various studies disagree about the impact of rising incomes on the demand for specific foods, there is general agreement that rising incomes increase the demand for meat substitutes, cheese, nuts, fresh and frozen fruits and vegetables and their juices. In contrast, the demand for fluid milk, cream, cereals, sugar, variety meats, eggs, and potatoes is not expected to increase with rising incomes (Smallwood and Blaylock, 1981).

#### Increasing Population

Increases in the overall demand for food in an affluent country depends largely on increasing the numbers of people. The United States' population growth has averaged about 1.3 percent per year for the last 30 years and is expected to grow at half that rate over the next 30 years. Consequently the rate of growth in domestic demand for food and feedgrains is expected to slow. Since increases in the efficiency with which animals will utilize feed offsets

increases in the consumption of animal products, the increased domestic need for feed grains is expected to be about the same as the rate of growth in the population -- less than 1 percent per year (Burbee, et al.; in Kinsey, pp. 60-72).

### Aging Population

The number and percent of elderly persons in the United States continues to increase. By 2030, over 20 percent of the population is expected to be over age 65 with an increasing number over age 80. The median age was 30.6 years in 1982, an all-time high, and is expected to be 40.8 by 2030. In addition, the elderly segment of the population is increasingly healthy, affluent, and predominantly female.

An aging domestic population has several implications for food consumption patterns. Elderly persons typically: (1) have higher relative expenditures for poultry, fruits, vegetables, bakery products, and cereals; (2) have smaller relative expenditures for milk, soft drinks, and red meat; (3) spend a smaller portion of their food dollars eating out, and (4) spend less per person for food since daily caloric needs decline with age. (For example, the recommended daily allowance of calories for women drops from 2100 at age 19 to 1650 at age 65.)

### Mobility and Ethnicity

Increased immigration, regional migration, foreign travel, and a growing proportion of nonwhites in the U.S. population increases the variety of foods consumed. The nonwhite population is growing twice as fast as the white population. Nonwhites spend less per person on food in general, but more on pork, fish, eggs, and poultry. By the year 2000, three out of five Americans

could be living in the South and West. If current regional food and eating habits continue, food expenditures away from home will increase even further, and expenditures on fruits, vegetables and fish should increase. The growing popularity of Mexican, Oriental, and Italian and other ethnic foods reflects an increasing preference for variety that is expected to continue.

#### Decreasing Household Size

The average household size has decreased from 3.8 persons in 1940 to 2.7 persons in 1985 and is projected to decline to 2.4 persons by the year 2000. Nearly a quarter of U.S. households have only one member while 55 percent have two or fewer members. Factors influencing this trend are lower birth rates, increased divorce rates, marrying later or not at all, and increased longevity.

Studies show that smaller households: (1) spend 44 percent more per person on food; (2) spend a larger portion of their food budget for convenience including food away from home (singles spend up to 50 percent of their food dollars eating out); (3) consume relatively large quantities of poultry, fruits, and vegetables (except potatoes), cheese, fish, soft drinks, and bakery products (except bread and cereal); and (4) consume relatively small amounts of fresh dairy products, pork, beef, eggs, sugars, sweets, and processed vegetables (Smallwood and Blaylock, 1981; Sexauer and Mann, 1979).

#### Women in the Labor Force

Almost 70 percent of women age 25-44 are in the labor force and 73 percent of them worked full-time in 1986 compared to 86 percent of working men. The amount of time spent in the labor force is declining for men and studies show that women still do the majority of housework. Relative to men,



women are losing leisure time, that is, time not working in the home or working for a wage. The main impacts of these trends on food consumption patterns result from the increased value of time and higher household incomes.

Households with working wives had average median weekly earnings 51 percent higher than households where only the husband worked; one-fifth of working wives earned more than their husbands in 1984. The increased income and decreased leisure time in dual earner households increases the demand for variety and convenience in foods. As a result, increased demand for relatively inexpensive and fast service restaurants and for carry-out foods has occurred in the FAFH sector. Some studies indicate that men (77 percent by one study) are beginning to do the grocery shopping and some cooking. These trends have affected food retailing practices but there is little evidence about how it impacts foods purchased. Single men are known to eat out more and buy more convenience foods and more meat than the average food shopper (Sexauer and Mann, 1979).

#### Health and Educational Forces

Publicity about scientific research has heightened awareness of the relationship between diet, health, and longevity. Food habits change slowly, but health related trends are apparent -- specifically a decline in the consumption of fresh whole milk, red meats, and eggs following increased information about cholesterol. Increased consumption of cheese and some seafoods defy these health concerns but the relative increases in poultry, whole grains, fruits, and vegetables support them, as does the growing per capita consumption of vegetable oils versus animal fats. These changes in the preferences of American consumers are partly attributable to education. The publication of "Dietary Guidelines for Americans" by the U.S. Department of

Agriculture and the U.S. Department of Health and Human Services has been a major force in this educational process. The seven guidelines suggest: (1) eating a variety of foods, (2) maintaining a desirable weight, (3) avoiding too much fat, especially saturated fat and cholesterol, (4) eating foods with adequate starch and fiber, (5) avoiding too much sugar, (6) avoiding too much sodium, and (7) limiting the intake of alcoholic beverages. There is some evidence that the eating patterns of Americans are evolving in the directions suggested by the Dietary Guidelines. The variety of foods eaten is increasing and concern about being overweight has influenced the types and quantities of food eaten. Twenty-eight percent of Americans are said to be overweight (Joint Nutrition Monitoring Committee). Among adults, 7 percent of men and 16 percent of women report being on a reducing diet at any moment in time. National Food Consumption Surveys show that the per capita calorie intake decreased from 2,036 Calories in 1965 to 1,826 Calories in 1978. Since the pounds of food consumed per capita has increased (see figure 2), intake of higher calori ed foods must be on the decline.

Consumption of cereals and flours (starches) appears to be holding steady (figure 1) while an increase in fruits and processed vegetables should help increase the amount of fiber in the diet. Studies done by the Food and Drug Administration show significant increases in the number of persons who purchase low sodium foods but dietary intake data on sodium or fiber has yet to be tracked over time. Although alcoholic beverage consumption increased 33 percent since 1964, most of the increase has been in beer which has a considerably lower alcoholic content per volume than wine or distilled spirits. Americans have increased their total per capita intake of fats by 6 percent and sweets by 35 percent but the composition of the fats and sweets

has changed in the directions suggested by the dietary guidelines. Between 1960 and 1984 the proportion of total fat attributable to vegetable fats and oils increased from 58 to 78 percent. The proportion of caloric sweeteners attributable to refined cane or beet sugars dropped from 86 to 46 percent.

#### IMPACTS OF CHANGES IN DOMESTIC FOOD DEMAND ON AGRICULTURE

Evolving consumer preferences for convenience, variety, fewer calories, less animal fat, lean protein and more fruits and vegetables are changing the mix of foods being purchased in the domestic market. Farmers can no longer assume that all food produced is desired by the consuming public or that consumers have the capacity to eat the quantities of food being supplied. These changes will impact farm prices, incomes and structure, especially for those producers who depend heavily on domestic demand.

#### Farm Prices and Income

Farm prices and income from basic agricultural commodities such as grains depend less on trends in domestic food consumption than on national farm policies and macroeconomic conditions, international trade and world food demand. However, trends in domestic food demand will put downward pressure on prices of traditional foods in excess supply including grains, red meat and dairy products.

Declining consumption of red meats in the form of steaks, chops and roasts suggests a decreasing demand for feed grains. Increased consumption of poultry and hamburger, a substitute for corn fed beef tends to push corn prices down and limits relative price increases of fed-beef and pork (Cornell and Sorenson). The continued consumption of poultry and the use of high

fructose corn sweeteners in soft drinks partially offsets this trend by using large quantities of corn.

USDA studies indicate that the domestic demand for feed grains will only grow at about the rate of population increases. Yet, government (CCC) and farmer owned reserve stocks of food and feed grains and manufactured dairy products are very substantial and growing. Farmers specializing in commodities with excess supplies can expect lower income growth than those specializing in foods for which domestic (or export) demand is growing. Disregarding government income support payments, farmers who specialize in crops such as fruits and vegetables, poultry and fish or those who tailor farm commodities for specialized processing and retail markets are likely to find good price and income opportunities.

#### Structure of Agriculture

The trend towards a bimodal distribution of very large and very small farms will be enhanced. A move towards branded fresh foods (fruits, vegetables, meats) will increase contract farming and make it harder to market surplus commodities on the generic commodity markets. Food processors, retailers, fast food chains and the institutional trade are continuing to vertically integrate up and down the marketing chain via contractual arrangements. These arrangements increase the opportunities for logistical control, risk management and market power.

Production for specialty markets will increase the need for sophisticated farm management and marketing skills. The production of specialty foods, without assured markets, entails considerable price and income risk as well as higher risks from disease and pests. Size economies in production, marketing and coordination of specialty products may induce differential impacts by

region and size of operation. Market access could become more problematical for many smaller or autonomous farm operations.

### Agribusiness

Agribusiness should continue to profit from market segmentation, product differentiation, and research and development of products, processes, packaging and regional markets. Advances in the technology of flavors, colors, emulsifiers, food substitutes and additives as well as production processes and packaging will enhance the abilities of agribusiness firms to adjust to consumption trends.

Agribusiness firms and food processors are likely to maintain sizable research budgets to document and/or alter product characteristics and to promote or attack research on health issues such as the cholesterol linkage to heart disease or the benefits of calcium for diminishing the effects of hypertension, osteoporosis and colon cancer.

Nutrition, health, safety and quality concerns will continue to demand that agribusiness firms and food retailers provide information about food product characteristics both in procurement (grades and standards, health and safety inspections) and marketing (nutritional and ingredient labeling and advertising).

## POLICY ISSUES AND CHANGING FOOD DEMAND

### Health and Safety, Nutrition and Quality

Continued emphasis on personal health and nutrition, food safety and quality raises several policy questions about how guidelines are set for these matters. (1) The U.S. Department of Agriculture and the Food and Drug Administration have turf battles concerning dietary needs, health and safety

guidelines and product specifications. Will these need to be resolved in the interests of protecting consumers? (2) Industry supported research in these areas has become an essential strategic weapon to defend product characteristics and image. Will these research results need to be verified by independent and neutral research entities? (3) Federal guidelines and recommendations as well as consumer behavior ultimately reflect research findings. How will the process by which health related research is funded, evaluated and disseminated impact its usefulness to consumers and producers? (4) Continual reevaluation of grades and standards, federal/state inspection procedures, and labeling requirements for a wide range of food and related products will continue to be demanded as a public service. How much are we willing to spend for information about our food? What is the most effective way for this information to be transmitted? (5) Voluntary regulations and standards are being advocated by both government and private firms. Can they be promulgated more quickly than government standards? Will they have credibility?

#### Balancing Supply and Demand: Consumer's Costs and Government Role

An overriding policy issue concerns the role of the U.S. government in subsidizing the production of agricultural commodities that are in excess supply and are expected to remain so in the foreseeable future. One might ask why have we, as a society, encouraged and approved agricultural policies that foster long-run excess supplies? It is generally believed that agricultural price support policies that have encouraged abundant production have favored consumers in the market place by putting downward pressure on food prices. Except during the 1940s and again in the 1970s real food prices fell

throughout this century. The portion of household incomes spent on food has fallen as well.

On the other hand, programs which have sought to limit the quantity of certain foods in the marketplace tend to raise both their farm and retail prices. The indirect costs of food and agricultural policies to consumers have been estimated at about \$7 billion per year (Heien; in Kinsey, 1986, pp. 9-14). Other estimates show that if the government were to stop all attempts to keep surplus food and fiber off the market, the farm price of commodities would fall 15 to 20 percent over a three to four year period and the price of food (particularly meat) would decrease about 3 percent (Johnson, et al., pp. 54-55).

Consumers also pay taxes to support food and agricultural programs. These costs rose dramatically in the early 1980s. Ninety percent of the agricultural program costs went for commodity price supports, averaging about \$18 billion per year. A roughly equal amount was spent on food and nutrition programs, primarily food stamps. In the early 1980s, these food and agricultural programs cost the average U.S. household \$350 to \$400 per year in taxes.

A major policy question arises over taxpayers' willingness to pay for price supports on commodities that are in excess supply. If these costs are minor compared to potentially higher food prices and/or alternative public costs of unemployment and retraining, they may readily be justified. There is a strong possibility, however, that such justification will be called for by taxpayers who are predominantly nonfarm in background and are increasingly removed from their agrarian heritage.

Another policy issue that directly impacts consumers' food costs is the increasing concentration in the food processing and sales sector. Trends toward vertical integration in the food production/marketing chain may increase market power. To the extent size economies are fully employed, society gains from efficient business practices, but who will monitor the tradeoffs between efficiency and monopoly power?

In the face of abundance, policy options involve cutting back supply or expanding demand. Policies to expand domestic food demand for domestic agricultural commodities will be limited since most Americans are eating as much as they want and in some cases more than they should.

Domestic food aid programs targeted at nutrition and income deficit population sub-groups help reduce surplus commodities and enhance health and nutritional well-being. There is some concern that direct commodity distribution significantly displaces commercial sales and, therefore, does not increase total demand. Available evidence indicates some displacement has, in fact, occurred especially in the sale of cheese and margarine (Zellner and Traub, 1986). When measured against the gains in health and nutritional status among the target populations, however, displacement of sales may or may not be considered a policy problem.

Government policies could foster more research leading to the development of technologies that increase the desirable characteristics of food. For example, decreasing the cholesterol content of eggs and beef or increasing the nutrient density of snack foods may help to bring healthier food to consumers as well as improve the balance of supply and demand.

The expansion of export markets is a prime target for increasing demand, but this depends largely on macroeconomic conditions, world food demand and



trade flows. International food aid has desirable humanitarian aims but likely displaces some commercial sales although many recipient countries would not be able to purchase the quantities of food aid they receive without concessionary sales. Food aid can also displace agricultural production and, hence, economic growth of the recipient countries. Although international food aid is noble in many circumstances, trade competitors will likely view concessionary international sales as dumping.

Commodity groups are likely to seek import restrictions to increase domestic demand by curbing consumption of imported foods. Given the current highly politicized context of international trade, retaliatory trade policies damaging to the U.S. are quite possible. While the implications of retaliatory trade policies are complex and varied, in the presence of new trade barriers: (1) prices of food and other imported consumer goods will increase. (2) both imports and exports will decrease, diminishing farmers' potential export markets, enhancing excess supplies and depressing farm prices, and (3) a smaller variety of foods will be available which is contrary to trends in consumers' revealed preferences.

Some suggest that research and development of non-food uses of agricultural commodities hold hope for expanding demand. Perhaps the most well developed of these efforts has been the production and sale of ethanol, a gasoline additive derived mostly from corn. By 1985, 240 million bushels of corn were being converted into 625 million gallons of ethanol, but USDA studies show that this is not an economically viable use of corn without huge government subsidies. These subsidies would offset any savings in commodity program payments resulting from increased demand for corn and increasing ethanol production would lead increased food costs (USDA, 1986).

It is possible that economically viable nonfood uses of agricultural products will be found but before public monies are invested in such ventures it should be noted that: (1) The economic value of the commodity in its highest and best use -- food -- has already fallen below its price largely due to excess supply. (2) Disposing of the excess supply is costly but using it in a way that is technologically inefficient could cost even more. (3) Research and development of new technologies that are economically viable take a long time to perfect. They are hardly a short-term solution for farmers suffering from low prices and incomes.

Another option would be to pursue an agricultural policy that is based on nutritional needs and demand. In essence, this would entail providing government support for agricultural commodities that contributed the most to human nutrition and were in the highest demand. Dropping price supports for commodities in excess supply and those that contribute little (or negatively) to nutrition would be a radical departure from historical policy goals and procedures. It would cause large dislocations in agricultural production, structure and profitability in the short run. It is an idea, however, that offers an optional framework for future food and agricultural policy.

Policy options responding more directly to changing domestic demand include providing incentives for farmers to switch into commodities for which there is a growing demand. There are some obvious geographical and agronomic problems with this. It is tantamount to occupational retraining and (literally) retooling for many farmers. This has potential for success as long as the total quantity of specific foods that can be consumed is kept in mind. It would be just as easy, for example, to overproduce broccoli as wheat.

## ADJUSTING TO CHANGE

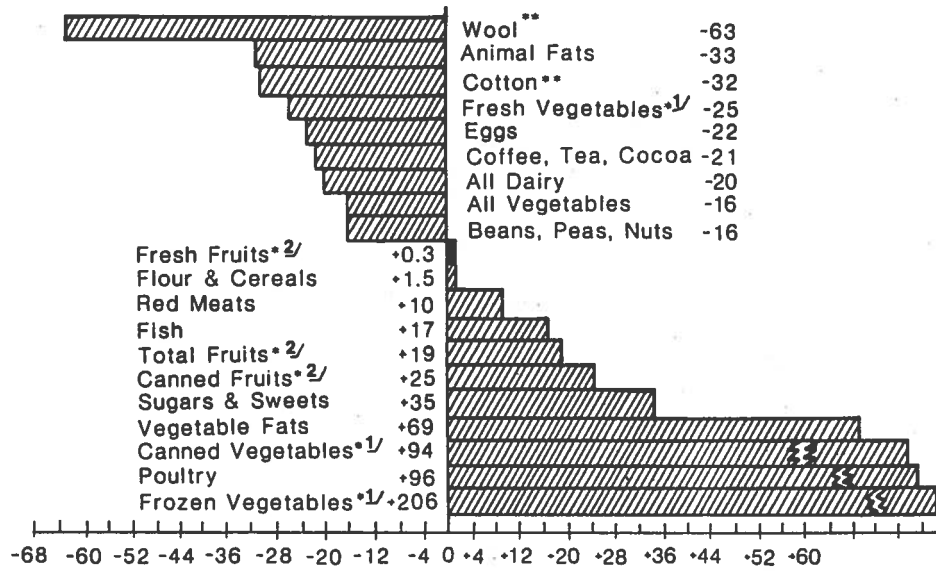
Domestic food consumption trends respond to changes in demographics and preferences for product characteristics. Evolving concerns about nutrition, health, safety, and food quality and lifestyles that demand convenience and variety make domestic food demand something of a moving target. Although it is always dangerous to predict tomorrow's events from yesterday's, the total domestic food market is expected to grow about as fast as the (declining) rate of population growth. The variety of foods consumed and the mix of farm commodity and marketing services embodied in the food consumed, suggest a declining share of farm value in the food dollar. The possibilities for expanding total domestic food consumption will be limited.

The government will undoubtedly continue to play a role in ensuring an abundant, nutritious and safe food supply but the policy instruments for achieving these goals may vary. Consumers' and taxpayers' willingness to pay for various types of food and agricultural policies will depend not only on their cost, but on how equitably distributed they appear to be. The merits of subsidizing the production of commodities for which there are no markets will be examined more closely. The alternatives of paring down supply to meet demand or expanding demand to use up the supply both pose difficult adjustment problems. Short of a miraculous expansion in exports, however, these difficult policy choices must be made.

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Figure 1. Percentage Change in Per Capita Consumption of Major Foods and Fibers in the United States, 1960-1984.



1) vegetables include potatoes

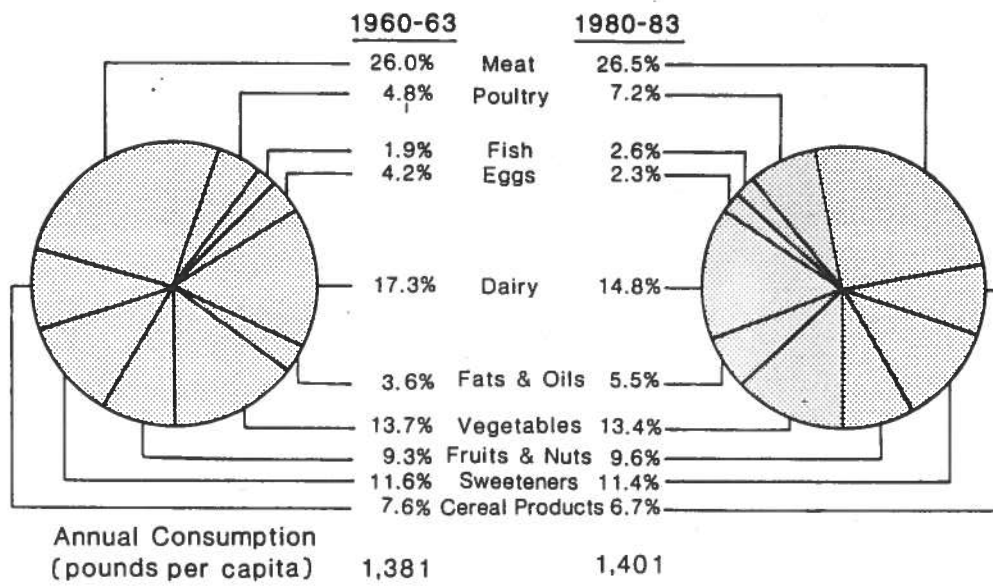
2) fruits include fruit juices

\* 1960-81

\*\* 1960-83

Source: U. S. Dept. of Agriculture, "Food Consumption and Expenditures", Statistical Bulletins No.565 & No. 736, and "Background for 1985 Farm Legislation", Bulletins No. 466 & No. 476.

Figure 2. Twenty Year Change in Food Consumption Patterns.



Source: U. S. Dept. of Agriculture