Demographic Trends and Consumer Demand for Agricultural Products

Patricia Knight Guseman
Texas A&M University

Stephen G. Sapp
Texas A&M University

Follow this and additional works at: https://egrove.olemiss.edu/jrss

Part of the Rural Sociology Commons

Recommended Citation

This Article is brought to you for free and open access by the Center for Population Studies at eGrove. It has been accepted for inclusion in Journal of Rural Social Sciences by an authorized editor of eGrove. For more information, please contact egrove@olemiss.edu.
DEMOGRAPHIC TRENDS AND CONSUMER DEMAND
FOR AGRICULTURAL PRODUCTS

Patricia Knight Guseman
and
Stephen G. Sapp
Department of Rural Sociology,
Texas A&M University

ABSTRACT

Food consumption patterns affected by macro-level population characteristics are examined with respect to projected demographic trends. Standard demand models based on price and income are enhanced to reflect impacts of total population, household size, and regional population distribution. These models provide baseline information for illustrating effects on food demand under different social-demographic scenarios, such as changes in population size, regional migration patterns, and changes in household size, composition, and income growth rates. Likely demographic projections show a greater proportional effect of total population, household size, and regional shifts on food demand than income for some commodities and for total food demand. Food consumption data are based on the USDA Nationwide Food Consumption Survey, 1977-78.

In agricultural research, scientists from numerous fields seek to improve productivity and to provide results that will boost consumption of agricultural products. This study focuses on the consuming population. Changes in the size, composition, and distribution of the American population are having significant effects on farm product sales. The evolving form and structure of the population can be viewed through examination of (1) decelerating total domestic population growth, (2) declining household size, (3) alterations in real income, and (4) regional redistribution of the population. These shifts in the population domain are not only having short-term, visible impacts on the consumption of specific agricultural products, but also represent evolutionary trends whose long-term effects on agricultural production

Published by eGrove, 1983
should be considered.

Agricultural economists traditionally have explored supply-demand relationships associated with the consumption of food, utilizing price and income as the principal conditioning or explanatory dimensions. At the present time, three factors are fostering the use of demographic indicators in explaining the changing structure of agricultural demand:

(1) Demographic estimates and projections for a variety of structural and compositional characteristics are now available on an annualized basis;

(2) Projections of demographic characteristics may be more reliable and less obscure than forecasts of currently volatile economic indicators such as real median income or product price; and

(3) The demand for food and fiber is less sensitive to economic conditions than are other major household purchases, as agricultural commodities fulfill sustenance needs.

THEORETICAL BOUNDARIES

A broad model of human action is required to focus on consumer demand—one at a sufficiently high level of generality to be applicable in all sciences which focus on human behavior. Consumptive patterns have long interested sociologists, as well as economists (Sobel, 1981: 56). This sociological interest can be traced to LePlay's concern with the effects of standards of living in 19th Century Europe. His studies of consumption revealed the inherent links among familial structure, social organization, and the value system, all of which influenced consumption patterns. On the basis of his observations, LePlay formulated a rudimentary theory of social structure (Timasheff, 1967: 48). Zimmerman (1929) and Loomis (1934), advancing LePlay's work, showed that types of investments vary with social structural
characteristics.

More recently, Parsons' (1955) integrative approach defined a general system of human behavior. His view of the social system distinguished sociological variables from those used in the other social sciences (such as economics, psychology, and biology), as well as pinpointed sociological relationships with nonsocial dimensions.

Sapp and Guseman (1983) have described food consumption through the use of Parsons' AGIL model, where the general system of action represents the first level of analysis, followed by an application to the social system and the individual as the second and third levels of abstraction, respectively (Figure 1). Food demand, through the AGIL model, can be observed as an interdisciplinary dimension, reflecting biological, sociocultural, and psychological needs for sustenance within the limits of one's ability to satisfy these needs. Desires for food are not strictly biological; if this dimension were the sole predictor of intake, consumers could subsist on dogmeat or seaweed—substances considered undesirable by most standards.

As Sapp and Guseman (1983) and Rocher (1975: 60) have explicated the AGIL model, the key predictors of food intake are represented by the four cells representing society's subsystems. These cells are then given concepts, each with concomitant concrete referents: the economy, polity, societal community, and socialization.

The empirical referents in these four cells are viewed as controlling factors (Parsons, 1966: 28), representing lifestyle differentiation at the macro- and micro-levels. This paper utilizes the macro-level or demographic dimensions of the Parsonian model to
FIGURE 1. Explanatory Referents of Food Demand

ADAPTATION
Economy

GOAL ATTAINMENT
Polity

PATTERN MAINTENANCE
Culture

INTERGRATION
Society

A. First Level of Abstraction: The General Theory of Action and Concomitant Sub-Systems of Society

<table>
<thead>
<tr>
<th>ECONOMY</th>
<th>POLITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median Income (Price of Products)</td>
<td>Total Population (Commodity Programs)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SOCIALIZATION</th>
<th>SOCIETAL COMMUNITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Region (Distribution of Food)</td>
<td>Household Size (Production/Marketing of Food)</td>
</tr>
</tbody>
</table>

B. Second Level of Abstraction: Macro-Level Influences on Food Consumption

<table>
<thead>
<tr>
<th>BEHAVIORAL ORGANISM</th>
<th>PERSONALITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, Sex</td>
<td>Tastes, Preferences</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CULTURE</th>
<th>SOCIETY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Socioeconomic Status, Race</td>
<td>Participation in Labor Force, Rural/Urban Residence</td>
</tr>
</tbody>
</table>

C. Third Level of Abstraction: Micro-Level Influences on Food Consumption
demonstrate that median income, total population, household size, and regional population distributions are useful in explaining food demand. Further, the paper seeks to verify that economic indicators, such as price and income, if used in isolation from other referents, cannot provide an accurate or complete assessment of food consumption.

METHODOLOGY

In its simplest form, the demand for any one commodity or commodity bundle has been measured as a function of quantity and price. In an empirical sense, the demand for agricultural commodities was measured in this study through consumption, with the assumption of fixed prices. Consumption per capita and for households was based on the most recent USDA Nationwide Food Consumption Survey (NFCS) undertaken in 1977-78. In two instances, comparisons are made with a comparable survey undertaken in 1965-66. The 1977-78 NFCS was based on a stratified area probability sample of the 48 coterminous states during the four quarters from April, 1977 to March, 1978, and contains consumption data for approximately 700,000 items for 15,000 households, nationwide, with individual data for 34,000 respondents. For this paper, the data on a per household or per capita basis is aggregated to national household or population totals for projection purposes.

Projections of total population, household size, household money income, and regional population were obtained from recent U.S. Bureau of the Census projection series (refer to table references).

1 Median household income and household size were included as macro-level indicators; both variables are viewed as being structurally determined and both are treated in the aggregate, i.e., at the societal level (McIntosh and Guseman, 1983).
Procedures for the projections are explained in published form by the Bureau of the Census (see references). In all cases, maximum and minimum projections from each series were utilized for the following demographic referents:

1. Changes in total population, representing the "polity" dimension;
2. Changes in household size, consistent with the "societal community" component;
3. Alterations in household income growth representing the "economy" dimension; and
4. Changes in location of the population regionally, reflecting the "cultural" component.

The configuration of empirical referents was arbitrary, based on a broad overview of the Parsonian model and Rocher's (1975: 61-70) discussion of the structural components of each of the four cells in the AGIL model.

CHANGING TOTAL POPULATION AND FOOD DEMAND

During the high growth period of the 1950s, the markets for food and fiber expanded in proportion to population growth. For the last two decades, a dominating force in the country's evolving demographic profile has been the deceleration of population growth. Despite an increasing absolute population, annualized growth rates have declined by 75 percent since 1950.

The declining total fertility rate has been the primary force behind the drop in population growth rates, rather than net immigration. While net civilian immigration remained around 400,000 annually for the 1970 decade, net natural increase dropped from 1.8 million in 1970 to slightly over 1.2 million in 1980.

Domestic population (Table 1) shows a continued deceleration of
TABLE 1. Projected Total U.S. Population

<table>
<thead>
<tr>
<th>Year</th>
<th>Total: Low Series</th>
<th>Percent Change</th>
<th>Total: Middle Series</th>
<th>Percent Change</th>
<th>Total: High Series</th>
<th>Percent Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>226,505</td>
<td></td>
<td>226,505</td>
<td></td>
<td>226,505</td>
<td></td>
</tr>
<tr>
<td>1980-1984</td>
<td></td>
<td>4.8</td>
<td></td>
<td>5.4</td>
<td></td>
<td>6.1</td>
</tr>
<tr>
<td>1985</td>
<td>237,366</td>
<td></td>
<td>238,548</td>
<td></td>
<td>240,364</td>
<td></td>
</tr>
<tr>
<td>1985-1989</td>
<td></td>
<td>4.3</td>
<td></td>
<td>4.6</td>
<td></td>
<td>6.0</td>
</tr>
<tr>
<td>1990</td>
<td>245,507</td>
<td></td>
<td>249,731</td>
<td></td>
<td>254,686</td>
<td></td>
</tr>
<tr>
<td>1990-1994</td>
<td></td>
<td>2.5</td>
<td></td>
<td>4.0</td>
<td></td>
<td>5.5</td>
</tr>
<tr>
<td>1995</td>
<td>251,550</td>
<td></td>
<td>259,631</td>
<td></td>
<td>268,834</td>
<td></td>
</tr>
<tr>
<td>1995-1999</td>
<td></td>
<td>1.6</td>
<td></td>
<td>3.2</td>
<td></td>
<td>5.0</td>
</tr>
<tr>
<td>2000</td>
<td>255,638</td>
<td></td>
<td>267,990</td>
<td></td>
<td>282,339</td>
<td></td>
</tr>
</tbody>
</table>

a Actual population count

b The series assume a 1.6 to 2.3 range of ultimate life-time births per woman, a life expectancy by 2050 ranging from 76.7 to 83.3, and an annualized net immigration from 250,000 to 750,000 over the projection periods.

growth for three series of projections through the year 2000. These series point to a range of 12.9 to 24.6 percent increase in total population for the 1980-2000 period. Mid-series projections of growth prepared by the Bureau of the Census indicate that after the year 2050, population will begin to decline. Zero population growth could have been a reality in 1980, based on the under-replacement fertility rate of 1.83, were it not for the births by women from the baby boom generation and a positive net immigration.

Because of decelerating growth rates, some policy analysts and planners have shown concern about economic stagnation and decline caused by population stationarity. Espenshade (1981: 23) argues, however, that higher per capita disposable income will provide a compensating dimension, so that the level of expenditures will remain similar to the past. Further, Espenshade suggests that the proportion of expenditures across major economic sectors will not alter appreciably.

Musgrove (1982: 26-29) recently developed a model for future consumer spending in the United States using 12 major expenditure categories (see Table 2). He analyzed future consumer purchases for specific goods and services and isolated the relative proportion of expenditure growth attributable to projected changes in (a) population size, (b) population composition (treated as an aggregate variable), and (c) disposable income. Based on this comprehensive assessment across expenditure categories, a greater proportion of the increase in consumption was explained by rises in disposable income than by changes in total population or population composition (Musgrove, 1982: 28). However, food and clothing remained relatively unaffected by income and,
<table>
<thead>
<tr>
<th>Category &amp; Scenario</th>
<th>1985 Projected Changes Due to Total Population</th>
<th>1985 Projected Changes Due to Population Composition</th>
<th>Projected Changes Due to Household Disposable Income</th>
<th>2000 Projected Changes Due to Total Population</th>
<th>2000 Projected Changes Due to Population Composition</th>
<th>Projected Changes Due to Household Disposable Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total (12 categories)</td>
<td>D: 36.8</td>
<td>E: 31.4</td>
<td>F: 23.7</td>
<td>Projected Changes Due to Total Population</td>
<td>Projected Changes Due to Population Composition</td>
<td>Projected Changes Due to Household Disposable Income</td>
</tr>
<tr>
<td>Food, drink &amp; tobacco</td>
<td>D: 58.9</td>
<td>E: 51.2</td>
<td>F: 43.8</td>
<td>D: 58.9</td>
<td>E: 51.2</td>
<td>F: 43.8</td>
</tr>
<tr>
<td>Clothing &amp; footwear</td>
<td>D: 31.6</td>
<td>E: 27.2</td>
<td>F: 21.0</td>
<td>D: 31.6</td>
<td>E: 27.2</td>
<td>F: 21.0</td>
</tr>
<tr>
<td>Furnishings &amp; durables</td>
<td>D: 28.4</td>
<td>E: 23.6</td>
<td>F: 18.2</td>
<td>D: 28.4</td>
<td>E: 23.6</td>
<td>F: 18.2</td>
</tr>
<tr>
<td>Energy</td>
<td>D: 50.4</td>
<td>E: 42.1</td>
<td>F: 37.9</td>
<td>D: 50.4</td>
<td>E: 42.1</td>
<td>F: 37.9</td>
</tr>
<tr>
<td>Vehicles &amp; tires</td>
<td>D: 31.9</td>
<td>E: 27.2</td>
<td>F: 18.2</td>
<td>D: 31.9</td>
<td>E: 27.2</td>
<td>F: 18.2</td>
</tr>
<tr>
<td>Public transport</td>
<td>D: 24.4</td>
<td>E: 20.1</td>
<td>F: 15.3</td>
<td>D: 24.4</td>
<td>E: 20.1</td>
<td>F: 15.3</td>
</tr>
<tr>
<td>Health care</td>
<td>D: 19.8</td>
<td>E: 13.4</td>
<td>F: 9.6</td>
<td>D: 19.8</td>
<td>E: 13.4</td>
<td>F: 9.6</td>
</tr>
<tr>
<td>Education</td>
<td>D: 27.8</td>
<td>E: 15.5</td>
<td>F: 12.9</td>
<td>D: 27.8</td>
<td>E: 15.5</td>
<td>F: 12.9</td>
</tr>
<tr>
<td>Trade</td>
<td>D: 33.2</td>
<td>E: 26.2</td>
<td>F: 19.9</td>
<td>D: 33.2</td>
<td>E: 26.2</td>
<td>F: 19.9</td>
</tr>
<tr>
<td>Other services</td>
<td>D: 29.0</td>
<td>E: 23.4</td>
<td>F: 18.3</td>
<td>D: 29.0</td>
<td>E: 23.4</td>
<td>F: 18.3</td>
</tr>
</tbody>
</table>

Scenario D represents a high per annum population growth, while Scenario F depicts a low population growth, ending in stationarity by 2025.

along with transportation requirements, were shown to be more susceptible to projected changes in population than in income. Food, fulfilling a sustenance need, was more affected by the population scale parameter than any other expenditure category.

Further, even with increased per capita income, there are indications of a decline in the proportion of consumer expenditures for basic necessities—food and clothing—with a greater share of income expended for consumer durables and services (Musgrove, 1982: 26; Ridker, 1978: 127-155). Musgrove projects a decline in food expenditures under both zero income growth and income growth assumptions.

In sum, population projections suggest a deceleration in the demand for food, while multivariate models of future population and income show a reduction in the share of disposable income utilized for food and fiber products. These trends will have a direct effect on the structure of demand for agricultural products.

**FOOD DEMAND AND CHANGING HOUSEHOLD SIZE AND COMPOSITION**

Absolute population totals provide an aggregated picture of food demand, but partialling of component effects is necessary to address the implications of demographic change for the agricultural market basket. Household configurations affect food expenditures, with observable economies of scale (based on household size) and different proportions of various commodities consumed (based on household composition).

Household size has declined substantially each decade throughout this century. The number of persons per household in 1950 was 3.37 and 2.76 in 1980, a decline of 18 percent. The household-size transformation has been a composite of many elements, including housing
availability, income growth, the fertility rate, and increasing numbers living alone.

As household size declines, greater expenditures per capita are observed. Analysis of the NFCS data shows that per capita expenditures in one-person households are 1.6 times higher than in six-person households. Thus, the decline in household size should result in greater expenditures on a per capita basis.

Salathe (1979: 1041-42) showed that declining household size resulted in increased per capita intake for most food products, especially cheese, beef, fish, and fruits—foods that are typically preferred superior goods.2 Projections of household size show the effects on food intake for selected meat products (Table 3), i.e., an increased per capita consumption of meat. Using an elasticity measure of household size, the effects of a one-percent decline in average persons per household can be assessed, controlling for price. This approach thus tests whether the per capita and household demand for meat is sensitive to changes in household size.3 Elasticity, using the shrinkage ratio, is defined as:

---

2 A superior good has a positive income elasticity for all income levels, while a preferred superior good evidences higher elasticities with higher income levels.

3 Household size elasticities, as well as income elasticities, are difficult to estimate accurately. However, with income elasticities a standard monetary unit can be used, but the addition or loss of one person per household does not represent a "standard" person, unless adult equivalent scales are used.
TABLE 3. Elasticities of Household Size for Per Capita and Household Meat Consumption

<table>
<thead>
<tr>
<th>Consumptive Unit</th>
<th>Consumption by Period (grams/daily)</th>
<th>1990: Projected Series I</th>
<th>1990: Projected Series II</th>
<th>Elasticities of Household Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Per Capita</td>
<td>293.3 319.1</td>
<td>326.8</td>
<td>337.9</td>
<td>-.50</td>
</tr>
<tr>
<td>Household</td>
<td>965.1 865.6</td>
<td>840.1</td>
<td>804.4</td>
<td>.59</td>
</tr>
</tbody>
</table>

*aAll meats include red meats, poultry and fish.*
where $q =$ quantity consumed at times 1 and 2 (i.e., 1965 and 1977; 1977 and 1990; 1977 and 1995)

$h =$ household size at times 1 and 2 (i.e., 1965 and 1977; 1977 and 1990; and 1977 and 1995)

As might be anticipated, household consumption declined with reductions in the number of persons per dwelling unit. Using an elasticity measurement for household size, a large inverse relationship was observed with per capita quantities of meat consumed; meat intake per person rises with declining household size. Most significantly, elasticities for household size are larger on a per capita basis than are income elasticities (see George and King, 1971: 70; Salathe and Buse, 1970: 10). Thus, household size is a critical population parameter that should be incorporated in further analyses of consumer demand.

INCOME CHANGES AND FOOD DEMAND

In the Parsonian framework, the successful economic functioning of a society is dependent on its adaptive capacities. The processes of distribution of income to households and individuals are concentrated within the economic sub-system.

Agricultural economists (Farris, 1982; George and King, 1971; Haidacher, et al., 1982: 85) have emphasized the strong predictive value of income in explaining the variation in quantity of specific agricultural products consumed. Further, as household income increased, proportionately less was expended for food products (Huang and Raunikar, 1981: 39). Historically, real household incomes have increased, while
slight declines in the proportion spent on food have been observed.

However, real household income declined between three to five percent annually since 1979 because of reduced household size and economic conditions (Bureau of the Census, 1982: 3). Several demographic factors are likely to have significant effects on the level and growth of household income in the 1980s. The reduction in persons per household and, therefore, in wage earners, will effect the money income of individual households. Second, alterations in household composition, such as the increase in female-headed households and other non-traditional household formations, will have a dampening effect on the overall growth rate of household income. On the other hand, increased labor force participation by women should continue to favorably increase median incomes. Finally, the changing age distribution of the population, with a 40 percent increase in the number of persons 35 to 44 years old, will increase the earnings potential of the population.

Overall, there are "push" and "pull" factors affecting household income. Compositional effects point to greater earnings potential for those in the labor force and a greater proportion of the total population employed. On the other hand, declining household size and an unstable economy should have greater impacts on real median household income, so that a continued decline appears feasible. The range of alternative household money incomes growth rates projected by the Bureau of the Census is presented in Table 4.

Income has typically been used as the prime independent variable at the individual or household level to explain food demand (Salathe, 1979:...
<table>
<thead>
<tr>
<th>Year (and Household Size)</th>
<th>No Income Growth (annual)</th>
<th>.02 Income Growth (annual)</th>
<th>.04 Income Growth (annual)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Aggregate Consumption</td>
<td>Aggregate Consumption</td>
<td>Aggregate Consumption</td>
</tr>
<tr>
<td></td>
<td>(all households in</td>
<td>(all households in</td>
<td>(all households in</td>
</tr>
<tr>
<td></td>
<td>Household Size)</td>
<td>Household Size)</td>
<td>Household Size)</td>
</tr>
<tr>
<td></td>
<td>thousand lbs.)</td>
<td>thousand lbs.)</td>
<td>thousand lbs.)</td>
</tr>
<tr>
<td>1980</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.76 (1)</td>
<td>697.24</td>
<td>698.17</td>
<td>699.13</td>
</tr>
<tr>
<td>2.71 (III)</td>
<td>684.61</td>
<td>685.52</td>
<td>686.47</td>
</tr>
<tr>
<td>1990</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.65 (1)</td>
<td>669.16</td>
<td>671.60</td>
<td>674.41</td>
</tr>
<tr>
<td>2.53 (III)</td>
<td>638.86</td>
<td>641.19</td>
<td>643.87</td>
</tr>
<tr>
<td>1995</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.58 (1)</td>
<td>651.39</td>
<td>655.44</td>
<td>660.55</td>
</tr>
<tr>
<td>2.39 (III)</td>
<td>603.42</td>
<td>607.17</td>
<td>611.90</td>
</tr>
<tr>
<td>2.54 (1)</td>
<td>641.12</td>
<td>646.86</td>
<td>654.86</td>
</tr>
<tr>
<td>2.28 (III)</td>
<td>575.50</td>
<td>580.54</td>
<td>587.82</td>
</tr>
</tbody>
</table>

a Holding per capita consumption levels constant at 1977 levels.

b Series I reflects a growing population and Series III portrays a slowing of population growth to zero in 2020.

22), with other sociodemographic variables, such as household size, race, sex and age, treated as conditioning factors. Very often the effects of other variables are "concealed" within this bivariate approach to examining consumption. Thus, when household income and household consumption are correlated, income may actually have "hidden" multicollinear effects with household size, household composition (sex of household head and age of adult household members), educational level of the purchaser, and a wide variety of other sociodemographic factors. In sum, the use of income and price as key predictors of food demand may mask other equally explanatory variables heretofore not rigorously examined.

Table 4 shows a multivariate analysis of future meat consumption, using the maximum range of projections of household income, household size, and total domestic population. Per capita meat intake was fixed at 1977 levels (based on NFCS data). Meats, including red meats, poultry, and fish, are defined broadly as preferred superior goods and, thus, as sensitive to changes in income. However, when comparing changes in income to changes in household size, the latter variable appears to have a greater effect on the demand for beef (see Table 4). The impacts of three annual household income growth rates and two household size projections are shown in Table 4, with projected income referenced in 1977 real dollars for 0.0, 2.0, and 4.0 percent annual income growth rates.\textsuperscript{4} The change in meat demand for households is calculated:

\textsuperscript{4}The Bureau has not prepared projections of household money income which show annual declines based on real dollars.
D_2 = [D_1 (\varepsilon \cdot \% \Delta I) + D_1] \cdot H_2

Where 
D = demand for meat at times 1 and 2 
\varepsilon = income elasticity of 0.0225 
I = income, with \Delta I denoting the change from 1 to time 2 
H = household size

In the short term, changes in income and household size have equivalent effects on aggregate meat demand. By 1995, however, the effects of household size and total population show a 7 billion pound aggregate consumption differential for the two series (I and III) across all three income scenarios. Within household projection Series I or III, income changes affect aggregate demand by less than 2 billion pounds annually. While this example is illustrative, it demonstrates that, under some conditions, the aggregate demand for meat and other agricultural commodities depends more on population size and household size than on changes in income.

REGIONAL POPULATION REDISTRIBUTION AND FOOD DEMAND

The geographic distribution of food and fiber production is substantially different from the concentration of population. Residential movement, especially to Southern and Western regions, has been substantial since 1970. Between 1970 and 1980 the number of persons migrating to Southern states was 8.3 million. Net migration to the South alone represented over two million more persons than the combined net migration in the remainder of the United States.

---

5 Cross-sectional elasticity for total meat, computed from the U.S.D.A. Nationwide Food Consumption Survey, Spring, 1977 data.
Since 1970, population in the South has been increasing at an accelerated rate, while the nation's growth rate has been declining. The effects of these opposing growth curves on the demand for food and fiber can be examined through analysis of per capita consumption projected to 2000. While intake is reduced for many age cohorts nationally, an increase across cohorts is projected for the South.

As shares of the national population are re-distributed, the movers will have pronounced impacts on the spatial allocations of consumer expenditures. Additionally, the locational configuration of processing, transportation, and other auxiliary agricultural marketing services will be altered by these migration patterns.

It has been suggested that population shifts should lessen the regional variation in food consumption, so that region of residence will become less salient as a cultural determinant of food consumption (Burk, 1961). Further, a closure in the income gap between Southern and all other states should bring greater uniformity in the demand for agricultural products (Ecklund, 1969). Comparisons of proportions of per capita intake for specific food products across regions are provided in Table 5 for 1965 and 1977, based on NFCS data. Interestingly, quantities of products consumed, controlling for changes in price and regional price differences, had not become more homogeneous by region. Levels of consumption varied more regionally in 1977 relative to 1965 for dairy products, poultry and pork, as well as vegetables and fruit. Regional variation had lessened for four of the nine major food categories, including beef and fish and some processed foods, such as cereals, baked goods and fats and oils.
TABLE 5. The Mean, Range, Standard Deviation, and Coefficient of Variation for Household Consumption-Expenditure Relationships for Foods for 1965-66 and 1977-78 Across Regions²

<table>
<thead>
<tr>
<th>Food Product</th>
<th>1965-66</th>
<th></th>
<th>1977-78</th>
<th></th>
<th>Percent Change in Coefficient of Variation: 1977-1965</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Range</td>
<td>Standard Deviation</td>
<td>Coefficient of Variation</td>
<td>Mean</td>
</tr>
<tr>
<td>Cereals/Bakery Items</td>
<td>131.5</td>
<td>29.1</td>
<td>13.0</td>
<td>9.9</td>
<td>82.6</td>
</tr>
<tr>
<td>Fresh Fruit</td>
<td>35.9</td>
<td>18.9</td>
<td>8.5</td>
<td>23.6</td>
<td>35.9</td>
</tr>
<tr>
<td>Fresh Vegetables</td>
<td>33.3</td>
<td>13.5</td>
<td>5.5</td>
<td>16.6</td>
<td>31.4</td>
</tr>
<tr>
<td>Fats and Oils</td>
<td>8.3</td>
<td>3.7</td>
<td>1.7</td>
<td>20.5</td>
<td>4.9</td>
</tr>
<tr>
<td>Beef</td>
<td>70.7</td>
<td>25.5</td>
<td>12.0</td>
<td>17.0</td>
<td>64.2</td>
</tr>
<tr>
<td>Pork</td>
<td>26.2</td>
<td>12.8</td>
<td>6.7</td>
<td>25.6</td>
<td>19.3</td>
</tr>
<tr>
<td>Poultry</td>
<td>9.6</td>
<td>3.0</td>
<td>1.4</td>
<td>14.2</td>
<td>9.6</td>
</tr>
<tr>
<td>Fish</td>
<td>2.8</td>
<td>2.6</td>
<td>1.4</td>
<td>40.3</td>
<td>3.5</td>
</tr>
<tr>
<td>Dairy Products</td>
<td>156.4</td>
<td>18.1</td>
<td>8.2</td>
<td>5.3</td>
<td>252.0</td>
</tr>
</tbody>
</table>

²The means, ranges, standard deviations, and coefficients of variation were obtained across the four major U.S. regions by dividing quantity consumed (measured in grams per day for the Spring) for each food by total food intake and multiplying by the expenditures per food product relative to total food expenditures, i.e., \((Q_i/Q_t)(E_i/E_t)\) (1000).
Using broad food categories, it appears that a great deal of diversity remains in regional consumption patterns. Differences by region exist after controlling for relative prices for each region. Thus, the diversity which remains in consumption patterns by region appears to be based more on variation in preferences and tastes, rather than differential availability of specific agricultural products.

CONCLUSIONS AND IMPLICATIONS FOR FUTURE RESEARCH

Lifestyle and, therefore, consumption are determined by micro-level factors as well as macro-level characteristics at the societal level. These latter characteristics, including income growth rates, changing household size, regional population re-distribution, and changes in the total population, have been shown to affect per capita and aggregate utilization of agricultural commodities. Further, the changing structure of demand for agricultural products can be explained, in large part, by demographic indicators.

In previous research, income has received a great deal of attention as the prime nonmarket dimension explaining the demand for agricultural commodities. Rising consumer income results in a substitution of more expensive, animal protein foods for staples and, typically, in proportionately less being spent on food. Nevertheless, changing income must be viewed as one of a complex set of societal and individual attributes which interact to establish the markets for farm products.

This research has focused on (1) an explication of demographic trends explaining food and fiber demands and (2) the interdependent nature of economic and demographic variables. In agricultural economics, utility maximization theory treats demographic variables as
exogeneous. The Parsonian AGIL model includes both social structural variables and accommodates economic dimensions as well. Thus, with prices held constant, the sociological theory subsumes the economic perspective.

In cases where the primary concern revolves around examination of the changing structure of demand for agricultural products, it is possible to draw upon prior economic work and develop a more incisive and complete model of consumption. This effort can be undertaken either through further demographic analyses or through monitoring consumption data at the individual level, using personal or background characteristics as primary predictors. Such research efforts can extend sociological theories of lifestyle differentiation and social structure.

Implications for agricultural production and marketing also should be considered. This paper has emphasized basic demographic trends which are anticipated to have a pronounced impact on the markets for agricultural commodities. Such trends will affect farm product sales in the following ways:

(1) Altering food and fiber demand in the aggregate and by commodities;

(2) Affecting the amount and proportion of consumer income spent on agricultural products; and

(3) Changing the allocation of available supplies; predictable population patterns will determine, to some extent whether there will be surpluses or shortages of specific products.
REFERENCES

Burk, Marguerite C.

Consumer Nutrition Center

Consumer Nutrition Center

Eklund, Helen M.

Espenshade, Thomas J.

Farris, Donald E.

Fox, Karl A.

George, P.S., and G.A. King

Haidacher, Richard C., et al.

Hansen, Alvin H.
Huang, Chung L. and Robert Raunikar

Keynes, John M.

Loomis, Charles P.
1934  The Growth of the Family Farm in Relation to Its Activities. Clemson, SC: Clemson University, South Carolina Agricultural Experiment Station, Research Bulletin 298.

McIntosh, Wm. Alex and Patricia K. Guseman

Musgrove, Philip

Parsons, Talcott

Parsons, Talcott

Ridker, Ronald G.

Rocher, Guy

Salathe, Larry E., and Rueben C. Buse

Salathe, Larry
Sapp, Stephen G. and Patricia K. Guseman

Sobel, Michael E.

Timasheff, Nicholas S.

U.S. Bureau of the Census

U.S. Bureau of the Census

U.S. Bureau of the Census

U.S. Bureau of the Census

U.S. Bureau of the Census

Zimmerman, C.C.