THE EFFECTS OF DEMOGRAPHIC CHARACTERISTICS ON THE RANKING OF FOOD PREFERENCES IN PAMPANGA AND PANGASINAN, PHILIPPINES

by

JOCELYN F. CATAPUSAN

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Joe W. Kondele

Major Professor

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Chapter 1

INTRODUCTION

a) Nature of the Study

The demands and expenditures of consumers are becoming increasingly important in a developing economy, such as the Philippines. In the 1978/79 marketing year, domestic food use was equal to around 88 percent of combined production of crops, livestock and fish products.[1] With economic growth, the shifting patterns of demand among consumers tend to become more important in the economy, and both policy-makers and industrialists watch consumer buying habits closely. A vast number of consumption characteristics influence the purchase and consumption of food items. Such characteristics include income differences, educational attainment, age, family size and other related factors.[2] The consumer market is the basic determinant of what goods and services will be produced, where and when and at what price they will be sold. Thus, seeking consumers' favor is a major marketing goal.

Consumer buyers in the retail public markets vary in income and preferences. For successful marketing of agricultural and food products, knowledge of consumer's perceptions and preferences is essential.

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[1] Integrated Agricultural Production and Marketing Project (IAPMP) Staff, "Food Demand and Markets," Philippine Food Consumption Trends and Prospects for the 1980's, Min. of Agric., Diliman, Quezon City, Jan. 1980, p. 10.

[2] Rosario B. Gill, "Consumer Preferences for Poultry and Poultry Products, West Kamias, Metro Manila, 1978" (Undergraduate Thesis, Univ. of the Phil. at Los Baños, 1978), p. 2.

Consumers can choose from a great variety of different products to meet their nutritional needs and it is important to know how these choices are made and how consumers' wants and preferences can be met better.[3] Consumer behavior in selecting food items in the market, however, may be the combined effect of their tastes, household income and the price of commodities. While the latter two factors, i.e., income and price, have some well-established relationship with demand and consumption level, consumers' taste and preferences are not yet clearly understood. It may be considered that consumers' taste and preferences are influenced by their cultural background, familiarity with the particular meat and fish and the way they utilized these for food. It is therefore deemed necessary to examine the effect of demographic characteristics on the preference level of food items like beef, carabeef, pork, chicken and fish. And since consumers choose from the bundle of commodities which reveal their preferences which in turn are a function of their taste, such information will be very useful to both farmers and traders. Understanding of consumer preferences for such food items will also enable the industry to adjust its production to meet consumer needs and maximize their satisfaction as well as to generate more returns for the producers.

b) Objectives

The main objective of this study is to examine the relationship of demographic characteristics on the ranking of food preferences for beef, carabeef, pork, chicken and fish. Specifically, the objectives are:

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[3]B. Wierenga, "Multidimensional Models for the Analysis of Consumer Perceptions and Preferences with Respect to Agricultural and Food Products," Journal of Ag. Economics, UK 31 (Jan. 1980): 83-97.

I. To test whether a statistically significant relationship exists between demographic characteristics and rank of food preferences.

II. To determine the coefficients of different relationships.

III. To identify the nature of the most important relationships.

IV. To relate socio-economic implications to market development and consumer education.

Chapter 2

THEORETICAL FRAMEWORK

The theory of consumption may be divided into three main parts, (1) the theory of individual consumer preference or the theory of individual demand, which differentiates the effects of income and price on a consumer's spending decisions, (2) theory based on some form of the consumption function, or the relation between personal income and consumption expenditure, and (3) theory based on the more modern concept of household decision-making, which introduces a number of non-economic variables to explain how households decide what and how much to buy. This study will revolve around the theory of individual consumer preference and the modern household decision-making approach.

a) Theory of Consumer Demand

Consumer demand theory is well known and well documented. The summary presented here relies heavily on E. Mansfield's Microeconomics Theory and Application (see Bibliography).

The theory of consumer behavior is based on the assumption that an individual consumer, facing given market prices and with limited income available for expenditures, will purchase the combination of commodities that is highest on his scale of preferences.

Let the utility function

$$U = f(X_1, X_2 \ldots X_n)$$

be an indicator of the consumer's preferences, where $(X_1, X_2 \ldots X_n)$ are

the quantities of n commodities so defined as to be exhaustive with respect to the choices facing the consumer. Furthermore, if one assumes for the moment that it is possible to measure the utility a consumer attaches to each market basket (good/services), these measurements are a complete representation of his or her tastes and preferences.

According to the great 19th century economists, William Stanley Jevons of England, Karl Menger of Austria and Léon Walras of France, utility was measurable in a cardinal sense, which means that the difference between two measurements is itself numerically significant. Assumptions underlying this cardinal measurement of utility are:

1. Consumers are able to express their tastes and preferences cardinally.
2. The amount of utility obtained from having a certain amount of commodity does not depend on the amount of other commodities possessed (Independent Tastes/Preferences).

In contrast, the assumption of the 20th century economists (E. Slutsky, Wilfredo Pareto, Sir John Hicks) is that utility is measurable in an ordinal sense, which means that a consumer can only rank various market baskets with regards to the satisfaction they give him or her. The underlying assumptions of ordinal measurement of utility are:

1. Consumers are able to express their tastes and preferences by ranking their choices of the various market baskets.
2. The amount of utility obtained from having a certain amount of one commodity is related to or depends on the amount of other commodities available in the market.

Three axioms form the basis for the above assumption of the ordinal measurement of utility.

Axiom of Comparison

a) The consumer is able to rank all market bundles.

b) Full information about his/her tastes or preferences is available.

c) For any two commodities, x and y, the consumer prefers y to x, x to y, or x and y are equivalent (or indifferent).

Axiom of Transitivity

The order of preferences is logically consistent in the following sense: For any three commodities (x, y and z) if x is preferred to y, and y is preferred to z then he or she must prefer x to z.

Axiom of Choice

a) The consumer chooses a budget which is preferred to any other budget that he can obtain, provided such a budget exists.

b) More is always preferred to less. Consumer can't be satiated. He/she prefers bigger market bundles than less or assuming non-satiety, a larger quantity of a commodity is always preferred to a smaller quantity.

b) The Household Decision-Making Concept[4]

The household decision-making concept adopts the household as the basic unit of consumption. It makes the assumption that individual preferences are reflected in the household decision.

It is concerned not only with economic variables of price and income but also with other socio-demographic factors such as household size and composition, the level of education and occupation, particularly of the household head and the socio-geographic environment.

Expenditures are expected to increase with household size. However with given levels of per capita income, a larger household may be able to attain a higher standard of living than a smaller household; that is, economies of scale in consumption may be achieved. The larger households tend to distribute their expenditures according to a standard of living

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[4]E. Tan and G. Tecson, "Consumption Patterns in the Philippines," IEDR-UPSE, Discussion Paper No. 74-9, July 15, 1974.

which is higher than that of smaller households with the same per capita income. This income effect results in increased consumption of a normal good by larger households.

Consumption differs with the household composition. Different age and sex groups have different consumption tastes and preferences. There are culturally and scientifically-prescribed groups of food for different age groups. Expenditures for medical services tend to be higher for households with very young or very old members.

Chapter 3

REVIEW OF LITERATURE

a) A Review of Related Empirical Studies

Several studies have investigated the importance of specific variables on the consumption of food or meat. Most of these studies have explained a small percentage of the variation in quantities purchased or expenditures. For example, in 1965, Raunikar and others published the results of an investigation which attempted to estimate the relationship of consumption and expenditures for meat, meat products, and eggs to household income, household size and composition, race, and guest meals. It was found that the responsiveness of the quantities purchased and expenditures to income varied within and among the retail categories. It was also concluded that, in general, pork items were more responsive than beef items to changes in household size.[5]

Price attempted to compute age-sex equivalent scales or consumer unit scales for United States food expenditures. Price found that the age-sex equivalent scales could be improved by including income and number of meals eaten at home as adjustment variables.[6]

Other studies have laid the preliminary groundwork for building a consumption model which would include social and economic variables. One

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[5]Robert Raunikar et al., "Consumption and Expenditure Analysis for Meat, Meat Products and Eggs in Atlanta, Georgia," Technical Bulletin, N.S. 46 (September 1965).

[6]David W. Price, "Age-Sex Equivalent Scales for United States Food Expenditures--Their Computation and Application" (Ph.D. dissertation, Michigan State University, 1965).

example of this was the study made by Richard Edgar Lund. Several socio-economic attributes of the households were examined with respect to their effect on demand for meat. Among the attributes examined, it was determined that purchasing behavior could be most satisfactorily explained by (a) household income, (b) household composition (presence of children), (c) size of household, and (d) age of household head.[7]

Factors affecting the demand for meat have been categorized by many authors based on economic theory. Economic theory provides a solid framework for analyzing problems of consumer demand. In particular, it provides a method of estimating a complete and consistent set of demand parameters which otherwise would have been difficult or impossible to estimate. Some have included non-quantifiable variables or socio-economic factors, which theorists believe influence the amount purchased. The major factor related to meat consumption is the price of the product. Other factors such as ethnic background, type of occupation, religious beliefs, personal tastes and preferences, diets and food fads were also considered.[8,9] Other authors have included size and composition of the family, urbanization and season of the year.[10,11]

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[7]Richard Edgar Lund, "Factors Affecting Consumer Demand for Meat, Webster County, Iowa" (Ph.D. dissertation, Iowa State University, 1967).

[8]J.H. McCoy, Livestock and Meat Marketing (The AVI Publishing Co., Inc., Westport, Connecticut, 1979).

[9]R.F. McDonald, "Influence of Selected Socio-Economic Factors on Red Meat Consumption Patterns in the Northeast Region," Bulletin 477 (Univ. of Maryland Ag. Expt. Station, June 1976).

[10]A.A. Dowell and K. Bjorkes, Livestock Marketing, 1st ed. (McGraw Hill Book Co., 1961).

[11]W.F. Williams and J.J. Stout, Economics of the Livestock Meat Industry (The Macmillan Co., New York, 1964).

Very few studies, however, have investigated the impact of economic variables on the level of food preferences.

Gaarder and associates' study was based on a sample survey of 499 households during June 1955. In this study, family size and income were the principal factors associated with differences in household pork consumption. Consumers generally expressed a preference for pork chops over ham, roasts, bacon and other cuts.[12]

In the early 1930's, Thurstone did some experimental work in developing indifference functions by use of a scaling method. Later, this author applied his method of developing indifference functions by use of a scaling method in the study of food preferences.[13]

In the study of general preferences for poultry meat and meat products, Gill makes the assumption that individual preferences are reflected in the household decision. Thus, in his study, he found that chicken meat was the first choice of the 150 households interviewed, while only 2 percent of the households preferred duck meat. In relation to other types of meat products, sausages and other frozen products were preferred followed by Australian beef.[14]

b) Consumer Demand and Preferences

During 1977-79, consumers in the Philippines have spent about 40-45 percent of their after-tax income for food. In the early years of the

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[12]R. Gaarder et al., "Consumer Preferences for Pork, Des Moines, Iowa," Research Bulletin 477 (Iowa Agric. and Home Econ. Experiment Station, 1960).

[13]L. Thurstone, The Measurement of Values (Chicago, Illinois: University of Chicago Press, 1959).

[14]Gill, p. 21.

1970 decade, food expenditures averaged about 50 percent of consumer income. These are relatively high ratios of expenditures for food relative to income.[15]

For the medium-income growth assumption which most closely follows recent income growth rates, the demand for fish will be 29.6 percent higher in 1985 than it was in 1978, the demand for pork will be 40.4 percent higher, the demand for chicken will be 37.7 percent higher and the demand for beef will be 41.9 percent higher in 1985 than in 1978.[16]

Because of strong consumer preference for meat and poultry products, demand projections for the coming decade indicate rising volume of demand, particularly under the assumptions of increased consumer purchasing power and relatively stable prices for these preferred foods.

Despite the sharp increase in poultry output in the past year (1979), as well as larger output of pork and fish, poultry prices have continued to rise even as larger supplies were coming into the Manila Market. Rising prices demonstrate the strong consumer demand for poultry. Moreover, poultry is a relatively good buy compared to other meats, even fish.[17]

Per capita consumption of fish increased during the decade of the 1970's and a strong market preference for fish will expand during the 1980's unless sharply higher prices restrict purchases by consumers.[18]

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[15]IAPMP Staff, Philippine Food Consumption Trends and Prospects for the 1980's, p. 15.

[16]National Policy Staff, "Projected Demand for Meat and Fish, 1979-85," Min. of Agric. Diliman, Quezon City, Sept. 11, 1979.

[17]National Policy Staff, "Poultry Situation," IAPMP, Min. of Agric. Diliman, Quezon City, Sept. 11, 1979.

[18]National Policy Staff, "Fish Situation," IAPMP, Min. of Agric. Diliman, Quezon City, 1979.

Per capita consumption of beef (cattle and carabao) in 1976 was about 3.1 kgs. and around 2.9 kgs. in 1977 and 1978. This relative stable per capita consumption of beef and the strongly advancing consumer demand for beef have resulted in substantial price increases in the past year. These price increases reflect a strong demand for beef despite larger supplies of other meats, i.e., poultry, pork and fish.[19]

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[19]National Policy Staff, "Cattle and Carabao Situation and Supply Utilizations Data for Recent Years," IAPMP, Min. of Agric., Diliman, Quezon City, 1979.

Chapter 4

RESEARCH METHODOLOGY

a) Data for Analysis

The data used in this study were obtained, with the author's consent, from a consumer survey conducted by Dr. Eduardo Marzan.[20] The survey was conducted in Pampanga and Pangasinan where carabeef consumption is quite popular. Respondents were chosen on the basis of a random sample systematically selected by barrio. A total of 500 respondent households, 160 from San Fernando, Pampanga and 340 from Mangaldan, Pangasinan were interviewed personally.

The data collected included selected characteristics of the household such as level of income, household size, location or province, age of respondents, occupation, religion, educational attainment and ethnic background. Each of the households interviewed was requested to rank five food items--beef, carabeef, pork, chicken and fish--in order of preference, with rank 1 indicating most preferred and rank 5, least preferred. For this study, only continuous variables like family income, household size, age and location (province) were used as demographic characteristics to test whether they had any effect on the ranking of the above foods.

The observed average values, together with standard deviations and ranges by study area are shown in Table 1. The sample households in both

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[20]Eduardo G. Marzan, Jr., "Socio-Economic Factors and Marketability of Carabeef in Central Luzon" (Ph.D. dissertation, Kansas State University, 1981).

Table 1. MEAN, RANGE, AND STANDARD DEVIATION FOR STUDY VARIABLES

VARIABLES	AREAS[1]	MEAN	STANDARD DEVIATION	RANGE LOW	RANGE HIGH
Sample (N)	SF(1) 160 M (0) 340 TOT 500				
Household Size	SF	6.36	2.83	2.0	22.0
	M	6.36	2.60	2.0	16.0
	TOT	6.36	2.67	2.0	22.0
Family Income (₱1000)	SF	9.5	9.4	0.12	72.0
	M	11.4	10.3	0.96	98.3
	TOT	10.8	10.0	0.12	98.3
Respondent Age	SF	43.0	12.7	18.0	75.0
	M	43.4	14.4	17.0	81.0
	TOT	43.3	13.8	17.0	81.0
Rank Beef	SF	3.40	1.55	1.0	5.0
	M	2.99	1.40	1.0	5.0
	TOT	3.12	1.46	1.0	5.0
Rank Carabeef	SF	3.89	1.13	1.0	5.0
	M	2.62	1.37	1.0	5.0
	TOT	3.02	1.42	1.0	5.0
Rank Pork	SF	1.86	0.99	1.0	5.0
	M	2.03	0.94	1.0	5.0
	TOT	1.98	0.96	1.0	5.0
Rank Chicken	SF	2.43	1.04	1.0	5.0
	M	2.97	1.18	1.0	5.0
	TOT	2.79	1.16	1.0	5.0
Rank Fish	SF	3.43	1.24	1.0	5.0
	M	4.39	0.95	1.0	5.0
	TOT	4.08	1.14	1.0	5.0

[1] SF denotes San Fernando, Pampanga; assigned province code 1.
M denotes Mangaldan, Pangasinan; assigned province code 0.
TOT denotes total combined sample.

Source: Appendices I, II and III.

study areas indicate the highest preference rank for pork (SF = 1.86, M = 2.03, TOT = 1.98), followed in order by that for chicken (2.43, 2.97, 2.79), that for beef and carabeef (3.40, 2.99, 3.12; 3.89, 2.62, 3.02), and finally that for fish (3.43, 4.39, 4.08). The average size of household in the sample was 6.36 persons, with an extreme range of 2 to 22 persons. Disposable family income varied from 120 pesos to 98,300 pesos, with an overall mean of 10,800 pesos; average family income was 9,500 pesos for the San Fernando sample compared to 11,400 pesos for the Mangaldan sample. At about 43 years, the average age of respondents was about the same in the two areas, with an outside range of 17 to 81 years. Note that each of the five types of meat was given preference rankings all the way from 1 to 5 by some households in each of the two study areas (Table 1).

b) Method of Analysis

A computer package known as "Statistical Analysis System (SAS)" was used to summarize and analyze the data. In one easy-to-use system, SAS provides all the tools needed for data analysis such as information storage and retrieval, data modification and programming, report writing, statistical analysis and site handling.[21]

A SAS program step known as PROC CORR (meaning Procedure Correlation) was used to measure the strength of associations between the rank of each food item and the demographic characteristics. Differences in rank means for each food item were analyzed using a z-test at $\alpha = .05$. This test indicates whether the rank means for Pampanga (with 160 respondents) were

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[21] SAS User's Guide, 1979 edition, edited by Jane T. Helwig and Kathryn A. Council (North Carolina: SAS Institute Inc., 1979), p. 3.

statistically different from that of Pangasinan (with 340 respondents). A test of significance of the difference between two correlations of each continuous variable with the rank of each food items was also performed.

The regression models written using SAS format were in the forms:

RANKB RANKCB RANKP RANKCH RANKF=f(HH FAMIN AGE HHSQ FAMINSQ AGESQ HHFA HHAGE FAAGE PROV PROV*HH PROV*FAMIN PROV*AGE PROV*HHSQ PROV*FAMINSQ PROV*AGESQ PROV*HHFA PROV*HHAGE PROV*FAAGE)

where:

RANKB = Rank of Beef

RANKCB = Rank of Carabeef

RANKP = Rank of Pork

RANKCH = Rank of Chicken

RANKF = Rank of Fish

HH = Household Size

FAMIN = Family Income

AGE = Age of Respondents

HHSQ = Square of Household Size

FAMINSQ = Square of Family Income

AGESQ = Square of Age

PROV = Province

HHFA = Cross-product of Household Size and Family Income

HHAGE = Cross-product of Household Size and Age

FAAGE = Cross-product of Family Income and Age

The response variables were written on the left hand side of the equality sign, while the explanatory variables were on the right. There were in all 19 independent variables, consisting of 4 demographic characteristics and the interaction terms (2 and 3 factor terms).

The above functions were estimated using the PROC GLM (General Linear Models) of the SAS Program to examine the statistical relationships of the demographic characteristics and the interaction terms to the ranking of food preferences.

The particular technique used to determine which of these demographic characteristics had significant effects on the rankings was the Backward Elimination Method. This method began with the largest regression using all variables and subsequently reduced the number of variables in the equation until a decision was reached on what equation to use. The basic steps used in this method were as follows:

1] Elimination of the non-significant interaction terms[1] which contain Province (PROV) as a factor using the F-test.

2] Elimination of non-significant cross-product terms (product of 2 variables) but retention of those cross product-terms that appeared in the significant interaction terms mentioned in Step 1 (this was done to assure that SAS tested the correct hypothesis for the remaining interaction terms--mentioned in Step 1).

3] Elimination of the non-significant one-factor term that did not appear in the 2 or 3 factor terms which remained significant.

4] Estimation of beta values and other parameters using equations based on the remaining variables.

Note: If any term with province (PROV) as a factor in it remained significant, the PROV term was retained in the model whether it was significant or not for the same reason as in Step 2.

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[1]An interaction term is also called a cross product term. In the equation, $y = a + bX_1 + cX_1X_2$, the cross-product term is X_1X_2. This equation indicates the change in y due to a change in X_1 is not only a function of X_1 but also a function of X_2 (that is the change in y due to X_1 will also depend on the value of X_2). Thus the above equation could be written in this form, $y = a + (b + cX_2)X_1$. In this study, anything in the equation with PROV term included in the interaction term shows the change in y (dependent variable) due to any cross-product term is different from one province to another.

Chapter 5

RESULTS AND DISCUSSION

a) Correlation Coefficients

The correlation coefficient is a measure of the degree of closeness of the linear relationship between the two variables, but does not by itself imply any sort of causal relationship existing between them.[22] Whether the relationship is interpreted as a causal one should depend not just on the correlation of two variables but also on some rational link between them, i.e., the extent to which the relationship "makes sense" within some sort of conceptual framework.[23]

Findings show that a number of relationships existed between the rank of food items and demographic characteristics. Overall, the majority of correlation coefficients were low. Only those relationships with relatively high correlations and statistically significant values ($p \leq .10$) are presented (see Appendix I for details).

Relationships between the rank of each food item and specific demographic characteristics are presented in Table 2. Rank of beef showed a positive significant correlation with household size and province but was negatively correlated with family income. Recall that the higher the rank value, the lower the rank preference of respondents (page 13, above);

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[22]George W. Snedecor and William G. Cochran, "Correlations," Statistical Methods, 6th ed. (Ames: The Iowa State University Press, 1967), p. 173.

[23]John L. Phillips, Jr., Statistical Thinking (San Francisco: W.H. Freeman and Company, 1973), p. 46.

Table 2. CORRELATION COEFFICIENTS SHOWING LINEAR RELATIONSHIPS BETWEEN THE RANK OF FOODS (DEPENDENT VARIABLES) AND DEMOGRAPHIC CHARACTERISTICS

DEPENDENT VARIABLES	RELATIONSHIP TO DEMOGRAPHIC CHARACTERISTICS[1]	
	POSITIVE :	NEGATIVE
	(Coefficient/probability)	
Rank of Beef (RANKB)	Household size (.0937/.0361)	Family income (.0965/.031)
	Province (.1296/.0037)	
Rank of Carabeef (RANKCB)	Province (.4164/.0001)	
Rank of Pork (RANKP)		Household size (.0954/.0328)
		Province (.0827/.0646)
Rank of Chicken (RANKCH)		Province (.2177/.0001)
Rank of Fish (RANKF)		Age (.0924/.0388)
		Province (.3932/.0001)

[1] Based on 500 observations; statistical significance level ($p \leq .10$).

thus the preference for beef increases with family income and decreases with family size, other factors being constant, as one would expect. The positive correlation with province simply reflects the lower preference for beef (higher RANKB score) in Pampanga (province = 1) than in Pangasinan (province = 0), as shown in Table 1.

Rank of carabeef was not significantly related to household size nor family income, but was found to vary significantly by province.

The rank of pork had a slight negative correlation with household size and province, indicating a greater rank preference for pork by larger households, and by those in the San Fernando area.

Rank preference of chicken was not significantly correlated with family size, family income nor age, but was significantly greater in Pampanga than in Pangasinan.

The rank of fish had negative correlation with age and province indicating the greater rank preference (lower score) for fish by households with older respondents, and the households in the San Fernando sample.

Examination of the simple correlation matrix (Table 2a) shows that there were also some significant relationships between different ranks of foods. For example, rank of chicken had significant negative correlations with the rank of beef, the rank of carabeef and the rank of pork. Likewise, the rank of fish was negatively related to the rank of beef and the rank of carabeef. The signs of these coefficients followed from the rank ordering requested on the questionnaire.

Table 3 shows significant relationships of rank of each food item to demographic characteristics separately for Pampanga and Pangasinan. In the province of Pampanga, the five preference ranks had neither positive nor negative significant correlations with the variables, household size,

Table 2a. CORRELATION MATRIX[1]

[Correlation Coefficients (top) and Probability[2] (bottom) under the null hypothesis (Ho)]

	IIH	FAMIN	AGE	PROV	RANKB	RANKCB	RANKP	RANKCH	RANKF
IIH	-	.11886 (.0078)***	NS	NS	.09375 (.0361)**	NS	-.09548 (.0328)**	NS	NS
FAMIN	.11886 (.0078)***	-	NS	-.08962 (.0452)**	-.09650 (.031)**	NS	NS	NS	NS
AGE	NS	NS	-	NS	NS	NS	NS	NS	-.09243 (.0388)**
PROV	NS	-.08962 (.0452)**	NS	-	.12965 (.0037)***	.41634 (.0001)***	-.08272 (.0646)*	-.21774 (.0001)***	-.39324 (.0001)***
RANKB	.09375 (.0361)**	-.0965 (.0310)**	NS	.12965 (.0037)***	-	-.22576 (.0001)***	-.40410 (.0001)***	-.20407 (.0001)***	-.45062 (.0001)***
RANKCB	NS	NS	NS	.41643 (.0001)***	-.22576 (.0001)***	-	-.17429 (.0001)***	-.48077 (.0001)***	-.32111 (.0001)***
RANKP	-.09548 (.0328)**	NS	NS	-.08272 (.0646)*	-.40410 (.0001)***	-.17429 (.0001)***	-	-.13159 (.0032)***	NS
RANKCH	NS	NS	NS	-.21774 (.0001)***	-.20407 (.0001)***	-.48077 (.0001)***	-.13159 (.0032)***	-	NS
RANKF	NS	NS	-.09243 (.0388)**	-.39324 (.0001)***	-.45062 (.0001)***	-.3211 (.0001)***	NS	NS	-

[1] Including both provinces.

[2] Probability of the correlation coefficient being greater than some absolute value of R.

* Statistically significant ($p \leq .10$)
** Statistically significant ($p \leq .05$)
*** Statistically significant ($p \leq .01$)
NS Not significant

Source: Appendix I.

Table 3. CORRELATION COEFFICIENTS BY PROVINCE SHOWING LINEAR RELATIONSHIP BETWEEN THE RANK OF FOODS (DEPENDENT VARIABLES) AND DEMOGRAPHIC CHARACTERISTICS

DEPENDENT VARIABLES	RELATIONSHIP TO DEMOGRAPHIC CHARACTERISTICS[1]			
	POSITIVE		NEGATIVE	
	PAMPANGA	PANGASINAN	PAMPANGA	PANGASINAN
	(Coefficient/Probability)			
Rank of Beef (RANKB)	-	Household Size (.1595/.0032)	-	Family Income (.1202/.0266)
Rank of Carabeef (RANKCB)	-	Family Income (.1279/.0183)	-	-
Rank of Pork (RANKP)	-	-	-	Household Size (.1457/.0071)
Rank of Chicken (RANKCH)	-	-	-	-
Rank of Fish (RANKF)	-	-	-	Age (.1131/.0371)

[1] Statistical significance level ($p \leq .10$).

family income and age. By contrast, in Pangasinan all the ranks except rank of chicken had either positive or negative significant correlations with the demographic characteristics. The sample households in Pangasinan indicated that preference for beef increases with increased family income and decreases with family size, preference for carabeef decreases with increased family income, preference for pork increases with family size, and preference for fish increases with age. The lack of significant correlations for Pampanga in fact was due to the smaller sample size. Comparison of the correlation matrices for the two areas in Appendix II and Appendix III shows that the signs and general magnitude of the coefficients obtained for the two separate areas are comparable. Statistical significance test of the difference between the two correlations of rank of each food item with demographic characteristics in the two provinces indicated that the differences were not statistically different from zero. The conclusion is that the two samples are from the same population.

Table 3a shows the matrix of correlation coefficients between the three demographic characteristics and the five preference ranks of food for the Province of Pangasinan. Here, rank of chicken and rank of carabeef had the highest absolute correlations followed by correlations between rank of beef and rank of carabeef. There were also comparatively high correlations between rank of pork and rank of beef, and between rank of fish and rank of beef. In Pangasinan, rank of fish also had a relatively high negative correlation to rank of beef.

Comparable coefficients for the Pampanga sample households are shown in Table 3b. Here the highest absolute correlations were between rank of beef and rank of fish and between rank of beef and rank of pork. Relatively high correlations also were found between rank of carabeef and

Table 3a. CORRELATION MATRIX (Province of Pangasinan)

[Correlation Coefficients (top) and Probability[1] (bottom) under the null hypothesis (Ho)]

	HH	FAMIN	AGE	RANKB	RANKCB	RANKP	RANKCH	RANKF
HH	-	.16461 (.0023)**	NS	.15952 (.0032)***	NS	-.14576 (.0071)***	NS	NS
FAMIN	.16461 (.0023)***	-	NS	-.12027 (.0266)**	.1279 (.0183)**	NS	NS	NS
AGE	NS	NS	-	NS	NS	NS	NS	-.11311 (.0371)**
RANKB	.15952 (.0032)***	-.12027 (.0266)**	NS	-	-.39319 (.0001)***	-.38930 (.0001)***	-.12328 (.0230)**	-.36331 (.0001)***
RANKCB	NS	.12790 (.0183)**	NS	-.39319 (.0001)***	-	.15778 (.0035)***	-.47049 (.0001)***	-.11700 (.0310)**
RANKP	-.14576 (.0071)***	NS	NS	-.38930 (.0001)***	-.15778 (.0035)***	-	.15292 (.0047)***	NS
RANKCH	NS	NS	NS	-.12328 (.0230)**	-.47049 (.0001)***	-.15292 (.0047)***	-	-.23303 (.0001)***
RANKF	NS	NS	-.11311 (.0371)**	-.36831 (.0001)***	-.11700 (.0310)**	NS	-.23303 (.0001)***	-

[1] Probability of the correlation coefficient being greater than some absolute value of R.

** Statistically significant ($p \leq .05$)
*** Statistically significant ($p \leq .01$)
NS Not significant

Source: Appendix II.

Table 3b. CORRELATION MATRIX (Province of Pampanga)

[Correlation coefficients (top) and Probability[1] (bottom) under the null hypothesis (Ho)]

	HH	FAMIN	AGE	RANKB	RANKCB	RANKP	RANKCH	RANKF
HH	-	NS	NS	NS	NS	NS	NS	NS
FAMIN	NS	-	NS	NS	NS	NS	NS	NS
AGE	NS	NS	-	NS	NS	NS	NS	NS
RANKB	NS	NS	NS	-	NS	-.41463 (.0001)***	-.31272 (.0001)***	-.54472 (.0001)***
RANKCB	NS	NS	NS	NS	-	-.14891 (.0602)*	-.34981 (.0001)***	-.34147 (.0001)***
RANKP	NS	NS	NS	-.41463 (.0001)***	-.14891 (.0602)*	-	-.15752 (.0467)**	NS
RANKCH	NS	NS	NS	-.31272 (.0001)***	-.34981 (.0001)***	-.15752 (.0467)**	-	NS
RANKF	NS	NS	NS	-.54472 (.0001)***	-.34147 (.0001)***	NS	NS	-

[1] Probability of the correlation coefficient being greater than some absolute value of R.

* Statistically significant ($p \leq .10$)
** Statistically significant ($p \leq .05$)
*** Statistically significant ($p \leq .01$)
NS Not significant

Source: Appendix III.

rank of chicken and rank of carabeef and rank of fish. The correlation between rank of beef and rank of carabeef was negative but not significant.

b) Rank Analysis

The 500 respondents in the total sample ranked the different food items as follows: pork (1.98), chicken (2.79), carabeef (3.02), beef (3.12) and fish (4.08) (see Table 1). The ranking according to province resulted in slightly different preferences. The samples in Pampanga ranked them: pork (1.86), chicken (2.43), beef (3.40), fish (3.43) and carabeef (3.89). Those in Pangasinan preferred pork (2.03), then carabeef (2.62), followed by chicken (2.97), beef (2.99) and fish (4.39). Differences in rank means for each food item in the two provinces showed different results. The mean rank of beef for Pampanga was statistically different from that in Pangasinan. The same was true of the mean rank of carabeef. Carabeef was preferred more in Pangasinan than in Pampanga. The mean rank of pork for Pampanga was not statistically different from that for Pangasinan. The mean ranks of chicken and fish for Pampanga were statistically different from those for Pangasinan.

c) Regression for Rank of Beef

The full model of the rank of beef was

RANKB = f(HH FAMIN AGE HHSQ FAMINSQ AGESQ HHFA HHAGE FAAGE
PROV PROV*HH PROV*FAMIN PROV*AGE PROV*HHSQ PROV*FAMINSQ
PROV*AGESQ PROV*HHFA PROV*HHAGE PROV*FAAGE)

Not all of the independent variables were retained because not all variables explained the significant portion of the total variation due to Y. After removing the variables that were non-significant, the final model became

$$RANKB = 3.71 - .04\ HH - 1.47\ E\text{-}05\ FAMIN + .002\ HHSQ - 1.97\ PROV_0 + .395\ HH*PROV_0 - .019\ HHSQ*PROV_0;\ R^2 = 0.053;\ F = 4.57$$

Household size, family income, province and the other interaction terms were the only variables that had a statistically significant effect on the rank of beef. Table 4 indicates the probability of occurrence for these variables to be significant at $\alpha = .10$ level except those variables which should remain as explained in the methodology.

All coefficients of beta estimates except the variable family income were biased estimates and did not estimate the actual parameter. Thus the t-value test was not used in the analysis. The low value of R^2 indicates the equation has little value for predicting.

d) Regression for Rank of Carabeef

All demographic characteristics and their interaction terms except one (interaction of province, household size and family income) had no significant effect on the rank of carabeef in the full model at $\alpha = .10$. All estimates were biased so they did not estimate the actual parameters.

The final model is specified in the form

$$RANKCB = 3.86 - 3.27\ E\text{-}05\ FAMIN + 5.58\ E\text{-}06\ HHFA - 1.45\ PROV_0 + 5.79\ E\text{-}05\ FAMIN*PROV_0 - 6.59\ E\text{-}06\ HHFA*PROV_0;\ R^2 = .188;\ F = 22.94$$

These independent variables were the only ones left that had a statistically significant effect on the rank of carabeef (Table 5). The interaction of these variables had some effect on the rank of carabeef.

The coefficients of the estimates were all biased and thus could not be used to estimate the parameters. With an R^2 of only .188, one concludes there were unidentified factors affecting the rank of carabeef.

Table 4. VARIABLES THAT HAD SIGNIFICANT EFFECT ON THE RANK OF BEEF

VARIABLES	F-VALUE	PROBABILITY[1]
Household Size	3.49	0.0622
Family Income	5.12	0.0240
Square of Household Size	2.24	0.1355
Province	10.10	0.0016
Province and Household Size	5.69	0.0174
Province and Square of Household Size	3.55	0.0600

[1] Probability of a larger F-value under the null hypothesis (Ho).

Table 5. VARIABLES THAT HAD SIGNIFICANT EFFECT ON THE RANK OF CARABEEF

VARIABLES	F-VALUE	PROBABILITY[1]
Family Income	0.07	0.7906
Household Size and Family Income	1.41	0.2353
Province	63.78	0.0001
Province and Family Income	4.29	0.0389
Province, Household Size and Family Income	2.93	0.0878

[1] Probability of a larger F-value under the null hypothesis (Ho).

e) Regression for Rank of Pork

The estimates of the full model were all biased thus were not used to estimate the actual parameters. There were only four variables that were statistically significant. So after removing the non-significant variables, as explained in the procedures, the final model was

$$RANKP = 1.33 + .15\ HH + .0002\ AGESQ - .003\ HHAGE + .55\ PROV_0 - .064\ HH*PROV_0;\ R^2 = .04;\ F = 3.95$$

These were the variables which had some effect on the rank of pork. Table 6 summarizes the variables which influenced the preference level of pork. The estimates were all biased except for square of age and interaction of household size and age. The R^2 indicates there were several important predictive factors excluded from the model.

f) Regression for Rank of Chicken

The results of the full model were the same as for the other three rank models. The final model was in the form:

$$RANKCH = 2.43 + .54\ PROV_0;\ R^2 = .047;\ F = 24.78$$

Province was the only variable left which had a statistically significant effect on the rank of chicken. The estimates were still biased. The equation showed less explanation of the variation in the rank of chicken with its $R^2 = .047$.

g) Regression for Rank of Fish

As previously discussed in the four other ranks of food items, the estimates of the full model showed biased estimates thus could not be used to estimate the actual parameters.

The final model was as follows:

$$RANKF = 3.58 + 2.49\ E\text{-}05\ FAMIN - .008\ AGE + .94\ PROV_0 - 3.36\ E\text{-}10\ FAMINSQ;\ R^2 = .173;\ F = 26.02$$

Table 6. VARIABLES THAT HAD SIGNIFICANT EFFECT ON THE RANK OF PORK

VARIABLES	F-VALUE	PROBABILITY[1]
Household Size	4.79	0.0291
Square of Age	8.96	0.0029
Household Size and Age	7.96	0.0050
Province	5.75	0.0169
Province and Household Size	3.65	0.0565

[1] Probability of a larger F-value under the null hypothesis (Ho).

Table 7. VARIABLES THAT HAD SIGNIFICANT EFFECT ON THE RANK OF FISH

VARIABLES	F-VALUE	PROBABILITY[1]
Family Income	5.75	0.0169
Age	5.04	0.0253
Province	86.40	0.0001
Square of Family Income	5.00	0.0258

[1] Probability of a larger F-value under the null hypothesis (Ho).

Family income, age, province and the square of family income had a significant effect on the rank of fish. There were no three-variable interaction terms which were significant as indicated in Table 7. Most of the coefficients of estimates were biased except for family income, age, and family income squared. An increase in family income lowered the preference for fish. An increase in age was associated with higher preference for fish. The R^2 indicates that there were unidentified factors affecting the rank of fish.

Chapter 6

CONCLUSIONS AND RECOMMENDATIONS

a) Summary and Interpretation of Findings

The findings of this study indicate that there are demographic characteristics which have probable positive and negative effects on the preference ranking for different foods by households in Pampanga and Pangasinan, Philippines. As household size increased, the preference level for beef was found to be lower. Other things equal, larger families and those with lower incomes prefer food items other than beef. Preference for pork was found to be relatively high, and to increase as household size increases. Preference for fish was relatively low by the average household, but was found to be higher among older respondents. The rank preferences for carabeef and for chicken varied significantly between provinces, but were not significantly correlated with family size, family income nor age.

The significant negative correlations found between rank preferences for one food with such preferences for another are to be expected. Respondents who have a high preference rank for beef have a lower preference for substitute foods, and vice versa.

An overall test of significance of the difference between two correlations of each of the five ranks with demographic characteristics, in the Provinces of Pampanga and Pangasinan shows that differences between the two correlations were not significantly different from zero. This indicates that the sample households in the two provinces were from a common population in this respect.

Differences in rank means for each food item show different results. The four mean ranks--beef, carabeef, chicken and fish for Pampanga were all statistically different from those for Pangasinan. This means that people of Pangasinan ranked the four items differently than those from Pampanga. Only the mean rank of pork for Pampanga was not statistically different from that of Pangasinan. Respondents in both provinces indicate a higher mean preference for pork than for the other four commodities.

The homogeneity of the respondents' preference rankings in both provinces was tested. The null hypothesis of no differences in the mean ranks for each food item in Pampanga and Pangasinan was rejected at the .10 level of probability. Regression equations were not used for estimation because their estimates were not important for the main purpose of identifying the most influential factors. This study was not concerned with autocorrelation and the Durbin-Watson test since it was not based on time series data.

The demographic characteristics and the interaction terms that were identified in the final model of each rank had significant influence on the rank of food items. Household size had a significant effect on the way consumers ranked their preference for beef. The bigger the household, holding other factors constant, the more would consumers prefer less expensive food items to beef. Family income also was found to be one of the factors that influenced the ranking of beef. Income created both an opportunity and a restraint on what and how much could be bought. Thus, a consumer may rank a very much desired, but expensive food item, lower on his preference scale because the same money could buy several other needed food items. People with higher incomes can afford the better things in

life. In this case, they could afford to buy the most expensive meat which was beef.

Province may be considered one of the influences on the rank of beef. Province affected the consumers' preferences for food. Important differences in purchasing power of consumers were found among provinces. Pampanga and Pangasinan had different preference levels for beef. People of Pangasinan ranked preference for beef relatively higher than those of Pampanga.

Family income had an important effect on the rank of carabeef, especially in Pangasinan. An increase in family income lessened preference for carabeef. People with higher incomes indicated preference for other food items which they considered superior. On the basis of household size and income, small, high-income families could afford to buy more expensive meats like beef and pork. Large, low-income families tend to spend their money on other protein substitute foods such as carabeef. Province was an influencing factor. Because of larger continuous supply of carabeef, people of Pangasinan ate more carabeef. This was reflected by the higher preference in Pangasinan than in Pampanga, even though mean family incomes were lower in Pampanga.

Pork was the most preferred food item as shown by its mean rank. Size of household had a great effect on how people ranked foods. Bigger households indicated stronger preference for pork than smaller ones. Age of the household head had some negative effect on preference of pork. Most young people are meat eaters and usually pork is their favorite meat. Since often there are more young people in larger households, the positive effect of family size is logical. Preference patterns for pork were found to be very similar for Pampanga and Pangasinan; province was not much of

an influencing factor except through the interrelation with size of household.

Province was the only variable that influenced the preference level for chicken. Preferences of people depended very much on which province they came from. The two provinces had different preference ranks for chicken. People from Pampanga had a higher preference for chicken than those from Pangasinan, perhaps reflecting a more dependable supply of quality chicken.

Age of respondents and province were the only factors that significantly affected the preference for fish. As people grow older, their preference for meat declines and they prefer fish more than meat. They like fish since it is low in calories, and very easy to cook and eat because it is more tender than some meats. Fish preference was ranked slightly higher in Pampanga than in Pangasinan, perhaps because of more dependable supply. Although not statistically significant, an increase in family income showed a tendency to lower the preference for fish. This is usually true for Filipino families.

The socio-economic and demographic factors discussed interact in influencing the preference levels for high-protein foods. Consumers scale their preferences on the basis of these factors. As a result, it is hard to predict accurately consumer's preferences for such foods.

One point is clear. When consumers try to base their preferences for foods on so many interacting influences, their expressed preferences differ. No two consumers are likely to weigh all these considerations exactly the same way. The actual preference rank of each food varied among respondents from first to last. Several influencing factors, other than those identified in this study apparently are involved.

All of the five models yielded relatively low R^2 values, which means they are not useful for prediction purposes. However, this does not affect the validity of the results. The low R^2 values do suggest that there are some important unidentified factors which were excluded from the study. However, the study shows the relationships and influences of certain demographic characteristics on the ranking of food items, and the findings are supported by theoretical concepts of consumer preferences.

b) Comparison with Findings of Previous Studies

Comparing this study with previous studies for the Philippines is difficult because no other study has, to the knowledge of the author, considered rank of food preferences as the dependent variable; other studies have used consumers' purchases and consumer expenditures for meat as dependent variables.

This study used a model resembling the model employed by Richard Lund, but the response variables were different. Lund's study employed several socio-economic attributes of households as factors influencing consumer demand for meat items. In this study, household size, family income, age of respondents, province and interaction terms were taken as factors influencing the rank of food preferences rather than the volume of demand or consumption expenditure for specific commodities.

c) Recommendations

Findings of this study may serve as a guide to producers in planning production to meet the needs and to satisfy the wants of consumers. A demographic and economic analysis of this kind which shows factors influencing the rank of food preferences is capable of yielding direct applications for marketing strategy. The demographic characteristics and

interaction terms which had a significant effect on the rankings can be helpful to marketing people. They may be able to concentrate more on those specific factors that influenced the preferences of consumers for the particular food item of interest to them.

This study is not useful for prediction purposes since all the models had relatively low R^2 values indicating other relevant variables were left out. However, the regression equations are still useful and could be used to guide further research on consumer preferences.

If similar studies are conducted in the future, factors like the functional, physiological values of food and socio-psychological values (lifestyle, status, aesthetics) could be included. Other important factors that influence a person's scale of preferences for a particular food item are subjective satisfaction, consumer needs, knowledge and information about foods, availability of foods, attitudes related to use, and price of food items. Perceived subjective satisfaction is important because it considers the emotional make-up of the consumer during the ranking process. Need is an important consideration to the consumer in scaling preferences. A certain proportion of our income must always go to fulfill our physical needs for nutritious foods to maintain health. The importance of relative prices rest on its effect on consumers' income and on its substitution effects. Consumers may wish to rank many food items high on their preference list, but the price of these preferred items makes it prohibitive.

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APPENDICES

APPENDIX I

S T A T I S T I C A L A N A L Y S I S S Y S T E M 8:48 MONDAY, FEBRUARY 22, 1982 1

VARIABLE	N	MEAN	STD DEV	SUM	MINIMUM	MAXIMUM
HH	500	6.36000000	2.67145529	3180.0000000	2.00000000	22.00000000
FAMIN	500	10829.91400000	10043.16916777	5414957.0000000	120.00000000	98280.00000000
RANKB	500	3.12400000	1.46181317	1562.0000000	1.00000000	5.00000000
RANKCB	500	3.02400000	1.42389570	1512.0000000	1.00000000	5.00000000
RANKP	500	1.97800000	0.95882986	989.0000000	1.00000000	5.00000000
RANKCH	500	2.79400000	1.16373216	1397.0000000	1.00000000	5.00000000
RANKF	500	4.08000000	1.14377289	2040.0000000	1.00000000	5.00000000
AGE	500	43.27800000	13.82182338	21639.0000000	17.00000000	81.00000000
PROV	500	0.32000000	0.46694333	160.0000000	0	1.00000000

CORRELATION COEFFICIENTS / PROB > |R| UNDER HO:RHO=0 / N = 500

	HH	FAMIN	RANKB	RANKCB	RANKP	RANKCH	RANKF	AGE	PROV
HH	1.00000 0.0000	0.11886 0.0078	0.09375 0.0361	0.01511 0.7361	-0.09548 0.0328	-0.04249 0.3430	-0.01535 0.7321	0.00119 0.9788	0.00064 0.9886
FAMIN	0.11886 0.0078	1.00000 0.0000	-0.09650 0.0310	0.05017 0.2620	-0.02315 0.6056	0.00752 0.8660	0.07263 0.1048	-0.01043 0.8161	-0.08962 0.0452
RANKB	0.09375 0.0361	-0.09650 0.0310	1.00000 0.0000	-0.22576 0.0001	-0.40410 0.0001	-0.20407 0.0001	-0.45062 0.0001	0.00851 0.8495	0.12965 0.0037
RANKCB	0.01511 0.7361	0.05017 0.2620	-0.22576 0.0001	1.00000 0.0000	-0.17429 0.0001	-0.48077 0.0001	-0.32111 0.0001	0.01025 0.8192	0.41643 0.0001
RANKP	-0.09548 0.0328	-0.02315 0.6056	-0.40410 0.0001	-0.17429 0.0001	1.00000 0.0000	-0.13159 0.0032	0.02902 0.5174	0.03570 0.4258	-0.08272 0.0646
RANKCH	-0.04249 0.3430	0.00752 0.8660	-0.20407 0.0001	-0.48077 0.0001	-0.13159 0.0032	1.00000 0.0000	-0.04782 0.2859	0.03820 0.3940	-0.21774 0.0001
RANKF	-0.01535 0.7321	0.07263 0.1048	-0.45062 0.0001	-0.32111 0.0001	0.02902 0.5174	-0.04782 0.2859	1.00000 0.0000	-0.09243 0.0388	-0.39324 0.0001
AGE	0.00119 0.9788	-0.01043 0.8161	0.00851 0.8495	0.01025 0.8192	0.03570 0.4258	0.03820 0.3940	-0.09243 0.0388	1.00000 0.0000	-0.01195 0.7898
PROV	0.00064 0.9886	-0.08962 0.0452	0.12965 0.0037	0.41643 0.0001	-0.08272 0.0646	-0.21774 0.0001	-0.39324 0.0001	-0.01195 0.7898	1.00000 0.0000

APPENDIX II

S T A T I S T I C A L A N A L Y S I S S Y S T E M 8:48 MONDAY, FEBRUARY 22, 1982 2

PROV=0

VARIABLE	N	MEAN	STD DEV	SUM	MINIMUM	MAXIMUM
HH	340	6.35882353	2.59919634	2162.0000000	2.00000000	16.00000000
FAMIN	340	11446.75294118	10300.63789863	3891896.0000000	960.00000000	98280.00000000
RANKB	340	2.99411765	1.39952398	1018.0000000	1.00000000	5.00000000
RANKCB	340	2.61764706	1.36571387	890.0000000	1.00000000	5.00000000
RANKP	340	2.03235294	0.94173022	691.0000000	1.00000000	5.00000000
RANKCH	340	2.96764706	1.18077535	1009.0000000	1.00000000	5.00000000
RANKF	340	4.38823529	0.95124967	1492.0000000	1.00000000	5.00000000
AGE	340	43.39117647	14.35608815	14753.0000000	17.00000000	81.00000000

CORRELATION COEFFICIENTS / PROB > |R| UNDER HO:RHO=0 / N = 340

	HH	FAMIN	RANKB	RANKCB	RANKP	RANKCH	RANKF	AGE
HH	1.00000 0.0000	0.16461 0.0023	0.15952 0.0032	-0.01442 0.7911	-0.14576 0.0071	-0.05003 0.3577	-0.00759 0.8891	-0.03785 0.4867
FAMIN	0.16461 0.0023	1.00000 0.0000	-0.12027 0.0266	0.12790 0.0183	-0.03149 0.5628	0.00879 0.8717	0.01358 0.8030	-0.01361 0.8026
RANKB	0.15952 0.0032	-0.12027 0.0266	1.00000 0.0000	-0.39319 0.0001	-0.38930 0.0001	-0.12328 0.0230	-0.36831 0.0001	0.01215 0.8233
RANKCB	-0.01442 0.7911	0.12790 0.0183	-0.39319 0.0001	1.00000 0.0000	-0.15778 0.0035	-0.47049 0.0001	-0.11700 0.0310	0.00690 0.8991
RANKP	-0.14576 0.0071	-0.03149 0.5628	-0.38930 0.0001	-0.15778 0.0035	1.00000 0.0000	-0.15292 0.0047	-0.00089 0.9869	0.00561 0.9180
RANKCH	-0.05003 0.3577	0.00879 0.8717	-0.12328 0.0230	-0.47049 0.0001	-0.15292 0.0047	1.00000 0.0000	-0.23303 0.0001	0.06427 0.2373
RANKF	-0.00759 0.8891	0.01358 0.8030	-0.36831 0.0001	-0.11700 0.0310	-0.00089 0.9869	-0.23303 0.0001	1.00000 0.0000	-0.11311 0.0371
AGE	-0.03785 0.4867	-0.01361 0.8026	0.01215 0.8233	0.00690 0.8991	0.00561 0.9180	0.06427 0.2373	-0.11311 0.0371	1.00000 0.0000

APPENDIX III

S T A T I S T I C A L A N A L Y S I S S Y S T E M 8:48 MONDAY, FEBRUARY 22, 1982 3
PROV=1

VARIABLE	N	MEAN	STD DEV	SUM	MINIMUM	MAXIMUM
HH	160	6.36250000	2.82728730	1018.0000000	2.00000000	22.00000000
FAMIN	160	9519.13125000	9369.60241541	1523061.0000000	120.00000000	72300.00000000
RANKB	160	3.40000000	1.55486657	544.0000000	1.00000000	5.00000000
RANKCB	160	3.88750000	1.13263482	622.0000000	1.00000000	5.00000000
RANKP	160	1.86250000	0.90726163	298.0000000	1.00000000	5.00000000
RANKCH	160	2.42500000	1.03735270	388.0000000	1.00000000	5.00000000
RANKF	160	3.42500000	1.24157538	548.0000000	1.00000000	5.00000000
AGE	160	43.03750000	12.65154054	6886.0000000	18.00000000	75.00000000

CORRELATION COEFFICIENTS / PROB > |R| UNDER HO:RHO=0 / N = 160

	HH	FAMIN	RANKB	RANKCB	RANKP	RANKCH	RANKF	AGE
HH	1.00000 0.0000	0.02329 0.7700	-0.02032 0.7987	0.08941 0.2609	-0.00231 0.9769	-0.02927 0.7133	-0.02983 0.7081	0.08806 0.2682
FAMIN	0.02329 0.7700	1.00000 0.0000	-0.01470 0.8536	0.00852 0.9140	-0.02944 0.7117	-0.06872 0.3879	0.09147 0.2500	-0.00606 0.9394
RANKB	-0.02032 0.7987	-0.01470 0.8536	1.00000 0.0000	-0.12785 0.1072	-0.41463 0.0001	-0.31272 0.0001	-0.54472 0.0001	0.00595 0.9405
RANKCB	0.08941 0.2609	0.00852 0.9140	-0.12785 0.1072	1.00000 0.0000	-0.14091 0.0602	-0.34981 0.0001	-0.34147 0.0001	0.04550 0.5678
RANKP	-0.00231 0.9769	-0.02944 0.7117	-0.41463 0.0001	-0.14091 0.0602	1.00000 0.0000	-0.15752 0.0467	-0.00847 0.9154	0.10263 0.1966
RANKCH	-0.02927 0.7133	-0.06872 0.3879	-0.31272 0.0001	-0.34981 0.0001	-0.15752 0.0467	1.00000 0.0000	0.00049 0.9951	-0.04004 0.6152
RANKF	-0.02983 0.7081	0.09147 0.2500	-0.54472 0.0001	-0.34147 0.0001	-0.00847 0.9154	0.00049 0.9951	1.00000 0.0000	-0.09712 0.2218
AGE	0.08806 0.2682	-0.00606 0.9394	0.00595 0.9405	0.04550 0.5678	0.10263 0.1966	-0.04004 0.6152	-0.09712 0.2218	1.00000 0.0000

THE EFFECTS OF DEMOGRAPHIC CHARACTERISTICS ON THE RANKING OF FOOD PREFERENCES IN PAMPANGA AND PANGASINAN, PHILIPPINES

by

JOCELYN F. CATAPUSAN

B.S.A.B., University of the Philippines at Los Baños, 1978

AN ABSTRACT OF A MASTER'S REPORT

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requirements for the degree

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Department of Economics

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Manhattan, Kansas

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The main objective of this study was to examine the relationship of demographic characteristics to the ranking of food preferences such as beef, carabeef, pork, chicken and fish. The specific objectives were: (1) to test whether there was a statistically significant relationship between demographic characteristics and rank of food preferences; (2) to determine the coefficients of different relationships; (3) to identify the nature of the most important relationships; and (4) to relate socio-economic implications to market development and consumer education.

The data used in this study were obtained from a consumer survey conducted by Dr. Eduardo Marzan. A total of 500 randomly-selected respondents from Pampanga and Pangasinan provinces were interviewed personally. Variables like family income, household size, age and province were used as demographic characteristics to test whether they had any effect on the ranking of food preferences for five commodities.

Correlation analysis was used to measure the strength of associations between the rank of each food item and the demographic characteristics. For each rank of food items, there were demographic characteristics which had either positive or negative relationships. An overall test of significant difference between two correlations of each of the five ranks with demographic characteristics in each province showed that differences in the two correlations were not significantly different from zero, indicating that the two province samples represent the same population.

Differences in rank means for each food item showed different results. The four mean ranks for beef, carabeef, chicken and fish for Pampanga were all statistically different from those in Pangasinan. Only the mean rank of pork for Pampanga was not statistically different from

that of Pangasinan. People from both provinces expressed greatest preference for pork.

The Backward Elimination Method was used to determine which of these demographic characteristics had significant effects on the ranking at $\alpha = .10$. Household size, family income, province and interaction terms like province with household size were the only variables that had significant effects on the rank of beef. Province, family income, and interaction of province with family income and household size had significant effects on the rank of carabeef. The demographic characteristics (household size, age and province), and interaction terms like province-household size and household size-age were statistically significant for the rank of pork. Province was the only variable which had a significant effect on the rank of chicken. Family income, age and province had significant effect on the rank of fish.

Results of the regression analysis indicate that all five models had low R^2 values, implying that the equations are not good for prediction purposes. It suggests that there probably are some unidentified factors which were excluded in the study. However, the results indicate important relationships between selected demographic characteristics and the preference ranking of alternative high-protein food items.