

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

A MASTER'S REPORT

submitted in partial fulfillment of the

requirements for the degree

MASTER OF SCIENCE

Agricultural Economics

Department of Economics

KANSAS STATE UNIVERSITY
Manhattan, Kansas

1982

Approved by:



Major Professor

Spec
Coll.
LD
2668
R4
1982
C37
C2

A11202 247269

ACKNOWLEDGMENTS

The author wishes to express sincere appreciation to the Integrated Agricultural Production and Marketing Program (IAPMP) in providing the scholarship.

Acknowledgments and sincere thanks are due Dr. Joe W. Koudele, major professor, for his valuable suggestions and constructive criticisms in the preparation of this report.

The author also wishes to express her gratitude to Drs. Richard Phillips and Arlin Feyerherm for serving as members of her graduate committee. Their comments and suggestions were very useful in the completion of this report.

I also express my gratitude to Dr. Eduardo Marzan of Central Luzon State University for letting me use the data from his study.

My deepest appreciation is extended to Vannia Samaranayake ("Sam") and other close friends for providing the assistance during the study.

My most special gratitude is reserved for Roel, for providing the much needed moral support, encouragement, and love.

I wish to thank the Almighty God for His blessings and guidance.

To my dear parents, Mr. Gorgonio T. Catapusan and Mrs. Justa F. Catapusan and loving sister, Leny, this piece of work is heartily dedicated.

ILLEGIBLE DOCUMENT

**THE FOLLOWING
DOCUMENT(S) IS OF
POOR LEGIBILITY IN
THE ORIGINAL**

**THIS IS THE BEST
COPY AVAILABLE**

TABLE OF CONTENTS

	Page
ACKNOWLEDGMENTS	ii
Chapter	
1. INTRODUCTION	1
a) Nature of the Study	1
b) Objectives	2
2. THEORETICAL FRAMEWORK	4
a) Theory of Consumer Demand	4
b) The Household Decision-Making Concept	6
3. REVIEW OF LITERATURE	8
a) A Review of Related Empirical Studies	8
b) Consumer Demand and Preferences	10
4. RESEARCH METHODOLOGY	13
a) Data for Analysis	13
b) Method of Analysis	15
5. RESULTS AND DISCUSSION	18
a) Correlation Coefficients	18
b) Rank Analysis	26
c) Regression for Rank of Beef	26
d) Regression for Rank of Carabeef	27
e) Regression for Rank of Pork	29
f) Regression for Rank of Chicken	29
g) Regression for Rank of Fish	29
6. CONCLUSIONS AND RECOMMENDATIONS	32
a) Summary and Interpretation of Findings	32
b) Comparison with Findings of Previous Studies	36
c) Recommendations	36
SELECTED BIBLIOGRAPHY	38
APPENDICES	40

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.

¹Integrated 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.

²Rosario 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:

³B. 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

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

be an indicator of the consumer's preferences, where $(X_1, X_2 \dots X_n)$ 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 Concept⁴

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

⁴E. 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

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

⁶David 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}

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

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

⁹R.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).

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

¹¹W.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

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

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

¹⁴Gill, 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

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

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

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

¹⁸National 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

¹⁹National 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

²⁰Eduardo 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	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 (P1000)	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

²¹SAS 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 terms¹ 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.

¹An 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);

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

²³John 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,