TEXAS' CHILI: A SPATIAL ANALYSIS OF FOOD PREFERENCE

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PREFACE

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My parents have given me encouragement and moral support throughout academic life. For this I am thankful.

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CHAPTER I

INTRODUCTION

The cultural geography of human activities is a traditional branch of geography, and to some people it is the essence of geography. Cultural geographers study a variety of topics including the various customs, costumes, building types, languages, agriculture, and foods of people throughout the earth. These topics are not only interesting, but can be economically important in today's commercialized world.

There are five implicit themes in cultural geography. These are culture, cultural area, cultural landscape, culture history, and cultural ecology (Wagner, 1962, p.1). The study of the cultural trait of food preferences is tied to each of these themes. Food can be distinctive in each cultural area and influence the landscape with regard to the resulting agriculture. Restaurants, food festivals, chili cookoffs and other food establishments and events are also part of the cultural landscape. Cultural landscape is the imprint of man on the natural landscape. By tracing a peoples' food history one can learn more about their culture history. Foods and food preferences may indicate where the people have lived and with what other people they have interacted. This

diffusion of foods is an important part of culture history. Cultural ecology considers the interrelationships between humans as culture bearers and the natural environment. This thesis is concerned with the geography of food preference in a distinct cultural area.

Food, then, is an important component of culture and cultural geography. Food preference and consumption contain important geographical information such as which groups of people have interacted in the past, where cultural groups are located and to where they have moved. Foods and food preferences also help us to understand how a culture has evolved and what has influenced it.

Food is interrelated with other cultural traits. One of these is the well-known tie between food and religion. People often eat what their religion dictates they should eat. Agriculture is influenced by food preferences. People usually cultivate food crops, as opposed to cash crops, that they consume after harvest. Language often contains illusions to food. For example, "she was the apple of her mother's eye." Terms of endearment often involve food, such as calling a loved one "honey." Customs are often linked to food. One example of this is the English social custom of afternoon "tea."

Food habits can indicate the history and historical location of a group of people. For example, some of the foods stereotypically associated with black Americans are originally from Africa and may have come to the United

States with them. An example of this is the watermelon (Sauer, 1952, p.35). Another example is of Marco Polo bringing tea to Europe from China. History shows the introduction of tea to Europe corresponds with European exploration of the Far East.

America is such a mobile society now that the people eat a variety of foods. Fast food is common throughout the United States. Some foods formerly considered regional, for example fried chicken, are now popular throughout the country as a result of fast food marketing chains. Americans may acquire food habits from each of the places they have lived. Regional foods such as grits in the South, Boston baked beans in New England, and crawfish in the Cajun area of Louisiana have been added to diets outside the original regions. Foodways in America are less associated with cultural boundaries than they used to be but are still used to identify multi-feature cultural regions.

Although the geography of food and food preferences is a subject often neglected by geographers, it is one which touches our daily lives. Food is essential for life itself. Groups of people become accustomed to eating certain foods and gain a preference for them. When a group migrates, it usually takes its food habits along so it can eat at least some familiar foods when it arrives at its destination (Kariel, 1972, p.91). Food habits do, however reflect the culture, the environment, and the technological advancement of people (Grivetti, 1978,

p.171). The culture, especially religion, can dictate what foods are to be eaten. Examples include the Jewish law against eating pork and the Hindus' avoidance of beef. This partially explains why people do not eat every type of food that is available to them. The natural environment partially affects what foods are available and what types are practical for consumption. For example, Eskimos in cold climates consume more fatty foods for energy. It also happens that these foods are more readily available to Eskimos than are those high in carbohydrates such as wheat. Technological advances have helped farmers produce hybrid plants, some of which are able to withstand more harsh conditions than the native versions. It has also made importation of non-native foods possible, through the use of refrigeration and speedy transporttion. Food affects many aspects of life, therefore, it is both logical and necessary that human geographers should study both food and food habits.

Food preferences can be important for group identity (Brown, 1984, p.7). Within the United States there has been a recent emphasis on Mexican foods. This is probably due to Mexico's adjacency and the influx of Mexicans into the United States. Non-Mexicans sometimes consider any food with hot pepper to be Mexican in origin. Hot peppers are an essential ingredient in most Mexican cooking and are considered the single most identifiably Mexican ingredient in cooking. The ability to tolerate exceptionally hot peppers sometimes acts as an important

symbol of group identification for Mexican Americans (Fellows, 1972, p.51). Perhaps no single trait of material culture is so highly charged with emotion as this one (Edmonson, 1957, p.21). Hot peppers are also essential ingredients in a main dish called "chili." Chili has been a source of unity and pride for Texans as they sometimes boast about how hot they like their chili.

Hot chile peppers are native to the western hemisphere. The common name for them comes from the Aztec word "quauhchilli" which the Spanish shortened to "chile" and Anglos call "chili" (Coleman, 1949, p.102). In the country of Chile, hot peppers are known by the Incan name of "aji" (Verrill, 1937, p.230). In this study, "chile" will be used to refer to the hot pepper, while "chili" and "chili con carne" will be used to refer to the main dish that uses that fiery vegetable. "Chili con carne" is Spanish for "chile with meat." "Chili" is considered to be a shortened name for the dish and will be used interchangeably.

Chile peppers of the species Capiscum frutenscens belong to the same family as tomatoes and potatoes (Verrill, 1949, p.230). Eggplant is another member of this diverse Solanaceae family (Brody, 1983, p.6). These peppers, of which there are many varieties, were first cultivated in parts of South and Central America between 5000 and 7000 B.C. (Bernal, 1968, p.31). In 1493, Columbus introduced the chile pepper to Europe (Bassett, 1982, p.3). This may have been Columbus' most important

discovery in the eyes of some Europeans, since it was spices that he had intended to bring back.

Chile peppers come in many degrees of hotness and are used in cooking raw, cooked in sauces, dried and used as flavoring, stuffed and fried. They are very nutritious and are good sources of Vitamin A and C, niacin and iron. They are said to stimulate the flow of digestive juices which aids digestion (Devore, 1978, p.242). They have been used to stimulate the appetite of horses. Chiles dilate the blood vessels which increases blood circulation and helps the consumer feel cooler through perspiration. Study is now underway with regard to their use as anticoagulents (Bassett, p.3).

When eating food that is too hot with spice, many people drink water-based liquids such as tea or beer. Capsaicin, the chemical source of the heat, is insoluable in water, so water-based liquids may displace it to the stomach but do not neutralize it. Dairy products, however, do partially neutralize capsaicin. This indicates the most logical liquids to drink with chili are milk and buttermilk. Ice cream makes an excellent desert (Dewitt, 1984, p.14).

Chili usually contains beef, hot chile peppers or powder for seasoning, other seasonings, usually tomatoes and the most common beans used are pinto or kidney (Clark, 1970, p.59. It is served heated, in a bowl, and usually with crackers. Although it is a simple dish there are nearly as many chili recipes as there are chili cooks as

the subtle blend of several varieties of chiles and other spices drives them to experiment (Dewitt, 1984, p.5). This gives rise to numerous chili cookoffs held annually across the United States. The "secret ingredients" used in these cookoffs range from exotic meat to beer.

The History of Chili

The history of chili is shrouded in mystery. Indeed, it is such a simple food that to say one person invented chili may be comparable to saying one person invented the spoon. One theory is that chili is an example of concurrent invention.

The Mexicans and the Native Americans before them have used the chile peppers in so many ways they are sometimes given credit for inventing chili con carne. This is doubtful because if chili had come from one of these groups of people it would probably still be used by them. These people seldom change their culinary customs (Tolbert, 1972, p.33). Mexicans do not claim chili as their native dish.

Some believe that Native Americans invented chili by mixing chile peppers with meat when they dried it. They would later make a "stew" from the mixture. Related to this is the legend that a Spanish nun, Sister Mary of Agreda, first wrote down the recipe in the 1620's (Tolbert, 1972, p.37). Sister Mary never traveled outside Spain, but she experienced death-like trances. When she came out of them she would report that she had been

working among the unsocialized natives in a far away land. During the same period there were reports by Native Americans of a white woman who came to teach them. She was said to wear blue robes which corresponded with the color of Sister Mary's habit (Tolbert, 1972, p.37). There is, however, no reliable documentation of a white woman working among the Native Americans during that time period.

Yet another theory is that chili was invented by chuckwagon cooks to add variety to their menus on cattle drives in Texas. Beans were added only at the end of the drive in order to stretch the serving capacity. Native hot peppers may have first been used when the cooks ran out of black pepper. Wolf Brand Chili dates the invention of its chili to 1885 and says it was invented on a ranch (Associated Press, 1984). This chili was first sold in brick form.

Perhaps the most accepted theory is that chili was invented in San Antonio sometime after the Civil War (Root, 1976, p.278). It is believed that although by 1842 Mexican dishes were popular in Southern cities, chili con carne (Spanish for "chile with meat") was yet to be invented (Root, 1976, p.278). However, by 1895 it was observed that "chili con carne was always on sale in San Antonio" (Bourke, 1895, p.60). Chili was commonly sold by "chili queens" who were Mexican women with carts containing cauldrons of hot chili (Tolbert, 1972, p.34). They sold their wares mainly at night and were gaily

dressed and usually carried large ornate lamps to light their serving areas. Health regulations forced them to stop, but not until 1943 (Tolbert, 1972, p.36).

Chili became more convenient to make and therefore more popular after chili powder was invented. Many sources credit a German-American, William Gebhardt, in New Braunfels with being the inventor, but a few believe DeWitt Clinton Pendery of Fort Worth was the first (Tolbert, 1972, p.62). In any case, it is known that Gebhardt developed a chili powder by 1900 and started canning chili around 1911 (Root, 1976, p. 278). The main emphasis of this powder is the chili-generated heat. One powder is even referred to with fire fighter terms such as "one alarm" and "two alarm," depending upon its heat. There is also one called "false alarm" which contains no hot pepper at all (Root, 1976, p. 278).

Chili has an image of being a "poor folks'" food. This is probably because of its simplicity as well as the fact it was a standard jail house entree in Texas by 1890 (Tolbert, 1972, p.45). It has been a common food for army troops as well. During the Great Depression chili was served with regularity (Bridges, 1982, p.46). Chili started its rise to respectability when native Texan Lyndon B. Johnson became President. Johnson may be responsible for chili first being served in the White House and on Air Force One.

Chili now challenges apple pie as the culinary symbol of America. It has become not only socially acceptable

but upwardly mobile (Johnson, 1981, p.144). In 1983 chili fans lobbied the United States Congress to declare chili the national dish. The effort failed. The leaders of the bi-partisan movement argued that: Chili is an indigenous American dish created and refined in the United States, it enjoys almost universal popularity, and it has nourished millions of Americans economically since its inception (New York Times, 1983, sec C p.11). It is a mystery how this hearty, plebian stew became the object of such zealotry (Span , 1982, p. 14). Research indicates that one of the substances in chiles, capsaicin, may actually be addictive (Bassett, 1882, p.3).

Because of its seasoning, chili is often thought of as a Mexican food. More accurately it is a cross-bred maverick from Texas (Clark, 1970, p.107). Perhaps the best name for it is Tex-Mex, or simply Texas food, because it originated in Texas and has become the official state dish. Military service gave many men their first taste of chili. This is undoubtedly one factor contributing to the spreading popularity of the dish, not only in the United States, but in the areas overseas where the service men are stationed (Bridges, 1982, p.48). As chili diffused from its cultural hearth in the American Southwest, the recipes changed. Today, many ingredients are found in chili besides meat and chili powder of the original Texas recipe.

Almost since the invention of chili, there has been a controversy over the ingredients used. Beans have been

perhaps the most controversial ingredient. One "chilihead," a person with an almost irrational fondness for chili, wrote a song titled "If You Know Beans About Chili, You Know That Chili Has No Beans" (Bridges, 1982, p.68). The song is a tradition at the annual chili cook-off at Terlingua, Texas. Most Texans are thought to favor "plain" chili. Other areas of the country may put any of a wide range of ingredients in the dish. Cinnamon flavored chili with spaghetti is common. People in Illinois favor vegetables such as corn in their chili (Bridges, 1982, p. 25), and Californians, often on the culinary frontier, put mushrooms, olives, Japanese garlic, leeks, and even avocado in their chili (Bridges, 1982, p.51).

Thus, chili is truly American. It was invented in the Southwest and native ingredients are used in its preparation. It has diffused throughout the United States and to many parts of the world. Local ingredients have been added along the way, but it has retained its basic distinctive flavor.

History of the Chili Industry

Many theories exist about the invention of chili, but the history of the chili industry is more easily documented. One of the best known Texas chili mixes is "Wick Fowler's." Fowler has been a frequent participant in the annual International Chili cookoff. This is the

one held at Terlingua, Texas, mentioned previously. Fowler's cookoff fame led to the founding of his company. "Wick Fowler's Famous 2-Alarm Chili" is based in Austin, Texas, but sells its product nation wide.

With regard to canned chili, the Hormel Company is the national leader. This product was first developed in 1930. The company currently has three facilities which manufacture Hormel Chili Products. These are located in Beloit, Wisconsin, Stockton, California, and Atlanta, Georgia. The same recipe or formula is used at all three plant locations. Hormel chili products are distributed and available for retail sale in all 50 states.

The nation's second leading chili producer is Wolf Brand Products of Dallas, Texas. Wolf Brand is the leading canned chili manufacturer in the Southwest, where chili originated. The original Wolf Brand recipe was developed in 1895 by Lyman T. Davis, the offical company founder, and an unidentified ranch cook. Their chili was first sold from the back of a wagon for five cents a bowl. Later it was dried and sold in brick form.

In the early 1920's Davis began canning his popular product. It was first known as Lyman's Famous Homemade Chili, but later his pet wolf, Kaiser Bill, was used on the label. Since then, the chili has been known as "Wolf Brand."

By 1923 production had outgrown its original location and machinery was installed making it possible to produce 2,000 cans of chili a day. The 1920s saw tremendous

growth for the company. Salesmen sold the product throughout the Southwest in "wolfmobiles," which were cars shaped like a can of chili and contained a caged wolf in the back. By 1927 the factory had the capacity to put out 8,000 cans per day, but were still constantly behind in filling orders. By 1957 Wolf Brand was the leading canned chili manufacturer in the Southwest and the second in the nation. That year it became part of the Quaker Oats family, and in 1985 it was moved from its original home in Corsicana to Dallas.

Canned chili is the largest category and also the fastest growing of all canned meats. In 1983, 235 million pounds were produced. Chili's share of the canned meat industry hovers around 9%. National sales in 1976 were estimated at + 3.5%, with a value of approximately $107 million at retail.

Per capita consumption of chili in Texas and the Southwest is the highest in the United States. Texas with 5.5% of the population, accounts for 14% of the total national chili volume and 18% of the dollar sales. Hormel is number one nationally with 20.3% of chili sales dollars, and Wolf is number two with 14.6%.

Purpose

The purpose of this thesis is to increase geographical knowledge in the area of food preference. Specifically, the chili cultural hearth of Texas was

studied to determine the spatial variation of chili preference and to determine if preferences have changed from the original "bowl of red." To do this a questionnaire about chili was administered to geography students at universities in Texas.

Importance of the Study

The geographic cupboard is almost bare with regard to serious work on what people eat and drink as well as preferences within the United States (Zelinsky, 1973, p.150). Although the United States is one country, it has many place to place differences in human preference. As culture in general varies over the United States landscape so does food preference. By identifying the preference patterns of a regionalized food such as chili, one can better understand how foodways change.

The chile pepper industry is growing. In 1981 over six million tons of chile peppers were produced (Cialbe, 1981, p.33). The largest producers of Capiscum peppers are India, China, Mexico, and Nigeria. Mexico produces the most dried hot pepper (as opposed to mild peppers such as paprika). In 1980 Mexico exported 1,268.4 metric tons of chiles to the United States (USDA,1981, p. 14).

Within the United States, California and New Mexico are the major producers of dried chile pepper. In 1971 California produced 2,087 metric tons, and in 1981 that figure rose to 5,461 metric tons (USDA, 1982, p. 10). New

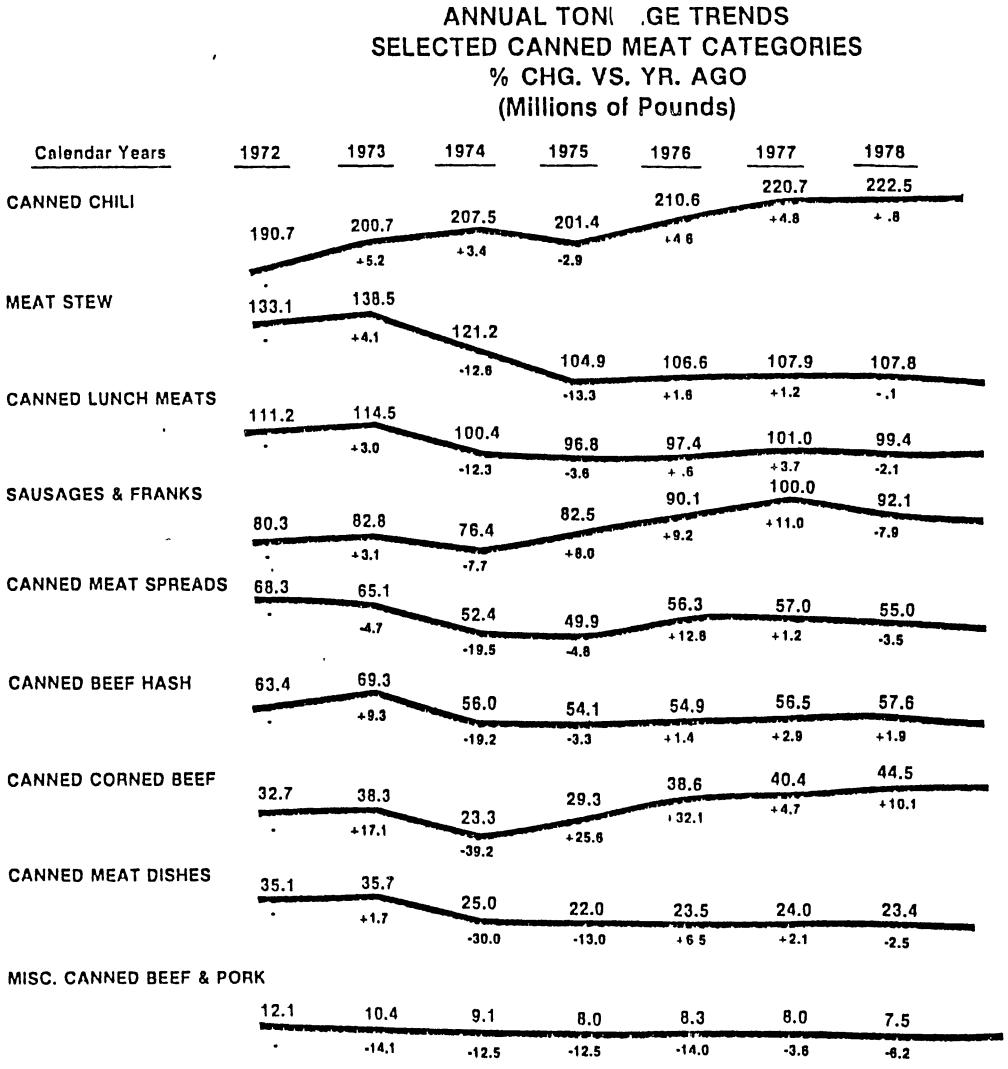
Mexico produced 2,533 tons in 1981 (USDA, 1982, p. 10). This was a bumper crop for each state with the output being above average for both quality and yields. Most of the crop was used to make chili powder for chili.

Chili as a main dish has increased in popularity. The canned chili industry is booming. According to Wolf Brand Chili, canned chili represents the largest and fastest growing type of canned meat (Figure 1). Factories producing canned chili were orginally located in the Southwest and were few in number. Today, they are located in various states, and older established companies such as Campbell's Soup have started making a type of chili.

Cookbook chapters and some entire cookbooks are devoted to chili recipes. These often note regional variation by calling the various types of chili by place names such as "Texas Chili" and "Cincinnati Chili." While many cultures have a spicy dish in their culinary heritage, chili is the only one indigenous to America and represents one of the few authentic American foods. By studying the chili preference in Texas, one attempts to gain insight concerning the influence of Texas on other regions.

Hypothesis

This study has several hypotheses. The major hypothesis is that a spatial variation in chili preferences exists in Texas. Texas is a large state with



Source: Wolf Brand Chili, Inc.

Figure 1. Canned Meat Production

people from many different backgrounds and therefore different culinary heritages. The secondary hypotheses are the following. The frequency of eating chili correlates positively with lower economic status. The ranking of chili compared with other foods correlates positively with lower economic status. Males are more likely to prefer their chili hotter than are females. The majority of families have their own special chili recipe. There is spatial variation of preferred ingredients with regard to ethnic background. There is spatial variation of preferred ingredients in chili throughout Texas. Native Texans are more likely to prefer chili than are non-natives. Chili is identified with Texas more than any other state, so the inhabitants are more likely to be familiar with and have an opinion about chili.

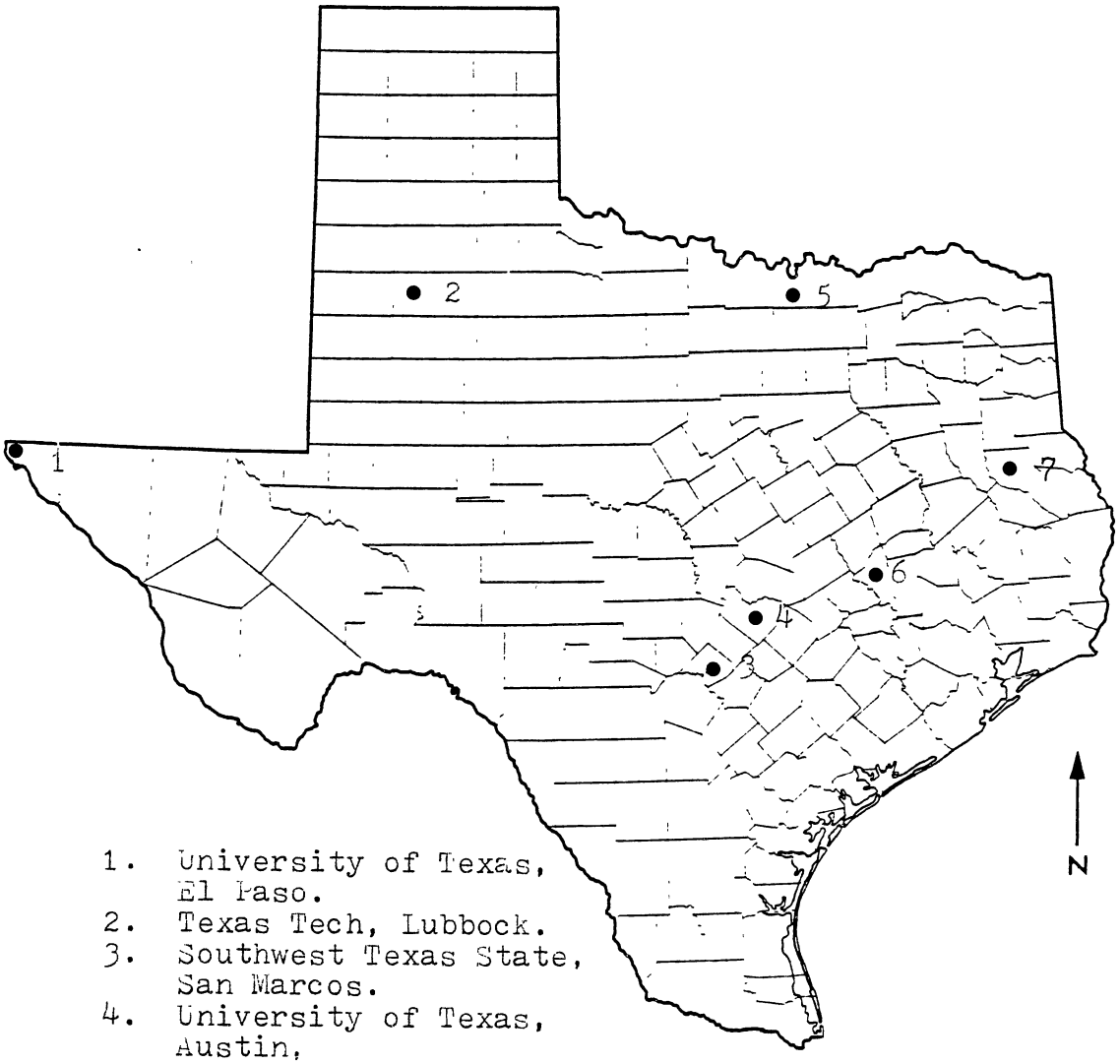
Rationale

Texas was chosen as the study site primarily because it is believed to be the cultural hearth of chili. This was the location of the original chili and is the only state listing chili as its state dish. Thus, chili is probably more important in Texas than in any other state.

Data Collection

Forty questionnaires were sent to each of seven geography departments at universities in Texas. These

include the University of Texas at Austin, the University of Texas at El Paso, Texas Technological University, Texas A & M, North Texas State University, Stephen F. Austin State University, and Southwest Texas State (see Figure 2). The questionnaires were distributed to geography classes and returned as a group from each university. This yielded 206 usable questionnaires to be evaluated. A copy of the questionnaire can be seen in the Appendix.



1. University of Texas, El Paso.
2. Texas Tech, Lubbock.
3. Southwest Texas State, San Marcos.
4. University of Texas, Austin.
5. North Texas State, Denton.
6. Texas A & M, College Station.
7. Stephen F. Austin State, Nacogdoches.

Figure 2. Universities in the Study Area

CHAPTER II

REVIEW OF THE LITERATURE

Geographic Literature

Although there is an abundance of literature regarding human and cultural geography, there is little on the subject of food preferences and consumption. One of the pioneer articles on the subject was written by Sorre (1969). This ambitious article helped set the stage for geographers' interest in global food studies and in the geographical study of famine.

Simoons' book (1962) about food avoidances in the Old World is one of the early geographical works regarding food. He examines the taboo against eating pork, beef, chicken, eggs, horseflesh, camel flesh, and dog flesh. For each of these foods he identifies the areas of the world where they are avoided and tries determine the origin and diffusion of that avoidance. While this book is dated 1962, it is still valuable since food taboos are enduring.

More recently there have been studies on a more limited scale. One of these is a book by Hilliard (1972). He studied the food production in the ante-bellum South

and then made assumptions with regard to food consumption. The work is thorough and well documented, but unfortunately it is limited to historical culture. In the work by DeBlij (1981), the geography of one food-related crop, grapes, is studied. It is a good general book of viticulture on a global scale. He does not attempt to examine the refinements of each local region. One of the best articles concerning food preferences in a specific area is that of Chakravarti (1974). He studied the regional preferences for foods in India and attempted to explain the variations he found. It is interesting to note that he found hot chili peppers to be common in some parts of India even though they are not native to the area (Chakravarti, p.96).

The book by Fellows in 1972 is not as obviously spatial in nature. He studied s several different ethnic groups in the United States and touched upon the diet preferences of each one. Hunter's article on geophagy (1973) compared earth-eating in Africa and the United States. He noted geophagy is a common practice in Africa and an ethnic practice in the United States by people of African origin. Minerals missing from the diet can often be found in the soil.

Rooney and Butt's (1978) article concerning alcoholic beverages is another interesting example of geographic research on regional preferences. They found definite regional patterns in the consumption of types of alcoholic beverages. The difficulty in obtaining data on

consumption is evident in that they used retail sales data as a surrogate.

A master's thesis by Gebhardt in 1979 dealt with the geography of beer in the United States and effectively combined cultural and economic geography. She studied the history of the beer industry and explained its current status with regard to consumption and production.

The atlas edited by Rooney, Zelinsky, and Louder (1982) contains an interesting chapter by Henderson dealing with foodways. The regional tastes in beverages as well as food tastes are considered. Food and drink preferences reflect settlement patterns. The various names given to specific foods in regional areas was investigated. The last series of maps in the chapter dealt with chain restaurants. The chapter itself was good but small. Little scholarly work has been done regarding foodways and culture. The Society for the North American Culture Survey has done a survey regarding food but the data have yet to be analyzed.

One of the most recent geographical articles concerned with food consumption is by Shortridge and Shortridge (1983). This interesting work deals exclusively with rice consumption in the United States. The authors compare the consumption of rice in 1950 to that in 1980 and attempt to analyze the changes observed.

Non-Geographic Literature

The works by Bourke (1895), Cussler (1952), and Brown (1984) are not actually geographies but do provide insight into the study of food preferences. Bourke's article is one of the earliest in folklore literature and thoroughly describes the foods eaten in the Rio Grande Valley and Northern Mexico. Cussler performed research in foodways by studying the psychological and socio-cultural factors affecting food habits. The depth of the study forced her to limit it to the southeastern United States. Brown's book studies social and cultural impacts on foodways. She found food to be a force supporting the ethnic identity of groups and helping in the resocialization of new groups.

Although Cummings (1940) produced one of the most scholarly studies of the American diet, his work is somewhat dated. It does provide a good chronology from the pre-Columbian days through the Federal food programs of the 1930's. A more recent book by Root (1976) provides excellent information about the regional diet in America but does not study the menus of Federal food programs that Cummings included.

Research by DeVore (1978) considered the diet and nutritional benefits of nine societies throughout the world. She provided insight into the Mexican diet and evaluated the major foods consumed as well as recomendations for diet improvement.

The work by Smith and Christian (1984) is a recent account of the social and economic history of food and drink in Russia. It mainly centers on the production, storage, and distribution of food and drink in the 19th century. It seems to be thorough and well documented.

Washburne's work (1961) is a study of the uses and functions of alcohol in preliterate societies. This is written from an anthropolpologist's perspective as he studies societies in Africa, North and South America, Asia, and the Pacific Islands.

Grivetti's article (1978) in Bioscience deals with food consumption and preference from an anthropologist's viewpoint. It is a good general article which shows the effects of availability on consumption and preference. He cites the discovery by Marco Polo of tea use in the Orient as a changing point in the European diet. Not only did Europeans add the "new" drink to their diets but the boiling of water for tea helped to purify the water and improve the general health of the people. Another example the author cites is that after potatoes were discovered in the New World and brought to Europe the famines became less severe.

Arnott (1975) edited a more scholarly tome regarding the anthropology of food and food habit. This is a collection of individually authored chapters on such topics as bread in Mani and the origin of grape wine. It should be noted that this book has diverse chapters and is interdisciplinary.

The volume by Darby, Ghalioungui, and Grivetti (1977) is also interdisciplinary in nature. This provides us with a general history of Ancient Egypt and of specific foods used during that time. Nearly 200 foods are discussed with regard to their origin and uses.

Chili Literature

When considering chili, one must examine the chile peppers themselves. The history of the domestication of these plants as well as their habitat are discussed in the works of Heiser (1965), Pickesgill (1969), and Verrill (1937). These works are not actually geographies, however, they do deal with some time-space aspects of plants.

With regard to canned chili and chile peppers specifically, there has been little serious research. The volume by Tolbert in 1972 was about chili and yet was not a cookbook. It gave an interesting account of chili history as well as an eyewitness view of the first chili cookoff in Terlingua, Texas. This book may be considered the seminal work on chili research but was quite weak in documentation.

One of the best sources for a history of the subject seems to be cookbooks, especially those dealing with Texas recipes (Coleman, 1949). For information about the types of chile peppers one looks to Mexican cookbooks (Morton, 1981). The cookbook that stands above the rest is the one

by Bill Bridges (1982). This book covers both the lore and practice of chili making. He attempts to explain the chili legends and gives an interesting account of chili history. He then provides recipes from various areas of the United States and supplies a short history of each recipe. Bridges' publication is probably the best published research on chili with regard to its thoroughness and documentation.

Most serious articles about chile peppers deal only with the history and cultivation as previously mentioned. One interesting exception is by Rozin (1979). He studied the attempt to induce a preference for chili peppers in rats. He found that, unlike humans, rats did not experience a reversal of the innate adversion to hot spiced food. He raised some rats entirely on rat chow with chili powder added, but found they still preferred ordinary rat chow. He used various methods such as spiking the ordinary chow with a mild poison to induce the preference, yet to no avail.

CHAPTER III

DATA ANALYSIS

Methodology

Two hundred twenty-six questionnaires were returned from six universities in Texas. Questionnaires from those who were not citizens of the United States were disregarded leaving 206 useable ones. The universities were selected to represent as broad a spatial pattern as possible. The majority of them were in the eastern half of Texas, however it should be noted that the majority of the population and all of the largest cities are located there as well. One university, Texas Tech, did not respond to the survey. This resulted in an under-representation of respondents from the Texas Panhandle area and the area south of it through much of west Texas. The chili cultural hearth of San Antonio and the metroplex of Dallas - Fort Worth, and Houston, as well as the remainder of the state were well represented.

It is recognized that the majority of Texas residents are not college students nor in the college age range of 18-22 years old. The responses are believed to be representative of Texas as a whole, however, because this

age group largely reflects the preferences of their parents with regard to such fundamental things as food preferences. These are formed at an early age and usually as a result of family interaction (Cussler and DeGive, 1952, p.85). The availability of this group outweighed its possible bias.

The main forms of analysis used were comparison of percentages, correlation analysis, and chi squared from the tso IBM system.

General Tendencies

The first step in analyzing the data was to recognize general tendencies. A profile of the typical Texas respondent was made. The typical respondent is a 20 year old white female who is a native of Texas. Each of her parents have at least a high school education with her father most likely having a college education. Together, they make more than $50,000 per year.

The typical respondent most likely eats chili monthly, and prefers ground beef in it. The typical chili is made with medium spiciness, medium thickness and probably contains beans, onions, garlic, tomatoes, and chile peppers. Iced tea is most likely drunk with it and crackers, cheese and often corn bread accompany it. The typical chili is usually eaten at home and made from scratch but with no special recipe. The average respondent ranks chili as a "good" food as compared to other foods.

Of the university students included in the sample 139 (67.5%) identify themselves as native Texans. There are 67 (32.5%) who are non-natives. The definition of "native Texan" was left up to the respondents in order to allow them to use their self-perception. The number of years non-natives have lived in Texas ranges from 1 to 23 years.

As would be expected from a university population, the majority (61.4%) is in the 19-22 year old age bracket. Fifty-seven percent identify themselves as females and 43% as males.

With regard to parents background, 55% of the mothers and 69.9% of the fathers have at least a high school education. Nearly 44% of those responding indicate that their combined incomes are greater than or equal to $50,000. It should be noted, however, that nearly 11% of those questioned refused to answer the income question.

About one-half (50.7%) of those sampled stated that they eat chili at least once a month. Slightly over 93% say they eat meat in it and of these 71.3% eat the meat ground and 28.2% eat it chopped. Chopped meat is considered to be true Texas style. The meat preferred by 138 respondents is beef. The second choice is "chili meat." This is a cheap cut of beef that favors long cooking. Deer meat is preferred by 6 respondents. One respondent says he prefers "road meat" but does not explain what this is.

There was a normal distribution with regard to the hotness of spice. This is a subjective measure and was

left up to the tastes of the respondents. When thickness was considered, 53.7% prefer medium thickness and 45.6% prefer it thick. This is also a subjective measure with thick, hot chili considered to be typical of Texas.

An overwhelming majority, 74.8%, respond "yes" to preferring beans in their chili. This was surprizing since "traditional Texas" chili is beanless. Of those who eat beans, 43 prefer pinto and 21 preferred kidney. Garbonzo, lima, navy, and "chili" beans were also mentioned.

Crackers are usually eaten with chili(82.5%), with 61 people listing saltines as the preferred type. Only one person prefers oyster crackers. This individual is not a native Texan and is originally from Oregon. The literature suggests that oyster crackers may have been invented specifically for use with chili (Bridges, 1982, p. 51). These small round crackers do not have to be crushed for use, so they help eliminate the problem of crumbs on the table. Cheese crackers also were mentioned as preferred.

Several additional items are eaten along with the chili. The most common is corn bread with 50% of the respondents preferring it. Corn chips and tortillas are also popular with tortillas preferred in the El Paso area. Perhaps the most unusual preference listed is for French fries. Others include peppers, pickles, sour cream, biscuits, bread, and hot dogs.

Additional ingredients in the ideal chili recipes include rice, spaghetti, onions, garlic, tomatoes, chile peppers, and cheese. Rice is preferred by 19.4% of the respondents and spaghetti by 2.9%. Some respondents like both onions and garlic. There is 74.3% who like onions and 57.3% who like garlic. A majority (72.3%) prefer tomatoes in their chili. Perhaps the more interesting observation is that over 25% of the respondents do not like tomatoes, because tomatoes usually are the most common vegetable in chili. Chile peppers are enjoyed by 66.5% of the respondents. Cheese is popular with 68.4% of those responding.

To "put the fire out" iced tea is the most commonly used (47.6%) drink. Beer is second with 41.4% preferring it, and soft drinks are preferred by 36.9%. Water is used by 32.7%. Milk is drunk by 20.4%. No one chose buttermilk in spite of the fact that some people do drink buttermilk with chili. These percentages do not total 100% because some respondents chose more than one drink with their chili.

The majority of respondents, 81.3%, eat chili at home. Only 10.5% eat it in restaurants. This is in keeping with the idea that chili is not an exotic food that is sought out in restaurants. Although chili is served in schools, schools evidently play a much smaller role in chili consumption than do homes.

Since most respondents consume their chili at home, the question of how it is made is important. A clear

majority of 66.3% make their chili from "scratch" while 16% use canned chili and 15.4% use a mix. Chili is made from simple ingredients and needs no recipe. Most of those making it from scratch state that they do not use a special recipe when they make it.

Over 93% of the respondents indicate they are familiar with "Texas" chili. This is not a surprise since the survey was done in Texas. St. Louis and Illinois chilis were known to 2.4% of the people and only 1.5% indicated they were familiar with Cincinnati chili. This is noteworthy particularly because some chili enthusiasts maintian that chili was invented in Ohio (Bridges, 1982, p.31). One respondent emphatically stated that Texas chili was the only true chili. He wrote, "The others are all soup!"

Of the respondents, 56.1% maintain they do not use a special recipe when they make chili. Since 66.3% make their chili from scratch, it can be concluded that the majority of these people simply improvise a recipe each time they cook.

Compared to other foods, chili was rated "among the best" by 20% of the respondents. About half (48%) gave it a "good" rating, and another 28% rated it as just "okay." The remainder of the respondents rated it "not so good" or "awful." Thus, an overwhelming majority (96%) rate chili at least as a tolerable food, and a large majority (68%) rate it as "good" or better.

Specific Observations

As previously noted, the majority of respondents do not use a specific recipe when making chili. Of those who do, few would reveal the ingredients they use. Several emphatically say "no way" when asked to list them. This is probably a reflection of the secrecy that surrounds the annual chili cookoffs in which emphasis is placed on competition of recipes. Some of the respondents do not know what special ingredients are used because they do not cook chili themselves, but rather leave the cooking up to their elders.

The typical Texas chili recipe is quite simple. The recipe includes meat tomatoes or tomato sauce, onion, chile powder, other spices, and possibly beans (Bridges, 1982, p.104-123). Texas chili has fewer ingredients than do most other chilies. Some individuals believe the fewer ingredients chili has, the better it is. The only essential ingredient is the chile powder itself.

The Mexican-Americans are more willing than the other respondents to reveal their chili ingredients. These include mescal, beer, cilantro, laurel leaf, chile de arbol, serrano chiles, and jicama. Mescal is an alcoholic spirit distilled from the agave plant in Mexico. Cilantro is an herb that is most often used in Mexican food. Chile do arbol and serrano chiles are specific names of very hot chile peppers. Jicama is similar to the potato and is a common Mexican vegetable. Other ingredients mentioned by non-Mexican respondents include celery, bell peppers,

olives, sour cream, corn, ketchup, and "whatever looks good at the time." One of the black respondents prefers the addition of "Cajun seasoning" to his chili.

Accompanying the chili one respondent eats French bread and ice cream. Coffee and mixed drinks are preferred drinks by some of the respondents. These are some of the more unusual responses.

Two respondents say they eat chili on picnics and on field trips. Chili is a simple dish to make in a single pot. Thus it is ideal for camping situations.

The use of onions and garlic in making chili was found to correlate positively with the age of the respondents. The older students prefer more onions and garlic in their chili than do younger students. It is known that as people, mature, their tastes become more refined. The correlation results can be seen on Table I on the following page.

Respondents who eat cornbread are neither more nor less likely to eat crackers with their chili than are those who do not eat cornbread. These foods are dissimilar enough to stand on their own merits. Table II shows this.

Respondents who rate chili highly are more likely to prefer the more hotly spiced chili and more likely to eat it at home. Chili is known for its spiciness, so perhaps only those who like spicy food rate chili highly. It can be assumed that those who rate it highly take the time to cook it at home. This relationship is shown in Table III.

TABLE I

CORRELATION BETWEEN
ONIONS AND GARLIC
AND AGE

Correlation Unexplained	Age
Onions	.29946 .0236
Garlic	.15843 .0236

TABLE II

CORRELATION BETWEEN
CRACKERS AND
CORNBREAD

Correlation Unexplained	Cornbread
Crackers	.0000 1.0000

TABLE III

CORRELATION BETWEEN SPICINESS,
WHERE CHILI IS EATEN
AND ITS RATING

Correlation Unexplained	Rating
Where	.21754 .0018
Spice	.20798 .0067

By using chi square analysis it was found that men eat chili more frequently than do women. Chili is stereotyped as a masculine dish, cooked and eaten primarily by men. Table IV shows this.

Oddly, chi square analysis shows the higher the income, the more likely the respondent is to prefer beans in chili. It would be thought that the lower income individuals would use beans to "extend" their chili. Perhaps the respondents with higher incomes have less regionalized tastes. Table V shows the bean to income relationship.

TABLE IV

CHI SQUARE ANALYSIS OF FREQUENCY OF EATING CHILI AND SEX OF RESPONDENTS

SEX FREQ

FREQUENCY / EXPECTED / DEVIATION / CELL CHI2 / PERCENT / ROW PCT / COL PCT	.	1	2	3	4	5	TOTAL
0	1	0	7	18	45	18	88
	.	1.7	4.7	9.5	44.4	27.6	
	.	-1.7	2.3	8.5	0.6	-9.6	
	.	1.7	1.1	7.6	0.0	3.3	
	.	0.00	3.43	8.82	22.06	8.82	43.14
	.	0.00	7.95	20.45	51.14	20.45	
	.	0.00	63.64	81.82	43.69	28.13	
1	1	4	4	4	58	46	116
	.	2.3	6.3	12.5	58.6	36.4	
	.	1.7	-2.3	-8.5	-0.6	9.6	
	.	1.3	0.8	5.8	0.0	2.5	
	.	1.96	1.96	1.96	28.43	22.55	56.86
	.	3.45	3.45	3.45	50.00	39.66	
	.	100.00	36.36	18.18	56.31	71.88	
TOTAL	.	4	11	22	103	64	204
	.	1.96	5.39	10.78	50.49	31.37	100.00

STATISTICS FOR 2-WAY TABLES

CHI-SQUARE 24.231 DF= 4 PROB=0.0001

TABLE V

CHI SQUARE ANALYSIS OF INCOME AND PREFERENCE FOR BEANS IN CHILI

INCO BEAN

FREQUENCY / EXPECTED / DEVIATION / CELL CHI2 / PERCENT / ROW PCT / COL PCT	.	0	1	TOTAL
.	1	5	17	.
	.	.	.	
	.	.	.	
	.	.	.	
	.	.	.	
	.	.	.	
	.	.	.	
1	0	3	14	17
	.	4.3	12.7	
	.	-1.3	1.3	
	.	0.4	0.1	
	.	1.64	7.65	9.29
	.	17.65	82.35	
	.	6.52	10.22	
2	0	9	14	23
	.	5.8	17.2	
	.	3.2	-3.2	
	.	1.8	0.6	
	.	4.92	7.65	12.57
	.	39.13	60.87	
	.	19.57	10.22	
3	0	13	20	33
	.	8.3	24.7	
	.	4.7	-4.7	
	.	2.7	0.9	
	.	7.10	10.93	18.03
	.	39.39	60.61	
	.	28.26	14.60	
4	0	5	25	30
	.	7.5	22.5	
	.	-2.5	2 5	
	.	0.9	0.3	
	.	2.73	13.66	16.39
	.	16.67	83.33	
	.	10.87	18.25	
5	0	16	64	80
	.	20.1	59.9	
	.	-4.1	4.1	
	.	0.8	0.3	
	.	8.74	34.97	43.72
	.	20.00	80.00	
	.	34.78	46.72	
TOTAL	.	46	137	183
	.	25.14	74.86	100 00

STATISTICS FOR 2-WAY TABLES

CHI-SQUARE 8.730 DF= 4 PROB=0.0682

CHAPTER IV

SPATIAL ANALYSIS

The major hypothesis is that a spatial variation in chili preferences exists in Texas. This was found to be true from observing the spatial preference patterns. Major differences do exist between areas in in the state, but the major variation seems to be between El Paso and the remainder of the state. With regard to locations, the majority of the respondents were from the eastern half of the state as is the majority of the general population (Figure 3). The respondents' home towns were mapped by county.

To analyze the data, Texas was divided into six regions based on county boundaries (Figure 4). The boundaries were drawn to include at least one university where the surveys were taken in each area. The hometowns of the respondents was considered in order to have as balanced a population in each area as possible.

Little racial and ethnic diversity exists in the sample of respondents. The areas mapped in Figure 5 were based upon the percent of Mexicans in the largest city in each area. Only the homes' of the mothers were mapped in this study because the mothers are most likely to

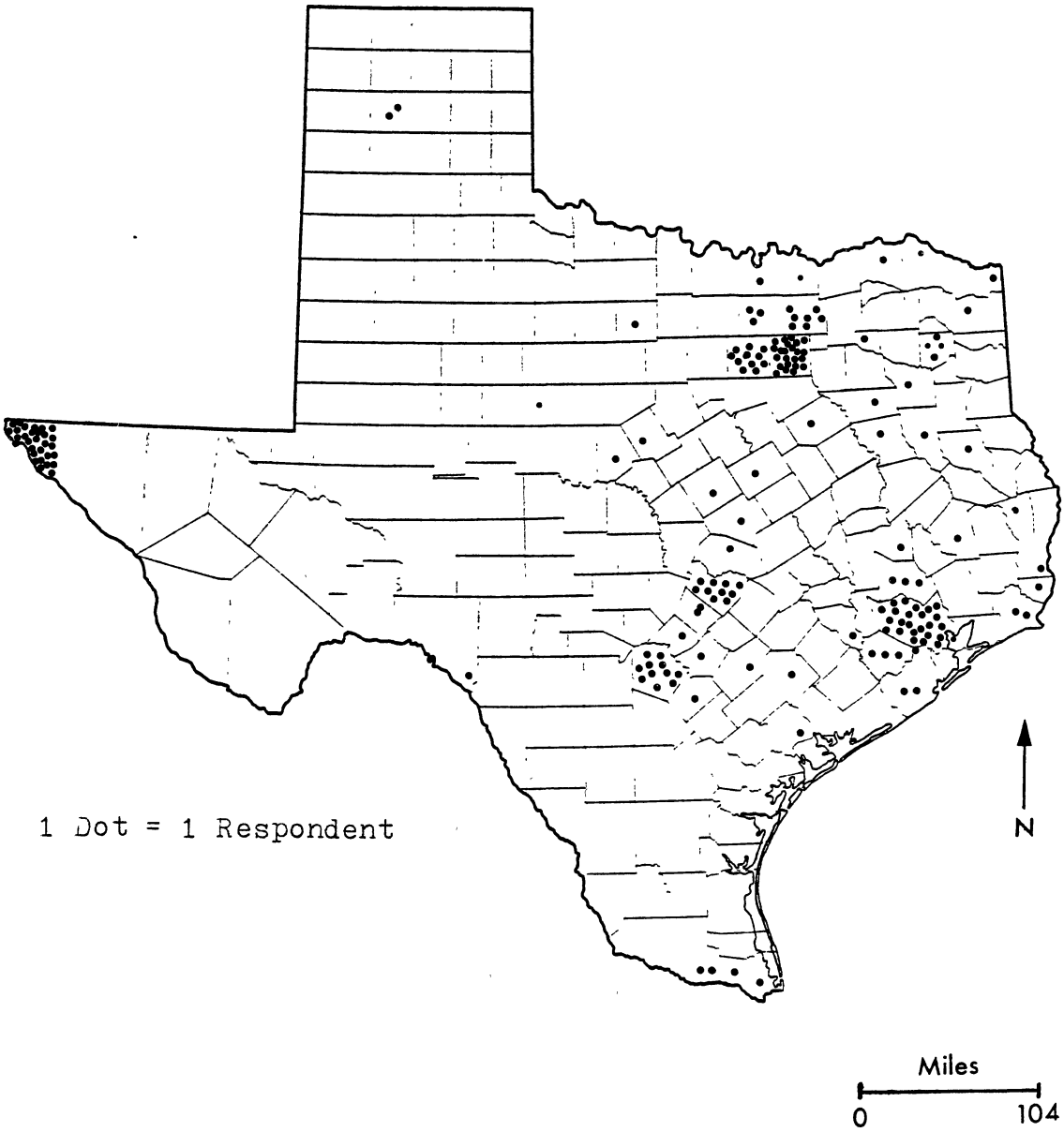


Figure 3. Location of Respondents by County

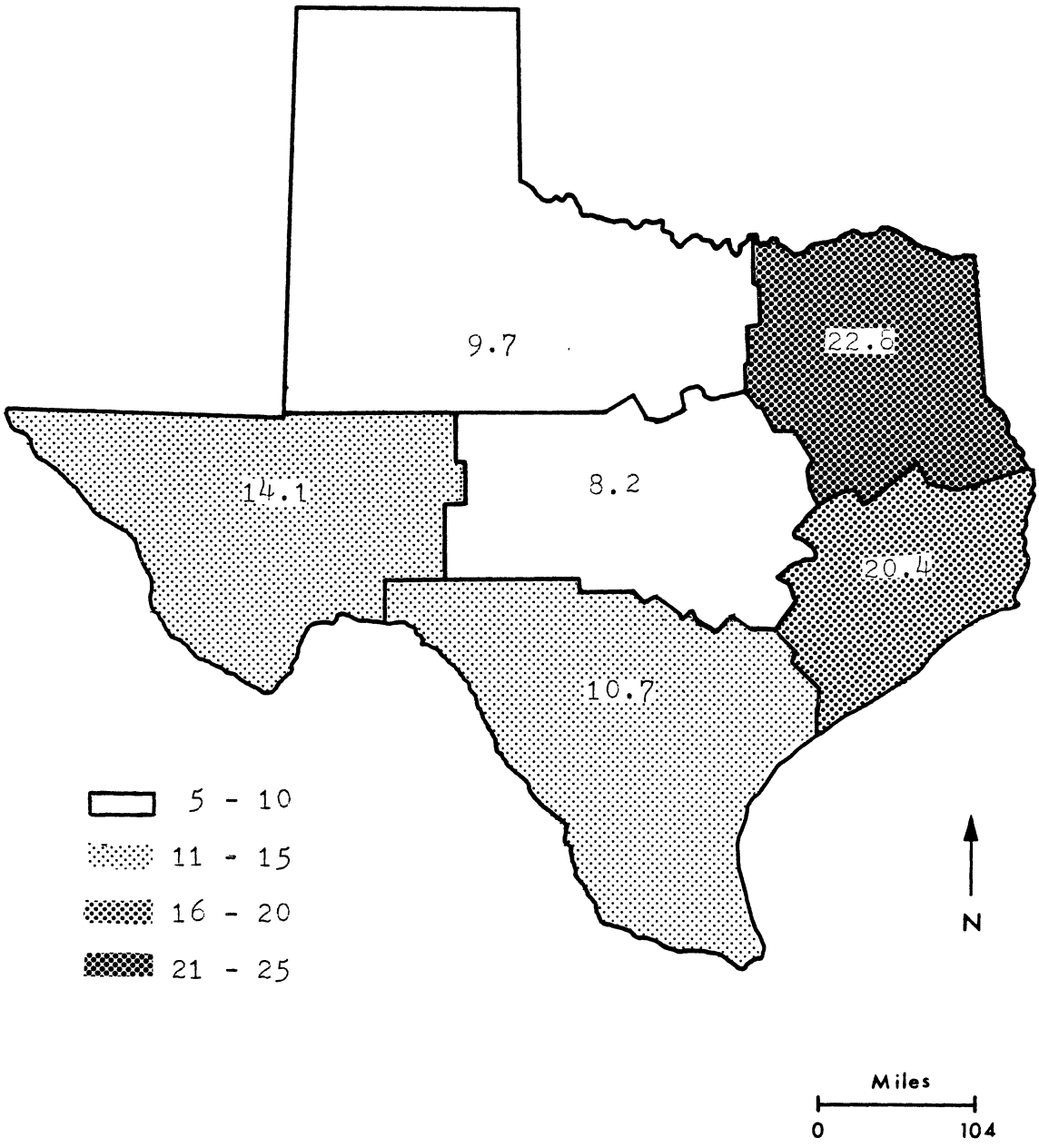


Figure 4. Percent of Respondents in Each Area

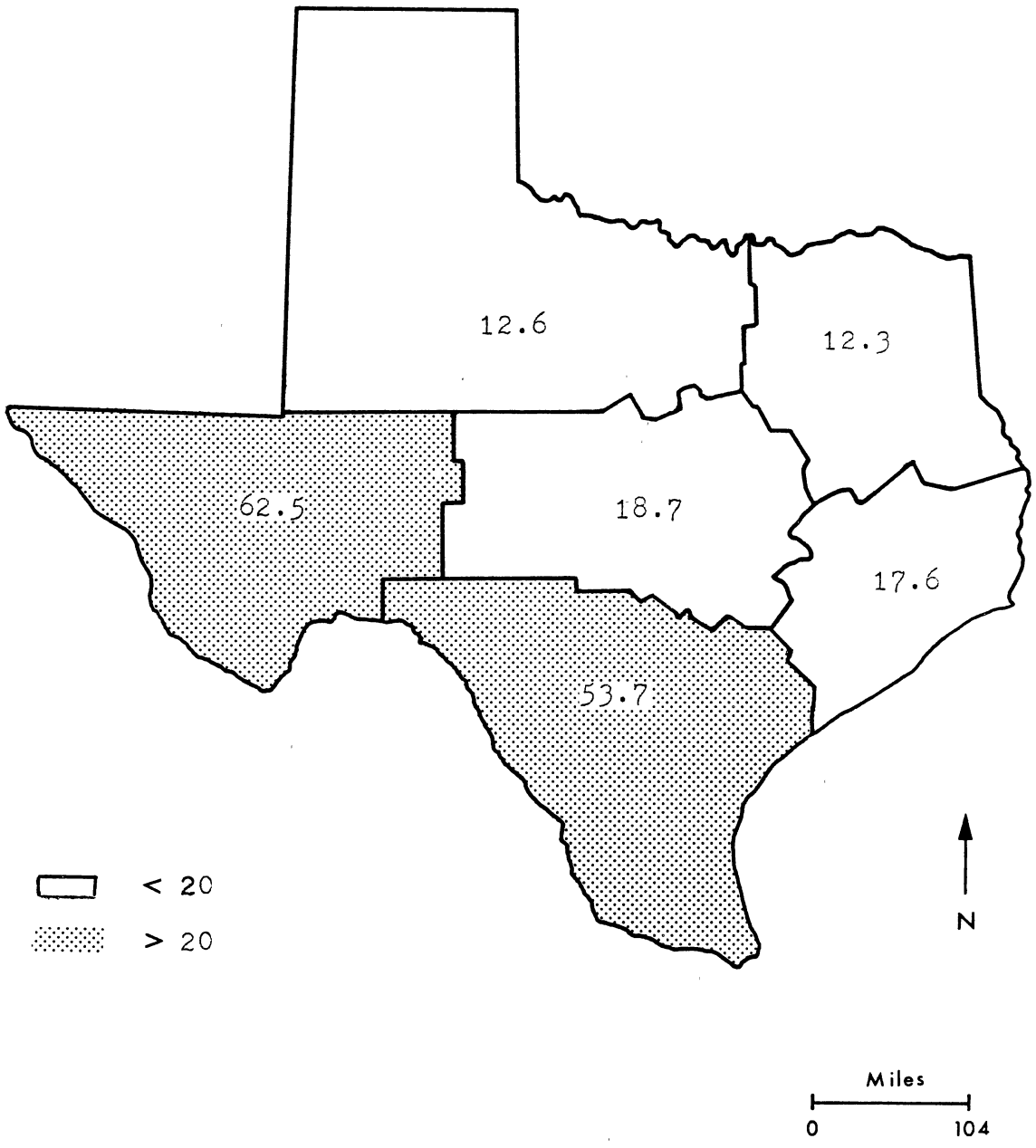


Figure 5. Percent of Mexican Americans in the Major City in Each Region

influence the food consumption and preferences of the children. There were only five respondents with black mothers. These were spatially scattered (Figure 6). When mapping the location of respondents with Mexican mothers, it was found the majority were in the El Paso area (Figure 5). This was found to be representative because that area has the largest Mexican population in the state. Mexicans were found to be the prominent ethnic group because Texas has a large Mexican population.

Beans are a common ingredient in chili and are preferred by a majority of the respondents. The areas in which the respondents prefer no beans also proves to be informative (Figure 7). These areas are scattered, but the two major places are Houston and Dallas. These areas are the home of some outspoken critics of chili with beans.

The primary location of all those who enjoy rice in their chili is the eastern half of Texas (Figure 8). This area is closer to Louisiana, a state high in rice production. There is a chili parlor in Dallas which has used rice in its chili for some time (Bridges, 1982, p.53).

Only five Texas residents said they eat spaghetti in their chili. One of these respondents was from Ohio where spaghetti is a principle ingredient in the chili. There seems to be no spatial pattern in Texas with regard to spaghetti preference in chili.

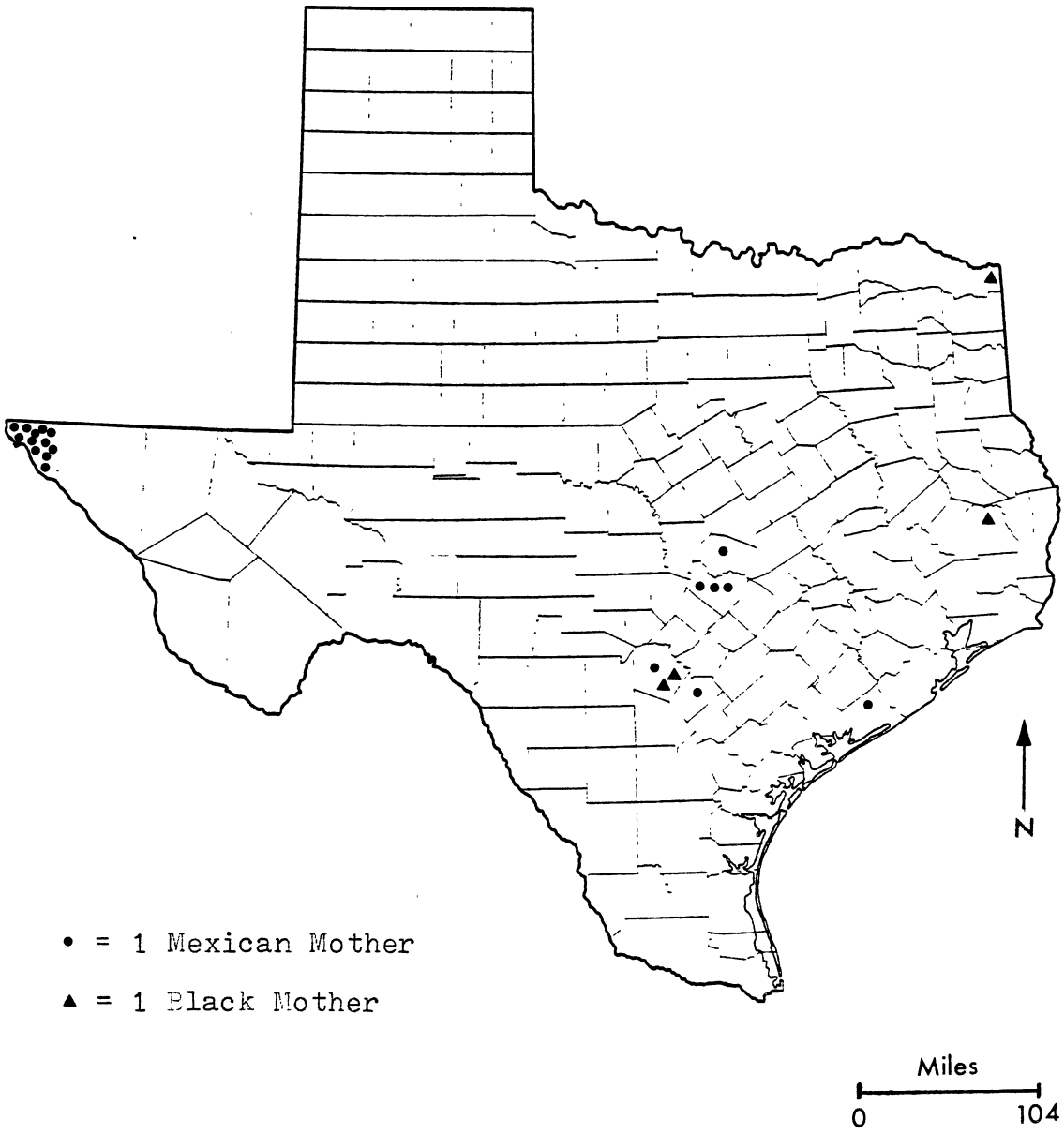


Figure 6. Location of Mexican and Black Mothers of the Respondents

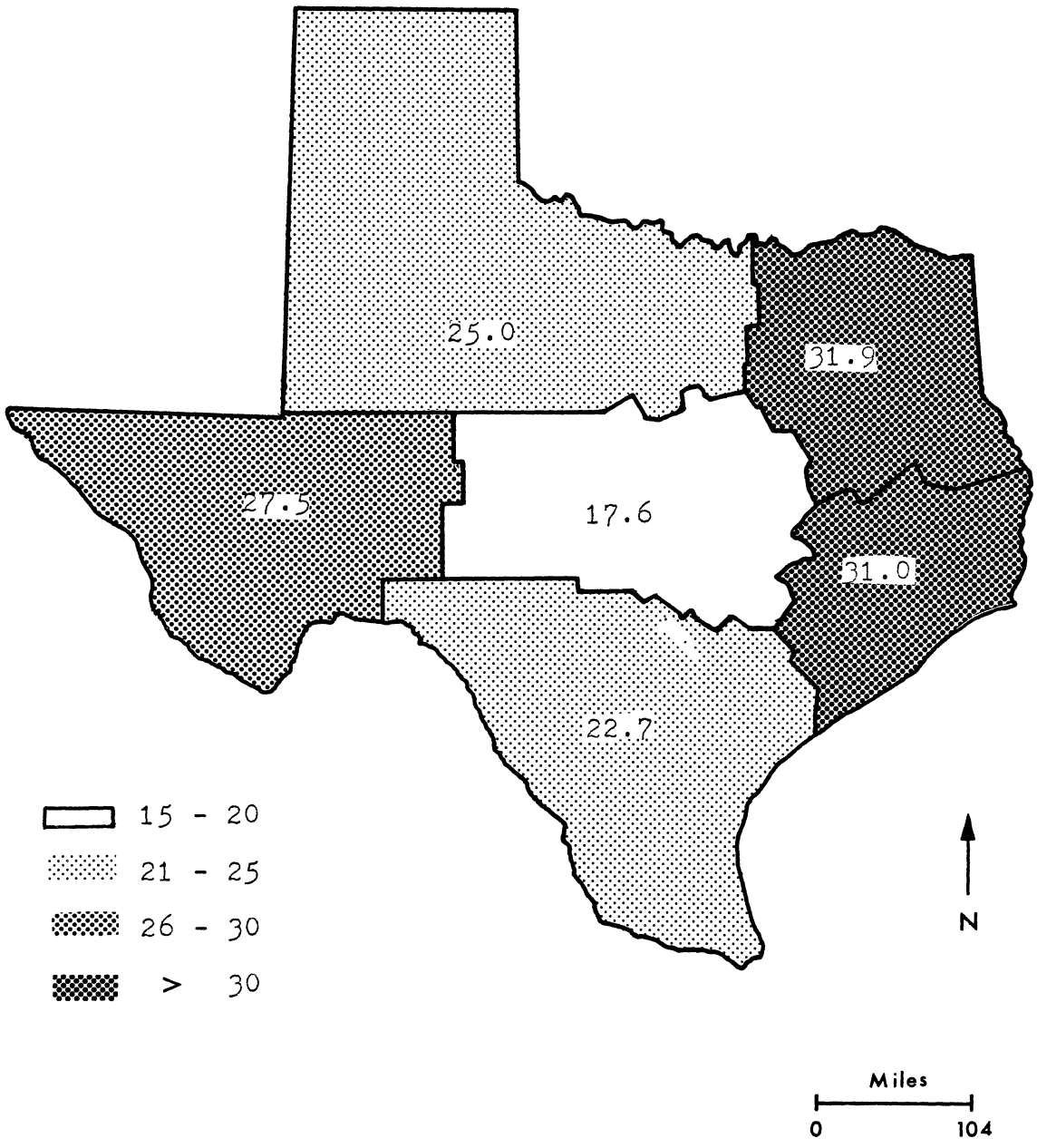


Figure 7. Percent of Respondents Choosing No Beans

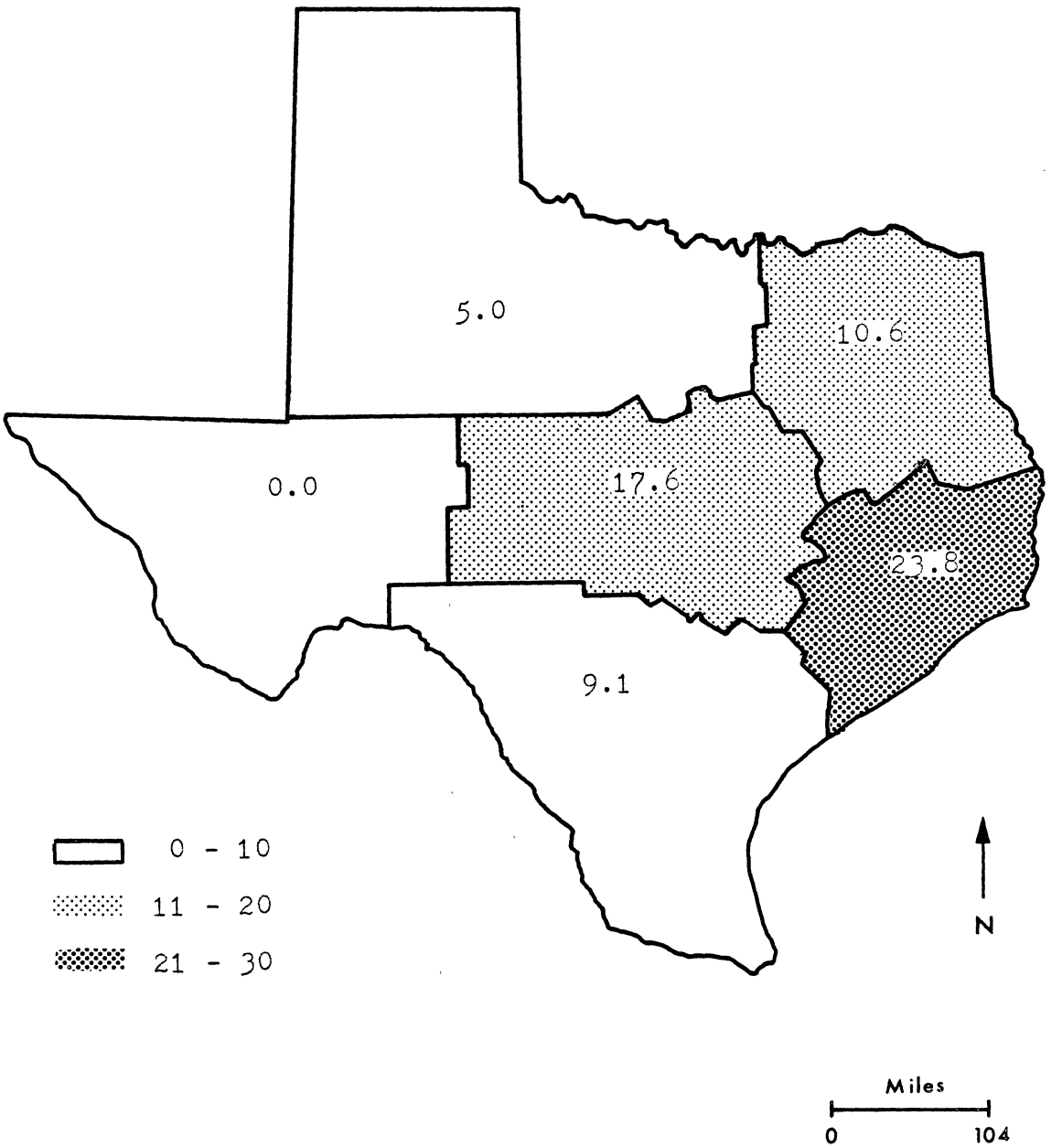


Figure 8. Percent of Respondents Choosing Rice

Since tomatoes are such a common ingredient in chili, a map of those preferring no tomatoes proves to be informative (Figure 9). The spatial pattern resulting from this indicates a relatively large number of respondents in the Austin area who do not eat tomatoes, and a very low number in the El Paso area who do not eat them. This may be explained by noting the El Paso area has many Mexicans, and tomatoes are a primary ingredient in most Mexican food. Houston, by contrast, has a number of chili enthusiasts who pride themselves on eating "Texas chili" and state that this chili does not contain tomatoes. Its red color comes from the chili powder alone.

Onions are a very popular ingredient in chili (Figure 10). Again the areas where they are the most popular seem to be the El Paso area and the Dallas area. Onions have long been a common ingredient in chili as well as Mexican food. Obviously, their popularity continues.

Garlic became part of the chili pot somewhat later than did onions. The spatial pattern seen in Figure 11 is very similar to that of onions. They are slightly more popular in the San Antonio area than anywhere else. Garlic is not as popular as onions as a chili ingredient, although some respondents enjoy both.

While all chili must by definition contain chile powder, chile peppers are a less common ingredient. The locations of those preferring chile peppers can be seen in Figure 12. While the pattern seems scattered, the El Paso

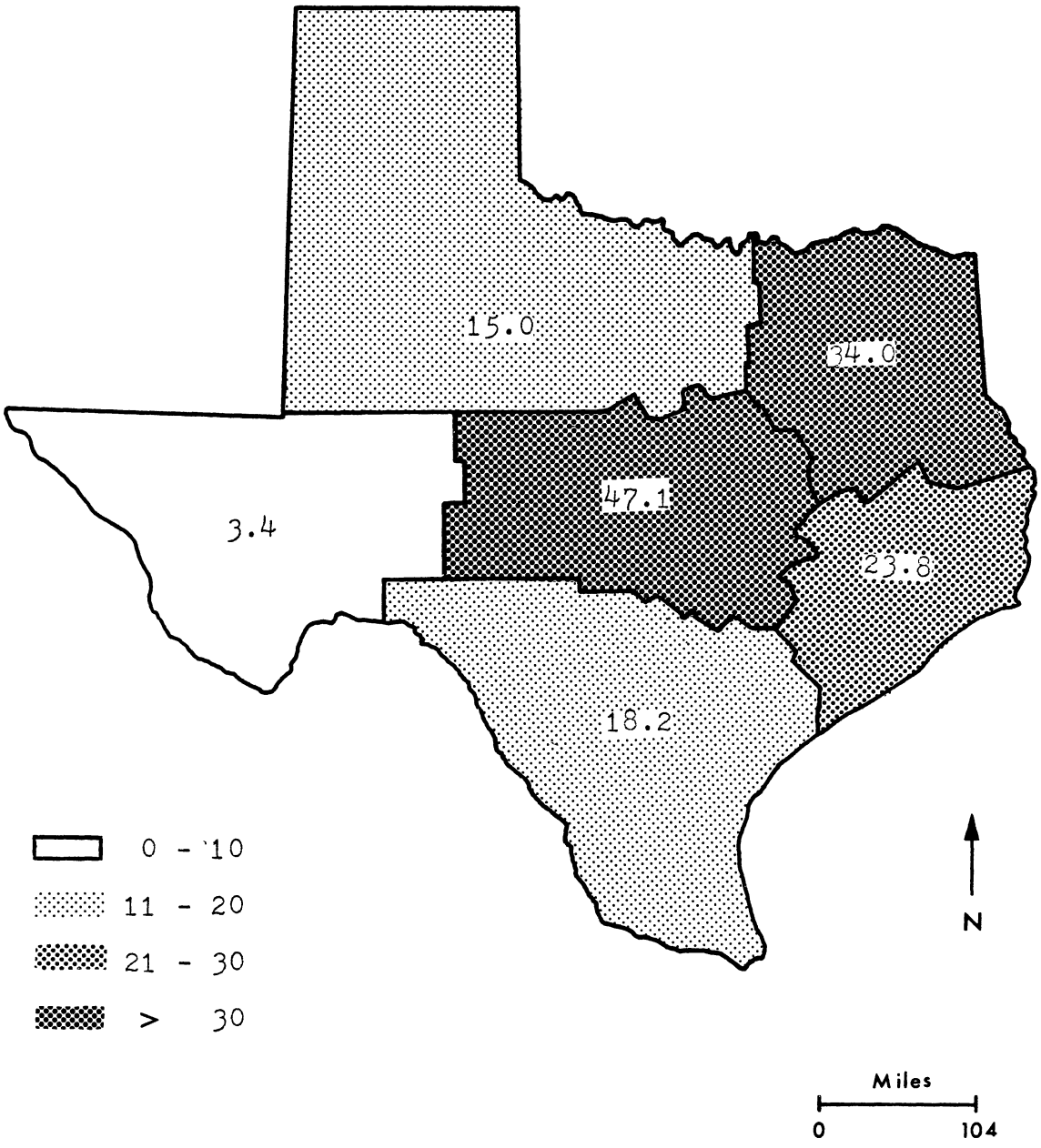


Figure 9. Percent of Respondents Choosing No Tomatoes

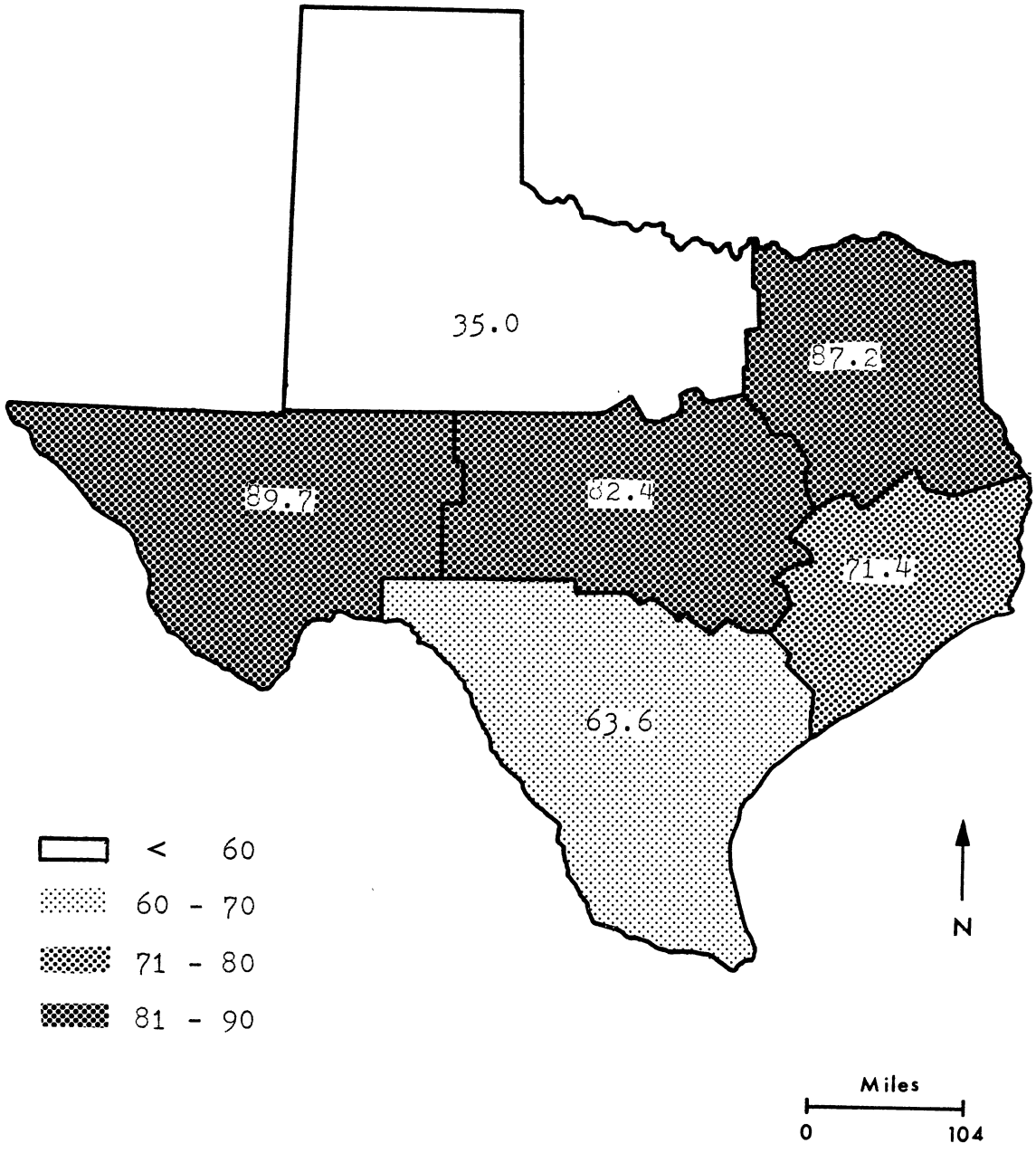


Figure 10. Percent of Respondents Choosing Onions

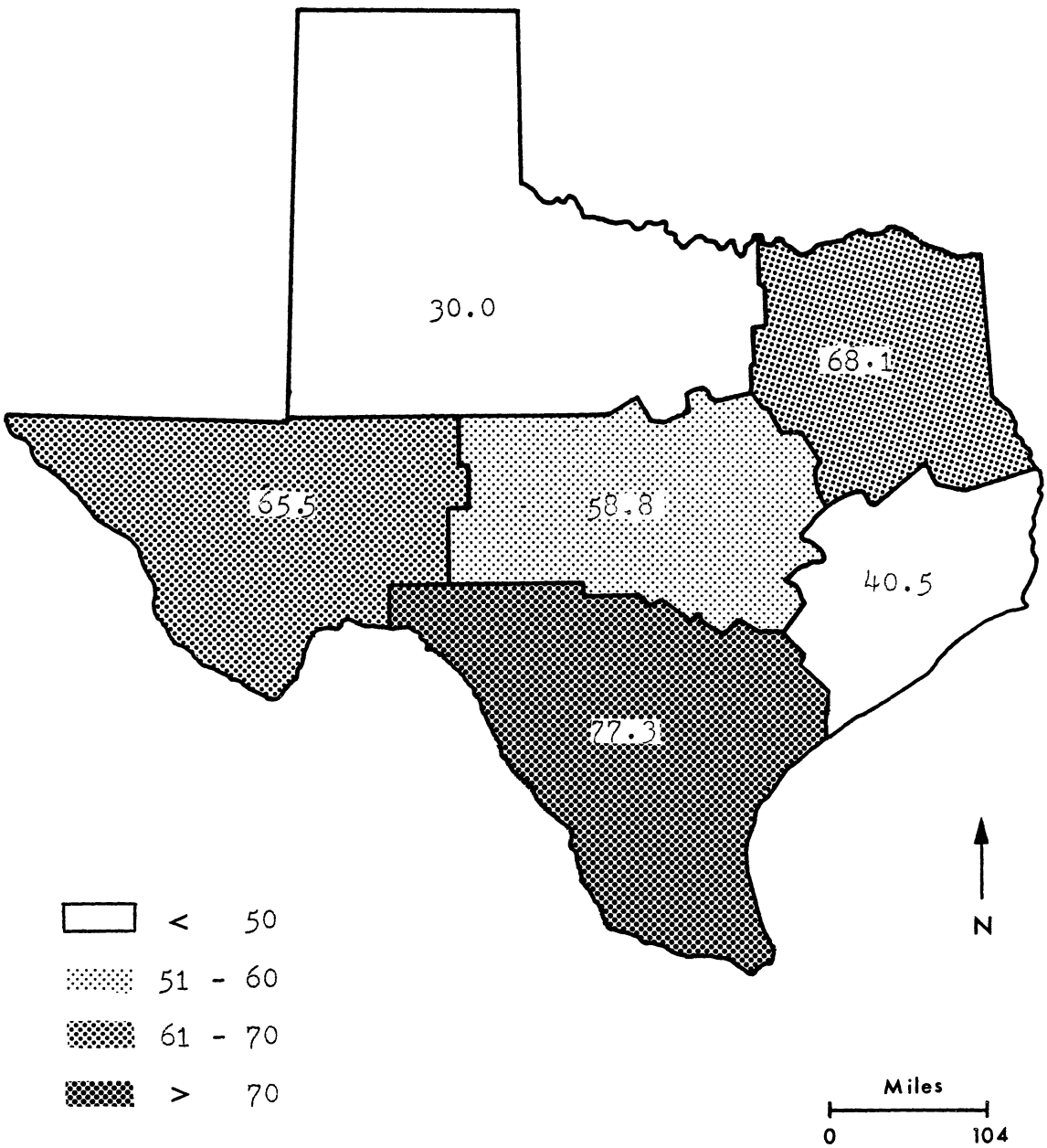


Figure 11. Percent of Respondents Choosing Garlic

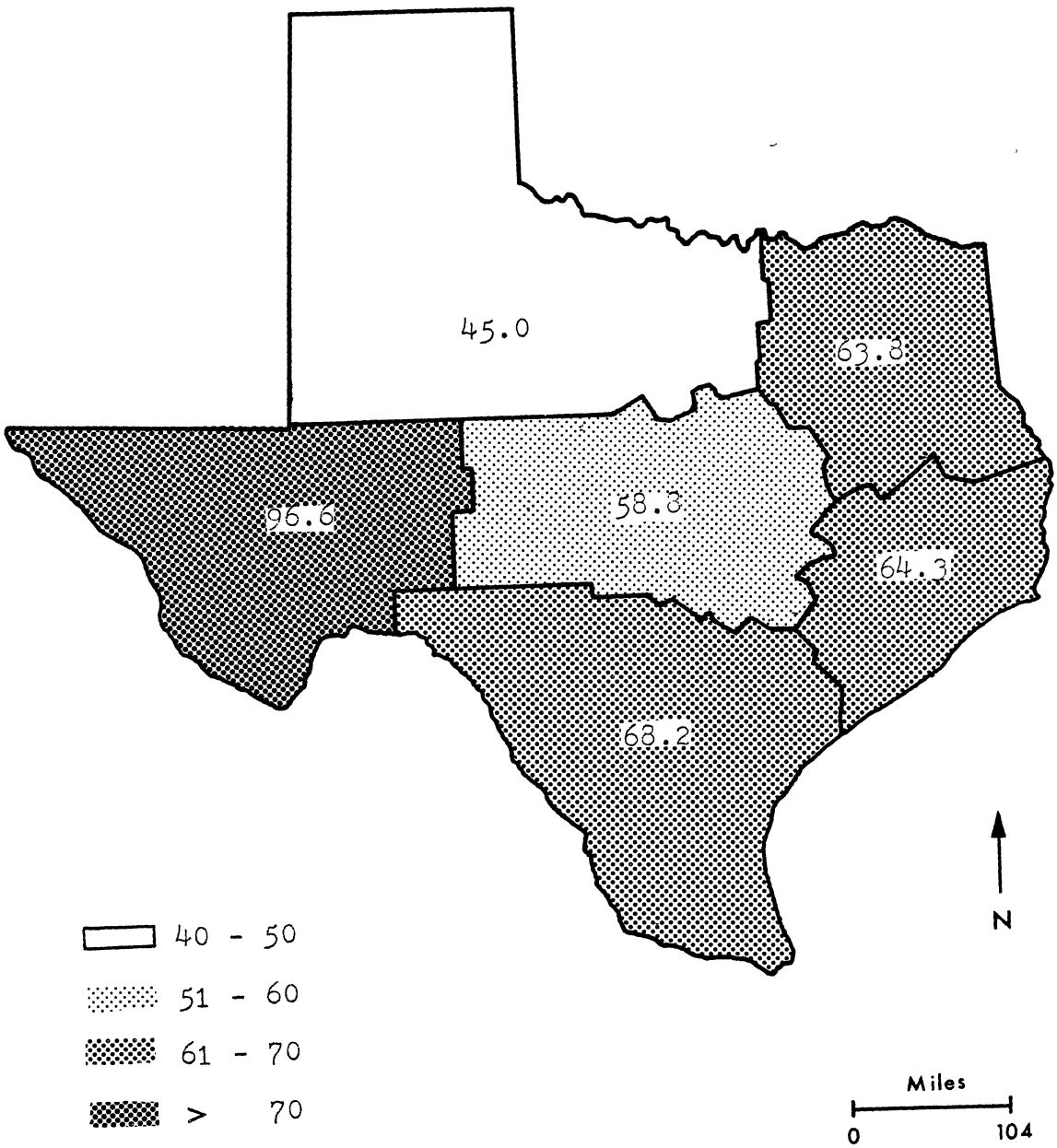


Figure 12. Percent of Respondents Choosing Chile Peppers

area stands out as having all but one of the respondents preferring chile peppers in their chili. Once again we look to the Mexican influence to explain this. Chile peppers are perhaps the most identifiably Mexican ingredient in Mexican food.

Crackers are such a commonly eaten side item that respondents who prefer no crackers are more interesting. As can be seen in Figure 13, most of these respondents reside in the El Paso area. In Mexican cookery, tortillas often take the place of crackers.

The most common beverage drunk with chili is tea. Figure 14 shows that the areas with the two highest percentages are the northwestern areas of Fort Worth and the panhandle and the southeastern area of Houston. This is relative to the percentage of respondents in the areas. The Austin area is the least likely to drink tea with their chili.

Chili and beer are a popular combination. Compared to the percentage of respondents from the region, the San Antonio area drinks the most beer. This may be explained by the fact the area has German immigrants. The Fort Worth and panhandle area as well as El Paso are the least likely to drink beer with chili as Figure 15 shows.

Water is also used to put out the chili fire. In Figure 16, it can be seen that the Dallas area is the most likely to use it. In relative percentages the areas of Forth Worth and Austin are likely to use it.

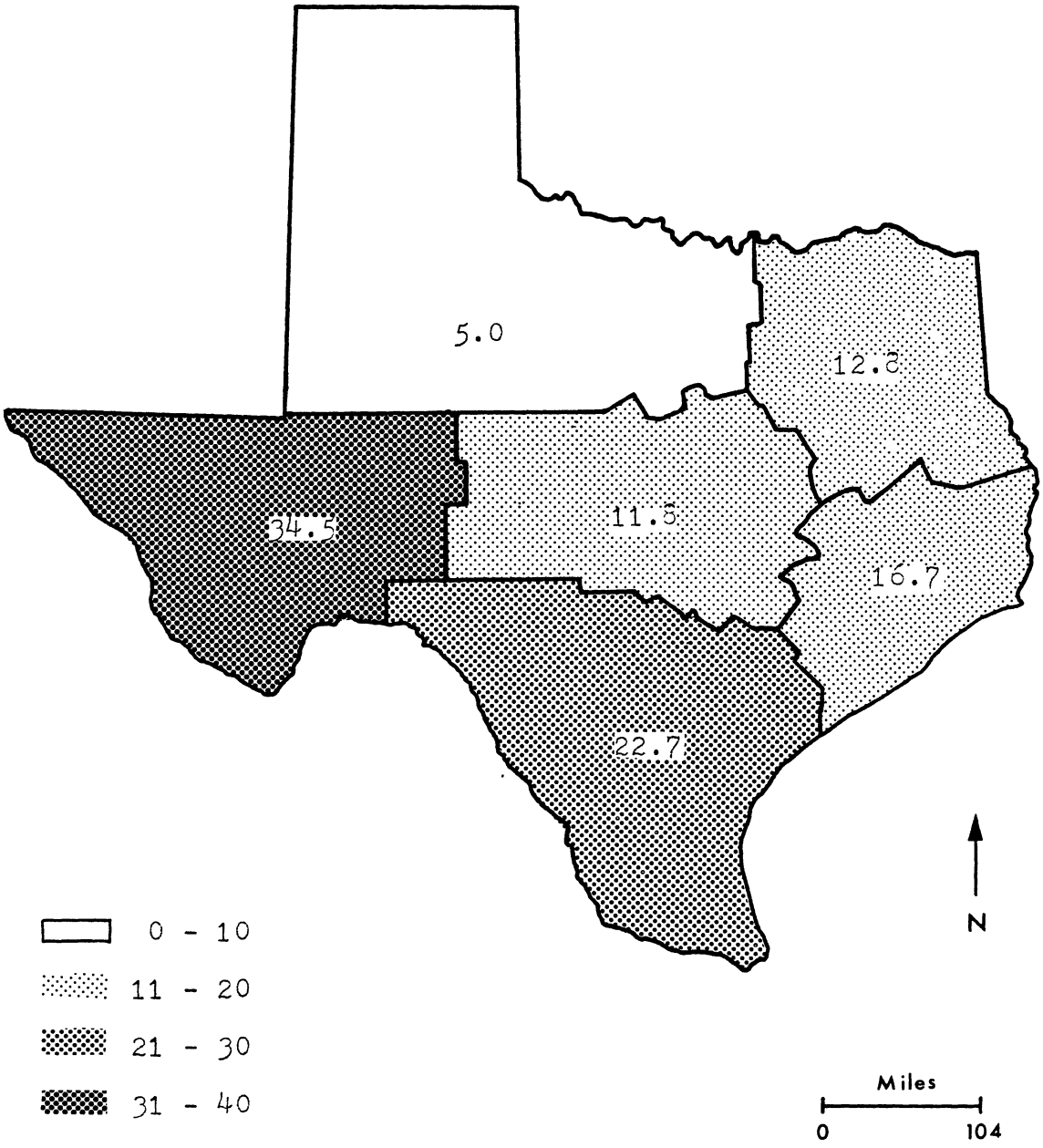


Figure 13. Percent of Respondents Choosing No Crackers

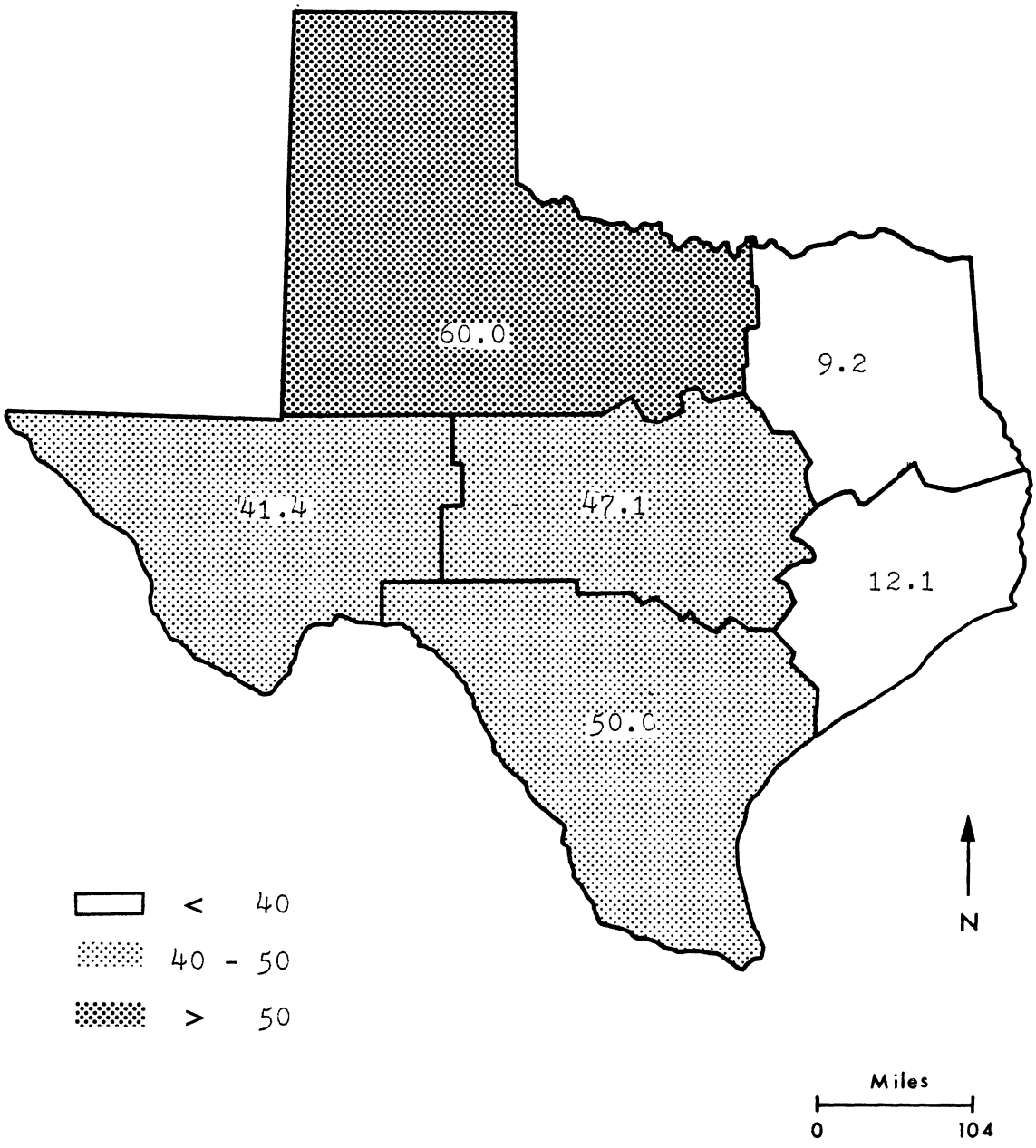


Figure 14. Percent of Respondents Drinking Tea with Chili

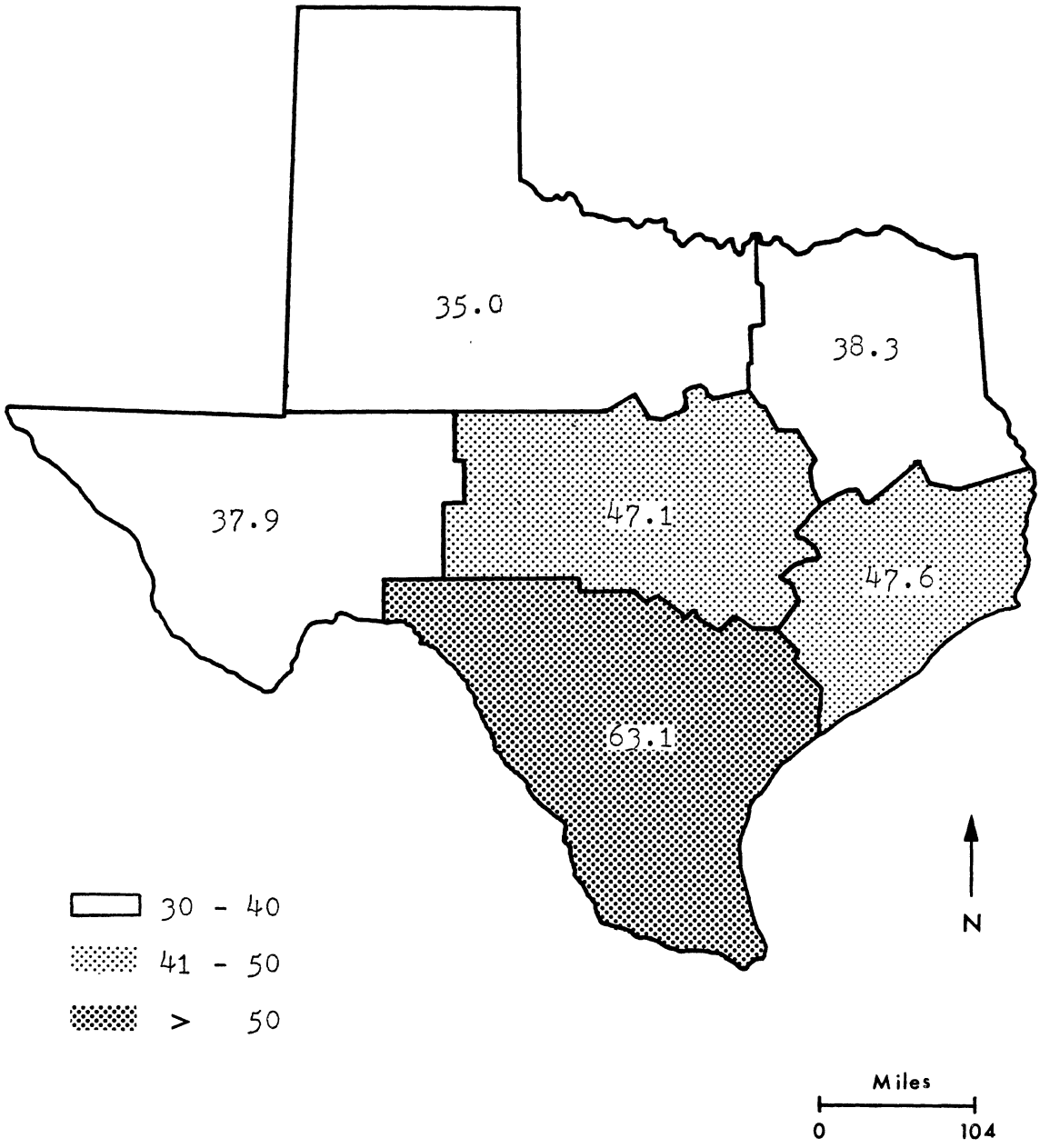


Figure 15. Percent of Respondents Drinking Beer with Chili

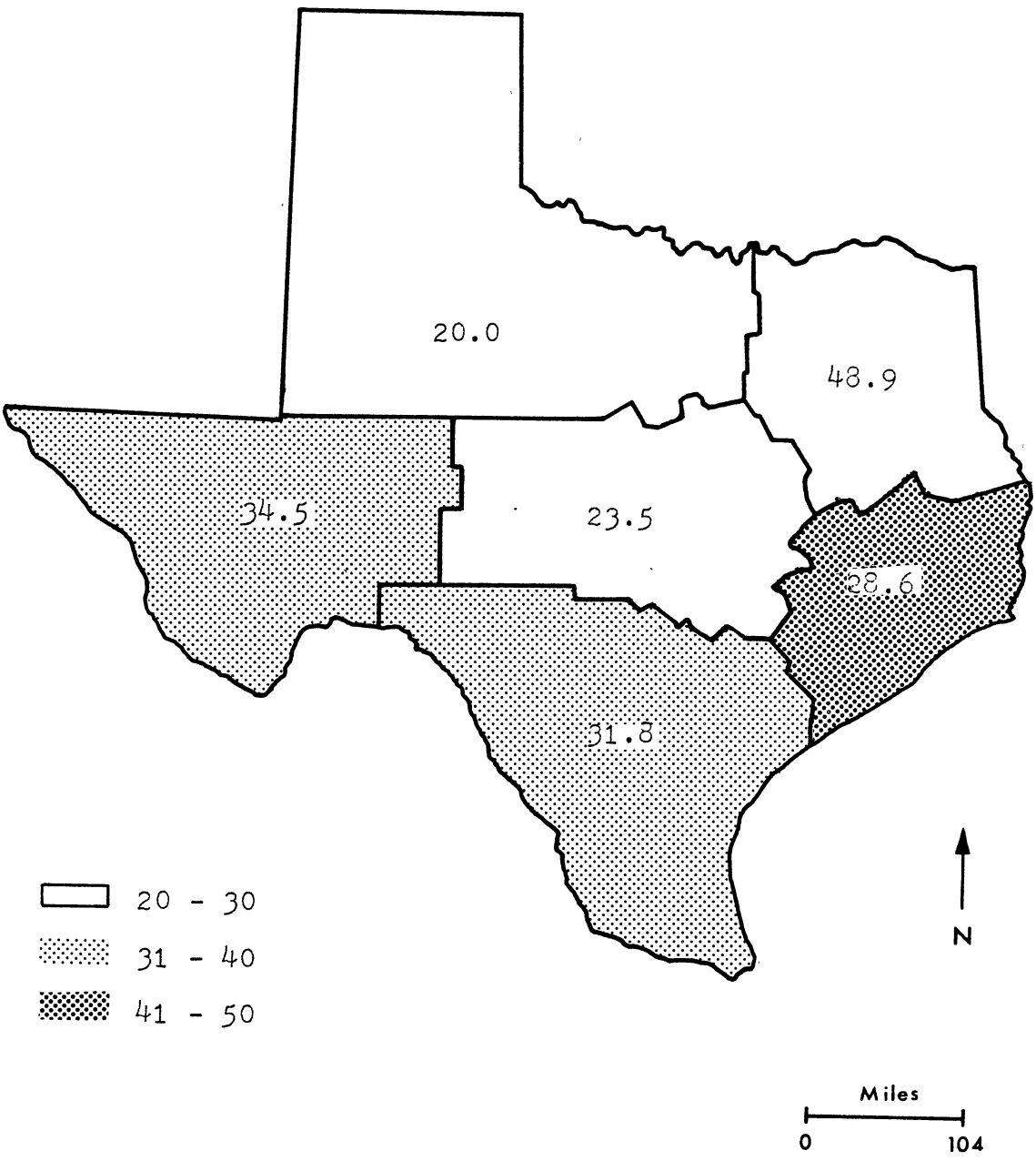


Figure 16. Percent of Respondents Drinking Water with Chili

Soft drinks are also drunk with chili. In Figure 17 it can be seen that the San Antonio area is least likely to drink them whereas the Fort Worth area is the most likely. As previously noted, the San Antonio area is the one most likely to drink beer.

The percentage of those drinking milk with chili is shown in Figure 18. While all the percentages are low, the highest relative percentage is in the San Antonio area. The lowest percentage is in the Houston area where there is a metropolitan atmosphere.

The respondents were asked to rate chili compared to all other foods. The responses were mostly positive. There were very few who rated it below "good." Figure 19 shows those who rated it "among the best." The San Antonio area gave it the highest percentage, while the Austin area gave it the lowest percentage. This is interesting because the Austin and San Antonio areas are said to be its cultural hearth.

Chili received a "good" rating as shown in Figure 20. The Houston area gave it the greatest percentages. The Austin and El Paso areas have the lowest percentage of "good" ratings.

The area with the lowest percentage rating chili "okay" was the Houston area. This area rated it much more highly as the previous figures showed. The Dallas area had the highest percentage rating it "okay" in Figure 21. This corresponds with the previous figures in which the Dallas area did not rate it highly.

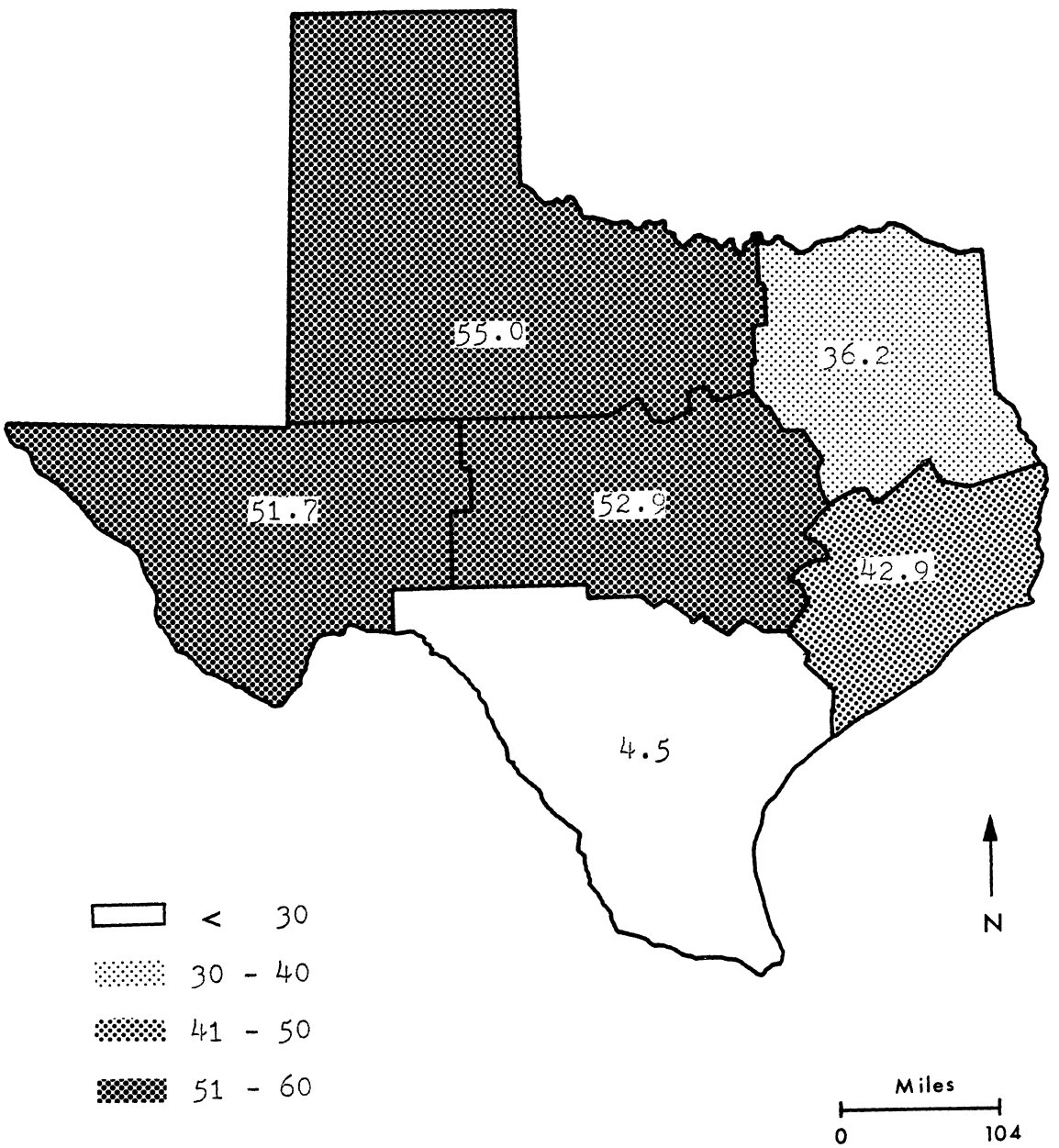


Figure 17. Percent of Respondents Drinking Soft Drinks with Chili

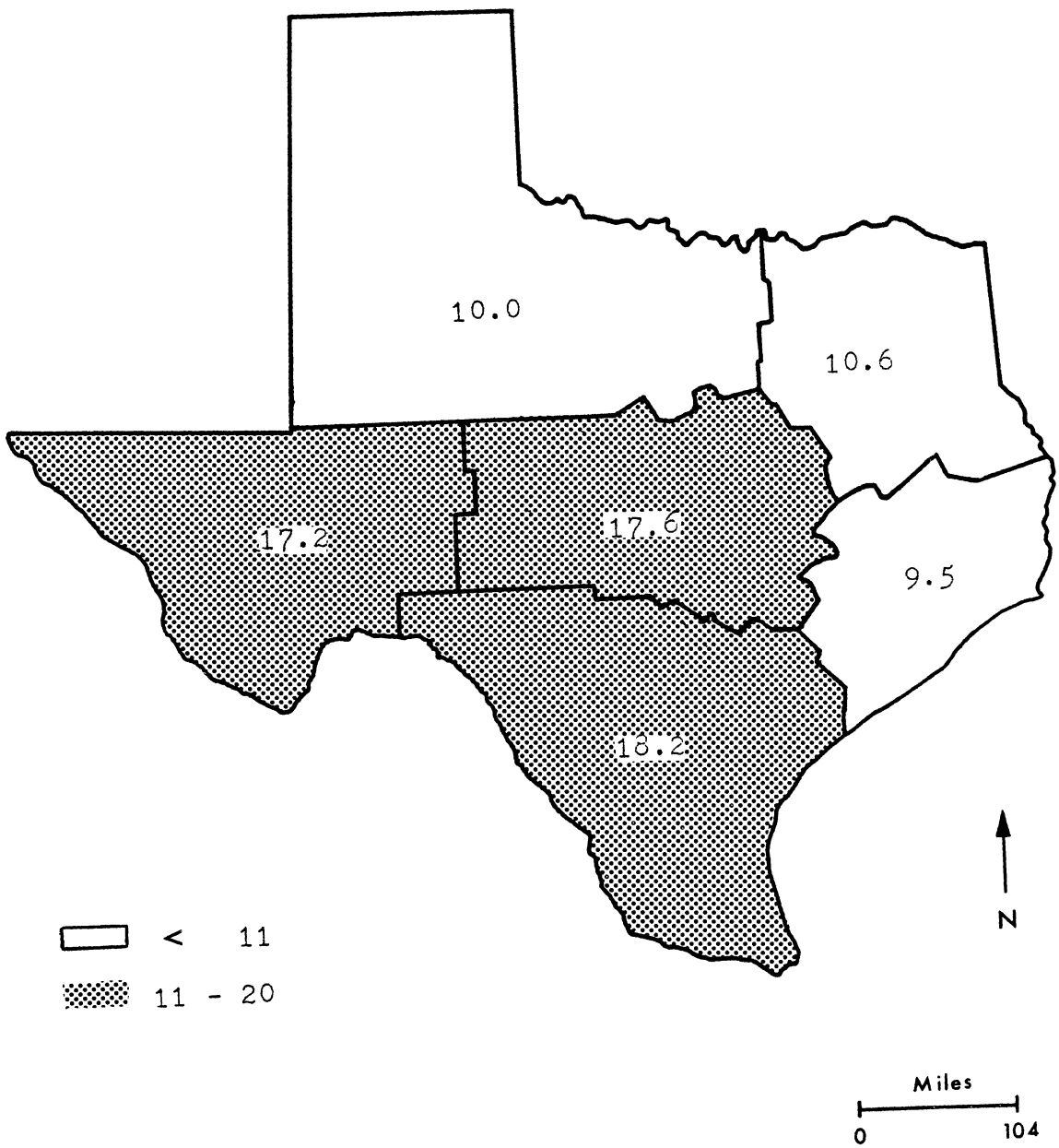


Figure 18. Percent of Respondents Drinking Milk with Chili

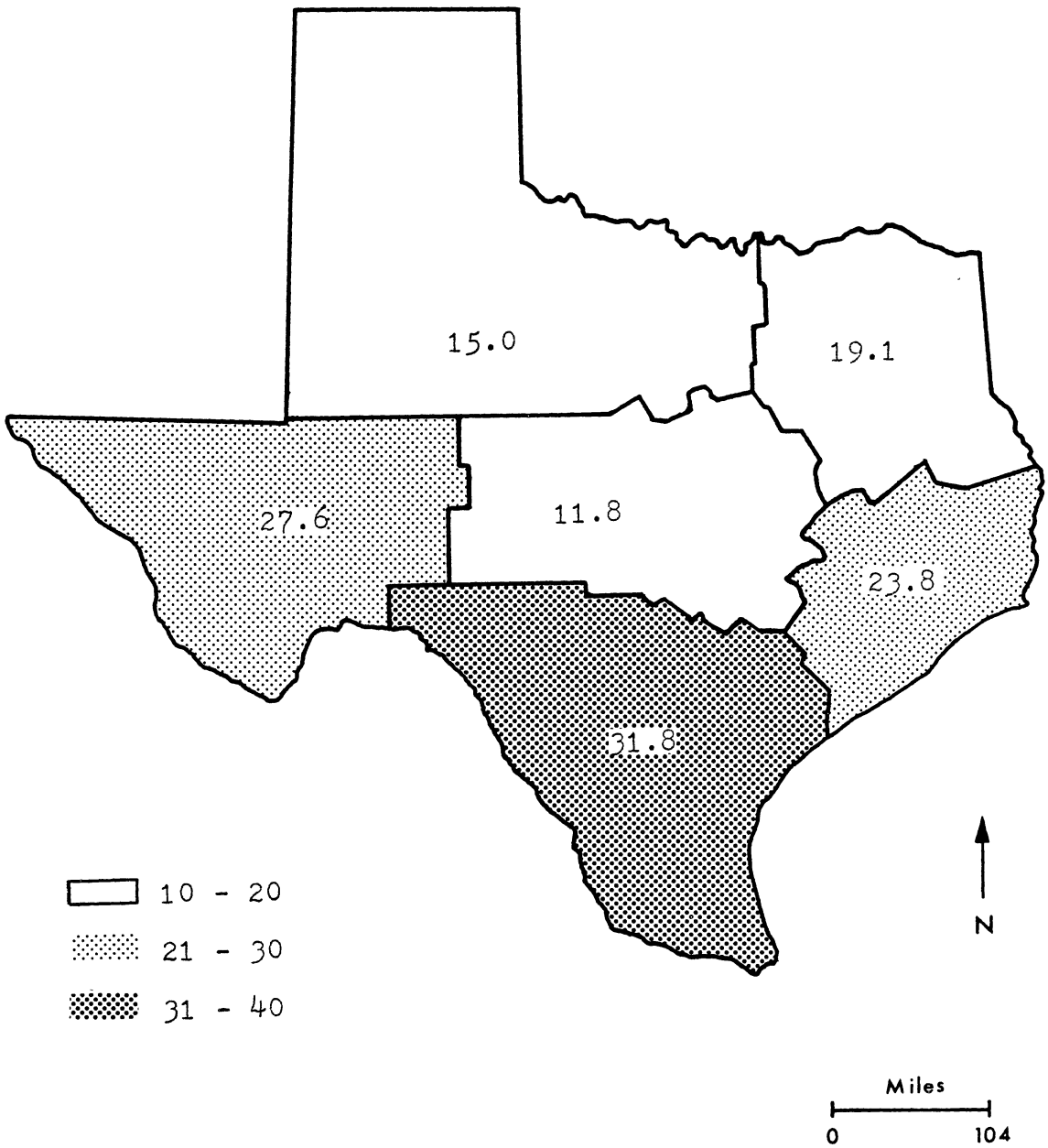


Figure 19. Percent of Respondents Rating Chili Among the Best Foods

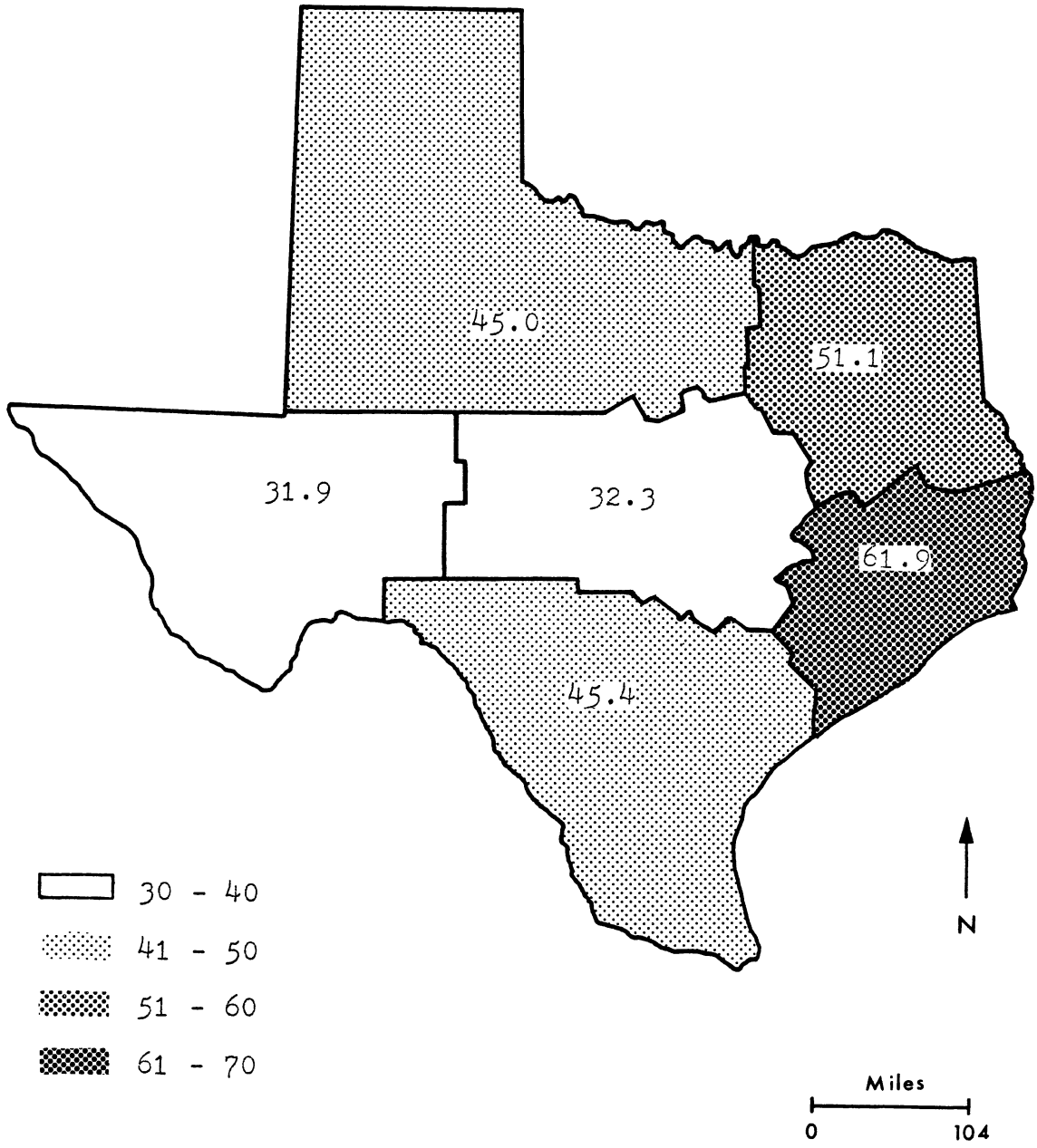


Figure 20. Percent of Respondents Rating Chili as a Good Food

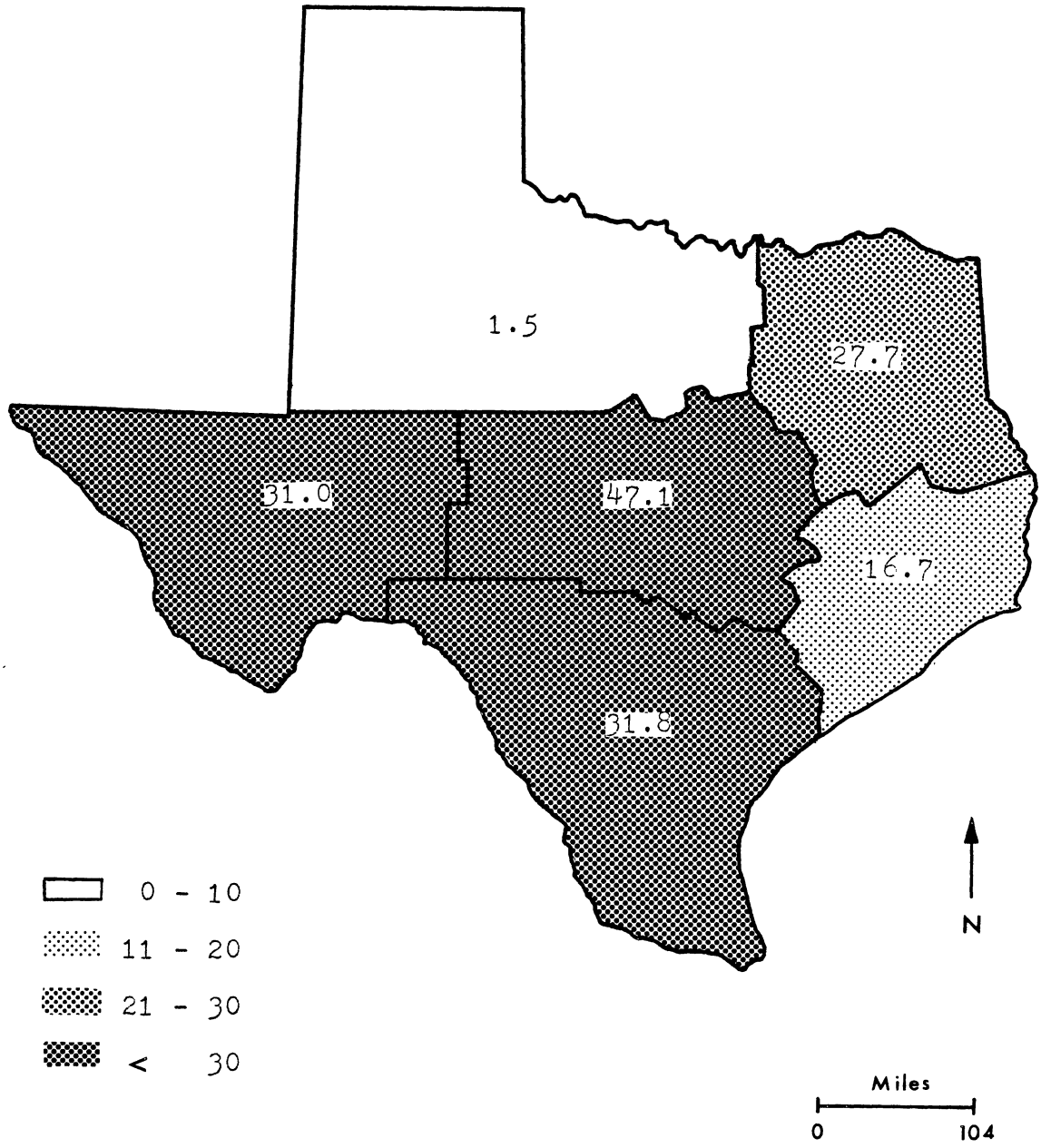


Figure 21. Percent of Respondents Rating Chili as ar Okay Food

Figures 22 and 23 are simplified additions of the previous figures abd nd are indended to make them more easily compared. Figure 22 shows the major areas where specific ingredients are preferred in chili. It should be noted that the Panhandle area was under represented by respondents and thus does not appear as a major preference area. Figure 23 shows in which areas specific beverages are preferred with chili.

Testing the Hypotheses

The major hypothesis is that a spatial variation in chili preferences exists in Texas. This was found to be essentially true from observing the preference patterns shown previously.

The second hypothesis states that the frequency of eating chili is directly related to lower income. By using chi squared analysis as shown in Table VI, it was found that respondents in the lower income brackets eat chili more often than those in the higher brackets. This may be true because chili is an inexpensive dish to make. Another possible explanation for this is the people with higher incomes may choose not to eat chili because it is considered "poor folks food."

The third hypothesis states that the respondents' rating of chili compared with all other foods is positively related to lower income. As can be seen in Table VII, the chi square values show that respondents in

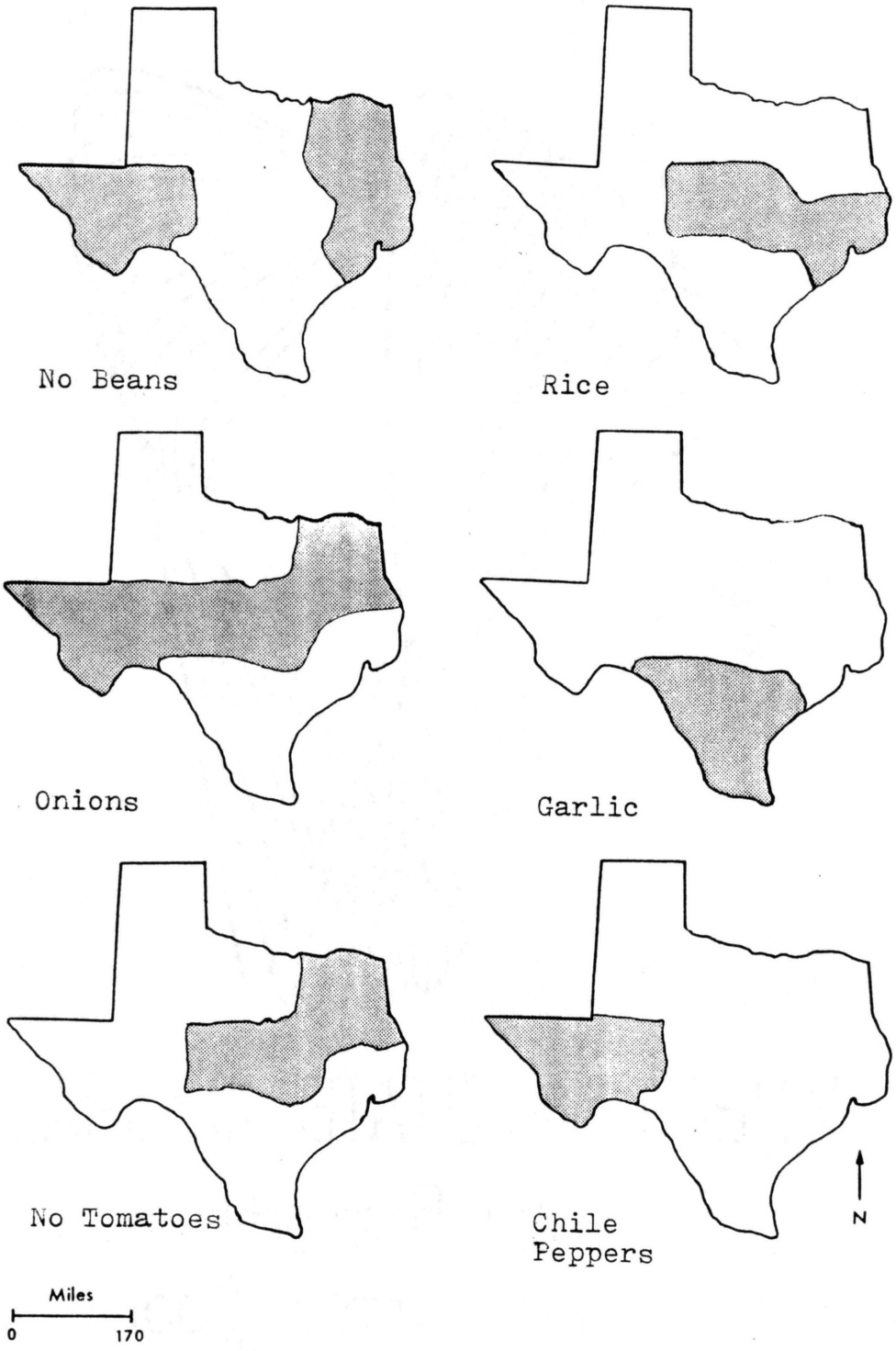


Figure 22. Preferred Chili Ingredients by Area

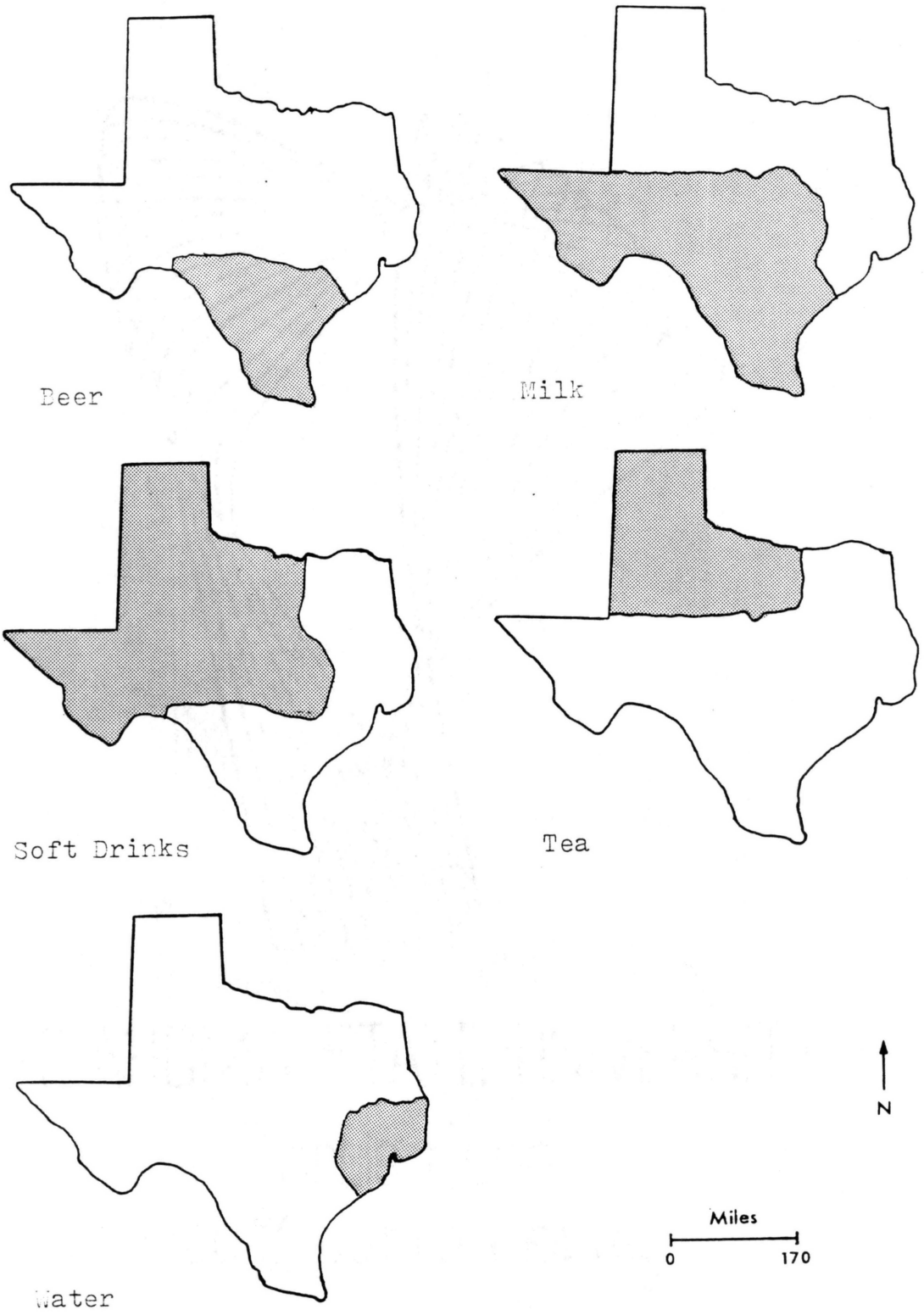


Figure 23. Preferred Beverages by Area

TABLE VI

CHI SQUARE ANALYSIS OF INCOME AND FREQUENCY OF EATING CHILI

INCO / FREQ	.	1	2	3	4	5	TOTAL
.	1	1	0	2	12	7	.
	.	.	.	.	.	.	
	.	.	.	.	.	.	
	.	.	.	.	.	.	
	.	.	.	.	.	.	
	.	.	.	.	.	.	
	.	.	.	.	.	.	
	.	.	.	.	.	.	
1	0	0	2	3	6	6	17
	.	0.3	1.0	1.9	8.5	5.3	
	.	-0.3	1.0	1.1	-2.5	0.7	
	.	0.3	0.9	0.7	0.7	0.1	
	.	0.00	1.10	1.65	3.30	3.30	9.34
	.	0.00	11.76	17.65	35.29	35.29	
	.	0.00	18.18	15.00	6.59	10.53	
2	0	2	6	5	4	6	23
	.	0.4	1.4	2.5	11.5	7.2	
	.	1.6	4.6	2.5	-7.5	-1.2	
	.	6.9	15.3	2.4	4.9	0.2	
	.	1.10	3.30	2.75	2.20	3.30	12.64
	.	8.70	26.09	21.74	17.39	26.09	
	.	66.67	54.55	25.00	4.40	10.53	
3	0	0	0	2	17	14	33
	.	0.5	2.0	3.6	16.5	10.3	
	.	-0.5	-2.0	-1.6	0.5	3.7	
	.	0.5	2.0	0.7	0.0	1.3	
	.	0.00	0.00	1.10	9.34	7.69	18.13
	.	0.00	0.00	6.06	51.52	42.42	
	.	0.00	0.00	10.00	18.68	24.56	
4	1	1	1	3	11	13	29
	.	0.5	1.8	3.2	14.5	9.1	
	.	0.5	-0.8	-0.2	-3.5	3.9	
	.	0.6	0.3	0.0	0.8	1.7	
	.	0.55	0.55	1.65	6.04	7.14	15.93
	.	3.45	3.45	10.34	37.93	44.83	
	.	33.33	9.09	15.00	12.09	22.81	
5	0	0	2	7	53	18	80
	.	1.3	4.8	8.8	40.0	25.1	.
	.	-1.3	-2.8	-1.8	13.0	-7.1	
	.	1.3	1.7	0.4	4.2	2.0	
	.	0.00	1.10	3.85	29.12	9.89	43.96
	.	0.00	2.50	8.75	66.25	22.50	
	.	0.00	18.18	35.00	58.24	31.58	
TOTAL	.	3	11	20	91	57	182
	.	1.65	6.04	10.99	50.00	31.32	100.00

STATISTICS FOR 2-WAY TABLES

CHI-SQUARE 50.015 DF= 16 PROB=0.0001

TABLE VII

CHI SQUARE ANALYSIS OF INCOME AND THE RATING OF CHILI

INCO / RATE	.	1	2	3	4	5	TOTAL
.	1	4	11	6	1	0	.
1	0	2	9	6	0	0	17
	.	3.5	8.1	4.8	0.4	0.3	
	.	-1.5	0.9	1.2	-0.4	-0.3	
	.	0.6	0.1	0.3	0.4	0.3	
	.	1.10	4.95	3.30	0.00	0.00	9.34
	.	11.76	52.94	35.29	0.00	0.00	
	.	5.41	10.34	11.76	0.00	0.00	
2	0	5	9	7	1	1	23
	.	4.7	11.0	6.4	0.5	0.4	
	.	0.3	-2.0	0.6	0.5	0.6	
	.	0.0	0.4	0.0	0.5	1.0	
	.	2.75	4.95	3.85	0.55	0.55	12.64
	.	21.74	39.13	30.43	4.35	4.35	
	.	13.51	10.34	13.73	25.00	33.33	
3	0	5	14	13	1	0	33
	.	6.7	15.8	9.2	0.7	0.5	
	.	-1.7	-1.8	3.8	0.3	-0.5	
	.	0.4	0.2	1.5	0.1	0.5	
	.	2.75	7.69	7.14	0.55	0.00	18.13
	.	15.15	42.42	39.39	3.03	0.00	
	.	13.51	16.09	25.49	25.00	0.00	
4	1	6	13	9	0	1	29
	.	5.9	13.9	8.1	0.6	0.5	
	.	0.1	-0.9	0.9	-0.6	0.5	
	.	0.0	0.1	0.1	0.6	0.6	
	.	3.30	7.14	4.95	0.00	0.55	15.93
	.	20.69	44.83	31.03	0.00	3.45	
	.	16.22	14.94	17.65	0.00	33.33	
5	0	19	42	16	2	1	80
	.	16.3	38.2	22.4	1.8	1.3	
	.	2.7	3.8	-6.4	0.2	-0.3	
	.	0.5	0.4	1.8	0.0	0.1	
	.	10.44	23.08	8.79	1.10	0.55	43.96
	.	23.75	52.50	20.00	2.50	1.25	
	.	51.35	48.28	31.37	50.00	33.33	
TOTAL	.	37	87	51	4	3	182
	.	20.33	47.80	28.02	2.20	1.65	100.00

STATISTICS FOR 2-WAY TABLES

CHI-SQUARE 10 554 DF= 16 PROB=0.8361

the lower income brackets are not more likely to rank chili higher than other respondents rank it. This indicates although those with lower income eat chili more frequently than do those with higher income, the income does not influence the preference for it. The hypothesis was rejected.

The fourth hypothesis states males are more likely to prefer hotter chili than are females. Table VIII the chi square test indicates male respondents do prefer their chili hotter than do females. The females most often prefer "medium" hot chili. Males evidently want to show how tough they are by being able to tolerate very hot chili. The Mexicans call this "macho" behavior.

The fifth hypothesis holds that the majority of Texas families have their own chili recipe. By noting the chi square value in Table IX, it can be concluded that native Texans are not more likely to have their own chili recipe than are non-natives. Chili is such a simple dish a specific written recipe is not really necessary.

The sixth hypothesis states that there is spatial variation of ingredients with regard to ethnicity. By comparing the maps of the ingredients with the ethnic location, this was found to be true with regard to the respondents who have Mexican mothers. There is an ethnic influence with regard to beanless chili, chile peppers, and omitting crackers. As has been shown, the Mexicans eat more beanless chili, more chile peppers in their chili, and eat crackers with their chili less frequently

TABLE VIII

CHI SQUARE ANALYSIS OF SPICINESS OF CHILI AND SEX OF RESPONDENTS

SPIC	SEX		
FREQUENCY EXPECTED DEVIATION CELL CHI2 PERCENT ROW PCT COL PCT	0	1	TOTAL
	2	0	
1	10 9.4 0.6 0.0 4.90 45.45 11.49	12 12.6 -0.6 5.88 54.55 10.26	22 10.78
2	34 27.7 6.3 1.4 16.67 52.31 39.08	31 37.3 -6.3 1.1 15.20 47.69 26.50	65 31.86
3	32 38.4 -6.4 1.1 15.69 35.56 36.78	58 51.6 6.4 0.8 28.43 64.44 49.57	90 44.12
4	11 11.5 -0.5 0.0 5.39 40.74 12.64	16 15.5 0.5 0.0 7.84 59.26 13.68	27 13.24
TOTAL	87 42.65	117 57.35	204 100.00

STATISTICS FOR 2-WAY TABLES

CHI-SQUARE 4.442 DF= 3 PROB=0.2176

TABLE IX

CHI SQUARE ANALYSIS OF NATIVITY OF RESPONDENTS AND HOME RECIPES

NATV	RECP		
FREQUENCY EXPECTED DEVIATION CELL CHI2 PERCENT ROW PCT COL PCT	.	1	2	TOTAL
.	0	0	1	
1	1	62 61.8 0.2 0.0 30.39 45.26 67.39	75 75.2 -0.2 0.0 36.76 54.74 66.96	137 67.16
2	0	30 30.2 -0.2 0.0 14.71 44.78 32.61	37 36.8 0.2 0.0 18.14 55.22 33.04	67 32.84
TOTAL	.	92 45.10	112 54.90	204 100.00

STATISTICS FOR 2-WAY TABLES

CHI-SQUARE 0.004 DF= 1 PROB=0.9485

than do the Anglos. Tortillas take the place of crackers in some cases. The number of black respondents was so low and so spatially varied that no generalizations can be drawn.

The last hypothesis suggested that native Texans are more likely to prefer chili than are non-natives. As seen in Table X, the chi square value indicates native Texans are no more likely to rate chili highly than are other Texas residents. Perhaps this is because chili has gained national popularity and a taste for it has been acquired outside the state of Texas.

TABLE X

CHI SQUARE ANALYSIS OF NATIVITY OF RESPONDENTS AND THE RATING OF CHILI

NATV / RATE	.	1	2	3	4	5	TOTAL
.	0	0	0	0	1	0	
	.	.	.	.	.	.	
	.	.	.	.	.	.	
	.	.	.	.	.	.	
	.	.	.	.	.	.	
	.	.	.	.	.	.	
	.	.	.	.	.	.	
1	1	31	62	40	3	1	137
	.	27.7	66.1	38.5	2.7	2.0	
	.	3.3	-4.1	1.5	0.3	-1.0	
	.	0.4	0.3	0.1	0.0	0.5	
	.	15.27	30.54	19.70	1.48	0.49	67.49
	.	22.63	45.26	29.20	2.19	0.73	
	.	75.61	63.27	70.18	75.00	33.33	
2	1	10	36	17	1	2	66
	.	13.3	31.9	18.5	1.3	1.0	
	.	-3.3	4.1	-1.5	-0.3	1.0	
	.	0.8	0.5	0.1	0.1	1.1	
	.	4.93	17.73	8.37	0.49	0.99	32.51
	.	15.15	54.55	25.76	1.52	3.03	
	.	24.39	36.73	29.82	25.00	66.67	
TOTAL	.	41	98	57	4	3	203
	.	20.20	48.28	28.08	1.97	1.48	100.00

STATISTICS FOR 2-WAY TABLES

CHI-SQUARE 3.914 DF= 4 PROB=0.4177

CHAPTER V

SUMMARY AND CONCLUSIONS

It was found that chili preferences do vary spatially throughout Texas. These variations are related to some extent with the location of the Mexican population in El Paso. The staples of the Mexican diet include tomatoes, chile peppers and tortillas. These foods stand out as preferred in their chili. While chili is not a true Mexican dish, Mexicans continue to contribute to its character.

Chili is likely to be eaten more frequently by people in the lower income brackets. On the other hand, those respondents in the lower income brackets are no more likely to rate chili highly than were the other respondents. It must be remembered, however, that few of the respondents were in particularly low income brackets. They are, after all, university students with relatively well educated parents.

Many of the chili ingredients varied little across Texas. This suggests that food marketing may have limited the possible regional diversity of chili. There are many companies producing canned chili, and they use the same recipe where ever they sell their product. This may help unify national food preferences by exposing the people to

a standard recipe. Although there is not much variation of chili preferences within Texas, the respondents do not prefer the more exotic and innovative ingredients that are used in other parts of the United States. These include mushrooms, tofu, and leeks, to name a few. Food preferences do not seem to be as easily influenced as clothing fashions.

In spite of the availability of chili in cans, most respondents make it from "scratch." They do not consider it necessary to use a specific recipe. Some respondents take canned chili and add other ingredients. Males like their chili hotter than do females. This can cause disagreements in recipes when the chili is made to be eaten by a diverse group.

With regard to this study, we must conclude that chili is alive and well in its cultural hearth of Texas. Within Texas there are some similarities as well as differences in chili preference. Chili is popular from El Paso to Houston and from San Antonio to Dallas. Perhaps chili will one day be equally popular throughout the United States.

The diffusion of chili from its cultural hearth of San Antonio would make an interesting study. The principle sources of information for this would be individuals who had lived in the area their entire lives. The researcher would probably have to travel through Texas interviewing them.

There do seem to be some cultural boundaries concerning food preference. The Mexican Americans usually ate tortillas with their chili rather than crackers. A broader study might reveal similar differences in the Black, Asian or other ethnic groups.

The geography of food and food preferences is worthy of pursuit but the difficulties encountered in obtaining the data can make serious study prohibitive, however. A good example of this would be a study of the diffusion of the chili industry over time and through space. The chili industry refuses to provide the needed data to researchers and states the information is too sensitive.

Chili cookoffs fascinate many people. Tracing their diffusion from Texas would be interesting yet difficult. Chiliheads tend to be independent and therefore keep limited records of their cookoffs. The cookoffs are also informal and may change dates, times, and locations repeatedly. This complicates recordkeeping.

Another interesting study would be to survey people in every state to get a nationwide chili preference pattern. This would be very difficult to do because of the cost and the volume of data needed.

Even on a state level, more research is needed. This research could be duplicated in other states and possibly correlated with them. A state-wide research sample of 206 respondents has limited application. Ideally, a larger sample covering a wider range of socioeconomic levels should be made.

In addition to chili, other American foods such as popcorn and pizza could be studied. Their origin and diffusion could be as interesting as the landmark book by Carl Sauer (1952). The origin and dispersal of American foods could make an interesting dissertation or perhaps even a best seller.

Since almost every person makes chili a slightly different way, perhaps there will be restaurants serving 31 flavors of chili as well as 31 flavors of ice cream. These restaurants could suit any taste since the only required ingredient would be mild chili powder. Even weight watchers and vegetarians could be accommodated.

As chili as a food has gained popularity, it has also become more popular in other ways. Products from paint to nail polish describe their color as "chili red." Chili is sometimes a theme in cartoons and comic strips. There is even a music group calling themselves the "Red Hot Chili Peppers." Is this a temporary interest in chili, or has the dish found a permanent and prominent place in American culture? Only time will tell.

Another unanswered question is why is the canned chili industry growing when most of the respondents make their chili from "scratch?" Is Texas an anomoly in this regard? Whatever the answer, chili has had a colorful past and promises to have a bright future.

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APPENDIX

CHILI QUESTIONNAIRE

Please answer as fully as possible. Check the blank or write in the appropriate response.

I. Personal Data

1. Sex:_____male _____female

2. Age _____

3. College classification: FR____ SO____ JR____ SR____ GRAD____

4. Are you a native Texan? yes_____ no_____
If no, how many years have you lived in Texas? _____

5. Please list your Hometown (where you graduated High School).
town_____ state_____

6. Parents highest level of education:
Mother: Elementary_____ High School_____ College_____ Other_____
Father: Elementary_____ High School_____ College_____ Other_____

7. Your parents' approximate yearly income: 10-20,000_____
21-30,000____ 31-40,000____ 41-50,000____ over $50,000____

8. Ethnic background: Mother_____ Father _____

II. Chili Preferences

1. Approximately how often do you eat chili? never_____ daily_____
weekly_____ monthly_____ other_____

2. Do you eat meat in your chili? yes_____ no_____
If yes, what type? _____
How do you prefer the meat to be cut? ground____ chopped____

3. How hot with spice do you prefer your chili? very hot_____
hot_____ medium_____ mild_____

4. Good chili should be: thick_____ medium_____ thin_____

5. Which of the following ingredients do you like in your chili?
(check as many as apply): beans (type)_____ rice_____
spaghetti_____ onions____ garlic____ tomatoes____
chile peppers____ other_____

6. Which of the following items do you eat with your chili?
(check as many as apply): crackers (type)_____ cheese_____
pickles_____ appies_____ corn bread_____ other_____

7 Which of the following items do you prefer to drink with your chili?
water_____ tea_____ milk_____ beer_____ buttermilk____
soft drink_____ other _____

8. Where do you most often eat chili? school____ home____
home of a friend____ restaurant____ other_____

9. When you eat chili at home, is it usually made from:
a recipe (or from "scratch")____ a mix____ a can_____
a "brick"_____ frozen_____ other_____

10. Check the following types of chili with which you are familiar.
Texas____ Cincinnati____ St. Louis____ Illinois____

11. Does your family have a special chili recipe? yes_____ no_____
If yes, could you please list the special ingredients used?
_____

12. Compared to all other foods, how do you rate chili?
among the best____ good, but not in the "best" group____
okay____ not so good____ awful____

Thank you for your help.

VITA

Mary Beth Aue

Candidate for the Degree of

Master of Science

Thesis: TEXAS' CHILI: A SPATIAL ANALYSIS OF FOOD PREFERENCE

Major Field: Geography

Biographical:

Personal Data: Born in Conway, Arkansas, December 28, 1959, the daughter of Ernest H. and Dorothy M. Aue.

Education: Graduated Beebe High School, Beebe, Arkansas, May, 1978; received Bachelor of Science degree at the University of Central Arkansas, Conway, Arkansas, May 1983; completed requirements for the Master of Science degree at Oklahoma State University, Stillwater, Oklahoma, May, 1983.

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