Household Food Security Among Migrant and Seasonal Latino Farmworkers in North Carolina

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SYNOPSIS

Objective. Food insecurity is defined as lack of access at all times, due to economic barriers, to enough food for an active and healthy lifestyle. The objective of this study was threefold: to characterize levels of food security, food insecurity, and hunger among migrant and seasonal Latino farmworkers; to assess predictors of food insecurity for this group; and to describe the strategies farmworkers use to cope with food insecurity.

Methods. Adults from 102 farmworker households in North Carolina responded to a survey that used a Spanish-language adaptation of the U.S. Household Food Security Survey Module and questions about sociodemographic characteristics and food behaviors. Twenty-five farmworkers participated in in-depth interviews in which they described their households' food security situation and coping strategies.

Results. Forty-eight of the 102 sample households (47.1%) were classified as food insecure, including 10 (9.8%) with moderate hunger and five (4.9%) with severe hunger. Households with children had a significantly higher prevalence of food insecurity than those without children (56.4% vs. 36.2%). Households with children accessed food programs such as the Special Supplemental Nutrition Program for Women, Infants and Children (WIC) that were unavailable to those without children, while those without children were more likely to access food pantries and to consume wild game or fish. Coping strategies included borrowing money, reducing food variety, and adults consuming less food to protect children from hunger. Food insecurity was more than four times as prevalent among farmworker households as among the general U.S. population.

Conclusion. Policy changes to increase economic resources and access to federal programs are needed to decrease this food insecurity.

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Food security is defined as access at all times to enough food for an active, healthy life. This includes having foods available that are nutritionally adequate, safe, acceptable, and obtained without resorting to emergency food supplies, scavenging, stealing, or similar coping strategies.[1] As one of the signers of the Declaration of Rome at the 1996 International Food Summit, the U.S. pledged to reduce by at least half the prevalence of hunger in this country by 2010. The Food Security Measurement Project, a joint undertaking of U.S. government agencies and private sector experts, led by the U.S. Department of Agriculture (USDA) and the National Center for Health Statistics, has developed a standard questionnaire to measure food security, food insecurity, and hunger across the U.S. population.[2] This instrument has been used as part of an effort to document the prevalence of food insecurity and hunger and to understand the process by which individuals and families become food insecure. As defined by U.S. policy, food insecurity and hunger are understood to result from financial constraints, not voluntary restrictions in food intake.

Data published by the USDA show that 11.1% of all households in the United States experienced food insecurity in 2002; 21.7% of the Hispanic population was food insecure, almost twice the national percentage.[2] Nationally, 16.5% of households with children younger than age 18, and 8.1% of households with no children, reported food insecurity. Other research has targeted at-risk populations, finding rates of food insecurity substantially higher than the national average. For example, a study of 600 Latino, Vietnamese, and Cambodian immigrants found that 81% experienced some degree of food insecurity: 40% were food insecure without hunger, 27% were food insecure with moderate hunger, and 14% were food insecure with severe hunger.[3] The rate of food insecurity in these immigrant populations was more than seven times that of the general population.[2]

We report data on food insecurity and hunger among members of one vulnerable population: migrant and seasonal farmworkers and their families. There are an estimated 4.2 million migrant and seasonal farmworkers and their dependents in the U.S.[4] Most of these farmworkers are foreign-born, most from Mexico.[4,5] Some migrate point-to-point for farm work, others follow the crops in an annual cycle, and others work seasonally in the place where they reside. Ironically, while migrant and seasonal farmworkers play an essential role in the production of most of the fruits and vegetables in the U.S., most have incomes that are low and precarious enough that they may be at risk for food insecurity.[5] The National Agricultural Workers Survey found that wages for migrant and seasonal farmworkers, adjusted for 1998 dollars, dropped from $6.89 per hour in 1989 to $6.18 per hour in 1998.[5] The median income of individual farmworkers was less than $7,500 and that of farmworker families less than $10,000. Sixty-one percent of all farmworkers had annual incomes below the poverty level.[5]

Many migrant and seasonal farmworkers lack immigration or citizenship documents necessary for access to publicly funded food safety net programs such as the Food Stamp program. To date, no published assessments of food security focusing on this farmworker population have been done. We found only one published study of farmworker nutritional status and dietary intake[6] and one study of childhood food security that drew some participants from Migrant Head Start,[7] an early childhood education program that serves children of migrant farmworkers.

The goal of this report is to provide baseline information on food security among migrant and seasonal Latino farmworkers in North Carolina. We characterize levels of food security, food insecurity, and hunger; assess predictors of food insecurity; and describe the strategies farmworkers use to cope with food insecurity.

The migrant and seasonal farmworker population in North Carolina is estimated at 100,000 workers and their dependents.[8] Until 15 years ago, this population was largely African American and white. Today, its ethnic composition mirrors the national trend: most workers are Latino, primarily from Mexico.[5] When Mexican migrant and seasonal farmworkers began to come to North Carolina, most were unaccompanied men. Increasingly, their families are joining them and establishing residence in the U.S. Workers are employed in the production of a variety of crops, including green peppers, cucumbers, sweet potatoes, apples, tobacco, and Christmas trees.

METHODS

This study was conducted as part of a larger project, *Casa y Campo*, which is a four-year effort funded by the National Institute for Occupational Safety and Health (NIOSH) that brings together environmental health scientists, health care providers, and farmworkers to reduce pesticide exposure and the adverse health effects of pesticide exposure among farmworkers, and to address other health issues of concern to the farmworker community.

Sampling and recruitment

Households were recruited for the present study from a five-county area of central North Carolina that includes Duplin, Harnett, Johnston, Sampson, and Wake counties. This region has the state's greatest concentration of migrant and seasonal farmworkers, with an estimated 16,471 workers in 2000.[8] To be eligible for the present study, the household had to have at least one adult resident who had done paid farm work in the past 12 months. The sampling plan called for 50 households with at least one child younger than 6 years of age; the remaining households could be made up of adults or adults plus older children. In the absence of a census listing all eligible farmworkers, a site-based sampling method was used to recruit a representative sample.[9] A similar method has been used in previous farmworker health research.[10,11] Briefly, such an approach is based on the idea that every resident of a household is a member of at least one group, or "site." Sites can include, but are not limited to, trailer parks, migrant camps, sports teams, church congregations, schools, clienteles of businesses, work groups, or patients of clinics. If sites that vary across community characteristics (e.g., households with or without children, in town vs. rural) are chosen and respondents are selected from a variety of sites, the resulting sample should reflect the variability in the community.

Project staff compiled a list of sites in the study counties. Respondents were recruited at 22 sites, including farm labor camps, trailer parks, individual dwellings, churches, Migrant

Head Start programs, and laundromats. To obtain informed consent, interviewers explained the purpose, procedures, and risks and benefits of the study. They mentioned that each respondent would receive a small gift at the end of the interview. (Those with children received a booklet on household lead exposure and a children's picture book; those without children received a hat with a safety logo.) Each respondent was provided an information sheet in Spanish containing the same information that had been reviewed orally. This sheet contained the contact information for the Wake Forest University School of Medicine Institutional Review Board, which had approved this procedure for obtaining informed consent.

Data collection

Three interviewers collected questionnaire data in face-to-face interviews during June and July 2002. Two interviewers were college students employed as summer interns by Student Action with Farmworkers, a program that places bilingual college students, including children of farmworkers, in agencies serving farmworkers in North and South Carolina. The third was one of the authors (Tapia), a bilingual staff member of the North Carolina Farmworkers' Project, a nonprofit advocacy and service organization that assists farmworkers. All three interviewers were native Spanish speakers.

Food security was measured using a Spanish-language adaptation of the 18-item U.S. Household Food Security Survey Module, which has been developed and tested by the USDA.[12] This instrument classifies households as food secure, food insecure without hunger, food insecure with moderate hunger, and food insecure with severe hunger during the previous 12 months. Harrison and colleagues developed the Spanish language version, which is intended to be valid across different Hispanic populations.[13] The developmental process included word-by-word comparisons of existing Spanish translations, focus group interviews with groups of native speakers (Cuban American, Puerto Rican, Mexican American), and translation followed by back translation.

For the present study, data were also collected on the following: (*1*) potential predictors of food security (household composition, place of origin, employment, education), (*2*) the availability of food-related facilities and resources (presence/absence of working refrigerator and stove, participation in gardening and hunting, availability of transportation to purchase food), and (*3*) the use of food-related governmental and non-governmental services (Food Stamps, food pantries, the Special Supplemental Nutrition Program for Women, Infants and Children [WIC], Migrant Head Start).

The survey data were supplemented with qualitative data gathered from the same population. As part of the larger *Casa y Campo* project, in-depth interviews were collected from adult members of 25 households of farmworker families with one or more children younger than 18 years of age. These interview respondents were drawn from the same set of 22 sites. Participants in the in-depth interview overlapped with those participating in the larger food security questionnaire study; 14 households participated in both.

During the course of the interviews, which focused on a variety of health concerns and experiences of farmworker families, respondents were asked about whether they or their family had ever had trouble getting enough to eat since coming to North Carolina. Interviewers followed up on respondents' replies to find out what they did to prevent or cope with such circumstances and if they knew of others in such circumstances.

Data analysis

Data from questionnaires were entered into an Epi Info database[14] and converted to an SPSS dataset[15] for analysis. Households were divided into four categories: food secure, food insecure without hunger, food insecure with moderate hunger, and food insecure with severe hunger.[12] Bivariate relationships with predictors were assessed using analysis of variance or contingency table analysis, as appropriate. Summary statistics for three categories of food security (secure, insecure without hunger, insecure with hunger) for households with and without children were compared with food security data for U.S. households for 2002.[2]

In-depth interviews were tape recorded, translated into English, and transcribed verbatim. Text pertaining to food security was extracted using The Ethnograph, Version 5.0.[16] Extracted text segments were reviewed and summarized by the authors; themes related to the management of food insecurity were compiled.[17] Illustrative quotations from the interviewees are presented below, with household identification number and the gender and age of the respondent indicated.

RESULTS

Survey data

Description of the sample. The sample was divided into households with children younger than 18 years of age (n=55) and households without children (n=47). In 80.0% of the households with children, the respondent was female. Otherwise, the respondent was almost always a male member of the household (97.9%). Overall, 96.1% of respondents reported having been born in Mexico. Forty-six percent of respondents reported having had only a primary education, and 45.0% the equivalent of a middle school education.

In households with children, the number of children ranged from one to five, with a mean of 2.6 (standard deviation [SD]=1.2). The age of children ranged from <1 year to 17 years, with a mean of 5.3 years (SD=2.9).

The average household size was larger for households with children, ranging from 3 to 11 individuals, with a mean of 6.0 (SD=1.7). Households without children ranged in size from one to six individuals, with a mean of 3.3 (SD=2.0). Households with and without children did not differ in the number of household members holding jobs (2.9 [SD=1.4] vs. 3.2 [SD=2.1]). The median time spent in the U.S. by respondents from households with children was 72 months, compared to 14 months for those without children.

Prevalence of food security. Overall, 47.1% of the sample households were classified as food insecure, including 33 (32.4%) food insecure without hunger, 10 (9.8%) with moderate hunger, and five (4.9%) with severe hunger (Table 1). Households with children had a significantly higher prevalence of

Table 1. Number and proportion of households in each food security category

	Households with children (n=55)	*Households without children (n=47)*	*Total households (n=102)*
	Number (percent)	*Number (percent)*	*Number (percent)*
Food secure	24 (43.6)	30 (63.8)	54 (52.9)
Food insecure without hunger	23 (41.8)	10 (21.3)	33 (32.4)
Food insecure with moderate hunger	5 (9.1)	5 (10.6)	10 (9.8)
Food insecure with severe hunger	3 (5.5)	2 (4.3)	5 (4.9)

food insecurity than those without children (56.4% vs. 36.2%). The percentage of households classified as food insecure without hunger was almost twice as great among those with children as among those without children (41.8% vs. 21.3%). There were no differences based on the presence of children in the number of households categorized as food insecure with hunger (moderate or severe).

Predictors of food security. There were no significant differences in the prevalence of food security according to several measures of household composition, including total number of household residents, number of working adults, number of children, and age of children. For households with children, the level of education of the respondent (almost always the mother) was significantly related to food insecurity; 70% of households in which the respondent had a primary education or less were classified as food insecure, compared with only 40% in households in which the respondent reported *secundaria* (equivalent to middle school) or higher education (χ^2=4.523; p=0.033). There was no relationship between food security and education level of the respondent in households with no children. Other possible predictors (presence of working stove and refrigerator, and access to a vehicle) were not associated with food security (data not shown).

Food resources and food security. Table 2 indicates that most families with children used grocery stores for the majority of their food purchases. Those without children tended to use a wider variety of stores, including *tiendas* (small stores with limited inventories run by Latinos for Latino clientele) and convenience stores. There were no significant differences between food secure and food insecure households in these food sources.

Families with children used a variety of government-sponsored nutrition services, most of which are unavailable to families without children. WIC, Migrant Head Start, and free or reduced-price school lunch were the most commonly used programs. Use of the school lunch program was not associated with food security. The association between use of

Table 2. Food resources used by farmworker families (*N*=102 families)

	Number (percent) of households			
	With children		*Without children*	
Food source	*Food secure (n=24)*	*Food insecure (n=31)*	*Food secure (n=30)*	*Food insecure (n=17)*
Purchased food				
Grocery store	24 (100.0)	29 (93.5)	23 (76.7)	14 (82.4)
Convenience store	—	1 (3.2)	2 (6.7)	2 (11.8)
Tienda	—	1 (3.2)	4 (13.3)	1 (5.9)
Other	—	—	1 (3.3)	—
Food programs				
Food Stamps	5 (20.8)	6 (19.4)	—	1 (5.9)
WIC	11 (45.8)	22 (71.0)	—	—
Migrant Head Start	15 (62.5)	14 (45.2)	—	—
Free or reduced-price school lunch	17 (70.8)	17 (54.8)	—	—
Food pantry/churches/community agencies	6 (25.0)	7 (22.3)	15 (50.0)	10 (58.8)
Food production				
Wild game or fish	14 (63.6)	8 (25.8)	22 (73.3)	11 (64.7)
Garden	8 (42.1)	11 (35.5)	15 (50.0)	6 (35.3)

WIC = Special supplemental Nutrition Program for Women, Infants and Children

WIC services and food security approached statistical significance for families with children (χ^2=3.56; p=0.059). Food pantries, churches, and other community agencies were used by significantly more families without children than families with children; there was no association between use of these sources and food security.

Wild game or fish were consumed by 70.2% of families without children and 40.0% of those with children. This food source was associated with greater food security in the total sample (χ^2=7.502; p=0.006) and among those with children (χ^2=5.963; p=0.015). Gardening was practiced by about 40% of each group but was not associated with food security.

In-depth interviews

Three general areas of concern emerged from the analysis of the qualitative interview data. First, farmworkers described the experience of food insecurity and hunger, including when it occurred and how household members experienced the problem. Second, farmworkers placed a particular emphasis on trying to protect children from experiencing hunger. The third area of concern related to ways of either coping with food insecurity or trying to prevent it.

Interviewees reported that many farmworker families experience food insecurity in cycles, rather than continuously. Cycles sometimes correspond to pay periods. Often food does not last from one paycheck to the next, particularly when other bills come due or when the farmworker is being paid piece work rates.

> "It's almost every week that the good food we bought lasts just until Wednesday, and then we have to eat whatever is left. We put up with it and just eat what we have." [Farmworker No. 9 (FW09)—female, age 32]

> "There are weeks when you have to limit the food you are going to buy so the money will last. The job sometimes, like during this time when it doesn't rain, the job is not good. Or if the job in the fields depends on the person, it depends on how fast you are. Well, in the blueberries if you work fast, then you earn more. But if you're not fast, you earn less." [FW07—female, age 25]

> "We're just earning enough to pay bills, rent, and the food. And sometimes it's very hard because we don't have enough and we have to wait until the next week to pay something. If we have an accumulation of bills—for example, insurance, rent, and groceries—then we just pay the rent and the insurance because we wait until the next week to buy food. And we eat whatever we have. And the next week, since we don't have to pay rent, we then buy all our groceries." [FW10—female, age 24]

They also reported annual cycles of hunger; the problem of food insecurity is worse when no work is available due to winter or changes in crop seasons.

> "[We struggle more] in the times of the snows. When the snow falls, we don't have money because I don't work and sometimes, [my wife] can't walk to get to work [as a housekeeper at a motel]." [FW16—male, age 32]

> "The months that it snows, it's the worst, like in January, February, March and April, when there is no work in the fields. Well, it's very difficult to have work. And when we don't have sufficient money to buy food, we have to limit the amount of food that we are going to buy." [FW07—female, age 25]

Sparing children. Parents believed that children are more vulnerable than adults to the effects of food shortages, and they make feeding children a priority when supplies are short.

> "The food is the most important thing for the children. Because the children get desperate if there is not enough food for them. And we feel that the most important thing is for the children to have a good diet because they can get sick if they don't eat well. Even if it is not much, they have to eat. . . . The most important thing is that the children eat, because a big person knows how to limit his [or her] food." [FW06—female, age 33]

To spare children, parents resort to a variety of strategies. One farmworker described how he handles the situation when the family does not have sufficient food:

> "I told my wife to eat what she could while I would go with my cousins and friends. I would do it sometimes just to leave. I would eat lunch and stay gone all day in the fields so my wife and children would have more to eat. We have had to do this at times." [FW23—male, age 38]

Coping or prevention strategies. When faced with insufficient money to buy food, most families reported that they stretch their food dollars. Some seek stores where the prices are lower. Others change their buying habits.

> "I always buy the most inexpensive foods [when we are running out of money]. The children will say something about eating the same thing again. Sometimes they don't want to eat it, but when you're hungry, you'll eat whatever." [FW09—female, age 32]

Farmworkers reported using local church food pantries and food distribution programs run by social service organizations. They tended to refer to them by location, rather than by name or by the sponsoring agency. Those who had not experienced food insecurity did not know names or locations of agencies from which they could receive food, perhaps because such information is not salient to them.

> "There were some people from the Catholic Church who came from Raleigh before and they would bring us food sometimes. And when we have a way to go, we go to Raleigh to the Catholic Fair, and they give us food there." [FW15—female, age 35]

> "Our food ran out, and we didn't have anything to buy food for the week. Since my wife was getting welfare, we managed on that little bit of help. And when we needed more, we went to Newton Grove [Episcopal Farmworker Ministry]. They gave us food, and then we went to [another agency] in downtown Clinton and they gave us food also." [FW23—male, age 38]

"Two or three months ago, a lady from Harnett County, who helped enroll the children in [Migrant Head Start], came and she said that there was a place that donates food. But I didn't know anything about that and I didn't pay a lot of attention. I heard her say it was something like for immigrants." [FW13—female, age 30]

Living in a rural environment, farmworkers reported being able to supplement their food supply with wild game and fish.

"[D]uring the deer season or the turkey season, the white people hunt them and give us some. And I have freezers, and there I have a lot of meat frozen. And when we are a little short, we take deer from there. Or I'll go fishing, and we'll clean them and keep them in the freezer with water in the little bags that zip closed." [FW16—male, age 32]

Informal borrowing arrangements were also reported as ways to get money for food. Farmworkers reported obtaining loans from friends, employers, or other family members. All reported that the loans were repaid when they had earned sufficient money by working. None reported being charged interest.

"We have borrowed money from other people and then bought food. Then when we returned to work, we would pay this money back." [FW06—female, age 33]

"One time I came from Florida with very limited money. [To be able to eat], I asked my boss here to lend me some money. And he asked me how I wanted to repay it—all at once or little by little. And I told him that I wanted to pay him back by $50 a week." [FW21—male, age 21]

"My father helped us a lot last year because my husband was out of work in the fields for two months, and my father worked in the factory . . . . My brother is paid every 15 days. Sometimes we borrow money to buy food, and when [my husband] gets paid, we pay back what we have borrowed." [FW25—female, age 23]

Few farmworkers talked about government food programs. Although the survey data showed that many families participated in such programs as WIC and free or reduced-price school lunch, these were not mentioned as sources of food to supplement household supplies. Food stamps were mentioned, but with emphasis on their limited availability.

"Right now the help that I have is the food stamps that they give to my little boy. But that's just the first three months that they give me $130. After that they lowered the amount. When we started work again, they just give me $32. That's very little, and with that amount I can't feed my son for one month." [FW15—female, age 35]

Even those who had not experienced hunger or food insecurity had thought of being without food. Several described their strategies for preventing hunger in their households, pointing to the need to plan for times when money was short.

"If I earn a little bit this week, then I'm not going to spend it all because you have to have control. And we are not going to go hungry because we have soup at least—or whatever might be more economical. We have to save because we don't know whether next week or next month we will have a job." [FW18—female, age 38]

"If the rent comes due, we pay it, and if we need money for something else, we find it. And then, with the next check, we pay it back. And then we buy shoes. You have to know how to manage your money. One month we pay one thing, and the next month, we pay something . . . . And if this month I'm going to have to pay bills, then I buy potatoes or beans, whatever is cheaper." [FW24—female, age 32]

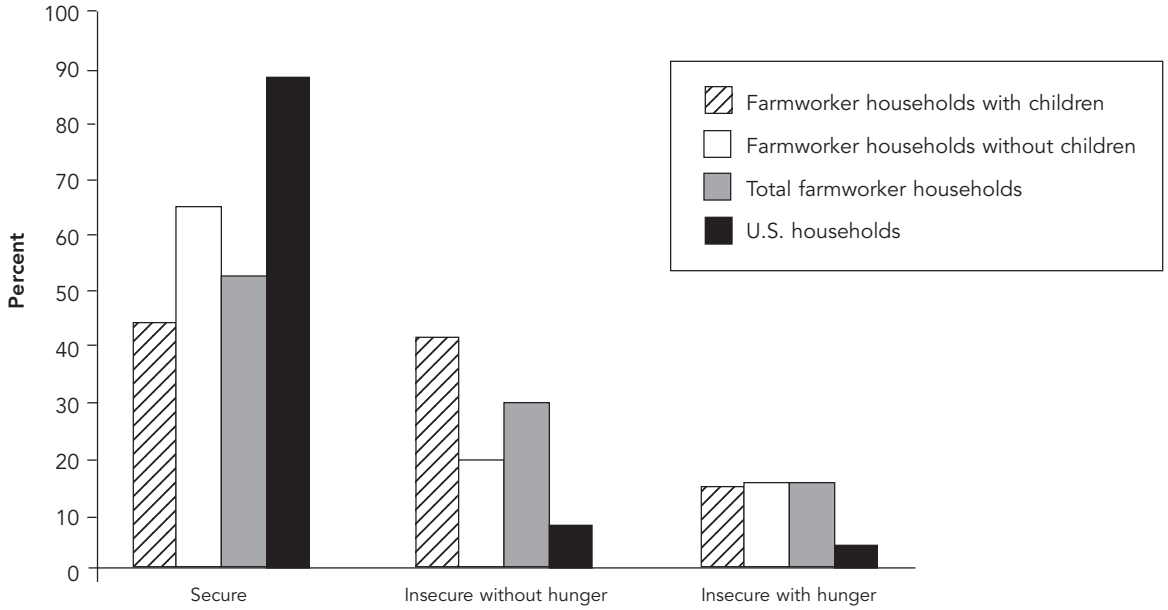
DISCUSSION

At almost 50% of households, food insecurity is extremely high among Latino farmworkers in North Carolina, especially in households with children. Food insecurity is more than four times as common in this sample of farmworkers as in the general U.S. population[2] (see Figure). Farmworker households without children are more than three times as likely as the general population to be food insecure; households with children are more than four times as likely.[2] These findings corroborate those of other studies of Hispanic populations in the U.S., which have found levels of food insecurity substantially higher than among non-Hispanics.[3,18]

Although an assessment of progress from 1995 to 2000 toward the national goal of reducing food security by half by 2010 found encouraging gains,[19] the most recent figures suggest that progress has slowed since the 1990s.[2] The national gains in the late 1990s were probably due to improvements in income due to strong economic growth. Therefore, without renewed economic growth and attention to policies that affect income among the most vulnerable portion of the U.S. population, including farmworkers, further gains in food security are in doubt.

This study examined a variety of predictors for food security. One significant predictor for households with children was the educational attainment of the respondent, usually the mother. This supports worldwide findings of maternal education as a predictor of child health, often as a proxy for income and access to services.[20] The qualitative results of the present study suggest that the ability to formulate successful strategies—saving, budgeting, economizing—might be important in preventing hunger when economic resources are scarce; this may be related to formal education in several ways. Concepts such as budgeting may actually be learned in formal education settings, or those with higher educational attainment may have had greater opportunities to master such skills through the employment or economic opportunities afforded by higher education. Whether providing more formal education to women as adults could result in less food insecurity for their households is unknown; however, this finding suggests that educational opportunities for females do translate in some way into greater food security for their families. One of the components of adult nutrition

Figure. Comparison of food security status, 2002: North Carolina farmworker households (*N*=102 households) and all U.S. households



education offered by the Cooperative Extension Service is planning to accommodate adequate nutrition on a limited budget. These results suggest that farmworker households might benefit from learning such skills.

There were few clear predictors of food insecurity in these data. This may be because the sample was fairly homogenous on some predictor variables (e.g., access to a vehicle, having working cooking facilities). We were also unable to assess economic resources with measures such as household income and employment history. Economic variables are usually the best predictors of food security, though there is likely to be considerable homogeneity in economic factors among farmworkers. Also, the food security data are based on reports of circumstances for the past 12 months. Because food insecurity may be quite seasonal due to fluctuations in income and the availability of garden produce, predictors of farmworker family food security status may need to be assessed seasonally as well.

Coping strategies included a high use of government services among households with children. This may be an overestimate of farmworker dependence on services because part of the sample was recruited through Migrant Head Start programs, which provide services only to families with small children. WIC participation was about three times as high as that reported by the National Agricultural Workers Survey (NAWS) for 1997–1998.[5] Food Stamp participation, however, which is not dependent on having children, was comparable to the NAWS rate (approximately 10%).[5] Some respondents may not have mentioned programs such as WIC and school lunch in discussing ways to cope with food insecurity because they saw these as routine rather than emergency sources of food. In contrast, households without children used emergency food sources, including food pantries, church-sponsored services, and community agencies, at a higher rate than households with children. Gardens, wild game, and fish were also used in a large number of farmworker households. These alternate sources of food may represent a part of rural foodways traditional to Mexico. Many farmworkers practice subsistence farming in Mexico, or work as farm laborers there when not in the U.S. The use of wild game was associated with food security in households with children.

These findings are significant because of the health, social, and psychological impacts of food insecurity and hunger.[21–23] Previous research has demonstrated that food insecurity is associated with poorer health (e.g., more colds, anemia, earaches). This translates into greater school absenteeism, poorer school performance, anxiety, and behavioral problems.

Limitations to this study include a small sample size and a non-random sample. With no census of the Latino migrant and seasonal farmworker population in North Carolina available, a random sample was not possible. Instead, site-based sampling was used to obtain a diverse group. Such a strategy is necessary in this and other hard to reach populations,[24,25] but it may produce unintended bias in results. Of note, the study area had experienced drought conditions during the year of data collection. This may have produced greater than usual food insecurity by reducing the availability of farm employment opportunities and by lowering household garden yields.

Despite these limitations, the study suggests that substantial food insecurity exists among farmworkers. The use of the USDA's established food security measurement makes

these findings comparable to national data and to the results of other focused studies of local populations.

Recommendations

This study indicates that the population largely responsible for producing the abundant food available to most Americans includes households that experience food shortages and adults who worry about whether their children will have enough to eat. Both short- and long-range solutions should be implemented. In the short term, access to existing emergency food supplies can alleviate hunger. While some churches and other agencies in the area operate food pantries, most are oriented to the indigenous rural community. Such food pantries should expand outreach efforts to farmworkers. This may be especially important for seasonal workers who remain in the area year-round and appear to have limited access to food in the winter or when work is unavailable. Health and social service providers need to explore ways to detect food insecurity through routine screening and to provide access to food supplies when needed by farmworker families in their communities. Additionally, growers should be aware that a significant number of workers experience food insecurity, often in slack periods in the agricultural cycle. Obtaining food assistance for these workers will help ensure an available and capable workforce during peak periods of work, as well as improve the general health and well-being of workers.

Longer-term solutions, both local and national, are possible. Unlike the short-term options, these are more sustainable and can lead to independence from emergency food sources such as food pantries. For example, at the local level, food-buying cooperatives could be established to purchase staple food in bulk and sell it to cooperative members as inexpensively as possible. Such cooperatives generally give members discounts for work contributed. They have the additional advantage of being able to sell foods preferred by members that may not be available locally. Other local solutions are community gardens or other food production enterprises, as well as credit unions or other financial institutions accessible by farmworkers that can provide low-interest loans to help smooth out income cycles.

National long-term solutions necessarily lie in improving economic conditions for this vulnerable population. Alleviating the poverty characteristic of farmworkers will require substantial economic and regulatory change in the production of food. Agriculture as an industry is exempt from many of the labor laws that have been instituted to guarantee overtime pay, workers' compensation, protection of children, and other benefits to U.S. workers. Thus, improving the ability of workers to be able to meet the definition of food security (having access at all times to enough food for an active, healthy life) will require changes in these regulations.

Crafting a solution to the problems of hunger and food insecurity in the U.S. is not within the scope of this paper. While there is considerable willingness on the part of the public to contribute to food pantries and other emergency food programs,[26] it is not known to what extent people are willing to translate this concern into the political and economic changes necessary to produce sustainable reductions in food insecurity.

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