PD-AAQ-242 37302

Trip Report: Doris Howes Calloway, Mexico, March 20-22, 1984

Purpose: To evaluate progress on implementation of Phase II CRSP research, USAID contract #DAN-1309-G-SS-1070-00

Persons Contacted:

Dr. Adolfo Chavez, Director, NIN (CRSP-PI)

Professor Gretel Pelto, University of Connecticut (CRSP-PI)

Professor P. Pelto, University of Connecticut (CRSP-Sr. I)

Dr. Alfonso Mata, Field Director

Dr. Homero Martinez, Clinic and Field Physician

Ms. Elsa Molina Rivera, Chief Field Nutritionist

Ms. Julia Castillo, Chief Field Physiologist

Ms. Marguerite Mata, Laboratory Chief

Ms. Luzma Meneses, Chief Field Social Worker

Ms. Leticia Serrano, Chief Field Dietary Intake

Ms. Eulalia Martinez, Chief Cognitive Studies

Mr. Ramon Lira, Principal Data Management

Dr. Robert Tripp, Nutritional Anthropologist, CIMMYT

The evening of March 20th, I met with Dr. Chavez and the Peltos for a general discussion of the status of the project. The Peltos are spending a one-year sabbatical leave in Mexico (except for summer travel to Finland) and are in residence in Mexico City. Dr. P. Pelto has begun analysis of project socioeconomic data using locally developed microcomputer programs, and provided as examples two preliminary analyses. (Please see attachments.)

The next two days were spent in Solis with Drs. Chavez and G. Pelto, and field staff. At my invitation, Dr. Robert Tripp joined us on

the first day. His expert area is on-farm agricultural research and his comments on the productivity questionnaire were sought. (The Mexico project inquiry in this area is much more extensive than other projects and might be regarded as non-core.) He also participated in a discussion of food consumption methodology and observed a food intake interview in a sample household. I observed a newly-introduced toddler food intake method and visited the laboratory, clinic and offices, and the teams measuring resting metabolism of schoolers and conducting playground observation.

There have been several changes in project management since our last visit (December, 1983). A new chief field nutritionist has been hired (replacing Ms. Serano lost by matrimony in December); she has had some advance nutrition training at the INN and seems a real asset to the project. Rooms have been rented in four locations, in a minimodel of the Kenya project structure. The field staff now numbers about 40. There are also outreach health facilities staffed by young physicians. Since December, 130 households have been enrolled in the study, of which only 7 have dropped out. The project laboratory is still under construction; work has been temporarily stopped until an electrical problem can be resolved. The circuit available has wide swings in voltage and cannot be adequately controlled to instrument needs. Alternatives are to bring a new line from Temascalcingo, tap into the hospital line, or buy very expensive voltage regulators. Meanwhile, laboratory space is being donated in the hospital and routine laboratory work is underway. Pregnancy testing has revealed that 35% of women sampled are pregnant, which is good news for the project, if somewhat

disheartening to the birth control program. Stool parasites are being examined and routine hematologic procedures are in place. The Matas are exploring the possibility of using a Combistix bacteriologic test to assess water quality. If this procedure is successful, it opens up many new possibilities for assessing sanitation at very low cost. Immunologic tests are not yet being made; Dr. Chavez and I discussed the desirability of having expert advice and training available locally. He will follow up with the PI's.

The project appears to have most of its forms in good order for tests currently in progress. If written instruction for methods and administration of forms exist, they were not available for examination. Training emphasizes "hands-on" aspects but, while this is unquestionally needed, it was strongly emphasized that written materials are crucial for continuity, uniformity and quality control. Copies of all forms and manuals were again requested for ME.

Dr. Gretel Pelto reported that a decision had been taken to measure toddler food intake by direct observation (with food weighment) over an entire daily feeding cycle. This is an expensive method as it involves one-on-one observation, but the PI's believe there is no reliable alternative method; I agree. The nutritionist I observed clearly understood the procedure and had elicited the necessary cooperation of the mother. Notes were being taken in ink using a spiral notebook; if this method is to be used routinely, suitable forms will need to be designed to facilitate coding. In the late afternoon a second interviewer came to the house to begin the routine food intake measurement (household food preparation and individual intake of target

S's). It would seem more efficient to have the nutritionist-observer already present do the additional recording required, and/or conduct other appropriately structured observations/inquiries. The PI's were alreadly considering consolidation of some field work to minimize the number of workers, dealing with a given household.

A room for RMR measurement of schoolers has been made available at the school. Cots have been placed in it but several windows are broken and there is no insulation. On the day of my visit, it was uncomfortably cold and hence, unsuitable for test purposes. The team is making creative use of makeshift equipment (a Kofranyi for measurement of volume, with expired air sampled in large plastic syringes) as the new Beckman apparatus is still delayed in customs. There is no barometer available as yet but Dr. Allen is procuring this essential instrument. In the case of adults, the plan is to measure BMR in their homes early in the morning (teams begin work about 0500 hours). This will provide an ideal opportunity for recording body weight as well. According to Dr. Mata, it will not be possible to measure skinfold thickness of adults due to objection by male heads of household. This development will have to be discussed by the SCB but the project staff should be encouraged to try for upper arm measures, at least.

Playground observation seemed to be under control but we did not linger as our presence was a deterrent to usual behavior. Cognitive tests have been completed on nearly all adults in the present sample population. Cognitive measures of infants and toddlers are not yet in place; the principal field worker was away, receiving training in the methodology, in the United States. Dr. Gretel Pelto and I discussed the problems this poses, i.e. that the method may need adjustment for local

conditions, and that toddlers now enrolled are passing the ages designated for measurement. Staff were reminded of previous advice, to enroll toddlers at 15 months of age in order to be ready for the 18-month measures.

Morbidity questionnaires are being administered weekly, using a simplified reporting system, as was agreed by the project physicians at their last meeting. Principal data are presence or absence of illness and grade of incapacitation (1-3). A system for differential diagnosis and specification of intervention has been developed, using the Apple computer. This program is used particularly for training new staff (physicians and auxilliaries). Data presently stored locally include the complete community census (project and other), and vaccination and other health records. Programs have been developed locally to retrieve selected information. According to Drs. Martinez and Mata, the Apple is used only on Fridays for non-project health studies, that being the day that project staff meetings and weekly case reviews occur. Collection of non-project data will allow determination of the degree to which the project population is representative of the health conditions of the community, but the PI's should be aware that this is not necessary to the research design and costs (time and resources) invested in this manner must be carefully weighed against other non-core research priorities.

Food intake measurement remains a serious and unresolved problem. Dr. Tripp and I received mixed messages about the reliability of reported food purchase and other food transactions as a measure of household food consumption; the PI's should now validate this method by

other measures of a representative sample of households, and also assure that the variance in a purchased weight or measure is known reliably. The most distressing discovery, however, is one made by the new chief field nutritionist. She states that accurate recording of tortilla consumption remains a great difficulty; she believes that of the 123 households currently enrolled, data are fully trustworthy for only 49 and marginally so for another 50. I asked that codes for these households be identified with the data tapes, and that the 24 unreliable sets be eliminated. Various strategies were discussed; the most promising appeared to be allocation of tortillas by count in plastic bags with color coding of target S's.

The difficulty of conversion from raw weight of food to portions as eaten was again raised by Dr. Pelto. Cooked yield of recipes is being recorded in the case-study families and examination of these data should aid decision-making about the need for laboratory analysis, individual household factors and the like. Questions about diet composites were held for the May SCB meeting.

All present were reminded of the requirement that all target subjects be enrolled by October, 1984 and that all outcome variables must be appropriately linked to food intake over 12 months for each subject or mother-infant pair. Decisions as to whether or not the population provides the variability needed to test hypotheses will be made on the basis of data available May 1, 1984.

Dr. Gretel Pelto was taken quite ill and Dr. Chavez left the city on business the following day, so I did not hve an opportunity to discuss Dr. Tripp's comments (reported to me 3/25) with them. Dr. Tripp

thinks that there is some opportunity for simplification of the productivity questionnaire and that simplification is highly desirable. He will discuss this with Dr. Pelto personally.

The project has come a long distance since December but serious problems remain.

Recommendations:

1. The PI's need to give close, consistent and sustained attention to field work. Dr. Chavez cannot be expected to carry more of this major burden than he already does, given his other responsibilities, so it is fortunate that Dr. Pelto has leave to do so.
2. Solution of food intake measurement problems must be highest priority.
3. Performance of core research components must reach 100% (quantity and quality) by October, 1984. Hard work and more staff will be required to reach this goal.
4. Training manuals, protocols and forms must be prepared or revised as required. Forms should be given identifying numbers and data of original/revised versions. An archival copy of each form, in Spanish and in English, should be sent to UCB.

Attwell

SOCIOCULTURAL DATA FROM SOLIS:A PRELIMINARY REPORT / P. Relto 3/84

This report has two primary objectives:

1. to present descriptive data on a portion of our Solis research sample, in order to acquaint project members with some basic parameters as collected in the sociocultural and socioeconomic interviews in 54 households.

2. to examine the kinds of data analysis that are possible and useful using the APPLE microcomputer on relatively small subfiles from our data system. These data analyses with microcomputers will in any case be of great importance for tracking significant relationships in our rapidly accumulating mass of data files. We will show, however, that these microcomputer analyses can be an important aspect of later, advanced processing of the data.

INTRODUCTION

A considerable body of data from 54 households were availab le in January, 1984, from initial full-scale research, including the full socioeconomic and sociocultural interviews. The first interviews were with the female heads of households, so that certain features (including travel and aspirations for sons/daughters may be expected to be fairly different for the male household heads. Comparisons with those data will be presented in a later report.
These data were entered into a data file using the A-STAT statistical program for the Apple IIPLUS. The details of data entry and working with the A-STAT program will be discussed below. Because a great deal of preliminary sociocultural and socioeconomic research has been carried out in the past year of pre-testing of instruments, the "goodness of fit" between these current data and social, economic, and cultural features in our other research communities can be assessed with considerable confidence.

ASPIRATIONS FOR CAREERS OF SONS AND DAUGHTERS

The levels of aspiration for sons and daughters is a strong indicator of "modernization" and social change in any region. To some extent aspirations reflect unrealistic dreams and hopes for the next generation, but they at the same time are usually not totally divorced from reality. If large majorities of people "wish" that their children receive college educations, then pathways to colleges and universities are to some extent available to the population, even though it may be somewhat unrealistic to expect that their children could manage the financial resources, and the years of "delayed gratification" involved in serious university study.

The data in the following tables show clear distinctions between aspirations for male children as compared with female children. In accord with very widespread rural value orientations, this population wishes much less education and professionalism for their daughters than for sons.

TABLE I LEVEL OF EDUCATION DESIRED FOR SONS/DAUGHTERS

LEVELS	SONS		DAUGHTERS	
	NO.	%	NO.	%
Primary school	11	21	21	41
Secondary schl	14	27	15	29
Preparatory	10	19	6	12
Higher Ed.	16	31	9	18

TABLE II. LEVELS OF CAREER DESIRED FOR SONS AND DAUGHERS

LEVELS	SONS		DAUGHTERS	
Primary	9	18%	-	-
Housewife/home	3	6	23	46
Factory Worker	3	6	4	8
Teachers/etc	17	35	4	8
Professionals, etc.	17	35	9	18

(totals differ because of missing data)

As we see from these data, there is still a strong tendency for people to want their daughters to be more-or-less traditional housewives. This emphasis is even stronger when we note in the table below that these householders strongly desire that their children remain in the local area, indeed in their natal community!

TABLE III. DESIRED RESIDENCE LOCATIONS FOR OFFSPRING

LOCATION	SONS	DAUGHTERS
This community	47	50
Nearby comm.	1	
Mexico City	2	1

The data concerning desired living locations for sons and daughters are revealing in their degree of endorsement of local living conditions. The people of the Solis Valley area may feel that life is hard, the economy is deteriorating, prices keep going up; but there is very little sentiment favoring "getting out of here" to find a better life in the city or some other more promising location. This strong and continued faith in the local community is significant, particularly in the face of the considerable amount of actual out-migration. Thirty-seven percent (approximately) of the brothers/sisters of our sample have moved to urban locations, most of them to Mexico City. In addition, there is considerable temporary migration of persons to wage work in Mexico City. In this generation, at least, the sentiment is in favor of "keeping 'em down on the farm."

TRAVEL EXPERIENCE

The women interviewed are not very well travelled, except in very local terms. In the following table we see that the majority of these women have not travelled to urban centers during the past 12 months. On the other hand, most of them go to the nearby market center of Temascalcingo at least monthly.

TABLE IV. TRAVEL EXPERIENCE IN PAST 12 MONTHS

TIMES	GILACOMULCO	TOLUCA	MEX.CITY
0	37 (73%)	47 (93%)	36 (71%)
1	4	1	4
2/3	5	1	8
4 OR MORE	8	5	6

TABLE V. VISITS TO TEMASCALCINGO MARKET

PER MONTH	NO.
0	4
1	10
2	15
3	4
4	17
MORE	4

The Temascalcingo weekly market is on Sundays, with considerable activity continuing on Monday. (cf. DeWalt, Bee, Pelto, 1972). Large numbers of vendors arrive in the town on Saturday afternoon to set up their stands of produce, factory-made clothing, jewelry, household goods, and other items. The Sunday market is a major source of both perishables and non-perishable merchandise for the Solis Valley population, although for food supplies it is undoubtedly much more important to the local townspeople than for the villagers in our research communities. The market may be a major source for clothing and miscellaneous household supplies other than food, as we note that fully 90% of our respondents buy clothing for their families in Temascalcingo. Although the several general stores in town certainly account for a portion of this trade, the weekly market appears to be the more signficant source for dry goods.

TABLE VI. LITERACY AND MEDIA CONTACTS

	LITERATE	OWN RADIO	TELEVISION
NO	20 (37%)	9 (17%)	32 (59%)
YES	34 (63%)	45 (83%)	22 (41%)

TABLE VII. PROGRAMS LISTENED TO/WATCHED

	COMICS/NOVELAS	NEWS	MUSICAL
FREQUENCY			
RADIO			
Never	39	25	13
1-3/wkly		13	15
4-7/wkly		16	26
TELEVISION			
Never	41	44	–
1-3/wkly	8	6	–
4-7/wkly	5	4	–

The data show that the radio is much more important than the television in terms of frequency of listening/watching. Contrary to some reports, the farm women in the Solis Valley spend rather little time in watching soap óperas(novelas), or much of anything else on television; in part because only a minority of households have television sets in working condition. This situation is changing rather rapidly, as television sets have been important acquisition items in the past few years. However, our researchers report that women's activities demand a fairly strenuous dedication to work routines, in various locations away from the television (which is usually placed in the least used part of the house.

Radios, on the other hand, are much more important, in terms of frequency of use. Musical programs are the favorites, but we note that about half of the women household heads listen to the news at least weekly. Fifteen women reported listening to the news every day.

FAMILY AND SOCIAL SUPPORT SYSTEMS

Social support systems--the networks of kin and non-kin that people count on in times of shortage or need (including illness)--are likely to be significant indicators of the adaptive flexibility and resourcefulness of families. Families with few kin contacts, with fewer regular social ties, may be unable to cope with illness or temporary food shortages effectively, hence the burdens of marginal socioeconomic status fall more severely on them. In our sociocultural data we have information on the "Who would you go to to borrow small amounts of food...." "From whom would you borrow a burro if you needed some hauling...." and other questions concerning occasional support. The following composite code contains the number of types of persons (e.g. neighbor, in-law, sibling, cousin, sons, compadres) mentioned, and the total number of mentions of helping persons. Thus, in this initial tabulation we have not attempted to separate out different patterns of social support such as "all kin" "mainly non-kin" or other combinations.

TABLE VIII. SOCIAL SUPPORT NETWORKS OF FAMILIES
(Composite score of helping persons mentioned)

	# families
0-30	7
31-40	9
41-50	21
51-	17

(Composite score is constructed from number of types of persons and total number of mentions of persons....e.g. "father, neighbors, in-law, sister and storekeeper" would be a "5" in the first column; if the total number of mentions in the response were 8, then we get a composite score of "58". Persons with scores in the 20s therefore only mentioned two helping persons in response to the 5 questions.)

A second major source of social support and resource management is from the governmental social and economic programs in the Solis Valley region. These government sponsored programs include "DIF" (Integral Family Development Program), Banrural (program of loans to agriculturalists), the Nutrition Institute (current research program), public health services, and others. Householders were simply asked if they were familiar with these programs. Knowledge of the existence of the programs was felt to be at least a first step to utilization of such programs when the need arises.

TABLE IX. KNOWLEDGE OF GOVERNMENTAL SUPPORT PROGRAMS

#PROGRAMS	#FAMILIES
0	7
1	13
2	9
3	10
4	3
5	6
6	6

These data do not give a particularly strong impression of the levels of information in the families. Perhaps some of the programs, such as the Banrural, are more the province of the male heads of families. However, 4 of the 6 programs in our interview were concerned with health services, about which we would have expected that the female household heads should be at least moderately informed. To the question of whether they have received services from any of these programs only 13 families reported receiving services from two or more programs; 20 families reported services from one program; and 19 reported receiving no services. Most of the contacts reported were in health services.

Aside from social support from kin and non-kin, plus contacts with governmental agencies, a major source of strength for managing economic and other problems in the family is in <u>information.</u> Of course the "knowledge of governmental programs," above, is an important measure of information. We also sought an indication of the respondents' awareness of the wider world, using such informational items as "name of president," "capital of the State of Mexico," "Who was Lazaro Cardenas", as well as naming the President of the municipio and current head of the local Ejido (community land-holding organization). The results of our information questions provide a relatively accurate picture of knowledge and information levels in the region. As it turns out, only 32 of our 54 female respondents could name the current president of Mexico. Less than 10 respondents could name any countries that border on Mexico, while 32 gave a fairly accurate estimate of the cost of the bus ticket from Temascalcingo to Mexico City. Rather few people seemed to know the name of the governor of the state, or even the location of the capital of the State (Toluca), even though many local people travel to Toluca fairly regularly. About half the respondents knew that Lazaro Cardenas was a former president of Mexico. The following table shows the number of correct answers in the total of eight questions.

TABLE X. INFORMATION SCORES
(No. of correct answers to eight questions)

SCORE	NO. OF RESPONDENTS
0	5
1	9
2	12
3	9
4	7
5	7
6	1
7	4

HOUSING, HOUSEHOLD SIZE, AND MATERIAL STYLE OF LIFE

The modal family size in this subsample is seven persons, which corresponds fairly well to the family sizes we have previously found in the full-scale census of the research area. The range is from 3 to 15 persons, reflecting the fact that these families in our research sample will, of course, not include any single-person or two-person households. The following table shows the distribution of family sizes.

TABLE XI. HOUSEHOLD SIZE

NO. OF PERSONS	NO. OF HOUSEHOLDS
3	5
4	3
5	4
6	7
7	10
8	4
9	5
10	7
11	3
13	1
15	2

The houses in this research subsample are slightly larger than the overall averages for the valley area. Instead of the 2 room median throughout the area, this sample has 3 rooms, on the average, with only 3 households reporting a single room dwelling. The floors are mainly cement (27) brick (5), or a combination of the two (4 houses), though 12 families in this sample have a simple dirt floor. (Three houses have a combination of dirt and cement floors.) Half the houses have tile roofs, while another 12 homes are roofed with cement. Various combinations of galvanized iron, pressed asbestos, or other sheeting accounts for the other roofs. Walls are mainly adobe (36 houses), with 8 cinderblock, 2 of stone, and 5 with brick walls.

Fifteen homes report having no windows. Ten have only one window, and only 13 houses have 3 or more windows. In many cases these windows do not have glass panes, however. Thus, in an area that is above 2500 meters in altitude, with cold winds and frequent frosts in the winter months, it is possible to say that the houses are less than full protection against cold and damp. The costs of fuel in the region are such that few families would be able to spend money for heating of rooms; however, even affluent families in central Mexico general do not heat their houses, except for occasional use of small electric and gas space heaters (which are practically unknown in the research area.)

In surveys conducted throughout the valley region 15 years ago, it was apparent that beds were a scarce and costly consumer luxury. Most people slept on straw pallets on the floor. Now the situation has changed drastically, for only one household in the sample reported having no beds. The following tables show that beds have become common household furnishings in the region, although in most families there are many fewer beds than persons, with considerable doubling and "tripling up" in sleeping arrangements.

TABLE XII. NUMBERS OF BEDS

SINGLE BEDS	NO. HOUSEHOLDS
0	37
1	11
2	2
3	1

DOUBLE BEDS	NO. HOUSEHOLDS
0	1
1	14
2	19
3	9
4	6
5	2

The following table shows the range of frequencies in possession of key household furnishings and other equipment. This list of "material style of life" items provides, in our view, the best sensitive indicator of the economic status of the households. Households with 5 or 6 or more items from the list of material items can be regarded as relatively affluent in economic means, compared to the families who have only a radio and one or two other items. The price estimates of the items are rough averages, estimated by a research assistant well acquainted with the Zo_is Valley area. Items such as radios, television, and record players can, of course, have quite varied prices. Some may have been purchased second-hand, some may be "contraband", and of course the prices (and values) differ greatly depending on the year of acquisition of the goods.

TABLE XIII. MATERIAL STYLE OF LIFE (GOODS) IN HOUSEHOLDS

ITEM	NO. OF HOUSEHOLDS	AVE. VALUE
gas stove	32	29,000 pesos
television	22	25-35,000
radio	33	2-4,000
record player(tape)	24	16,000
record player	10	40,000
blender	28	4,000
electric iron	35	2,000
sewing machine	13	25,000
wardrobe	31	6-9,000
dining table	14	9-14,000
dish cabinet	16	7,000
refrigerator	8	40.000
vehicle	2	200,000 +

Another major economic resource that should be considered in these families is the numbers of animals they own. In general, meat animals and draft animals have held a central place in counting the well-being of agricultural families. Practically every families needs to have ready access to a horse, mule, or at least a burro, for hauling equipment, food, fuel, and many other kinds of materials. Meat animals have traditionally been a mode of savings. Thus, whenever a family needs ready cash for special purposes or for an emergency, the sale of a pig, sheep, or a few poultry generally met the situation. On the other hand, some diversification of life-styles has entered these communities, so that one can find a few families with economic means but few animals. Presumably they keep any excess money in the bank instead of in animals. Also, there are a few families in which the household material possessions are scant, yet they have more than average numbers of animals. Thus, in our earlier sample of 112 households from the four research communities the correlation between "animals owned" and "material style of life" was only some --------. Dewalt reports from his 1974-75 research in a nearby community within the valley region that "animal wealth" correlated with "material style of life" at .35, which is statistically significant, but at the same time indicates that these two different indicators of economic resources are substantially different measures of wealth levels.

TABLE XIV. ANIMALS OWNED BY HOUSEHOLDS

	HOUSEHOLDS/NO. OWNED				APPROX. VALUE
ANIMALS	0	1	2	MORE	(AVE. PER ANIMAL)
Mules	30	5	9	1	30,000
Ox	47	1	3	0	45,000
Cow	29	8	8	6	45,000
Horse	21	18	9	3	30,000
Pig	34	7	3	6	13,000
Burro	26	22	1		8-10,000
Goat	30	1			3-4,000
Sheep	38	2	3	5	3-4,000
Turkeys	17	3	5	14	1,500
Chickens	12	(1-5)20	(6-10)14	(more)5	400

From the table we see that most households have turkeys and/or chickens, but many households have very few larger animals. Only 10 households have sheep, and only one family has a goat. This corresponds with our earlier studies in the valley area, in which it was noted for example that goats are kept by a small minority of families. In some communities of the area we will find larger numbers of pigs. Raising and marketing pigs appears to be an important economic strategy in some communities, perhaps because of the presence of local middlemen with trucks. The estimates of values from a key informant are approximations, based on healthy, mature animals. In some cases, however, the numbers of pigs or sheep listed undoubtedly include immature and unhealthy specimens, whose values would be considerably less than the amounts listed here.

SOME BIVARIATE RELATIONSHIPS

We will explore some bivariate relationships in these data, simply to illustrate a few of the kinds of lower level, but useful, statistical analyses that we may wish to carry out using the Apple microcomputer. All of these data were assembled using the A-STAT program on the Apple (plus (48 K) microcomputer.

We are of course interested in the inter-correlations among our various statistical data. in order to search for significant patterns of relationship at this early stage of research. and in order to check that certain usually expected relationships actually occur in patterns that lend support to the veracity of the basic data-gathering process.

For example, we would expect that there would, in these small houses, be a relationship between the number of "double-beds" (camas matrimoniales), and the number of rooms. After all, the rooms are small--a one-room house can't really have very many double beds. The following table supports this common sense view:

TABLE XV. DOUBLE BEDS BY NUMBER OF ROOMS

	ROOMS						
DOUBLE BEDS	1	2	3	4	5	6	9
0	0	0	1	0	0	0	0
1	2	7	5	0	0	0	0
2	1	6	8	2	1	1	0
3	0	1	5	2	1	0	0
4	0	0	1	3	1	1	0
5	0	0	0	1	0	0	1

CHI SQUARE=----- P. 0 .....
TAU-B .51
COEF. OF CORR. .71
GAMMA .66

In circumstances of even moderate affluence we would expect that the numbers of beds in homes has a relationship to the numbers of persons. On the other hand, in earlier years--only a decade ago--most people slept on straw palletes and only a few wealthier homes had beds. Let us, then, examine the relationship of beds to number of people in the household. Table XVI. shows the inter-coorelations of persons and beds.

TABLE XVI. PERSONS AND BEDS

PERSONS	BEDS 0-1	2	3+
3-7	8	6	15
8+	5	10	7

(51 CASES)

These data are very revealing, for they clearly demonstrate that some factor other than "number of persons in household" accounts for the number of beds. The most likely other explanation is, of course, the relative wealth of the household in relative local terms. It is a poignant, but extremely realistic lesson for us to note the following relationship between presence of TV in the house and the number of double beds:

TABLE XVII. RELATIONSHIP OF BEDS TO PRESENCE OF TELEVISION

BEDS	TELEVISION YES	TELEVISION NO
0-1	2	10
2	3	13
3+	16	6

Chi Square=
Gamma .68
Tau-B .43
Lambda(col.).41

The following table, showing the relationship between the ownership of beds and possession of gas stoves gives us the same picture as the relationship to television ownership:

TABLE XVIII. RELATIONSHIP OF BEDS TO GAS STOVES

BEDS	STOVE	NO STOVE
0-1	6	6
2	4	12
3+	14	0

Chi Square=
p. =
Gamma = .68
Tau-b = .42

Clearly these two indicators--television and gas stoves -- are general indicators of economic status and resources. Thus, we can generalize with some confidence that the numbers of beds in households reflect relative affluence, rather than simply the number of persons in the households. We can expect with considerable confidence that these same relationships will be found in the other communities of our research sample.

The people of the Solis Valley have invested very considerable financial resources in their houses and furnishings. Another interesting reflection of the inter-relationships of wealth indicators is that between number of rooms in the house and presence of a television (from the table earlier we recall that slightly less than half the households have TV):

TABLE XIX. NUMBER OF ROOMS RELATED TO TELEVISION OWNERSHIP

NO. OF ROOMS	TELEVISION YES	TELEVISION NO
1	0	3
2	3	11
3	7	13
4+	12	2

Chi Square = (SIG.)
C = .51
Gamma = .74
Lambda = .45
Tau-b = .48

EXPENDITURES FOR FOOD

How much people spend for food is of course a major variable affecting the levels of nutrition and malnutrition in our sample households. From the pilot research thus far it seems clear that there is a good deal of variation in the diversity and extent of food resources in the families. Dietary intakes vary substantially; and so do the expenditures for food. Total expenditures for food do no necessarily express all the richness of a household's food resources, however. Some households have higher weekly expenditures for food simply because they have fewer home-produced resources. The following table shows the considerable range of expenditures weekly, as reported to our interviewers.

TABLE XX. WEEKLY EXPENDITURES FOR FOOD

WEEKLY EXP. (PESOS)	NO. HOUSEHOLDS
500 PESOS	6
800	1
1000	10
1200	1
1400	1
1500	5
2000	15
2100	1
2500	3
3000	6
4000	1
	(50 CASES)

Naturally one would expect that expenditures for food would vary with the number of persons in the household. Households with only 3 persons should tend to be in the low expenditure category, compared with families of 10 or more persons. Table XXI shows the relationship between these two variables, and we see that "number of persons in household" is a rather weak predictor of the total (weekly) expenditures for food.

TABLE XXI. EXPENDITURES FOR FOOD IN RELATION TO HOUSEHOLD SIZE

PERSONS IN HOUSE	WEEKLY EXPENDITURES FOR FOOD LOW	HIGH(ABOVE MEDIAN)
3	3	2 (No. of mshlds)
4	2	1
5	3	1
6	6	1
7	2	8
8	3	1
9	1	4
10	2	5
11	1	2
13	1	0
14	1	1

Chi Square = N.S.
Tau-b .21
Gamma .30
Somer's D(SYMM.) .20

Since we have earlier identified ownership of beds as a significant indicator of family wealth (material style of life), we can examine the intercorrelation between "number of beds" and "weekly expenditures for food" to see if material style of life is a stronger predictor(than number of persons) of the food expenditure patterns. Table XXII. shows the relationships of these variables:

TABLE XXII. NUMBERS OF BEDS IN RELATION TO FOOD EXPENDITURES

NO. BEDS	EXPENDITURE FOR FOOD BELOW MEDIAN	ABOVE MED.
0	0	1 (MSHLDS)
1	10	1
2	8	8
3	4	5
4	3	7
5	0	3
6	0	1

CHI SQUARE. SIG. .01
Tau-b .39
Gamma .59
Somer's D. (SYMM.) .38

Again we can turn to the ownership of television as another indication of upper socio-economic resources (higher material style of life), in relation to weekly food expenditures. Table XXIII. shows the relationship between the two variables:

TABLE XXIII. WEEKLY FOOD EXPENDITURES IN RELATION TO TELEVISION.

WEEKLY FOOD EXPEND.	TELEVISION YES	NO
ABOVE MEDIAN	19	7
BELOW MEDIAN	3	22

CHI SQUARE = 16.97
D. (.0001
Tau-b .62
Gamma .90
Somer's D(sym).62

The striking correlation between weekly food expenditures and ownership of television gives us two important clues about our field data. In the first place these striking patterns would appear to underscore the general accuracy and consistency of the basic field data. Evidently our field workers are getting accurate (or at least, distinctively patterned) information in the interviews. If, on the other hand, our field interviewers were carelessly getting random answers from the respondents, the analyses here would be full of random error, full of very low correlations, lacking in patterns of usually expected correlations.

The second major "clue", in the two tables above, has important implications for our nutrition project. The fact that our material style of life indicators are stronger than the number of persons in family, as predictors of weekly food expenditures would appear to indicate that many families are indeed living very close to, or below, the economic margins. That is, families, even large families, are restricting food expenditures because they have very limited economic means. This inference from the above data fits with the earlier observation above: in answer to the question of what they would do if they suddenly got more money, many families replied that they would buy food.

We can examine one more indicator of material style of life in relation to "weekly food expenditures", simply to see if there might be anything different in that particular variable. TABLE XXIV. shows the relationship between weekly food expenditures and the ownership of gas stoves.

TABLE XXIV. OWNERSHIP OF GAS STOVE IN RELATION TO FOOD EXPENDIT.

FOOD EXPENDITURES	GAS STOVE YES	NO
ABOVE MEDIAN	20	6
BELOW MEDIAN	12	13

CHI SQUARE: SIG. .04
Tau-b .30
Gamma .57
Somer's D (SYM). .30

The relationship between gasstove ownership and weekly food expenditures is not quite as striking as that between television sets and weekly food purchases. In looking at the table we are struck by the possibility that gas stoves are not quite the "luxury item" that television sets constitute. Gas stoves are becoming more and more essential, as the costs of other fuels (firewood, charcoal, etc.) have continued to rise. It would appear that a number of relatively poor families have managed to buy gas stoves, even though they are not able to spend much for food on a regular basis. On the other hand, the large majority of the somewhat more affluent families have bought gas stoves, hence the ratio of 20 to 6 in the top line of our table above.

Based on the correlations examined thus far, we can of course develop a large number of additional questions. These questions will be examined in the next installment of these statistical analyses, based on (probably) an additional sample from another community. That is, a comparison of some of these same data from San Antonio (for example), would give us a view of possible moderate differences between the communities in socio-economic characteristics affecting food use and other key variables. We already know that San Antonio has a somewhat lower rate of out-migration for temporary wage work, for example...These are the kinds of small-scale differences in sociocultural, economic, and other characteristics which we should examine in much detail as the research continues.

Attach #2

SOME COMMENTS ABOUT STATISTICAL ANALYSIS WITH MICROCOMPUTERS / R. Pelto 3/84

All of the statistical data presented above have been processed with the APPLE IIPLUS, using the A-STAT program package developed by G. Brandon of S. Florida University. The sample of 50 households, from San Nicolas, is opportunistic and not of course representative of the entire valley area. On the other hand, we have quite clear ideas of what sorts of data to expect from San Nicolas, from prior data analysis. so that these experiments can be quite revealing, though we expect to see some differences when we get into data from, e.g., San Antonio...

Based on the above statistical analyses we can quickly affirm that there is an important level of data manipulation that can be accomplished quite handily with the Microcomputer. Samples of at least 120 cases can be managed, with up to 45 variables in the matrix. When cross-tables are entered, it may take a couple of minutes, depending on the complexity of instructions entered, but a couple of minutes of waiting is nothing compared to the possible waiting times to get access to bigger machines.

The A-STAT program package works well enough with simple statistics, such as the bivariate analyses in the data above. However, A-STAT will also run regressions, and some sort of simple PATH ANALYSIS, which I haven't yet tried. Thus, full exploration of the A-STAT should give us a fairly wide range of capabilities for analysis of moderate chunks of data.

I feel that we should do alot of data analysis with subgroups from the total sample, especially in early stages. It will be useful, for example, to keep the several communities separate in many data analyses...then lump them together later. Several of our subsets of "cases" are going to be in the neighborhood of 80-100 even in later data analysis.

These early explorations in the data are important for several reasons:

1. We can explore most useful ways to sort out, and aggregate, complex variables. For example, we will need to look at a number of different ways to express family food intakes, and family food diversity.

2. Simple frequencies, and cross-tabs, can help to identify variables that are "not working." Variables may be theoretically just fine, but if there is no variation in them, then continued collection of the information accomplishes nothing useful.

3. Continued working with the data, in small batches, can be very important in identifying errors, especially repeated and patterned errors or biases in data collection.

4. Perhaps most important from our immediate perspective is the fact that continuing anaysis with small samples simply gives us a closer "feel" for the data--for the actual shapes of relationships and patterns out there in the communities. Most of the time we are intimidated in searching through the data, because of the immense difficulties in analysis of even very small numbers of cases. The usual solution has been to do selected "hand sorting" of cases, to explore a few limited questions. With the microcomputer we can do a great deal more than that, and really become fully acquainted with the data.

5. I have the feeling that we will be able to do much more. The fact is, that in practically all large-scale projects of this type, the researchers basically lose track of their data for long periods of time, as the process leaves their hands and disappears "out there" to the big Computer Center people. Using microcomputers, we should continue to have close control of what is going on, and we may be able to carry out something close to 70% of the major data analysis at the microcomputer. Granted that we will have some extremely complicated analysis to work with when we have longitudinal, multi-timepoint, data to work with.

Some of the main problems are these: that the A-STAT program, at least as I understand it thus far, cannot very effectively group individual items into larger, "key variables." I can get the program to add two variables together, and it will supposedly transpose an individual variable into some multiple or other, but, say, adding up "all the MATERIAL STYLE OF LIFE ITEMS" into a single variable does not seem to be possible.

Also, the program seems awkward and fussy about many aspects of how data are entered. When we are entering a file of data, it is not possible to back up and correct mistakes easily. One gets the impression that the entire system was created by someone who did not have alot of experience in dealing with "field level data", in which alot of manipulation and experimentation is the usual procedure.

There are two main lines of solution to some of these problems. In the first place, RAMON seems very capable, and interested, in devising programs OUTSIDE THE A-STAT program, which then can be entered into the A-STAT as a series of ready-made formats. That is, if we can't aggregate a bunch of items in a composite variable INSIDE A-STAT, we can aggregate them in fairly simple programs designed by RAMON, and then use the A-STAT procedures on these ready-made packages.

The second possibility, which deserves exploration, is that some new programs have come out, or are coming out, for the APPLE IIPLUS, which are more flexible and versatile than the A-STAT. Certainly we can continue to run numbers of simple and quite informative statistics of the type discussed above. We can also explore the use of the more complex processes in A-STAT, which does include (supposedly) the stringing together of separate files. So we have no need to give up completely on this set of programs, even though we should be exploring more streamlined, updated possibilities. (The microcomputer programmers are among the most aggressive and hard-working folks in all North America today....we simply have to keep track of what their newest products can do...)

AN EXAMPLE OF MICRO-DATA ANALYSIS: WITH A-STAT

I constructed a file from 49 households in San Nicolas, from the SOCIO-ECONOMIC/MIGRATION interviews. The file contains 20 variables, as follows: IDENTIFICATION VARS: 1.communidad: 2. familia; 3. individuo; 4. fecha. Then the following variables that are all designed to measure economic resources in one way or another:

3. camas (total of matrimoniales and individuales)
6. personas
7. cosas (total of all items listed, without weights)
8. animales (weighted as follows: cow,horse, ox, mule=10; burro or pig=5; sheep,goats=2; turkeys=1; chickens= .5.)
9. instrumentos (of agriculture) total of all items listed, not weighted.

10. WEEKLY COSTS OF FOOD PURCHASES (TO BE A MAJOR DEPENDENT VARIABLE)

11.-20. Various data on the migration pattern, mainly focussed on the head of family. Of these, the following were the only ones to be used in later analysis: 11. JEFEMIGRA (months worked in wage work outside the valley); 12 JEFEPATRON (pattern of wage work outside the valley in the past 5 years.)

It is worth noting that the patterns of out-migration to wage work of other family members did not amount to anything significant enough for statistical anslysis in this sample.

Some quite interesting features can be examined with simple cross-tabulations. For example, we are quite interested in the relationships between Material Style of Life, as measured in household goods/equipment such as gas stoves, television, and other appliances <u>and</u> the relative values of peoples' animal holdings. Table I shows the relationship between the two variables for this sub-sample.

TABLE I. RELATIONSHIP OF MATERIAL STYLE OF LIFE TO ANIMAL WEALTH

ANIMALS	MATERIAL GOODS 1	2	3	4	5	6	7	8	9	10+
BELOW MEDIAN	8	3	3	4	4	1	2	1	1	3
ABOVE MEDIAN	1	0	0	3	0	3	3	1	4	4

Chi Square 22.0

p <.02

Tau-b .39

Gamma .57

Somer's D .37

This cross-tabulation shows that there is, indeed, a relationship between household Material Style of Life, but the correlation is less than .50. DeWalt, in his intensive study of agricultural patterns in the Temascalcingo Valley region nine years ago found a very similar relationship. These data suggest that we may, for some general purposes lump together the MSL and the animal wealth variables, but the two domains should be kept distinct for many data analyses, as they are clearly measuring somewhat different dimensions of household economic strategies.

After examining some of the cross-tabulations in this small data set, I used the "CORRELATIONS" program of A-STAT with the following data set:

VARIABLE	MEAN	ST. DEVIATION
FOOD COSTS (3 PT. SC)	1.88	.73
BEDS	2.63	1.35
PERSONS IN FAM.	7.45	2.9
MATERIAL THINGS	5.5	3.5
ANIMAL WEALTH	39.8	31.2
FARM IMPLEMENTS	8.5	5.4
MIGRATION: FAM.HEAD (in months)	3.1	3.6

The correlation matrix of these variables shows some interesting relationships (Pearson product moment correlations):

TABLE III. CORRELATION MATRIX AMONG ECONOMIC/MIGRATION VARIABLES

	BEDS	PERSONS	MATERIALS	FOOD EXP.	ANIM.	IMPL.	MIGR
BEDS	—	.10	.61	.41	.49	.54	.0
PERSONS		—	-.05	.10	.15	.20	-.02
MATERIALS			—	.60	.43	.25	.27
FOOD EXPEND.				—	.20	.19	.30
ANIMALS					—	.63	-.03
IMPLEMENTS(FARM)						—	-.08
MIGRATION OF FAM. HEAD							—

From this matrix we can now turn to examine the pattern of predictors affecting reported weekly food expenditures. Some families reported food expenditures of less than 1000 pesos per week; others reported 3000 pesos or more. We can now look at the way in which all our variables together (minus the farm implements) affect food expenditures. The following multiple regression analysis was run in A-STAT, based on the data in the correlation matrix above.

TABLE IV. PREDICTORS OF WEEKLY FOOD EXP. MULTIPLE REGRESSION

	BETA	Simple R
BEDS	.121	.41
PERSONS	.13	.1
MATERIALS (MSL)	.54	.60
ANIMALS	-.10	.20
MIGRATION(HEAD)	.16	.30

MULTIPLE R = .64
R SQUARE= .41

In field research terms, a Multiple R of .64 is quite a strong prediction. Nearly half the variance in reported weekly food expenditures is accounted for. The extremely strong effect of MSL (which we feel represents household economic fluidity), is further supported by the "beds" variable, which we treat separately here because it appears to have interesting patterns of its own. The low correlation, and weak contribution, of "number of persons", tells us that people are undoubtedly living close to the economic margins, and many large families are simply unable to afford expanded food expenditures, despite their needs. Animal wealth is quite interesting, for it shows the expected rural agricultural pattern--families with alot of animals can get by with slightly less cash expenditures for food. Finally, the migration of the family head (usually to Mexico City to day labor), contributes a small increase in household food moneys.